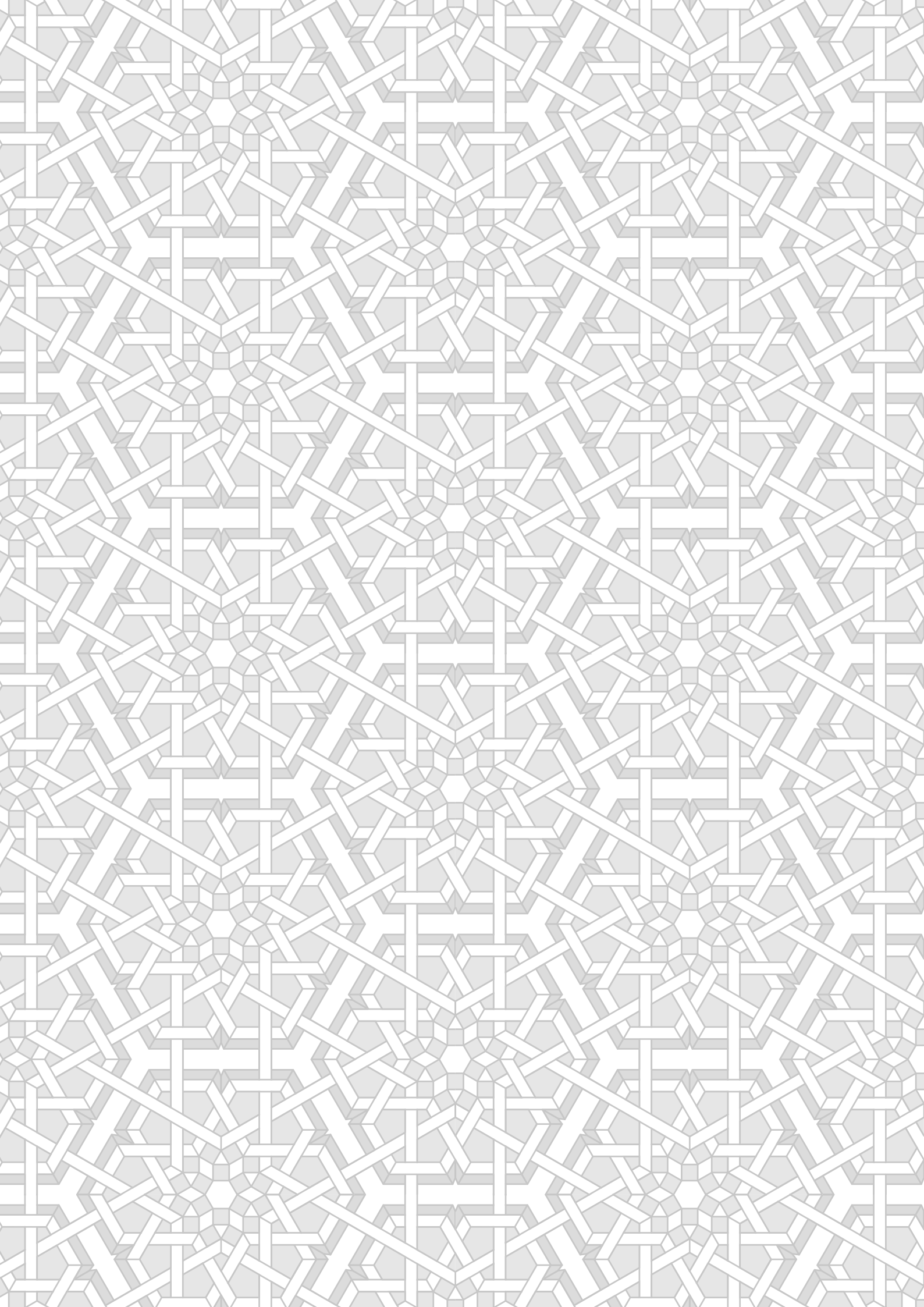


EPHEMERIS 2022





KATA PENGANTAR

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Alhamdulillah, segala puji serta syukur kita panjatkan kepada Allah SWT Tuhan yang menciptakan alam semesta dan mengatur perjalanannya serta telah memberikan nikmat dan kekuatan sehingga Direktorat Urusan Agama Islam dan Pembinaan Syariah Direktorat Jenderal Bimbingan Masyarakat Islam Kementerian Agama Republik Indonesia dapat menerbitkan “EPHEMERIS HISAB RUKYAT 2022” pada tahun anggaran 2021 ini. Shalawat serta salam selalu tercurahkan untuk hamba-Nya yang terpilih, Nabi Muhammad SAW beserta keluarga, sahabat dan para pengikutnya hingga akhir masa.

Buku ini merupakan data matahari dan bulan lengkap selama satu tahun masehi dan disertai dengan penjelasan mengenai istilah-istilah data tersebut. Dalam buku ini juga terdapat daftar gerhana matahari dan gerhana bulan yang terdapat pada tahun 2022 M, daftar waktu ijtima', tinggi hilal, data posisi matahari dan bulan pada setiap awal bulan kamariah di tahun 2022 M.

Selain itu, dalam buku ini terdapat lampiran-lampiran yang akan memudahkan pembaca memahami atau pun menggunakan data-data ephemeris dan implikasinya terhadap kajian hisab rukyat. Lampiran tersebut terdiri dari Keputusan Presiden RI Nomor 41 Tahun 1987 tentang Pembagian Wilayah RI Menjadi 3 (tiga) Wilayah Waktu, Kebijakan Pemerintah dalam Menetapkan Awal Bulan Qamariyah, Fatwa MUI Nomor 2 Tahun 2004 tentang Penetapan Awal Bulan Ramadhan, Syawal dan Dzulhijjah, Fatwa MUI Nomor 5 Tahun 2010 tentang Arah Kiblat, Daftar Refraksi, Daftar Kerendahan Ufuk, Magnetic Variation Epoch tahun 2020, Perhitungan Waktu Salat, dan Perhitungan Awal Bulan Kamariah.

Dengan terbitnya buku EPHEMERIS HISAB RUKYAT 2022 ini dapat menjadi salah satu rujukan bagi masyarakat yang fokus pada kajian hisab rukyat serta pegawai kantor Kementerian Agama se-Indonesia. Apabila dalam buku ini terdapat kekurangan atau pun kesalahan kami sangat berharap adanya masukan dan saran agar kami dapat membuat buku ini lebih baik lagi.

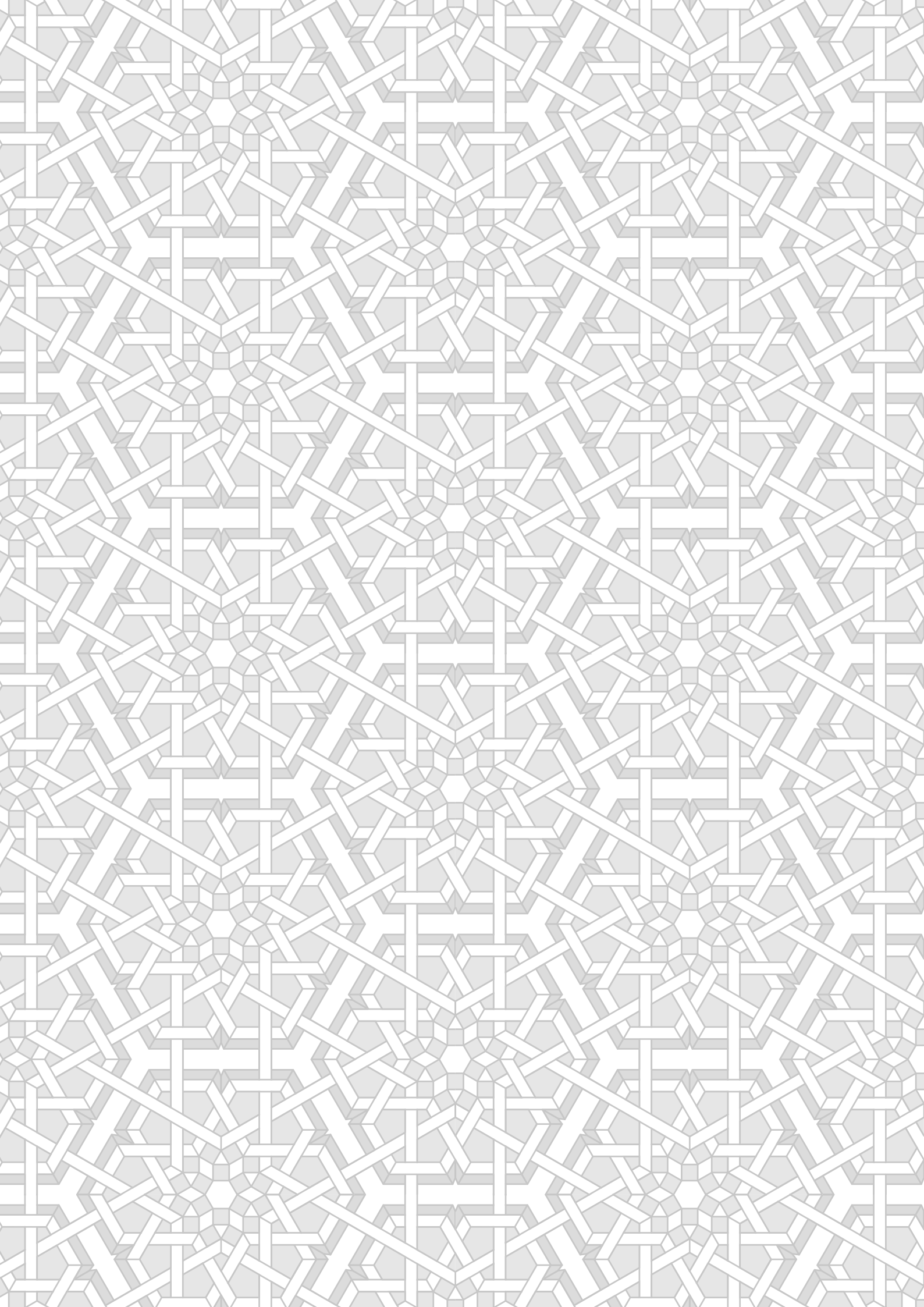
Jakarta, 13 Rabi'ul Akhir 1443 H
18 November 2021 M

Pt. Direktur Urusan Agama Islam
dan Pembinaan Syariah



H. Usman Fahmi, S.Ag

NIP. 197811092003121002



SAMBUTAN DIREKTUR JENDERAL BIMBINGAN MASYARAKAT ISLAM

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Alhamdulillah, segala puji kami persembahkan kepada Dzat yang menciptakan bulan sebagai cahaya dan matahari sebagai sumber cahaya sehingga atas kehendak-Nya buku “Ephemeris Hisab Rukyat 2022” dapat diterbitkan. Shalawat dan salam kita panjatkan kepada Nabi Muhammad SAW yang telah menyampaikan risalah dari Allah SWT agar kita dapat mendekatkan diri kepada-Nya serta keluarga, para sahabatnya dan pengikutnya hingga hari kiamat sehingga kita dapat berkumpul dengan mereka di surga-Nya, Amin.

Berdasarkan Peraturan Menteri Agama Nomor 42 Tahun 2016 tentang Organisasi dan Tata Kerja Kementerian Agama, Direktorat Urusan Agama Islam dan Pembinaan Syariah antara lain mempunyai tugas melaksanakan penyiapan perumusan dan pelaksanaan kebijakan, penyusunan norma, standar prosedur, kriteria bimbingan teknis, dan evaluasi di bidang hisab rukyat. Oleh karena itu, sebagai bentuk pelayanan pemerintah terhadap masyarakat mengenai hal-hal terkait data yang digunakan untuk kajian hisab rukyat Direktorat Jenderal Bimbingan Masyarakat Islam Kementerian Agama mengadakan buku Ephemeris Hisab Rukyat 2022.

Buku ini diharapkan menjadi referensi utama bagi para peminat falak baik dari unsur pelajar, akademisi, organisasi hisab rukyat, individu dan juga para pegawai di lingkungan Kementerian Agama se-Indonesia. Dengan hadirnya buku ini, diharapkan menjadi standar dalam perhitungan posisi matahari dan bulan serta menjadi dasar untuk mempelajari perhitungan yang terkait dengan data pada buku ini seperti perhitungan awal waktu salat, perhitungan awal bulan kamariah, dan lain sebagainya.

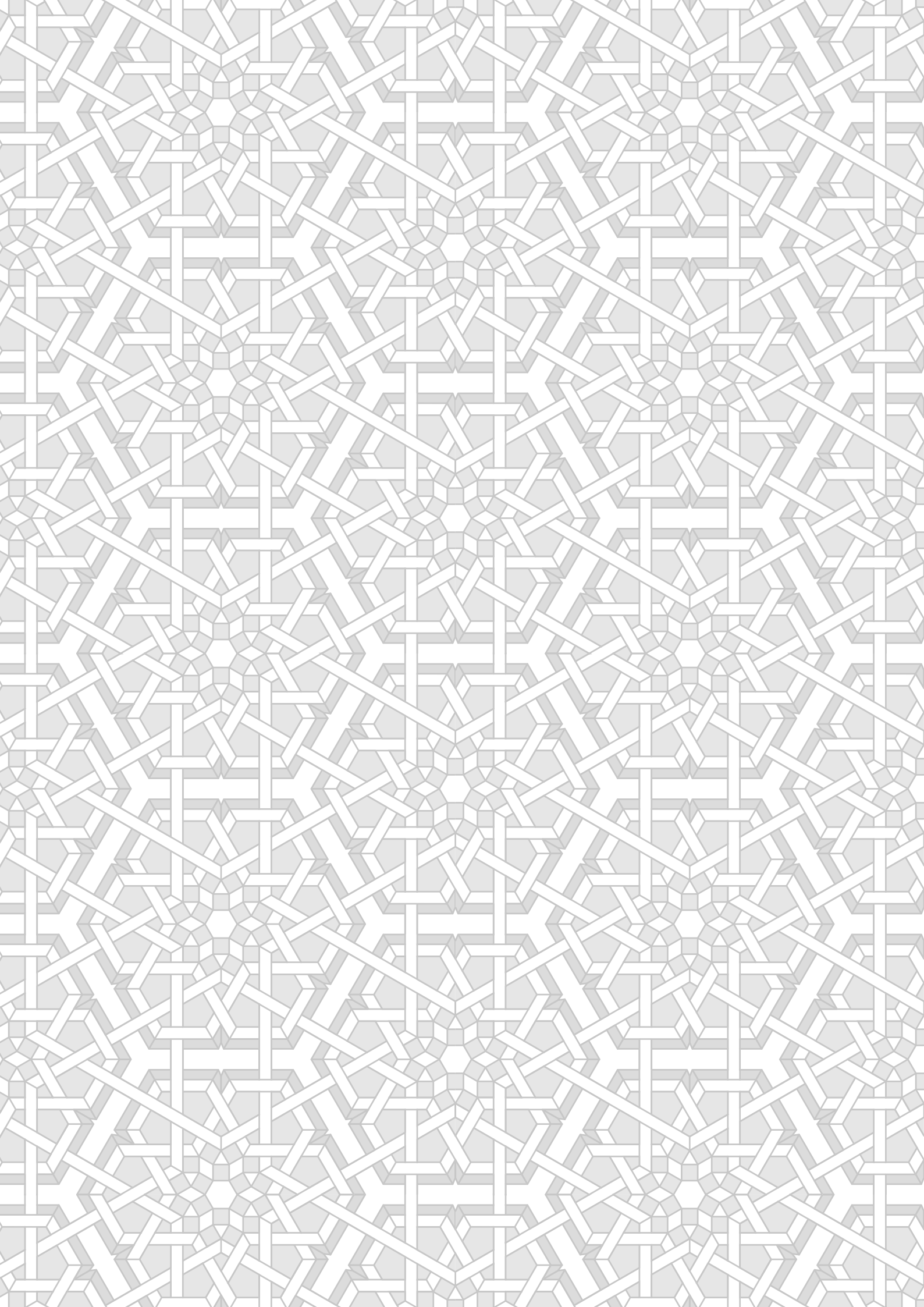
Akhirnya, kami selaku Direktur Jenderal Bimbingan Masyarakat Islam menyampaikan apresiasi kepada Tim Penyusun yang telah berupaya mewujudkan buku Ephemeris Hisab Rukyat ini. Semoga upaya kita dalam memberikan pelayanan terbaik kepada umat Islam menjadi catatan amal baik di sisi Allah *Subhanahu wa ta'ala*. Amin.

Jakarta, 13 Rabi'ul Akhir 1443 H
18 November 2021 M



Direktur Jenderal
Bimbingan Masyarakat Islam

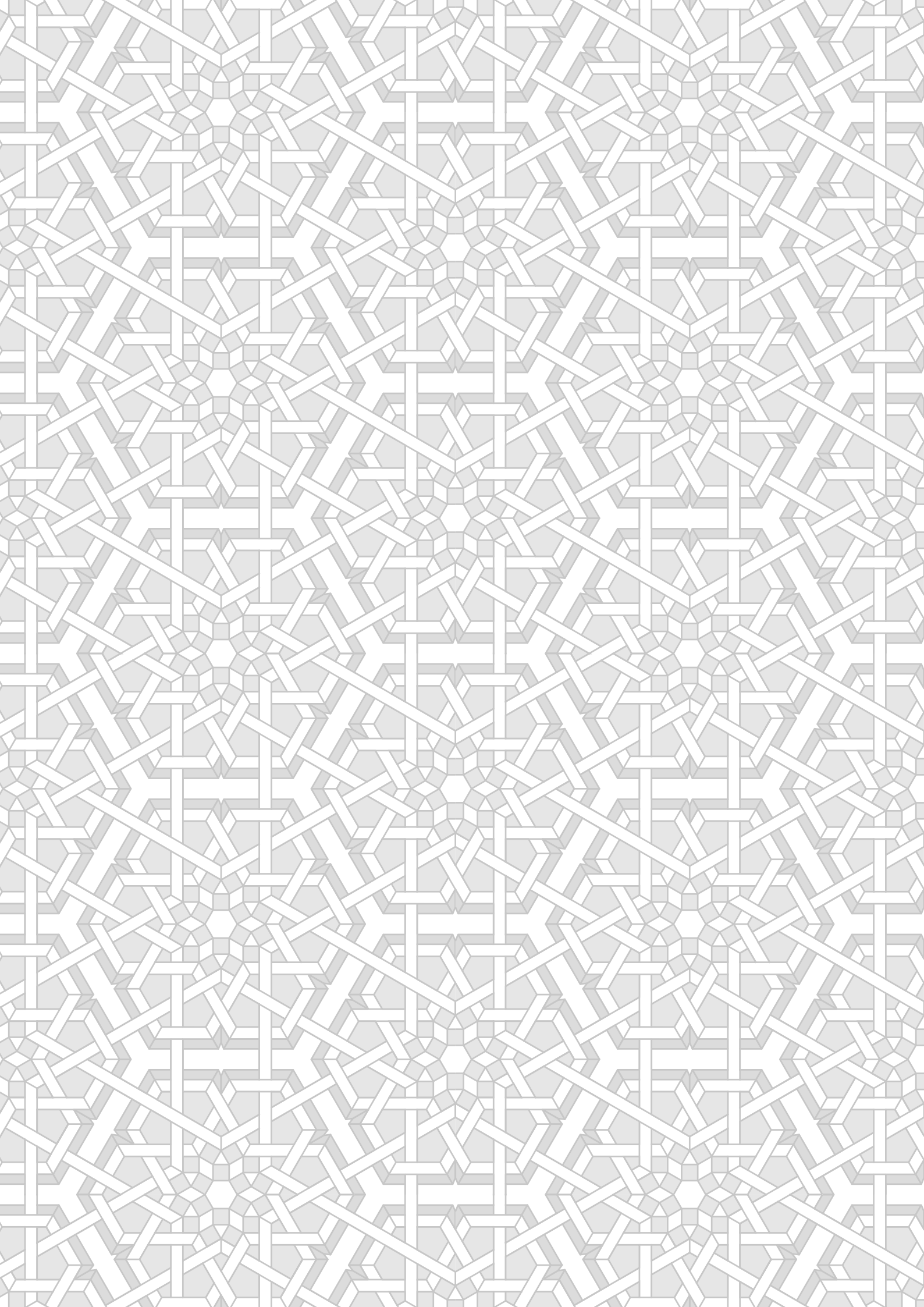
Prof. Dr. Phil. Kamaruddin Amin, M.A.
NIP. 19690105 199603 1 003





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PENJELASAN DATA EPHEMERIS

I. UMUM

Ephemeris Hisab Rukyat ini menyediakan beberapa data mengenai Matahari dan Bulan yang dapat digunakan untuk kegiatan hisab maupun rukyat, menentukan arah kiblat, waktu-waktu salat, awal bulan kamariyah, dan gerhana.

Data Matahari yang disediakan adalah Bujur Astronomi, Lintang Astronomi, Asensio Rekta, Deklinasi, Jarak Geosentris, Semi Diameter, Kemiringan Ekliptika dan Perata Waktu. Sedangkan data Bulan yang disediakan adalah Bujur Astronomi, Lintang Astronomi, Asensio Rekta, Deklinasi, Horizontal Paralaks, Semi Diameter, Sudut Kemiringan Bulan, dan Luas Cahaya Bulan

II. DATA MATAHARI

1. Ecliptic Longitude

Ecliptic Longitude dikenal dalam bahasa Indonesia dengan Bujur Astronomi yang dikenal pula dengan istilah *Taqwim* atau *Thul* (التقويم = الطول) *Thulus Syams* (طول الشمس) adalah jarak Matahari dari titik Aries (Vernal Equinox = الحمل) diukur sepanjang lingkaran Ekliptika (Lihat gambar 1).

2. Ecliptic Latitude

Ecliptic Latitude dikenal dalam bahasa Indonesia dengan Lintang Astronomi yang dikenal pula dengan *Ardlusy Syams* (عرض الشمس). Data ini adalah jarak titik pusat Matahari dari Lingkaran Ekliptika. Sebetulnya Ekliptika itu sendiri adalah jarak yang ditempuh oleh gerak semu Matahari secara tahunan. Oleh karena itu, Matahari seolah-olah selalu berada di Lingkaran Ekliptika. Sebenarnya, jalannya tidak rata persis, namun ada sedikit geseran. Keadaan seperti ini dapat dilihat pada nilai Ecliptic Latitude yang selalu mendekati nol. Karena nilainya yang sangat kecil sehingga banyak sistem perhitungan yang mengabaikan nilai data ini.

3. Apparent Right Ascension

Apparent Right Ascension dikenal dalam bahasa Indonesia dengan Asensio Rekta. Data ini dikenal juga dengan istilah panjatan Tegak atau *Ash-shu'udul Mustaqim* atau *al-Mathali'ul Baladiyah* (الصعود المستقيم = المطالع البلدية) adalah jarak Matahari dari titik Aries (Hamal) diukur sepanjang Lingkaran Equator (Lihat gambar 1).

4. Apparent Declination

Apparent Declination dikenal dalam bahasa Indonesia dengan Deklinasi Matahari yang terlihat (bukan Matahari Hakiki), atau dikenal pula dengan istilah *Mail al-Syams* (ميل الشمس) adalah jarak Matahari dari Equator (Lihat gambar 1 dan 2). Bila nilai Deklinasi

positif berarti Matahari berada di sebelah utara Equator; tapi bila nilai Deklinasi negatif berarti Matahari berada disebelah selatan Equator.

5. True Geocentric Distance

True Geocentric Distance dikenal dalam bahasa Indonesia dengan istilah Jarak Geosentric. Data ini menggambarkan jarak antara Bumi dan Matahari dalam satuan AU (*Astronomical Unit*). Oleh karena Bumi mengelilingi Matahari tidak merupakan bulat bola, melainkan berbentuk ellips (menyerupai bulat telur), sehingga terkadang dekat dan terkadang jauh. Jarak terdekat antara Bumi dengan Matahari disebut *Perigee* atau *al-Hadhidh* (الحضيض), sedangkan jarak terjauhnya disebut *Apogee* atau *al-Auj* (الأوج).

6. Semi Diameter

Semi Diameter dikenal dalam bahasa Indonesia dengan jari-jari yang dikenal pula dengan *Nisfu Quthr al-Syams* (نصف قطر الشمس) adalah jarak titik pusat Matahari dengan piringan luarnya.

7. True Obliquity

True Obliquity dikenal dalam bahasa Indonesia dengan Kemiringan Ekliptika yang dikenal pula dengan istilah *al-Mail al-Kulli* (الميل الكلي) atau *al-Mail A'dham* (الميل الاعظم) adalah Kemiringan Ekliptika dari Equator (lihat gambar 1).

8. Equation of Time

Equation of Time dikenal dalam bahasa Indonesia dengan Perata Waktu yang dikenal pula dengan *Ta'dil Waqt* atau *Ta'dil Zaman* (تعديل الزمن = تعديل الوقت) adalah selisih antara waktu kulminasi Matahari Hakiki dengan waktu kulminasi Matahari Rata-rata. Data ini biasanya dinyatakan dengan huruf “e” kecil.

III. DATA BULAN

1. Apparent Longitude

Apparent Longitude yaitu Bujur Astronomi Bulan (yang terlihat) yang dalam bahasa Arab dikenal dengan *Thul al-Qamar* (طول القمر). Data ini adalah jarak antara titik Aries sampai Bulan diukur sepanjang Lingkaran Ekliptika (Lihat gambar 1).

2. Apparent Latitude

Apparent Latitude diterjemahkan dengan Lintang Astronomi Bulan (yang terlihat) yang dalam istilah Arab disebut *Ardlual-Qomar* (عرض القمر). Data ini adalah jarak antara Bulan dengan Lingkaran Ekliptika diukur sepanjang Lingkaran Kutub Ekliptika. Nilai maksimum Lintang Astronomi Bulan adalah $5^{\circ} 8'$ (lima derajat delapan menit). Nilai positif berarti bulan berada di utara Ekliptika, dan nilai negatif berarti Bulan berada di sebelah selatan Ekliptika.

3. Apparent Right Ascension

Apparent Right Ascension dikenal dalam bahasa Indonesia dengan Asensio Rekta Bulan (yang terlihat) yang dikenal pula dengan istilah Panjang Tegakatau *Ash-shu'udu*

al-Mustaqim atau *Al-Matholi'u al-Baladiyah* (المطالع المستقيم = البلدية). Data ini adalah jarak titik pusat Bulan dari titik Aries diukur sepanjang lingkaran Equator (Lihat gambar 1).

4. Apparent Declination

Apparent Declination disini adalah Deklinasi Bulan yang dikenal pula dengan istilah *Mailual-Qamar* (ميل القمر). Data ini adalah jarak Bulan dari Equator (Lihat gambar 1 dan 2). Nilai Deklinasi positif jika Bulan di sebelah utara Equator, dan negatif jika di sebelah selatan Equator.

5. Horizontal Parallax

Parallax dikenal dalam bahasa Indonesia dengan “Benda Lihat” atau dalam bahasa Arab *Ikhtilafu al-Mandhar* (اختلاف المنظر). Sedangkan Horizontal Parallax adalah besaran sudut yang ditarik dari titik pusat Bulan ketika di ufuk (horizon) ke titik pusat Bumi dan garis yang ditarik dari titik pusat Bulan ketika itu ke permukaan Bumi.

6. Semi Diameter

Semi Diameter di sini adalah jari-jari Bulan atau *Nisfu Quthri al-Qamar* (نصف قطر القمر) adalah jarak antara titik pusat Bulan dengan piringan luarnya (Lihat gambar 4).

7. Angle Bright Limb

Angle Bright Limb dikenal dalam bahasa Indonesia dengan sudut kemiringan hilal, adalah sudut kemiringan piringan hilal yang memancarkan sinar sebagai akibat arah posisi hilal dari Matahari. Sudut ini diukur dari garis yang menghubungkan titik pusat hilal dengan titik Zenith (سمت الرأس) ke garis yang menghubungkan titik pusat hilal dengan titik pusat Matahari dengan arah sesuai perputaran jarum jam (lihat gambar 5).

8. Fraction Illumination

Fraction Illumination adalah besar atau luas piringan Bulan yang menerima sinar Matahari yang tampak dari Bumi. Jika seluruh piringan Bulan yang menerima sinar Matahari terlihat dari Bumi maka bentuknya akan berupa “bulatan penuh”. Dalam keadaan seperti ini nilai Fraction Illumination Bulan adalah 1 (satu), yaitu persis pada saat puncak Bulan Purnama. Sedangkan jika Bumi, Bulan dan Matahari sedang persis berada pada satu garis lurus, maka akan terjadi Gerhana Matahari Total. Dalam keadaan seperti ini nilai Fraction Illumination Bulan adalah nol. Setelah Bulan Purnama, nilai Fraction Illumination akan semakin mengecil sampai pada nilai yang paling kecil, yaitu pada saat ijtimia dan setelah itu nilai Fraction Illumination ini akan kembali membesar sampai mencapai nilai satu, pada saat Bulan Purnama. Dengan demikian, data Fraction Illumination ini dapat dijadikan pedoman untuk mengetahui kapan terjadinya ijtimia’ dan kapan bulan purnama (*istiqlal* = الإستقبال). Demikian pula saat first quarter (التربيع الأول) dan last quarter (التربيع الثاني) dari bulan dapat diketahui, yaitu dengan mencari nilai Fraction Illumination sebesar 0.5 (setengah).

IV. WAKTU YANG DIPERGUNAKAN

Data Matahari dan Bulan dalam Ephemeris ini disajikan berdasarkan waktu Greenwich atau Greenwich Mean Time (GMT). Sehingga untuk mencari data Matahari dan Bulan bagi wilayah Indonesia, maka waktu-waktu daerah di Indonesia terlebih dahulu harus diubah menjadi GMT, dengan cara :

GMT = WIB - 7 jam

GMT = WITA - 8 jam

GMT = WIT - 9 jam

V. CONTOH PENGGUNAAN

Misalnya mencari Deklinasi Matahari dan Bulan pada pukul 18:00 WIB tanggal 01 Mei 2022.

Mengubah WIB menjadi GMT, dengan cara :

GMT = WIB - 7 jam, sehingga jam 18.00 WIB = jam 11.00 GMT

Dilihat data Matahari dan Bulan pada tanggal 01 Mei 2022.

Dalam kolom jam (paling kiri) pada angka 11 ditarik ke kanan hingga kolom "Apparent Declination"

Lihat angka yang ada pada baris dan kolom itu, yaitu :

Deklinasi Matahari = $15^{\circ} 08' 43''$

Deklinasi Bulan = $16^{\circ} 46' 14''$

VI. PENYISIPAN ATAU INTERPOLASI

Oleh karena data Matahari dan Bulan dalam Ephemeris ini disajikan pada setiap jam, maka untuk memperoleh data pada pecahan jam (menit dan detik), diperlukan langkah-langkah penyisipan atau interpolasi atau ta'dil.

Contoh :

Mencari Bujur Astronomi Bulan pada pukul 17:47:8.89 WIB tanggal 1 Mei 2022

Langkah 1 :

Mengubah WIB menjadi GMT dengan cara :

GMT = WIB - 7 jam, sehingga jam 17:47:8.89 WIB => 10:47:8.89 GMT

Langkah 2 :

Melacak data Bujur Astronomi Bulan pada kolom Apparent Longitude Bulan sebagai berikut :

Data pada pukul 10 GMT = $47^{\circ} 24' 38''$

Data pada pukul 11 GMT = $47^{\circ} 55' 18''$

Perubahan 1 jam = $47^{\circ} 55' 18'' - 47^{\circ} 24' 38'' = 00^{\circ} 30' 40''$

Perubahan selama 47 menit 8.89 detik = $00^{\circ} 47' 8.89'' \times 00^{\circ} 31' 42'' = 00^{\circ} 24' 5.88''$

Maka Bujur Astronomi Bulan pada pukul 10:47:08.89 GMT =

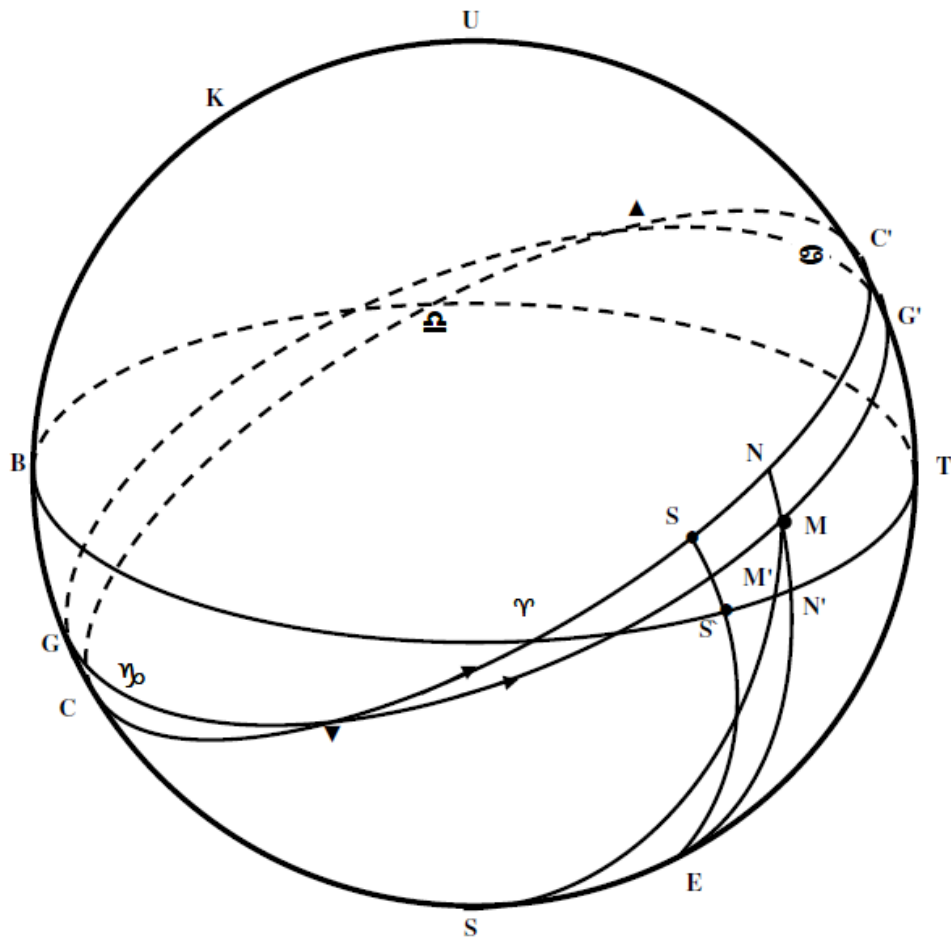
$$47^{\circ} 24' 38'' + 00^{\circ} 24' 5.88'' = 47^{\circ} 48' 43.88''$$

Atau dapat digunakan cara sbb :

$$\begin{array}{rclcl}
 \text{Bujur Astronomi Bulan jam 10} & = 47^{\circ} 24' 38'' & \rightarrow & 47^{\circ} 24' 38'' \\
 \text{Bujur Astronomi Bulan jam 11} & = 47^{\circ} 55' 18'' - & & \\
 & - 00^{\circ} 30' 40'' & & \\
 & \underline{00^{\circ} 47' 08.89''} \times & & \\
 & 00^{\circ} 24' 05.88'' & \rightarrow & \underline{00^{\circ} 24' 05.88''} - \\
 \text{Bujur Astronomi Bulan jam 10:47:08.89} = & & & 47^{\circ} 48' 43.88''
 \end{array}$$

VII. GAMBAR-GAMBAR

1. BOLA LANGIT PADA 0° DILIHAT DARI ZENITH



BUTS = Barat, Utara, Timur, Selatan = Lingkaran Horizon = دائرة الأفق

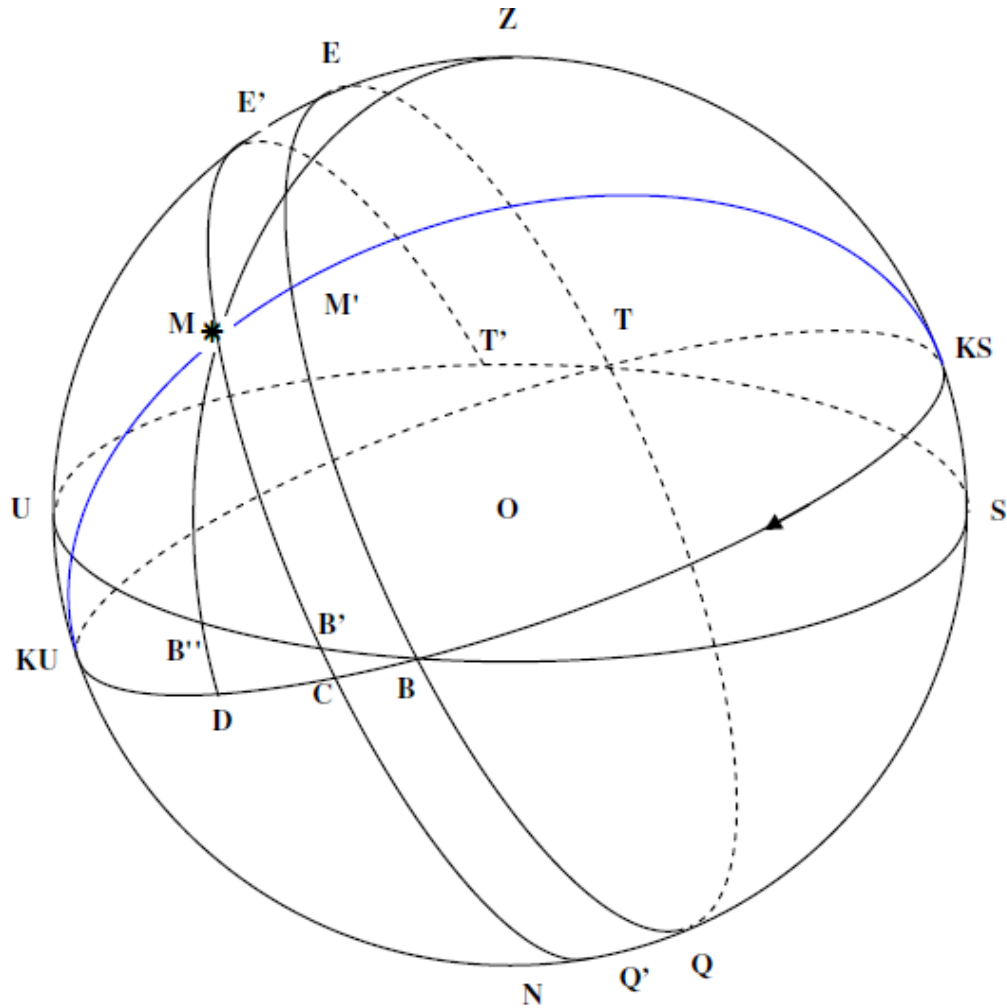
♈ = Titik Aries = Titik musim semi = Vernal Aquinox = حمل

♋ = Titik Cancer = سرطان

♌ = Titik Libra = Titik musim dingin = Authomnal Aquinox = ميزان

♑	= Titik Capricorn = جدي
▼	= Simpul Turun = Decending Node = العقدة النازلة
▲	= Simpul Naik = Ascending Node = العقدة الصاعدة
B♑ T♑	= Katulistiwa Langit = Equator = معدل النهار
C♑ C'♑	= Ekliptika = Lingkaran Zodiak = منطقة البروج
G♑ G'♑	= Orbit Bulan = Falak Bulan = فلك القمر
KE	= Kutub Ekliptika = قطب منطقة البروج = قطب دائرة البروج
S	= Sun = Matahari = الشمس
♑S	= Takwim Matahari = Longitude of the Sun = طول الشمس
M	= Moon = Bulan = القمر
♑N	= Takwim Bulan = Longitude of the Moon = طول القمر
♑S'	= Panjang Tepak Matahari = Right Ascension of the sun = Asensio Rekta = المطالع البلادية = الصعود المستقيم
♑M'	= Panjang Tepak Bulan = Right Ascension of the Moon = Asensio Rekta = المطالع البلادية = الصعود المستقيم
SS'	= Deklinasi Matahari = Declination of the sun = ميل الشمس
MM'	= Deklinasi Bulan = Declination of the moon = ميل القمر = الميل الأول
MN'	= Deklinasi Kedua Bulan = الميل الثاني للقمر
BC	= TC' = Maksimum Deklinasi Matahari = 23° 27' = الميل الأعظم = الميل الكلي
MN	= Lintang Astronomis Bulan = عرض القمر
GC	= G'C' = Maksimum 'Ard Bulan = 5° 8' = عرض القمر الكلي
→	= Arah ke Timur = Retrograde = المخالف

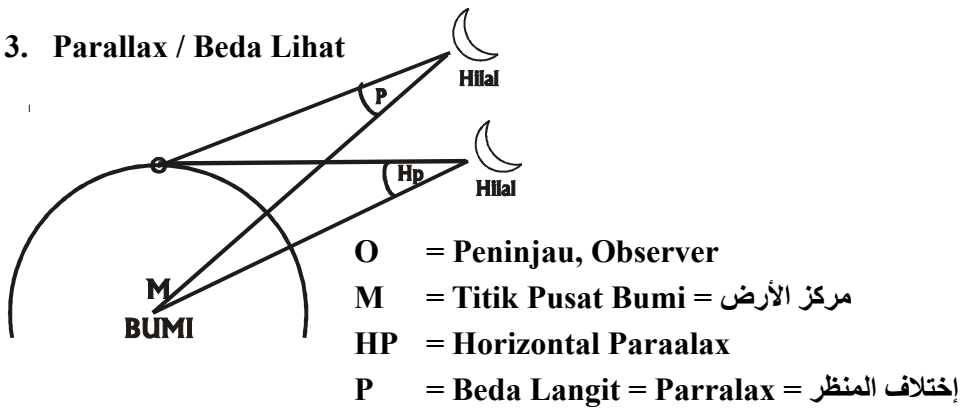
2. BOLA LANGIT PADA 20° LINTANG SELATAN DILIHAT DARI BARAT



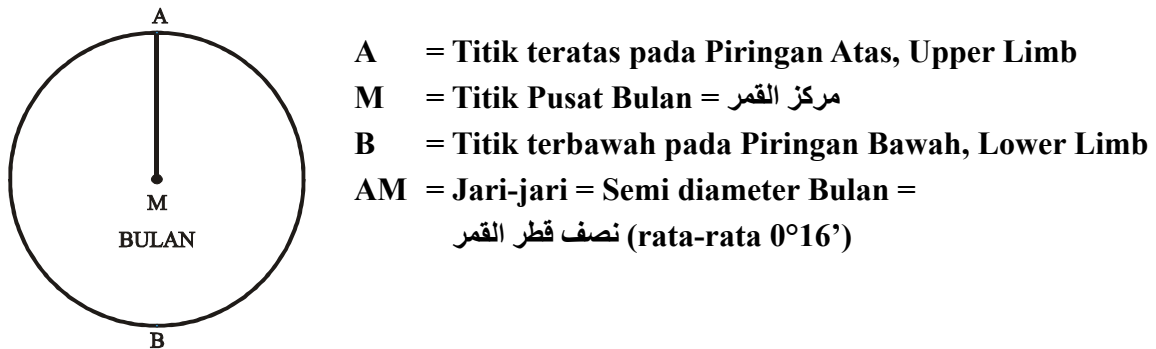
O	= Observer, Pengamat di Bumi
Z	= Zenit = Puncak Langit = سمت الرأس
N	= Nadir = Titil terbawah dari Bola Langit = سمت القدم
SBUT	= Selatan, Barat, Utara dan Timur = Cakrawala = Horizon = دائرة الأفق
KS	= Kutub Langit Selatan
KU	= Kutub Langit Utara
ZE	= Lintang Tempat = Latitude = عرض البلاد
ZUNS	= Meridian Langit = دائرة نصف النهار
EBQT	= Khatulistiwa Langit = Equator = معدل النهار
M	= Suatu Benda Langit = الجرم
ZM	= Jarak Zenit = Zenith Distance = بعد السم
E'MB'Q	= Lingkaran Perjalanan Harian Benda Langit = المدار
KUMM'KS	= Lingkaran Waktu/Lingkaran Deklinasi = دائرة الميل
MM'	= Deklinasi = Declination = الميل

E'	= Titik Kulminasi atas
E'MB'	= Setengah Busur Siang = نصف قوس النهار
E'M	= Sudut Waktu = Hour Angle = t = فضل الدائر
MB'	= Dair = الدائر
B'C	= 90° - Setengah Busur Siang = نصف الفضلة
E'U	= Tinggi Kulminasi = غاية الإرتفاع
E'KU	= Ashal Hakiki = الأصل المطلق
UTSBB''	= Azimuth = السميت
MB''	= Tinggi = Altitude = الإرتفاع
←	= Arah Ke barat = Prograde = التوالي

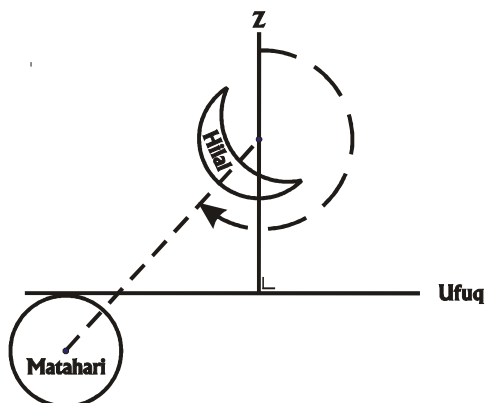
3. Parallax / Beda Lihat



4. Semi Diameter



5. Sudut Kemiringan Hilal



GERHANA MATAHARI DAN BULAN TAHUN 2022

Dalam tahun 2022 M terjadi 4 (empat) kali gerhana, yaitu 2 (dua) kali gerhana matahari dan 2 (dua) kali gerhana bulan:

- Gerhana Matahari Sebagian (Parsial)** 30 April 2022 - 01 Mei 2022 Menjelang awal bulan Syawal 1443 Hijriah. Tidak teramati dari wilayah Indonesia. Jalur gerhana melewati: Pasifik bagian tenggara, Amerika Selatan bagian selatan.

	30 April 2022	01 Mei 2022
Kontak Penumbra1 (P1)	: 18:45:13 UT	01:45:13 WIB
Maksimum Gerhana	: 20:41:20 UT	03:41:20 WIB
Kotak Penumbra4 (P4)	: 22:37:56 UT	05:37:56 WIB
Magnitudo Gerhana	: 0.6389	

- Gerhana Bulan Total** 16 Mei 2022 Tengah Bulan Syawal 1443 Hijriah. Tidak teramati di wilayah Indonesia. Jalur gerhana: Amerika, Eropa dan Afrika

Magnitudo Penumbra	: 2,3726	
Magnitudo Umbra	: 1,4137	
Kontak Penumbra 1 (P1)	: 01:32:07 UT	08:32:07 WIB
Kontak Umbra 1 (U1)	: 02:27:53 UT	09:27:53 WIB
Kontak Umbra 2 (U2)	: 03:29:03 UT	10:29:03 WIB
Maksimum Gerhana	: 04:11:28 UT	11:11:28 WIB
Kontak Umbra 3 (U3)	: 04:53:56 UT	11:53:56 WIB
Kontak Umbra 4 (U4)	: 05:55:57 UT	12:55:57 WIB
Kontak Penumbra 4 (P4)	: 06:50:48 UT	13:50:48 WIB

- Gerhana Matahari Sebagian (Parsial)** 25 Oktober 2022 Menjelang awal bulan Rabi'ul Akhir 1444 Hijriah. Tidak teramati dari wilayah Indonesia. Jalur gerhana melewati: Eropa, Afrika bagian timur laut, Timur Tengah, Asia bagian barat.

Kontak Penumbra1 (P1)	: 08:58:10 UT	15:58:10 WIB
Maksimum Gerhana	: 11:00:00 UT	18:00:00 WIB
Kotak Penumbra4 (P4)	: 13:02:00 UT	20:02:07 WIB
Magnitudo Gerhana	: 0.8611	

- Gerhana Bulan Total** 08 November 2022 Tengah Bulan Rabi'ul Akhir 1444 Hijriah. Teramati di seluruh wilayah Indonesia. Jalur gerhana: Asia, Australia, Pasifik dan Amerika

Magnitudo Penumbra	: 2,4143	
Magnitudo Umbra	: 1,3589	
Durasi Gerhana Pnumbra	: 5j 53m 51d	
Durasi Gerhana Umbra	: 3j 39m 50d	
Durasi Gerhana Total	: 1j 24m 58d	
Kontak Penumbra 1 (P1)	: 08:02:17 UT	15:02:17 WIB
Kontak Umbra 1 (U1)	: 09:09:12 UT	16:09:12 WIB
Kontak Umbra 2 (U2)	: 10:16:39 UT	17:16:39 WIB
Maksimum Gerhana	: 10:59:08 UT	17:59:08 WIB
Kontak Umbra 3 (U3)	: 11:41:37 UT	18:41:37 WIB

Partial Solar Eclipse of 2022 Apr 30

Geocentric Conjunction = 19:40:42.5 UT J.D. = 2459700.319937

Greatest Eclipse = 20:41:20.2 UT J.D. = 2459700.362039

Eclipse Magnitude = 0.6389 Gamma = -1.1900

Saros Series = 119 Member = 66 of 71

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 02h32m15.6s

Dec. = +14°57'53.4"

S.D. = 00°15'52.6"

H.P. = 00°00'08.7"

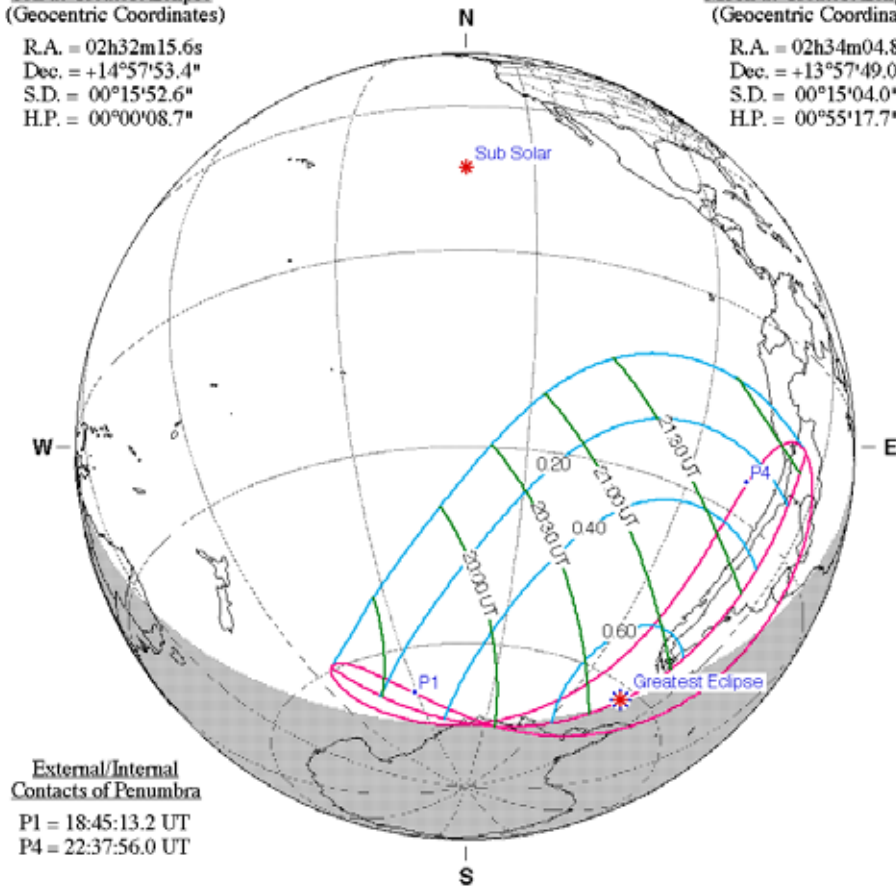
Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 02h34m04.8s

Dec. = +13°57'49.0"

S.D. = 00°15'04.0"

H.P. = 00°55'17.7"



External/Internal
Contacts of Penumbra

P1 = 18:45:13.2 UT

P4 = 22:37:56.0 UT

Ephemeris & Constants

Eph. = Newcomb/ILE

$\Delta T = 79.2$ s

$k1 = 0.2724880$

$k2 = 0.2722810$

$\Delta b = 0.0''$ $\Delta l = 0.0''$

Geocentric Libration
(Optical + Physical)

$l = 4.01^\circ$

$b = 1.40^\circ$

$c = -16.62^\circ$

Brown Lun. No. = 1229



F. Espenak, NASA's GSFC - Fri, Jul 2,

sunearth.gsfc.nasa.gov/eclipse/eclipse.html

Total Lunar Eclipse of 2022 May 16

Ecliptic Conjunction = 04:15:18.8 TD (= 04:14:06.0 UT)

Greatest Eclipse = 04:12:41.6 TD (= 04:11:28.8 UT)

Penumbral Magnitude = 2.3726

P. Radius = 1.2854°

Gamma = -0.2532

Umbral Magnitude = 1.4137

U. Radius = 0.7580°

Axis = 0.2555°

Saros Series = 131 Member = 34 of 72

Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 03h31m49.5s

Dec. = +19°05'13.4"

S.D. = 00°15'49.2"

H.P. = 00°00'08.7"

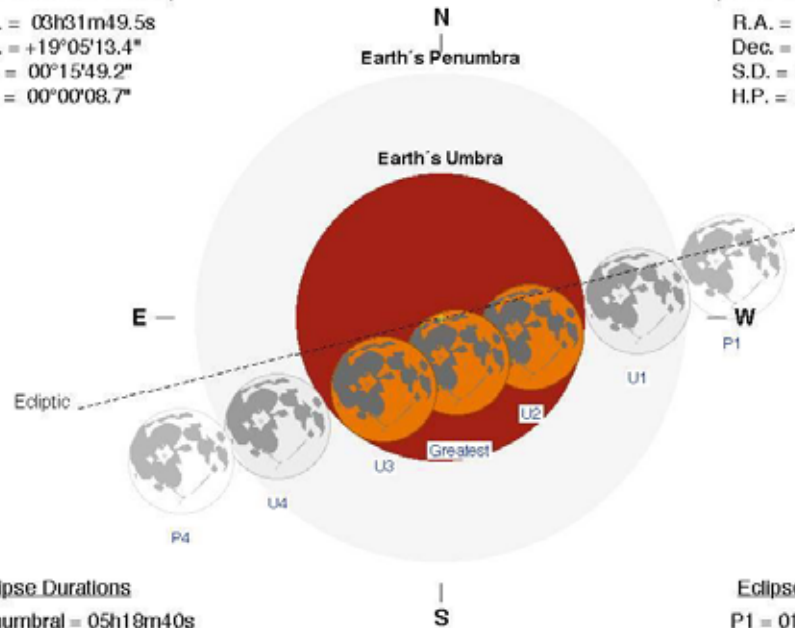
Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 15h31m27.8s

Dec. = -19°19'40.4"

S.D. = 00°16'29.9"

H.P. = 01°00'33.1"



Eclipse Durations

Penumbral = 05h18m40s

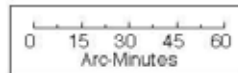
Umbral = 03h27m14s

Total = 01h24m53s

$\Delta T = 73$ s

Rule = CdT (Danjon)

Eph. = VSOP87/ELP2000-85



F. Espenak, NASA's GSFC
eclipse.gsfc.nasa.gov/eclipse.html

Eclipse Contacts

P1 = 01:32:07 UT

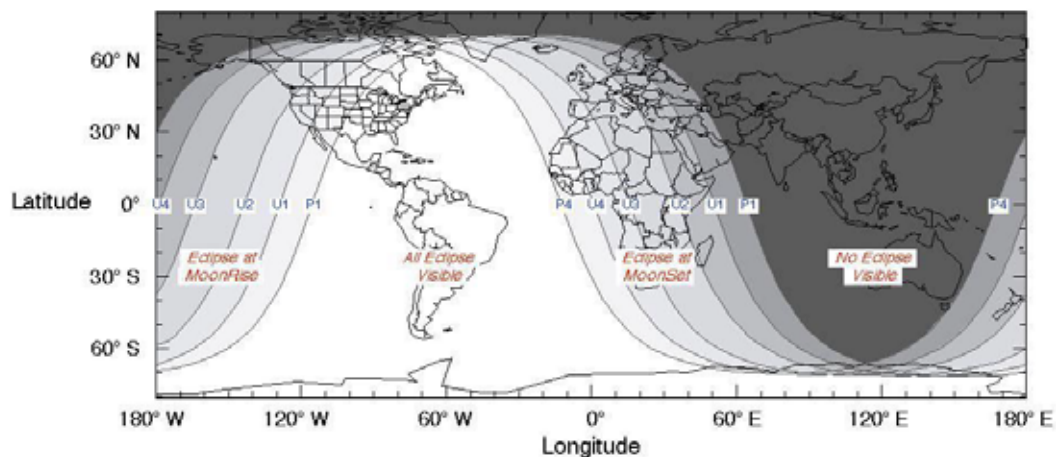
U1 = 02:27:53 UT

U2 = 03:29:03 UT

U3 = 04:53:56 UT

U4 = 05:55:07 UT

P4 = 06:50:48 UT



2009 Apr 29

Partial Solar Eclipse of 2022 Oct 25

Geocentric Conjunction = 10:03:36.7 UT J.D. = 2459877.919175
 Greatest Eclipse = 11:00:00.4 UT J.D. = 2459877.958338

Eclipse Magnitude = 0.8611 Gamma = 1.0700

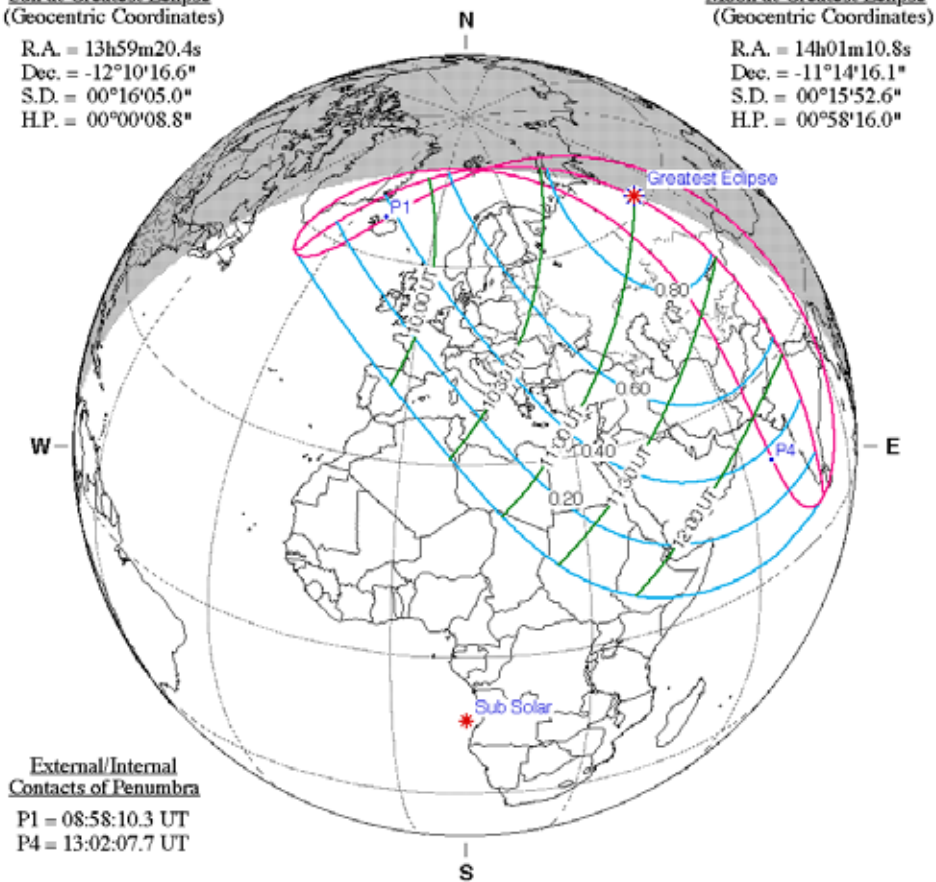
Saros Series = 124 Member = 55 of 73

Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 13h59m20.4s
 Dec. = -12°10'16.6"
 S.D. = 00°16'05.0"
 H.P. = 00°00'08.8"

Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 14h01m10.8s
 Dec. = -11°14'16.1"
 S.D. = 00°15'52.6"
 H.P. = 00°58'16.0"



External/Internal Contacts of Penumbra

P1 = 08:58:10.3 UT
 P4 = 13:02:07.7 UT

Ephemeris & Constants

Eph. = Newcomb/ILE
 $\Delta T = 79.7$ s
 $k1 = 0.2724880$
 $k2 = 0.2722810$
 $\Delta b = 0.0''$ $\Delta l = 0.0''$

Geocentric Libration (Optical + Physical)

$l = -4.55''$
 $b = -1.38''$
 $c = 18.60''$

Brown Lun. No. = 1235



F. Espenak, NASA's GSFC - Fri, Jul 2,
sunearth.gsfc.nasa.gov/eclipse/eclipse.html

Total Lunar Eclipse of 2022 Nov 08

Ecliptic Conjunction = 11:03:18.4 TD (= 11:02:05.3 UT)

Greatest Eclipse = 11:00:22.0 TD (= 10:59:08.8 UT)

Penumbral Magnitude = 2.4143

P. Radius = 1.2164°

Gamma = 0.2570

Umbral Magnitude = 1.3589

U. Radius = 0.6783°

Axis = 0.2404°

Saros Series = 136 Member = 20 of 72

Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 14h54m11.2s

Dec. = -16°37'47.0"

S.D. = 00°16'08.5"

H.P. = 00°00'08.9"

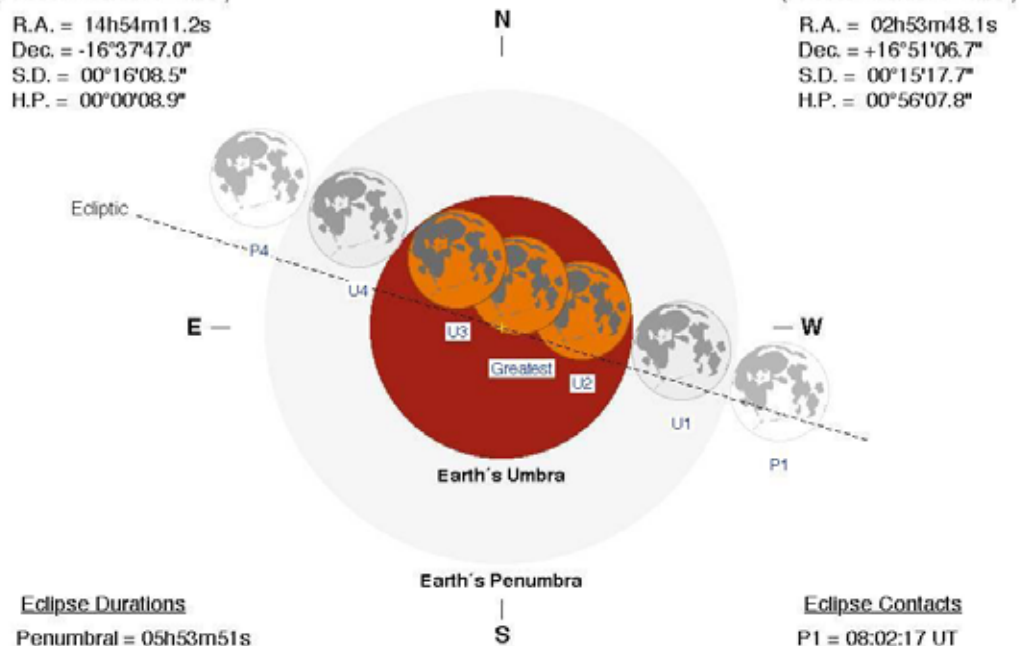
Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 02h53m48.1s

Dec. = +16°51'06.7"

S.D. = 00°15'17.7"

H.P. = 00°56'07.8"



Eclipse Durations

Penumbral = 05h53m51s

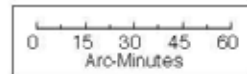
Umbral = 03h39m50s

Total = 01h24m58s

ΔT = 73 s

Rule = CdT (Danjon)

Eph. = VSOP87/ELP2000-85



F. Espenak, NASA's GSFC
eclipse.gsfc.nasa.gov/eclipse.html

Eclipse Contacts

P1 = 08:02:17 UT

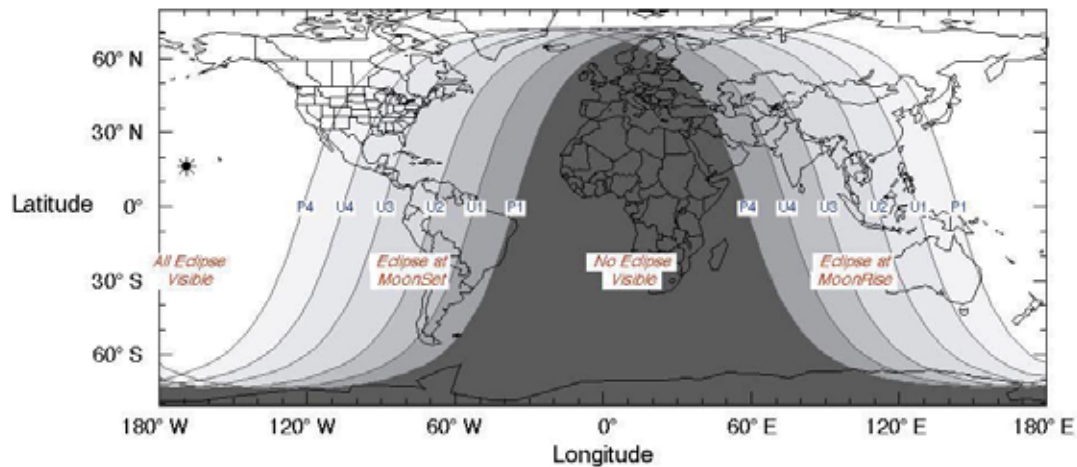
U1 = 09:09:12 UT

U2 = 10:16:39 UT

U3 = 11:41:37 UT

U4 = 12:49:03 UT

P4 = 13:56:08 UT



2009 Apr 29

DAFTAR WAKTU IJTIMA' DAN TINGGI HILAL PENENTU AWAL BULAN HIJRIYAH TAHUN 2022 M

No	Bulan	IJTIMA'			TINGGI HILAL DI INDONESIA	PREDIKSI AWAL BULAN	
		HARI	TANGGAL	JAM WIB		HARI	TANGGAL
1	Jumadal Akhirah 1443H	Senin	03 Januari 2022 M	01:33	07° 08.54' s.d 08° 40.77'	Selasa	04 Januari 2022 M
2	Rajab 1443 H	Selasa	01 Februari 2022 M	12:45	01° 48.17' s.d 03° 12.59'	Rabu	02 Februari 2022 M
3	Sya'ban 1443 H	Kamis	03 Maret 2022 M	00:34	-03° 53.82' s.d -01° 54.26'	Jumat	04 Maret 2022 M
4	Ramadhan 1443 H	Jumat	01 April 2022 M	13:24	01° 06.78' s.d 02° 10.02'	Sabtu	02 April 2022 M
5	Syawal 1443 H	Ahad	01 Mei 2022 M	03:27	-06° 33.26' s.d -05° 21.39'	Senin	02 Mei 2022 M
6	Zulqad'ah 1443 H	Senin	30 Mei 2022 M	18:30	-03° 07.02' s.d -01° 00.88'	Rabu	01 Juni 2022 M
7	Zulhijjah 1443 H	Rabu	29 Juni 2022 M	09:52	01° 10.33' s.d 03° 12.15'	Kamis	30 Juni 2022 M
8	Muharram 1444 H	Jumat	29 Juli 2022 M	00:54	-05° 14.48' s.d -02° 12.60'	Sabtu	30 Juli 2022 M
9	Shafar 1444 H	Sabtu	27 Agustus 2022 M	15:16	00° 21.01' s.d 02° 10.79'	Ahad	28 Agustus 2022 M
10	Rabi'ul Awal 1444 H	Senin	26 September 2022 M	04:54	04° 27.49' s.d 05° 49.50'	Selasa	27 September 2022 M
11	Rabi'ul Akhir 1444 H	Selasa	25 Oktober 2022 M	17:48	'-02° 13.53' s.d -00° 28.10'	Kamis	27 Oktober 2022 M
12	Jumadal Ula 1444 H	Kamis	24 November 2022 M	05:57	03° 24.44' s.d 04° 52.84'	Jumat	25 November 2022 M
13	Jumadal Akhirah 1444 H	Jumat	23 Desember 2022 M	17:16	-02° 01.85' s.d -00° 13.97'	Ahad	25 Desember 2022 M

Keterangan:

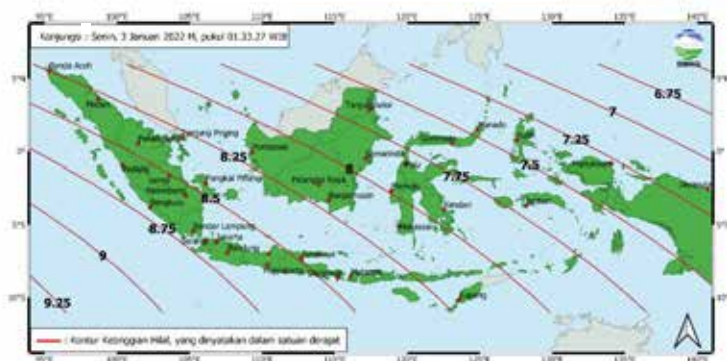
- 1 Data ini diambil dari Keputusan Musyawarah Jawatankuasa Penyelaras Rukyat dan Taqvim Islam MABIMS tanggal 1 s/d 5 Juli 1994 di Jakarta dan Hasil Temu Kerja Hisab Rukyat Tahun 2020 tanggal 07 s/d 09 Oktober 2020 bertepatan tanggal 19 s/d 21 Shafar 1440 H di Kota Yogyakarta, Provinsi Yogyakarta.
- 2 Penetapan tanggal 1 Ramadhan, 1 Syawal, 1 Zulhijjah 1443 H untuk pelaksanaan ibadah menunggu pengumuman Menteri Agama RI.



DATA POSISI HILAL SELURUH INDONESIA
SENIN, 3 JANUARI 2022 M
PENENTU AWAL BULAN JUMADAL AKHIRAH 1443 H
 KONJUNSI: SENIN, 3 JANUARI 2022 M, PUKUL 01:33 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	o '	o '	o '	o '	%
1	Banda Aceh	18 : 37 WIB	19 : 19 WIB	247 10,51	243 2,04	8 14,87	9 52,85	0,75
2	Medan	18 : 27 WIB	19 : 9 WIB	247 12,58	243 27,00	8 17,79	9 46,41	0,73
3	Padang	18 : 28 WIB	19 : 11 WIB	247 10,95	244 17,71	8 35,13	9 45,16	0,73
4	Pekanbaru	18 : 21 WIB	19 : 03 WIB	247 12,42	244 2,02	8 26,24	9 41,94	0,72
5	Bengkulu	18 : 25 WIB	19 : 09 WIB	247 5,21	244 46,00	8 41,99	9 42,79	0,72
6	Jambi	18 : 16 WIB	18 : 58 WIB	247 9,89	244 24,08	8 30,40	9 38,43	0,71
7	Tanjung Pinang	18 : 08 WIB	18 : 50 WIB	247 12,62	243 57,40	8 17,46	9 35,17	0,70
8	Palembang	18 : 14 WIB	18 : 56 WIB	247 7,15	244 37,60	8 33,22	9 36,77	0,71
9	Bandar Lampung	18 : 16 WIB	18 : 59 WIB	247 0,28	244 59,83	8 40,65	9 37,30	0,71
10	Pangkal Pinang	18 : 07 WIB	18 : 49 WIB	247 8,91	244 28,95	8 26,76	9 33,27	0,70
11	Serang	18 : 13 WIB	18 : 57 WIB	246 57,85	245 5,39	8 40,77	9 35,82	0,70
12	Jakarta	18 : 11 WIB	18 : 54 WIB	246 57,64	245 5,58	8 39,39	9 34,37	0,70
13	Bandung	18 : 09 WIB	18 : 52 WIB	246 54,71	245 11,44	8 39,87	9 33,21	0,70
14	Semarang	17 : 58 WIB	18 : 41 WIB	246 54,41	245 10,73	8 33,56	9 27,02	0,68
15	Yogyakarta	17 : 59 WIB	18 : 43 WIB	246 50,99	245 16,99	8 36,02	9 27,79	0,68
16	Surabaya	17 : 49 WIB	18 : 32 WIB	246 52,91	245 12,49	8 29,40	9 22,29	0,67
17	Pontianak	17 : 50 WIB	18 : 31 WIB	247 11,82	244 7,30	8 10,51	9 24,99	0,68
18	Palangka Raya	17 : 36 WIB	18 : 17 WIB	247 8,58	244 28,31	8 9,18	9 16,30	0,66
19	Banjarmasin	18 : 35 WITA	19 : 16 WITA	247 6,21	244 38,21	8 11,77	9 15,44	0,65
20	Samarinda	18 : 20 WITA	19 : 00 WITA	247 11,20	244 11,04	7 54,51	9 8,27	0,64
21	Tanjungselor	18 : 13 WITA	18 : 52 WITA	247 12,62	243 36,10	7 38,25	9 6,05	0,63
22	Denpasar	18 : 41 WITA	19 : 24 WITA	246 46,85	245 21,05	8 27,32	9 17,81	0,66
23	Mataram	18 : 38 WITA	19 : 20 WITA	246 47,22	245 20,05	8 25,10	9 15,80	0,66
24	Kupang	18 : 11 WITA	18 : 52 WITA	246 38,84	245 26,47	8 12,11	9 0,65	0,62
25	Mamuju	18 : 17 WITA	18 : 57 WITA	247 7,60	244 31,33	7 59,38	9 5,66	0,63
26	Makassar	18 : 19 WITA	18 : 59 WITA	247 1,03	244 52,38	8 7,12	9 6,05	0,63
27	Palu	18 : 10 WITA	18 : 49 WITA	247 10,67	244 14,48	7 49,87	9 2,55	0,62
28	Kendari	18 : 04 WITA	18 : 44 WITA	247 4,43	244 41,72	7 55,89	8 58,55	0,62
29	Gorontalo	17 : 54 WITA	18 : 33 WITA	247 12,07	244 0,08	7 36,12	8 54,83	0,61
30	Manado	17 : 46 WITA	18 : 24 WITA	247 12,51	243 50,39	7 27,56	8 50,51	0,60
31	Sofifi	18 : 36 WIT	19 : 14 WIT	247 12,13	243 57,76	7 24,79	8 45,00	0,58
32	Ambon	18 : 41 WIT	19 : 20 WIT	247 5,05	244 37,88	7 41,86	8 46,08	0,59
33	Manokwari	18 : 13 WIT	18 : 50 WIT	247 10,47	244 12,11	7 16,85	8 31,76	0,56
34	Jayapura	17 : 49 WIT	18 : 25 WIT	247 7,52	244 25,32	7 8,54	8 18,40	0,53

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
SENIN, 3 JANUARI 2022 M
PENENTU AWAL BULAN JUMADAL AKHIRAH 1443 H



DATA POSISI HILAL SELURUH INDONESIA
SELASA, 1 FEBRUARI 2022 M
PENENTU AWAL BULAN RAJAB 1443 H
 KONJUNSI: SELASA, 1 FEBRUARI 2022 M, PUKUL 12:45WIB

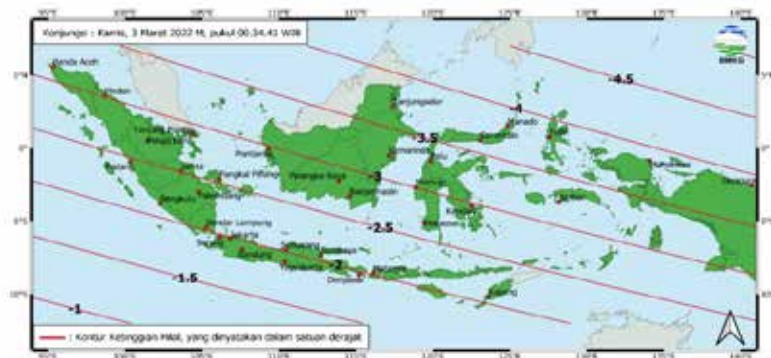
NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	o '	o '	o '	o '	%
1	Banda Aceh	18 : 48 WIB	19 : 03 WIB	252 58,31	248 47,37	2 42,61	5 19,20	0,22
2	Medan	18 : 37 WIB	18 : 52 WIB	252 59,27	248 56,50	2 45,21	5 14,56	0,21
3	Padang	18 : 36 WIB	18 : 52 WIB	252 57,06	249 16,19	3 2,64	5 10,64	0,21
4	Pekanbaru	18 : 30 WIB	18 : 46 WIB	252 58,41	249 9,37	2 53,81	5 10,14	0,20
5	Bengkulu	18 : 32 WIB	18 : 49 WIB	252 52,20	249 25,45	3 11,24	5 7,39	0,20
6	Jambi	18 : 24 WIB	18 : 40 WIB	252 56,03	249 16,56	2 58,92	5 6,89	0,20
7	Tanjung Pinang	18 : 18 WIB	18 : 33 WIB	252 58,53	249 5,80	2 45,74	5 7,25	0,20
8	Palembang	18 : 21 WIB	18 : 37 WIB	252 53,70	249 20,75	3 2,66	5 5,07	0,20
9	Bandar Lampung	18 : 22 WIB	18 : 39 WIB	252 48,15	249 28,01	3 11,95	5 3,55	0,20
10	Pangkal Pinang	18 : 15 WIB	18 : 30 WIB	252 55,11	249 16,74	2 56,14	5 4,07	0,20
11	Serang	18 : 19 WIB	18 : 37 WIB	252 46,20	249 29,11	3 12,95	5 2,34	0,19
12	Jakarta	18 : 17 WIB	18 : 34 WIB	252 46,01	249 28,65	3 11,81	5 1,61	0,19
13	Bandung	18 : 15 WIB	18 : 32 WIB	252 43,69	249 29,83	3 13,29	5 0,52	0,19
14	Semarang	18 : 03 WIB	18 : 20 WIB	252 43,36	249 27,37	3 7,88	4 57,59	0,19
15	Yogyakarta	18 : 05 WIB	18 : 22 WIB	252 40,69	249 29,19	3 11,24	4 57,36	0,19
16	Surabaya	17 : 55 WIB	18 : 11 WIB	252 42,10	249 26,04	3 4,78	4 55,21	0,19
17	Pontianak	17 : 59 WIB	18 : 14 WIB	252 57,56	249 6,72	2 40,10	5 1,94	0,19
18	Palangka Raya	17 : 44 WIB	17 : 58 WIB	252 54,58	249 11,40	2 40,69	4 56,53	0,19
19	Banjarmasin	18 : 42 WITA	18 : 57 WITA	252 52,59	249 14,25	2 44,08	4 55,32	0,19
20	Samarinda	18 : 29 WITA	18 : 42 WITA	252 56,74	249 3,33	2 26,24	4 54,67	0,18
21	Tanjungselor	18 : 24 WITA	18 : 36 WITA	252 58,48	248 50,30	2 9,91	4 56,57	0,19
22	Denpasar	18 : 46 WITA	19 : 03 WITA	252 37,31	249 26,14	3 5,12	4 52,25	0,18
23	Mataram	18 : 43 WITA	18 : 59 WITA	252 37,56	249 25,14	3 3,06	4 51,45	0,18
24	Kupang	18 : 15 WITA	18 : 31 WITA	252 30,85	249 19,67	2 54,74	4 44,07	0,17
25	Mamuju	18 : 24 WITA	18 : 38 WITA	252 53,59	249 9,08	2 32,52	4 51,91	0,18
26	Makassar	18 : 25 WITA	18 : 40 WITA	252 48,25	249 15,17	2 42,21	4 50,11	0,18
27	Palu	18 : 18 WITA	18 : 31 WITA	252 56,17	249 2,83	2 22,47	4 52,18	0,18
28	Kendari	18 : 11 WITA	18 : 25 WITA	252 50,87	249 9,79	2 30,93	4 48,20	0,18
29	Gorontalo	18 : 04 WITA	18 : 16 WITA	252 57,39	248 55,89	2 9,25	4 50,61	0,18
30	Manado	17 : 55 WITA	18 : 07 WITA	252 57,85	248 51,45	2 1,11	4 49,97	0,18
31	Sofifi	18 : 45 WIT	18 : 57 WIT	252 57,31	248 52,44	1 59,16	4 47,56	0,18
32	Ambon	18 : 48 WIT	19 : 01 WIT	252 51,18	249 4,64	2 18,38	4 44,11	0,17
33	Manokwari	18 : 21 WIT	18 : 32 WIT	252 55,53	248 53,11	1 53,56	4 42,32	0,17
34	Jayapura	17 : 57 WIT	18 : 07 WIT	252 52,78	248 52,49	1 48,17	4 37,51	0,16



DATA POSISI HILAL SELURUH INDONESIA
RABU, 2 MARET 2022 M
PENENTU AWAL BULAN SYA'BAN 1443 H
 KONJUNGSI: KAMIS, 3 MARET 2022 M, PUKUL 00:34 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	POSISI BULA	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	o '	o '	o '	o '	%
1	Banda Aceh	18 : 51 WIB	18 : 40 WIB	262 56,26	257 21,57	-3 7,78	6 6,43	0,29
2	Medan	18 : 38 WIB	18 : 28 WIB	262 55,50	257 15,48	-3 0,89	6 9,18	0,29
3	Padang	18 : 34 WIB	18 : 26 WIB	262 52,24	257 5,48	-2 27,96	6 6,58	0,29
4	Pekanbaru	18 : 29 WIB	18 : 20 WIB	262 53,48	257 7,29	-2 43,07	6 9,87	0,29
5	Bengkulu	18 : 28 WIB	18 : 20 WIB	262 48,72	256 57,77	-2 8,37	6 6,11	0,28
6	Jambi	18 : 21 WIB	18 : 13 WIB	262 51,34	257 0,94	-2 30,75	6 10,70	0,29
7	Tanjung Pinang	18 : 17 WIB	18 : 07 WIB	262 53,60	257 5,36	-2 54,26	6 14,84	0,30
8	Palembang	18 : 17 WIB	18 : 07 WIB	262 49,63	256 56,83	-2 21,76	6 10,85	0,29
9	Bandar Lampung	18 : 17 WIB	18 : 10 WIB	262 46,11	256 51,01	-2 2,01	6 8,77	0,29
10	Pangkal Pinang	18 : 12 WIB	18 : 03 WIB	262 50,58	256 57,28	-2 32,67	6 13,90	0,30
11	Serang	18 : 13 WIB	18 : 03 WIB	262 44,92	256 48,47	-1 58,34	6 9,33	0,29
12	Jakarta	18 : 11 WIB	18 : 01 WIB	262 44,79	256 47,58	-1 59,55	6 10,31	0,29
13	Bandung	18 : 08 WIB	18 : 08 WIB	262 43,42	256 44,96	-1 55,02	6 10,62	0,29
14	Semarang	17 : 57 WIB	17 : 57 WIB	262 43,13	256 41,48	-2 1,39	6 14,95	0,30
15	Yogyakarta	17 : 57 WIB	17 : 57 WIB	262 41,63	256 39,65	-1 54,26	6 13,88	0,30
16	Surabaya	17 : 48 WIB	17 : 48 WIB	262 42,33	256 37,94	-2 3,86	6 18,09	0,30
17	Pontianak	17 : 58 WIB	17 : 48 WIB	262 52,50	256 58,73	-2 58,81	6 21,26	0,31
18	Palangka Raya	17 : 41 WIB	17 : 31 WIB	262 49,97	256 49,14	-2 51,82	6 25,89	0,32
19	Banjarmasin	18 : 38 WITA	18 : 28 WITA	262 48,58	256 45,74	-2 44,14	6 25,75	0,32
20	Samarinda	18 : 27 WITA	18 : 17 WITA	262 51,58	256 50,22	-3 14,64	6 32,99	0,33
21	Tanjungselor	18 : 24 WITA	18 : 14 WITA	262 53,97	256 58,39	-3 42,21	6 37,12	0,33
22	Denpasar	18 : 39 WITA	18 : 39 WITA	262 39,59	256 31,58	-1 58,28	6 20,48	0,31
23	Mataram	18 : 35 WITA	18 : 25 WITA	262 39,69	256 30,69	-2 1,10	6 21,98	0,31
24	Kupang	18 : 06 WITA	17 : 56 WITA	262 35,80	256 16,97	-2 4,72	6 32,17	0,33
25	Mamuju	18 : 21 WITA	18 : 11 WITA	262 49,12	256 42,89	-3 0,61	6 33,34	0,33
26	Makassar	18 : 20 WITA	18 : 10 WITA	262 45,67	256 35,86	-2 40,31	6 31,36	0,33
27	Palu	18 : 16 WITA	18 : 06 WITA	262 51,03	256 46,57	-3 18,15	6 36,92	0,33
28	Kendari	18 : 07 WITA	17 : 57 WITA	262 47,19	256 35,60	-2 58,40	6 37,72	0,34
29	Gorontalo	18 : 02 WITA	17 : 52 WITA	262 52,11	256 47,35	-3 37,70	6 43,73	0,35
30	Manado	17 : 55 WITA	17 : 45 WITA	262 52,70	256 48,33	-3 49,50	6 47,69	0,35
31	Sofifi	18 : 44 WIT	18 : 34 WIT	262 51,98	256 43,75	-3 49,98	6 51,31	0,36
32	Ambon	18 : 44 WIT	18 : 34 WIT	262 47,20	256 30,29	-3 14,66	6 47,32	0,35
33	Manokwari	18 : 19 WIT	18 : 09 WIT	262 50,16	256 32,81	-3 52,36	7 0,36	0,38
34	Jayapura	17 : 53 WIT	17 : 43 WIT	262 47,89	256 20,74	-3 53,82	7 9,70	0,39

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
 RABU, 2 MARET 2022 M
 PENENTU AWAL BULAN SYA'BAN 1443 H



DATA POSISI HILAL SELURUH INDONESIA
JUMAT, 1 APRIL 2022 M
PENENTU AWAL BULAN RAMADAN 1443 H
 KONJUNGSI: JUM'AT, 1 APRIL 2022 M, PUKUL 13:24 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI		FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN				
		j m	j m	o ' "	o ' "	o ' "	o ' "		%
1	Banda Aceh	18 : 47 WIB	18 : 58 WIB	274 44,53	272 28,42	2 4,40	3 27,38		0,09
2	Medan	18 : 33 WIB	18 : 44 WIB	274 41,79	272 30,27	2 2,61	3 22,91		0,09
3	Padang	18 : 25 WIB	18 : 36 WIB	274 37,20	272 40,74	2 8,24	3 18,38		0,08
4	Pekanbaru	18 : 21 WIB	18 : 32 WIB	274 38,39	272 35,58	2 3,82	3 18,40		0,08
5	Bengkulu	18 : 16 WIB	18 : 28 WIB	274 35,12	272 47,51	2 10,02	3 14,91		0,08
6	Jambi	18 : 12 WIB	18 : 23 WIB	274 36,47	272 39,37	2 4,10	3 15,17		0,08
7	Tanjung Pinang	18 : 09 WIB	18 : 20 WIB	274 38,57	272 31,65	1 58,08	3 16,20		0,08
8	Palembang	18 : 07 WIB	18 : 18 WIB	274 35,44	272 42,27	2 4,65	3 13,31		0,08
9	Bandar Lampung	18 : 04 WIB	18 : 15 WIB	274 34,12	272 49,40	2 7,86	3 11,38		0,08
10	Pangkal Pinang	18 : 02 WIB	18 : 12 WIB	274 35,93	272 38,31	2 0,97	3 12,79		0,08
11	Serang	18 : 00 WIB	18 : 11 WIB	274 33,79	272 50,63	2 7,53	3 10,24		0,08
12	Jakarta	17 : 57 WIB	18 : 08 WIB	274 33,73	272 50,02	2 6,56	3 9,66		0,08
13	Bandung	17 : 54 WIB	18 : 05 WIB	274 33,43	272 51,61	2 6,51	3 8,58		0,08
14	Semarang	17 : 43 WIB	17 : 53 WIB	274 33,22	272 48,43	2 2,23	3 6,37		0,07
15	Yogyakarta	17 : 43 WIB	17 : 54 WIB	274 33,02	272 51,20	2 3,60	3 5,94		0,07
16	Surabaya	17 : 34 WIB	17 : 44 WIB	274 32,98	272 46,86	1 59,31	3 4,51		0,07
17	Pontianak	17 : 49 WIB	17 : 59 WIB	274 37,37	272 29,38	1 51,84	3 11,79		0,08
18	Palangka Raya	17 : 30 WIB	17 : 40 WIB	274 35,35	272 30,42	1 48,59	3 7,12		0,07
19	Banjarmasin	18 : 27 WITA	18 : 37 WITA	274 34,60	272 32,61	1 49,48	3 5,90		0,07
20	Samarinda	18 : 18 WITA	18 : 27 WITA	274 36,47	272 22,79	1 40,00	3 6,41		0,07
21	Tanjungsekor	18 : 18 WITA	18 : 27 WITA	274 39,74	272 15,42	1 32,64	3 8,86		0,08
22	Denpasar	18 : 23 WITA	18 : 34 WITA	274 32,54	272 48,17	1 57,60	3 1,99		0,07
23	Mataram	18 : 20 WITA	18 : 30 WITA	274 32,49	272 46,81	1 56,14	3 1,46		0,07
24	Kupang	17 : 49 WITA	17 : 59 WITA	274 31,85	272 42,57	1 47,57	2 56,18		0,07
25	Mamuju	18 : 10 WITA	18 : 19 WITA	274 34,73	272 26,28	1 41,42	3 3,81		0,07
26	Makassar	18 : 07 WITA	18 : 17 WITA	274 33,34	272 32,28	1 45,18	3 1,76		0,07
27	Palu	18 : 07 WITA	18 : 16 WITA	274 35,97	272 20,96	1 36,36	3 4,62		0,07
28	Kendari	17 : 55 WITA	18 : 04 WITA	274 33,72	272 25,66	1 38,16	3 0,99		0,07
29	Gorontalo	17 : 55 WITA	18 : 03 WITA	274 37,01	272 14,68	1 28,19	3 4,18		0,07
30	Manado	17 : 48 WITA	17 : 56 WITA	274 37,81	272 11,14	1 23,24	3 4,19		0,07
31	Sofifi	18 : 37 WIT	18 : 44 WIT	274 36,90	272 9,96	1 20,45	3 2,55		0,07
32	Ambon	18 : 33 WIT	18 : 41 WIT	274 33,51	272 18,75	1 28,76	2 58,81		0,07
33	Manokwari	18 : 10 WIT	18 : 17 WIT	274 35,08	272 6,52	1 13,49	2 59,39		0,07
34	Jayapura	17 : 43 WIT	17 : 50 WIT	274 33,41	272 2,78	1 6,78	2 57,04		0,07



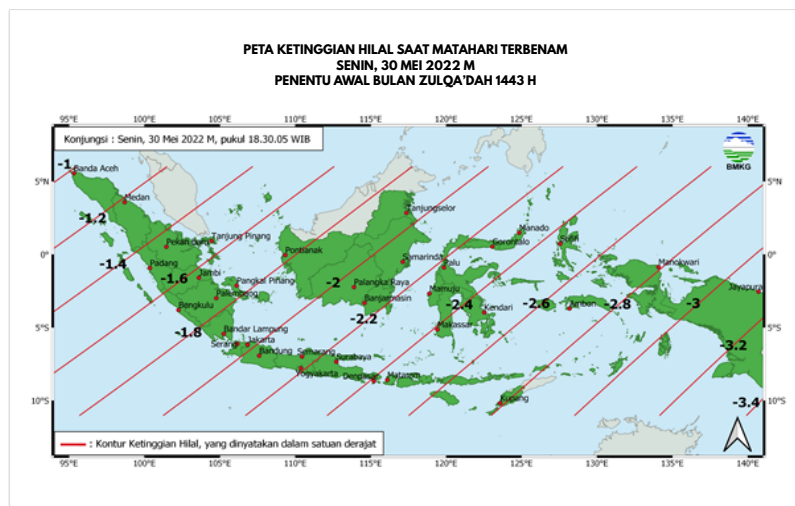
DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
SABTU, 30 APRIL 2022 M
PENENTU AWAL BULAN SYAWAL 1443 H
 KONJUNSI: AHAD, 1 MEI 2022 M, PUKUL 03:27 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	o '	o '	o '	o '	%
1	Banda Aceh	18 : 45 WIB	18 : 25 WIB	285 0,51	282 38,79	-5 33,40	5 12,82	0,21
2	Medan	18 : 29 WIB	18 : 09 WIB	284 55,99	282 23,73	-5 35,30	5 19,33	0,22
3	Padang	18 : 18 WIB	17 : 59 WIB	284 50,12	281 57,66	-5 26,93	5 22,55	0,22
4	Pekanbaru	18 : 15 WIB	17 : 55 WIB	284 51,31	282 4,09	-5 32,81	5 24,64	0,22
5	Bengkulu	18 : 07 WIB	17 : 48 WIB	284 49,26	281 43,33	-5 22,03	5 26,05	0,23
6	Jambi	18 : 04 WIB	17 : 45 WIB	284 49,57	281 51,64	-5 30,91	5 28,72	0,23
7	Tanjung Pinang	18 : 03 WIB	17 : 43 WIB	284 51,61	282 3,85	-5 39,33	5 30,33	0,23
8	Palembang	17 : 58 WIB	17 : 39 WIB	284 49,12	281 44,33	-5 28,91	5 30,86	0,23
9	Bandar Lampung	17 : 53 WIB	17 : 35 WIB	284 49,71	281 34,31	-5 22,23	5 31,67	0,23
10	Pangkal Pinang	17 : 53 WIB	17 : 34 WIB	284 49,23	281 46,92	-5 33,85	5 33,47	0,24
11	Serang	17 : 49 WIB	17 : 30 WIB	284 50,13	281 31,05	-5 21,56	5 33,33	0,24
12	Jakarta	17 : 46 WIB	17 : 27 WIB	284 50,14	281 30,18	-5 22,55	5 34,62	0,24
13	Bandung	17 : 42 WIB	17 : 24 WIB	284 50,78	281 26,97	-5 21,39	5 36,04	0,24
14	Semarang	17 : 31 WIB	17 : 12 WIB	284 50,70	281 23,80	-5 26,03	5 41,45	0,25
15	Yogyakarta	17 : 30 WIB	17 : 11 WIB	284 51,62	281 21,46	-5 23,13	5 41,24	0,25
16	Surabaya	17 : 22 WIB	17 : 02 WIB	284 50,97	281 20,30	-5 28,69	5 45,76	0,25
17	Pontianak	17 : 43 WIB	17 : 22 WIB	284 50,35	281 54,55	-5 45,58	5 39,66	0,25
18	Palangka Raya	17 : 22 WIB	17 : 02 WIB	284 48,80	281 39,42	-5 47,36	5 48,30	0,26
19	Banjarmasin	18 : 18 WITA	17 : 58 WITA	284 48,60	281 33,71	-5 45,24	5 49,60	0,26
20	Samarinda	18 : 11 WITA	17 : 50 WITA	284 49,56	281 45,49	-5 58,24	5 54,50	0,27
21	Tanjungselor	18 : 14 WITA	17 : 52 WITA	284 53,71	282 5,45	-6 7,90	5 54,90	0,27
22	Denpasar	18 : 10 WITA	17 : 51 WITA	284 52,58	281 13,75	-5 28,19	5 50,41	0,26
23	Mataram	18 : 07 WITA	17 : 47 WITA	284 52,42	281 12,99	-5 29,96	5 52,11	0,26
24	Kupang	17 : 35 WITA	17 : 15 WITA	284 54,75	281 0,45	-5 36,35	6 6,26	0,28
25	Mamuju	18 : 02 WITA	17 : 41 WITA	284 48,44	281 32,72	-5 54,80	5 57,83	0,27
26	Makassar	17 : 57 WITA	17 : 36 WITA	284 48,82	281 21,31	-5 47,72	5 58,74	0,27
27	Palu	18 : 00 WITA	17 : 38 WITA	284 49,14	281 41,01	-6 1,95	5 59,71	0,27
28	Kendari	17 : 46 WITA	17 : 25 WITA	284 48,26	281 23,27	-5 56,96	6 4,72	0,28
29	Gorontalo	17 : 49 WITA	17 : 26 WITA	284 50,22	281 46,51	-6 11,88	6 5,83	0,28
30	Manado	17 : 42 WITA	17 : 20 WITA	284 51,27	281 50,96	-6 17,78	6 9,21	0,29
31	Sofifi	18 : 31 WIT	18 : 08 WIT	284 50,21	281 44,06	-6 20,51	6 14,42	0,30
32	Ambon	18 : 24 WIT	18 : 02 WIT	284 47,93	281 19,12	-6 7,66	6 15,55	0,30
33	Manokwari	18 : 03 WIT	17 : 40 WIT	284 48,44	281 28,91	-6 27,21	6 26,88	0,32
34	Jayapura	17 : 35 WIT	17 : 17 WIT	284 47,35	281 13,37	-6 33,26	6 39,54	0,34



DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
SENIN, 30 MEI 2022 M
PENENTU AWAL BULAN ZULQA'DAH 1443 H
 KONJUNGSI: SENIN, 30 MEI 2022 M, PUKUL 18:30 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	o ' "	o ' "	o ' "	o ' "	%
1	Banda Aceh	18 : 48 WIB	18 : 45 WIB	292 0,36	293 31,65	-1 0,88	1 43,82	0,02
2	Medan	18 : 32 WIB	18 : 27 WIB	291 54,58	293 24,62	-1 12,90	1 48,43	0,03
3	Padang	18 : 18 WIB	18 : 12 WIB	291 47,75	293 15,26	-1 29,05	1 54,72	0,03
4	Pekanbaru	18 : 16 WIB	18 : 10 WIB	291 48,98	293 16,80	-1 27,26	1 54,01	0,03
5	Bengkulu	18 : 6 WIB	17 : 59 WIB	291 47,81	293 12,36	-1 41,49	1 59,33	0,03
6	Jambi	18 : 4 WIB	17 : 57 WIB	291 47,39	293 12,88	-1 38,09	1 58,13	0,03
7	Tanjung Pinang	18 : 4 WIB	17 : 59 WIB	291 49,41	293 16,20	-1 32,64	1 56,10	0,03
8	Palembang	17 : 57 WIB	17 : 50 WIB	291 47,37	293 11,18	-1 44,72	2 0,62	0,03
9	Bandar Lampung	17 : 51 WIB	17 : 44 WIB	291 49,35	293 10,64	-1 52,94	2 3,61	0,03
10	Pangkal Pinang	17 : 53 WIB	17 : 46 WIB	291 47,23	293 11,05	-1 45,26	2 0,93	0,03
11	Serang	17 : 46 WIB	17 : 39 WIB	291 50,34	293 10,36	-1 56,95	2 5,12	0,03
12	Jakarta	17 : 43 WIB	17 : 36 WIB	291 50,41	293 9,94	-1 58,63	2 5,79	0,03
13	Bandung	17 : 39 WIB	17 : 31 WIB	291 51,76	293 9,93	-2 2,55	2 7,28	0,03
14	Semarang	17 : 28 WIB	17 : 20 WIB	291 51,81	293 7,99	-2 9,19	2 10,08	0,04
15	Yogyakarta	17 : 27 WIB	17 : 19 WIB	291 53,55	293 8,77	-2 11,28	2 10,80	0,04
16	Surabaya	17 : 18 WIB	17 : 10 WIB	291 52,48	293 6,67	-2 15,37	2 12,73	0,04
17	Pontianak	17 : 43 WIB	17 : 37 WIB	291 48,19	293 12,18	-1 46,49	2 1,75	0,03
18	Palangka Raya	17 : 22 WIB	17 : 14 WIB	291 47,04	293 6,73	-2 3,49	2 8,77	0,04
19	Banjarmasin	18 : 17 WITA	18 : 09 WITA	291 47,25	293 5,33	-2 8,29	2 10,66	0,04
20	Samarinda	18 : 11 WITA	18 : 04 WITA	291 47,61	293 7,63	-2 6,03	2 10,48	0,04
21	Tanjungselor	18 : 16 WITA	18 : 08 WITA	291 52,43	293 15,77	-1 56,64	2 7,09	0,03
22	Denpasar	18 : 06 WITA	17 : 57 WITA	291 55,64	293 6,19	-2 24,69	2 16,64	0,04
23	Mataram	18 : 02 WITA	17 : 53 WITA	291 55,41	293 5,43	-2 26,49	2 17,52	0,04
24	Kupang	17 : 30 WITA	17 : 20 WITA	292 0,04	293 1,79	-2 47,31	2 27,53	0,05
25	Mamuju	18 : 01 WITA	17 : 52 WITA	291 46,95	293 3,48	-2 16,54	2 14,77	0,04
26	Makassar	17 : 55 WITA	17 : 46 WITA	291 48,62	293 1,50	-2 24,71	2 17,87	0,04
27	Pahu	18 : 00 WITA	17 : 52 WITA	291 47,29	293 5,57	-2 13,67	2 14,02	0,04
28	Kendari	17 : 44 WITA	17 : 35 WITA	291 47,43	293 0,15	-2 28,71	2 20,33	0,04
29	Gorontalo	17 : 49 WITA	17 : 41 WITA	291 48,46	293 7,07	-2 17,14	2 16,32	0,04
30	Manado	17 : 44 WITA	17 : 35 WITA	291 49,73	293 8,79	-2 18,63	2 17,50	0,04
31	Sofifi	18 : 32 WIT	18 : 23 WIT	291 48,59	293 5,55	-2 27,37	2 21,73	0,04
32	Ambon	18 : 22 WIT	18 : 12 WIT	291 47,11	292 57,01	-2 41,21	2 27,05	0,05
33	Manokwari	18 : 03 WIT	17 : 53 WIT	291 46,96	292 58,52	-2 47,36	2 31,93	0,05
34	Jayapura	17 : 34 WIT	17 : 23 WIT	291 46,39	292 51,50	-3 7,02	2 42,71	0,06



DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM

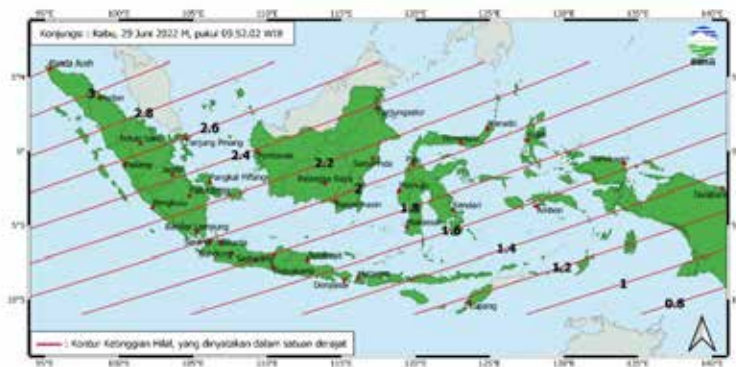
RABU, 29 JUNI 2022 M

PENENTU AWAL BULAN ZULHIJAH 1443 H

KONJUNGSI: RABU, 29 JUNI 2022 M, PUKUL 09:52 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGAS I	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	o '	o '	o '	o '	%
1	Banda Aceh	18 : 55 WIB	19 : 13 WIB	293 25,13	296 37,14	3 12,15	4 58,42	0,19
2	Medan	18 : 38 WIB	18 : 54 WIB	293 19,19	296 42,20	2 57,81	4 54,50	0,18
3	Padang	18 : 24 WIB	18 : 38 WIB	293 12,26	296 57,18	2 34,33	4 53,46	0,18
4	Pekanbaru	18 : 22 WIB	18 : 37 WIB	293 13,51	296 51,70	2 39,27	4 51,79	0,18
5	Bengkulu	18 : 11 WIB	18 : 24 WIB	293 12,60	297 9,98	2 17,18	4 52,08	0,18
6	Jambi	18 : 09 WIB	18 : 23 WIB	293 12,03	296 59,82	2 25,60	4 49,82	0,18
7	Tanjung Pinang	18 : 10 WIB	18 : 25 WIB	293 14,05	296 50,44	2 36,01	4 48,15	0,18
8	Palembang	18 : 02 WIB	18 : 16 WIB	293 12,16	297 5,84	2 16,93	4 48,92	0,18
9	Bandar Lampung	17 : 56 WIB	18 : 08 WIB	293 14,47	297 17,96	2 4,04	4 49,20	0,18
10	Pangkal Pinang	17 : 59 WIB	18 : 12 WIB	293 11,99	297 1,94	2 18,79	4 47,10	0,18
11	Serang	17 : 52 WIB	18 : 03 WIB	293 15,62	297 21,57	1 59,10	4 48,44	0,18
12	Jakarta	17 : 49 WIB	18 : 00 WIB	293 15,73	297 21,73	1 57,70	4 47,71	0,18
13	Bandung	17 : 44 WIB	17 : 55 WIB	293 17,25	297 25,86	1 52,62	4 47,13	0,18
14	Semarang	17 : 33 WIB	17 : 44 WIB	293 17,41	297 25,57	1 47,62	4 44,05	0,17
15	Yogyakarta	17 : 32 WIB	17 : 42 WIB	293 19,34	297 30,31	1 43,68	4 44,47	0,17
16	Surabaya	17 : 23 WIB	17 : 33 WIB	293 18,24	297 27,07	1 42,10	4 41,76	0,17
17	Pontianak	17 : 49 WIB	18 : 03 WIB	293 12,98	296 53,82	2 23,18	4 42,77	0,17
18	Palangka Raya	17 : 27 WIB	17 : 39 WIB	293 12,07	297 1,85	2 5,17	4 38,44	0,16
19	Banjarmasin	18 : 23 WITA	18 : 34 WITA	293 12,40	297 6,35	1 58,78	4 38,09	0,16
20	Samarinda	18 : 17 WITA	18 : 30 WITA	293 12,67	296 55,38	2 7,86	4 34,32	0,16
21	Tanjungselor	18 : 22 WITA	18 : 36 WITA	293 17,61	296 46,19	2 22,65	4 32,94	0,16
22	Denpasar	18 : 11 WITA	18 : 20 WITA	293 21,82	297 34,31	1 31,35	4 39,71	0,17
23	Mataram	18 : 7 WITA	18 : 17 WITA	293 21,60	297 33,57	1 30,31	4 38,76	0,17
24	Kupang	17 : 35 WITA	17 : 42 WITA	293 26,96	297 41,16	1 10,33	4 32,08	0,16
25	Mamuju	18 : 6 WITA	18 : 18 WITA	293 12,18	297 3,25	1 54,67	4 33,28	0,16
26	Makassar	18 : 0 WITA	18 : 10 WITA	293 14,18	297 14,00	1 41,97	4 33,77	0,16
27	Palu	18 : 6 WITA	18 : 17 WITA	293 12,45	296 56,65	2 1,44	4 31,56	0,16
28	Kendari	17 : 50 WITA	18 : 00 WITA	293 12,92	297 8,23	1 42,47	4 30,10	0,16
29	Gorontalo	17 : 55 WITA	18 : 07 WITA	293 13,72	296 52,27	2 2,64	4 27,66	0,15
30	Manado	17 : 50 WITA	18 : 02 WITA	293 15,07	296 49,90	2 3,95	4 25,46	0,15
31	Sofifi	18 : 38 WIT	18 : 49 WIT	293 14,01	296 51,88	1 56,00	4 23,01	0,15
32	Ambon	18 : 28 WIT	18 : 37 WIT	293 12,77	297 6,41	1 34,41	4 24,39	0,15
33	Manokwari	18 : 9 WIT	18 : 19 WIT	293 12,60	296 56,24	1 37,87	4 17,46	0,14
34	Jayapura	17 : 39 WIT	17 : 48 WIT	293 12,35	297 1,00	1 19,27	4 12,44	0,14

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
RABU, 29 JUNI 2022 M
PENENTU AWAL BULAN ZULHIJAH 1443 H



DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM

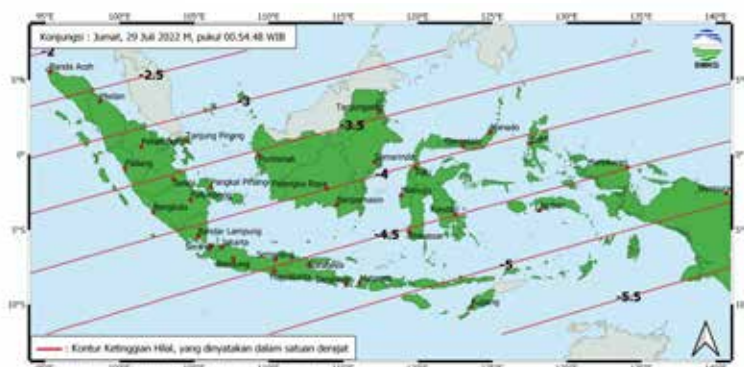
KAMIS, 28 JULI 2022 M

PENENTU AWAL BULAN MUHARRAM 1444 H

KONJUNGSI: JUM'AT, 29 JULI 2022 M, PUKUL 00:54 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	o '	o '	o '	o '	%
1	Banda Aceh	18 : 56 WIB	18 : 48 WIB	289 5,84	294 33,21	-2 12,60	5 44,57	0,25
2	Medan	18 : 40 WIB	18 : 30 WIB	289 0,89	294 28,23	-2 38,05	5 50,93	0,26
3	Padang	18 : 27 WIB	18 : 15 WIB	288 54,71	294 16,11	-3 20,33	5 58,63	0,27
4	Pekanbaru	18 : 24 WIB	18 : 13 WIB	288 55,97	294 20,33	-3 10,77	5 58,01	0,27
5	Bengkulu	18 : 15 WIB	18 : 01 WIB	288 54,61	294 10,79	-3 47,26	6 4,41	0,28
6	Jambi	18 : 13 WIB	18 : 00 WIB	288 54,53	294 15,85	-3 32,95	6 3,19	0,28
7	Tanjung Pinang	18 : 13 WIB	18 : 01 WIB	288 56,56	294 22,90	-3 14,17	6 0,94	0,28
8	Palembang	18 : 06 WIB	17 : 53 WIB	288 54,45	294 13,21	-3 46,39	6 6,28	0,29
9	Bandar Lampung	18 : 01 WIB	17 : 46 WIB	288 55,95	294 8,98	-4 5,88	6 9,90	0,29
10	Pangkal Pinang	18 : 02 WIB	17 : 49 WIB	288 54,50	294 15,58	-3 42,63	6 6,78	0,29
11	Serang	17 : 57 WIB	17 : 41 WIB	288 56,79	294 8,21	-4 12,84	6 11,78	0,29
12	Jakarta	17 : 54 WIB	17 : 38 WIB	288 56,88	294 8,30	-4 14,68	6 12,64	0,30
13	Bandung	17 : 50 WIB	17 : 33 WIB	288 58,01	294 7,49	-4 21,55	6 14,47	0,30
14	Semarang	17 : 38 WIB	17 : 22 WIB	288 58,22	294 8,04	-4 27,11	6 17,90	0,30
15	Yogyakarta	17 : 37 WIB	17 : 20 WIB	288 59,63	294 7,03	-4 32,43	6 18,78	0,30
16	Surabaya	17 : 29 WIB	17 : 11 WIB	288 58,90	294 8,05	-4 34,08	6 21,04	0,31
17	Pontianak	17 : 52 WIB	17 : 39 WIB	288 55,71	294 22,35	-3 33,00	6 7,92	0,29
18	Palangka Raya	17 : 31 WIB	17 : 16 WIB	288 54,79	294 18,29	-3 59,94	6 16,14	0,30
19	Banjarmasin	18 : 27 WITA	18 : 11 WITA	288 54,91	294 15,89	-4 9,67	6 18,36	0,30
20	Samarinda	18 : 20 WITA	18 : 06 WITA	288 55,64	294 24,42	-3 53,34	6 17,88	0,30
21	Tanjungselor	18 : 24 WITA	18 : 11 WITA	289 0,11	294 35,99	-3 26,71	6 13,86	0,30
22	Denpasar	18 : 17 WITA	17 : 59 WITA	289 1,63	294 6,93	-4 48,26	6 25,64	0,32
23	Mataram	18 : 13 WITA	17 : 55 WITA	289 1,49	294 7,16	-4 49,48	6 26,63	0,32
24	Kupang	17 : 41 WITA	17 : 21 WITA	289 5,77	294 6,51	-5 14,48	6 37,73	0,34
25	Mamuju	18 : 10 WITA	17 : 55 WITA	288 54,97	294 18,99	-4 13,78	6 22,80	0,31
26	Makassar	18 : 05 WITA	17 : 48 WITA	288 56,20	294 13,42	-4 31,89	6 26,50	0,32
27	Palu	18 : 09 WITA	17 : 54 WITA	288 55,49	294 24,40	-4 2,11	6 21,74	0,31
28	Kendari	17 : 54 WITA	17 : 37 WITA	288 55,48	294 16,97	-4 29,62	6 28,90	0,32
29	Gorontalo	17 : 58 WITA	17 : 44 WITA	288 56,82	294 30,49	-3 57,59	6 23,90	0,31
30	Manado	17 : 52 WITA	17 : 38 WITA	288 58,10	294 34,77	-3 53,75	6 24,92	0,31
31	Sofifi	18 : 40 WIT	18 : 25 WIT	288 57,22	294 33,32	-4 5,33	6 29,32	0,32
32	Ambon	18 : 32 WIT	18 : 14 WIT	288 55,57	294 19,49	-4 39,23	6 35,70	0,33
33	Manokwari	18 : 12 WIT	17 : 55 WIT	288 56,06	294 30,49	-4 29,78	6 39,73	0,34
34	Jayapura	17 : 43 WIT	17 : 25 WIT	288 55,81	294 27,31	-4 55,42	6 50,53	0,36

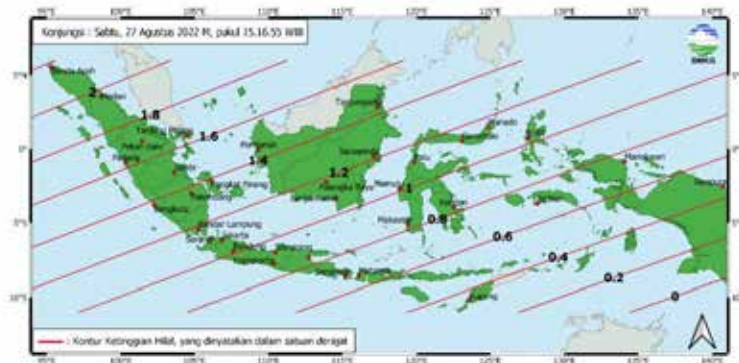
**PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
KAMIS, 28 JULI 2022 M
PENENTU AWAL BULAN MUHARRAM 1444 H**



DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
SABTU, 27 AGUSTUS 2022 M
PENENTU AWAL BULAN SHAFAR 1444 H
KONJUNSI: SABTU, 27 AGUSTUS 2022 M, PUKUL 15:16 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	o '	o '	o '	o '	%
1	Banda Aceh	18 : 47 WIB	18 : 59 WIB	280 5,98	283 32,86	2 10,79	4 23,59	0,15
2	Medan	18 : 32 WIB	18 : 43 WIB	280 2,76	283 40,36	1 58,09	4 24,07	0,15
3	Padang	18 : 22 WIB	18 : 31 WIB	279 57,80	283 52,76	1 37,62	4 27,22	0,15
4	Pekanbaru	18 : 19 WIB	18 : 28 WIB	279 59,09	283 49,94	1 41,74	4 25,83	0,15
5	Bengkulu	18 : 13 WIB	18 : 21 WIB	279 56,64	284 2,07	1 22,67	4 29,27	0,15
6	Jambi	18 : 09 WIB	18 : 17 WIB	279 57,56	283 57,02	1 29,67	4 27,19	0,15
7	Tanjung Pinang	18 : 10 WIB	18 : 16 WIB	279 59,67	283 51,46	1 38,60	4 24,96	0,15
8	Palembang	18 : 11 WIB	18 : 11 WIB	279 57,00	284 1,57	1 22,03	4 28,20	0,15
9	Bandar Lampung	18 : 12 WIB	18 : 07 WIB	279 56,77	284 8,78	1 10,92	4 30,26	0,16
10	Pangkal Pinang	17 : 13 WIB	18 : 06 WIB	279 57,42	284 0,29	1 23,44	4 27,29	0,15
11	Serang	17 : 14 WIB	18 : 02 WIB	279 56,96	284 11,36	1 6,53	4 30,77	0,16
12	Jakarta	17 : 15 WIB	17 : 59 WIB	279 57,01	284 11,93	1 5,21	4 30,76	0,16
13	Bandung	17 : 16 WIB	17 : 55 WIB	279 57,30	284 14,63	1 0,72	4 31,36	0,16
14	Semarang	17 : 17 WIB	17 : 44 WIB	279 57,50	284 16,48	0 55,88	4 31,25	0,16
15	Yogyakarta	17 : 18 WIB	17 : 43 WIB	279 57,89	284 18,80	0 52,53	4 31,99	0,16
16	Surabaya	17 : 19 WIB	17 : 34 WIB	279 57,79	284 18,82	0 50,71	4 31,53	0,16
17	Pontianak	17 : 20 WIB	17 : 55 WIB	279 59,02	283 57,72	1 26,92	4 25,17	0,15
18	Palangka Raya	17 : 21 WIB	17 : 34 WIB	279 57,83	284 6,30	1 10,63	4 26,85	0,15
19	Banjarmasin	18 : 22 WITA	18 : 30 WITA	279 57,47	284 9,40	1 4,92	4 27,83	0,15
20	Samarinda	18 : 23 WITA	18 : 23 WITA	279 59,10	284 4,96	1 12,76	4 25,31	0,15
21	Tanjungselor	18 : 24 WITA	18 : 25 WITA	280 2,77	283 58,77	1 26,12	4 22,35	0,15
22	Denpasar	18 : 25 WITA	18 : 22 WITA	279 58,74	284 24,02	0 40,96	4 32,79	0,16
23	Mataram	18 : 26 WITA	18 : 18 WITA	279 58,73	284 24,26	0 39,88	4 32,75	0,16
24	Kupang	17 : 27 WITA	17 : 46 WITA	280 0,55	284 32,55	0 21,01	4 34,98	0,16
25	Mamuju	18 : 28 WITA	18 : 13 WITA	279 57,93	284 10,97	1 0,85	4 27,35	0,15
26	Makassar	18 : 29 WITA	18 : 08 WITA	279 57,58	284 17,07	0 49,53	4 29,68	0,15
27	Palu	18 : 30 WITA	18 : 11 WITA	279 58,97	284 7,91	1 6,84	4 25,77	0,15
28	Kendari	17 : 31 WITA	17 : 57 WITA	279 57,80	284 16,41	0 49,64	4 28,86	0,15
29	Gorontalo	17 : 32 WITA	17 : 59 WITA	280 0,36	284 7,75	1 7,83	4 24,70	0,15
30	Manado	17 : 33 WITA	17 : 53 WITA	280 1,48	284 7,61	1 9,03	4 24,02	0,15
31	Sofifi	18 : 34 WIT	18 : 41 WIT	280 0,82	284 11,13	1 1,71	4 25,08	0,15
32	Ambon	18 : 35 WIT	18 : 34 WIT	279 58,18	284 19,72	0 41,93	4 29,43	0,15
33	Manokwari	18 : 36 WIT	18 : 12 WIT	279 59,82	284 18,94	0 44,94	4 27,94	0,15
34	Jayapura	17 : 37 WIT	17 : 43 WIT	279 59,26	284 26,55	0 27,55	4 31,57	0,16

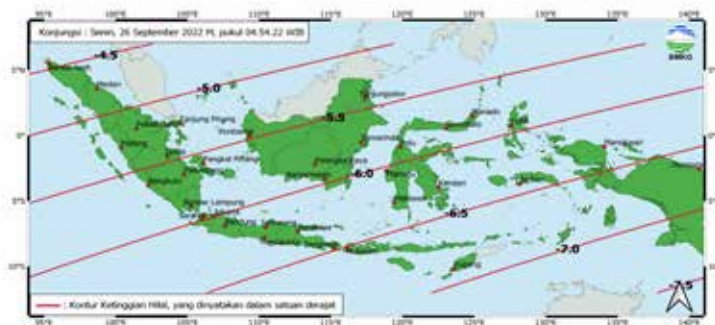
PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
 SABTU, 27 AGUSTUS 2022 M
 PENENTU AWAL BULAN SHAFAR 1444 H



DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
AHAD, 25 SEPTEMBER 2022 M
PENENTU AWAL BULAN RABI'UL AWAL 1444 H
 KONJUNSI: SENIN, 26 SEPTEMBER 2022 M, PUKUL 04:54WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j . m . d	j . m . d	o ' "	o ' "	o ' "	o ' "	%
1	Banda Aceh	18.33.24 WIB	18.18.26 WIB	269 7,64	274 55,40	-4 27,12	6 49,51	0,36
2	Medan	18.20.03 WIB	18.03.54 WIB	269 6,28	274 51,73	-4 46,41	6 57,12	0,37
3	Padang	18.13.38 WIB	17.55.28 WIB	269 2,55	274 34,41	-5 17,57	7 3,49	0,38
4	Pekanbaru	18.09.11 WIB	17.51.29 WIB	269 3,90	274 41,94	-5 10,74	7 4,39	0,38
5	Bengkulu	18.06.15 WIB	17.46.40 WIB	269 0,04	274 22,55	-5 38,01	7 8,93	0,39
6	Jambi	18.00.42 WIB	17.41.52 WIB	269 2,16	274 34,40	-5 27,58	7 9,81	0,39
7	Tanjung Pinang	17.57.12 WIB	17.39.17 WIB	269 4,44	274 46,74	-5 13,74	7 9,49	0,39
8	Palembang	17.56.11 WIB	17.36.38 WIB	269 0,96	274 28,75	-5 37,95	7 12,87	0,40
9	Bandar Lampung	17.54.22 WIB	17.33.43 WIB	268 58,67	274 16,82	-5 52,90	7 15,44	0,40
10	Pangkal Pinang	17.50.44 WIB	17.31.21 WIB	269 1,84	274 34,17	-5 35,39	7 14,70	0,40
11	Serang	17.50.50 WIB	17.29.47 WIB	268 58,05	274 13,93	-5 58,43	7 17,51	0,41
12	Jakarta	17.48.08 WIB	17.26.58 WIB	268 58,04	274 14,18	-5 60,00	7 18,75	0,41
13	Bandung	17.45.05 WIB	17.23.30 WIB	268 57,34	274 10,72	-6 5,63	7 20,65	0,41
14	Semarang	17.33.44 WIB	17.11.46 WIB	268 57,46	274 12,57	-6 11,31	7 25,80	0,42
15	Yogyakarta	17.34.06 WIB	17.11.47 WIB	268 56,64	274 8,01	-6 15,58	7 26,18	0,42
16	Surabaya	17.24.41 WIB	17.02.16 WIB	268 57,25	274 12,32	-6 17,53	7 30,12	0,43
17	Pontianak	17.37.41 WIB	17.18.48 WIB	269 3,91	274 47,22	-5 28,66	7 19,04	0,41
18	Palangka Raya	17.19.38 WIB	16.59.15 WIB	269 2,25	274 40,83	-5 50,29	7 28,85	0,43
19	Banjarmasin	18.16.54 WITA	17.55.58 WITA	269 1,29	274 35,83	-5 58,06	7 30,87	0,43
20	Samarinda	18.06.36 WITA	17.46.33 WITA	269 4,01	274 52,62	-5 45,63	7 33,50	0,44
21	Tanjungselor	18.05.24 WITA	17.46.45 WITA	269 6,89	275 8,89	-5 24,79	7 31,52	0,43
22	Denpasar	18.14.47 WITA	17.51.27 WITA	268 56,06	274 6,49	-6 29,47	7 35,47	0,44
23	Mataram	18.11.14 WITA	17.47.49 WITA	268 56,20	274 7,59	-6 30,72	7 37,02	0,44
24	Kupang	17.41.27 WITA	17.16.19 WITA	268 55,01	274 3,02	-6 53,41	7 51,54	0,47
25	Mamuju	17.59.40 WITA	17.38.29 WITA	269 2,17	274 43,08	-6 2,11	7 38,23	0,45
26	Makassar	17.57.43 WITA	17.35.23 WITA	268 59,88	274 30,11	-6 17,57	7 40,84	0,45
27	Palu	17.55.42 WITA	17.35.09 WITA	269 3,84	274 53,28	-5 52,99	7 38,76	0,45
28	Kendari	17.45.15 WITA	17.23.02 WITA	269 1,20	274 39,26	-6 16,46	7 45,71	0,46
29	Gorontalo	17.42.46 WITA	17.22.27 WITA	269 5,31	275 3,71	-5 49,77	7 43,60	0,46
30	Manado	17.35.35 WITA	17.15.27 WITA	269 6,24	275 10,29	-5 46,85	7 46,18	0,46
31	Sofifi	18.24.46 WIT	18.03.59 WIT	269 5,77	275 9,26	-5 56,52	7 51,70	0,47
32	Ambon	18.22.35 WIT	17.59.47 WIT	269 1,82	274 45,71	-6 25,22	7 55,87	0,48
33	Manokwari	17.58.49 WIT	17.36.33 WIT	269 4,79	275 7,13	-6 18,34	8 4,77	0,50
34	Jayapura	17.32.26 WIT	17.08.35 WIT	269 3,70	275 3,63	-6 40,85	8 18,09	0,53

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
AHAD, 25 SEPTEMBER 2022 M
PENENTU AWAL BULAN RABI'UL AWAL 1444 H



DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM

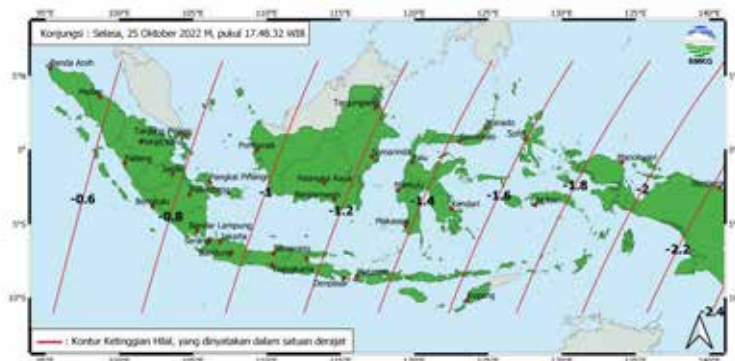
SELASA, 25 OKTOBER 2022 M

PENENTU AWAL BULAN RABI'UL AKHIR 1444 H

KONJUNSI: SELASA, 25 OKTOBER 2022 M, PUKUL 17:48 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHAR	BULAN			
		j m	j m	o '	o '	o '	o '	%
1	Banda Aceh	18 : 21 WIB	18 : 20 WIB	257 50,81	258 37,98	0 -28,10	0 49,81	0,01
2	Medan	18 : 09 WIB	18 : 08 WIB	257 51,25	258 42,93	0 -34,71	0 56,64	0,01
3	Padang	18 : 06 WIB	18 : 04 WIB	257 48,62	258 43,52	0 -40,04	1 2,00	0,01
4	Pekanbaru	18 : 01 WIB	17 : 59 WIB	257 50,06	258 45,51	0 -41,25	1 3,08	0,01
5	Bengkulu	18 : 01 WIB	17 : 59 WIB	257 44,58	258 41,90	0 -45,25	1 6,74	0,01
6	Jambi	17 : 54 WIB	17 : 52 WIB	257 48,01	258 45,94	0 -46,55	1 7,94	0,01
7	Tanjung Pinang	17 : 48 WIB	17 : 46 WIB	257 50,53	258 48,72	0 -46,59	1 8,18	0,01
8	Palembang	17 : 51 WIB	17 : 48 WIB	257 46,08	258 45,25	0 -49,66	1 10,65	0,01
9	Bandar Lampung	17 : 51 WIB	17 : 48 WIB	257 41,55	258 41,47	0 -52,22	1 12,69	0,01
10	Pangkal Pinang	17 : 44 WIB	17 : 42 WIB	257 47,44	258 47,60	0 -51,78	1 12,65	0,01
11	Serang	17 : 48 WIB	17 : 45 WIB	257 40,07	258 40,71	0 -54,50	1 14,56	0,01
12	Jakarta	17 : 45 WIB	17 : 42 WIB	257 39,99	258 41,11	0 -55,94	1 15,77	0,01
13	Bandung	17 : 43 WIB	17 : 39 WIB	257 38,22	258 39,92	0 -58,09	1 17,46	0,01
14	Semarang	17 : 31 WIB	17 : 28 WIB	257 38,23	258 41,85	-1 4,23	1 22,55	0,01
15	Yogyakarta	17 : 32 WIB	17 : 29 WIB	257 36,12	258 39,65	-1 4,67	1 22,73	0,01
16	Surabaya	17 : 23 WIB	17 : 19 WIB	257 37,45	258 42,56	-1 9,54	1 26,82	0,02
17	Pontianak	17 : 30 WIB	17 : 27 WIB	257 50,03	258 52,90	0 -56,74	1 17,64	0,01
18	Palangka Raya	17 : 13 WIB	17 : 10 WIB	257 47,74	258 54,48	-1 7,94	1 27,11	0,02
19	Banjarmasin	18 : 12 WITA	18 : 07 WITA	257 46,11	258 53,25	-1 10,39	1 28,85	0,02
20	Samarinda	17 : 59 WITA	17 : 55 WITA	257 50,03	258 59,94	-1 13,40	1 32,70	0,02
21	Tanjungselor	17 : 55 WITA	17 : 51 WITA	257 52,19	259 3,15	-1 10,73	1 31,96	0,02
22	Denpasar	18 : 14 WITA	18 : 09 WITA	257 33,95	258 40,39	-1 16,36	1 31,89	0,02
23	Mataram	18 : 10 WITA	18 : 06 WITA	257 34,23	258 41,24	-1 18,38	1 33,51	0,02
24	Kupang	17 : 42 WITA	17 : 36 WITA	257 29,76	258 40,51	-1 38,36	1 48,10	0,02
25	Mamuju	17 : 54 WITA	17 : 49 WITA	257 47,38	258 58,19	-1 19,44	1 36,89	0,02
26	Makassar	17 : 54 WITA	17 : 49 WITA	257 43,00	258 53,37	-1 23,07	1 38,71	0,02
27	Palu	17 : 48 WITA	17 : 44 WITA	257 49,77	259 2,01	-1 19,85	1 38,18	0,02
28	Kendari	17 : 40 WITA	17 : 35 WITA	257 45,44	258 58,66	-1 29,27	1 44,37	0,02
29	Gorontalo	17 : 34 WITA	17 : 29 WITA	257 51,31	259 7,06	-1 25,61	1 44,05	0,02
30	Manado	17 : 26 WITA	17 : 21 WITA	257 52,05	259 9,96	-1 28,59	1 47,32	0,02
31	Sofifi	18 : 16 WIT	18 : 11 WIT	257 51,72	259 11,81	-1 35,85	1 53,01	0,03
32	Ambon	18 : 17 WIT	18 : 12 WIT	257 46,25	259 4,08	-1 42,88	1 55,48	0,03
33	Manokwari	17 : 51 WIT	17 : 45 WIT	257 50,62	259 15,55	-1 53,96	2 6,61	0,03
34	Jayapura	17 : 26 WIT	17 : 19 WIT	257 48,83	259 17,85	-2 13,53	2 20,48	0,04

**PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
SELASA, 25 OKTOBER 2022 M
PENENTU AWAL BULAN RABI'UL AKHIR 1444 H**



DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM

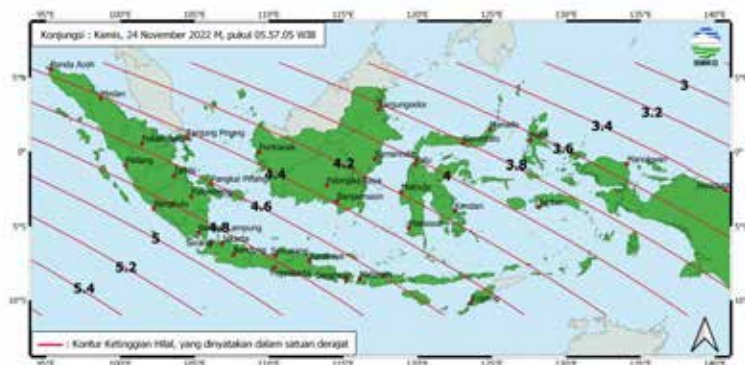
KAMIS, 24 NOVEMBER 2022 M

PENENTU AWAL BULAN JUMADAL ULA 1444 H

KONJUNSI: KAMIS, 24 NOVEMBER 2022 M, PUKUL 05:57 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	o ' "	o ' "	o ' "	o ' "	%
1	Banda Aceh	18 : 20 WIB	18 : 43 WIB	249 23,55	245 8,07	4 21,64	6 34,52	0,33
2	Medan	18 : 10 WIB	18 : 33 WIB	249 25,36	245 25,40	4 25,09	6 27,45	0,32
3	Padang	18 : 10 WIB	18 : 34 WIB	249 23,50	245 54,88	4 43,40	6 24,59	0,31
4	Pekanbaru	18 : 03 WIB	18 : 27 WIB	249 25,02	245 47,21	4 34,32	6 21,94	0,31
5	Bengkulu	18 : 06 WIB	18 : 32 WIB	249 18,16	246 10,78	4 51,99	6 21,18	0,31
6	Jambi	17 : 58 WIB	18 : 22 WIB	249 22,64	246 0,55	4 39,48	6 17,69	0,30
7	Tanjung Pinang	17 : 51 WIB	18 : 14 WIB	249 25,39	245 46,92	4 26,09	6 15,38	0,30
8	Palembang	17 : 55 WIB	18 : 20 WIB	249 20,10	246 8,26	4 43,12	6 15,52	0,30
9	Bandar Lampung	17 : 57 WIB	18 : 22 WIB	249 13,73	246 19,35	4 52,16	6 15,13	0,30
10	Pangkal Pinang	17 : 48 WIB	18 : 13 WIB	249 21,83	246 4,81	4 36,48	6 12,38	0,29
11	Serang	17 : 54 WIB	18 : 20 WIB	249 11,53	246 22,44	4 52,92	6 13,40	0,30
12	Jakarta	17 : 52 WIB	18 : 17 WIB	249 11,37	246 22,93	4 51,65	6 11,95	0,29
13	Bandung	17 : 50 WIB	18 : 15 WIB	249 8,71	246 25,96	4 52,84	6 10,51	0,29
14	Semarang	17 : 39 WIB	18 : 04 WIB	249 8,58	246 27,27	4 46,86	6 4,36	0,28
15	Yogyakarta	17 : 40 WIB	18 : 05 WIB	249 5,43	246 29,82	4 50,02	6 4,80	0,28
16	Surabaya	17 : 30 WIB	17 : 55 WIB	249 7,31	246 29,27	4 43,21	5 59,54	0,27
17	Pontianak	17 : 32 WIB	17 : 55 WIB	249 24,81	245 55,87	4 20,26	6 4,97	0,28
18	Palangka Raya	17 : 18 WIB	17 : 40 WIB	249 21,91	246 9,86	4 20,24	5 55,57	0,27
19	Banjarmasin	18 : 16 WITA	18 : 39 WITA	249 19,71	246 15,14	4 23,32	5 54,30	0,27
20	Samarinda	18 : 02 WITA	18 : 24 WITA	249 24,58	246 3,48	4 5,84	5 48,28	0,26
21	Tanjungselor	17 : 56 WITA	18 : 16 WITA	249 26,21	245 45,20	3 50,00	5 47,31	0,26
22	Denpasar	18 : 22 WITA	18 : 47 WITA	249 1,88	246 33,91	4 42,52	5 54,59	0,27
23	Mataram	18 : 18 WITA	18 : 43 WITA	249 2,25	246 33,99	4 40,29	5 52,64	0,26
24	Kupang	17 : 51 WITA	18 : 15 WITA	248 54,97	246 39,52	4 29,29	5 37,04	0,24
25	Mamuju	17 : 58 WITA	18 : 20 WITA	249 21,22	246 14,73	4 11,41	5 44,89	0,25
26	Makassar	18 : 00 WITA	18 : 23 WITA	249 15,12	246 24,69	4 20,18	5 44,34	0,25
27	Palu	17 : 52 WITA	18 : 13 WITA	249 24,19	246 7,18	4 1,77	5 42,48	0,25
28	Kendari	17 : 46 WITA	18 : 08 WITA	249 18,43	246 21,93	4 8,89	5 37,38	0,24
29	Gorontalo	17 : 37 WITA	17 : 57 WITA	249 25,76	246 2,23	3 48,72	5 35,41	0,24
30	Manado	17 : 28 WITA	17 : 48 WITA	249 26,34	245 58,57	3 40,75	5 31,49	0,23
31	Sofifi	18 : 18 WIT	18 : 38 WIT	249 26,05	246 4,39	3 38,43	5 25,80	0,23
32	Ambon	18 : 23 WIT	18 : 43 WIT	249 19,28	246 23,86	3 55,66	5 25,20	0,22
33	Manokwari	17 : 55 WIT	18 : 14 WIT	249 24,71	246 16,14	3 31,61	5 12,19	0,21
34	Jayapura	17 : 31 WIT	17 : 49 WIT	249 22,21	246 26,64	3 24,44	4 58,43	0,19

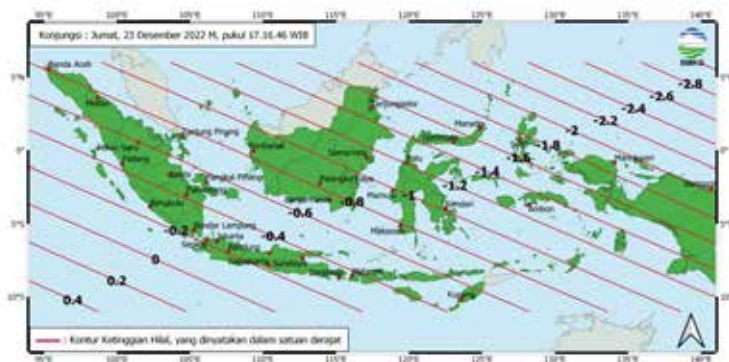
PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
KAMIS, 24 NOVEMBER 2022 M
PENENTU AWAL BULAN JUMADAL ULA 1444 H

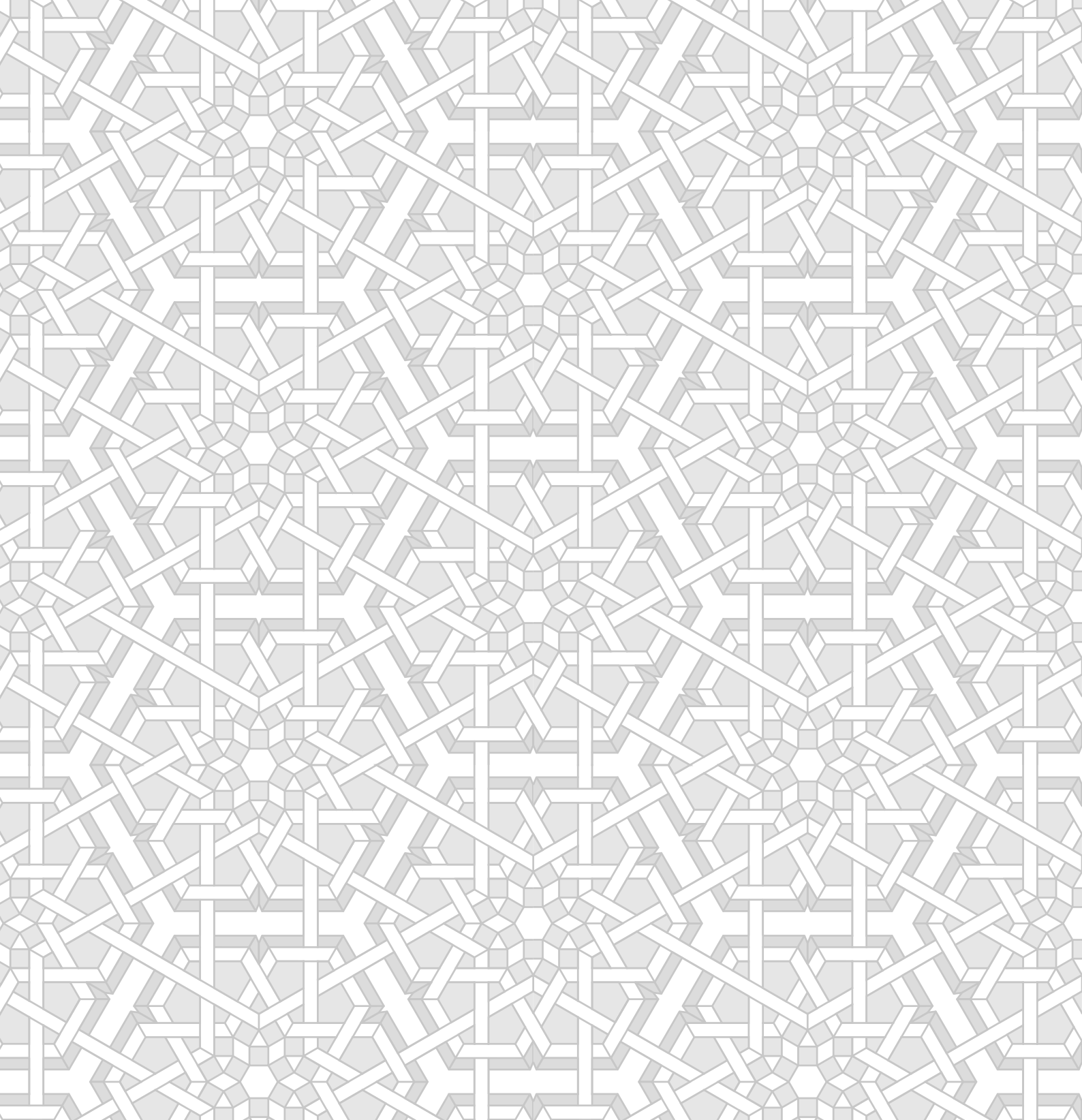


DATA HILAL DAN MATAHARI PADA SAAT MATAHARI TERBENAM
JUMAT, 23 DESEMBER 2022 M
PENENTU AWAL BULAN JUMADAL AKHIRAH 1444 H
 KONJUNGSI: JUM'AT, 23 DESEMBER 2022 M, PUKUL 17:16 WIB

NO	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	o '	o '	o '	o '	%
1	Banda Aceh	18 : 31 WIB	18 : 28 WIB	246 32,41	242 34,05	0 -48,66	4 1,27	0,12
2	Medan	18 : 21 WIB	18 : 18 WIB	246 34,63	242 37,95	0 -45,62	3 59,15	0,12
3	Padang	18 : 22 WIB	18 : 21 WIB	246 33,05	242 39,45	0 -26,08	3 53,98	0,12
4	Pekanbaru	18 : 15 WIB	18 : 13 WIB	246 34,56	242 39,97	0 -35,75	3 55,81	0,12
5	Bengkulu	18 : 20 WIB	18 : 19 WIB	246 27,22	242 36,48	0 -16,11	3 50,73	0,11
6	Jambi	18 : 10 WIB	18 : 09 WIB	246 32,03	242 39,12	0 -29,72	3 53,55	0,12
7	Tanjung Pinang	18 : 03 WIB	18 : 00 WIB	246 34,81	242 40,39	0 -44,61	3 56,76	0,12
8	Palembang	18 : 08 WIB	18 : 07 WIB	246 29,24	242 37,54	0 -25,28	3 52,03	0,11
9	Bandar Lampung	18 : 11 WIB	18 : 10 WIB	246 22,21	242 33,06	0 -14,58	3 49,13	0,11
10	Pangkal Pinang	18 : 01 WIB	18 : 00 WIB	246 31,06	242 38,61	0 -32,46	3 53,33	0,12
11	Serang	18 : 08 WIB	18 : 08 WIB	246 19,73	242 31,27	0 -13,18	3 48,43	0,11
12	Jakarta	18 : 06 WIB	18 : 05 WIB	246 19,53	242 31,02	0 -14,31	3 48,49	0,11
13	Bandung	18 : 04 WIB	18 : 04 WIB	246 16,54	242 28,82	0 -12,37	3 47,70	0,11
14	Semarang	17 : 53 WIB	17 : 52 WIB	246 16,27	242 28,03	0 -17,93	3 48,26	0,11
15	Yogyakarta	17 : 54 WIB	17 : 54 WIB	246 12,76	242 25,51	0 -13,97	3 47,22	0,11
16	Surabaya	17 : 44 WIB	17 : 43 WIB	246 14,76	242 26,43	0 -20,96	3 48,45	0,11
17	Pontianak	17 : 45 WIB	17 : 42 WIB	246 34,07	242 40,64	0 -50,79	3 56,74	0,12
18	Palangka Raya	17 : 30 WIB	17 : 27 WIB	246 30,85	242 38,49	0 -49,57	3 55,48	0,12
19	Banjarmasin	18 : 30 WITA	18 : 27 WITA	246 28,43	242 36,57	0 -45,34	3 54,33	0,12
20	Samarinda	18 : 15 WITA	18 : 10 WITA	246 33,56	242 40,92	-1 7,44	3 59,12	0,12
21	Tanjungselor	18 : 08 WITA	18 : 02 WITA	246 34,96	242 42,86	-1 29,17	4 3,64	0,13
22	Denpasar	18 : 36 WITA	18 : 36 WITA	246 8,58	242 21,10	0 -19,83	3 47,56	0,11
23	Mataram	18 : 33 WITA	18 : 32 WITA	246 8,97	242 21,14	0 -22,06	3 47,99	0,11
24	Kupang	18 : 06 WITA	18 : 04 WITA	246 0,48	242 11,93	0 -30,11	3 49,24	0,11
25	Mamuju	18 : 11 WITA	18 : 07 WITA	246 29,92	242 37,67	0 -59,19	3 57,08	0,12
26	Makassar	18 : 13 WITA	18 : 10 WITA	246 23,19	242 31,87	0 -46,83	3 54,03	0,12
27	Palu	18 : 04 WITA	17 : 59 WITA	246 33,06	242 40,62	-1 12,23	3 59,95	0,12
28	Kendari	17 : 59 WITA	17 : 55 WITA	246 26,72	242 34,63	-1 0,80	3 57,24	0,12
29	Gorontalo	17 : 49 WITA	17 : 43 WITA	246 34,53	242 42,64	-1 30,22	4 3,69	0,13
30	Manado	17 : 40 WITA	17 : 33 WITA	246 34,99	242 43,78	-1 41,83	4 6,09	0,13
31	Sofifi	18 : 31 WIT	18 : 24 WIT	246 34,65	242 43,44	-1 44,78	4 6,88	0,13
32	Ambon	18 : 36 WIT	18 : 31 WIT	246 27,44	242 34,94	-1 17,19	4 1,14	0,12
33	Manokwari	18 : 07 WIT	18 : 00 WIT	246 33,07	242 41,56	-1 53,37	4 9,58	0,13
34	Jayapura	17 : 44 WIT	17 : 36 WIT	246 30,15	242 37,65	-2 1,85	4 12,97	0,14

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
 JUMAT, 23 DESEMBER 2022 M
 PENENTU AWAL BULAN JUMADAL AKHIRAH 1444 H





POSISI MATAHARI DAN BULAN TAHUN 2022 M



1 Januari 2022

DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	280° 32' 16"	-0.49"	281° 27' 03"	-23° 01' 13"	0.9833542	16' 15.87"	23° 26' 15"	-3 m 20 s
1	280° 34' 49"	-0.50"	281° 29' 48"	-23° 01' 01"	0.9833537	16' 15.87"	23° 26' 15"	-3 m 21 s
2	280° 37' 22"	-0.50"	281° 32' 34"	-23° 00' 48"	0.9833532	16' 15.88"	23° 26' 15"	-3 m 22 s
3	280° 39' 55"	-0.51"	281° 35' 20"	-23° 00' 36"	0.9833528	16' 15.88"	23° 26' 15"	-3 m 23 s
4	280° 42' 28"	-0.51"	281° 38' 05"	-23° 00' 24"	0.9833523	16' 15.88"	23° 26' 15"	-3 m 24 s
5	280° 45' 01"	-0.52"	281° 40' 51"	-23° 00' 12"	0.9833518	16' 15.88"	23° 26' 15"	-3 m 25 s
6	280° 47' 34"	-0.52"	281° 43' 37"	-22° 59' 59"	0.9833514	16' 15.88"	23° 26' 15"	-3 m 27 s
7	280° 50' 06"	-0.53"	281° 46' 22"	-22° 59' 47"	0.9833509	16' 15.88"	23° 26' 15"	-3 m 28 s
8	280° 52' 39"	-0.53"	281° 49' 08"	-22° 59' 35"	0.9833505	16' 15.88"	23° 26' 15"	-3 m 29 s
9	280° 55' 12"	-0.54"	281° 51' 53"	-22° 59' 22"	0.9833501	16' 15.88"	23° 26' 15"	-3 m 30 s
10	280° 57' 45"	-0.54"	281° 54' 39"	-22° 59' 10"	0.9833496	16' 15.88"	23° 26' 15"	-3 m 31 s
11	281° 00' 18"	-0.55"	281° 57' 25"	-22° 58' 57"	0.9833492	16' 15.88"	23° 26' 15"	-3 m 32 s
12	281° 02' 51"	-0.55"	282° 00' 10"	-22° 58' 44"	0.9833488	16' 15.88"	23° 26' 15"	-3 m 34 s
13	281° 05' 24"	-0.56"	282° 02' 56"	-22° 58' 32"	0.9833484	16' 15.88"	23° 26' 15"	-3 m 35 s
14	281° 07' 57"	-0.56"	282° 05' 41"	-22° 58' 19"	0.9833480	16' 15.88"	23° 26' 15"	-3 m 36 s
15	281° 10' 30"	-0.57"	282° 08' 27"	-22° 58' 06"	0.9833476	16' 15.88"	23° 26' 15"	-3 m 37 s
16	281° 13' 03"	-0.57"	282° 11' 12"	-22° 57' 53"	0.9833472	16' 15.88"	23° 26' 15"	-3 m 38 s
17	281° 15' 36"	-0.58"	282° 13' 58"	-22° 57' 41"	0.9833468	16' 15.88"	23° 26' 15"	-3 m 40 s
18	281° 18' 09"	-0.58"	282° 16' 43"	-22° 57' 28"	0.9833464	16' 15.88"	23° 26' 15"	-3 m 41 s
19	281° 20' 42"	-0.59"	282° 19' 29"	-22° 57' 15"	0.9833460	16' 15.88"	23° 26' 15"	-3 m 42 s
20	281° 23' 15"	-0.59"	282° 22' 14"	-22° 57' 02"	0.9833457	16' 15.88"	23° 26' 15"	-3 m 43 s
21	281° 25' 48"	-0.60"	282° 24' 60"	-22° 56' 49"	0.9833453	16' 15.88"	23° 26' 15"	-3 m 44 s
22	281° 28' 21"	-0.60"	282° 27' 45"	-22° 56' 36"	0.9833450	16' 15.88"	23° 26' 15"	-3 m 45 s
23	281° 30' 54"	-0.61"	282° 30' 31"	-22° 56' 22"	0.9833446	16' 15.88"	23° 26' 15"	-3 m 47 s
24	281° 33' 26"	-0.61"	282° 33' 16"	-22° 56' 09"	0.9833443	16' 15.88"	23° 26' 15"	-3 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	255° 27' 45"	-1° 16' 56"	254° 03' 58"	-23° 55' 09"	1° 01' 06"	16' 38.97"	93° 31' 58"	0.04747
1	256° 05' 24"	-1° 20' 14"	254° 44' 33"	-24° 02' 28"	1° 01' 07"	16' 39.17"	93° 4' 38"	0.04533
2	256° 43' 05"	-1° 23' 32"	255° 25' 14"	-24° 09' 36"	1° 01' 07"	16' 39.36"	92° 36' 38"	0.04324
3	257° 20' 44"	-1° 26' 49"	256° 05' 57"	-24° 16' 33"	1° 01' 08"	16' 39.54"	92° 7' 58"	0.04120
4	257° 58' 27"	-1° 30' 06"	256° 46' 49"	-24° 23' 20"	1° 01' 09"	16' 39.72"	91° 38' 32"	0.03920
5	258° 36' 11"	-1° 33' 22"	257° 27' 46"	-24° 29' 56"	1° 01' 09"	16' 39.89"	91° 8' 18"	0.03725
6	259° 13' 56"	-1° 36' 37"	258° 08' 48"	-24° 36' 22"	1° 01' 10"	16' 40.04"	90° 37' 13"	0.03535
7	259° 51' 42"	-1° 39' 52"	258° 49' 56"	-24° 42' 36"	1° 01' 10"	16' 40.19"	90° 5' 14"	0.03349
8	260° 29' 29"	-1° 43' 06"	259° 31' 08"	-24° 48' 39"	1° 01' 11"	16' 40.34"	89° 32' 17"	0.03169
9	261° 07' 17"	-1° 46' 20"	260° 12' 25"	-24° 54' 30"	1° 01' 11"	16' 40.47"	88° 58' 17"	0.02993
10	261° 45' 05"	-1° 49' 33"	260° 53' 47"	-25° 00' 11"	1° 01' 12"	16' 40.59"	88° 23' 10"	0.02823
11	262° 22' 55"	-1° 52' 45"	261° 35' 13"	-25° 05' 40"	1° 01' 12"	16' 40.70"	87° 46' 51"	0.02657
12	263° 00' 45"	-1° 55' 56"	262° 16' 43"	-25° 10' 58"	1° 01' 13"	16' 40.81"	87° 9' 12"	0.02496
13	263° 38' 35"	-1° 59' 06"	262° 58' 18"	-25° 16' 04"	1° 01' 13"	16' 40.91"	86° 30' 08"	0.02341
14	264° 16' 27"	-2° 02' 16"	263° 39' 56"	-25° 20' 58"	1° 01' 13"	16' 40.99"	85° 49' 29"	0.02190
15	264° 54' 19"	-2° 05' 25"	264° 21' 39"	-25° 25' 41"	1° 01' 14"	16' 41.07"	85° 7' 08"	0.02045
16	265° 32' 11"	-2° 08' 32"	265° 03' 25"	-25° 30' 12"	1° 01' 14"	16' 41.14"	84° 22' 52"	0.01904
17	266° 10' 04"	-2° 11' 39"	265° 45' 14"	-25° 34' 31"	1° 01' 14"	16' 41.20"	83° 36' 32"	0.01769
18	266° 47' 58"	-2° 14' 45"	266° 27' 07"	-25° 38' 38"	1° 01' 14"	16' 41.25"	82° 47' 52"	0.01639
19	267° 25' 52"	-2° 17' 50"	267° 09' 03"	-25° 42' 34"	1° 01' 14"	16' 41.29"	81° 56' 37"	0.01514
20	268° 03' 46"	-2° 20' 54"	267° 51' 02"	-25° 46' 17"	1° 01' 15"	16' 41.32"	81° 2' 28"	0.01394
21	268° 41' 41"	-2° 23' 57"	268° 33' 04"	-25° 49' 49"	1° 01' 15"	16' 41.35"	80° 5' 03"	0.01280
22	269° 19' 36"	-2° 26' 59"	269° 15' 08"	-25° 53' 08"	1° 01' 15"	16' 41.36"	79° 3' 57"	0.01170
23	269° 57' 31"	-2° 29' 60"	269° 57' 15"	-25° 56' 15"	1° 01' 15"	16' 41.36"	77° 58' 40"	0.01066
24	270° 35' 27"	-2° 32' 59"	270° 39' 24"	-25° 59' 10"	1° 01' 15"	16' 41.36"	76° 48' 34"	0.00967



2 Januari 2022

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	281° 33' 26"	-0.61"	282° 33' 16"	-22° 56' 09"	0.9833443	16' 15.88"	23° 26' 15"	-3 m 48 s
1	281° 35' 59"	-0.62"	282° 36' 02"	-22° 55' 56"	0.9833439	16' 15.88"	23° 26' 15"	-3 m 49 s
2	281° 38' 32"	-0.62"	282° 38' 47"	-22° 55' 43"	0.9833436	16' 15.88"	23° 26' 15"	-3 m 50 s
3	281° 41' 05"	-0.63"	282° 41' 33"	-22° 55' 29"	0.9833433	16' 15.89"	23° 26' 15"	-3 m 51 s
4	281° 43' 38"	-0.63"	282° 44' 18"	-22° 55' 16"	0.9833430	16' 15.89"	23° 26' 15"	-3 m 52 s
5	281° 46' 11"	-0.64"	282° 47' 03"	-22° 55' 03"	0.9833427	16' 15.89"	23° 26' 15"	-3 m 54 s
6	281° 48' 44"	-0.64"	282° 49' 49"	-22° 54' 49"	0.9833424	16' 15.89"	23° 26' 15"	-3 m 55 s
7	281° 51' 17"	-0.64"	282° 52' 34"	-22° 54' 36"	0.9833421	16' 15.89"	23° 26' 15"	-3 m 56 s
8	281° 53' 50"	-0.65"	282° 55' 20"	-22° 54' 22"	0.9833418	16' 15.89"	23° 26' 15"	-3 m 57 s
9	281° 56' 23"	-0.65"	282° 58' 05"	-22° 54' 08"	0.9833415	16' 15.89"	23° 26' 15"	-3 m 58 s
10	281° 58' 56"	-0.66"	283° 00' 50"	-22° 53' 55"	0.9833412	16' 15.89"	23° 26' 15"	-3 m 59 s
11	282° 01' 29"	-0.66"	283° 03' 36"	-22° 53' 41"	0.9833409	16' 15.89"	23° 26' 15"	-4 m 01 s
12	282° 04' 02"	-0.67"	283° 06' 21"	-22° 53' 27"	0.9833407	16' 15.89"	23° 26' 15"	-4 m 02 s
13	282° 06' 35"	-0.67"	283° 09' 06"	-22° 53' 13"	0.9833404	16' 15.89"	23° 26' 15"	-4 m 03 s
14	282° 09' 08"	-0.68"	283° 11' 52"	-22° 52' 60"	0.9833401	16' 15.89"	23° 26' 15"	-4 m 04 s
15	282° 11' 41"	-0.68"	283° 14' 37"	-22° 52' 46"	0.9833399	16' 15.89"	23° 26' 15"	-4 m 05 s
16	282° 14' 14"	-0.68"	283° 17' 22"	-22° 52' 32"	0.9833396	16' 15.89"	23° 26' 15"	-4 m 06 s
17	282° 16' 47"	-0.69"	283° 20' 08"	-22° 52' 18"	0.9833394	16' 15.89"	23° 26' 15"	-4 m 07 s
18	282° 19' 20"	-0.69"	283° 22' 53"	-22° 52' 04"	0.9833392	16' 15.89"	23° 26' 15"	-4 m 09 s
19	282° 21' 52"	-0.70"	283° 25' 38"	-22° 51' 49"	0.9833389	16' 15.89"	23° 26' 15"	-4 m 10 s
20	282° 24' 25"	-0.70"	283° 28' 24"	-22° 51' 35"	0.9833387	16' 15.89"	23° 26' 15"	-4 m 11 s
21	282° 26' 58"	-0.70"	283° 31' 09"	-22° 51' 21"	0.9833385	16' 15.89"	23° 26' 15"	-4 m 12 s
22	282° 29' 31"	-0.71"	283° 33' 54"	-22° 51' 07"	0.9833383	16' 15.89"	23° 26' 15"	-4 m 13 s
23	282° 32' 04"	-0.71"	283° 36' 39"	-22° 50' 53"	0.9833381	16' 15.89"	23° 26' 15"	-4 m 14 s
24	282° 34' 37"	-0.72"	283° 39' 25"	-22° 50' 38"	0.9833379	16' 15.89"	23° 26' 15"	-4 m 16 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	270° 35' 27"	-2° 32' 59"	270° 39' 24"	-25° 59' 10"	1° 01' 15"	16' 41.36"	76° 48' 34"	0.00967
1	271° 13' 23"	-2° 35' 58"	271° 21' 35"	-26° 01' 52"	1° 01' 15"	16' 41.34"	75° 32' 58"	0.00873
2	271° 51' 19"	-2° 38' 55"	272° 03' 48"	-26° 04' 23"	1° 01' 15"	16' 41.32"	74° 10' 59"	0.00785
3	272° 29' 15"	-2° 41' 51"	272° 46' 02"	-26° 06' 41"	1° 01' 14"	16' 41.29"	72° 41' 33"	0.00701
4	273° 07' 11"	-2° 44' 46"	273° 28' 18"	-26° 08' 46"	1° 01' 14"	16' 41.24"	71° 3' 23"	0.00623
5	273° 45' 07"	-2° 47' 40"	274° 10' 36"	-26° 10' 40"	1° 01' 14"	16' 41.19"	69° 14' 54"	0.00551
6	274° 23' 03"	-2° 50' 33"	274° 52' 54"	-26° 12' 20"	1° 01' 14"	16' 41.13"	67° 14' 09"	0.00483
7	275° 00' 59"	-2° 53' 24"	275° 35' 13"	-26° 13' 49"	1° 01' 14"	16' 41.06"	64° 58' 39"	0.00421
8	275° 38' 55"	-2° 56' 14"	276° 17' 33"	-26° 15' 05"	1° 01' 13"	16' 40.98"	62° 25' 21"	0.00364
9	276° 16' 51"	-2° 59' 02"	276° 59' 53"	-26° 16' 09"	1° 01' 13"	16' 40.89"	59° 30' 25"	0.00313
10	276° 54' 47"	-3° 01' 49"	277° 42' 14"	-26° 16' 60"	1° 01' 13"	16' 40.79"	56° 9' 00"	0.00267
11	277° 32' 42"	-3° 04' 35"	278° 24' 34"	-26° 17' 39"	1° 01' 12"	16' 40.68"	52° 15' 11"	0.00226
12	278° 10' 37"	-3° 07' 20"	279° 06' 55"	-26° 18' 05"	1° 01' 12"	16' 40.57"	47° 41' 43"	0.00190
13	278° 48' 32"	-3° 10' 03"	279° 49' 15"	-26° 18' 19"	1° 01' 11"	16' 40.44"	42° 20' 19"	0.00160
14	279° 26' 26"	-3° 12' 44"	280° 31' 34"	-26° 18' 20"	1° 01' 11"	16' 40.30"	36° 2' 19"	0.00135
15	280° 04' 20"	-3° 15' 24"	281° 13' 53"	-26° 18' 09"	1° 01' 10"	16' 40.16"	28° 40' 37"	0.00116
16	280° 42' 14"	-3° 18' 03"	281° 56' 11"	-26° 17' 46"	1° 01' 10"	16' 40.01"	20° 13' 05"	0.00101
17	281° 20' 07"	-3° 20' 40"	282° 38' 28"	-26° 17' 10"	1° 01' 09"	16' 39.84"	10° 47' 20"	0.00092
18	281° 57' 59"	-3° 23' 16"	283° 20' 43"	-26° 16' 21"	1° 01' 09"	16' 39.67"	0° 44' 00"	0.00089
19	282° 35' 51"	-3° 25' 50"	284° 02' 57"	-26° 15' 21"	1° 01' 08"	16' 39.49"	350° 34' 33"	0.00090
20	283° 13' 42"	-3° 28' 22"	284° 45' 09"	-26° 14' 08"	1° 01' 07"	16' 39.30"	340° 52' 26"	0.00097
21	283° 51' 32"	-3° 30' 53"	285° 27' 19"	-26° 12' 43"	1° 01' 06"	16' 39.10"	332° 2' 47"	0.00110
22	284° 29' 22"	-3° 33' 22"	286° 09' 27"	-26° 11' 05"	1° 01' 06"	16' 38.89"	324° 17' 38"	0.00127
23	285° 07' 09"	-3° 35' 50"	286° 51' 30"	-26° 09' 15"	1° 01' 05"	16' 38.67"	317° 38' 07"	0.00150
24	285° 44' 57"	-3° 38' 16"	287° 33' 33"	-26° 07' 13"	1° 01' 04"	16' 38.44"	311° 57' 44"	0.00178

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	282° 34' 37"	-0.72"	283° 39' 25"	-22° 50' 38"	0.9833379	16' 15.89"	23° 26' 15"	-4 m 16 s
1	282° 37' 10"	-0.72"	283° 42' 10"	-22° 50' 24"	0.9833377	16' 15.89"	23° 26' 15"	-4 m 17 s
2	282° 39' 43"	-0.72"	283° 44' 55"	-22° 50' 09"	0.9833375	16' 15.89"	23° 26' 15"	-4 m 18 s
3	282° 42' 16"	-0.73"	283° 47' 40"	-22° 49' 55"	0.9833374	16' 15.89"	23° 26' 15"	-4 m 19 s
4	282° 44' 49"	-0.73"	283° 50' 26"	-22° 49' 40"	0.9833372	16' 15.89"	23° 26' 15"	-4 m 20 s
5	282° 47' 22"	-0.74"	283° 53' 11"	-22° 49' 26"	0.9833370	16' 15.89"	23° 26' 15"	-4 m 21 s
6	282° 49' 55"	-0.74"	283° 55' 56"	-22° 49' 11"	0.9833369	16' 15.89"	23° 26' 15"	-4 m 22 s
7	282° 52' 28"	-0.74"	283° 58' 41"	-22° 48' 57"	0.9833367	16' 15.89"	23° 26' 15"	-4 m 24 s
8	282° 55' 01"	-0.75"	284° 01' 26"	-22° 48' 42"	0.9833366	16' 15.89"	23° 26' 15"	-4 m 25 s
9	282° 57' 34"	-0.75"	284° 04' 11"	-22° 48' 27"	0.9833365	16' 15.89"	23° 26' 15"	-4 m 26 s
10	283° 00' 07"	-0.75"	284° 06' 57"	-22° 48' 12"	0.9833363	16' 15.89"	23° 26' 15"	-4 m 27 s
11	283° 02' 40"	-0.76"	284° 09' 42"	-22° 47' 57"	0.9833362	16' 15.89"	23° 26' 15"	-4 m 28 s
12	283° 05' 13"	-0.76"	284° 12' 27"	-22° 47' 43"	0.9833361	16' 15.89"	23° 26' 15"	-4 m 29 s
13	283° 07' 46"	-0.76"	284° 15' 12"	-22° 47' 28"	0.9833360	16' 15.89"	23° 26' 15"	-4 m 30 s
14	283° 10' 18"	-0.77"	284° 17' 57"	-22° 47' 13"	0.9833359	16' 15.89"	23° 26' 15"	-4 m 32 s
15	283° 12' 51"	-0.77"	284° 20' 42"	-22° 46' 58"	0.9833358	16' 15.89"	23° 26' 15"	-4 m 33 s
16	283° 15' 24"	-0.77"	284° 23' 27"	-22° 46' 42"	0.9833357	16' 15.89"	23° 26' 15"	-4 m 34 s
17	283° 17' 57"	-0.78"	284° 26' 12"	-22° 46' 27"	0.9833356	16' 15.89"	23° 26' 15"	-4 m 35 s
18	283° 20' 29"	-0.78"	284° 28' 56"	-22° 46' 12"	0.9833355	16' 15.89"	23° 26' 15"	-4 m 36 s
19	283° 23' 02"	-0.78"	284° 31' 41"	-22° 45' 57"	0.9833354	16' 15.89"	23° 26' 15"	-4 m 37 s
20	283° 25' 35"	-0.79"	284° 34' 27"	-22° 45' 42"	0.9833354	16' 15.89"	23° 26' 15"	-4 m 38 s
21	283° 28' 08"	-0.79"	284° 37' 12"	-22° 45' 26"	0.9833353	16' 15.89"	23° 26' 15"	-4 m 40 s
22	283° 30' 41"	-0.79"	284° 39' 57"	-22° 45' 11"	0.9833352	16' 15.89"	23° 26' 15"	-4 m 41 s
23	283° 33' 14"	-0.80"	284° 42' 42"	-22° 44' 56"	0.9833352	16' 15.89"	23° 26' 15"	-4 m 42 s
24	283° 35' 47"	-0.80"	284° 45' 27"	-22° 44' 40"	0.9833351	16' 15.89"	23° 26' 15"	-4 m 43 s

*) for mean equinox of date

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	285° 44' 57"	-3° 38' 16"	287° 33' 33"	-26° 07' 13"	1° 01' 04"	16' 38.44"	311° 57' 44"	0.00178
1	286° 22' 44"	-3° 40' 40"	288° 15' 33"	-26° 04' 59"	1° 01' 03"	16' 38.21"	307° 8' 26"	0.00211
2	287° 00' 31"	-3° 43' 03"	288° 57' 31"	-26° 02' 33"	1° 01' 02"	16' 37.96"	303° 1' 41"	0.00250
3	287° 38' 16"	-3° 45' 23"	289° 39' 25"	-25° 59' 55"	1° 01' 01"	16' 37.71"	299° 29' 50"	0.00294
4	288° 16' 00"	-3° 47' 43"	290° 21' 16"	-25° 57' 05"	1° 01' 00"	16' 37.45"	296° 26' 28"	0.00343
5	288° 53' 44"	-3° 50' 00"	291° 03' 04"	-25° 54' 02"	1° 00' 59"	16' 37.18"	293° 46' 24"	0.00397
6	289° 31' 26"	-3° 52' 16"	291° 44' 47"	-25° 50' 48"	1° 00' 58"	16' 36.90"	291° 25' 26"	0.00456
7	290° 09' 07"	-3° 54' 30"	292° 26' 28"	-25° 47' 23"	1° 00' 57"	16' 36.61"	289° 20' 17"	0.00521
8	290° 46' 47"	-3° 56' 42"	293° 08' 04"	-25° 43' 45"	1° 00' 56"	16' 36.32"	287° 28' 15"	0.00590
9	291° 24' 26"	-3° 58' 52"	293° 49' 35"	-25° 39' 56"	1° 00' 55"	16' 36.01"	285° 47' 14"	0.00665
10	292° 02' 03"	-4° 01' 01"	294° 31' 03"	-25° 35' 55"	1° 00' 54"	16' 35.70"	284° 15' 31"	0.00745
11	292° 39' 40"	-4° 03' 08"	295° 12' 26"	-25° 31' 42"	1° 00' 53"	16' 35.38"	282° 51' 43"	0.00830
12	293° 17' 14"	-4° 05' 12"	295° 53' 45"	-25° 27' 19"	1° 00' 52"	16' 35.05"	281° 34' 42"	0.00920
13	293° 54' 48"	-4° 07' 15"	296° 34' 58"	-25° 22' 43"	1° 00' 50"	16' 34.71"	280° 23' 31"	0.01015
14	294° 32' 20"	-4° 09' 17"	297° 16' 07"	-25° 17' 57"	1° 00' 49"	16' 34.36"	279° 17' 25"	0.01115
15	295° 09' 51"	-4° 11' 16"	297° 57' 10"	-25° 12' 59"	1° 00' 48"	16' 34.01"	278° 15' 45"	0.01220
16	295° 47' 20"	-4° 13' 13"	298° 38' 09"	-25° 07' 50"	1° 00' 46"	16' 33.65"	277° 17' 59"	0.01330
17	296° 24' 47"	-4° 15' 09"	299° 19' 02"	-25° 02' 31"	1° 00' 45"	16' 33.28"	276° 23' 40"	0.01445
18	297° 02' 14"	-4° 17' 02"	299° 59' 49"	-24° 56' 60"	1° 00' 44"	16' 32.90"	275° 32' 23"	0.01565
19	297° 39' 38"	-4° 18' 54"	300° 40' 31"	-24° 51' 18"	1° 00' 42"	16' 32.52"	274° 43' 51"	0.01690
20	298° 17' 01"	-4° 20' 43"	301° 21' 07"	-24° 45' 26"	1° 00' 41"	16' 32.13"	273° 57' 45"	0.01819
21	298° 54' 22"	-4° 22' 31"	302° 01' 37"	-24° 39' 23"	1° 00' 39"	16' 31.73"	273° 13' 52"	0.01954
22	299° 31' 41"	-4° 24' 17"	302° 42' 01"	-24° 33' 10"	1° 00' 38"	16' 31.32"	272° 31' 58"	0.02093
23	300° 08' 59"	-4° 26' 01"	303° 22' 18"	-24° 26' 46"	1° 00' 36"	16' 30.90"	271° 51' 53"	0.02237
24	300° 46' 14"	-4° 27' 42"	304° 02' 30"	-24° 20' 11"	1° 00' 35"	16' 30.48"	271° 13' 26"	0.02386

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	283° 35' 47"	-0.80"	284° 45' 27"	-22° 44' 40"	0.9833351	16' 15.89"	23° 26' 15"	-4 m 43 s
1	283° 38' 20"	-0.80"	284° 48' 12"	-22° 44' 25"	0.9833351	16' 15.89"	23° 26' 15"	-4 m 44 s
2	283° 40' 53"	-0.80"	284° 50' 57"	-22° 44' 09"	0.9833351	16' 15.89"	23° 26' 15"	-4 m 45 s
3	283° 43' 26"	-0.81"	284° 53' 42"	-22° 43' 53"	0.9833350	16' 15.89"	23° 26' 15"	-4 m 46 s
4	283° 45' 59"	-0.81"	284° 56' 26"	-22° 43' 38"	0.9833350	16' 15.89"	23° 26' 15"	-4 m 48 s
5	283° 48' 32"	-0.81"	284° 59' 11"	-22° 43' 22"	0.9833350	16' 15.89"	23° 26' 15"	-4 m 49 s
6	283° 51' 05"	-0.82"	285° 01' 56"	-22° 43' 06"	0.9833350	16' 15.89"	23° 26' 15"	-4 m 50 s
7	283° 53' 38"	-0.82"	285° 04' 41"	-22° 42' 51"	0.9833350	16' 15.89"	23° 26' 15"	-4 m 51 s
8	283° 56' 11"	-0.82"	285° 07' 26"	-22° 42' 35"	0.9833350	16' 15.89"	23° 26' 15"	-4 m 52 s
9	283° 58' 44"	-0.82"	285° 10' 11"	-22° 42' 19"	0.9833350	16' 15.89"	23° 26' 15"	-4 m 53 s
10	284° 01' 16"	-0.83"	285° 12' 56"	-22° 42' 03"	0.9833350	16' 15.89"	23° 26' 15"	-4 m 54 s
11	284° 03' 49"	-0.83"	285° 15' 41"	-22° 41' 47"	0.9833351	16' 15.89"	23° 26' 15"	-4 m 55 s
12	284° 06' 22"	-0.83"	285° 18' 26"	-22° 41' 31"	0.9833351	16' 15.89"	23° 26' 15"	-4 m 57 s
13	284° 08' 55"	-0.83"	285° 21' 11"	-22° 41' 15"	0.9833351	16' 15.89"	23° 26' 15"	-4 m 58 s
14	284° 11' 28"	-0.84"	285° 23' 55"	-22° 40' 59"	0.9833352	16' 15.89"	23° 26' 15"	-4 m 59 s
15	284° 14' 01"	-0.84"	285° 26' 40"	-22° 40' 42"	0.9833352	16' 15.89"	23° 26' 15"	-5 m 00 s
16	284° 16' 34"	-0.84"	285° 29' 25"	-22° 40' 26"	0.9833353	16' 15.89"	23° 26' 15"	-5 m 01 s
17	284° 19' 07"	-0.84"	285° 32' 10"	-22° 40' 10"	0.9833353	16' 15.89"	23° 26' 15"	-5 m 02 s
18	284° 21' 40"	-0.84"	285° 34' 55"	-22° 39' 54"	0.9833354	16' 15.89"	23° 26' 15"	-5 m 03 s
19	284° 24' 13"	-0.85"	285° 37' 40"	-22° 39' 37"	0.9833355	16' 15.89"	23° 26' 15"	-5 m 05 s
20	284° 26' 46"	-0.85"	285° 40' 24"	-22° 39' 21"	0.9833356	16' 15.89"	23° 26' 15"	-5 m 06 s
21	284° 29' 19"	-0.85"	285° 43' 09"	-22° 39' 04"	0.9833357	16' 15.89"	23° 26' 15"	-5 m 07 s
22	284° 31' 52"	-0.85"	285° 45' 54"	-22° 38' 48"	0.9833358	16' 15.89"	23° 26' 15"	-5 m 08 s
23	284° 34' 25"	-0.85"	285° 48' 39"	-22° 38' 31"	0.9833359	16' 15.89"	23° 26' 15"	-5 m 09 s
24	284° 36' 58"	-0.86"	285° 51' 23"	-22° 38' 15"	0.9833360	16' 15.89"	23° 26' 15"	-5 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	300° 46' 14"	-4° 27' 42"	304° 02' 30"	-24° 20' 11"	1° 00' 35"	16' 30.48"	271° 13' 26"	0.02386
1	301° 23' 28"	-4° 29' 22"	304° 42' 35"	-24° 13' 27"	1° 00' 33"	16' 30.05"	270° 36' 30"	0.02539
2	302° 00' 40"	-4° 30' 60"	305° 22' 34"	-24° 06' 32"	1° 00' 32"	16' 29.62"	270° 0' 58"	0.02698
3	302° 37' 50"	-4° 32' 36"	306° 02' 26"	-23° 59' 28"	1° 00' 30"	16' 29.17"	269° 26' 42"	0.02860
4	303° 14' 58"	-4° 34' 10"	306° 42' 11"	-23° 52' 13"	1° 00' 28"	16' 28.72"	268° 53' 37"	0.03028
5	303° 52' 05"	-4° 35' 41"	307° 21' 49"	-23° 44' 49"	1° 00' 27"	16' 28.27"	268° 21' 37"	0.03200
6	304° 29' 09"	-4° 37' 11"	308° 01' 21"	-23° 37' 15"	1° 00' 25"	16' 27.80"	267° 50' 39"	0.03376
7	305° 06' 11"	-4° 38' 39"	308° 40' 46"	-23° 29' 32"	1° 00' 23"	16' 27.33"	267° 20' 38"	0.03557
8	305° 43' 11"	-4° 40' 05"	309° 20' 03"	-23° 21' 39"	1° 00' 22"	16' 26.86"	266° 51' 30"	0.03743
9	306° 20' 09"	-4° 41' 28"	309° 59' 14"	-23° 13' 37"	1° 00' 20"	16' 26.37"	266° 23' 12"	0.03933
10	306° 57' 04"	-4° 42' 50"	310° 38' 17"	-23° 05' 26"	1° 00' 18"	16' 25.89"	265° 55' 41"	0.04127
11	307° 33' 58"	-4° 44' 09"	311° 17' 13"	-22° 57' 05"	1° 00' 16"	16' 25.39"	265° 28' 54"	0.04326
12	308° 10' 49"	-4° 45' 27"	311° 56' 02"	-22° 48' 36"	1° 00' 14"	16' 24.89"	265° 2' 50"	0.04529
13	308° 47' 38"	-4° 46' 42"	312° 34' 43"	-22° 39' 58"	1° 00' 12"	16' 24.38"	264° 37' 25"	0.04736
14	309° 24' 25"	-4° 47' 56"	313° 13' 17"	-22° 31' 11"	1° 00' 11"	16' 23.87"	264° 12' 37"	0.04947
15	310° 01' 10"	-4° 49' 07"	313° 51' 43"	-22° 22' 15"	1° 00' 09"	16' 23.35"	263° 48' 26"	0.05163
16	310° 37' 52"	-4° 50' 16"	314° 30' 02"	-22° 13' 12"	1° 00' 07"	16' 22.83"	263° 24' 49"	0.05383
17	311° 14' 31"	-4° 51' 23"	315° 08' 13"	-22° 03' 59"	1° 00' 05"	16' 22.30"	263° 1' 44"	0.05607
18	311° 51' 09"	-4° 52' 28"	315° 46' 17"	-21° 54' 39"	1° 00' 03"	16' 21.76"	262° 39' 10"	0.05835
19	312° 27' 44"	-4° 53' 31"	316° 24' 13"	-21° 45' 10"	1° 00' 01"	16' 21.22"	262° 17' 07"	0.06067
20	313° 04' 16"	-4° 54' 32"	317° 02' 01"	-21° 35' 34"	0° 59' 59"	16' 20.67"	261° 55' 32"	0.06303
21	313° 40' 46"	-4° 55' 31"	317° 39' 41"	-21° 25' 49"	0° 59' 57"	16' 20.12"	261° 34' 25"	0.06543
22	314° 17' 14"	-4° 56' 28"	318° 17' 14"	-21° 15' 57"	0° 59' 55"	16' 19.57"	261° 13' 44"	0.06787
23	314° 53' 38"	-4° 57' 23"	318° 54' 39"	-21° 05' 58"	0° 59' 53"	16' 19.01"	260° 53' 30"	0.07035
24	315° 30' 01"	-4° 58' 15"	319° 31' 56"	-20° 55' 50"	0° 59' 51"	16' 18.44"	260° 33' 40"	0.07286

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	284° 36' 58"	-0.86"	285° 51' 23"	-22° 38' 15"	0.9833360	16' 15.89"	23° 26' 15"	-5 m 10 s
1	284° 39' 31"	-0.86"	285° 54' 08"	-22° 37' 58"	0.9833361	16' 15.89"	23° 26' 15"	-5 m 11 s
2	284° 42' 04"	-0.86"	285° 56' 53"	-22° 37' 42"	0.9833362	16' 15.89"	23° 26' 15"	-5 m 12 s
3	284° 44' 36"	-0.86"	285° 59' 37"	-22° 37' 25"	0.9833363	16' 15.89"	23° 26' 15"	-5 m 13 s
4	284° 47' 09"	-0.86"	286° 02' 22"	-22° 37' 08"	0.9833365	16' 15.89"	23° 26' 15"	-5 m 15 s
5	284° 49' 42"	-0.86"	286° 05' 07"	-22° 36' 51"	0.9833366	16' 15.89"	23° 26' 15"	-5 m 16 s
6	284° 52' 15"	-0.87"	286° 07' 51"	-22° 36' 34"	0.9833368	16' 15.89"	23° 26' 15"	-5 m 17 s
7	284° 54' 48"	-0.87"	286° 10' 36"	-22° 36' 17"	0.9833369	16' 15.89"	23° 26' 15"	-5 m 18 s
8	284° 57' 21"	-0.87"	286° 13' 21"	-22° 36' 00"	0.9833371	16' 15.89"	23° 26' 15"	-5 m 19 s
9	284° 59' 54"	-0.87"	286° 16' 05"	-22° 35' 43"	0.9833372	16' 15.89"	23° 26' 15"	-5 m 20 s
10	285° 02' 27"	-0.87"	286° 18' 50"	-22° 35' 26"	0.9833374	16' 15.89"	23° 26' 15"	-5 m 21 s
11	285° 04' 60"	-0.87"	286° 21' 35"	-22° 35' 09"	0.9833376	16' 15.89"	23° 26' 15"	-5 m 22 s
12	285° 07' 33"	-0.87"	286° 24' 19"	-22° 34' 52"	0.9833378	16' 15.89"	23° 26' 15"	-5 m 23 s
13	285° 10' 06"	-0.88"	286° 27' 04"	-22° 34' 35"	0.9833380	16' 15.89"	23° 26' 15"	-5 m 25 s
14	285° 12' 39"	-0.88"	286° 29' 48"	-22° 34' 18"	0.9833382	16' 15.89"	23° 26' 15"	-5 m 26 s
15	285° 15' 12"	-0.88"	286° 32' 33"	-22° 34' 00"	0.9833384	16' 15.89"	23° 26' 15"	-5 m 27 s
16	285° 17' 45"	-0.88"	286° 35' 17"	-22° 33' 43"	0.9833386	16' 15.89"	23° 26' 15"	-5 m 28 s
17	285° 20' 18"	-0.88"	286° 38' 02"	-22° 33' 26"	0.9833388	16' 15.89"	23° 26' 15"	-5 m 29 s
18	285° 22' 51"	-0.88"	286° 40' 47"	-22° 33' 08"	0.9833391	16' 15.89"	23° 26' 15"	-5 m 30 s
19	285° 25' 23"	-0.88"	286° 43' 31"	-22° 32' 51"	0.9833393	16' 15.89"	23° 26' 15"	-5 m 31 s
20	285° 27' 56"	-0.88"	286° 46' 16"	-22° 32' 33"	0.9833396	16' 15.89"	23° 26' 15"	-5 m 32 s
21	285° 30' 29"	-0.88"	286° 49' 00"	-22° 32' 16"	0.9833398	16' 15.89"	23° 26' 15"	-5 m 33 s
22	285° 33' 02"	-0.88"	286° 51' 44"	-22° 31' 58"	0.9833401	16' 15.89"	23° 26' 15"	-5 m 35 s
23	285° 35' 35"	-0.88"	286° 54' 29"	-22° 31' 40"	0.9833403	16' 15.89"	23° 26' 15"	-5 m 36 s
24	285° 38' 08"	-0.88"	286° 57' 13"	-22° 31' 23"	0.9833406	16' 15.89"	23° 26' 15"	-5 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	315° 30' 01"	-4° 58' 15"	319° 31' 56"	-20° 55' 50"	0° 59' 51"	16' 18.44"	260° 33' 40"	0.07286
1	316° 06' 21"	-4° 59' 06"	320° 09' 05"	-20° 45' 36"	0° 59' 49"	16' 17.87"	260° 14' 14"	0.07542
2	316° 42' 38"	-4° 59' 55"	320° 46' 07"	-20° 35' 14"	0° 59' 46"	16' 17.30"	259° 55' 11"	0.07801
3	317° 18' 52"	-5° 00' 41"	321° 23' 01"	-20° 24' 46"	0° 59' 44"	16' 16.72"	259° 36' 31"	0.08063
4	317° 55' 04"	-5° 01' 25"	321° 59' 47"	-20° 14' 10"	0° 59' 42"	16' 16.13"	259° 18' 12"	0.08330
5	318° 31' 13"	-5° 02' 08"	322° 36' 25"	-20° 03' 27"	0° 59' 40"	16' 15.55"	259° 0' 15"	0.08600
6	319° 07' 20"	-5° 02' 48"	323° 12' 55"	-19° 52' 38"	0° 59' 38"	16' 14.96"	258° 42' 39"	0.08874
7	319° 43' 24"	-5° 03' 26"	323° 49' 17"	-19° 41' 42"	0° 59' 36"	16' 14.36"	258° 25' 23"	0.09151
8	320° 19' 25"	-5° 04' 02"	324° 25' 32"	-19° 30' 40"	0° 59' 33"	16' 13.76"	258° 8' 26"	0.09431
9	320° 55' 23"	-5° 04' 36"	325° 01' 39"	-19° 19' 31"	0° 59' 31"	16' 13.16"	257° 51' 49"	0.09715
10	321° 31' 19"	-5° 05' 08"	325° 37' 38"	-19° 08' 17"	0° 59' 29"	16' 12.55"	257° 35' 31"	0.10003
11	322° 07' 11"	-5° 05' 38"	326° 13' 29"	-18° 56' 56"	0° 59' 27"	16' 11.94"	257° 19' 31"	0.10293
12	322° 43' 01"	-5° 06' 06"	326° 49' 12"	-18° 45' 29"	0° 59' 25"	16' 11.33"	257° 3' 49"	0.10587
13	323° 18' 48"	-5° 06' 32"	327° 24' 48"	-18° 33' 56"	0° 59' 22"	16' 10.71"	256° 48' 24"	0.10885
14	323° 54' 33"	-5° 06' 56"	328° 00' 16"	-18° 22' 17"	0° 59' 20"	16' 10.09"	256° 33' 17"	0.11185
15	324° 30' 14"	-5° 07' 18"	328° 35' 36"	-18° 10' 33"	0° 59' 18"	16' 09.47"	256° 18' 27"	0.11489
16	325° 05' 53"	-5° 07' 38"	329° 10' 49"	-17° 58' 44"	0° 59' 15"	16' 08.85"	256° 3' 53"	0.11795
17	325° 41' 28"	-5° 07' 56"	329° 45' 54"	-17° 46' 49"	0° 59' 13"	16' 08.22"	255° 49' 36"	0.12105
18	326° 17' 01"	-5° 08' 11"	330° 20' 51"	-17° 34' 49"	0° 59' 11"	16' 07.59"	255° 35' 34"	0.12418
19	326° 52' 31"	-5° 08' 25"	330° 55' 41"	-17° 22' 43"	0° 59' 08"	16' 06.95"	255° 21' 49"	0.12734
20	327° 27' 57"	-5° 08' 37"	331° 30' 24"	-17° 10' 33"	0° 59' 06"	16' 06.32"	255° 8' 19"	0.13052
21	328° 03' 21"	-5° 08' 47"	332° 04' 59"	-16° 58' 18"	0° 59' 04"	16' 05.68"	254° 55' 04"	0.13374
22	328° 38' 42"	-5° 08' 55"	332° 39' 26"	-16° 45' 58"	0° 59' 01"	16' 05.04"	254° 42' 04"	0.13698
23	329° 14' 00"	-5° 09' 01"	333° 13' 46"	-16° 33' 33"	0° 58' 59"	16' 04.40"	254° 29' 19"	0.14025
24	329° 49' 15"	-5° 09' 05"	333° 47' 59"	-16° 21' 04"	0° 58' 57"	16' 03.75"	254° 16' 48"	0.14355

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	285° 38' 08"	-0.88"	286° 57' 13"	-22° 31' 23"	0.9833406	16' 15.89"	23° 26' 15"	-5 m 37 s
1	285° 40' 41"	-0.88"	286° 59' 58"	-22° 31' 05"	0.9833409	16' 15.89"	23° 26' 15"	-5 m 38 s
2	285° 43' 14"	-0.89"	287° 02' 42"	-22° 30' 47"	0.9833412	16' 15.89"	23° 26' 15"	-5 m 39 s
3	285° 45' 47"	-0.89"	287° 05' 27"	-22° 30' 29"	0.9833415	16' 15.89"	23° 26' 15"	-5 m 40 s
4	285° 48' 20"	-0.89"	287° 08' 11"	-22° 30' 11"	0.9833418	16' 15.89"	23° 26' 15"	-5 m 41 s
5	285° 50' 53"	-0.89"	287° 10' 55"	-22° 29' 53"	0.9833421	16' 15.89"	23° 26' 15"	-5 m 42 s
6	285° 53' 26"	-0.89"	287° 13' 40"	-22° 29' 35"	0.9833424	16' 15.89"	23° 26' 15"	-5 m 43 s
7	285° 55' 59"	-0.89"	287° 16' 24"	-22° 29' 17"	0.9833427	16' 15.89"	23° 26' 15"	-5 m 44 s
8	285° 58' 32"	-0.89"	287° 19' 09"	-22° 28' 59"	0.9833430	16' 15.89"	23° 26' 15"	-5 m 46 s
9	286° 01' 04"	-0.89"	287° 21' 53"	-22° 28' 41"	0.9833434	16' 15.88"	23° 26' 15"	-5 m 47 s
10	286° 03' 37"	-0.89"	287° 24' 37"	-22° 28' 23"	0.9833437	16' 15.88"	23° 26' 15"	-5 m 48 s
11	286° 06' 10"	-0.89"	287° 27' 21"	-22° 28' 05"	0.9833441	16' 15.88"	23° 26' 15"	-5 m 49 s
12	286° 08' 43"	-0.89"	287° 30' 06"	-22° 27' 46"	0.9833444	16' 15.88"	23° 26' 15"	-5 m 50 s
13	286° 11' 16"	-0.89"	287° 32' 50"	-22° 27' 28"	0.9833448	16' 15.88"	23° 26' 15"	-5 m 51 s
14	286° 13' 49"	-0.89"	287° 35' 34"	-22° 27' 10"	0.9833452	16' 15.88"	23° 26' 15"	-5 m 52 s
15	286° 16' 22"	-0.89"	287° 38' 19"	-22° 26' 51"	0.9833455	16' 15.88"	23° 26' 15"	-5 m 53 s
16	286° 18' 55"	-0.89"	287° 41' 03"	-22° 26' 33"	0.9833459	16' 15.88"	23° 26' 15"	-5 m 54 s
17	286° 21' 28"	-0.89"	287° 43' 47"	-22° 26' 14"	0.9833463	16' 15.88"	23° 26' 15"	-5 m 55 s
18	286° 24' 01"	-0.89"	287° 46' 31"	-22° 25' 56"	0.9833467	16' 15.88"	23° 26' 15"	-5 m 56 s
19	286° 26' 34"	-0.89"	287° 49' 16"	-22° 25' 37"	0.9833471	16' 15.88"	23° 26' 15"	-5 m 58 s
20	286° 29' 07"	-0.88"	287° 51' 60"	-22° 25' 19"	0.9833475	16' 15.88"	23° 26' 15"	-5 m 59 s
21	286° 31' 40"	-0.88"	287° 54' 44"	-22° 24' 60"	0.9833480	16' 15.88"	23° 26' 15"	-5 m 60 s
22	286° 34' 12"	-0.88"	287° 57' 28"	-22° 24' 41"	0.9833484	16' 15.88"	23° 26' 15"	-6 m 01 s
23	286° 36' 45"	-0.88"	288° 00' 12"	-22° 24' 22"	0.9833488	16' 15.88"	23° 26' 15"	-6 m 02 s
24	286° 39' 18"	-0.88"	288° 02' 56"	-22° 24' 04"	0.9833493	16' 15.88"	23° 26' 15"	-6 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	329° 49' 15"	-5° 09' 05"	333° 47' 59"	-16° 21' 04"	0° 58' 57"	16' 03.75"	254° 16' 48"	0.14355
1	330° 24' 27"	-5° 09' 07"	334° 22' 04"	-16° 08' 30"	0° 58' 54"	16' 03.10"	254° 4' 32"	0.14688
2	330° 59' 36"	-5° 09' 07"	334° 56' 03"	-15° 55' 52"	0° 58' 52"	16' 02.46"	253° 52' 30"	0.15023
3	331° 34' 42"	-5° 09' 05"	335° 29' 54"	-15° 43' 10"	0° 58' 50"	16' 01.81"	253° 40' 41"	0.15361
4	332° 09' 45"	-5° 09' 01"	336° 03' 37"	-15° 30' 23"	0° 58' 47"	16' 01.16"	253° 29' 07"	0.15701
5	332° 44' 45"	-5° 08' 55"	336° 37' 14"	-15° 17' 33"	0° 58' 45"	16' 00.50"	253° 17' 46"	0.16044
6	333° 19' 42"	-5° 08' 47"	337° 10' 44"	-15° 04' 39"	0° 58' 42"	15' 59.85"	253° 6' 39"	0.16389
7	333° 54' 36"	-5° 08' 38"	337° 44' 07"	-14° 51' 40"	0° 58' 40"	15' 59.19"	252° 55' 45"	0.16737
8	334° 29' 26"	-5° 08' 26"	338° 17' 23"	-14° 38' 39"	0° 58' 38"	15' 58.54"	252° 45' 03"	0.17087
9	335° 04' 14"	-5° 08' 13"	338° 50' 32"	-14° 25' 33"	0° 58' 35"	15' 57.88"	252° 34' 35"	0.17440
10	335° 38' 59"	-5° 07' 58"	339° 23' 34"	-14° 12' 24"	0° 58' 33"	15' 57.22"	252° 24' 20"	0.17795
11	336° 13' 40"	-5° 07' 41"	339° 56' 29"	-13° 59' 12"	0° 58' 30"	15' 56.56"	252° 14' 17"	0.18151
12	336° 48' 19"	-5° 07' 22"	340° 29' 18"	-13° 45' 57"	0° 58' 28"	15' 55.90"	252° 4' 27"	0.18511
13	337° 22' 54"	-5° 07' 01"	341° 02' 00"	-13° 32' 38"	0° 58' 25"	15' 55.24"	251° 54' 49"	0.18872
14	337° 57' 27"	-5° 06' 38"	341° 34' 36"	-13° 19' 16"	0° 58' 23"	15' 54.58"	251° 45' 23"	0.19235
15	338° 31' 56"	-5° 06' 14"	342° 07' 05"	-13° 05' 52"	0° 58' 21"	15' 53.92"	251° 36' 09"	0.19601
16	339° 06' 22"	-5° 05' 47"	342° 39' 28"	-12° 52' 24"	0° 58' 18"	15' 53.26"	251° 27' 08"	0.19968
17	339° 40' 45"	-5° 05' 19"	343° 11' 45"	-12° 38' 54"	0° 58' 16"	15' 52.59"	251° 18' 18"	0.20338
18	340° 15' 05"	-5° 04' 49"	343° 43' 55"	-12° 25' 20"	0° 58' 13"	15' 51.93"	251° 9' 40"	0.20709
19	340° 49' 22"	-5° 04' 18"	344° 15' 59"	-12° 11' 45"	0° 58' 11"	15' 51.27"	251° 1' 13"	0.21083
20	341° 23' 36"	-5° 03' 44"	344° 47' 57"	-11° 58' 07"	0° 58' 08"	15' 50.61"	250° 52' 58"	0.21458
21	341° 57' 47"	-5° 03' 09"	345° 19' 49"	-11° 44' 26"	0° 58' 06"	15' 49.95"	250° 44' 55"	0.21835
22	342° 31' 55"	-5° 02' 32"	345° 51' 35"	-11° 30' 43"	0° 58' 04"	15' 49.28"	250° 37' 02"	0.22213
23	343° 05' 60"	-5° 01' 54"	346° 23' 15"	-11° 16' 58"	0° 58' 01"	15' 48.62"	250° 29' 21"	0.22594
24	343° 40' 01"	-5° 01' 13"	346° 54' 49"	-11° 03' 10"	0° 57' 59"	15' 47.96"	250° 21' 51"	0.22976

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	286° 39' 18"	-0.88"	288° 02' 56"	-22° 24' 04"	0.9833493	16' 15.88"	23° 26' 15"	-6 m 03 s
1	286° 41' 51"	-0.88"	288° 05' 40"	-22° 23' 45"	0.9833497	16' 15.88"	23° 26' 15"	-6 m 04 s
2	286° 44' 24"	-0.88"	288° 08' 25"	-22° 23' 26"	0.9833502	16' 15.88"	23° 26' 15"	-6 m 05 s
3	286° 46' 57"	-0.88"	288° 11' 09"	-22° 23' 07"	0.9833507	16' 15.88"	23° 26' 15"	-6 m 06 s
4	286° 49' 30"	-0.88"	288° 13' 53"	-22° 22' 48"	0.9833511	16' 15.88"	23° 26' 15"	-6 m 07 s
5	286° 52' 03"	-0.88"	288° 16' 37"	-22° 22' 29"	0.9833516	16' 15.88"	23° 26' 15"	-6 m 08 s
6	286° 54' 36"	-0.88"	288° 19' 21"	-22° 22' 10"	0.9833521	16' 15.88"	23° 26' 15"	-6 m 09 s
7	286° 57' 09"	-0.88"	288° 22' 05"	-22° 21' 51"	0.9833526	16' 15.88"	23° 26' 15"	-6 m 11 s
8	286° 59' 42"	-0.87"	288° 24' 49"	-22° 21' 31"	0.9833531	16' 15.88"	23° 26' 15"	-6 m 12 s
9	287° 02' 14"	-0.87"	288° 27' 33"	-22° 21' 12"	0.9833536	16' 15.87"	23° 26' 15"	-6 m 13 s
10	287° 04' 47"	-0.87"	288° 30' 17"	-22° 20' 53"	0.9833542	16' 15.87"	23° 26' 15"	-6 m 14 s
11	287° 07' 20"	-0.87"	288° 33' 01"	-22° 20' 34"	0.9833547	16' 15.87"	23° 26' 15"	-6 m 15 s
12	287° 09' 53"	-0.87"	288° 35' 45"	-22° 20' 14"	0.9833552	16' 15.87"	23° 26' 15"	-6 m 16 s
13	287° 12' 26"	-0.87"	288° 38' 29"	-22° 19' 55"	0.9833558	16' 15.87"	23° 26' 15"	-6 m 17 s
14	287° 14' 59"	-0.87"	288° 41' 13"	-22° 19' 35"	0.9833563	16' 15.87"	23° 26' 15"	-6 m 18 s
15	287° 17' 32"	-0.87"	288° 43' 57"	-22° 19' 16"	0.9833569	16' 15.87"	23° 26' 15"	-6 m 19 s
16	287° 20' 05"	-0.86"	288° 46' 41"	-22° 18' 56"	0.9833574	16' 15.87"	23° 26' 15"	-6 m 20 s
17	287° 22' 38"	-0.86"	288° 49' 25"	-22° 18' 37"	0.9833580	16' 15.87"	23° 26' 15"	-6 m 21 s
18	287° 25' 11"	-0.86"	288° 52' 09"	-22° 18' 17"	0.9833586	16' 15.87"	23° 26' 15"	-6 m 22 s
19	287° 27' 44"	-0.86"	288° 54' 53"	-22° 17' 57"	0.9833592	16' 15.87"	23° 26' 15"	-6 m 23 s
20	287° 30' 16"	-0.86"	288° 57' 36"	-22° 17' 38"	0.9833598	16' 15.87"	23° 26' 15"	-6 m 24 s
21	287° 32' 49"	-0.86"	289° 00' 20"	-22° 17' 18"	0.9833604	16' 15.87"	23° 26' 15"	-6 m 26 s
22	287° 35' 22"	-0.85"	289° 03' 04"	-22° 16' 58"	0.9833610	16' 15.87"	23° 26' 15"	-6 m 27 s
23	287° 37' 55"	-0.85"	289° 05' 48"	-22° 16' 38"	0.9833616	16' 15.87"	23° 26' 15"	-6 m 28 s
24	287° 40' 28"	-0.85"	289° 08' 32"	-22° 16' 18"	0.9833623	16' 15.87"	23° 26' 15"	-6 m 29 s

(*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	343° 40' 01"	-5° 01' 13"	346° 54' 49"	-11° 03' 10"	0° 57' 59"	15' 47.96"	250° 21' 51"	0.22976
1	344° 13' 60"	-5° 00' 31"	347° 26' 18"	-10° 49' 21"	0° 57' 56"	15' 47.30"	250° 14' 32"	0.23360
2	344° 47' 55"	-4° 59' 47"	347° 57' 40"	-10° 35' 30"	0° 57' 54"	15' 46.64"	250° 7' 24"	0.23745
3	345° 21' 48"	-4° 59' 02"	348° 28' 58"	-10° 21' 37"	0° 57' 52"	15' 45.98"	250° 0' 26"	0.24132
4	345° 55' 37"	-4° 58' 15"	349° 00' 09"	-10° 07' 41"	0° 57' 49"	15' 45.33"	249° 53' 39"	0.24520
5	346° 29' 24"	-4° 57' 26"	349° 31' 15"	-9° 53' 45"	0° 57' 47"	15' 44.67"	249° 47' 03"	0.24910
6	347° 03' 07"	-4° 56' 36"	350° 02' 16"	-9° 39' 46"	0° 57' 44"	15' 44.01"	249° 40' 37"	0.25301
7	347° 36' 47"	-4° 55' 43"	350° 33' 12"	-9° 25' 46"	0° 57' 42"	15' 43.36"	249° 34' 22"	0.25694
8	348° 10' 24"	-4° 54' 50"	351° 04' 02"	-9° 11' 45"	0° 57' 39"	15' 42.71"	249° 28' 17"	0.26088
9	348° 43' 58"	-4° 53' 54"	351° 34' 47"	-8° 57' 42"	0° 57' 37"	15' 42.05"	249° 22' 22"	0.26483
10	349° 17' 30"	-4° 52' 57"	352° 05' 27"	-8° 43' 38"	0° 57' 35"	15' 41.40"	249° 16' 38"	0.26880
11	349° 50' 58"	-4° 51' 59"	352° 36' 03"	-8° 29' 33"	0° 57' 32"	15' 40.75"	249° 11' 03"	0.27278
12	350° 24' 23"	-4° 50' 59"	353° 06' 33"	-8° 15' 26"	0° 57' 30"	15' 40.10"	249° 5' 39"	0.27677
13	350° 57' 45"	-4° 49' 57"	353° 36' 58"	-8° 01' 19"	0° 57' 28"	15' 39.46"	249° 0' 24"	0.28077
14	351° 31' 04"	-4° 48' 54"	354° 07' 19"	-7° 47' 10"	0° 57' 25"	15' 38.81"	248° 55' 19"	0.28478
15	352° 04' 20"	-4° 47' 49"	354° 37' 35"	-7° 33' 00"	0° 57' 23"	15' 38.17"	248° 50' 24"	0.28880
16	352° 37' 34"	-4° 46' 43"	355° 07' 47"	-7° 18' 50"	0° 57' 20"	15' 37.53"	248° 45' 39"	0.29284
17	353° 10' 44"	-4° 45' 35"	355° 37' 53"	-7° 04' 39"	0° 57' 18"	15' 36.89"	248° 41' 03"	0.29688
18	353° 43' 51"	-4° 44' 26"	356° 07' 56"	-6° 50' 27"	0° 57' 16"	15' 36.25"	248° 36' 37"	0.30093
19	354° 16' 56"	-4° 43' 15"	356° 37' 54"	-6° 36' 14"	0° 57' 13"	15' 35.61"	248° 32' 21"	0.30500
20	354° 49' 57"	-4° 42' 03"	357° 07' 48"	-6° 22' 01"	0° 57' 11"	15' 34.98"	248° 28' 14"	0.30907
21	355° 22' 56"	-4° 40' 49"	357° 37' 38"	-6° 07' 47"	0° 57' 09"	15' 34.35"	248° 24' 16"	0.31315
22	355° 55' 51"	-4° 39' 34"	358° 07' 23"	-5° 53' 33"	0° 57' 07"	15' 33.72"	248° 20' 27"	0.31724
23	356° 28' 44"	-4° 38' 18"	358° 37' 05"	-5° 39' 18"	0° 57' 04"	15' 33.09"	248° 16' 48"	0.32133
24	357° 01' 34"	-4° 36' 60"	359° 06' 42"	-5° 25' 04"	0° 57' 02"	15' 32.47"	248° 13' 18"	0.32544



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	287° 40' 28"	-0.85"	289° 08' 32"	-22° 16' 18"	0.9833623	16' 15.87"	23° 26' 15"	-6 m 29 s
1	287° 43' 01"	-0.85"	289° 11' 16"	-22° 15' 58"	0.9833629	16' 15.87"	23° 26' 15"	-6 m 30 s
2	287° 45' 34"	-0.85"	289° 13' 59"	-22° 15' 38"	0.9833635	16' 15.86"	23° 26' 15"	-6 m 31 s
3	287° 48' 07"	-0.84"	289° 16' 43"	-22° 15' 18"	0.9833642	16' 15.86"	23° 26' 15"	-6 m 32 s
4	287° 50' 40"	-0.84"	289° 19' 27"	-22° 14' 58"	0.9833649	16' 15.86"	23° 26' 15"	-6 m 33 s
5	287° 53' 13"	-0.84"	289° 22' 11"	-22° 14' 38"	0.9833655	16' 15.86"	23° 26' 15"	-6 m 34 s
6	287° 55' 45"	-0.84"	289° 24' 54"	-22° 14' 18"	0.9833662	16' 15.86"	23° 26' 16"	-6 m 35 s
7	287° 58' 18"	-0.83"	289° 27' 38"	-22° 13' 57"	0.9833669	16' 15.86"	23° 26' 16"	-6 m 36 s
8	288° 00' 51"	-0.83"	289° 30' 22"	-22° 13' 37"	0.9833676	16' 15.86"	23° 26' 16"	-6 m 37 s
9	288° 03' 24"	-0.83"	289° 33' 05"	-22° 13' 17"	0.9833683	16' 15.86"	23° 26' 16"	-6 m 38 s
10	288° 05' 57"	-0.83"	289° 35' 49"	-22° 12' 57"	0.9833690	16' 15.86"	23° 26' 16"	-6 m 39 s
11	288° 08' 30"	-0.82"	289° 38' 33"	-22° 12' 36"	0.9833697	16' 15.86"	23° 26' 16"	-6 m 40 s
12	288° 11' 03"	-0.82"	289° 41' 16"	-22° 12' 16"	0.9833704	16' 15.86"	23° 26' 16"	-6 m 41 s
13	288° 13' 36"	-0.82"	289° 44' 00"	-22° 11' 55"	0.9833712	16' 15.86"	23° 26' 16"	-6 m 42 s
14	288° 16' 09"	-0.82"	289° 46' 44"	-22° 11' 35"	0.9833719	16' 15.86"	23° 26' 16"	-6 m 44 s
15	288° 18' 41"	-0.81"	289° 49' 27"	-22° 11' 14"	0.9833727	16' 15.86"	23° 26' 16"	-6 m 45 s
16	288° 21' 14"	-0.81"	289° 52' 11"	-22° 10' 53"	0.9833734	16' 15.86"	23° 26' 16"	-6 m 46 s
17	288° 23' 47"	-0.81"	289° 54' 55"	-22° 10' 33"	0.9833742	16' 15.85"	23° 26' 16"	-6 m 47 s
18	288° 26' 20"	-0.81"	289° 57' 38"	-22° 10' 12"	0.9833750	16' 15.85"	23° 26' 16"	-6 m 48 s
19	288° 28' 53"	-0.80"	290° 00' 22"	-22° 09' 51"	0.9833758	16' 15.85"	23° 26' 16"	-6 m 49 s
20	288° 31' 26"	-0.80"	290° 03' 05"	-22° 09' 30"	0.9833766	16' 15.85"	23° 26' 16"	-6 m 50 s
21	288° 33' 59"	-0.80"	290° 05' 49"	-22° 09' 09"	0.9833774	16' 15.85"	23° 26' 16"	-6 m 51 s
22	288° 36' 32"	-0.79"	290° 08' 32"	-22° 08' 48"	0.9833782	16' 15.85"	23° 26' 16"	-6 m 52 s
23	288° 39' 04"	-0.79"	290° 11' 16"	-22° 08' 27"	0.9833790	16' 15.85"	23° 26' 16"	-6 m 53 s
24	288° 41' 37"	-0.79"	290° 13' 59"	-22° 08' 06"	0.9833798	16' 15.85"	23° 26' 16"	-6 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	357° 01' 34"	-4° 36' 60"	359° 06' 42"	-5° 25' 04"	0° 57' 02"	15' 32.47"	248° 13' 18"	0.32544
1	357° 34' 21"	-4° 35' 40"	359° 36' 16"	-5° 10' 48"	0° 56' 60"	15' 31.85"	248° 9' 57"	0.32955
2	358° 07' 05"	-4° 34' 19"	0° 05' 46"	-4° 56' 33"	0° 56' 57"	15' 31.23"	248° 6' 45"	0.33367
3	358° 39' 47"	-4° 32' 57"	0° 35' 12"	-4° 42' 18"	0° 56' 55"	15' 30.61"	248° 3' 43"	0.33779
4	359° 12' 25"	-4° 31' 34"	1° 04' 35"	-4° 28' 02"	0° 56' 53"	15' 30.00"	248° 0' 49"	0.34192
5	359° 45' 01"	-4° 30' 09"	1° 33' 54"	-4° 13' 47"	0° 56' 51"	15' 29.38"	247° 58' 04"	0.34606
6	0° 17' 34"	-4° 28' 43"	2° 03' 10"	-3° 59' 31"	0° 56' 48"	15' 28.78"	247° 55' 27"	0.35020
7	0° 50' 04"	-4° 27' 15"	2° 32' 22"	-3° 45' 16"	0° 56' 46"	15' 28.17"	247° 53' 00"	0.35435
8	1° 22' 31"	-4° 25' 46"	3° 01' 31"	-3° 31' 01"	0° 56' 44"	15' 27.57"	247° 50' 41"	0.35850
9	1° 54' 56"	-4° 24' 16"	3° 30' 36"	-3° 16' 46"	0° 56' 42"	15' 26.97"	247° 48' 31"	0.36266
10	2° 27' 18"	-4° 22' 45"	3° 59' 39"	-3° 02' 31"	0° 56' 40"	15' 26.37"	247° 46' 30"	0.36682
11	2° 59' 37"	-4° 21' 12"	4° 28' 38"	-2° 48' 17"	0° 56' 37"	15' 25.77"	247° 44' 37"	0.37098
12	3° 31' 53"	-4° 19' 38"	4° 57' 34"	-2° 34' 03"	0° 56' 35"	15' 25.18"	247° 42' 53"	0.37515
13	4° 04' 07"	-4° 18' 03"	5° 26' 28"	-2° 19' 50"	0° 56' 33"	15' 24.59"	247° 41' 17"	0.37932
14	4° 36' 18"	-4° 16' 26"	5° 55' 18"	-2° 05' 37"	0° 56' 31"	15' 24.01"	247° 39' 50"	0.38349
15	5° 08' 27"	-4° 14' 49"	6° 24' 06"	-1° 51' 25"	0° 56' 29"	15' 23.43"	247° 38' 31"	0.38767
16	5° 40' 33"	-4° 13' 10"	6° 52' 51"	-1° 37' 13"	0° 56' 27"	15' 22.85"	247° 37' 21"	0.39185
17	6° 12' 36"	-4° 11' 30"	7° 21' 34"	-1° 23' 02"	0° 56' 25"	15' 22.27"	247° 36' 18"	0.39603
18	6° 44' 37"	-4° 09' 48"	7° 50' 14"	-1° 08' 52"	0° 56' 22"	15' 21.70"	247° 35' 24"	0.40021
19	7° 16' 35"	-4° 08' 06"	8° 18' 51"	0° -54' 42"	0° 56' 20"	15' 21.13"	247° 34' 39"	0.40439
20	7° 48' 30"	-4° 06' 22"	8° 47' 26"	0° -40' 34"	0° 56' 18"	15' 20.57"	247° 34' 01"	0.40858
21	8° 20' 23"	-4° 04' 38"	9° 15' 59"	0° -26' 26"	0° 56' 16"	15' 20.01"	247° 33' 32"	0.41276
22	8° 52' 14"	-4° 02' 52"	9° 44' 29"	0° -12' 19"	0° 56' 14"	15' 19.45"	247° 33' 11"	0.41695
23	9° 24' 01"	-4° 01' 05"	10° 12' 58"	0° 01' 47"	0° 56' 12"	15' 18.90"	247° 32' 58"	0.42114
24	9° 55' 47"	-3° 59' 17"	10° 41' 24"	0° 15' 51"	0° 56' 10"	15' 18.35"	247° 32' 52"	0.42532

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	288° 41' 37"	-0.79"	290° 13' 59"	-22° 08' 06"	0.9833798	16' 15.85"	23° 26' 16"	-6 m 54 s
1	288° 44' 10"	-0.79"	290° 16' 43"	-22° 07' 45"	0.9833806	16' 15.85"	23° 26' 16"	-6 m 55 s
2	288° 46' 43"	-0.78"	290° 19' 26"	-22° 07' 24"	0.9833815	16' 15.85"	23° 26' 16"	-6 m 56 s
3	288° 49' 16"	-0.78"	290° 22' 10"	-22° 07' 03"	0.9833823	16' 15.85"	23° 26' 16"	-6 m 57 s
4	288° 51' 49"	-0.78"	290° 24' 53"	-22° 06' 42"	0.9833832	16' 15.85"	23° 26' 16"	-6 m 58 s
5	288° 54' 22"	-0.77"	290° 27' 36"	-22° 06' 21"	0.9833841	16' 15.84"	23° 26' 16"	-6 m 59 s
6	288° 56' 55"	-0.77"	290° 30' 20"	-22° 05' 59"	0.9833849	16' 15.84"	23° 26' 16"	-7 m 00 s
7	288° 59' 28"	-0.77"	290° 33' 03"	-22° 05' 38"	0.9833858	16' 15.84"	23° 26' 16"	-7 m 01 s
8	289° 02' 00"	-0.76"	290° 35' 46"	-22° 05' 17"	0.9833867	16' 15.84"	23° 26' 16"	-7 m 02 s
9	289° 04' 33"	-0.76"	290° 38' 30"	-22° 04' 55"	0.9833876	16' 15.84"	23° 26' 16"	-7 m 03 s
10	289° 07' 06"	-0.76"	290° 41' 13"	-22° 04' 34"	0.9833885	16' 15.84"	23° 26' 16"	-7 m 04 s
11	289° 09' 39"	-0.75"	290° 43' 56"	-22° 04' 12"	0.9833895	16' 15.84"	23° 26' 16"	-7 m 05 s
12	289° 12' 12"	-0.75"	290° 46' 40"	-22° 03' 51"	0.9833904	16' 15.84"	23° 26' 16"	-7 m 06 s
13	289° 14' 45"	-0.74"	290° 49' 23"	-22° 03' 29"	0.9833913	16' 15.84"	23° 26' 16"	-7 m 07 s
14	289° 17' 18"	-0.74"	290° 52' 06"	-22° 03' 08"	0.9833923	16' 15.84"	23° 26' 16"	-7 m 08 s
15	289° 19' 50"	-0.74"	290° 54' 50"	-22° 02' 46"	0.9833932	16' 15.84"	23° 26' 16"	-7 m 09 s
16	289° 22' 23"	-0.73"	290° 57' 33"	-22° 02' 24"	0.9833942	16' 15.83"	23° 26' 16"	-7 m 11 s
17	289° 24' 56"	-0.73"	291° 00' 16"	-22° 02' 02"	0.9833952	16' 15.83"	23° 26' 16"	-7 m 12 s
18	289° 27' 29"	-0.73"	291° 02' 59"	-22° 01' 41"	0.9833961	16' 15.83"	23° 26' 16"	-7 m 13 s
19	289° 30' 02"	-0.72"	291° 05' 42"	-22° 01' 19"	0.9833971	16' 15.83"	23° 26' 16"	-7 m 14 s
20	289° 32' 35"	-0.72"	291° 08' 26"	-22° 00' 57"	0.9833981	16' 15.83"	23° 26' 16"	-7 m 15 s
21	289° 35' 08"	-0.71"	291° 11' 09"	-22° 00' 35"	0.9833991	16' 15.83"	23° 26' 16"	-7 m 16 s
22	289° 37' 41"	-0.71"	291° 13' 52"	-22° 00' 13"	0.9834002	16' 15.83"	23° 26' 16"	-7 m 17 s
23	289° 40' 13"	-0.71"	291° 16' 35"	-21° 59' 51"	0.9834012	16' 15.83"	23° 26' 16"	-7 m 18 s
24	289° 42' 46"	-0.70"	291° 19' 18"	-21° 59' 29"	0.9834022	16' 15.83"	23° 26' 16"	-7 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	9° 55' 47"	-3° 59' 17"	10° 41' 24"	0° 15' 51"	0° 56' 10"	15' 18.35"	247° 32' 52"	0.42532
1	10° 27' 30"	-3° 57' 28"	11° 09' 48"	0° 29' 55"	0° 56' 08"	15' 17.80"	247° 32' 55"	0.42951
2	10° 59' 10"	-3° 55' 37"	11° 38' 10"	0° 43' 57"	0° 56' 06"	15' 17.26"	247° 33' 06"	0.43370
3	11° 30' 49"	-3° 53' 46"	12° 06' 31"	0° 57' 59"	0° 56' 04"	15' 16.72"	247° 33' 25"	0.43788
4	12° 02' 24"	-3° 51' 54"	12° 34' 49"	1° 11' 59"	0° 56' 02"	15' 16.18"	247° 33' 52"	0.44206
5	12° 33' 58"	-3° 50' 00"	13° 03' 06"	1° 25' 58"	0° 56' 00"	15' 15.65"	247° 34' 26"	0.44625
6	13° 05' 29"	-3° 48' 06"	13° 31' 21"	1° 39' 55"	0° 55' 58"	15' 15.12"	247° 35' 09"	0.45043
7	13° 36' 57"	-3° 46' 11"	13° 59' 35"	1° 53' 51"	0° 55' 56"	15' 14.60"	247° 35' 59"	0.45461
8	14° 08' 24"	-3° 44' 14"	14° 27' 47"	2° 07' 46"	0° 55' 54"	15' 14.08"	247° 36' 57"	0.45878
9	14° 39' 47"	-3° 42' 17"	14° 55' 58"	2° 21' 39"	0° 55' 53"	15' 13.56"	247° 38' 03"	0.46296
10	15° 11' 09"	-3° 40' 18"	15° 24' 07"	2° 35' 31"	0° 55' 51"	15' 13.05"	247° 39' 17"	0.46713
11	15° 42' 29"	-3° 38' 19"	15° 52' 15"	2° 49' 21"	0° 55' 49"	15' 12.54"	247° 40' 38"	0.47130
12	16° 13' 46"	-3° 36' 19"	16° 20' 22"	3° 03' 09"	0° 55' 47"	15' 12.04"	247° 42' 07"	0.47546
13	16° 45' 01"	-3° 34' 17"	16° 48' 28"	3° 16' 56"	0° 55' 45"	15' 11.54"	247° 43' 44"	0.47962
14	17° 16' 14"	-3° 32' 15"	17° 16' 32"	3° 30' 41"	0° 55' 43"	15' 11.04"	247° 45' 28"	0.48378
15	17° 47' 24"	-3° 30' 12"	17° 44' 36"	3° 44' 25"	0° 55' 41"	15' 10.55"	247° 47' 20"	0.48794
16	18° 18' 33"	-3° 28' 08"	18° 12' 38"	3° 58' 06"	0° 55' 40"	15' 10.06"	247° 49' 20"	0.49209
17	18° 49' 39"	-3° 26' 03"	18° 40' 40"	4° 11' 46"	0° 55' 38"	15' 09.58"	247° 51' 27"	0.49623
18	19° 20' 43"	-3° 23' 58"	19° 08' 41"	4° 25' 24"	0° 55' 36"	15' 09.10"	247° 53' 42"	0.50037
19	19° 51' 45"	-3° 21' 51"	19° 36' 41"	4° 39' 00"	0° 55' 34"	15' 08.62"	247° 56' 04"	0.50451
20	20° 22' 45"	-3° 19' 43"	20° 04' 41"	4° 52' 34"	0° 55' 33"	15' 08.15"	247° 58' 33"	0.50864
21	20° 53' 43"	-3° 17' 35"	20° 32' 40"	5° 06' 06"	0° 55' 31"	15' 07.69"	248° 1' 11"	0.51276
22	21° 24' 39"	-3° 15' 26"	21° 00' 38"	5° 19' 36"	0° 55' 29"	15' 07.23"	248° 3' 55"	0.51688
23	21° 55' 33"	-3° 13' 16"	21° 28' 36"	5° 33' 04"	0° 55' 28"	15' 06.77"	248° 6' 47"	0.52100
24	22° 26' 25"	-3° 11' 05"	21° 56' 34"	5° 46' 30"	0° 55' 26"	15' 06.31"	248° 9' 47"	0.52511

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	289° 42' 46"	-0.70"	291° 19' 18"	-21° 59' 29"	0.9834022	16' 15.83"	23° 26' 16"	-7 m 19 s
1	289° 45' 19"	-0.70"	291° 22' 01"	-21° 59' 07"	0.9834033	16' 15.83"	23° 26' 16"	-7 m 20 s
2	289° 47' 52"	-0.69"	291° 24' 44"	-21° 58' 44"	0.9834043	16' 15.82"	23° 26' 16"	-7 m 21 s
3	289° 50' 25"	-0.69"	291° 27' 28"	-21° 58' 22"	0.9834054	16' 15.82"	23° 26' 16"	-7 m 22 s
4	289° 52' 58"	-0.69"	291° 30' 11"	-21° 57' 60"	0.9834064	16' 15.82"	23° 26' 16"	-7 m 23 s
5	289° 55' 31"	-0.68"	291° 32' 54"	-21° 57' 38"	0.9834075	16' 15.82"	23° 26' 16"	-7 m 24 s
6	289° 58' 03"	-0.68"	291° 35' 37"	-21° 57' 15"	0.9834086	16' 15.82"	23° 26' 16"	-7 m 25 s
7	290° 00' 36"	-0.67"	291° 38' 20"	-21° 56' 53"	0.9834097	16' 15.82"	23° 26' 16"	-7 m 26 s
8	290° 03' 09"	-0.67"	291° 41' 03"	-21° 56' 30"	0.9834108	16' 15.82"	23° 26' 16"	-7 m 27 s
9	290° 05' 42"	-0.66"	291° 43' 46"	-21° 56' 08"	0.9834119	16' 15.82"	23° 26' 16"	-7 m 28 s
10	290° 08' 15"	-0.66"	291° 46' 29"	-21° 55' 45"	0.9834131	16' 15.82"	23° 26' 16"	-7 m 29 s
11	290° 10' 48"	-0.65"	291° 49' 12"	-21° 55' 23"	0.9834142	16' 15.81"	23° 26' 16"	-7 m 30 s
12	290° 13' 20"	-0.65"	291° 51' 55"	-21° 55' 00"	0.9834153	16' 15.81"	23° 26' 16"	-7 m 31 s
13	290° 15' 53"	-0.65"	291° 54' 38"	-21° 54' 38"	0.9834165	16' 15.81"	23° 26' 16"	-7 m 32 s
14	290° 18' 26"	-0.64"	291° 57' 20"	-21° 54' 15"	0.9834176	16' 15.81"	23° 26' 16"	-7 m 33 s
15	290° 20' 59"	-0.64"	292° 00' 03"	-21° 53' 52"	0.9834188	16' 15.81"	23° 26' 16"	-7 m 34 s
16	290° 23' 32"	-0.63"	292° 02' 46"	-21° 53' 29"	0.9834200	16' 15.81"	23° 26' 16"	-7 m 35 s
17	290° 26' 05"	-0.63"	292° 05' 29"	-21° 53' 06"	0.9834212	16' 15.81"	23° 26' 16"	-7 m 36 s
18	290° 28' 38"	-0.62"	292° 08' 12"	-21° 52' 44"	0.9834224	16' 15.81"	23° 26' 16"	-7 m 37 s
19	290° 31' 10"	-0.62"	292° 10' 55"	-21° 52' 21"	0.9834236	16' 15.81"	23° 26' 16"	-7 m 38 s
20	290° 33' 43"	-0.61"	292° 13' 38"	-21° 51' 58"	0.9834248	16' 15.80"	23° 26' 16"	-7 m 39 s
21	290° 36' 16"	-0.61"	292° 16' 20"	-21° 51' 35"	0.9834260	16' 15.80"	23° 26' 16"	-7 m 40 s
22	290° 38' 49"	-0.60"	292° 19' 03"	-21° 51' 12"	0.9834273	16' 15.80"	23° 26' 16"	-7 m 41 s
23	290° 41' 22"	-0.60"	292° 21' 46"	-21° 50' 48"	0.9834285	16' 15.80"	23° 26' 16"	-7 m 42 s
24	290° 43' 55"	-0.59"	292° 24' 29"	-21° 50' 25"	0.9834298	16' 15.80"	23° 26' 16"	-7 m 43 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	22° 26' 25"	-3° 11' 05"	21° 56' 34"	5° 46' 30"	0° 55' 26"	15' 06.31"	248° 9' 47"	0.52511
1	22° 57' 15"	-3° 08' 54"	22° 24' 31"	5° 59' 54"	0° 55' 24"	15' 05.87"	248° 12' 54"	0.52921
2	23° 28' 03"	-3° 06' 41"	22° 52' 28"	6° 13' 15"	0° 55' 23"	15' 05.42"	248° 16' 08"	0.53330
3	23° 58' 50"	-3° 04' 28"	23° 20' 25"	6° 26' 35"	0° 55' 21"	15' 04.98"	248° 19' 30"	0.53739
4	24° 29' 34"	-3° 02' 14"	23° 48' 22"	6° 39' 51"	0° 55' 19"	15' 04.55"	248° 22' 60"	0.54148
5	25° 00' 16"	-2° 59' 60"	24° 16' 18"	6° 53' 06"	0° 55' 18"	15' 04.11"	248° 26' 36"	0.54555
6	25° 30' 57"	-2° 57' 45"	24° 44' 15"	7° 06' 18"	0° 55' 16"	15' 03.69"	248° 30' 20"	0.54962
7	26° 01' 36"	-2° 55' 29"	25° 12' 11"	7° 19' 28"	0° 55' 15"	15' 03.26"	248° 34' 11"	0.55368
8	26° 32' 13"	-2° 53' 12"	25° 40' 08"	7° 32' 36"	0° 55' 13"	15' 02.85"	248° 38' 10"	0.55773
9	27° 02' 48"	-2° 50' 54"	26° 08' 05"	7° 45' 41"	0° 55' 12"	15' 02.43"	248° 42' 16"	0.56177
10	27° 33' 21"	-2° 48' 36"	26° 36' 02"	7° 58' 43"	0° 55' 10"	15' 02.02"	248° 46' 29"	0.56581
11	28° 03' 53"	-2° 46' 17"	27° 03' 60"	8° 11' 43"	0° 55' 09"	15' 01.62"	248° 50' 50"	0.56984
12	28° 34' 23"	-2° 43' 58"	27° 31' 58"	8° 24' 40"	0° 55' 07"	15' 01.22"	248° 55' 18"	0.57386
13	29° 04' 51"	-2° 41' 38"	27° 59' 56"	8° 37' 35"	0° 55' 06"	15' 00.83"	248° 59' 53"	0.57787
14	29° 35' 18"	-2° 39' 17"	28° 27' 55"	8° 50' 27"	0° 55' 04"	15' 00.43"	249° 4' 35"	0.58187
15	30° 05' 43"	-2° 36' 56"	28° 55' 54"	9° 03' 16"	0° 55' 03"	15' 00.05"	249° 9' 25"	0.58586
16	30° 36' 06"	-2° 34' 34"	29° 23' 54"	9° 16' 02"	0° 55' 02"	14' 59.67"	249° 14' 22"	0.58984
17	31° 06' 28"	-2° 32' 11"	29° 51' 55"	9° 28' 46"	0° 55' 00"	14' 59.29"	249° 19' 26"	0.59382
18	31° 36' 48"	-2° 29' 48"	30° 19' 56"	9° 41' 27"	0° 54' 59"	14' 58.92"	249° 24' 38"	0.59778
19	32° 07' 07"	-2° 27' 24"	30° 47' 58"	9° 54' 05"	0° 54' 57"	14' 58.55"	249° 29' 57"	0.60174
20	32° 37' 24"	-2° 24' 60"	31° 16' 01"	10° 06' 40"	0° 54' 56"	14' 58.19"	249° 35' 23"	0.60568
21	33° 07' 40"	-2° 22' 35"	31° 44' 05"	10° 19' 12"	0° 54' 55"	14' 57.83"	249° 40' 56"	0.60961
22	33° 37' 54"	-2° 20' 10"	32° 12' 10"	10° 31' 41"	0° 54' 53"	14' 57.47"	249° 46' 36"	0.61353
23	34° 08' 07"	-2° 17' 44"	32° 40' 16"	10° 44' 07"	0° 54' 52"	14' 57.12"	249° 52' 24"	0.61745
24	34° 38' 18"	-2° 15' 17"	33° 08' 23"	10° 56' 30"	0° 54' 51"	14' 56.78"	249° 58' 19"	0.62135

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	290° 43' 55"	-0.59"	292° 24' 29"	-21° 50' 25"	0.9834298	16' 15.80"	23° 26' 16"	-7 m 43 s
1	290° 46' 27"	-0.59"	292° 27' 11"	-21° 50' 02"	0.9834310	16' 15.80"	23° 26' 16"	-7 m 44 s
2	290° 49' 00"	-0.58"	292° 29' 54"	-21° 49' 39"	0.9834323	16' 15.80"	23° 26' 16"	-7 m 45 s
3	290° 51' 33"	-0.58"	292° 32' 37"	-21° 49' 16"	0.9834336	16' 15.80"	23° 26' 16"	-7 m 46 s
4	290° 54' 06"	-0.57"	292° 35' 20"	-21° 48' 52"	0.9834349	16' 15.79"	23° 26' 16"	-7 m 47 s
5	290° 56' 39"	-0.57"	292° 38' 02"	-21° 48' 29"	0.9834362	16' 15.79"	23° 26' 16"	-7 m 48 s
6	290° 59' 12"	-0.56"	292° 40' 45"	-21° 48' 05"	0.9834375	16' 15.79"	23° 26' 16"	-7 m 49 s
7	291° 01' 44"	-0.56"	292° 43' 28"	-21° 47' 42"	0.9834388	16' 15.79"	23° 26' 16"	-7 m 50 s
8	291° 04' 17"	-0.55"	292° 46' 10"	-21° 47' 18"	0.9834401	16' 15.79"	23° 26' 16"	-7 m 51 s
9	291° 06' 50"	-0.55"	292° 48' 53"	-21° 46' 55"	0.9834415	16' 15.79"	23° 26' 16"	-7 m 52 s
10	291° 09' 23"	-0.54"	292° 51' 35"	-21° 46' 31"	0.9834428	16' 15.79"	23° 26' 16"	-7 m 53 s
11	291° 11' 56"	-0.54"	292° 54' 18"	-21° 46' 08"	0.9834442	16' 15.78"	23° 26' 16"	-7 m 54 s
12	291° 14' 29"	-0.53"	292° 57' 01"	-21° 45' 44"	0.9834455	16' 15.78"	23° 26' 16"	-7 m 55 s
13	291° 17' 01"	-0.53"	292° 59' 43"	-21° 45' 20"	0.9834469	16' 15.78"	23° 26' 16"	-7 m 56 s
14	291° 19' 34"	-0.52"	293° 02' 26"	-21° 44' 56"	0.9834483	16' 15.78"	23° 26' 16"	-7 m 57 s
15	291° 22' 07"	-0.52"	293° 05' 08"	-21° 44' 33"	0.9834497	16' 15.78"	23° 26' 16"	-7 m 58 s
16	291° 24' 40"	-0.51"	293° 07' 51"	-21° 44' 09"	0.9834511	16' 15.78"	23° 26' 15"	-7 m 59 s
17	291° 27' 13"	-0.51"	293° 10' 33"	-21° 43' 45"	0.9834525	16' 15.78"	23° 26' 15"	-7 m 60 s
18	291° 29' 45"	-0.50"	293° 13' 16"	-21° 43' 21"	0.9834539	16' 15.78"	23° 26' 15"	-8 m 01 s
19	291° 32' 18"	-0.50"	293° 15' 58"	-21° 42' 57"	0.9834553	16' 15.77"	23° 26' 15"	-8 m 02 s
20	291° 34' 51"	-0.49"	293° 18' 41"	-21° 42' 33"	0.9834568	16' 15.77"	23° 26' 15"	-8 m 03 s
21	291° 37' 24"	-0.49"	293° 21' 23"	-21° 42' 09"	0.9834582	16' 15.77"	23° 26' 15"	-8 m 04 s
22	291° 39' 57"	-0.48"	293° 24' 05"	-21° 41' 45"	0.9834597	16' 15.77"	23° 26' 15"	-8 m 05 s
23	291° 42' 30"	-0.48"	293° 26' 48"	-21° 41' 20"	0.9834612	16' 15.77"	23° 26' 15"	-8 m 05 s
24	291° 45' 02"	-0.47"	293° 29' 30"	-21° 40' 56"	0.9834627	16' 15.77"	23° 26' 15"	-8 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	34° 38' 18"	-2° 15' 17"	33° 08' 23"	10° 56' 30"	0° 54' 51"	14' 56.78"	249° 58' 19"	0.62135
1	35° 08' 28"	-2° 12' 50"	33° 36' 31"	11° 08' 49"	0° 54' 50"	14' 56.44"	250° 4' 21"	0.62524
2	35° 38' 37"	-2° 10' 23"	34° 04' 40"	11° 21' 06"	0° 54' 48"	14' 56.10"	250° 10' 31"	0.62912
3	36° 08' 44"	-2° 07' 55"	34° 32' 51"	11° 33' 20"	0° 54' 47"	14' 55.77"	250° 16' 48"	0.63299
4	36° 38' 50"	-2° 05' 26"	35° 01' 03"	11° 45' 30"	0° 54' 46"	14' 55.45"	250° 23' 12"	0.63684
5	37° 08' 54"	-2° 02' 57"	35° 29' 16"	11° 57' 37"	0° 54' 45"	14' 55.12"	250° 29' 43"	0.64069
6	37° 38' 58"	-2° 00' 28"	35° 57' 30"	12° 09' 41"	0° 54' 44"	14' 54.81"	250° 36' 21"	0.64452
7	38° 08' 59"	-1° 57' 58"	36° 25' 46"	12° 21' 41"	0° 54' 43"	14' 54.49"	250° 43' 07"	0.64834
8	38° 39' 00"	-1° 55' 28"	36° 54' 04"	12° 33' 38"	0° 54' 41"	14' 54.19"	250° 49' 60"	0.65215
9	39° 08' 60"	-1° 52' 57"	37° 22' 23"	12° 45' 31"	0° 54' 40"	14' 53.88"	250° 57' 00"	0.65594
10	39° 38' 58"	-1° 50' 26"	37° 50' 44"	12° 57' 21"	0° 54' 39"	14' 53.58"	251° 4' 08"	0.65972
11	40° 08' 55"	-1° 47' 54"	38° 19' 06"	13° 09' 08"	0° 54' 38"	14' 53.29"	251° 11' 22"	0.66349
12	40° 38' 51"	-1° 45' 22"	38° 47' 30"	13° 20' 51"	0° 54' 37"	14' 53.00"	251° 18' 44"	0.66725
13	41° 08' 46"	-1° 42' 50"	39° 15' 56"	13° 32' 30"	0° 54' 36"	14' 52.71"	251° 26' 14"	0.67100
14	41° 38' 40"	-1° 40' 17"	39° 44' 23"	13° 44' 06"	0° 54' 35"	14' 52.43"	251° 33' 50"	0.67473
15	42° 08' 32"	-1° 37' 44"	40° 12' 53"	13° 55' 38"	0° 54' 34"	14' 52.16"	251° 41' 34"	0.67844
16	42° 38' 24"	-1° 35' 11"	40° 41' 24"	14° 07' 07"	0° 54' 33"	14' 51.89"	251° 49' 25"	0.68215
17	43° 08' 14"	-1° 32' 37"	41° 09' 57"	14° 18' 31"	0° 54' 32"	14' 51.62"	251° 57' 23"	0.68584
18	43° 38' 04"	-1° 30' 03"	41° 38' 33"	14° 29' 52"	0° 54' 31"	14' 51.36"	252° 5' 29"	0.68951
19	44° 07' 52"	-1° 27' 29"	42° 07' 10"	14° 41' 09"	0° 54' 30"	14' 51.10"	252° 13' 42"	0.69317
20	44° 37' 40"	-1° 24' 54"	42° 35' 49"	14° 52' 23"	0° 54' 29"	14' 50.85"	252° 22' 02"	0.69682
21	45° 07' 26"	-1° 22' 19"	43° 04' 31"	15° 03' 32"	0° 54' 28"	14' 50.60"	252° 30' 30"	0.70045
22	45° 37' 12"	-1° 19' 44"	43° 33' 15"	15° 14' 37"	0° 54' 27"	14' 50.35"	252° 39' 05"	0.70407
23	46° 06' 57"	-1° 17' 08"	44° 02' 01"	15° 25' 39"	0° 54' 26"	14' 50.12"	252° 47' 47"	0.70767
24	46° 36' 41"	-1° 14' 32"	44° 30' 49"	15° 36' 36"	0° 54' 26"	14' 49.88"	252° 56' 36"	0.71126



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	291° 45' 02"	-0.47"	293° 29' 30"	-21° 40' 56"	0.9834627	16' 15.77"	23° 26' 15"	-8 m 06 s
1	291° 47' 35"	-0.47"	293° 32' 13"	-21° 40' 32"	0.9834641	16' 15.77"	23° 26' 15"	-8 m 07 s
2	291° 50' 08"	-0.46"	293° 34' 55"	-21° 40' 08"	0.9834656	16' 15.76"	23° 26' 15"	-8 m 08 s
3	291° 52' 41"	-0.45"	293° 37' 37"	-21° 39' 43"	0.9834672	16' 15.76"	23° 26' 15"	-8 m 09 s
4	291° 55' 14"	-0.45"	293° 40' 20"	-21° 39' 19"	0.9834687	16' 15.76"	23° 26' 15"	-8 m 10 s
5	291° 57' 46"	-0.44"	293° 43' 02"	-21° 38' 55"	0.9834702	16' 15.76"	23° 26' 15"	-8 m 11 s
6	292° 00' 19"	-0.44"	293° 45' 44"	-21° 38' 30"	0.9834717	16' 15.76"	23° 26' 15"	-8 m 12 s
7	292° 02' 52"	-0.43"	293° 48' 26"	-21° 38' 06"	0.9834733	16' 15.76"	23° 26' 15"	-8 m 13 s
8	292° 05' 25"	-0.43"	293° 51' 09"	-21° 37' 41"	0.9834748	16' 15.75"	23° 26' 15"	-8 m 14 s
9	292° 07' 58"	-0.42"	293° 53' 51"	-21° 37' 16"	0.9834764	16' 15.75"	23° 26' 15"	-8 m 15 s
10	292° 10' 30"	-0.42"	293° 56' 33"	-21° 36' 52"	0.9834780	16' 15.75"	23° 26' 15"	-8 m 16 s
11	292° 13' 03"	-0.41"	293° 59' 15"	-21° 36' 27"	0.9834796	16' 15.75"	23° 26' 15"	-8 m 17 s
12	292° 15' 36"	-0.41"	294° 01' 57"	-21° 36' 02"	0.9834812	16' 15.75"	23° 26' 15"	-8 m 18 s
13	292° 18' 09"	-0.40"	294° 04' 40"	-21° 35' 38"	0.9834828	16' 15.75"	23° 26' 15"	-8 m 19 s
14	292° 20' 42"	-0.39"	294° 07' 22"	-21° 35' 13"	0.9834844	16' 15.75"	23° 26' 15"	-8 m 20 s
15	292° 23' 15"	-0.39"	294° 10' 04"	-21° 34' 48"	0.9834860	16' 15.74"	23° 26' 15"	-8 m 21 s
16	292° 25' 47"	-0.38"	294° 12' 46"	-21° 34' 23"	0.9834877	16' 15.74"	23° 26' 15"	-8 m 22 s
17	292° 28' 20"	-0.38"	294° 15' 28"	-21° 33' 58"	0.9834893	16' 15.74"	23° 26' 15"	-8 m 23 s
18	292° 30' 53"	-0.37"	294° 18' 10"	-21° 33' 33"	0.9834910	16' 15.74"	23° 26' 15"	-8 m 24 s
19	292° 33' 26"	-0.37"	294° 20' 52"	-21° 33' 08"	0.9834926	16' 15.74"	23° 26' 15"	-8 m 25 s
20	292° 35' 58"	-0.36"	294° 23' 34"	-21° 32' 43"	0.9834943	16' 15.74"	23° 26' 15"	-8 m 26 s
21	292° 38' 31"	-0.36"	294° 26' 16"	-21° 32' 18"	0.9834960	16' 15.73"	23° 26' 15"	-8 m 27 s
22	292° 41' 04"	-0.35"	294° 28' 58"	-21° 31' 53"	0.9834977	16' 15.73"	23° 26' 15"	-8 m 28 s
23	292° 43' 37"	-0.34"	294° 31' 40"	-21° 31' 27"	0.9834994	16' 15.73"	23° 26' 15"	-8 m 29 s
24	292° 46' 10"	-0.34"	294° 34' 22"	-21° 31' 02"	0.9835011	16' 15.73"	23° 26' 15"	-8 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	46° 36' 41"	-1° 14' 32"	44° 30' 49"	15° 36' 36"	0° 54' 26"	14' 49.88"	252° 56' 36"	0.71126
1	47° 06' 24"	-1° 11' 56"	44° 59' 39"	15° 47' 30"	0° 54' 25"	14' 49.65"	253° 5' 33"	0.71483
2	47° 36' 06"	-1° 09' 20"	45° 28' 32"	15° 58' 19"	0° 54' 24"	14' 49.42"	253° 14' 38"	0.71839
3	48° 05' 47"	-1° 06' 44"	45° 57' 27"	16° 09' 04"	0° 54' 23"	14' 49.20"	253° 23' 49"	0.72193
4	48° 35' 28"	-1° 04' 07"	46° 26' 25"	16° 19' 45"	0° 54' 22"	14' 48.99"	253° 33' 09"	0.72546
5	49° 05' 07"	-1° 01' 30"	46° 55' 25"	16° 30' 21"	0° 54' 22"	14' 48.77"	253° 42' 35"	0.72897
6	49° 34' 46"	0°-58' 53"	47° 24' 27"	16° 40' 54"	0° 54' 21"	14' 48.57"	253° 52' 09"	0.73247
7	50° 04' 25"	0°-56' 15"	47° 53' 32"	16° 51' 22"	0° 54' 20"	14' 48.36"	254° 1' 51"	0.73595
8	50° 34' 02"	0°-53' 38"	48° 22' 40"	17° 01' 46"	0° 54' 19"	14' 48.16"	254° 11' 39"	0.73941
9	51° 03' 39"	0°-51' 00"	48° 51' 50"	17° 12' 05"	0° 54' 19"	14' 47.97"	254° 21' 36"	0.74285
10	51° 33' 15"	0°-48' 22"	49° 21' 03"	17° 22' 20"	0° 54' 18"	14' 47.78"	254° 31' 40"	0.74628
11	52° 02' 51"	0°-45' 44"	49° 50' 18"	17° 32' 30"	0° 54' 17"	14' 47.59"	254° 41' 51"	0.74970
12	52° 32' 26"	0°-43' 06"	50° 19' 36"	17° 42' 36"	0° 54' 17"	14' 47.41"	254° 52' 10"	0.75309
13	53° 02' 00"	0°-40' 28"	50° 48' 57"	17° 52' 38"	0° 54' 16"	14' 47.23"	255° 2' 36"	0.75647
14	53° 31' 34"	0°-37' 49"	51° 18' 21"	18° 02' 34"	0° 54' 15"	14' 47.06"	255° 13' 10"	0.75983
15	54° 01' 07"	0°-35' 11"	51° 47' 47"	18° 12' 27"	0° 54' 15"	14' 46.89"	255° 23' 52"	0.76318
16	54° 30' 40"	0°-32' 32"	52° 17' 16"	18° 22' 14"	0° 54' 14"	14' 46.73"	255° 34' 41"	0.76651
17	55° 00' 12"	0°-29' 53"	52° 46' 49"	18° 31' 57"	0° 54' 13"	14' 46.57"	255° 45' 37"	0.76982
18	55° 29' 43"	0°-27' 15"	53° 16' 23"	18° 41' 35"	0° 54' 13"	14' 46.41"	255° 56' 42"	0.77311
19	55° 59' 14"	0°-24' 36"	53° 46' 01"	18° 51' 08"	0° 54' 12"	14' 46.26"	256° 7' 54"	0.77638
20	56° 28' 45"	0°-21' 57"	54° 15' 42"	19° 00' 36"	0° 54' 12"	14' 46.11"	256° 19' 13"	0.77964
21	56° 58' 15"	0°-19' 18"	54° 45' 26"	19° 09' 60"	0° 54' 11"	14' 45.97"	256° 30' 41"	0.78287
22	57° 27' 45"	0°-16' 39"	55° 15' 12"	19° 19' 18"	0° 54' 11"	14' 45.83"	256° 42' 16"	0.78609
23	57° 57' 14"	0°-13' 60"	55° 45' 02"	19° 28' 32"	0° 54' 10"	14' 45.70"	256° 53' 59"	0.78929
24	58° 26' 43"	0°-11' 21"	56° 14' 55"	19° 37' 40"	0° 54' 10"	14' 45.57"	257° 5' 50"	0.79248

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	292° 46' 10"	-0.34"	294° 34' 22"	-21° 31' 02"	0.9835011	16' 15.73"	23° 26' 15"	-8 m 29 s
1	292° 48' 42"	-0.33"	294° 37' 04"	-21° 30' 37"	0.9835029	16' 15.73"	23° 26' 15"	-8 m 30 s
2	292° 51' 15"	-0.33"	294° 39' 46"	-21° 30' 11"	0.9835046	16' 15.72"	23° 26' 15"	-8 m 31 s
3	292° 53' 48"	-0.32"	294° 42' 28"	-21° 29' 46"	0.9835063	16' 15.72"	23° 26' 15"	-8 m 32 s
4	292° 56' 21"	-0.32"	294° 45' 10"	-21° 29' 21"	0.9835081	16' 15.72"	23° 26' 15"	-8 m 33 s
5	292° 58' 54"	-0.31"	294° 47' 52"	-21° 28' 55"	0.9835099	16' 15.72"	23° 26' 15"	-8 m 34 s
6	293° 01' 26"	-0.31"	294° 50' 34"	-21° 28' 30"	0.9835116	16' 15.72"	23° 26' 15"	-8 m 35 s
7	293° 03' 59"	-0.30"	294° 53' 16"	-21° 28' 04"	0.9835134	16' 15.72"	23° 26' 15"	-8 m 36 s
8	293° 06' 32"	-0.29"	294° 55' 58"	-21° 27' 38"	0.9835152	16' 15.71"	23° 26' 15"	-8 m 37 s
9	293° 09' 05"	-0.29"	294° 58' 39"	-21° 27' 13"	0.9835170	16' 15.71"	23° 26' 15"	-8 m 38 s
10	293° 11' 38"	-0.28"	295° 01' 21"	-21° 26' 47"	0.9835188	16' 15.71"	23° 26' 15"	-8 m 39 s
11	293° 14' 10"	-0.28"	295° 04' 03"	-21° 26' 21"	0.9835207	16' 15.71"	23° 26' 15"	-8 m 40 s
12	293° 16' 43"	-0.27"	295° 06' 45"	-21° 25' 56"	0.9835225	16' 15.71"	23° 26' 15"	-8 m 41 s
13	293° 19' 16"	-0.27"	295° 09' 27"	-21° 25' 30"	0.9835244	16' 15.71"	23° 26' 15"	-8 m 42 s
14	293° 21' 49"	-0.26"	295° 12' 08"	-21° 25' 04"	0.9835262	16' 15.70"	23° 26' 15"	-8 m 43 s
15	293° 24' 21"	-0.26"	295° 14' 50"	-21° 24' 38"	0.9835281	16' 15.70"	23° 26' 15"	-8 m 44 s
16	293° 26' 54"	-0.25"	295° 17' 32"	-21° 24' 12"	0.9835300	16' 15.70"	23° 26' 15"	-8 m 44 s
17	293° 29' 27"	-0.24"	295° 20' 14"	-21° 23' 46"	0.9835318	16' 15.70"	23° 26' 15"	-8 m 45 s
18	293° 31' 60"	-0.24"	295° 22' 55"	-21° 23' 20"	0.9835337	16' 15.70"	23° 26' 15"	-8 m 46 s
19	293° 34' 33"	-0.23"	295° 25' 37"	-21° 22' 54"	0.9835357	16' 15.69"	23° 26' 15"	-8 m 47 s
20	293° 37' 05"	-0.23"	295° 28' 19"	-21° 22' 28"	0.9835376	16' 15.69"	23° 26' 15"	-8 m 48 s
21	293° 39' 38"	-0.22"	295° 31' 00"	-21° 22' 02"	0.9835395	16' 15.69"	23° 26' 15"	-8 m 49 s
22	293° 42' 11"	-0.22"	295° 33' 42"	-21° 21' 36"	0.9835414	16' 15.69"	23° 26' 15"	-8 m 50 s
23	293° 44' 44"	-0.21"	295° 36' 23"	-21° 21' 09"	0.9835434	16' 15.69"	23° 26' 15"	-8 m 51 s
24	293° 47' 16"	-0.21"	295° 39' 05"	-21° 20' 43"	0.9835453	16' 15.68"	23° 26' 15"	-8 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	58° 26' 43"	0° -11' 21"	56° 14' 55"	19° 37' 40"	0° 54' 10"	14' 45.57"	257° 5' 50"	0.79248
1	58° 56' 12"	0° -8' 42"	56° 44' 50"	19° 46' 44"	0° 54' 09"	14' 45.44"	257° 17' 48"	0.79564
2	59° 25' 40"	0° -6' 03"	57° 14' 49"	19° 55' 42"	0° 54' 09"	14' 45.32"	257° 29' 55"	0.79878
3	59° 55' 08"	0° -3' 24"	57° 44' 51"	20° 04' 35"	0° 54' 08"	14' 45.20"	257° 42' 09"	0.80191
4	60° 24' 36"	0° 00' -45"	58° 14' 56"	20° 13' 23"	0° 54' 08"	14' 45.09"	257° 54' 31"	0.80501
5	60° 54' 03"	0° 01' 54"	58° 45' 04"	20° 22' 06"	0° 54' 08"	14' 44.98"	258° 7' 01"	0.80810
6	61° 23' 30"	0° 04' 33"	59° 15' 15"	20° 30' 43"	0° 54' 07"	14' 44.87"	258° 19' 39"	0.81117
7	61° 52' 57"	0° 07' 09"	59° 45' 30"	20° 39' 13"	0° 54' 07"	14' 44.77"	258° 32' 23"	0.81422
8	62° 22' 24"	0° 09' 48"	60° 15' 47"	20° 47' 40"	0° 54' 07"	14' 44.67"	258° 45' 18"	0.81724
9	62° 51' 50"	0° 12' 27"	60° 46' 08"	20° 56' 01"	0° 54' 06"	14' 44.58"	258° 58' 20"	0.82025
10	63° 21' 17"	0° 15' 05"	61° 16' 32"	21° 04' 17"	0° 54' 06"	14' 44.49"	259° 11' 30"	0.82324
11	63° 50' 43"	0° 17' 44"	61° 46' 58"	21° 12' 28"	0° 54' 06"	14' 44.40"	259° 24' 49"	0.82620
12	64° 20' 09"	0° 20' 22"	62° 17' 29"	21° 20' 33"	0° 54' 05"	14' 44.32"	259° 38' 15"	0.82915
13	64° 49' 34"	0° 23' 01"	62° 48' 02"	21° 28' 32"	0° 54' 05"	14' 44.25"	259° 51' 51"	0.83208
14	65° 19' 00"	0° 25' 39"	63° 18' 38"	21° 36' 26"	0° 54' 05"	14' 44.17"	260° 5' 34"	0.83498
15	65° 48' 26"	0° 28' 17"	63° 49' 18"	21° 44' 14"	0° 54' 04"	14' 44.10"	260° 19' 26"	0.83787
16	66° 17' 51"	0° 30' 55"	64° 20' 01"	21° 51' 57"	0° 54' 04"	14' 44.04"	260° 33' 26"	0.84073
17	66° 47' 16"	0° 33' 32"	64° 50' 47"	21° 59' 33"	0° 54' 04"	14' 43.97"	260° 47' 34"	0.84357
18	67° 16' 42"	0° 36' 10"	65° 21' 36"	22° 07' 04"	0° 54' 04"	14' 43.92"	261° 1' 52"	0.84639
19	67° 46' 07"	0° 38' 47"	65° 52' 29"	22° 14' 29"	0° 54' 04"	14' 43.86"	261° 16' 17"	0.84919
20	68° 15' 32"	0° 41' 24"	66° 23' 24"	22° 21' 49"	0° 54' 03"	14' 43.81"	261° 30' 52"	0.85197
21	68° 44' 58"	0° 44' 01"	66° 54' 23"	22° 29' 02"	0° 54' 03"	14' 43.76"	261° 45' 35"	0.85473
22	69° 14' 23"	0° 46' 38"	67° 25' 25"	22° 36' 09"	0° 54' 03"	14' 43.72"	262° 0' 27"	0.85746
23	69° 43' 49"	0° 49' 15"	67° 56' 31"	22° 43' 11"	0° 54' 03"	14' 43.68"	262° 15' 28"	0.86017
24	70° 13' 14"	0° 51' 51"	68° 27' 39"	22° 50' 06"	0° 54' 03"	14' 43.65"	262° 30' 38"	0.86286



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	293° 47' 16"	-0.21"	295° 39' 05"	-21° 20' 43"	0.9835453	16' 15.68"	23° 26' 15"	-8 m 52 s
1	293° 49' 49"	-0.20"	295° 41' 47"	-21° 20' 17"	0.9835473	16' 15.68"	23° 26' 15"	-8 m 53 s
2	293° 52' 22"	-0.19"	295° 44' 28"	-21° 19' 50"	0.9835493	16' 15.68"	23° 26' 15"	-8 m 54 s
3	293° 54' 55"	-0.19"	295° 47' 10"	-21° 19' 24"	0.9835513	16' 15.68"	23° 26' 15"	-8 m 55 s
4	293° 57' 27"	-0.18"	295° 49' 51"	-21° 18' 57"	0.9835533	16' 15.68"	23° 26' 15"	-8 m 56 s
5	294° 00' 00"	-0.18"	295° 52' 33"	-21° 18' 31"	0.9835553	16' 15.67"	23° 26' 15"	-8 m 56 s
6	294° 02' 33"	-0.17"	295° 55' 14"	-21° 18' 04"	0.9835573	16' 15.67"	23° 26' 15"	-8 m 57 s
7	294° 05' 06"	-0.17"	295° 57' 56"	-21° 17' 38"	0.9835593	16' 15.67"	23° 26' 15"	-8 m 58 s
8	294° 07' 38"	-0.16"	296° 00' 37"	-21° 17' 11"	0.9835614	16' 15.67"	23° 26' 15"	-8 m 59 s
9	294° 10' 11"	-0.16"	296° 03' 18"	-21° 16' 44"	0.9835634	16' 15.67"	23° 26' 15"	-9 m 00 s
10	294° 12' 44"	-0.15"	296° 05' 60"	-21° 16' 18"	0.9835655	16' 15.66"	23° 26' 15"	-9 m 01 s
11	294° 15' 17"	-0.15"	296° 08' 41"	-21° 15' 51"	0.9835676	16' 15.66"	23° 26' 15"	-9 m 02 s
12	294° 17' 50"	-0.14"	296° 11' 23"	-21° 15' 24"	0.9835697	16' 15.66"	23° 26' 15"	-9 m 03 s
13	294° 20' 22"	-0.14"	296° 14' 04"	-21° 14' 57"	0.9835718	16' 15.66"	23° 26' 15"	-9 m 04 s
14	294° 22' 55"	-0.13"	296° 16' 45"	-21° 14' 30"	0.9835739	16' 15.66"	23° 26' 15"	-9 m 05 s
15	294° 25' 28"	-0.12"	296° 19' 27"	-21° 14' 04"	0.9835760	16' 15.65"	23° 26' 15"	-9 m 06 s
16	294° 28' 01"	-0.12"	296° 22' 08"	-21° 13' 37"	0.9835781	16' 15.65"	23° 26' 15"	-9 m 06 s
17	294° 30' 33"	-0.11"	296° 24' 49"	-21° 13' 10"	0.9835802	16' 15.65"	23° 26' 15"	-9 m 07 s
18	294° 33' 06"	-0.11"	296° 27' 30"	-21° 12' 42"	0.9835824	16' 15.65"	23° 26' 15"	-9 m 08 s
19	294° 35' 39"	-0.10"	296° 30' 12"	-21° 12' 15"	0.9835845	16' 15.65"	23° 26' 15"	-9 m 09 s
20	294° 38' 12"	-0.10"	296° 32' 53"	-21° 11' 48"	0.9835867	16' 15.64"	23° 26' 15"	-9 m 10 s
21	294° 40' 44"	-0.09"	296° 35' 34"	-21° 11' 21"	0.9835889	16' 15.64"	23° 26' 15"	-9 m 11 s
22	294° 43' 17"	-0.09"	296° 38' 15"	-21° 10' 54"	0.9835911	16' 15.64"	23° 26' 15"	-9 m 12 s
23	294° 45' 50"	-0.08"	296° 40' 57"	-21° 10' 27"	0.9835933	16' 15.64"	23° 26' 15"	-9 m 13 s
24	294° 48' 23"	-0.08"	296° 43' 38"	-21° 09' 59"	0.9835955	16' 15.63"	23° 26' 15"	-9 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	70° 13' 14"	0° 51' 51"	68° 27' 39"	22° 50' 06"	0° 54' 03"	14' 43.65"	262° 30' 38"	0.86286
1	70° 42' 40"	0° 54' 27"	68° 58' 51"	22° 56' 55"	0° 54' 03"	14' 43.61"	262° 45' 57"	0.86553
2	71° 12' 05"	0° 57' 03"	69° 30' 06"	23° 03' 38"	0° 54' 03"	14' 43.59"	263° 1' 25"	0.86818
3	71° 41' 31"	0° 59' 38"	70° 01' 24"	23° 10' 15"	0° 54' 02"	14' 43.56"	263° 17' 03"	0.87080
4	72° 10' 57"	1° 02' 14"	70° 32' 45"	23° 16' 46"	0° 54' 02"	14' 43.54"	263° 32' 49"	0.87340
5	72° 40' 23"	1° 04' 49"	71° 04' 09"	23° 23' 11"	0° 54' 02"	14' 43.52"	263° 48' 46"	0.87598
6	73° 09' 49"	1° 07' 23"	71° 35' 37"	23° 29' 29"	0° 54' 02"	14' 43.51"	264° 4' 51"	0.87853
7	73° 39' 15"	1° 09' 58"	72° 07' 08"	23° 35' 41"	0° 54' 02"	14' 43.50"	264° 21' 07"	0.88107
8	74° 08' 42"	1° 12' 32"	72° 38' 41"	23° 41' 47"	0° 54' 02"	14' 43.49"	264° 37' 32"	0.88357
9	74° 38' 08"	1° 15' 05"	73° 10' 18"	23° 47' 46"	0° 54' 02"	14' 43.49"	264° 54' 07"	0.88606
10	75° 07' 35"	1° 17' 39"	73° 41' 58"	23° 53' 39"	0° 54' 02"	14' 43.49"	265° 10' 52"	0.88852
11	75° 37' 02"	1° 20' 12"	74° 13' 41"	23° 59' 25"	0° 54' 02"	14' 43.49"	265° 27' 48"	0.89096
12	76° 06' 30"	1° 22' 45"	74° 45' 27"	24° 05' 05"	0° 54' 02"	14' 43.50"	265° 44' 54"	0.89337
13	76° 35' 57"	1° 25' 17"	75° 17' 15"	24° 10' 38"	0° 54' 02"	14' 43.51"	266° 2' 10"	0.89576
14	77° 05' 25"	1° 27' 49"	75° 49' 07"	24° 16' 05"	0° 54' 02"	14' 43.52"	266° 19' 37"	0.89813
15	77° 34' 53"	1° 30' 21"	76° 21' 02"	24° 21' 25"	0° 54' 02"	14' 43.54"	266° 37' 15"	0.90047
16	78° 04' 22"	1° 32' 52"	76° 52' 60"	24° 26' 38"	0° 54' 02"	14' 43.56"	266° 55' 04"	0.90279
17	78° 33' 51"	1° 35' 22"	77° 25' 00"	24° 31' 45"	0° 54' 03"	14' 43.59"	267° 13' 05"	0.90508
18	79° 03' 20"	1° 37' 53"	77° 57' 04"	24° 36' 45"	0° 54' 03"	14' 43.61"	267° 31' 16"	0.90735
19	79° 32' 49"	1° 40' 23"	78° 29' 10"	24° 41' 38"	0° 54' 03"	14' 43.64"	267° 49' 40"	0.90959
20	80° 02' 19"	1° 42' 52"	79° 01' 19"	24° 46' 24"	0° 54' 03"	14' 43.68"	268° 8' 16"	0.91181
21	80° 31' 49"	1° 45' 21"	79° 33' 31"	24° 51' 04"	0° 54' 03"	14' 43.71"	268° 27' 03"	0.91401
22	81° 01' 20"	1° 47' 50"	80° 05' 46"	24° 55' 36"	0° 54' 03"	14' 43.75"	268° 46' 04"	0.91618
23	81° 30' 51"	1° 50' 18"	80° 38' 03"	25° 00' 02"	0° 54' 03"	14' 43.80"	269° 5' 17"	0.91832
24	82° 00' 22"	1° 52' 46"	81° 10' 23"	25° 04' 21"	0° 54' 03"	14' 43.84"	269° 24' 43"	0.92044

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	294° 48' 23"	-0.08"	296° 43' 38"	-21° 09' 59"	0.9835955	16' 15.63"	23° 26' 15"	-9 m 14 s
1	294° 50' 55"	-0.07"	296° 46' 19"	-21° 09' 32"	0.9835977	16' 15.63"	23° 26' 15"	-9 m 14 s
2	294° 53' 28"	-0.07"	296° 48' 60"	-21° 09' 05"	0.9835999	16' 15.63"	23° 26' 15"	-9 m 15 s
3	294° 56' 01"	-0.06"	296° 51' 41"	-21° 08' 37"	0.9836021	16' 15.63"	23° 26' 15"	-9 m 16 s
4	294° 58' 33"	-0.06"	296° 54' 22"	-21° 08' 10"	0.9836044	16' 15.63"	23° 26' 15"	-9 m 17 s
5	295° 01' 06"	-0.05"	296° 57' 03"	-21° 07' 42"	0.9836067	16' 15.62"	23° 26' 15"	-9 m 18 s
6	295° 03' 39"	-0.05"	296° 59' 44"	-21° 07' 15"	0.9836089	16' 15.62"	23° 26' 15"	-9 m 19 s
7	295° 06' 12"	-0.04"	297° 02' 25"	-21° 06' 47"	0.9836112	16' 15.62"	23° 26' 15"	-9 m 20 s
8	295° 08' 44"	-0.04"	297° 05' 06"	-21° 06' 19"	0.9836135	16' 15.62"	23° 26' 15"	-9 m 21 s
9	295° 11' 17"	-0.03"	297° 07' 47"	-21° 05' 52"	0.9836158	16' 15.61"	23° 26' 15"	-9 m 22 s
10	295° 13' 50"	-0.03"	297° 10' 28"	-21° 05' 24"	0.9836181	16' 15.61"	23° 26' 15"	-9 m 22 s
11	295° 16' 23"	-0.02"	297° 13' 09"	-21° 04' 56"	0.9836204	16' 15.61"	23° 26' 15"	-9 m 23 s
12	295° 18' 55"	-0.02"	297° 15' 50"	-21° 04' 28"	0.9836228	16' 15.61"	23° 26' 15"	-9 m 24 s
13	295° 21' 28"	-0.01"	297° 18' 31"	-21° 04' 00"	0.9836251	16' 15.61"	23° 26' 15"	-9 m 25 s
14	295° 24' 01"	-0.01"	297° 21' 12"	-21° 03' 33"	0.9836275	16' 15.60"	23° 26' 15"	-9 m 26 s
15	295° 26' 34"	-0.00"	297° 23' 53"	-21° 03' 05"	0.9836298	16' 15.60"	23° 26' 15"	-9 m 27 s
16	295° 29' 06"	0.00"	297° 26' 34"	-21° 02' 37"	0.9836322	16' 15.60"	23° 26' 15"	-9 m 28 s
17	295° 31' 39"	0.01"	297° 29' 15"	-21° 02' 09"	0.9836346	16' 15.60"	23° 26' 15"	-9 m 29 s
18	295° 34' 12"	0.01"	297° 31' 56"	-21° 01' 41"	0.9836370	16' 15.59"	23° 26' 15"	-9 m 29 s
19	295° 36' 44"	0.02"	297° 34' 36"	-21° 01' 12"	0.9836394	16' 15.59"	23° 26' 15"	-9 m 30 s
20	295° 39' 17"	0.02"	297° 37' 17"	-21° 00' 44"	0.9836418	16' 15.59"	23° 26' 15"	-9 m 31 s
21	295° 41' 50"	0.03"	297° 39' 58"	-21° 00' 16"	0.9836442	16' 15.59"	23° 26' 15"	-9 m 32 s
22	295° 44' 23"	0.03"	297° 42' 39"	-20° 59' 48"	0.9836467	16' 15.58"	23° 26' 15"	-9 m 33 s
23	295° 46' 55"	0.03"	297° 45' 20"	-20° 59' 20"	0.9836491	16' 15.58"	23° 26' 15"	-9 m 34 s
24	295° 49' 28"	0.04"	297° 48' 00"	-20° 58' 51"	0.9836516	16' 15.58"	23° 26' 15"	-9 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	82° 00' 22"	1° 52' 46"	81° 10' 23"	25° 04' 21"	0° 54' 03"	14' 43.84"	269° 24' 43"	0.92044
1	82° 29' 54"	1° 55' 13"	81° 42' 46"	25° 08' 32"	0° 54' 04"	14' 43.89"	269° 44' 23"	0.92253
2	82° 59' 26"	1° 57' 39"	82° 15' 11"	25° 12' 37"	0° 54' 04"	14' 43.95"	270° 4' 17"	0.92460
3	83° 28' 59"	2° 00' 06"	82° 47' 39"	25° 16' 35"	0° 54' 04"	14' 44.00"	270° 24' 24"	0.92664
4	83° 58' 32"	2° 02' 31"	83° 20' 09"	25° 20' 25"	0° 54' 04"	14' 44.06"	270° 44' 47"	0.92865
5	84° 28' 06"	2° 04' 56"	83° 52' 42"	25° 24' 09"	0° 54' 04"	14' 44.12"	271° 5' 24"	0.93064
6	84° 57' 40"	2° 07' 21"	84° 25' 17"	25° 27' 43"	0° 54' 05"	14' 44.19"	271° 26' 17"	0.93261
7	85° 27' 15"	2° 09' 45"	84° 57' 54"	25° 31' 14"	0° 54' 05"	14' 44.26"	271° 47' 26"	0.93454
8	85° 56' 50"	2° 12' 08"	85° 30' 34"	25° 34' 36"	0° 54' 05"	14' 44.33"	272° 8' 52"	0.93645
9	86° 26' 26"	2° 14' 31"	86° 03' 16"	25° 37' 51"	0° 54' 06"	14' 44.40"	272° 30' 34"	0.93834
10	86° 56' 02"	2° 16' 53"	86° 36' 01"	25° 40' 58"	0° 54' 06"	14' 44.48"	272° 52' 34"	0.94019
11	87° 25' 39"	2° 19' 15"	87° 08' 47"	25° 43' 59"	0° 54' 06"	14' 44.56"	273° 14' 53"	0.94202
12	87° 55' 16"	2° 21' 36"	87° 41' 36"	25° 46' 52"	0° 54' 06"	14' 44.64"	273° 37' 30"	0.94383
13	88° 24' 54"	2° 23' 56"	88° 14' 27"	25° 49' 37"	0° 54' 07"	14' 44.72"	274° 0' 28"	0.94560
14	88° 54' 33"	2° 26' 16"	88° 47' 19"	25° 52' 15"	0° 54' 07"	14' 44.81"	274° 23' 45"	0.94735
15	89° 24' 12"	2° 28' 35"	89° 20' 14"	25° 54' 46"	0° 54' 07"	14' 44.90"	274° 47' 25"	0.94907
16	89° 53' 52"	2° 30' 54"	89° 53' 11"	25° 57' 09"	0° 54' 08"	14' 45.00"	275° 11' 26"	0.95077
17	90° 23' 32"	2° 33' 12"	90° 26' 09"	25° 59' 25"	0° 54' 08"	14' 45.09"	275° 35' 51"	0.95244
18	90° 53' 13"	2° 35' 29"	90° 59' 10"	26° 01' 34"	0° 54' 08"	14' 45.19"	276° 0' 40"	0.95408
19	91° 22' 55"	2° 37' 46"	91° 32' 12"	26° 03' 35"	0° 54' 09"	14' 45.30"	276° 25' 55"	0.95569
20	91° 52' 37"	2° 40' 01"	92° 05' 16"	26° 05' 28"	0° 54' 09"	14' 45.40"	276° 51' 36"	0.95727
21	92° 22' 20"	2° 42' 17"	92° 38' 21"	26° 07' 14"	0° 54' 10"	14' 45.51"	277° 17' 45"	0.95883
22	92° 52' 04"	2° 44' 31"	93° 11' 28"	26° 08' 52"	0° 54' 10"	14' 45.62"	277° 44' 24"	0.96035
23	93° 21' 48"	2° 46' 45"	93° 44' 37"	26° 10' 23"	0° 54' 10"	14' 45.73"	278° 11' 34"	0.96185
24	93° 51' 33"	2° 48' 58"	94° 17' 47"	26° 11' 46"	0° 54' 11"	14' 45.85"	278° 39' 17"	0.96332

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	295° 49' 28"	0.04"	297° 48' 00"	-20° 58' 51"	0.9836516	16' 15.58"	23° 26' 15"	-9 m 35 s
1	295° 52' 01"	0.04"	297° 50' 41"	-20° 58' 23"	0.9836541	16' 15.58"	23° 26' 15"	-9 m 36 s
2	295° 54' 34"	0.05"	297° 53' 22"	-20° 57' 55"	0.9836565	16' 15.57"	23° 26' 15"	-9 m 36 s
3	295° 57' 06"	0.05"	297° 56' 02"	-20° 57' 26"	0.9836590	16' 15.57"	23° 26' 15"	-9 m 37 s
4	295° 59' 39"	0.06"	297° 58' 43"	-20° 56' 58"	0.9836615	16' 15.57"	23° 26' 15"	-9 m 38 s
5	296° 02' 12"	0.06"	298° 01' 24"	-20° 56' 29"	0.9836640	16' 15.57"	23° 26' 15"	-9 m 39 s
6	296° 04' 44"	0.07"	298° 04' 04"	-20° 56' 01"	0.9836666	16' 15.56"	23° 26' 15"	-9 m 40 s
7	296° 07' 17"	0.07"	298° 06' 45"	-20° 55' 32"	0.9836691	16' 15.56"	23° 26' 15"	-9 m 41 s
8	296° 09' 50"	0.07"	298° 09' 26"	-20° 55' 03"	0.9836716	16' 15.56"	23° 26' 15"	-9 m 42 s
9	296° 12' 23"	0.08"	298° 12' 06"	-20° 54' 35"	0.9836742	16' 15.56"	23° 26' 15"	-9 m 42 s
10	296° 14' 55"	0.08"	298° 14' 47"	-20° 54' 06"	0.9836768	16' 15.55"	23° 26' 15"	-9 m 43 s
11	296° 17' 28"	0.09"	298° 17' 27"	-20° 53' 37"	0.9836793	16' 15.55"	23° 26' 15"	-9 m 44 s
12	296° 20' 01"	0.09"	298° 20' 08"	-20° 53' 08"	0.9836819	16' 15.55"	23° 26' 15"	-9 m 45 s
13	296° 22' 33"	0.10"	298° 22' 48"	-20° 52' 39"	0.9836845	16' 15.55"	23° 26' 15"	-9 m 46 s
14	296° 25' 06"	0.10"	298° 25' 29"	-20° 52' 11"	0.9836871	16' 15.54"	23° 26' 15"	-9 m 47 s
15	296° 27' 39"	0.10"	298° 28' 09"	-20° 51' 42"	0.9836898	16' 15.54"	23° 26' 15"	-9 m 48 s
16	296° 30' 12"	0.11"	298° 30' 50"	-20° 51' 13"	0.9836924	16' 15.54"	23° 26' 15"	-9 m 48 s
17	296° 32' 44"	0.11"	298° 33' 30"	-20° 50' 44"	0.9836950	16' 15.54"	23° 26' 15"	-9 m 49 s
18	296° 35' 17"	0.12"	298° 36' 11"	-20° 50' 15"	0.9836977	16' 15.53"	23° 26' 15"	-9 m 50 s
19	296° 37' 50"	0.12"	298° 38' 51"	-20° 49' 45"	0.9837003	16' 15.53"	23° 26' 15"	-9 m 51 s
20	296° 40' 22"	0.12"	298° 41' 31"	-20° 49' 16"	0.9837030	16' 15.53"	23° 26' 15"	-9 m 52 s
21	296° 42' 55"	0.13"	298° 44' 12"	-20° 48' 47"	0.9837057	16' 15.53"	23° 26' 15"	-9 m 53 s
22	296° 45' 28"	0.13"	298° 46' 52"	-20° 48' 18"	0.9837084	16' 15.52"	23° 26' 15"	-9 m 53 s
23	296° 48' 00"	0.13"	298° 49' 32"	-20° 47' 49"	0.9837111	16' 15.52"	23° 26' 15"	-9 m 54 s
24	296° 50' 33"	0.14"	298° 52' 13"	-20° 47' 19"	0.9837138	16' 15.52"	23° 26' 15"	-9 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	93° 51' 33"	2° 48' 58"	94° 17' 47"	26° 11' 46"	0° 54' 11"	14' 45.85"	278° 39' 17"	0.96332
1	94° 21' 18"	2° 51' 10"	94° 50' 59"	26° 13' 02"	0° 54' 11"	14' 45.96"	279° 7' 34"	0.96477
2	94° 51' 05"	2° 53' 22"	95° 24' 11"	26° 14' 10"	0° 54' 12"	14' 46.08"	279° 36' 28"	0.96618
3	95° 20' 52"	2° 55' 32"	95° 57' 26"	26° 15' 10"	0° 54' 12"	14' 46.21"	280° 6' 00"	0.96757
4	95° 50' 40"	2° 57' 42"	96° 30' 41"	26° 16' 03"	0° 54' 13"	14' 46.33"	280° 36' 14"	0.96892
5	96° 20' 28"	2° 59' 52"	97° 03' 57"	26° 16' 48"	0° 54' 13"	14' 46.46"	281° 7' 11"	0.97025
6	96° 50' 18"	3° 02' 00"	97° 37' 15"	26° 17' 25"	0° 54' 14"	14' 46.59"	281° 38' 55"	0.97155
7	97° 20' 08"	3° 04' 08"	98° 10' 34"	26° 17' 55"	0° 54' 14"	14' 46.72"	282° 11' 29"	0.97282
8	97° 49' 58"	3° 06' 15"	98° 43' 53"	26° 18' 16"	0° 54' 15"	14' 46.86"	282° 44' 55"	0.97406
9	98° 19' 50"	3° 08' 21"	99° 17' 14"	26° 18' 31"	0° 54' 15"	14' 47.00"	283° 19' 18"	0.97527
10	98° 49' 42"	3° 10' 26"	99° 50' 35"	26° 18' 37"	0° 54' 16"	14' 47.14"	283° 54' 41"	0.97645
11	99° 19' 35"	3° 12' 30"	100° 23' 57"	26° 18' 36"	0° 54' 16"	14' 47.28"	284° 31' 10"	0.97760
12	99° 49' 29"	3° 14' 34"	100° 57' 20"	26° 18' 27"	0° 54' 17"	14' 47.43"	285° 8' 49"	0.97872
13	100° 19' 24"	3° 16' 36"	101° 30' 43"	26° 18' 10"	0° 54' 17"	14' 47.57"	285° 47' 44"	0.97982
14	100° 49' 20"	3° 18' 38"	102° 04' 07"	26° 17' 45"	0° 54' 18"	14' 47.72"	286° 27' 60"	0.98088
15	101° 19' 16"	3° 20' 39"	102° 37' 32"	26° 17' 13"	0° 54' 18"	14' 47.87"	287° 9' 44"	0.98191
16	101° 49' 13"	3° 22' 39"	103° 10' 57"	26° 16' 33"	0° 54' 19"	14' 48.03"	287° 53' 04"	0.98291
17	102° 19' 11"	3° 24' 38"	103° 44' 22"	26° 15' 45"	0° 54' 19"	14' 48.18"	288° 38' 09"	0.98389
18	102° 49' 10"	3° 26' 36"	104° 17' 47"	26° 14' 49"	0° 54' 20"	14' 48.34"	289° 25' 07"	0.98483
19	103° 19' 10"	3° 28' 33"	104° 51' 13"	26° 13' 46"	0° 54' 21"	14' 48.50"	290° 14' 09"	0.98574
20	103° 49' 10"	3° 30' 30"	105° 24' 39"	26° 12' 35"	0° 54' 21"	14' 48.67"	291° 5' 27"	0.98662
21	104° 19' 12"	3° 32' 25"	105° 58' 05"	26° 11' 16"	0° 54' 22"	14' 48.83"	291° 59' 13"	0.98747
22	104° 49' 14"	3° 34' 20"	106° 31' 31"	26° 09' 49"	0° 54' 22"	14' 49.00"	292° 55' 44"	0.98829
23	105° 19' 17"	3° 36' 13"	107° 04' 57"	26° 08' 14"	0° 54' 23"	14' 49.17"	293° 55' 15"	0.98908
24	105° 49' 21"	3° 38' 06"	107° 38' 23"	26° 06' 32"	0° 54' 24"	14' 49.34"	294° 58' 07"	0.98984

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	296° 50' 33"	0.14"	298° 52' 13"	-20° 47' 19"	0.9837138	16' 15.52"	23° 26' 15"	-9 m 55 s
1	296° 53' 06"	0.14"	298° 54' 53"	-20° 46' 50"	0.9837165	16' 15.51"	23° 26' 15"	-9 m 56 s
2	296° 55' 39"	0.15"	298° 57' 33"	-20° 46' 21"	0.9837193	16' 15.51"	23° 26' 15"	-9 m 57 s
3	296° 58' 11"	0.15"	299° 00' 13"	-20° 45' 51"	0.9837220	16' 15.51"	23° 26' 15"	-9 m 58 s
4	297° 00' 44"	0.15"	299° 02' 54"	-20° 45' 22"	0.9837248	16' 15.51"	23° 26' 15"	-9 m 58 s
5	297° 03' 17"	0.16"	299° 05' 34"	-20° 44' 52"	0.9837276	16' 15.50"	23° 26' 16"	-9 m 59 s
6	297° 05' 49"	0.16"	299° 08' 14"	-20° 44' 23"	0.9837303	16' 15.50"	23° 26' 16"	-10 m 00 s
7	297° 08' 22"	0.16"	299° 10' 54"	-20° 43' 53"	0.9837331	16' 15.50"	23° 26' 16"	-10 m 01 s
8	297° 10' 55"	0.17"	299° 13' 34"	-20° 43' 23"	0.9837359	16' 15.50"	23° 26' 16"	-10 m 02 s
9	297° 13' 27"	0.17"	299° 16' 15"	-20° 42' 54"	0.9837387	16' 15.49"	23° 26' 16"	-10 m 03 s
10	297° 16' 00"	0.17"	299° 18' 55"	-20° 42' 24"	0.9837416	16' 15.49"	23° 26' 16"	-10 m 03 s
11	297° 18' 33"	0.18"	299° 21' 35"	-20° 41' 54"	0.9837444	16' 15.49"	23° 26' 16"	-10 m 04 s
12	297° 21' 05"	0.18"	299° 24' 15"	-20° 41' 24"	0.9837472	16' 15.48"	23° 26' 16"	-10 m 05 s
13	297° 23' 38"	0.18"	299° 26' 55"	-20° 40' 55"	0.9837501	16' 15.48"	23° 26' 16"	-10 m 06 s
14	297° 26' 11"	0.18"	299° 29' 35"	-20° 40' 25"	0.9837530	16' 15.48"	23° 26' 16"	-10 m 07 s
15	297° 28' 43"	0.19"	299° 32' 15"	-20° 39' 55"	0.9837558	16' 15.48"	23° 26' 16"	-10 m 07 s
16	297° 31' 16"	0.19"	299° 34' 55"	-20° 39' 25"	0.9837587	16' 15.47"	23° 26' 16"	-10 m 08 s
17	297° 33' 49"	0.19"	299° 37' 35"	-20° 38' 55"	0.9837616	16' 15.47"	23° 26' 16"	-10 m 09 s
18	297° 36' 22"	0.20"	299° 40' 15"	-20° 38' 25"	0.9837645	16' 15.47"	23° 26' 16"	-10 m 10 s
19	297° 38' 54"	0.20"	299° 42' 55"	-20° 37' 55"	0.9837675	16' 15.46"	23° 26' 16"	-10 m 11 s
20	297° 41' 27"	0.20"	299° 45' 35"	-20° 37' 25"	0.9837704	16' 15.46"	23° 26' 16"	-10 m 12 s
21	297° 43' 60"	0.21"	299° 48' 15"	-20° 36' 54"	0.9837733	16' 15.46"	23° 26' 16"	-10 m 12 s
22	297° 46' 32"	0.21"	299° 50' 55"	-20° 36' 24"	0.9837763	16' 15.46"	23° 26' 16"	-10 m 13 s
23	297° 49' 05"	0.21"	299° 53' 35"	-20° 35' 54"	0.9837792	16' 15.45"	23° 26' 16"	-10 m 14 s
24	297° 51' 38"	0.21"	299° 56' 14"	-20° 35' 24"	0.9837822	16' 15.45"	23° 26' 16"	-10 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	105° 49' 21"	3° 38' 06"	107° 38' 23"	26° 06' 32"	0° 54' 24"	14' 49.34"	294° 58' 07"	0.98984
1	106° 19' 26"	3° 39' 57"	108° 11' 49"	26° 04' 42"	0° 54' 24"	14' 49.51"	296° 4' 40"	0.99057
2	106° 49' 32"	3° 41' 48"	108° 45' 15"	26° 02' 44"	0° 54' 25"	14' 49.69"	297° 15' 21"	0.99127
3	107° 19' 39"	3° 43' 37"	109° 18' 40"	26° 00' 38"	0° 54' 26"	14' 49.87"	298° 30' 36"	0.99193
4	107° 49' 46"	3° 45' 26"	109° 52' 05"	25° 58' 25"	0° 54' 26"	14' 50.05"	299° 51' 00"	0.99257
5	108° 19' 55"	3° 47' 14"	110° 25' 29"	25° 56' 04"	0° 54' 27"	14' 50.23"	301° 17' 10"	0.99317
6	108° 50' 04"	3° 49' 00"	110° 58' 53"	25° 53' 35"	0° 54' 28"	14' 50.41"	302° 49' 49"	0.99374
7	109° 20' 15"	3° 50' 46"	111° 32' 17"	25° 50' 58"	0° 54' 28"	14' 50.60"	304° 29' 48"	0.99428
8	109° 50' 26"	3° 52' 30"	112° 05' 40"	25° 48' 13"	0° 54' 29"	14' 50.79"	306° 18' 03"	0.99479
9	110° 20' 38"	3° 54' 14"	112° 39' 02"	25° 45' 21"	0° 54' 30"	14' 50.98"	308° 15' 41"	0.99527
10	110° 50' 52"	3° 55' 56"	113° 12' 23"	25° 42' 21"	0° 54' 30"	14' 51.17"	310° 23' 58"	0.99572
11	111° 21' 06"	3° 57' 37"	113° 45' 44"	25° 39' 14"	0° 54' 31"	14' 51.36"	312° 44' 21"	0.99613
12	111° 51' 21"	3° 59' 17"	114° 19' 03"	25° 35' 59"	0° 54' 32"	14' 51.56"	315° 18' 29"	0.99651
13	112° 21' 37"	4° 00' 57"	114° 52' 22"	25° 32' 36"	0° 54' 33"	14' 51.76"	318° 8' 12"	0.99686
14	112° 51' 54"	4° 02' 35"	115° 25' 40"	25° 29' 05"	0° 54' 33"	14' 51.96"	321° 15' 30"	0.99718
15	113° 22' 12"	4° 04' 11"	115° 58' 56"	25° 25' 27"	0° 54' 34"	14' 52.16"	324° 42' 31"	0.99747
16	113° 52' 31"	4° 05' 47"	116° 32' 12"	25° 21' 41"	0° 54' 35"	14' 52.36"	328° 31' 23"	0.99772
17	114° 22' 51"	4° 07' 22"	117° 05' 26"	25° 17' 48"	0° 54' 35"	14' 52.57"	332° 44' 03"	0.99795
18	114° 53' 12"	4° 08' 56"	117° 38' 39"	25° 13' 47"	0° 54' 36"	14' 52.77"	337° 22' 02"	0.99814
19	115° 23' 33"	4° 10' 28"	118° 11' 51"	25° 09' 38"	0° 54' 37"	14' 52.98"	342° 25' 57"	0.99830
20	115° 53' 56"	4° 11' 59"	118° 45' 02"	25° 05' 22"	0° 54' 38"	14' 53.19"	347° 55' 04"	0.99842
21	116° 24' 20"	4° 13' 29"	119° 18' 11"	25° 00' 59"	0° 54' 39"	14' 53.41"	353° 46' 54"	0.99851
22	116° 54' 45"	4° 14' 58"	119° 51' 19"	24° 56' 28"	0° 54' 39"	14' 53.62"	359° 56' 49"	0.99858
23	117° 25' 11"	4° 16' 26"	120° 24' 25"	24° 51' 49"	0° 54' 40"	14' 53.84"	6° 18' 12"	0.99860
24	117° 55' 38"	4° 17' 53"	120° 57' 29"	24° 47' 03"	0° 54' 41"	14' 54.05"	12° 42' 60"	0.99860

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	297° 51' 38"	0.21"	299° 56' 14"	-20° 35' 24"	0.9837822	16' 15.45"	23° 26' 16"	-10 m 15 s
1	297° 54' 10"	0.22"	299° 58' 54"	-20° 34' 53"	0.9837852	16' 15.45"	23° 26' 16"	-10 m 16 s
2	297° 56' 43"	0.22"	300° 01' 34"	-20° 34' 23"	0.9837882	16' 15.44"	23° 26' 16"	-10 m 16 s
3	297° 59' 16"	0.22"	300° 04' 14"	-20° 33' 53"	0.9837912	16' 15.44"	23° 26' 16"	-10 m 17 s
4	298° 01' 48"	0.22"	300° 06' 54"	-20° 33' 22"	0.9837942	16' 15.44"	23° 26' 16"	-10 m 18 s
5	298° 04' 21"	0.23"	300° 09' 33"	-20° 32' 52"	0.9837972	16' 15.43"	23° 26' 16"	-10 m 19 s
6	298° 06' 54"	0.23"	300° 12' 13"	-20° 32' 21"	0.9838003	16' 15.43"	23° 26' 16"	-10 m 20 s
7	298° 09' 26"	0.23"	300° 14' 53"	-20° 31' 50"	0.9838033	16' 15.43"	23° 26' 16"	-10 m 20 s
8	298° 11' 59"	0.23"	300° 17' 33"	-20° 31' 20"	0.9838064	16' 15.43"	23° 26' 16"	-10 m 21 s
9	298° 14' 32"	0.23"	300° 20' 12"	-20° 30' 49"	0.9838095	16' 15.42"	23° 26' 16"	-10 m 22 s
10	298° 17' 04"	0.24"	300° 22' 52"	-20° 30' 19"	0.9838125	16' 15.42"	23° 26' 16"	-10 m 23 s
11	298° 19' 37"	0.24"	300° 25' 32"	-20° 29' 48"	0.9838156	16' 15.42"	23° 26' 16"	-10 m 24 s
12	298° 22' 10"	0.24"	300° 28' 11"	-20° 29' 17"	0.9838187	16' 15.41"	23° 26' 16"	-10 m 24 s
13	298° 24' 42"	0.24"	300° 30' 51"	-20° 28' 46"	0.9838219	16' 15.41"	23° 26' 16"	-10 m 25 s
14	298° 27' 15"	0.24"	300° 33' 31"	-20° 28' 15"	0.9838250	16' 15.41"	23° 26' 16"	-10 m 26 s
15	298° 29' 48"	0.25"	300° 36' 10"	-20° 27' 44"	0.9838281	16' 15.40"	23° 26' 16"	-10 m 27 s
16	298° 32' 20"	0.25"	300° 38' 50"	-20° 27' 14"	0.9838313	16' 15.40"	23° 26' 16"	-10 m 28 s
17	298° 34' 53"	0.25"	300° 41' 29"	-20° 26' 43"	0.9838344	16' 15.40"	23° 26' 16"	-10 m 28 s
18	298° 37' 26"	0.25"	300° 44' 09"	-20° 26' 12"	0.9838376	16' 15.39"	23° 26' 16"	-10 m 29 s
19	298° 39' 58"	0.25"	300° 46' 48"	-20° 25' 41"	0.9838408	16' 15.39"	23° 26' 16"	-10 m 30 s
20	298° 42' 31"	0.26"	300° 49' 28"	-20° 25' 09"	0.9838440	16' 15.39"	23° 26' 16"	-10 m 31 s
21	298° 45' 04"	0.26"	300° 52' 07"	-20° 24' 38"	0.9838472	16' 15.39"	23° 26' 16"	-10 m 31 s
22	298° 47' 36"	0.26"	300° 54' 47"	-20° 24' 07"	0.9838504	16' 15.38"	23° 26' 16"	-10 m 32 s
23	298° 50' 09"	0.26"	300° 57' 26"	-20° 23' 36"	0.9838536	16' 15.38"	23° 26' 16"	-10 m 33 s
24	298° 52' 42"	0.26"	301° 00' 05"	-20° 23' 05"	0.9838568	16' 15.38"	23° 26' 16"	-10 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	117° 55' 38"	4° 17' 53"	120° 57' 29"	24° 47' 03"	0° 54' 41"	14' 54.05"	12° 42' 60"	0.99860
1	118° 26' 06"	4° 19' 18"	121° 30' 32"	24° 42' 10"	0° 54' 42"	14' 54.27"	19° 2' 39"	0.99856
2	118° 56' 34"	4° 20' 42"	122° 03' 34"	24° 37' 09"	0° 54' 43"	14' 54.49"	25° 9' 19"	0.99850
3	119° 27' 04"	4° 22' 05"	122° 36' 33"	24° 32' 01"	0° 54' 43"	14' 54.72"	30° 56' 43"	0.99839
4	119° 57' 35"	4° 23' 27"	123° 09' 31"	24° 26' 45"	0° 54' 44"	14' 54.94"	36° 20' 41"	0.99826
5	120° 28' 07"	4° 24' 47"	123° 42' 27"	24° 21' 22"	0° 54' 45"	14' 55.17"	41° 19' 03"	0.99809
6	120° 58' 40"	4° 26' 07"	124° 15' 21"	24° 15' 52"	0° 54' 46"	14' 55.40"	45° 51' 25"	0.99789
7	121° 29' 14"	4° 27' 25"	124° 48' 14"	24° 10' 14"	0° 54' 47"	14' 55.62"	49° 58' 37"	0.99766
8	121° 59' 49"	4° 28' 41"	125° 21' 04"	24° 04' 30"	0° 54' 48"	14' 55.86"	53° 42' 15"	0.99739
9	122° 30' 25"	4° 29' 57"	125° 53' 53"	23° 58' 38"	0° 54' 48"	14' 56.09"	57° 4' 20"	0.99709
10	123° 01' 02"	4° 31' 11"	126° 26' 39"	23° 52' 39"	0° 54' 49"	14' 56.32"	60° 7' 00"	0.99676
11	123° 31' 40"	4° 32' 24"	126° 59' 23"	23° 46' 33"	0° 54' 50"	14' 56.56"	62° 52' 23"	0.99640
12	124° 02' 19"	4° 33' 36"	127° 32' 05"	23° 40' 19"	0° 54' 51"	14' 56.80"	65° 22' 27"	0.99600
13	124° 32' 60"	4° 34' 46"	128° 04' 46"	23° 33' 59"	0° 54' 52"	14' 57.04"	67° 38' 60"	0.99557
14	125° 03' 41"	4° 35' 56"	128° 37' 23"	23° 27' 31"	0° 54' 53"	14' 57.28"	69° 43' 38"	0.99511
15	125° 34' 23"	4° 37' 03"	129° 09' 59"	23° 20' 57"	0° 54' 54"	14' 57.52"	71° 37' 46"	0.99461
16	126° 05' 07"	4° 38' 10"	129° 42' 33"	23° 14' 16"	0° 54' 55"	14' 57.76"	73° 22' 39"	0.99408
17	126° 35' 51"	4° 39' 15"	130° 15' 04"	23° 07' 27"	0° 54' 55"	14' 58.01"	74° 59' 21"	0.99352
18	127° 06' 37"	4° 40' 19"	130° 47' 33"	23° 00' 32"	0° 54' 56"	14' 58.26"	76° 28' 47"	0.99292
19	127° 37' 23"	4° 41' 22"	131° 19' 59"	22° 53' 30"	0° 54' 57"	14' 58.50"	77° 51' 47"	0.99229
20	128° 08' 11"	4° 42' 23"	131° 52' 23"	22° 46' 21"	0° 54' 58"	14' 58.75"	79° 9' 03"	0.99163
21	128° 38' 59"	4° 43' 23"	132° 24' 45"	22° 39' 05"	0° 54' 59"	14' 59.01"	80° 21' 12"	0.99093
22	129° 09' 49"	4° 44' 21"	132° 57' 04"	22° 31' 43"	0° 55' 00"	14' 59.26"	81° 28' 44"	0.99020
23	129° 40' 40"	4° 45' 18"	133° 29' 21"	22° 24' 14"	0° 55' 01"	14' 59.51"	82° 32' 09"	0.98944
24	130° 11' 32"	4° 46' 14"	134° 01' 36"	22° 16' 38"	0° 55' 02"	14' 59.77"	83° 31' 50"	0.98865

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	298° 52' 42"	0.26"	301° 00' 05"	-20° 23' 05"	0.9838568	16' 15.38"	23° 26' 16"	-10 m 34 s
1	298° 55' 14"	0.26"	301° 02' 45"	-20° 22' 33"	0.9838601	16' 15.37"	23° 26' 16"	-10 m 35 s
2	298° 57' 47"	0.26"	301° 05' 24"	-20° 22' 02"	0.9838633	16' 15.37"	23° 26' 16"	-10 m 35 s
3	299° 00' 19"	0.27"	301° 08' 04"	-20° 21' 31"	0.9838666	16' 15.37"	23° 26' 16"	-10 m 36 s
4	299° 02' 52"	0.27"	301° 10' 43"	-20° 20' 59"	0.9838698	16' 15.36"	23° 26' 16"	-10 m 37 s
5	299° 05' 25"	0.27"	301° 13' 22"	-20° 20' 28"	0.9838731	16' 15.36"	23° 26' 16"	-10 m 38 s
6	299° 07' 57"	0.27"	301° 16' 02"	-20° 19' 56"	0.9838764	16' 15.36"	23° 26' 16"	-10 m 38 s
7	299° 10' 30"	0.27"	301° 18' 41"	-20° 19' 25"	0.9838797	16' 15.35"	23° 26' 16"	-10 m 39 s
8	299° 13' 03"	0.27"	301° 21' 20"	-20° 18' 53"	0.9838831	16' 15.35"	23° 26' 16"	-10 m 40 s
9	299° 15' 35"	0.27"	301° 23' 59"	-20° 18' 22"	0.9838864	16' 15.35"	23° 26' 16"	-10 m 41 s
10	299° 18' 08"	0.27"	301° 26' 39"	-20° 17' 50"	0.9838897	16' 15.34"	23° 26' 16"	-10 m 42 s
11	299° 20' 41"	0.27"	301° 29' 18"	-20° 17' 18"	0.9838931	16' 15.34"	23° 26' 16"	-10 m 42 s
12	299° 23' 13"	0.27"	301° 31' 57"	-20° 16' 46"	0.9838964	16' 15.34"	23° 26' 16"	-10 m 43 s
13	299° 25' 46"	0.28"	301° 34' 36"	-20° 16' 15"	0.9838998	16' 15.33"	23° 26' 16"	-10 m 44 s
14	299° 28' 19"	0.28"	301° 37' 15"	-20° 15' 43"	0.9839032	16' 15.33"	23° 26' 16"	-10 m 45 s
15	299° 30' 51"	0.28"	301° 39' 54"	-20° 15' 11"	0.9839066	16' 15.33"	23° 26' 16"	-10 m 45 s
16	299° 33' 24"	0.28"	301° 42' 33"	-20° 14' 39"	0.9839100	16' 15.32"	23° 26' 16"	-10 m 46 s
17	299° 35' 56"	0.28"	301° 45' 13"	-20° 14' 07"	0.9839134	16' 15.32"	23° 26' 16"	-10 m 47 s
18	299° 38' 29"	0.28"	301° 47' 52"	-20° 13' 35"	0.9839168	16' 15.32"	23° 26' 16"	-10 m 48 s
19	299° 41' 02"	0.28"	301° 50' 31"	-20° 13' 03"	0.9839203	16' 15.31"	23° 26' 16"	-10 m 48 s
20	299° 43' 34"	0.28"	301° 53' 10"	-20° 12' 31"	0.9839237	16' 15.31"	23° 26' 16"	-10 m 49 s
21	299° 46' 07"	0.28"	301° 55' 49"	-20° 11' 59"	0.9839272	16' 15.31"	23° 26' 16"	-10 m 50 s
22	299° 48' 40"	0.28"	301° 58' 28"	-20° 11' 27"	0.9839306	16' 15.30"	23° 26' 16"	-10 m 51 s
23	299° 51' 12"	0.28"	302° 01' 07"	-20° 10' 55"	0.9839341	16' 15.30"	23° 26' 16"	-10 m 51 s
24	299° 53' 45"	0.28"	302° 03' 46"	-20° 10' 23"	0.9839376	16' 15.30"	23° 26' 16"	-10 m 52 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	130° 11' 32"	4° 46' 14"	134° 01' 36"	22° 16' 38"	0° 55' 02"	14' 59.77"	83° 31' 50"	0.98865
1	130° 42' 25"	4° 47' 08"	134° 33' 47"	22° 08' 55"	0° 55' 03"	15' 00.03"	84° 28' 10"	0.98782
2	131° 13' 19"	4° 48' 02"	135° 05' 57"	22° 01' 06"	0° 55' 04"	15' 00.29"	85° 21' 26"	0.98695
3	131° 44' 14"	4° 48' 53"	135° 38' 04"	21° 53' 11"	0° 55' 05"	15' 00.55"	86° 11' 55"	0.98606
4	132° 15' 10"	4° 49' 43"	136° 10' 08"	21° 45' 09"	0° 55' 06"	15' 00.81"	86° 59' 53"	0.98513
5	132° 46' 08"	4° 50' 32"	136° 42' 10"	21° 37' 00"	0° 55' 07"	15' 01.07"	87° 45' 31"	0.98417
6	133° 17' 06"	4° 51' 20"	137° 14' 09"	21° 28' 45"	0° 55' 08"	15' 01.34"	88° 29' 02"	0.98317
7	133° 48' 05"	4° 52' 06"	137° 46' 05"	21° 20' 24"	0° 55' 09"	15' 01.60"	89° 10' 35"	0.98214
8	134° 19' 06"	4° 52' 50"	138° 17' 59"	21° 11' 56"	0° 55' 10"	15' 01.87"	89° 50' 21"	0.98108
9	134° 50' 08"	4° 53' 33"	138° 49' 50"	21° 03' 22"	0° 55' 11"	15' 02.14"	90° 28' 26"	0.97999
10	135° 21' 10"	4° 54' 15"	139° 21' 39"	20° 54' 42"	0° 55' 12"	15' 02.41"	91° 4' 59"	0.97886
11	135° 52' 14"	4° 54' 56"	139° 53' 25"	20° 45' 56"	0° 55' 13"	15' 02.68"	91° 40' 06"	0.97770
12	136° 23' 19"	4° 55' 34"	140° 25' 08"	20° 37' 03"	0° 55' 14"	15' 02.96"	92° 13' 53"	0.97650
13	136° 54' 25"	4° 56' 12"	140° 56' 49"	20° 28' 05"	0° 55' 15"	15' 03.23"	92° 46' 26"	0.97527
14	137° 25' 32"	4° 56' 48"	141° 28' 27"	20° 18' 60"	0° 55' 16"	15' 03.51"	93° 17' 49"	0.97401
15	137° 56' 41"	4° 57' 22"	142° 00' 02"	20° 09' 49"	0° 55' 17"	15' 03.78"	93° 48' 07"	0.97272
16	138° 27' 50"	4° 57' 55"	142° 31' 35"	20° 00' 33"	0° 55' 18"	15' 04.06"	94° 17' 24"	0.97139
17	138° 59' 01"	4° 58' 27"	143° 03' 05"	19° 51' 10"	0° 55' 19"	15' 04.34"	94° 45' 44"	0.97003
18	139° 30' 12"	4° 58' 57"	143° 34' 32"	19° 41' 42"	0° 55' 20"	15' 04.63"	95° 13' 09"	0.96864
19	140° 01' 25"	4° 59' 26"	144° 05' 57"	19° 32' 07"	0° 55' 21"	15' 04.91"	95° 39' 44"	0.96721
20	140° 32' 39"	4° 59' 53"	144° 37' 19"	19° 22' 27"	0° 55' 22"	15' 05.19"	96° 5' 30"	0.96575
21	141° 03' 53"	5° 00' 19"	145° 08' 38"	19° 12' 42"	0° 55' 23"	15' 05.48"	96° 30' 31"	0.96426
22	141° 35' 10"	5° 00' 43"	145° 39' 55"	19° 02' 50"	0° 55' 24"	15' 05.77"	96° 54' 49"	0.96274
23	142° 06' 27"	5° 01' 06"	146° 11' 09"	18° 52' 53"	0° 55' 25"	15' 06.06"	97° 18' 26"	0.96118
24	142° 37' 45"	5° 01' 27"	146° 42' 20"	18° 42' 51"	0° 55' 26"	15' 06.35"	97° 41' 23"	0.95959



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	299° 53' 45"	0.28"	302° 03' 46"	-20° 10' 23"	0.9839376	16' 15.30"	23° 26' 16"	-10 m 52 s
1	299° 56' 18"	0.28"	302° 06' 25"	-20° 09' 50"	0.9839411	16' 15.29"	23° 26' 16"	-10 m 53 s
2	299° 58' 50"	0.28"	302° 09' 03"	-20° 09' 18"	0.9839446	16' 15.29"	23° 26' 16"	-10 m 54 s
3	300° 01' 23"	0.28"	302° 11' 42"	-20° 08' 46"	0.9839481	16' 15.29"	23° 26' 16"	-10 m 54 s
4	300° 03' 55"	0.28"	302° 14' 21"	-20° 08' 13"	0.9839517	16' 15.28"	23° 26' 16"	-10 m 55 s
5	300° 06' 28"	0.28"	302° 17' 00"	-20° 07' 41"	0.9839552	16' 15.28"	23° 26' 16"	-10 m 56 s
6	300° 09' 01"	0.28"	302° 19' 39"	-20° 07' 09"	0.9839588	16' 15.27"	23° 26' 16"	-10 m 57 s
7	300° 11' 33"	0.28"	302° 22' 18"	-20° 06' 36"	0.9839623	16' 15.27"	23° 26' 16"	-10 m 57 s
8	300° 14' 06"	0.28"	302° 24' 57"	-20° 06' 04"	0.9839659	16' 15.27"	23° 26' 16"	-10 m 58 s
9	300° 16' 39"	0.28"	302° 27' 35"	-20° 05' 31"	0.9839695	16' 15.26"	23° 26' 16"	-10 m 59 s
10	300° 19' 11"	0.28"	302° 30' 14"	-20° 04' 58"	0.9839731	16' 15.26"	23° 26' 16"	-10 m 59 s
11	300° 21' 44"	0.28"	302° 32' 53"	-20° 04' 26"	0.9839767	16' 15.26"	23° 26' 16"	-11 m 00 s
12	300° 24' 16"	0.28"	302° 35' 32"	-20° 03' 53"	0.9839803	16' 15.25"	23° 26' 16"	-11 m 01 s
13	300° 26' 49"	0.28"	302° 38' 10"	-20° 03' 20"	0.9839839	16' 15.25"	23° 26' 16"	-11 m 02 s
14	300° 29' 22"	0.28"	302° 40' 49"	-20° 02' 48"	0.9839876	16' 15.25"	23° 26' 16"	-11 m 02 s
15	300° 31' 54"	0.28"	302° 43' 28"	-20° 02' 15"	0.9839912	16' 15.24"	23° 26' 16"	-11 m 03 s
16	300° 34' 27"	0.28"	302° 46' 06"	-20° 01' 42"	0.9839949	16' 15.24"	23° 26' 16"	-11 m 04 s
17	300° 36' 60"	0.27"	302° 48' 45"	-20° 01' 09"	0.9839985	16' 15.24"	23° 26' 16"	-11 m 05 s
18	300° 39' 32"	0.27"	302° 51' 23"	-20° 00' 36"	0.9840022	16' 15.23"	23° 26' 16"	-11 m 05 s
19	300° 42' 05"	0.27"	302° 54' 02"	-20° 00' 03"	0.9840059	16' 15.23"	23° 26' 16"	-11 m 06 s
20	300° 44' 37"	0.27"	302° 56' 41"	-19° 59' 30"	0.9840096	16' 15.22"	23° 26' 16"	-11 m 07 s
21	300° 47' 10"	0.27"	302° 59' 19"	-19° 58' 57"	0.9840133	16' 15.22"	23° 26' 16"	-11 m 07 s
22	300° 49' 43"	0.27"	303° 01' 58"	-19° 58' 24"	0.9840170	16' 15.22"	23° 26' 16"	-11 m 08 s
23	300° 52' 15"	0.27"	303° 04' 36"	-19° 57' 51"	0.9840208	16' 15.21"	23° 26' 16"	-11 m 09 s
24	300° 54' 48"	0.27"	303° 07' 15"	-19° 57' 18"	0.9840245	16' 15.21"	23° 26' 16"	-11 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	142° 37' 45"	5° 01' 27"	146° 42' 20"	18° 42' 51"	0° 55' 26"	15' 06.35"	97° 41' 23"	0.95959
1	143° 09' 04"	5° 01' 46"	147° 13' 29"	18° 32' 42"	0° 55' 27"	15' 06.64"	98° 3' 44"	0.95796
2	143° 40' 25"	5° 02' 05"	147° 44' 35"	18° 22' 29"	0° 55' 28"	15' 06.93"	98° 25' 29"	0.95631
3	144° 11' 46"	5° 02' 21"	148° 15' 38"	18° 12' 10"	0° 55' 29"	15' 07.23"	98° 46' 41"	0.95462
4	144° 43' 09"	5° 02' 36"	148° 46' 39"	18° 01' 45"	0° 55' 30"	15' 07.52"	99° 7' 20"	0.95289
5	145° 14' 33"	5° 02' 50"	149° 17' 37"	17° 51' 16"	0° 55' 31"	15' 07.82"	99° 27' 28"	0.95114
6	145° 45' 58"	5° 03' 02"	149° 48' 33"	17° 40' 41"	0° 55' 33"	15' 08.12"	99° 47' 06"	0.94935
7	146° 17' 24"	5° 03' 13"	150° 19' 26"	17° 30' 01"	0° 55' 34"	15' 08.42"	100° 6' 16"	0.94753
8	146° 48' 51"	5° 03' 22"	150° 50' 16"	17° 19' 15"	0° 55' 35"	15' 08.72"	100° 24' 59"	0.94568
9	147° 20' 20"	5° 03' 29"	151° 21' 04"	17° 08' 25"	0° 55' 36"	15' 09.02"	100° 43' 15"	0.94380
10	147° 51' 49"	5° 03' 35"	151° 51' 50"	16° 57' 29"	0° 55' 37"	15' 09.33"	101° 1' 05"	0.94188
11	148° 23' 20"	5° 03' 40"	152° 22' 33"	16° 46' 28"	0° 55' 38"	15' 09.63"	101° 18' 32"	0.93993
12	148° 54' 52"	5° 03' 43"	152° 53' 13"	16° 35' 23"	0° 55' 39"	15' 09.94"	101° 35' 34"	0.93795
13	149° 26' 25"	5° 03' 44"	153° 23' 51"	16° 24' 12"	0° 55' 40"	15' 10.25"	101° 52' 14"	0.93594
14	149° 57' 59"	5° 03' 44"	153° 54' 27"	16° 12' 57"	0° 55' 41"	15' 10.56"	102° 8' 31"	0.93390
15	150° 29' 34"	5° 03' 42"	154° 24' 60"	16° 01' 37"	0° 55' 43"	15' 10.87"	102° 24' 27"	0.93182
16	151° 01' 11"	5° 03' 39"	154° 55' 31"	15° 50' 12"	0° 55' 44"	15' 11.18"	102° 40' 02"	0.92971
17	151° 32' 48"	5° 03' 34"	155° 25' 59"	15° 38' 43"	0° 55' 45"	15' 11.49"	102° 55' 17"	0.92757
18	152° 04' 27"	5° 03' 27"	155° 56' 25"	15° 27' 08"	0° 55' 46"	15' 11.81"	103° 10' 12"	0.92540
19	152° 36' 07"	5° 03' 19"	156° 26' 49"	15° 15' 30"	0° 55' 47"	15' 12.12"	103° 24' 48"	0.92319
20	153° 07' 48"	5° 03' 10"	156° 57' 11"	15° 03' 46"	0° 55' 48"	15' 12.44"	103° 39' 06"	0.92096
21	153° 39' 30"	5° 02' 59"	157° 27' 30"	14° 51' 58"	0° 55' 50"	15' 12.76"	103° 53' 05"	0.91869
22	154° 11' 13"	5° 02' 46"	157° 57' 47"	14° 40' 06"	0° 55' 51"	15' 13.08"	104° 6' 47"	0.91640
23	154° 42' 58"	5° 02' 32"	158° 28' 02"	14° 28' 09"	0° 55' 52"	15' 13.40"	104° 20' 11"	0.91407
24	155° 14' 44"	5° 02' 16"	158° 58' 15"	14° 16' 08"	0° 55' 53"	15' 13.73"	104° 33' 19"	0.91171

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	300° 54' 48"	0.27"	303° 07' 15"	-19° 57' 18"	0.9840245	16' 15.21"	23° 26' 16"	-11 m 10 s
1	300° 57' 20"	0.27"	303° 09' 53"	-19° 56' 45"	0.9840283	16' 15.21"	23° 26' 16"	-11 m 10 s
2	300° 59' 53"	0.27"	303° 12' 32"	-19° 56' 12"	0.9840320	16' 15.20"	23° 26' 16"	-11 m 11 s
3	301° 02' 26"	0.26"	303° 15' 10"	-19° 55' 38"	0.9840358	16' 15.20"	23° 26' 16"	-11 m 12 s
4	301° 04' 58"	0.26"	303° 17' 48"	-19° 55' 05"	0.9840396	16' 15.19"	23° 26' 16"	-11 m 12 s
5	301° 07' 31"	0.26"	303° 20' 27"	-19° 54' 32"	0.9840434	16' 15.19"	23° 26' 16"	-11 m 13 s
6	301° 10' 03"	0.26"	303° 23' 05"	-19° 53' 58"	0.9840472	16' 15.19"	23° 26' 16"	-11 m 14 s
7	301° 12' 36"	0.26"	303° 25' 44"	-19° 53' 25"	0.9840510	16' 15.18"	23° 26' 16"	-11 m 15 s
8	301° 15' 09"	0.26"	303° 28' 22"	-19° 52' 51"	0.9840548	16' 15.18"	23° 26' 16"	-11 m 15 s
9	301° 17' 41"	0.26"	303° 31' 00"	-19° 52' 18"	0.9840586	16' 15.18"	23° 26' 16"	-11 m 16 s
10	301° 20' 14"	0.25"	303° 33' 38"	-19° 51' 44"	0.9840625	16' 15.17"	23° 26' 16"	-11 m 17 s
11	301° 22' 47"	0.25"	303° 36' 17"	-19° 51' 11"	0.9840663	16' 15.17"	23° 26' 16"	-11 m 17 s
12	301° 25' 19"	0.25"	303° 38' 55"	-19° 50' 37"	0.9840702	16' 15.16"	23° 26' 16"	-11 m 18 s
13	301° 27' 52"	0.25"	303° 41' 33"	-19° 50' 04"	0.9840741	16' 15.16"	23° 26' 16"	-11 m 19 s
14	301° 30' 24"	0.25"	303° 44' 11"	-19° 49' 30"	0.9840780	16' 15.16"	23° 26' 16"	-11 m 20 s
15	301° 32' 57"	0.25"	303° 46' 50"	-19° 48' 56"	0.9840819	16' 15.15"	23° 26' 16"	-11 m 20 s
16	301° 35' 30"	0.24"	303° 49' 28"	-19° 48' 22"	0.9840858	16' 15.15"	23° 26' 16"	-11 m 21 s
17	301° 38' 02"	0.24"	303° 52' 06"	-19° 47' 49"	0.9840897	16' 15.14"	23° 26' 16"	-11 m 22 s
18	301° 40' 35"	0.24"	303° 54' 44"	-19° 47' 15"	0.9840936	16' 15.14"	23° 26' 16"	-11 m 22 s
19	301° 43' 07"	0.24"	303° 57' 22"	-19° 46' 41"	0.9840976	16' 15.14"	23° 26' 16"	-11 m 23 s
20	301° 45' 40"	0.24"	304° 00' 00"	-19° 46' 07"	0.9841015	16' 15.13"	23° 26' 16"	-11 m 24 s
21	301° 48' 12"	0.23"	304° 02' 38"	-19° 45' 33"	0.9841055	16' 15.13"	23° 26' 16"	-11 m 24 s
22	301° 50' 45"	0.23"	304° 05' 16"	-19° 44' 59"	0.9841094	16' 15.13"	23° 26' 16"	-11 m 25 s
23	301° 53' 18"	0.23"	304° 07' 54"	-19° 44' 25"	0.9841134	16' 15.12"	23° 26' 16"	-11 m 26 s
24	301° 55' 50"	0.23"	304° 10' 32"	-19° 43' 51"	0.9841174	16' 15.12"	23° 26' 16"	-11 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	155° 14' 44"	5° 02' 16"	158° 58' 15"	14° 16' 08"	0° 55' 53"	15' 13.73"	104° 33' 19"	0.91171
1	155° 46' 30"	5° 01' 58"	159° 28' 26"	14° 04' 03"	0° 55' 54"	15' 14.05"	104° 46' 10"	0.90932
2	156° 18' 18"	5° 01' 39"	159° 58' 34"	13° 51' 54"	0° 55' 56"	15' 14.38"	104° 58' 45"	0.90689
3	156° 50' 08"	5° 01' 19"	160° 28' 41"	13° 39' 40"	0° 55' 57"	15' 14.71"	105° 11' 04"	0.90444
4	157° 21' 58"	5° 00' 57"	160° 58' 46"	13° 27' 22"	0° 55' 58"	15' 15.03"	105° 23' 08"	0.90196
5	157° 53' 50"	5° 00' 33"	161° 28' 48"	13° 15' 00"	0° 55' 59"	15' 15.36"	105° 34' 57"	0.89944
6	158° 25' 42"	5° 00' 08"	161° 58' 49"	13° 02' 35"	0° 56' 00"	15' 15.70"	105° 46' 31"	0.89690
7	158° 57' 36"	4° 59' 41"	162° 28' 48"	12° 50' 05"	0° 56' 02"	15' 16.03"	105° 57' 50"	0.89432
8	159° 29' 31"	4° 59' 12"	162° 58' 45"	12° 37' 31"	0° 56' 03"	15' 16.36"	106° 8' 55"	0.89172
9	160° 01' 28"	4° 58' 42"	163° 28' 40"	12° 24' 54"	0° 56' 04"	15' 16.70"	106° 19' 46"	0.88908
10	160° 33' 25"	4° 58' 11"	163° 58' 34"	12° 12' 12"	0° 56' 05"	15' 17.04"	106° 30' 23"	0.88642
11	161° 05' 24"	4° 57' 38"	164° 28' 26"	11° 59' 27"	0° 56' 07"	15' 17.37"	106° 40' 46"	0.88372
12	161° 37' 24"	4° 57' 03"	164° 58' 16"	11° 46' 38"	0° 56' 08"	15' 17.71"	106° 50' 56"	0.88100
13	162° 09' 25"	4° 56' 27"	165° 28' 04"	11° 33' 46"	0° 56' 09"	15' 18.05"	107° 0' 53"	0.87824
14	162° 41' 27"	4° 55' 49"	165° 57' 51"	11° 20' 50"	0° 56' 10"	15' 18.40"	107° 10' 37"	0.87546
15	163° 13' 30"	4° 55' 09"	166° 27' 37"	11° 07' 51"	0° 56' 12"	15' 18.74"	107° 20' 08"	0.87265
16	163° 45' 35"	4° 54' 28"	166° 57' 21"	10° 54' 48"	0° 56' 13"	15' 19.09"	107° 29' 26"	0.86980
17	164° 17' 41"	4° 53' 45"	167° 27' 03"	10° 41' 42"	0° 56' 14"	15' 19.43"	107° 38' 32"	0.86693
18	164° 49' 48"	4° 53' 01"	167° 56' 44"	10° 28' 32"	0° 56' 15"	15' 19.78"	107° 47' 26"	0.86403
19	165° 21' 57"	4° 52' 15"	168° 26' 24"	10° 15' 19"	0° 56' 17"	15' 20.13"	107° 56' 07"	0.86110
20	165° 54' 06"	4° 51' 28"	168° 56' 03"	10° 02' 03"	0° 56' 18"	15' 20.48"	108° 4' 37"	0.85814
21	166° 26' 17"	4° 50' 39"	169° 25' 40"	9° 48' 43"	0° 56' 19"	15' 20.83"	108° 12' 54"	0.85516
22	166° 58' 29"	4° 49' 48"	169° 55' 16"	9° 35' 21"	0° 56' 21"	15' 21.19"	108° 20' 60"	0.85214
23	167° 30' 42"	4° 48' 56"	170° 24' 51"	9° 21' 55"	0° 56' 22"	15' 21.54"	108° 28' 54"	0.84910
24	168° 02' 57"	4° 48' 03"	170° 54' 25"	9° 08' 27"	0° 56' 23"	15' 21.90"	108° 36' 37"	0.84603

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	301° 55' 50"	0.23"	304° 10' 32"	-19° 43' 51"	0.9841174	16' 15.12"	23° 26' 16"	-11 m 26 s
1	301° 58' 23"	0.22"	304° 13' 10"	-19° 43' 17"	0.9841214	16' 15.11"	23° 26' 16"	-11 m 27 s
2	302° 00' 55"	0.22"	304° 15' 48"	-19° 42' 43"	0.9841254	16' 15.11"	23° 26' 16"	-11 m 28 s
3	302° 03' 28"	0.22"	304° 18' 26"	-19° 42' 08"	0.9841294	16' 15.11"	23° 26' 16"	-11 m 28 s
4	302° 06' 01"	0.22"	304° 21' 04"	-19° 41' 34"	0.9841335	16' 15.10"	23° 26' 16"	-11 m 29 s
5	302° 08' 33"	0.21"	304° 23' 42"	-19° 40' 60"	0.9841375	16' 15.10"	23° 26' 16"	-11 m 30 s
6	302° 11' 06"	0.21"	304° 26' 20"	-19° 40' 26"	0.9841415	16' 15.09"	23° 26' 16"	-11 m 30 s
7	302° 13' 38"	0.21"	304° 28' 58"	-19° 39' 51"	0.9841456	16' 15.09"	23° 26' 16"	-11 m 31 s
8	302° 16' 11"	0.21"	304° 31' 36"	-19° 39' 17"	0.9841497	16' 15.09"	23° 26' 16"	-11 m 32 s
9	302° 18' 44"	0.20"	304° 34' 14"	-19° 38' 43"	0.9841538	16' 15.08"	23° 26' 16"	-11 m 33 s
10	302° 21' 16"	0.20"	304° 36' 52"	-19° 38' 08"	0.9841578	16' 15.08"	23° 26' 16"	-11 m 33 s
11	302° 23' 49"	0.20"	304° 39' 29"	-19° 37' 34"	0.9841619	16' 15.07"	23° 26' 16"	-11 m 34 s
12	302° 26' 21"	0.19"	304° 42' 07"	-19° 36' 59"	0.9841661	16' 15.07"	23° 26' 16"	-11 m 35 s
13	302° 28' 54"	0.19"	304° 44' 45"	-19° 36' 24"	0.9841702	16' 15.07"	23° 26' 16"	-11 m 35 s
14	302° 31' 26"	0.19"	304° 47' 23"	-19° 35' 50"	0.9841743	16' 15.06"	23° 26' 16"	-11 m 36 s
15	302° 33' 59"	0.19"	304° 50' 00"	-19° 35' 15"	0.9841784	16' 15.06"	23° 26' 16"	-11 m 37 s
16	302° 36' 32"	0.18"	304° 52' 38"	-19° 34' 41"	0.9841826	16' 15.05"	23° 26' 16"	-11 m 37 s
17	302° 39' 04"	0.18"	304° 55' 16"	-19° 34' 06"	0.9841867	16' 15.05"	23° 26' 16"	-11 m 38 s
18	302° 41' 37"	0.18"	304° 57' 53"	-19° 33' 31"	0.9841909	16' 15.04"	23° 26' 16"	-11 m 39 s
19	302° 44' 09"	0.17"	305° 00' 31"	-19° 32' 56"	0.9841951	16' 15.04"	23° 26' 16"	-11 m 39 s
20	302° 46' 42"	0.17"	305° 03' 09"	-19° 32' 21"	0.9841993	16' 15.04"	23° 26' 16"	-11 m 40 s
21	302° 49' 15"	0.17"	305° 05' 46"	-19° 31' 47"	0.9842035	16' 15.03"	23° 26' 16"	-11 m 40 s
22	302° 51' 47"	0.16"	305° 08' 24"	-19° 31' 12"	0.9842077	16' 15.03"	23° 26' 16"	-11 m 41 s
23	302° 54' 20"	0.16"	305° 11' 01"	-19° 30' 37"	0.9842119	16' 15.02"	23° 26' 16"	-11 m 42 s
24	302° 56' 52"	0.16"	305° 13' 39"	-19° 30' 02"	0.9842161	16' 15.02"	23° 26' 16"	-11 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	168° 02' 57"	4° 48' 03"	170° 54' 25"	9° 08' 27"	0° 56' 23"	15' 21.90"	108° 36' 37"	0.84603
1	168° 35' 13"	4° 47' 07"	171° 23' 58"	8° 54' 55"	0° 56' 24"	15' 22.26"	108° 44' 08"	0.84293
2	169° 07' 30"	4° 46' 10"	171° 53' 29"	8° 41' 20"	0° 56' 26"	15' 22.62"	108° 51' 28"	0.83980
3	169° 39' 48"	4° 45' 12"	172° 23' 00"	8° 27' 43"	0° 56' 27"	15' 22.98"	108° 58' 37"	0.83664
4	170° 12' 08"	4° 44' 12"	172° 52' 30"	8° 14' 03"	0° 56' 28"	15' 23.34"	109° 5' 35"	0.83346
5	170° 44' 29"	4° 43' 11"	173° 21' 60"	8° 00' 20"	0° 56' 30"	15' 23.70"	109° 12' 21"	0.83025
6	171° 16' 51"	4° 42' 07"	173° 51' 28"	7° 46' 35"	0° 56' 31"	15' 24.07"	109° 18' 57"	0.82702
7	171° 49' 14"	4° 41' 03"	174° 20' 56"	7° 32' 46"	0° 56' 32"	15' 24.43"	109° 25' 22"	0.82375
8	172° 21' 39"	4° 39' 57"	174° 50' 23"	7° 18' 56"	0° 56' 34"	15' 24.80"	109° 31' 37"	0.82046
9	172° 54' 05"	4° 38' 49"	175° 19' 50"	7° 05' 02"	0° 56' 35"	15' 25.17"	109° 37' 40"	0.81715
10	173° 26' 32"	4° 37' 40"	175° 49' 16"	6° 51' 06"	0° 56' 36"	15' 25.54"	109° 43' 34"	0.81380
11	173° 59' 00"	4° 36' 29"	176° 18' 41"	6° 37' 08"	0° 56' 38"	15' 25.91"	109° 49' 16"	0.81043
12	174° 31' 30"	4° 35' 16"	176° 48' 07"	6° 23' 08"	0° 56' 39"	15' 26.28"	109° 54' 49"	0.80704
13	175° 04' 01"	4° 34' 02"	177° 17' 32"	6° 09' 05"	0° 56' 41"	15' 26.66"	110° 0' 10"	0.80362
14	175° 36' 34"	4° 32' 47"	177° 46' 56"	5° 54' 60"	0° 56' 42"	15' 27.03"	110° 5' 22"	0.80017
15	176° 09' 07"	4° 31' 30"	178° 16' 21"	5° 40' 53"	0° 56' 43"	15' 27.41"	110° 10' 23"	0.79670
16	176° 41' 42"	4° 30' 12"	178° 45' 45"	5° 26' 43"	0° 56' 45"	15' 27.79"	110° 15' 14"	0.79320
17	177° 14' 19"	4° 28' 51"	179° 15' 09"	5° 12' 32"	0° 56' 46"	15' 28.17"	110° 19' 55"	0.78968
18	177° 46' 56"	4° 27' 30"	179° 44' 33"	4° 58' 18"	0° 56' 48"	15' 28.55"	110° 24' 26"	0.78613
19	178° 19' 35"	4° 26' 07"	180° 13' 57"	4° 44' 03"	0° 56' 49"	15' 28.93"	110° 28' 47"	0.78256
20	178° 52' 16"	4° 24' 42"	180° 43' 21"	4° 29' 46"	0° 56' 50"	15' 29.32"	110° 32' 58"	0.77896
21	179° 24' 57"	4° 23' 16"	181° 12' 46"	4° 15' 27"	0° 56' 52"	15' 29.70"	110° 36' 59"	0.77534
22	179° 57' 40"	4° 21' 48"	181° 42' 10"	4° 01' 06"	0° 56' 53"	15' 30.09"	110° 40' 50"	0.77170
23	180° 30' 25"	4° 20' 19"	182° 11' 35"	3° 46' 43"	0° 56' 55"	15' 30.48"	110° 44' 31"	0.76803
24	181° 03' 11"	4° 18' 49"	182° 41' 01"	3° 32' 19"	0° 56' 56"	15' 30.86"	110° 48' 03"	0.76434

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	302° 56' 52"	0.16"	305° 13' 39"	-19° 30' 02"	0.9842161	16' 15.02"	23° 26' 16"	-11 m 42 s
1	302° 59' 25"	0.15"	305° 16' 17"	-19° 29' 27"	0.9842204	16' 15.02"	23° 26' 16"	-11 m 43 s
2	303° 01' 57"	0.15"	305° 18' 54"	-19° 28' 52"	0.9842246	16' 15.01"	23° 26' 16"	-11 m 44 s
3	303° 04' 30"	0.15"	305° 21' 32"	-19° 28' 17"	0.9842289	16' 15.01"	23° 26' 16"	-11 m 44 s
4	303° 07' 03"	0.14"	305° 24' 09"	-19° 27' 41"	0.9842331	16' 15.00"	23° 26' 16"	-11 m 45 s
5	303° 09' 35"	0.14"	305° 26' 46"	-19° 27' 06"	0.9842374	16' 15.00"	23° 26' 16"	-11 m 46 s
6	303° 12' 08"	0.14"	305° 29' 24"	-19° 26' 31"	0.9842417	16' 14.99"	23° 26' 16"	-11 m 46 s
7	303° 14' 40"	0.13"	305° 32' 01"	-19° 25' 56"	0.9842460	16' 14.99"	23° 26' 16"	-11 m 47 s
8	303° 17' 13"	0.13"	305° 34' 39"	-19° 25' 21"	0.9842503	16' 14.99"	23° 26' 16"	-11 m 48 s
9	303° 19' 45"	0.12"	305° 37' 16"	-19° 24' 45"	0.9842546	16' 14.98"	23° 26' 16"	-11 m 48 s
10	303° 22' 18"	0.12"	305° 39' 53"	-19° 24' 10"	0.9842589	16' 14.98"	23° 26' 16"	-11 m 49 s
11	303° 24' 50"	0.12"	305° 42' 31"	-19° 23' 34"	0.9842632	16' 14.97"	23° 26' 16"	-11 m 50 s
12	303° 27' 23"	0.11"	305° 45' 08"	-19° 22' 59"	0.9842676	16' 14.97"	23° 26' 16"	-11 m 50 s
13	303° 29' 56"	0.11"	305° 47' 45"	-19° 22' 24"	0.9842719	16' 14.96"	23° 26' 16"	-11 m 51 s
14	303° 32' 28"	0.10"	305° 50' 23"	-19° 21' 48"	0.9842763	16' 14.96"	23° 26' 16"	-11 m 51 s
15	303° 35' 01"	0.10"	305° 52' 60"	-19° 21' 13"	0.9842807	16' 14.96"	23° 26' 16"	-11 m 52 s
16	303° 37' 33"	0.10"	305° 55' 37"	-19° 20' 37"	0.9842850	16' 14.95"	23° 26' 16"	-11 m 53 s
17	303° 40' 06"	0.09"	305° 58' 14"	-19° 20' 01"	0.9842894	16' 14.95"	23° 26' 16"	-11 m 53 s
18	303° 42' 38"	0.09"	306° 00' 52"	-19° 19' 26"	0.9842938	16' 14.94"	23° 26' 16"	-11 m 54 s
19	303° 45' 11"	0.08"	306° 03' 29"	-19° 18' 50"	0.9842982	16' 14.94"	23° 26' 16"	-11 m 55 s
20	303° 47' 44"	0.08"	306° 06' 06"	-19° 18' 14"	0.9843027	16' 14.93"	23° 26' 16"	-11 m 55 s
21	303° 50' 16"	0.08"	306° 08' 43"	-19° 17' 38"	0.9843071	16' 14.93"	23° 26' 16"	-11 m 56 s
22	303° 52' 49"	0.07"	306° 11' 20"	-19° 17' 03"	0.9843115	16' 14.93"	23° 26' 16"	-11 m 56 s
23	303° 55' 21"	0.07"	306° 13' 57"	-19° 16' 27"	0.9843160	16' 14.92"	23° 26' 16"	-11 m 57 s
24	303° 57' 54"	0.06"	306° 16' 34"	-19° 15' 51"	0.9843204	16' 14.92"	23° 26' 16"	-11 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	181° 03' 11"	4° 18' 49"	182° 41' 01"	3° 32' 19"	0° 56' 56"	15' 30.86"	110° 48' 03"	0.76434
1	181° 35' 58"	4° 17' 17"	183° 10' 26"	3° 17' 53"	0° 56' 57"	15' 31.25"	110° 51' 24"	0.76062
2	182° 08' 46"	4° 15' 43"	183° 39' 52"	3° 03' 26"	0° 56' 59"	15' 31.65"	110° 54' 36"	0.75688
3	182° 41' 36"	4° 14' 08"	184° 09' 19"	2° 48' 57"	0° 57' 00"	15' 32.04"	110° 57' 38"	0.75312
4	183° 14' 27"	4° 12' 31"	184° 38' 46"	2° 34' 26"	0° 57' 02"	15' 32.43"	111° 0' 31"	0.74934
5	183° 47' 20"	4° 10' 53"	185° 08' 15"	2° 19' 55"	0° 57' 03"	15' 32.83"	111° 3' 14"	0.74553
6	184° 20' 14"	4° 09' 14"	185° 37' 43"	2° 05' 22"	0° 57' 05"	15' 33.23"	111° 5' 47"	0.74170
7	184° 53' 10"	4° 07' 33"	186° 07' 13"	1° 50' 47"	0° 57' 06"	15' 33.62"	111° 8' 10"	0.73785
8	185° 26' 06"	4° 05' 51"	186° 36' 44"	1° 36' 12"	0° 57' 08"	15' 34.02"	111° 10' 24"	0.73398
9	185° 59' 05"	4° 04' 07"	187° 06' 15"	1° 21' 35"	0° 57' 09"	15' 34.42"	111° 12' 28"	0.73008
10	186° 32' 04"	4° 02' 22"	187° 35' 48"	1° 06' 58"	0° 57' 11"	15' 34.83"	111° 14' 23"	0.72616
11	187° 05' 05"	4° 00' 35"	188° 05' 21"	0° 52' 19"	0° 57' 12"	15' 35.23"	111° 16' 08"	0.72223
12	187° 38' 08"	3° 58' 47"	188° 34' 56"	0° 37' 39"	0° 57' 14"	15' 35.63"	111° 17' 44"	0.71827
13	188° 11' 12"	3° 56' 57"	189° 04' 32"	0° 22' 59"	0° 57' 15"	15' 36.04"	111° 19' 10"	0.71429
14	188° 44' 17"	3° 55' 06"	189° 34' 10"	0° 08' 18"	0° 57' 17"	15' 36.44"	111° 20' 27"	0.71029
15	189° 17' 24"	3° 53' 14"	190° 03' 48"	0° -6' 24"	0° 57' 18"	15' 36.85"	111° 21' 34"	0.70627
16	189° 50' 33"	3° 51' 20"	190° 33' 29"	0° -21' 07"	0° 57' 19"	15' 37.26"	111° 22' 32"	0.70223
17	190° 23' 43"	3° 49' 25"	191° 03' 10"	0° -35' 50"	0° 57' 21"	15' 37.67"	111° 23' 20"	0.69817
18	190° 56' 54"	3° 47' 29"	191° 32' 54"	0° -50' 34"	0° 57' 23"	15' 38.08"	111° 23' 59"	0.69410
19	191° 30' 07"	3° 45' 31"	192° 02' 39"	-1° 05' 19"	0° 57' 24"	15' 38.49"	111° 24' 28"	0.69000
20	192° 03' 21"	3° 43' 31"	192° 32' 26"	-1° 20' 04"	0° 57' 26"	15' 38.91"	111° 24' 48"	0.68588
21	192° 36' 37"	3° 41' 31"	193° 02' 14"	-1° 34' 49"	0° 57' 27"	15' 39.32"	111° 24' 58"	0.68175
22	193° 09' 54"	3° 39' 29"	193° 32' 05"	-1° 49' 35"	0° 57' 29"	15' 39.74"	111° 24' 59"	0.67760
23	193° 43' 13"	3° 37' 26"	194° 01' 58"	-2° 04' 20"	0° 57' 30"	15' 40.15"	111° 24' 51"	0.67343
24	194° 16' 33"	3° 35' 21"	194° 31' 52"	-2° 19' 06"	0° 57' 32"	15' 40.57"	111° 24' 33"	0.66924



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	303° 57' 54"	0.06"	306° 16' 34"	-19° 15' 51"	0.9843204	16' 14.92"	23° 26' 16"	-11 m 58 s
1	304° 00' 26"	0.06"	306° 19' 11"	-19° 15' 15"	0.9843249	16' 14.91"	23° 26' 16"	-11 m 58 s
2	304° 02' 59"	0.05"	306° 21' 48"	-19° 14' 39"	0.9843293	16' 14.91"	23° 26' 16"	-11 m 59 s
3	304° 05' 31"	0.05"	306° 24' 25"	-19° 14' 03"	0.9843338	16' 14.90"	23° 26' 16"	-11 m 60 s
4	304° 08' 04"	0.05"	306° 27' 02"	-19° 13' 27"	0.9843383	16' 14.90"	23° 26' 16"	-12 m 00 s
5	304° 10' 37"	0.04"	306° 29' 39"	-19° 12' 51"	0.9843428	16' 14.89"	23° 26' 16"	-12 m 01 s
6	304° 13' 09"	0.04"	306° 32' 16"	-19° 12' 15"	0.9843473	16' 14.89"	23° 26' 16"	-12 m 01 s
7	304° 15' 42"	0.03"	306° 34' 53"	-19° 11' 39"	0.9843518	16' 14.89"	23° 26' 16"	-12 m 02 s
8	304° 18' 14"	0.03"	306° 37' 30"	-19° 11' 03"	0.9843564	16' 14.88"	23° 26' 16"	-12 m 03 s
9	304° 20' 47"	0.02"	306° 40' 07"	-19° 10' 26"	0.9843609	16' 14.88"	23° 26' 16"	-12 m 03 s
10	304° 23' 19"	0.02"	306° 42' 44"	-19° 09' 50"	0.9843654	16' 14.87"	23° 26' 16"	-12 m 04 s
11	304° 25' 52"	0.01"	306° 45' 21"	-19° 09' 14"	0.9843700	16' 14.87"	23° 26' 16"	-12 m 04 s
12	304° 28' 24"	0.01"	306° 47' 58"	-19° 08' 38"	0.9843745	16' 14.86"	23° 26' 16"	-12 m 05 s
13	304° 30' 57"	0.00"	306° 50' 34"	-19° 08' 01"	0.9843791	16' 14.86"	23° 26' 16"	-12 m 06 s
14	304° 33' 29"	-0.00"	306° 53' 11"	-19° 07' 25"	0.9843837	16' 14.85"	23° 26' 16"	-12 m 06 s
15	304° 36' 02"	-0.00"	306° 55' 48"	-19° 06' 48"	0.9843883	16' 14.85"	23° 26' 16"	-12 m 07 s
16	304° 38' 35"	-0.01"	306° 58' 25"	-19° 06' 12"	0.9843929	16' 14.84"	23° 26' 16"	-12 m 07 s
17	304° 41' 07"	-0.01"	307° 01' 01"	-19° 05' 35"	0.9843975	16' 14.84"	23° 26' 16"	-12 m 08 s
18	304° 43' 40"	-0.02"	307° 03' 38"	-19° 04' 59"	0.9844021	16' 14.84"	23° 26' 16"	-12 m 09 s
19	304° 46' 12"	-0.02"	307° 06' 15"	-19° 04' 22"	0.9844067	16' 14.83"	23° 26' 16"	-12 m 09 s
20	304° 48' 45"	-0.03"	307° 08' 51"	-19° 03' 46"	0.9844113	16' 14.83"	23° 26' 16"	-12 m 10 s
21	304° 51' 17"	-0.03"	307° 11' 28"	-19° 03' 09"	0.9844160	16' 14.82"	23° 26' 16"	-12 m 10 s
22	304° 53' 50"	-0.04"	307° 14' 05"	-19° 02' 32"	0.9844206	16' 14.82"	23° 26' 16"	-12 m 11 s
23	304° 56' 22"	-0.04"	307° 16' 41"	-19° 01' 56"	0.9844253	16' 14.81"	23° 26' 16"	-12 m 12 s
24	304° 58' 55"	-0.05"	307° 19' 18"	-19° 01' 19"	0.9844299	16' 14.81"	23° 26' 16"	-12 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	194° 16' 33"	3° 35' 21"	194° 31' 52"	-2° 19' 06"	0° 57' 32"	15' 40.57"	111° 24' 33"	0.66924
1	194° 49' 55"	3° 33' 15"	195° 01' 49"	-2° 33' 53"	0° 57' 33"	15' 40.99"	111° 24' 05"	0.66503
2	195° 23' 18"	3° 31' 08"	195° 31' 48"	-2° 48' 39"	0° 57' 35"	15' 41.41"	111° 23' 28"	0.66081
3	195° 56' 43"	3° 28' 59"	196° 01' 49"	-3° 03' 25"	0° 57' 36"	15' 41.83"	111° 22' 42"	0.65657
4	196° 30' 09"	3° 26' 49"	196° 31' 52"	-3° 18' 11"	0° 57' 38"	15' 42.25"	111° 21' 46"	0.65231
5	197° 03' 37"	3° 24' 38"	197° 01' 58"	-3° 32' 57"	0° 57' 39"	15' 42.67"	111° 20' 41"	0.64804
6	197° 37' 07"	3° 22' 25"	197° 32' 07"	-3° 47' 43"	0° 57' 41"	15' 43.09"	111° 19' 26"	0.64375
7	198° 10' 38"	3° 20' 12"	198° 02' 18"	-4° 02' 28"	0° 57' 42"	15' 43.52"	111° 18' 02"	0.63945
8	198° 44' 11"	3° 17' 57"	198° 32' 31"	-4° 17' 13"	0° 57' 44"	15' 43.94"	111° 16' 28"	0.63513
9	199° 17' 45"	3° 15' 40"	199° 02' 48"	-4° 31' 58"	0° 57' 46"	15' 44.37"	111° 14' 45"	0.63079
10	199° 51' 21"	3° 13' 23"	199° 33' 07"	-4° 46' 42"	0° 57' 47"	15' 44.79"	111° 12' 52"	0.62644
11	200° 24' 58"	3° 11' 04"	200° 03' 29"	-5° 01' 25"	0° 57' 49"	15' 45.22"	111° 10' 50"	0.62208
12	200° 58' 37"	3° 08' 44"	200° 33' 54"	-5° 16' 08"	0° 57' 50"	15' 45.65"	111° 8' 38"	0.61770
13	201° 32' 17"	3° 06' 23"	201° 04' 22"	-5° 30' 51"	0° 57' 52"	15' 46.08"	111° 6' 17"	0.61331
14	202° 05' 60"	3° 04' 01"	201° 34' 53"	-5° 45' 32"	0° 57' 53"	15' 46.51"	111° 3' 46"	0.60890
15	202° 39' 43"	3° 01' 37"	202° 05' 28"	-6° 00' 13"	0° 57' 55"	15' 46.94"	111° 1' 06"	0.60449
16	203° 13' 29"	2° 59' 12"	202° 36' 05"	-6° 14' 52"	0° 57' 57"	15' 47.37"	110° 58' 16"	0.60005
17	203° 47' 16"	2° 56' 46"	203° 06' 46"	-6° 29' 31"	0° 57' 58"	15' 47.80"	110° 55' 16"	0.59561
18	204° 21' 05"	2° 54' 19"	203° 37' 30"	-6° 44' 09"	0° 57' 60"	15' 48.23"	110° 52' 07"	0.59115
19	204° 54' 55"	2° 51' 51"	204° 08' 18"	-6° 58' 45"	0° 58' 01"	15' 48.66"	110° 48' 48"	0.58669
20	205° 28' 47"	2° 49' 22"	204° 39' 09"	-7° 13' 20"	0° 58' 03"	15' 49.09"	110° 45' 19"	0.58221
21	206° 02' 41"	2° 46' 51"	205° 10' 04"	-7° 27' 54"	0° 58' 05"	15' 49.53"	110° 41' 41"	0.57772
22	206° 36' 36"	2° 44' 20"	205° 41' 03"	-7° 42' 27"	0° 58' 06"	15' 49.96"	110° 37' 53"	0.57321
23	207° 10' 33"	2° 41' 47"	206° 12' 06"	-7° 56' 58"	0° 58' 08"	15' 50.40"	110° 33' 56"	0.56870
24	207° 44' 32"	2° 39' 13"	206° 43' 12"	-8° 11' 28"	0° 58' 09"	15' 50.83"	110° 29' 48"	0.56418

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	304° 58' 55"	-0.05"	307° 19' 18"	-19° 01' 19"	0.9844299	16' 14.81"	23° 26' 16"	-12 m 12 s
1	305° 01' 27"	-0.05"	307° 21' 55"	-19° 00' 42"	0.9844346	16' 14.80"	23° 26' 16"	-12 m 13 s
2	305° 03' 60"	-0.06"	307° 24' 31"	-19° 00' 05"	0.9844393	16' 14.80"	23° 26' 16"	-12 m 13 s
3	305° 06' 32"	-0.06"	307° 27' 08"	-18° 59' 28"	0.9844440	16' 14.79"	23° 26' 16"	-12 m 14 s
4	305° 09' 05"	-0.07"	307° 29' 44"	-18° 58' 51"	0.9844487	16' 14.79"	23° 26' 16"	-12 m 14 s
5	305° 11' 37"	-0.07"	307° 32' 21"	-18° 58' 14"	0.9844534	16' 14.78"	23° 26' 16"	-12 m 15 s
6	305° 14' 10"	-0.08"	307° 34' 57"	-18° 57' 37"	0.9844581	16' 14.78"	23° 26' 16"	-12 m 16 s
7	305° 16' 43"	-0.08"	307° 37' 34"	-18° 57' 00"	0.9844628	16' 14.78"	23° 26' 16"	-12 m 16 s
8	305° 19' 15"	-0.09"	307° 40' 10"	-18° 56' 23"	0.9844676	16' 14.77"	23° 26' 16"	-12 m 17 s
9	305° 21' 48"	-0.09"	307° 42' 46"	-18° 55' 46"	0.9844723	16' 14.77"	23° 26' 16"	-12 m 17 s
10	305° 24' 20"	-0.10"	307° 45' 23"	-18° 55' 09"	0.9844771	16' 14.76"	23° 26' 16"	-12 m 18 s
11	305° 26' 53"	-0.10"	307° 47' 59"	-18° 54' 32"	0.9844818	16' 14.76"	23° 26' 16"	-12 m 19 s
12	305° 29' 25"	-0.11"	307° 50' 36"	-18° 53' 55"	0.9844866	16' 14.75"	23° 26' 16"	-12 m 19 s
13	305° 31' 58"	-0.12"	307° 53' 12"	-18° 53' 18"	0.9844913	16' 14.75"	23° 26' 16"	-12 m 20 s
14	305° 34' 30"	-0.12"	307° 55' 48"	-18° 52' 40"	0.9844961	16' 14.74"	23° 26' 16"	-12 m 20 s
15	305° 37' 03"	-0.13"	307° 58' 24"	-18° 52' 03"	0.9845009	16' 14.74"	23° 26' 16"	-12 m 21 s
16	305° 39' 35"	-0.13"	308° 01' 01"	-18° 51' 26"	0.9845057	16' 14.73"	23° 26' 16"	-12 m 21 s
17	305° 42' 08"	-0.14"	308° 03' 37"	-18° 50' 48"	0.9845105	16' 14.73"	23° 26' 16"	-12 m 22 s
18	305° 44' 40"	-0.14"	308° 06' 13"	-18° 50' 11"	0.9845153	16' 14.72"	23° 26' 16"	-12 m 22 s
19	305° 47' 13"	-0.15"	308° 08' 49"	-18° 49' 33"	0.9845202	16' 14.72"	23° 26' 16"	-12 m 23 s
20	305° 49' 45"	-0.15"	308° 11' 26"	-18° 48' 56"	0.9845250	16' 14.71"	23° 26' 16"	-12 m 24 s
21	305° 52' 18"	-0.16"	308° 14' 02"	-18° 48' 18"	0.9845298	16' 14.71"	23° 26' 16"	-12 m 24 s
22	305° 54' 50"	-0.16"	308° 16' 38"	-18° 47' 41"	0.9845347	16' 14.70"	23° 26' 16"	-12 m 25 s
23	305° 57' 23"	-0.17"	308° 19' 14"	-18° 47' 03"	0.9845395	16' 14.70"	23° 26' 16"	-12 m 25 s
24	305° 59' 55"	-0.17"	308° 21' 50"	-18° 46' 26"	0.9845444	16' 14.69"	23° 26' 16"	-12 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	207° 44' 32"	2° 39' 13"	206° 43' 12"	-8° 11' 28"	0° 58' 09"	15' 50.83"	110° 29' 48"	0.56418
1	208° 18' 32"	2° 36' 38"	207° 14' 22"	-8° 25' 56"	0° 58' 11"	15' 51.27"	110° 25' 31"	0.55965
2	208° 52' 34"	2° 34' 02"	207° 45' 36"	-8° 40' 22"	0° 58' 12"	15' 51.70"	110° 21' 04"	0.55510
3	209° 26' 38"	2° 31' 25"	208° 16' 55"	-8° 54' 47"	0° 58' 14"	15' 52.14"	110° 16' 28"	0.55055
4	210° 00' 43"	2° 28' 47"	208° 48' 17"	-9° 09' 09"	0° 58' 16"	15' 52.57"	110° 11' 41"	0.54599
5	210° 34' 50"	2° 26' 08"	209° 19' 44"	-9° 23' 30"	0° 58' 17"	15' 53.01"	110° 6' 45"	0.54143
6	211° 08' 59"	2° 23' 28"	209° 51' 15"	-9° 37' 49"	0° 58' 19"	15' 53.44"	110° 1' 38"	0.53685
7	211° 43' 09"	2° 20' 47"	210° 22' 50"	-9° 52' 05"	0° 58' 20"	15' 53.88"	109° 56' 22"	0.53227
8	212° 17' 22"	2° 18' 05"	210° 54' 30"	-10° 06' 20"	0° 58' 22"	15' 54.32"	109° 50' 56"	0.52767
9	212° 51' 36"	2° 15' 22"	211° 26' 15"	-10° 20' 32"	0° 58' 24"	15' 54.75"	109° 45' 20"	0.52308
10	213° 25' 51"	2° 12' 38"	211° 58' 04"	-10° 34' 42"	0° 58' 25"	15' 55.19"	109° 39' 34"	0.51847
11	214° 00' 09"	2° 09' 53"	212° 29' 57"	-10° 48' 50"	0° 58' 27"	15' 55.62"	109° 33' 38"	0.51386
12	214° 34' 28"	2° 07' 08"	213° 01' 56"	-11° 02' 55"	0° 58' 28"	15' 56.06"	109° 27' 32"	0.50924
13	215° 08' 49"	2° 04' 21"	213° 33' 59"	-11° 16' 57"	0° 58' 30"	15' 56.50"	109° 21' 16"	0.50462
14	215° 43' 12"	2° 01' 33"	214° 06' 07"	-11° 30' 57"	0° 58' 32"	15' 56.93"	109° 14' 50"	0.50000
15	216° 17' 36"	1° 58' 45"	214° 38' 20"	-11° 44' 54"	0° 58' 33"	15' 57.37"	109° 8' 14"	0.49536
16	216° 52' 03"	1° 55' 56"	215° 10' 38"	-11° 58' 48"	0° 58' 35"	15' 57.80"	109° 1' 27"	0.49073
17	217° 26' 31"	1° 53' 05"	215° 43' 01"	-12° 12' 39"	0° 58' 36"	15' 58.24"	108° 54' 31"	0.48609
18	218° 01' 00"	1° 50' 14"	216° 15' 30"	-12° 26' 27"	0° 58' 38"	15' 58.67"	108° 47' 24"	0.48145
19	218° 35' 32"	1° 47' 22"	216° 48' 03"	-12° 40' 12"	0° 58' 40"	15' 59.11"	108° 40' 07"	0.47680
20	219° 10' 05"	1° 44' 30"	217° 20' 42"	-12° 53' 53"	0° 58' 41"	15' 59.54"	108° 32' 40"	0.47215
21	219° 44' 40"	1° 41' 36"	217° 53' 26"	-13° 07' 32"	0° 58' 43"	15' 59.97"	108° 25' 02"	0.46750
22	220° 19' 17"	1° 38' 42"	218° 26' 16"	-13° 21' 07"	0° 58' 44"	16' 00.41"	108° 17' 14"	0.46285
23	220° 53' 56"	1° 35' 47"	218° 59' 11"	-13° 34' 38"	0° 58' 46"	16' 00.84"	108° 9' 16"	0.45819
24	221° 28' 37"	1° 32' 51"	219° 32' 12"	-13° 48' 06"	0° 58' 48"	16' 01.27"	108° 1' 08"	0.45354

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	305° 59' 55"	-0.17"	308° 21' 50"	-18° 46' 26"	0.9845444	16' 14.69"	23° 26' 16"	-12 m 26 s
1	306° 02' 28"	-0.18"	308° 24' 26"	-18° 45' 48"	0.9845492	16' 14.69"	23° 26' 16"	-12 m 26 s
2	306° 05' 00"	-0.18"	308° 27' 02"	-18° 45' 10"	0.9845541	16' 14.68"	23° 26' 16"	-12 m 27 s
3	306° 07' 33"	-0.19"	308° 29' 38"	-18° 44' 33"	0.9845590	16' 14.68"	23° 26' 16"	-12 m 27 s
4	306° 10' 05"	-0.20"	308° 32' 14"	-18° 43' 55"	0.9845639	16' 14.68"	23° 26' 16"	-12 m 28 s
5	306° 12' 38"	-0.20"	308° 34' 50"	-18° 43' 17"	0.9845688	16' 14.67"	23° 26' 16"	-12 m 29 s
6	306° 15' 10"	-0.21"	308° 37' 26"	-18° 42' 39"	0.9845737	16' 14.67"	23° 26' 16"	-12 m 29 s
7	306° 17' 43"	-0.21"	308° 40' 02"	-18° 42' 01"	0.9845786	16' 14.66"	23° 26' 16"	-12 m 30 s
8	306° 20' 15"	-0.22"	308° 42' 38"	-18° 41' 23"	0.9845835	16' 14.66"	23° 26' 16"	-12 m 30 s
9	306° 22' 48"	-0.22"	308° 45' 14"	-18° 40' 45"	0.9845885	16' 14.65"	23° 26' 16"	-12 m 31 s
10	306° 25' 21"	-0.23"	308° 47' 50"	-18° 40' 07"	0.9845934	16' 14.65"	23° 26' 16"	-12 m 31 s
11	306° 27' 53"	-0.23"	308° 50' 26"	-18° 39' 29"	0.9845984	16' 14.64"	23° 26' 16"	-12 m 32 s
12	306° 30' 26"	-0.24"	308° 53' 02"	-18° 38' 51"	0.9846033	16' 14.64"	23° 26' 16"	-12 m 32 s
13	306° 32' 58"	-0.24"	308° 55' 38"	-18° 38' 13"	0.9846083	16' 14.63"	23° 26' 16"	-12 m 33 s
14	306° 35' 31"	-0.25"	308° 58' 14"	-18° 37' 35"	0.9846132	16' 14.63"	23° 26' 16"	-12 m 33 s
15	306° 38' 03"	-0.26"	309° 00' 49"	-18° 36' 57"	0.9846182	16' 14.62"	23° 26' 16"	-12 m 34 s
16	306° 40' 36"	-0.26"	309° 03' 25"	-18° 36' 19"	0.9846232	16' 14.62"	23° 26' 16"	-12 m 34 s
17	306° 43' 08"	-0.27"	309° 06' 01"	-18° 35' 41"	0.9846282	16' 14.61"	23° 26' 16"	-12 m 35 s
18	306° 45' 41"	-0.27"	309° 08' 37"	-18° 35' 02"	0.9846332	16' 14.61"	23° 26' 16"	-12 m 36 s
19	306° 48' 13"	-0.28"	309° 11' 12"	-18° 34' 24"	0.9846382	16' 14.60"	23° 26' 16"	-12 m 36 s
20	306° 50' 46"	-0.28"	309° 13' 48"	-18° 33' 46"	0.9846432	16' 14.60"	23° 26' 16"	-12 m 37 s
21	306° 53' 18"	-0.29"	309° 16' 24"	-18° 33' 07"	0.9846482	16' 14.59"	23° 26' 16"	-12 m 37 s
22	306° 55' 51"	-0.29"	309° 18' 60"	-18° 32' 29"	0.9846533	16' 14.59"	23° 26' 16"	-12 m 38 s
23	306° 58' 23"	-0.30"	309° 21' 35"	-18° 31' 50"	0.9846583	16' 14.58"	23° 26' 16"	-12 m 38 s
24	307° 00' 56"	-0.30"	309° 24' 11"	-18° 31' 12"	0.9846633	16' 14.58"	23° 26' 16"	-12 m 39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	221° 28' 37"	1° 32' 51"	219° 32' 12"	-13° 48' 06"	0° 58' 48"	16' 01.27"	108° 1' 08"	0.45354
1	222° 03' 19"	1° 29' 55"	220° 05' 18"	-14° 01' 30"	0° 58' 49"	16' 01.70"	107° 52' 49"	0.44888
2	222° 38' 03"	1° 26' 58"	220° 38' 30"	-14° 14' 51"	0° 58' 51"	16' 02.13"	107° 44' 19"	0.44422
3	223° 12' 49"	1° 23' 60"	221° 11' 48"	-14° 28' 07"	0° 58' 52"	16' 02.56"	107° 35' 40"	0.43957
4	223° 47' 37"	1° 21' 01"	221° 45' 11"	-14° 41' 20"	0° 58' 54"	16' 02.99"	107° 26' 49"	0.43491
5	224° 22' 26"	1° 18' 02"	222° 18' 41"	-14° 54' 29"	0° 58' 55"	16' 03.41"	107° 17' 49"	0.43026
6	224° 57' 17"	1° 15' 02"	222° 52' 16"	-15° 07' 33"	0° 58' 57"	16' 03.84"	107° 8' 37"	0.42561
7	225° 32' 11"	1° 12' 02"	223° 25' 57"	-15° 20' 33"	0° 58' 59"	16' 04.26"	106° 59' 15"	0.42096
8	226° 07' 06"	1° 09' 01"	223° 59' 45"	-15° 33' 29"	0° 59' 00"	16' 04.69"	106° 49' 43"	0.41631
9	226° 42' 02"	1° 05' 59"	224° 33' 38"	-15° 46' 20"	0° 59' 02"	16' 05.11"	106° 40' 00"	0.41166
10	227° 17' 01"	1° 02' 57"	225° 07' 37"	-15° 59' 07"	0° 59' 03"	16' 05.53"	106° 30' 06"	0.40702
11	227° 52' 01"	0° 59' 54"	225° 41' 43"	-16° 11' 49"	0° 59' 05"	16' 05.95"	106° 20' 02"	0.40239
12	228° 27' 04"	0° 56' 51"	226° 15' 55"	-16° 24' 26"	0° 59' 06"	16' 06.37"	106° 9' 47"	0.39775
13	229° 02' 08"	0° 53' 47"	226° 50' 13"	-16° 36' 58"	0° 59' 08"	16' 06.79"	105° 59' 21"	0.39312
14	229° 37' 14"	0° 50' 43"	227° 24' 38"	-16° 49' 25"	0° 59' 09"	16' 07.20"	105° 48' 45"	0.38850
15	230° 12' 21"	0° 47' 38"	227° 59' 08"	-17° 01' 48"	0° 59' 11"	16' 07.62"	105° 37' 58"	0.38388
16	230° 47' 31"	0° 44' 33"	228° 33' 46"	-17° 14' 05"	0° 59' 12"	16' 08.03"	105° 26' 60"	0.37927
17	231° 22' 42"	0° 41' 27"	229° 08' 29"	-17° 26' 17"	0° 59' 14"	16' 08.44"	105° 15' 51"	0.37466
18	231° 57' 56"	0° 38' 21"	229° 43' 19"	-17° 38' 23"	0° 59' 15"	16' 08.85"	105° 4' 31"	0.37006
19	232° 33' 11"	0° 35' 15"	230° 18' 16"	-17° 50' 24"	0° 59' 17"	16' 09.26"	104° 53' 01"	0.36547
20	233° 08' 28"	0° 32' 08"	230° 53' 19"	-18° 02' 19"	0° 59' 18"	16' 09.66"	104° 41' 19"	0.36089
21	233° 43' 46"	0° 29' 00"	231° 28' 29"	-18° 14' 09"	0° 59' 20"	16' 10.07"	104° 29' 27"	0.35631
22	234° 19' 07"	0° 25' 53"	232° 03' 46"	-18° 25' 52"	0° 59' 21"	16' 10.47"	104° 17' 24"	0.35175
23	234° 54' 29"	0° 22' 45"	232° 39' 09"	-18° 37' 30"	0° 59' 23"	16' 10.87"	104° 5' 10"	0.34719
24	235° 29' 53"	0° 19' 37"	233° 14' 38"	-18° 49' 02"	0° 59' 24"	16' 11.26"	103° 52' 45"	0.34264

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	307° 00' 56"	-0.30"	309° 24' 11"	-18° 31' 12"	0.9846633	16' 14.58"	23° 26' 16"	-12 m 39 s
1	307° 03' 28"	-0.31"	309° 26' 46"	-18° 30' 33"	0.9846684	16' 14.57"	23° 26' 16"	-12 m 39 s
2	307° 06' 00"	-0.32"	309° 29' 22"	-18° 29' 55"	0.9846734	16' 14.57"	23° 26' 16"	-12 m 40 s
3	307° 08' 33"	-0.32"	309° 31' 58"	-18° 29' 16"	0.9846785	16' 14.56"	23° 26' 16"	-12 m 40 s
4	307° 11' 05"	-0.33"	309° 34' 33"	-18° 28' 38"	0.9846836	16' 14.56"	23° 26' 16"	-12 m 41 s
5	307° 13' 38"	-0.33"	309° 37' 09"	-18° 27' 59"	0.9846886	16' 14.55"	23° 26' 16"	-12 m 41 s
6	307° 16' 10"	-0.34"	309° 39' 44"	-18° 27' 20"	0.9846937	16' 14.55"	23° 26' 16"	-12 m 42 s
7	307° 18' 43"	-0.34"	309° 42' 20"	-18° 26' 42"	0.9846988	16' 14.54"	23° 26' 16"	-12 m 42 s
8	307° 21' 15"	-0.35"	309° 44' 55"	-18° 26' 03"	0.9847039	16' 14.54"	23° 26' 16"	-12 m 43 s
9	307° 23' 48"	-0.35"	309° 47' 31"	-18° 25' 24"	0.9847090	16' 14.53"	23° 26' 16"	-12 m 43 s
10	307° 26' 20"	-0.36"	309° 50' 06"	-18° 24' 45"	0.9847141	16' 14.53"	23° 26' 16"	-12 m 44 s
11	307° 28' 53"	-0.36"	309° 52' 41"	-18° 24' 06"	0.9847192	16' 14.52"	23° 26' 16"	-12 m 44 s
12	307° 31' 25"	-0.37"	309° 55' 17"	-18° 23' 27"	0.9847244	16' 14.52"	23° 26' 16"	-12 m 45 s
13	307° 33' 58"	-0.38"	309° 57' 52"	-18° 22' 48"	0.9847295	16' 14.51"	23° 26' 16"	-12 m 45 s
14	307° 36' 30"	-0.38"	310° 00' 27"	-18° 22' 10"	0.9847346	16' 14.51"	23° 26' 16"	-12 m 46 s
15	307° 39' 03"	-0.39"	310° 03' 03"	-18° 21' 30"	0.9847398	16' 14.50"	23° 26' 16"	-12 m 46 s
16	307° 41' 35"	-0.39"	310° 05' 38"	-18° 20' 51"	0.9847449	16' 14.50"	23° 26' 16"	-12 m 47 s
17	307° 44' 08"	-0.40"	310° 08' 13"	-18° 20' 12"	0.9847501	16' 14.49"	23° 26' 16"	-12 m 47 s
18	307° 46' 40"	-0.40"	310° 10' 49"	-18° 19' 33"	0.9847553	16' 14.49"	23° 26' 16"	-12 m 48 s
19	307° 49' 13"	-0.41"	310° 13' 24"	-18° 18' 54"	0.9847604	16' 14.48"	23° 26' 16"	-12 m 48 s
20	307° 51' 45"	-0.41"	310° 15' 59"	-18° 18' 15"	0.9847656	16' 14.48"	23° 26' 16"	-12 m 49 s
21	307° 54' 18"	-0.42"	310° 18' 34"	-18° 17' 36"	0.9847708	16' 14.47"	23° 26' 16"	-12 m 49 s
22	307° 56' 50"	-0.42"	310° 21' 09"	-18° 16' 56"	0.9847760	16' 14.47"	23° 26' 16"	-12 m 50 s
23	307° 59' 23"	-0.43"	310° 23' 45"	-18° 16' 17"	0.9847812	16' 14.46"	23° 26' 16"	-12 m 50 s
24	308° 01' 55"	-0.43"	310° 26' 20"	-18° 15' 38"	0.9847864	16' 14.45"	23° 26' 16"	-12 m 51 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	235° 29' 53"	0° 19' 37"	233° 14' 38"	-18° 49' 02"	0° 59' 24"	16' 11.26"	103° 52' 45"	0.34264
1	236° 05' 19"	0° 16' 28"	233° 50' 15"	-19° 00' 28"	0° 59' 26"	16' 11.66"	103° 40' 09"	0.33810
2	236° 40' 47"	0° 13' 20"	234° 25' 58"	-19° 11' 47"	0° 59' 27"	16' 12.05"	103° 27' 21"	0.33358
3	237° 16' 16"	0° 10' 11"	235° 01' 48"	-19° 23' 00"	0° 59' 29"	16' 12.44"	103° 14' 23"	0.32906
4	237° 51' 48"	0° 07' 01"	235° 37' 45"	-19° 34' 07"	0° 59' 30"	16' 12.83"	103° 1' 14"	0.32456
5	238° 27' 21"	0° 03' 52"	236° 13' 48"	-19° 45' 06"	0° 59' 31"	16' 13.22"	102° 47' 54"	0.32007
6	239° 02' 56"	0° 00' 43"	236° 49' 58"	-19° 55' 60"	0° 59' 33"	16' 13.60"	102° 34' 23"	0.31559
7	239° 38' 32"	0° -2' 27"	237° 26' 15"	-20° 06' 46"	0° 59' 34"	16' 13.98"	102° 20' 41"	0.31112
8	240° 14' 11"	0° -5' 37"	238° 02' 39"	-20° 17' 26"	0° 59' 36"	16' 14.36"	102° 6' 47"	0.30667
9	240° 49' 51"	0° -8' 47"	238° 39' 10"	-20° 27' 58"	0° 59' 37"	16' 14.73"	101° 52' 43"	0.30223
10	241° 25' 33"	0° -11' 57"	239° 15' 47"	-20° 38' 23"	0° 59' 38"	16' 15.10"	101° 38' 27"	0.29781
11	242° 01' 17"	0° -15' 07"	239° 52' 31"	-20° 48' 41"	0° 59' 40"	16' 15.47"	101° 24' 00"	0.29340
12	242° 37' 03"	0° -18' 17"	240° 29' 22"	-20° 58' 52"	0° 59' 41"	16' 15.84"	101° 9' 23"	0.28901
13	243° 12' 50"	0° -21' 27"	241° 06' 20"	-21° 08' 55"	0° 59' 42"	16' 16.20"	100° 54' 34"	0.28463
14	243° 48' 39"	0° -24' 37"	241° 43' 25"	-21° 18' 51"	0° 59' 44"	16' 16.56"	100° 39' 33"	0.28027
15	244° 24' 30"	0° -27' 48"	242° 20' 36"	-21° 28' 39"	0° 59' 45"	16' 16.92"	100° 24' 22"	0.27592
16	245° 00' 22"	0° -30' 58"	242° 57' 54"	-21° 38' 19"	0° 59' 46"	16' 17.27"	100° 8' 60"	0.27160
17	245° 36' 17"	0° -34' 08"	243° 35' 19"	-21° 47' 52"	0° 59' 48"	16' 17.62"	99° 53' 26"	0.26729
18	246° 12' 13"	0° -37' 18"	244° 12' 50"	-21° 57' 16"	0° 59' 49"	16' 17.97"	99° 37' 41"	0.26300
19	246° 48' 10"	0° -40' 28"	244° 50' 28"	-22° 06' 32"	0° 59' 50"	16' 18.31"	99° 21' 45"	0.25873
20	247° 24' 10"	0° -43' 37"	245° 28' 13"	-22° 15' 40"	0° 59' 51"	16' 18.65"	99° 5' 38"	0.25448
21	248° 00' 11"	0° -46' 47"	246° 06' 05"	-22° 24' 39"	0° 59' 53"	16' 18.98"	98° 49' 19"	0.25025
22	248° 36' 13"	0° -49' 56"	246° 44' 03"	-22° 33' 31"	0° 59' 54"	16' 19.32"	98° 32' 49"	0.24604
23	249° 12' 18"	0° -53' 05"	247° 22' 07"	-22° 42' 13"	0° 59' 55"	16' 19.64"	98° 16' 08"	0.24185
24	249° 48' 24"	0° -56' 14"	248° 00' 18"	-22° 50' 47"	0° 59' 56"	16' 19.97"	97° 59' 16"	0.23768



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	308° 01' 55"	-0.43"	310° 26' 20"	-18° 15' 38"	0.9847864	16' 14.45"	23° 26' 16"	-12 m 51 s
1	308° 04' 28"	-0.44"	310° 28' 55"	-18° 14' 59"	0.9847916	16' 14.45"	23° 26' 16"	-12 m 51 s
2	308° 07' 00"	-0.45"	310° 31' 30"	-18° 14' 19"	0.9847968	16' 14.44"	23° 26' 16"	-12 m 52 s
3	308° 09' 32"	-0.45"	310° 34' 05"	-18° 13' 40"	0.9848021	16' 14.44"	23° 26' 16"	-12 m 52 s
4	308° 12' 05"	-0.46"	310° 36' 40"	-18° 13' 00"	0.9848073	16' 14.43"	23° 26' 16"	-12 m 53 s
5	308° 14' 37"	-0.46"	310° 39' 15"	-18° 12' 21"	0.9848125	16' 14.43"	23° 26' 16"	-12 m 53 s
6	308° 17' 10"	-0.47"	310° 41' 50"	-18° 11' 41"	0.9848178	16' 14.42"	23° 26' 16"	-12 m 54 s
7	308° 19' 42"	-0.47"	310° 44' 25"	-18° 11' 02"	0.9848230	16' 14.42"	23° 26' 16"	-12 m 54 s
8	308° 22' 15"	-0.48"	310° 47' 00"	-18° 10' 22"	0.9848283	16' 14.41"	23° 26' 16"	-12 m 55 s
9	308° 24' 47"	-0.48"	310° 49' 35"	-18° 09' 43"	0.9848335	16' 14.41"	23° 26' 16"	-12 m 55 s
10	308° 27' 20"	-0.49"	310° 52' 10"	-18° 09' 03"	0.9848388	16' 14.40"	23° 26' 16"	-12 m 56 s
11	308° 29' 52"	-0.49"	310° 54' 45"	-18° 08' 23"	0.9848441	16' 14.40"	23° 26' 16"	-12 m 56 s
12	308° 32' 25"	-0.50"	310° 57' 20"	-18° 07' 43"	0.9848494	16' 14.39"	23° 26' 16"	-12 m 56 s
13	308° 34' 57"	-0.50"	310° 59' 55"	-18° 07' 04"	0.9848547	16' 14.39"	23° 26' 16"	-12 m 57 s
14	308° 37' 30"	-0.51"	311° 02' 29"	-18° 06' 24"	0.9848599	16' 14.38"	23° 26' 16"	-12 m 57 s
15	308° 40' 02"	-0.51"	311° 05' 04"	-18° 05' 44"	0.9848652	16' 14.38"	23° 26' 16"	-12 m 58 s
16	308° 42' 34"	-0.52"	311° 07' 39"	-18° 05' 04"	0.9848706	16' 14.37"	23° 26' 16"	-12 m 58 s
17	308° 45' 07"	-0.52"	311° 10' 14"	-18° 04' 24"	0.9848759	16' 14.37"	23° 26' 16"	-12 m 59 s
18	308° 47' 39"	-0.53"	311° 12' 49"	-18° 03' 44"	0.9848812	16' 14.36"	23° 26' 16"	-12 m 59 s
19	308° 50' 12"	-0.53"	311° 15' 23"	-18° 03' 04"	0.9848865	16' 14.36"	23° 26' 16"	-12 m 60 s
20	308° 52' 44"	-0.54"	311° 17' 58"	-18° 02' 24"	0.9848918	16' 14.35"	23° 26' 16"	-13 m 00 s
21	308° 55' 17"	-0.54"	311° 20' 33"	-18° 01' 44"	0.9848972	16' 14.35"	23° 26' 16"	-13 m 01 s
22	308° 57' 49"	-0.55"	311° 23' 07"	-18° 01' 04"	0.9849025	16' 14.34"	23° 26' 16"	-13 m 01 s
23	309° 00' 22"	-0.55"	311° 25' 42"	-18° 00' 24"	0.9849079	16' 14.33"	23° 26' 16"	-13 m 02 s
24	309° 02' 54"	-0.56"	311° 28' 17"	-17° 59' 44"	0.9849132	16' 14.33"	23° 26' 16"	-13 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	249° 48' 24"	0°-56' 14"	248° 00' 18"	-22° 50' 47"	0° 59' 56"	16' 19.97"	97° 59' 16"	0.23768
1	250° 24' 32"	0°-59' 23"	248° 38' 36"	-22° 59' 12"	0° 59' 57"	16' 20.29"	97° 42' 13"	0.23353
2	251° 00' 41"	-1° 02' 31"	249° 16' 59"	-23° 07' 28"	0° 59' 59"	16' 20.60"	97° 24' 58"	0.22941
3	251° 36' 52"	-1° 05' 39"	249° 55' 30"	-23° 15' 35"	0° 59' 60"	16' 20.92"	97° 7' 32"	0.22531
4	252° 13' 04"	-1° 08' 47"	250° 34' 06"	-23° 23' 34"	1° 00' 01"	16' 21.22"	96° 49' 55"	0.22123
5	252° 49' 18"	-1° 11' 55"	251° 12' 49"	-23° 31' 22"	1° 00' 02"	16' 21.53"	96° 32' 06"	0.21718
6	253° 25' 34"	-1° 15' 02"	251° 51' 38"	-23° 39' 02"	1° 00' 03"	16' 21.83"	96° 14' 06"	0.21315
7	254° 01' 51"	-1° 18' 08"	252° 30' 33"	-23° 46' 32"	1° 00' 04"	16' 22.12"	95° 55' 55"	0.20914
8	254° 38' 10"	-1° 21' 15"	253° 09' 33"	-23° 53' 53"	1° 00' 05"	16' 22.41"	95° 37' 33"	0.20516
9	255° 14' 30"	-1° 24' 20"	253° 48' 40"	-24° 01' 04"	1° 00' 06"	16' 22.70"	95° 18' 59"	0.20121
10	255° 50' 52"	-1° 27' 26"	254° 27' 53"	-24° 08' 06"	1° 00' 07"	16' 22.98"	95° 0' 14"	0.19728
11	256° 27' 16"	-1° 30' 31"	255° 07' 12"	-24° 14' 57"	1° 00' 08"	16' 23.25"	94° 41' 17"	0.19338
12	257° 03' 40"	-1° 33' 35"	255° 46' 36"	-24° 21' 39"	1° 00' 09"	16' 23.52"	94° 22' 10"	0.18951
13	257° 40' 07"	-1° 36' 39"	256° 26' 06"	-24° 28' 11"	1° 00' 10"	16' 23.79"	94° 2' 50"	0.18567
14	258° 16' 34"	-1° 39' 42"	257° 05' 41"	-24° 34' 33"	1° 00' 11"	16' 24.05"	93° 43' 19"	0.18185
15	258° 53' 03"	-1° 42' 45"	257° 45' 22"	-24° 40' 44"	1° 00' 12"	16' 24.31"	93° 23' 37"	0.17806
16	259° 29' 31"	-1° 45' 47"	258° 25' 04"	-24° 46' 45"	1° 00' 13"	16' 24.56"	93° 3' 45"	0.17431
17	260° 06' 03"	-1° 48' 48"	259° 04' 55"	-24° 52' 36"	1° 00' 14"	16' 24.81"	92° 43' 39"	0.17058
18	260° 42' 36"	-1° 51' 49"	259° 44' 51"	-24° 58' 17"	1° 00' 15"	16' 25.05"	92° 23' 22"	0.16688
19	261° 19' 11"	-1° 54' 49"	260° 24' 53"	-25° 03' 47"	1° 00' 16"	16' 25.28"	92° 2' 54"	0.16321
20	261° 55' 47"	-1° 57' 49"	261° 04' 59"	-25° 09' 06"	1° 00' 17"	16' 25.51"	91° 42' 13"	0.15958
21	262° 32' 24"	-2° 00' 47"	261° 45' 10"	-25° 14' 15"	1° 00' 17"	16' 25.74"	91° 21' 21"	0.15597
22	263° 09' 03"	-2° 03' 45"	262° 25' 25"	-25° 19' 13"	1° 00' 18"	16' 25.96"	91° 0' 16"	0.15240
23	263° 45' 43"	-2° 06' 43"	263° 05' 45"	-25° 24' 01"	1° 00' 19"	16' 26.17"	90° 39' 00"	0.14886
24	264° 22' 24"	-2° 09' 39"	263° 46' 10"	-25° 28' 37"	1° 00' 20"	16' 26.38"	90° 17' 32"	0.14535

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	309° 02' 54"	-0.56"	311° 28' 17"	-17° 59' 44"	0.9849132	16' 14.33"	23° 26' 16"	-13 m 02 s
1	309° 05' 26"	-0.56"	311° 30' 51"	-17° 59' 04"	0.9849186	16' 14.32"	23° 26' 16"	-13 m 02 s
2	309° 07' 59"	-0.57"	311° 33' 26"	-17° 58' 24"	0.9849240	16' 14.32"	23° 26' 16"	-13 m 03 s
3	309° 10' 31"	-0.57"	311° 36' 01"	-17° 57' 43"	0.9849293	16' 14.31"	23° 26' 16"	-13 m 03 s
4	309° 13' 04"	-0.58"	311° 38' 35"	-17° 57' 03"	0.9849347	16' 14.31"	23° 26' 16"	-13 m 04 s
5	309° 15' 36"	-0.58"	311° 41' 10"	-17° 56' 23"	0.9849401	16' 14.30"	23° 26' 16"	-13 m 04 s
6	309° 18' 09"	-0.59"	311° 43' 44"	-17° 55' 43"	0.9849455	16' 14.30"	23° 26' 16"	-13 m 05 s
7	309° 20' 41"	-0.59"	311° 46' 19"	-17° 55' 02"	0.9849509	16' 14.29"	23° 26' 16"	-13 m 05 s
8	309° 23' 14"	-0.60"	311° 48' 53"	-17° 54' 22"	0.9849563	16' 14.29"	23° 26' 16"	-13 m 06 s
9	309° 25' 46"	-0.60"	311° 51' 28"	-17° 53' 41"	0.9849617	16' 14.28"	23° 26' 16"	-13 m 06 s
10	309° 28' 18"	-0.60"	311° 54' 02"	-17° 53' 01"	0.9849671	16' 14.28"	23° 26' 16"	-13 m 06 s
11	309° 30' 51"	-0.61"	311° 56' 36"	-17° 52' 20"	0.9849725	16' 14.27"	23° 26' 16"	-13 m 07 s
12	309° 33' 23"	-0.61"	311° 59' 11"	-17° 51' 40"	0.9849780	16' 14.27"	23° 26' 16"	-13 m 07 s
13	309° 35' 56"	-0.62"	312° 01' 45"	-17° 50' 59"	0.9849834	16' 14.26"	23° 26' 16"	-13 m 08 s
14	309° 38' 28"	-0.62"	312° 04' 20"	-17° 50' 19"	0.9849888	16' 14.25"	23° 26' 16"	-13 m 08 s
15	309° 41' 00"	-0.63"	312° 06' 54"	-17° 49' 38"	0.9849943	16' 14.25"	23° 26' 16"	-13 m 09 s
16	309° 43' 33"	-0.63"	312° 09' 28"	-17° 48' 57"	0.9849997	16' 14.24"	23° 26' 16"	-13 m 09 s
17	309° 46' 05"	-0.64"	312° 12' 03"	-17° 48' 17"	0.9850052	16' 14.24"	23° 26' 16"	-13 m 09 s
18	309° 48' 38"	-0.64"	312° 14' 37"	-17° 47' 36"	0.9850106	16' 14.23"	23° 26' 16"	-13 m 10 s
19	309° 51' 10"	-0.64"	312° 17' 11"	-17° 46' 55"	0.9850161	16' 14.23"	23° 26' 16"	-13 m 10 s
20	309° 53' 43"	-0.65"	312° 19' 45"	-17° 46' 14"	0.9850216	16' 14.22"	23° 26' 16"	-13 m 11 s
21	309° 56' 15"	-0.65"	312° 22' 19"	-17° 45' 33"	0.9850271	16' 14.22"	23° 26' 16"	-13 m 11 s
22	309° 58' 47"	-0.66"	312° 24' 54"	-17° 44' 53"	0.9850325	16' 14.21"	23° 26' 16"	-13 m 12 s
23	310° 01' 20"	-0.66"	312° 27' 28"	-17° 44' 12"	0.9850380	16' 14.21"	23° 26' 16"	-13 m 12 s
24	310° 03' 52"	-0.67"	312° 30' 02"	-17° 43' 31"	0.9850435	16' 14.20"	23° 26' 16"	-13 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	264° 22' 24"	-2° 09' 39"	263° 46' 10"	-25° 28' 37"	1° 00' 20"	16' 26.38"	90° 17' 32"	0.14535
1	264° 59' 06"	-2° 12' 35"	264° 26' 38"	-25° 33' 02"	1° 00' 21"	16' 26.58"	89° 55' 51"	0.14187
2	265° 35' 50"	-2° 15' 29"	265° 07' 11"	-25° 37' 17"	1° 00' 21"	16' 26.78"	89° 33' 58"	0.13843
3	266° 12' 34"	-2° 18' 23"	265° 47' 47"	-25° 41' 20"	1° 00' 22"	16' 26.97"	89° 11' 53"	0.13503
4	266° 49' 20"	-2° 21' 16"	266° 28' 28"	-25° 45' 12"	1° 00' 23"	16' 27.15"	88° 49' 35"	0.13166
5	267° 26' 07"	-2° 24' 08"	267° 09' 12"	-25° 48' 53"	1° 00' 23"	16' 27.33"	88° 27' 05"	0.12832
6	268° 02' 55"	-2° 26' 60"	267° 49' 60"	-25° 52' 22"	1° 00' 24"	16' 27.50"	88° 4' 21"	0.12502
7	268° 39' 45"	-2° 29' 50"	268° 30' 51"	-25° 55' 41"	1° 00' 25"	16' 27.67"	87° 41' 24"	0.12175
8	269° 16' 35"	-2° 32' 39"	269° 11' 45"	-25° 58' 47"	1° 00' 25"	16' 27.83"	87° 18' 15"	0.11853
9	269° 53' 26"	-2° 35' 27"	269° 52' 42"	-26° 01' 43"	1° 00' 26"	16' 27.99"	86° 54' 51"	0.11533
10	270° 30' 19"	-2° 38' 14"	270° 33' 42"	-26° 04' 27"	1° 00' 26"	16' 28.13"	86° 31' 14"	0.11218
11	271° 07' 12"	-2° 41' 00"	271° 14' 45"	-26° 06' 59"	1° 00' 27"	16' 28.28"	86° 7' 23"	0.10906
12	271° 44' 06"	-2° 43' 45"	271° 55' 51"	-26° 09' 19"	1° 00' 27"	16' 28.41"	85° 43' 17"	0.10598
13	272° 21' 01"	-2° 46' 29"	272° 36' 59"	-26° 11' 28"	1° 00' 28"	16' 28.54"	85° 18' 56"	0.10294
14	272° 57' 57"	-2° 49' 12"	273° 18' 09"	-26° 13' 26"	1° 00' 28"	16' 28.66"	84° 54' 21"	0.09994
15	273° 34' 54"	-2° 51' 54"	273° 59' 22"	-26° 15' 11"	1° 00' 29"	16' 28.78"	84° 29' 30"	0.09698
16	274° 11' 52"	-2° 54' 34"	274° 40' 36"	-26° 16' 45"	1° 00' 29"	16' 28.89"	84° 4' 24"	0.09406
17	274° 48' 51"	-2° 57' 14"	275° 21' 52"	-26° 18' 07"	1° 00' 29"	16' 28.99"	83° 39' 01"	0.09118
18	275° 25' 50"	-2° 59' 52"	276° 03' 09"	-26° 19' 17"	1° 00' 30"	16' 29.09"	83° 13' 21"	0.08834
19	276° 02' 50"	-3° 02' 29"	276° 44' 28"	-26° 20' 16"	1° 00' 30"	16' 29.18"	82° 47' 23"	0.08553
20	276° 39' 51"	-3° 05' 05"	277° 25' 49"	-26° 21' 02"	1° 00' 30"	16' 29.26"	82° 21' 08"	0.08277
21	277° 16' 52"	-3° 07' 39"	278° 07' 10"	-26° 21' 37"	1° 00' 31"	16' 29.33"	81° 54' 34"	0.08006
22	277° 53' 55"	-3° 10' 12"	278° 48' 32"	-26° 21' 59"	1° 00' 31"	16' 29.40"	81° 27' 41"	0.07738
23	278° 30' 57"	-3° 12' 44"	279° 29' 55"	-26° 22' 10"	1° 00' 31"	16' 29.46"	81° 0' 28"	0.07475
24	279° 08' 01"	-3° 15' 14"	280° 11' 18"	-26° 22' 09"	1° 00' 31"	16' 29.52"	80° 32' 53"	0.07215

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	310° 03' 52"	-0.67"	312° 30' 02"	-17° 43' 31"	0.9850435	16' 14.20"	23° 26' 16"	-13 m 12 s
1	310° 06' 25"	-0.67"	312° 32' 36"	-17° 42' 50"	0.9850490	16' 14.20"	23° 26' 16"	-13 m 13 s
2	310° 08' 57"	-0.67"	312° 35' 10"	-17° 42' 09"	0.9850545	16' 14.19"	23° 26' 16"	-13 m 13 s
3	310° 11' 29"	-0.68"	312° 37' 44"	-17° 41' 28"	0.9850600	16' 14.18"	23° 26' 16"	-13 m 14 s
4	310° 14' 02"	-0.68"	312° 40' 18"	-17° 40' 47"	0.9850656	16' 14.18"	23° 26' 16"	-13 m 14 s
5	310° 16' 34"	-0.69"	312° 42' 52"	-17° 40' 06"	0.9850711	16' 14.17"	23° 26' 16"	-13 m 15 s
6	310° 19' 07"	-0.69"	312° 45' 26"	-17° 39' 24"	0.9850766	16' 14.17"	23° 26' 16"	-13 m 15 s
7	310° 21' 39"	-0.69"	312° 48' 00"	-17° 38' 43"	0.9850821	16' 14.16"	23° 26' 16"	-13 m 15 s
8	310° 24' 11"	-0.70"	312° 50' 34"	-17° 38' 02"	0.9850877	16' 14.16"	23° 26' 16"	-13 m 16 s
9	310° 26' 44"	-0.70"	312° 53' 08"	-17° 37' 21"	0.9850932	16' 14.15"	23° 26' 16"	-13 m 16 s
10	310° 29' 16"	-0.70"	312° 55' 42"	-17° 36' 40"	0.9850988	16' 14.15"	23° 26' 16"	-13 m 17 s
11	310° 31' 49"	-0.71"	312° 58' 16"	-17° 35' 58"	0.9851043	16' 14.14"	23° 26' 16"	-13 m 17 s
12	310° 34' 21"	-0.71"	313° 00' 50"	-17° 35' 17"	0.9851099	16' 14.13"	23° 26' 16"	-13 m 17 s
13	310° 36' 53"	-0.72"	313° 03' 24"	-17° 34' 36"	0.9851154	16' 14.13"	23° 26' 16"	-13 m 18 s
14	310° 39' 26"	-0.72"	313° 05' 58"	-17° 33' 54"	0.9851210	16' 14.12"	23° 26' 16"	-13 m 18 s
15	310° 41' 58"	-0.72"	313° 08' 31"	-17° 33' 13"	0.9851266	16' 14.12"	23° 26' 16"	-13 m 19 s
16	310° 44' 31"	-0.73"	313° 11' 05"	-17° 32' 31"	0.9851322	16' 14.11"	23° 26' 16"	-13 m 19 s
17	310° 47' 03"	-0.73"	313° 13' 39"	-17° 31' 50"	0.9851378	16' 14.11"	23° 26' 16"	-13 m 19 s
18	310° 49' 35"	-0.73"	313° 16' 13"	-17° 31' 08"	0.9851433	16' 14.10"	23° 26' 16"	-13 m 20 s
19	310° 52' 08"	-0.74"	313° 18' 47"	-17° 30' 27"	0.9851489	16' 14.10"	23° 26' 16"	-13 m 20 s
20	310° 54' 40"	-0.74"	313° 21' 20"	-17° 29' 45"	0.9851545	16' 14.09"	23° 26' 16"	-13 m 21 s
21	310° 57' 13"	-0.74"	313° 23' 54"	-17° 29' 04"	0.9851602	16' 14.09"	23° 26' 16"	-13 m 21 s
22	310° 59' 45"	-0.75"	313° 26' 28"	-17° 28' 22"	0.9851658	16' 14.08"	23° 26' 16"	-13 m 21 s
23	311° 02' 17"	-0.75"	313° 29' 01"	-17° 27' 40"	0.9851714	16' 14.07"	23° 26' 16"	-13 m 22 s
24	311° 04' 50"	-0.75"	313° 31' 35"	-17° 26' 58"	0.9851770	16' 14.07"	23° 26' 16"	-13 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	279° 08' 01"	-3° 15' 14"	280° 11' 18"	-26° 22' 09"	1° 00' 31"	16' 29.52"	80° 32' 53"	0.07215
1	279° 45' 05"	-3° 17' 43"	280° 52' 42"	-26° 21' 56"	1° 00' 31"	16' 29.57"	80° 4' 57"	0.06961
2	280° 22' 09"	-3° 20' 11"	281° 34' 06"	-26° 21' 31"	1° 00' 32"	16' 29.61"	79° 36' 38"	0.06710
3	280° 59' 14"	-3° 22' 37"	282° 15' 29"	-26° 20' 54"	1° 00' 32"	16' 29.64"	79° 7' 55"	0.06464
4	281° 36' 20"	-3° 25' 02"	282° 56' 53"	-26° 20' 06"	1° 00' 32"	16' 29.67"	78° 38' 46"	0.06222
5	282° 13' 25"	-3° 27' 26"	283° 38' 16"	-26° 19' 05"	1° 00' 32"	16' 29.69"	78° 9' 11"	0.05984
6	282° 50' 32"	-3° 29' 48"	284° 19' 39"	-26° 17' 52"	1° 00' 32"	16' 29.70"	77° 39' 08"	0.05751
7	283° 27' 38"	-3° 32' 08"	285° 01' 01"	-26° 16' 28"	1° 00' 32"	16' 29.70"	77° 8' 36"	0.05523
8	284° 04' 45"	-3° 34' 27"	285° 42' 22"	-26° 14' 51"	1° 00' 32"	16' 29.70"	76° 37' 32"	0.05299
9	284° 41' 52"	-3° 36' 45"	286° 23' 42"	-26° 13' 03"	1° 00' 32"	16' 29.69"	76° 5' 55"	0.05080
10	285° 18' 60"	-3° 39' 01"	287° 05' 00"	-26° 11' 03"	1° 00' 32"	16' 29.68"	75° 33' 43"	0.04865
11	285° 56' 08"	-3° 41' 15"	287° 46' 17"	-26° 08' 51"	1° 00' 32"	16' 29.65"	75° 0' 53"	0.04654
12	286° 33' 16"	-3° 43' 28"	288° 27' 33"	-26° 06' 27"	1° 00' 32"	16' 29.62"	74° 27' 23"	0.04448
13	287° 10' 24"	-3° 45' 39"	289° 08' 47"	-26° 03' 52"	1° 00' 32"	16' 29.58"	73° 53' 11"	0.04247
14	287° 47' 32"	-3° 47' 49"	289° 49' 58"	-26° 01' 05"	1° 00' 31"	16' 29.54"	73° 18' 12"	0.04051
15	288° 24' 40"	-3° 49' 57"	290° 31' 08"	-25° 58' 06"	1° 00' 31"	16' 29.48"	72° 42' 25"	0.03859
16	289° 01' 48"	-3° 52' 03"	291° 12' 15"	-25° 54' 55"	1° 00' 31"	16' 29.42"	72° 5' 45"	0.03672
17	289° 38' 57"	-3° 54' 08"	291° 53' 20"	-25° 51' 33"	1° 00' 31"	16' 29.35"	71° 28' 08"	0.03490
18	290° 16' 05"	-3° 56' 11"	292° 34' 22"	-25° 47' 59"	1° 00' 30"	16' 29.28"	70° 49' 29"	0.03312
19	290° 53' 13"	-3° 58' 12"	293° 15' 22"	-25° 44' 14"	1° 00' 30"	16' 29.20"	70° 9' 45"	0.03139
20	291° 30' 21"	-4° 00' 12"	293° 56' 18"	-25° 40' 18"	1° 00' 30"	16' 29.11"	69° 28' 48"	0.02971
21	292° 07' 29"	-4° 02' 10"	294° 37' 12"	-25° 36' 10"	1° 00' 29"	16' 29.01"	68° 46' 33"	0.02808
22	292° 44' 37"	-4° 04' 06"	295° 18' 02"	-25° 31' 50"	1° 00' 29"	16' 28.90"	68° 2' 53"	0.02649
23	293° 21' 45"	-4° 06' 01"	295° 58' 48"	-25° 27' 20"	1° 00' 29"	16' 28.79"	67° 17' 40"	0.02496
24	293° 58' 52"	-4° 07' 53"	296° 39' 31"	-25° 22' 38"	1° 00' 28"	16' 28.67"	66° 30' 46"	0.02347

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	311° 04' 50"	-0.75"	313° 31' 35"	-17° 26' 58"	0.9851770	16' 14.07"	23° 26' 16"	-13 m 22 s
1	311° 07' 22"	-0.76"	313° 34' 09"	-17° 26' 17"	0.9851826	16' 14.06"	23° 26' 16"	-13 m 22 s
2	311° 09' 54"	-0.76"	313° 36' 42"	-17° 25' 35"	0.9851883	16' 14.06"	23° 26' 16"	-13 m 23 s
3	311° 12' 27"	-0.76"	313° 39' 16"	-17° 24' 53"	0.9851939	16' 14.05"	23° 26' 16"	-13 m 23 s
4	311° 14' 59"	-0.76"	313° 41' 49"	-17° 24' 11"	0.9851996	16' 14.05"	23° 26' 16"	-13 m 24 s
5	311° 17' 32"	-0.77"	313° 44' 23"	-17° 23' 29"	0.9852052	16' 14.04"	23° 26' 16"	-13 m 24 s
6	311° 20' 04"	-0.77"	313° 46' 56"	-17° 22' 47"	0.9852109	16' 14.04"	23° 26' 16"	-13 m 24 s
7	311° 22' 36"	-0.77"	313° 49' 30"	-17° 22' 06"	0.9852165	16' 14.03"	23° 26' 16"	-13 m 25 s
8	311° 25' 09"	-0.78"	313° 52' 03"	-17° 21' 24"	0.9852222	16' 14.02"	23° 26' 16"	-13 m 25 s
9	311° 27' 41"	-0.78"	313° 54' 37"	-17° 20' 42"	0.9852279	16' 14.02"	23° 26' 16"	-13 m 25 s
10	311° 30' 13"	-0.78"	313° 57' 10"	-17° 19' 60"	0.9852335	16' 14.01"	23° 26' 16"	-13 m 26 s
11	311° 32' 46"	-0.78"	313° 59' 44"	-17° 19' 17"	0.9852392	16' 14.01"	23° 26' 16"	-13 m 26 s
12	311° 35' 18"	-0.79"	314° 02' 17"	-17° 18' 35"	0.9852449	16' 14.00"	23° 26' 16"	-13 m 27 s
13	311° 37' 50"	-0.79"	314° 04' 50"	-17° 17' 53"	0.9852506	16' 14.00"	23° 26' 16"	-13 m 27 s
14	311° 40' 23"	-0.79"	314° 07' 24"	-17° 17' 11"	0.9852563	16' 13.99"	23° 26' 16"	-13 m 27 s
15	311° 42' 55"	-0.80"	314° 09' 57"	-17° 16' 29"	0.9852620	16' 13.98"	23° 26' 16"	-13 m 28 s
16	311° 45' 27"	-0.80"	314° 12' 30"	-17° 15' 47"	0.9852677	16' 13.98"	23° 26' 16"	-13 m 28 s
17	311° 47' 60"	-0.80"	314° 15' 03"	-17° 15' 04"	0.9852734	16' 13.97"	23° 26' 16"	-13 m 28 s
18	311° 50' 32"	-0.80"	314° 17' 37"	-17° 14' 22"	0.9852791	16' 13.97"	23° 26' 16"	-13 m 29 s
19	311° 53' 05"	-0.80"	314° 20' 10"	-17° 13' 40"	0.9852849	16' 13.96"	23° 26' 16"	-13 m 29 s
20	311° 55' 37"	-0.81"	314° 22' 43"	-17° 12' 57"	0.9852906	16' 13.96"	23° 26' 16"	-13 m 29 s
21	311° 58' 09"	-0.81"	314° 25' 16"	-17° 12' 15"	0.9852963	16' 13.95"	23° 26' 16"	-13 m 30 s
22	312° 00' 42"	-0.81"	314° 27' 50"	-17° 11' 33"	0.9853021	16' 13.94"	23° 26' 16"	-13 m 30 s
23	312° 03' 14"	-0.81"	314° 30' 23"	-17° 10' 50"	0.9853078	16' 13.94"	23° 26' 16"	-13 m 30 s
24	312° 05' 46"	-0.82"	314° 32' 56"	-17° 10' 08"	0.9853135	16' 13.93"	23° 26' 16"	-13 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	293° 58' 52"	-4° 07' 53"	296° 39' 31"	-25° 22' 38"	1° 00' 28"	16' 28.67"	66° 30' 46"	0.02347
1	294° 35' 59"	-4° 09' 44"	297° 20' 10"	-25° 17' 45"	1° 00' 28"	16' 28.54"	65° 41' 60"	0.02203
2	295° 13' 06"	-4° 11' 33"	298° 00' 46"	-25° 12' 41"	1° 00' 27"	16' 28.41"	64° 51' 12"	0.02064
3	295° 50' 12"	-4° 13' 21"	298° 41' 17"	-25° 07' 26"	1° 00' 27"	16' 28.27"	63° 58' 08"	0.01930
4	296° 27' 18"	-4° 15' 06"	299° 21' 44"	-25° 01' 60"	1° 00' 26"	16' 28.12"	63° 2' 36"	0.01800
5	297° 04' 24"	-4° 16' 50"	300° 02' 07"	-24° 56' 23"	1° 00' 26"	16' 27.96"	62° 4' 18"	0.01676
6	297° 41' 29"	-4° 18' 32"	300° 42' 25"	-24° 50' 35"	1° 00' 25"	16' 27.79"	61° 2' 57"	0.01557
7	298° 18' 33"	-4° 20' 12"	301° 22' 39"	-24° 44' 36"	1° 00' 24"	16' 27.62"	59° 58' 11"	0.01442
8	298° 55' 37"	-4° 21' 50"	302° 02' 48"	-24° 38' 27"	1° 00' 24"	16' 27.44"	58° 49' 36"	0.01332
9	299° 32' 40"	-4° 23' 26"	302° 42' 52"	-24° 32' 08"	1° 00' 23"	16' 27.26"	57° 36' 45"	0.01228
10	300° 09' 43"	-4° 25' 01"	303° 22' 52"	-24° 25' 38"	1° 00' 22"	16' 27.06"	56° 19' 04"	0.01128
11	300° 46' 45"	-4° 26' 33"	304° 02' 46"	-24° 18' 57"	1° 00' 22"	16' 26.86"	54° 55' 58"	0.01033
12	301° 23' 47"	-4° 28' 04"	304° 42' 35"	-24° 12' 07"	1° 00' 21"	16' 26.65"	53° 26' 43"	0.00944
13	302° 00' 47"	-4° 29' 32"	305° 22' 19"	-24° 05' 06"	1° 00' 20"	16' 26.44"	51° 50' 28"	0.00859
14	302° 37' 47"	-4° 30' 59"	306° 01' 57"	-23° 57' 55"	1° 00' 19"	16' 26.21"	50° 6' 16"	0.00779
15	303° 14' 46"	-4° 32' 24"	306° 41' 30"	-23° 50' 34"	1° 00' 18"	16' 25.98"	48° 12' 57"	0.00704
16	303° 51' 44"	-4° 33' 46"	307° 20' 57"	-23° 43' 03"	1° 00' 17"	16' 25.75"	46° 9' 12"	0.00634
17	304° 28' 41"	-4° 35' 07"	308° 00' 19"	-23° 35' 23"	1° 00' 17"	16' 25.50"	43° 53' 28"	0.00570
18	305° 05' 38"	-4° 36' 26"	308° 39' 35"	-23° 27' 32"	1° 00' 16"	16' 25.25"	41° 23' 57"	0.00510
19	305° 42' 33"	-4° 37' 43"	309° 18' 44"	-23° 19' 32"	1° 00' 15"	16' 24.99"	38° 38' 37"	0.00455
20	306° 19' 27"	-4° 38' 58"	309° 57' 48"	-23° 11' 23"	1° 00' 14"	16' 24.73"	35° 35' 07"	0.00405
21	306° 56' 21"	-4° 40' 11"	310° 36' 46"	-23° 03' 04"	1° 00' 13"	16' 24.45"	32° 10' 53"	0.00360
22	307° 33' 13"	-4° 41' 22"	311° 15' 38"	-22° 54' 36"	1° 00' 12"	16' 24.17"	28° 23' 11"	0.00320
23	308° 10' 04"	-4° 42' 31"	311° 54' 23"	-22° 45' 59"	1° 00' 11"	16' 23.89"	24° 9' 17"	0.00285
24	308° 46' 54"	-4° 43' 38"	312° 33' 03"	-22° 37' 13"	1° 00' 10"	16' 23.59"	19° 26' 47"	0.00255



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	312° 05' 46"	-0.82"	314° 32' 56"	-17° 10' 08"	0.9853135	16' 13.93"	23° 26' 16"	-13 m 31 s
1	312° 08' 19"	-0.82"	314° 35' 29"	-17° 09' 25"	0.9853193	16' 13.93"	23° 26' 16"	-13 m 31 s
2	312° 10' 51"	-0.82"	314° 38' 02"	-17° 08' 43"	0.9853251	16' 13.92"	23° 26' 16"	-13 m 32 s
3	312° 13' 23"	-0.82"	314° 40' 35"	-17° 07' 60"	0.9853308	16' 13.92"	23° 26' 16"	-13 m 32 s
4	312° 15' 56"	-0.82"	314° 43' 08"	-17° 07' 17"	0.9853366	16' 13.91"	23° 26' 16"	-13 m 32 s
5	312° 18' 28"	-0.82"	314° 45' 41"	-17° 06' 35"	0.9853424	16' 13.91"	23° 26' 16"	-13 m 33 s
6	312° 21' 00"	-0.83"	314° 48' 14"	-17° 05' 52"	0.9853481	16' 13.90"	23° 26' 16"	-13 m 33 s
7	312° 23' 33"	-0.83"	314° 50' 47"	-17° 05' 09"	0.9853539	16' 13.89"	23° 26' 16"	-13 m 33 s
8	312° 26' 05"	-0.83"	314° 53' 20"	-17° 04' 27"	0.9853597	16' 13.89"	23° 26' 16"	-13 m 34 s
9	312° 28' 37"	-0.83"	314° 55' 53"	-17° 03' 44"	0.9853655	16' 13.88"	23° 26' 16"	-13 m 34 s
10	312° 31' 10"	-0.83"	314° 58' 26"	-17° 03' 01"	0.9853713	16' 13.88"	23° 26' 16"	-13 m 34 s
11	312° 33' 42"	-0.83"	315° 00' 59"	-17° 02' 18"	0.9853771	16' 13.87"	23° 26' 16"	-13 m 35 s
12	312° 36' 14"	-0.84"	315° 03' 32"	-17° 01' 35"	0.9853829	16' 13.87"	23° 26' 16"	-13 m 35 s
13	312° 38' 46"	-0.84"	315° 06' 04"	-17° 00' 52"	0.9853887	16' 13.86"	23° 26' 16"	-13 m 35 s
14	312° 41' 19"	-0.84"	315° 08' 37"	-17° 00' 09"	0.9853946	16' 13.85"	23° 26' 16"	-13 m 36 s
15	312° 43' 51"	-0.84"	315° 11' 10"	-16° 59' 26"	0.9854004	16' 13.85"	23° 26' 16"	-13 m 36 s
16	312° 46' 23"	-0.84"	315° 13' 43"	-16° 58' 44"	0.9854062	16' 13.84"	23° 26' 16"	-13 m 36 s
17	312° 48' 56"	-0.84"	315° 16' 16"	-16° 58' 00"	0.9854121	16' 13.84"	23° 26' 16"	-13 m 37 s
18	312° 51' 28"	-0.84"	315° 18' 48"	-16° 57' 17"	0.9854179	16' 13.83"	23° 26' 16"	-13 m 37 s
19	312° 54' 00"	-0.85"	315° 21' 21"	-16° 56' 34"	0.9854237	16' 13.82"	23° 26' 16"	-13 m 37 s
20	312° 56' 33"	-0.85"	315° 23' 54"	-16° 55' 51"	0.9854296	16' 13.82"	23° 26' 16"	-13 m 38 s
21	312° 59' 05"	-0.85"	315° 26' 26"	-16° 55' 08"	0.9854354	16' 13.81"	23° 26' 16"	-13 m 38 s
22	313° 01' 37"	-0.85"	315° 28' 59"	-16° 54' 25"	0.9854413	16' 13.81"	23° 26' 16"	-13 m 38 s
23	313° 04' 09"	-0.85"	315° 31' 32"	-16° 53' 42"	0.9854472	16' 13.80"	23° 26' 16"	-13 m 39 s
24	313° 06' 42"	-0.85"	315° 34' 04"	-16° 52' 58"	0.9854530	16' 13.80"	23° 26' 16"	-13 m 39 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	308° 46' 54"	-4° 43' 38"	312° 33' 03"	-22° 37' 13"	1° 00' 10"	16' 23.59"	19° 26' 47"	0.00255
1	309° 23' 42"	-4° 44' 43"	313° 11' 35"	-22° 28' 17"	1° 00' 08"	16' 23.29"	14° 14' 05"	0.00230
2	310° 00' 30"	-4° 45' 46"	313° 50' 02"	-22° 19' 13"	1° 00' 07"	16' 22.99"	8° 30' 58"	0.00210
3	310° 37' 16"	-4° 46' 46"	314° 28' 22"	-22° 10' 01"	1° 00' 06"	16' 22.67"	2° 19' 28"	0.00194
4	311° 14' 01"	-4° 47' 45"	315° 06' 35"	-22° 00' 39"	1° 00' 05"	16' 22.35"	355° 44' 21"	0.00184
5	311° 50' 44"	-4° 48' 42"	315° 44' 42"	-21° 51' 09"	1° 00' 04"	16' 22.02"	348° 53' 16"	0.00179
6	312° 27' 26"	-4° 49' 37"	316° 22' 42"	-21° 41' 31"	1° 00' 03"	16' 21.69"	341° 56' 13"	0.00178
7	313° 04' 07"	-4° 50' 30"	317° 00' 36"	-21° 31' 45"	1° 00' 01"	16' 21.35"	335° 4' 08"	0.00183
8	313° 40' 46"	-4° 51' 20"	317° 38' 22"	-21° 21' 50"	1° 00' 00"	16' 21.00"	328° 27' 11"	0.00192
9	314° 17' 24"	-4° 52' 09"	318° 16' 02"	-21° 11' 47"	0° 59' 59"	16' 20.65"	322° 13' 21"	0.00206
10	314° 54' 00"	-4° 52' 56"	318° 53' 35"	-21° 01' 37"	0° 59' 57"	16' 20.29"	316° 27' 48"	0.00226
11	315° 30' 34"	-4° 53' 40"	319° 31' 00"	-20° 51' 19"	0° 59' 56"	16' 19.92"	311° 13' 00"	0.00249
12	316° 07' 07"	-4° 54' 23"	320° 08' 20"	-20° 40' 53"	0° 59' 55"	16' 19.55"	306° 28' 35"	0.00278
13	316° 43' 38"	-4° 55' 03"	320° 45' 32"	-20° 30' 19"	0° 59' 53"	16' 19.17"	302° 13' 18"	0.00312
14	317° 20' 08"	-4° 55' 42"	321° 22' 38"	-20° 19' 38"	0° 59' 52"	16' 18.79"	298° 24' 48"	0.00350
15	317° 56' 36"	-4° 56' 18"	321° 59' 37"	-20° 08' 50"	0° 59' 50"	16' 18.40"	295° 0' 22"	0.00394
16	318° 33' 03"	-4° 56' 53"	322° 36' 28"	-19° 57' 54"	0° 59' 49"	16' 18.00"	291° 57' 16"	0.00442
17	319° 09' 27"	-4° 57' 25"	323° 13' 13"	-19° 46' 52"	0° 59' 48"	16' 17.60"	289° 12' 54"	0.00494
18	319° 45' 50"	-4° 57' 55"	323° 49' 51"	-19° 35' 42"	0° 59' 46"	16' 17.19"	286° 44' 55"	0.00552
19	320° 22' 11"	-4° 58' 24"	324° 26' 22"	-19° 24' 26"	0° 59' 45"	16' 16.78"	284° 31' 12"	0.00614
20	320° 58' 30"	-4° 58' 50"	325° 02' 45"	-19° 13' 03"	0° 59' 43"	16' 16.36"	282° 29' 56"	0.00681
21	321° 34' 48"	-4° 59' 14"	325° 39' 02"	-19° 01' 34"	0° 59' 41"	16' 15.93"	280° 39' 33"	0.00752
22	322° 11' 03"	-4° 59' 36"	326° 15' 12"	-18° 49' 58"	0° 59' 40"	16' 15.50"	278° 58' 42"	0.00829
23	322° 47' 17"	-4° 59' 56"	326° 51' 15"	-18° 38' 15"	0° 59' 38"	16' 15.07"	277° 26' 11"	0.00910
24	323° 23' 28"	-5° 00' 14"	327° 27' 11"	-18° 26' 27"	0° 59' 37"	16' 14.63"	276° 1' 03"	0.00995

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	313° 06' 42"	-0.85"	315° 34' 04"	-16° 52' 58"	0.9854530	16' 13.80"	23° 26' 16"	-13 m 39 s
1	313° 09' 14"	-0.85"	315° 36' 37"	-16° 52' 15"	0.9854589	16' 13.79"	23° 26' 16"	-13 m 39 s
2	313° 11' 46"	-0.85"	315° 39' 09"	-16° 51' 32"	0.9854648	16' 13.78"	23° 26' 16"	-13 m 39 s
3	313° 14' 19"	-0.85"	315° 41' 42"	-16° 50' 49"	0.9854707	16' 13.78"	23° 26' 16"	-13 m 40 s
4	313° 16' 51"	-0.85"	315° 44' 15"	-16° 50' 05"	0.9854766	16' 13.77"	23° 26' 16"	-13 m 40 s
5	313° 19' 23"	-0.85"	315° 46' 47"	-16° 49' 22"	0.9854825	16' 13.77"	23° 26' 16"	-13 m 40 s
6	313° 21' 55"	-0.85"	315° 49' 19"	-16° 48' 38"	0.9854884	16' 13.76"	23° 26' 16"	-13 m 41 s
7	313° 24' 28"	-0.85"	315° 51' 52"	-16° 47' 55"	0.9854943	16' 13.76"	23° 26' 16"	-13 m 41 s
8	313° 27' 00"	-0.85"	315° 54' 24"	-16° 47' 11"	0.9855002	16' 13.75"	23° 26' 16"	-13 m 41 s
9	313° 29' 32"	-0.85"	315° 56' 57"	-16° 46' 28"	0.9855061	16' 13.74"	23° 26' 16"	-13 m 42 s
10	313° 32' 05"	-0.86"	315° 59' 29"	-16° 45' 44"	0.9855120	16' 13.74"	23° 26' 16"	-13 m 42 s
11	313° 34' 37"	-0.86"	316° 02' 02"	-16° 45' 01"	0.9855180	16' 13.73"	23° 26' 16"	-13 m 42 s
12	313° 37' 09"	-0.86"	316° 04' 34"	-16° 44' 17"	0.9855239	16' 13.73"	23° 26' 16"	-13 m 42 s
13	313° 39' 41"	-0.86"	316° 07' 06"	-16° 43' 34"	0.9855298	16' 13.72"	23° 26' 16"	-13 m 43 s
14	313° 42' 14"	-0.86"	316° 09' 39"	-16° 42' 50"	0.9855358	16' 13.71"	23° 26' 16"	-13 m 43 s
15	313° 44' 46"	-0.86"	316° 12' 11"	-16° 42' 06"	0.9855417	16' 13.71"	23° 26' 16"	-13 m 43 s
16	313° 47' 18"	-0.86"	316° 14' 43"	-16° 41' 23"	0.9855477	16' 13.70"	23° 26' 16"	-13 m 44 s
17	313° 49' 50"	-0.86"	316° 17' 15"	-16° 40' 39"	0.9855536	16' 13.70"	23° 26' 16"	-13 m 44 s
18	313° 52' 23"	-0.86"	316° 19' 48"	-16° 39' 55"	0.9855596	16' 13.69"	23° 26' 16"	-13 m 44 s
19	313° 54' 55"	-0.86"	316° 22' 20"	-16° 39' 11"	0.9855656	16' 13.68"	23° 26' 16"	-13 m 45 s
20	313° 57' 27"	-0.86"	316° 24' 52"	-16° 38' 27"	0.9855716	16' 13.68"	23° 26' 16"	-13 m 45 s
21	313° 59' 59"	-0.86"	316° 27' 24"	-16° 37' 43"	0.9855775	16' 13.67"	23° 26' 16"	-13 m 45 s
22	314° 02' 32"	-0.85"	316° 29' 56"	-16° 36' 60"	0.9855835	16' 13.67"	23° 26' 16"	-13 m 45 s
23	314° 05' 04"	-0.85"	316° 32' 28"	-16° 36' 16"	0.9855895	16' 13.66"	23° 26' 16"	-13 m 46 s
24	314° 07' 36"	-0.85"	316° 35' 00"	-16° 35' 32"	0.9855955	16' 13.65"	23° 26' 16"	-13 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	323° 23' 28"	-5° 00' 14"	327° 27' 11"	-18° 26' 27"	0° 59' 37"	16' 14.63"	276° 1' 03"	0.00995
1	323° 59' 38"	-5° 00' 30"	328° 02' 59"	-18° 14' 32"	0° 59' 35"	16' 14.18"	274° 42' 25"	0.01085
2	324° 35' 45"	-5° 00' 44"	328° 38' 41"	-18° 02' 31"	0° 59' 33"	16' 13.73"	273° 29' 33"	0.01180
3	325° 11' 50"	-5° 00' 56"	329° 14' 16"	-17° 50' 25"	0° 59' 32"	16' 13.27"	272° 21' 50"	0.01279
4	325° 47' 54"	-5° 01' 06"	329° 49' 44"	-17° 38' 12"	0° 59' 30"	16' 12.81"	271° 18' 42"	0.01383
5	326° 23' 55"	-5° 01' 14"	330° 25' 05"	-17° 25' 54"	0° 59' 28"	16' 12.34"	270° 19' 41"	0.01491
6	326° 59' 54"	-5° 01' 20"	331° 00' 19"	-17° 13' 31"	0° 59' 27"	16' 11.87"	269° 24' 23"	0.01603
7	327° 35' 51"	-5° 01' 24"	331° 35' 27"	-17° 01' 02"	0° 59' 25"	16' 11.39"	268° 32' 26"	0.01720
8	328° 11' 45"	-5° 01' 26"	332° 10' 27"	-16° 48' 28"	0° 59' 23"	16' 10.91"	267° 43' 30"	0.01842
9	328° 47' 38"	-5° 01' 26"	332° 45' 21"	-16° 35' 49"	0° 59' 21"	16' 10.43"	266° 57' 20"	0.01968
10	329° 23' 28"	-5° 01' 24"	333° 20' 07"	-16° 23' 05"	0° 59' 19"	16' 09.94"	266° 13' 41"	0.02098
11	329° 59' 16"	-5° 01' 20"	333° 54' 47"	-16° 10' 16"	0° 59' 18"	16' 09.44"	265° 32' 20"	0.02232
12	330° 35' 01"	-5° 01' 14"	334° 29' 21"	-15° 57' 22"	0° 59' 16"	16' 08.94"	264° 53' 06"	0.02371
13	331° 10' 45"	-5° 01' 06"	335° 03' 47"	-15° 44' 23"	0° 59' 14"	16' 08.44"	264° 15' 48"	0.02514
14	331° 46' 26"	-5° 00' 56"	335° 38' 07"	-15° 31' 20"	0° 59' 12"	16' 07.93"	263° 40' 18"	0.02662
15	332° 22' 04"	-5° 00' 44"	336° 12' 21"	-15° 18' 12"	0° 59' 10"	16' 07.42"	263° 6' 27"	0.02813
16	332° 57' 40"	-5° 00' 31"	336° 46' 27"	-15° 05' 00"	0° 59' 08"	16' 06.90"	262° 34' 08"	0.02969
17	333° 33' 14"	-5° 00' 15"	337° 20' 27"	-14° 51' 44"	0° 59' 06"	16' 06.38"	262° 3' 15"	0.03129
18	334° 08' 45"	-4° 59' 57"	337° 54' 21"	-14° 38' 24"	0° 59' 04"	16' 05.86"	261° 33' 42"	0.03293
19	334° 44' 14"	-4° 59' 38"	338° 28' 08"	-14° 24' 60"	0° 59' 03"	16' 05.33"	261° 5' 24"	0.03460
20	335° 19' 41"	-4° 59' 16"	339° 01' 49"	-14° 11' 32"	0° 59' 01"	16' 04.80"	260° 38' 15"	0.03633
21	335° 55' 04"	-4° 58' 53"	339° 35' 24"	-13° 57' 60"	0° 58' 59"	16' 04.27"	260° 12' 12"	0.03809
22	336° 30' 26"	-4° 58' 28"	340° 08' 52"	-13° 44' 24"	0° 58' 57"	16' 03.73"	259° 47' 10"	0.03989
23	337° 05' 44"	-4° 58' 01"	340° 42' 14"	-13° 30' 45"	0° 58' 55"	16' 03.19"	259° 23' 06"	0.04173
24	337° 41' 01"	-4° 57' 32"	341° 15' 30"	-13° 17' 02"	0° 58' 53"	16' 02.64"	258° 59' 57"	0.04360



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	314° 07' 36"	-0.85"	316° 35' 00"	-16° 35' 32"	0.9855955	16' 13.65"	23° 26' 16"	-13 m 46 s
1	314° 10' 08"	-0.85"	316° 37' 33"	-16° 34' 48"	0.9856015	16' 13.65"	23° 26' 16"	-13 m 46 s
2	314° 12' 41"	-0.85"	316° 40' 05"	-16° 34' 04"	0.9856075	16' 13.64"	23° 26' 16"	-13 m 47 s
3	314° 15' 13"	-0.85"	316° 42' 37"	-16° 33' 20"	0.9856135	16' 13.64"	23° 26' 16"	-13 m 47 s
4	314° 17' 45"	-0.85"	316° 45' 09"	-16° 32' 35"	0.9856196	16' 13.63"	23° 26' 16"	-13 m 47 s
5	314° 20' 17"	-0.85"	316° 47' 41"	-16° 31' 51"	0.9856256	16' 13.63"	23° 26' 16"	-13 m 47 s
6	314° 22' 50"	-0.85"	316° 50' 13"	-16° 31' 07"	0.9856316	16' 13.62"	23° 26' 16"	-13 m 48 s
7	314° 25' 22"	-0.85"	316° 52' 44"	-16° 30' 23"	0.9856376	16' 13.61"	23° 26' 16"	-13 m 48 s
8	314° 27' 54"	-0.85"	316° 55' 16"	-16° 29' 39"	0.9856437	16' 13.61"	23° 26' 16"	-13 m 48 s
9	314° 30' 26"	-0.85"	316° 57' 48"	-16° 28' 55"	0.9856497	16' 13.60"	23° 26' 16"	-13 m 48 s
10	314° 32' 59"	-0.85"	317° 00' 20"	-16° 28' 10"	0.9856558	16' 13.60"	23° 26' 16"	-13 m 49 s
11	314° 35' 31"	-0.85"	317° 02' 52"	-16° 27' 26"	0.9856618	16' 13.59"	23° 26' 16"	-13 m 49 s
12	314° 38' 03"	-0.84"	317° 05' 24"	-16° 26' 42"	0.9856679	16' 13.58"	23° 26' 16"	-13 m 49 s
13	314° 40' 35"	-0.84"	317° 07' 56"	-16° 25' 57"	0.9856740	16' 13.58"	23° 26' 16"	-13 m 49 s
14	314° 43' 07"	-0.84"	317° 10' 27"	-16° 25' 13"	0.9856800	16' 13.57"	23° 26' 16"	-13 m 50 s
15	314° 45' 40"	-0.84"	317° 12' 59"	-16° 24' 28"	0.9856861	16' 13.57"	23° 26' 16"	-13 m 50 s
16	314° 48' 12"	-0.84"	317° 15' 31"	-16° 23' 44"	0.9856922	16' 13.56"	23° 26' 16"	-13 m 50 s
17	314° 50' 44"	-0.84"	317° 18' 03"	-16° 22' 60"	0.9856983	16' 13.55"	23° 26' 16"	-13 m 51 s
18	314° 53' 16"	-0.84"	317° 20' 34"	-16° 22' 15"	0.9857044	16' 13.55"	23° 26' 16"	-13 m 51 s
19	314° 55' 48"	-0.84"	317° 23' 06"	-16° 21' 31"	0.9857105	16' 13.54"	23° 26' 16"	-13 m 51 s
20	314° 58' 21"	-0.83"	317° 25' 38"	-16° 20' 46"	0.9857166	16' 13.54"	23° 26' 16"	-13 m 51 s
21	315° 00' 53"	-0.83"	317° 28' 09"	-16° 20' 01"	0.9857227	16' 13.53"	23° 26' 16"	-13 m 52 s
22	315° 03' 25"	-0.83"	317° 30' 41"	-16° 19' 17"	0.9857288	16' 13.52"	23° 26' 16"	-13 m 52 s
23	315° 05' 57"	-0.83"	317° 33' 13"	-16° 18' 32"	0.9857349	16' 13.52"	23° 26' 16"	-13 m 52 s
24	315° 08' 29"	-0.83"	317° 35' 44"	-16° 17' 47"	0.9857410	16' 13.51"	23° 26' 16"	-13 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	337° 41' 01"	-4° 57' 32"	341° 15' 30"	-13° 17' 02"	0° 58' 53"	16' 02.64"	258° 59' 57"	0.04360
1	338° 16' 14"	-4° 57' 01"	341° 48' 39"	-13° 03' 16"	0° 58' 51"	16' 02.09"	258° 37' 40"	0.04552
2	338° 51' 25"	-4° 56' 28"	342° 21' 43"	-12° 49' 27"	0° 58' 49"	16' 01.54"	258° 16' 11"	0.04748
3	339° 26' 34"	-4° 55' 54"	342° 54' 40"	-12° 35' 35"	0° 58' 47"	16' 00.99"	257° 55' 29"	0.04947
4	340° 01' 40"	-4° 55' 17"	343° 27' 31"	-12° 21' 39"	0° 58' 45"	16' 00.43"	257° 35' 31"	0.05150
5	340° 36' 43"	-4° 54' 39"	344° 00' 17"	-12° 07' 41"	0° 58' 42"	15' 59.87"	257° 16' 15"	0.05357
6	341° 11' 43"	-4° 53' 59"	344° 32' 57"	-11° 53' 40"	0° 58' 40"	15' 59.31"	256° 57' 39"	0.05568
7	341° 46' 41"	-4° 53' 17"	345° 05' 31"	-11° 39' 36"	0° 58' 38"	15' 58.74"	256° 39' 40"	0.05782
8	342° 21' 36"	-4° 52' 34"	345° 37' 59"	-11° 25' 30"	0° 58' 36"	15' 58.18"	256° 22' 19"	0.06000
9	342° 56' 29"	-4° 51' 48"	346° 10' 21"	-11° 11' 21"	0° 58' 34"	15' 57.61"	256° 5' 32"	0.06221
10	343° 31' 19"	-4° 51' 01"	346° 42' 38"	-10° 57' 09"	0° 58' 32"	15' 57.03"	255° 49' 19"	0.06446
11	344° 06' 06"	-4° 50' 13"	347° 14' 49"	-10° 42' 55"	0° 58' 30"	15' 56.46"	255° 33' 38"	0.06675
12	344° 40' 50"	-4° 49' 22"	347° 46' 55"	-10° 28' 40"	0° 58' 28"	15' 55.88"	255° 18' 27"	0.06907
13	345° 15' 31"	-4° 48' 30"	348° 18' 56"	-10° 14' 21"	0° 58' 26"	15' 55.30"	255° 3' 46"	0.07142
14	345° 50' 10"	-4° 47' 36"	348° 50' 51"	-10° 00' 01"	0° 58' 24"	15' 54.72"	254° 49' 34"	0.07381
15	346° 24' 46"	-4° 46' 40"	349° 22' 40"	-9° 45' 39"	0° 58' 21"	15' 54.14"	254° 35' 49"	0.07623
16	346° 59' 19"	-4° 45' 43"	349° 54' 25"	-9° 31' 15"	0° 58' 19"	15' 53.56"	254° 22' 31"	0.07868
17	347° 33' 50"	-4° 44' 44"	350° 26' 04"	-9° 16' 50"	0° 58' 17"	15' 52.97"	254° 9' 39"	0.08117
18	348° 08' 17"	-4° 43' 43"	350° 57' 38"	-9° 02' 22"	0° 58' 15"	15' 52.38"	253° 57' 11"	0.08369
19	348° 42' 42"	-4° 42' 41"	351° 29' 08"	-8° 47' 53"	0° 58' 13"	15' 51.79"	253° 45' 07"	0.08624
20	349° 17' 04"	-4° 41' 37"	352° 00' 32"	-8° 33' 23"	0° 58' 11"	15' 51.20"	253° 33' 27"	0.08883
21	349° 51' 23"	-4° 40' 31"	352° 31' 51"	-8° 18' 51"	0° 58' 08"	15' 50.61"	253° 22' 09"	0.09144
22	350° 25' 40"	-4° 39' 24"	353° 03' 06"	-8° 04' 18"	0° 58' 06"	15' 50.02"	253° 11' 13"	0.09409
23	350° 59' 53"	-4° 38' 15"	353° 34' 16"	-7° 49' 43"	0° 58' 04"	15' 49.42"	253° 0' 38"	0.09677
24	351° 34' 04"	-4° 37' 05"	354° 05' 21"	-7° 35' 08"	0° 58' 02"	15' 48.83"	252° 50' 24"	0.09948

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	315° 08' 29"	-0.83"	317° 35' 44"	-16° 17' 47"	0.9857410	16' 13.51"	23° 26' 16"	-13 m 52 s
1	315° 11' 02"	-0.83"	317° 38' 16"	-16° 17' 03"	0.9857472	16' 13.51"	23° 26' 16"	-13 m 53 s
2	315° 13' 34"	-0.82"	317° 40' 47"	-16° 16' 18"	0.9857533	16' 13.50"	23° 26' 16"	-13 m 53 s
3	315° 16' 06"	-0.82"	317° 43' 19"	-16° 15' 33"	0.9857595	16' 13.49"	23° 26' 16"	-13 m 53 s
4	315° 18' 38"	-0.82"	317° 45' 50"	-16° 14' 48"	0.9857656	16' 13.49"	23° 26' 16"	-13 m 53 s
5	315° 21' 10"	-0.82"	317° 48' 22"	-16° 14' 04"	0.9857718	16' 13.48"	23° 26' 16"	-13 m 54 s
6	315° 23' 43"	-0.82"	317° 50' 53"	-16° 13' 19"	0.9857779	16' 13.47"	23° 26' 16"	-13 m 54 s
7	315° 26' 15"	-0.81"	317° 53' 25"	-16° 12' 34"	0.9857841	16' 13.47"	23° 26' 16"	-13 m 54 s
8	315° 28' 47"	-0.81"	317° 55' 56"	-16° 11' 49"	0.9857903	16' 13.46"	23° 26' 16"	-13 m 54 s
9	315° 31' 19"	-0.81"	317° 58' 27"	-16° 11' 04"	0.9857964	16' 13.46"	23° 26' 16"	-13 m 54 s
10	315° 33' 51"	-0.81"	318° 00' 59"	-16° 10' 19"	0.9858026	16' 13.45"	23° 26' 16"	-13 m 55 s
11	315° 36' 23"	-0.81"	318° 03' 30"	-16° 09' 34"	0.9858088	16' 13.44"	23° 26' 16"	-13 m 55 s
12	315° 38' 56"	-0.80"	318° 06' 01"	-16° 08' 49"	0.9858150	16' 13.44"	23° 26' 16"	-13 m 55 s
13	315° 41' 28"	-0.80"	318° 08' 33"	-16° 08' 04"	0.9858212	16' 13.43"	23° 26' 16"	-13 m 55 s
14	315° 43' 60"	-0.80"	318° 11' 04"	-16° 07' 19"	0.9858274	16' 13.43"	23° 26' 16"	-13 m 56 s
15	315° 46' 32"	-0.80"	318° 13' 35"	-16° 06' 34"	0.9858336	16' 13.42"	23° 26' 16"	-13 m 56 s
16	315° 49' 04"	-0.79"	318° 16' 07"	-16° 05' 48"	0.9858398	16' 13.41"	23° 26' 16"	-13 m 56 s
17	315° 51' 36"	-0.79"	318° 18' 38"	-16° 05' 03"	0.9858460	16' 13.41"	23° 26' 16"	-13 m 56 s
18	315° 54' 08"	-0.79"	318° 21' 09"	-16° 04' 18"	0.9858523	16' 13.40"	23° 26' 16"	-13 m 56 s
19	315° 56' 41"	-0.79"	318° 23' 40"	-16° 03' 33"	0.9858585	16' 13.40"	23° 26' 16"	-13 m 57 s
20	315° 59' 13"	-0.78"	318° 26' 11"	-16° 02' 48"	0.9858647	16' 13.39"	23° 26' 16"	-13 m 57 s
21	316° 01' 45"	-0.78"	318° 28' 42"	-16° 02' 02"	0.9858710	16' 13.38"	23° 26' 16"	-13 m 57 s
22	316° 04' 17"	-0.78"	318° 31' 13"	-16° 01' 17"	0.9858772	16' 13.38"	23° 26' 16"	-13 m 57 s
23	316° 06' 49"	-0.77"	318° 33' 45"	-16° 00' 32"	0.9858835	16' 13.37"	23° 26' 16"	-13 m 58 s
24	316° 09' 21"	-0.77"	318° 36' 16"	-15° 59' 46"	0.9858898	16' 13.36"	23° 26' 16"	-13 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	351° 34' 04"	-4° 37' 05"	354° 05' 21"	-7° 35' 08"	0° 58' 02"	15' 48.83"	252° 50' 24"	0.09948
1	352° 08' 12"	-4° 35' 53"	354° 36' 22"	-7° 20' 31"	0° 57' 60"	15' 48.23"	252° 40' 30"	0.10221
2	352° 42' 17"	-4° 34' 40"	355° 07' 18"	-7° 05' 54"	0° 57' 58"	15' 47.64"	252° 30' 56"	0.10498
3	353° 16' 19"	-4° 33' 25"	355° 38' 09"	-6° 51' 15"	0° 57' 55"	15' 47.04"	252° 21' 40"	0.10778
4	353° 50' 18"	-4° 32' 08"	356° 08' 56"	-6° 36' 36"	0° 57' 53"	15' 46.44"	252° 12' 43"	0.11060
5	354° 24' 15"	-4° 30' 50"	356° 39' 39"	-6° 21' 56"	0° 57' 51"	15' 45.84"	252° 4' 05"	0.11345
6	354° 58' 08"	-4° 29' 31"	357° 10' 18"	-6° 07' 16"	0° 57' 49"	15' 45.24"	251° 55' 44"	0.11634
7	355° 31' 59"	-4° 28' 10"	357° 40' 53"	-5° 52' 35"	0° 57' 47"	15' 44.64"	251° 47' 40"	0.11924
8	356° 05' 47"	-4° 26' 47"	358° 11' 23"	-5° 37' 53"	0° 57' 44"	15' 44.04"	251° 39' 54"	0.12218
9	356° 39' 32"	-4° 25' 23"	358° 41' 49"	-5° 23' 11"	0° 57' 42"	15' 43.44"	251° 32' 24"	0.12514
10	357° 13' 14"	-4° 23' 58"	359° 12' 12"	-5° 08' 28"	0° 57' 40"	15' 42.84"	251° 25' 10"	0.12813
11	357° 46' 53"	-4° 22' 31"	359° 42' 30"	-4° 53' 46"	0° 57' 38"	15' 42.24"	251° 18' 12"	0.13115
12	358° 20' 29"	-4° 21' 03"	0° 12' 45"	-4° 39' 03"	0° 57' 36"	15' 41.64"	251° 11' 29"	0.13419
13	358° 54' 03"	-4° 19' 33"	0° 42' 56"	-4° 24' 20"	0° 57' 33"	15' 41.04"	251° 5' 02"	0.13725
14	359° 27' 33"	-4° 18' 03"	1° 13' 03"	-4° 09' 37"	0° 57' 31"	15' 40.44"	250° 58' 50"	0.14034
15	0° 01' 01"	-4° 16' 30"	1° 43' 07"	-3° 54' 54"	0° 57' 29"	15' 39.84"	250° 52' 52"	0.14346
16	0° 34' 26"	-4° 14' 57"	2° 13' 07"	-3° 40' 11"	0° 57' 27"	15' 39.25"	250° 47' 09"	0.14660
17	1° 07' 48"	-4° 13' 22"	2° 43' 04"	-3° 25' 29"	0° 57' 25"	15' 38.65"	250° 41' 40"	0.14976
18	1° 41' 07"	-4° 11' 45"	3° 12' 58"	-3° 10' 46"	0° 57' 22"	15' 38.05"	250° 36' 25"	0.15295
19	2° 14' 24"	-4° 10' 08"	3° 42' 48"	-2° 56' 04"	0° 57' 20"	15' 37.45"	250° 31' 23"	0.15616
20	2° 47' 37"	-4° 08' 29"	4° 12' 35"	-2° 41' 22"	0° 57' 18"	15' 36.86"	250° 26' 35"	0.15939
21	3° 20' 48"	-4° 06' 49"	4° 42' 19"	-2° 26' 41"	0° 57' 16"	15' 36.26"	250° 21' 60"	0.16264
22	3° 53' 56"	-4° 05' 08"	5° 11' 59"	-2° 12' 00"	0° 57' 14"	15' 35.67"	250° 17' 38"	0.16592
23	4° 27' 01"	-4° 03' 25"	5° 41' 37"	-1° 57' 20"	0° 57' 11"	15' 35.07"	250° 13' 29"	0.16922
24	5° 00' 03"	-4° 01' 41"	6° 11' 12"	-1° 42' 41"	0° 57' 09"	15' 34.48"	250° 9' 32"	0.17254

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Oblliquity	Equation Of Time
0	316° 09' 21"	-0.77"	318° 36' 16"	-15° 59' 46"	0.9858898	16' 13.36"	23° 26' 16"	-13 m 58 s
1	316° 11' 53"	-0.77"	318° 38' 47"	-15° 59' 01"	0.9858960	16' 13.36"	23° 26' 16"	-13 m 58 s
2	316° 14' 26"	-0.77"	318° 41' 18"	-15° 58' 15"	0.9859023	16' 13.35"	23° 26' 16"	-13 m 58 s
3	316° 16' 58"	-0.76"	318° 43' 49"	-15° 57' 30"	0.9859086	16' 13.35"	23° 26' 16"	-13 m 58 s
4	316° 19' 30"	-0.76"	318° 46' 20"	-15° 56' 44"	0.9859149	16' 13.34"	23° 26' 16"	-13 m 59 s
5	316° 22' 02"	-0.76"	318° 48' 51"	-15° 55' 59"	0.9859212	16' 13.33"	23° 26' 16"	-13 m 59 s
6	316° 24' 34"	-0.75"	318° 51' 22"	-15° 55' 13"	0.9859275	16' 13.33"	23° 26' 16"	-13 m 59 s
7	316° 27' 06"	-0.75"	318° 53' 52"	-15° 54' 28"	0.9859338	16' 13.32"	23° 26' 16"	-13 m 59 s
8	316° 29' 38"	-0.75"	318° 56' 23"	-15° 53' 42"	0.9859401	16' 13.31"	23° 26' 16"	-13 m 59 s
9	316° 32' 10"	-0.74"	318° 58' 54"	-15° 52' 57"	0.9859464	16' 13.31"	23° 26' 16"	-13 m 60 s
10	316° 34' 43"	-0.74"	319° 01' 25"	-15° 52' 11"	0.9859527	16' 13.30"	23° 26' 16"	-13 m 60 s
11	316° 37' 15"	-0.74"	319° 03' 56"	-15° 51' 25"	0.9859590	16' 13.30"	23° 26' 16"	-14 m 00 s
12	316° 39' 47"	-0.73"	319° 06' 27"	-15° 50' 39"	0.9859654	16' 13.29"	23° 26' 16"	-14 m 00 s
13	316° 42' 19"	-0.73"	319° 08' 57"	-15° 49' 54"	0.9859717	16' 13.28"	23° 26' 16"	-14 m 00 s
14	316° 44' 51"	-0.73"	319° 11' 28"	-15° 49' 08"	0.9859781	16' 13.28"	23° 26' 16"	-14 m 01 s
15	316° 47' 23"	-0.72"	319° 13' 59"	-15° 48' 22"	0.9859844	16' 13.27"	23° 26' 16"	-14 m 01 s
16	316° 49' 55"	-0.72"	319° 16' 30"	-15° 47' 36"	0.9859908	16' 13.26"	23° 26' 16"	-14 m 01 s
17	316° 52' 27"	-0.72"	319° 19' 00"	-15° 46' 50"	0.9859971	16' 13.26"	23° 26' 16"	-14 m 01 s
18	316° 54' 59"	-0.71"	319° 21' 31"	-15° 46' 05"	0.9860035	16' 13.25"	23° 26' 16"	-14 m 01 s
19	316° 57' 31"	-0.71"	319° 24' 02"	-15° 45' 19"	0.9860099	16' 13.25"	23° 26' 16"	-14 m 02 s
20	317° 00' 04"	-0.71"	319° 26' 32"	-15° 44' 33"	0.9860163	16' 13.24"	23° 26' 16"	-14 m 02 s
21	317° 02' 36"	-0.70"	319° 29' 03"	-15° 43' 47"	0.9860227	16' 13.23"	23° 26' 16"	-14 m 02 s
22	317° 05' 08"	-0.70"	319° 31' 34"	-15° 43' 01"	0.9860291	16' 13.23"	23° 26' 16"	-14 m 02 s
23	317° 07' 40"	-0.69"	319° 34' 04"	-15° 42' 15"	0.9860355	16' 13.22"	23° 26' 16"	-14 m 02 s
24	317° 10' 12"	-0.69"	319° 36' 35"	-15° 41' 29"	0.9860419	16' 13.21"	23° 26' 16"	-14 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	5° 00' 03"	-4° 01' 41"	6° 11' 12"	-1° 42' 41"	0° 57' 09"	15' 34.48"	250° 9' 32"	0.17254
1	5° 33' 02"	-3° 59' 56"	6° 40' 44"	-1° 28' 02"	0° 57' 07"	15' 33.89"	250° 5' 48"	0.17588
2	6° 05' 59"	-3° 58' 10"	7° 10' 13"	-1° 13' 24"	0° 57' 05"	15' 33.30"	250° 2' 16"	0.17924
3	6° 38' 52"	-3° 56' 22"	7° 39' 40"	0° 58' 47"	0° 57' 03"	15' 32.71"	249° 58' 57"	0.18262
4	7° 11' 43"	-3° 54' 34"	8° 09' 03"	0° 44' 10"	0° 57' 01"	15' 32.12"	249° 55' 49"	0.18602
5	7° 44' 31"	-3° 52' 44"	8° 38' 25"	0° 29' 35"	0° 56' 58"	15' 31.53"	249° 52' 53"	0.18944
6	8° 17' 17"	-3° 50' 53"	9° 07' 43"	0° 15' 01"	0° 56' 56"	15' 30.95"	249° 50' 08"	0.19288
7	8° 49' 59"	-3° 49' 01"	9° 36' 60"	0° 00' 28"	0° 56' 54"	15' 30.37"	249° 47' 35"	0.19633
8	9° 22' 39"	-3° 47' 08"	10° 06' 14"	0° 14' 04"	0° 56' 52"	15' 29.79"	249° 45' 13"	0.19981
9	9° 55' 16"	-3° 45' 14"	10° 35' 25"	0° 28' 35"	0° 56' 50"	15' 29.21"	249° 43' 03"	0.20330
10	10° 27' 51"	-3° 43' 19"	11° 04' 35"	0° 43' 05"	0° 56' 48"	15' 28.63"	249° 41' 03"	0.20681
11	11° 00' 22"	-3° 41' 22"	11° 33' 42"	0° 57' 33"	0° 56' 46"	15' 28.05"	249° 39' 14"	0.21034
12	11° 32' 51"	-3° 39' 25"	12° 02' 48"	1° 11' 60"	0° 56' 44"	15' 27.48"	249° 37' 36"	0.21389
13	12° 05' 18"	-3° 37' 26"	12° 31' 51"	1° 26' 25"	0° 56' 42"	15' 26.91"	249° 36' 09"	0.21745
14	12° 37' 41"	-3° 35' 27"	13° 00' 52"	1° 40' 49"	0° 56' 39"	15' 26.34"	249° 34' 52"	0.22103
15	13° 10' 02"	-3° 33' 27"	13° 29' 52"	1° 55' 12"	0° 56' 37"	15' 25.77"	249° 33' 46"	0.22462
16	13° 42' 20"	-3° 31' 25"	13° 58' 50"	2° 09' 33"	0° 56' 35"	15' 25.20"	249° 32' 50"	0.22823
17	14° 14' 36"	-3° 29' 23"	14° 27' 46"	2° 23' 52"	0° 56' 33"	15' 24.64"	249° 32' 04"	0.23186
18	14° 46' 49"	-3° 27' 19"	14° 56' 40"	2° 38' 09"	0° 56' 31"	15' 24.08"	249° 31' 28"	0.23550
19	15° 18' 59"	-3° 25' 15"	15° 25' 33"	2° 52' 25"	0° 56' 29"	15' 23.52"	249° 31' 02"	0.23915
20	15° 51' 06"	-3° 23' 10"	15° 54' 24"	3° 06' 39"	0° 56' 27"	15' 22.97"	249° 30' 46"	0.24282
21	16° 23' 12"	-3° 21' 04"	16° 23' 14"	3° 20' 51"	0° 56' 25"	15' 22.41"	249° 30' 40"	0.24650
22	16° 55' 14"	-3° 18' 57"	16° 52' 03"	3° 35' 01"	0° 56' 23"	15' 21.86"	249° 30' 44"	0.25020
23	17° 27' 14"	-3° 16' 49"	17° 20' 50"	3° 49' 09"	0° 56' 21"	15' 21.31"	249° 30' 57"	0.25391
24	17° 59' 11"	-3° 14' 40"	17° 49' 36"	4° 03' 15"	0° 56' 19"	15' 20.77"	249° 31' 20"	0.25763

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	317° 10' 12"	-0.69"	319° 36' 35"	-15° 41' 29"	0.9860419	16' 13.21"	23° 26' 16"	-14 m 02 s
1	317° 12' 44"	-0.69"	319° 39' 05"	-15° 40' 42"	0.9860483	16' 13.21"	23° 26' 16"	-14 m 03 s
2	317° 15' 16"	-0.68"	319° 41' 36"	-15° 39' 56"	0.9860547	16' 13.20"	23° 26' 16"	-14 m 03 s
3	317° 17' 48"	-0.68"	319° 44' 06"	-15° 39' 10"	0.9860611	16' 13.20"	23° 26' 16"	-14 m 03 s
4	317° 20' 20"	-0.67"	319° 46' 37"	-15° 38' 24"	0.9860676	16' 13.19"	23° 26' 16"	-14 m 03 s
5	317° 22' 52"	-0.67"	319° 49' 07"	-15° 37' 38"	0.9860740	16' 13.18"	23° 26' 16"	-14 m 03 s
6	317° 25' 24"	-0.67"	319° 51' 37"	-15° 36' 52"	0.9860804	16' 13.18"	23° 26' 16"	-14 m 04 s
7	317° 27' 56"	-0.66"	319° 54' 08"	-15° 36' 05"	0.9860869	16' 13.17"	23° 26' 16"	-14 m 04 s
8	317° 30' 28"	-0.66"	319° 56' 38"	-15° 35' 19"	0.9860934	16' 13.16"	23° 26' 16"	-14 m 04 s
9	317° 33' 00"	-0.65"	319° 59' 09"	-15° 34' 33"	0.9860998	16' 13.16"	23° 26' 16"	-14 m 04 s
10	317° 35' 33"	-0.65"	320° 01' 39"	-15° 33' 46"	0.9861063	16' 13.15"	23° 26' 16"	-14 m 04 s
11	317° 38' 05"	-0.65"	320° 04' 09"	-15° 33' 00"	0.9861128	16' 13.14"	23° 26' 16"	-14 m 04 s
12	317° 40' 37"	-0.64"	320° 06' 40"	-15° 32' 14"	0.9861192	16' 13.14"	23° 26' 16"	-14 m 05 s
13	317° 43' 09"	-0.64"	320° 09' 10"	-15° 31' 27"	0.9861257	16' 13.13"	23° 26' 16"	-14 m 05 s
14	317° 45' 41"	-0.63"	320° 11' 40"	-15° 30' 41"	0.9861322	16' 13.13"	23° 26' 16"	-14 m 05 s
15	317° 48' 13"	-0.63"	320° 14' 10"	-15° 29' 54"	0.9861387	16' 13.12"	23° 26' 16"	-14 m 05 s
16	317° 50' 45"	-0.62"	320° 16' 40"	-15° 29' 08"	0.9861452	16' 13.11"	23° 26' 16"	-14 m 05 s
17	317° 53' 17"	-0.62"	320° 19' 11"	-15° 28' 21"	0.9861518	16' 13.11"	23° 26' 16"	-14 m 05 s
18	317° 55' 49"	-0.61"	320° 21' 41"	-15° 27' 35"	0.9861583	16' 13.10"	23° 26' 16"	-14 m 05 s
19	317° 58' 21"	-0.61"	320° 24' 11"	-15° 26' 48"	0.9861648	16' 13.09"	23° 26' 16"	-14 m 06 s
20	318° 00' 53"	-0.61"	320° 26' 41"	-15° 26' 02"	0.9861713	16' 13.09"	23° 26' 16"	-14 m 06 s
21	318° 03' 25"	-0.60"	320° 29' 11"	-15° 25' 15"	0.9861779	16' 13.08"	23° 26' 16"	-14 m 06 s
22	318° 05' 57"	-0.60"	320° 31' 41"	-15° 24' 28"	0.9861844	16' 13.07"	23° 26' 16"	-14 m 06 s
23	318° 08' 29"	-0.59"	320° 34' 11"	-15° 23' 42"	0.9861910	16' 13.07"	23° 26' 16"	-14 m 06 s
24	318° 11' 01"	-0.59"	320° 36' 41"	-15° 22' 55"	0.9861975	16' 13.06"	23° 26' 16"	-14 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	17° 59' 11"	-3° 14' 40"	17° 49' 36"	4° 03' 15"	0° 56' 19"	15' 20.77"	249° 31' 20"	0.25763
1	18° 31' 06"	-3° 12' 30"	18° 18' 21"	4° 17' 19"	0° 56' 17"	15' 20.23"	249° 31' 52"	0.26136
2	19° 02' 58"	-3° 10' 20"	18° 47' 04"	4° 31' 21"	0° 56' 15"	15' 19.69"	249° 32' 34"	0.26511
3	19° 34' 48"	-3° 08' 08"	19° 15' 47"	4° 45' 21"	0° 56' 13"	15' 19.15"	249° 33' 25"	0.26887
4	20° 06' 35"	-3° 05' 56"	19° 44' 29"	4° 59' 18"	0° 56' 11"	15' 18.62"	249° 34' 25"	0.27264
5	20° 38' 20"	-3° 03' 43"	20° 13' 09"	5° 13' 14"	0° 56' 09"	15' 18.08"	249° 35' 35"	0.27642
6	21° 10' 02"	-3° 01' 30"	20° 41' 49"	5° 27' 07"	0° 56' 07"	15' 17.56"	249° 36' 53"	0.28022
7	21° 41' 42"	-2° 59' 15"	21° 10' 29"	5° 40' 57"	0° 56' 05"	15' 17.03"	249° 38' 21"	0.28402
8	22° 13' 20"	-2° 56' 60"	21° 39' 07"	5° 54' 46"	0° 56' 03"	15' 16.51"	249° 39' 57"	0.28783
9	22° 44' 55"	-2° 54' 44"	22° 07' 45"	6° 08' 31"	0° 56' 01"	15' 15.99"	249° 41' 43"	0.29166
10	23° 16' 27"	-2° 52' 27"	22° 36' 22"	6° 22' 15"	0° 55' 60"	15' 15.48"	249° 43' 37"	0.29549
11	23° 47' 58"	-2° 50' 10"	23° 04' 59"	6° 35' 56"	0° 55' 58"	15' 14.97"	249° 45' 40"	0.29934
12	24° 19' 26"	-2° 47' 51"	23° 33' 35"	6° 49' 34"	0° 55' 56"	15' 14.46"	249° 47' 51"	0.30319
13	24° 50' 51"	-2° 45' 33"	24° 02' 11"	7° 03' 09"	0° 55' 54"	15' 13.95"	249° 50' 11"	0.30705
14	25° 22' 15"	-2° 43' 13"	24° 30' 47"	7° 16' 42"	0° 55' 52"	15' 13.45"	249° 52' 40"	0.31092
15	25° 53' 36"	-2° 40' 53"	24° 59' 22"	7° 30' 12"	0° 55' 50"	15' 12.95"	249° 55' 18"	0.31480
16	26° 24' 54"	-2° 38' 32"	25° 27' 57"	7° 43' 40"	0° 55' 48"	15' 12.46"	249° 58' 04"	0.31869
17	26° 56' 11"	-2° 36' 11"	25° 56' 32"	7° 57' 04"	0° 55' 47"	15' 11.97"	250° 0' 58"	0.32259
18	27° 27' 25"	-2° 33' 48"	26° 25' 07"	8° 10' 26"	0° 55' 45"	15' 11.48"	250° 4' 00"	0.32649
19	27° 58' 37"	-2° 31' 26"	26° 53' 42"	8° 23' 45"	0° 55' 43"	15' 11.00"	250° 7' 11"	0.33040
20	28° 29' 47"	-2° 29' 02"	27° 22' 17"	8° 37' 01"	0° 55' 41"	15' 10.52"	250° 10' 31"	0.33432
21	29° 00' 54"	-2° 26' 39"	27° 50' 52"	8° 50' 14"	0° 55' 40"	15' 10.04"	250° 13' 58"	0.33824
22	29° 31' 60"	-2° 24' 14"	28° 19' 27"	9° 03' 23"	0° 55' 38"	15' 09.57"	250° 17' 34"	0.34217
23	30° 03' 03"	-2° 21' 49"	28° 48' 02"	9° 16' 30"	0° 55' 36"	15' 09.10"	250° 21' 18"	0.34611
24	30° 34' 04"	-2° 19' 23"	29° 16' 38"	9° 29' 34"	0° 55' 34"	15' 08.64"	250° 25' 09"	0.35005

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	318° 11' 01"	-0.59"	320° 36' 41"	-15° 22' 55"	0.9861975	16' 13.06"	23° 26' 16"	-14 m 06 s
1	318° 13' 33"	-0.58"	320° 39' 11"	-15° 22' 08"	0.9862041	16' 13.05"	23° 26' 16"	-14 m 07 s
2	318° 16' 05"	-0.58"	320° 41' 41"	-15° 21' 21"	0.9862107	16' 13.05"	23° 26' 16"	-14 m 07 s
3	318° 18' 37"	-0.57"	320° 44' 11"	-15° 20' 35"	0.9862173	16' 13.04"	23° 26' 16"	-14 m 07 s
4	318° 21' 09"	-0.57"	320° 46' 41"	-15° 19' 48"	0.9862239	16' 13.03"	23° 26' 16"	-14 m 07 s
5	318° 23' 41"	-0.56"	320° 49' 11"	-15° 19' 01"	0.9862304	16' 13.03"	23° 26' 16"	-14 m 07 s
6	318° 26' 13"	-0.56"	320° 51' 41"	-15° 18' 14"	0.9862370	16' 13.02"	23° 26' 16"	-14 m 07 s
7	318° 28' 45"	-0.55"	320° 54' 11"	-15° 17' 27"	0.9862437	16' 13.02"	23° 26' 16"	-14 m 07 s
8	318° 31' 17"	-0.55"	320° 56' 41"	-15° 16' 40"	0.9862503	16' 13.01"	23° 26' 16"	-14 m 07 s
9	318° 33' 49"	-0.54"	320° 59' 11"	-15° 15' 53"	0.9862569	16' 13.00"	23° 26' 16"	-14 m 08 s
10	318° 36' 21"	-0.54"	321° 01' 41"	-15° 15' 06"	0.9862635	16' 13.00"	23° 26' 16"	-14 m 08 s
11	318° 38' 53"	-0.53"	321° 04' 10"	-15° 14' 19"	0.9862701	16' 12.99"	23° 26' 16"	-14 m 08 s
12	318° 41' 25"	-0.53"	321° 06' 40"	-15° 13' 32"	0.9862768	16' 12.98"	23° 26' 16"	-14 m 08 s
13	318° 43' 57"	-0.52"	321° 09' 10"	-15° 12' 45"	0.9862834	16' 12.98"	23° 26' 16"	-14 m 08 s
14	318° 46' 29"	-0.52"	321° 11' 40"	-15° 11' 58"	0.9862901	16' 12.97"	23° 26' 16"	-14 m 08 s
15	318° 49' 01"	-0.51"	321° 14' 09"	-15° 11' 11"	0.9862968	16' 12.96"	23° 26' 16"	-14 m 08 s
16	318° 51' 33"	-0.51"	321° 16' 39"	-15° 10' 24"	0.9863034	16' 12.96"	23° 26' 16"	-14 m 08 s
17	318° 54' 05"	-0.50"	321° 19' 09"	-15° 09' 36"	0.9863101	16' 12.95"	23° 26' 16"	-14 m 09 s
18	318° 56' 37"	-0.50"	321° 21' 38"	-15° 08' 49"	0.9863168	16' 12.94"	23° 26' 16"	-14 m 09 s
19	318° 59' 09"	-0.49"	321° 24' 08"	-15° 08' 02"	0.9863235	16' 12.94"	23° 26' 16"	-14 m 09 s
20	319° 01' 41"	-0.49"	321° 26' 38"	-15° 07' 15"	0.9863302	16' 12.93"	23° 26' 16"	-14 m 09 s
21	319° 04' 13"	-0.48"	321° 29' 07"	-15° 06' 27"	0.9863369	16' 12.92"	23° 26' 16"	-14 m 09 s
22	319° 06' 45"	-0.48"	321° 31' 37"	-15° 05' 40"	0.9863436	16' 12.92"	23° 26' 16"	-14 m 09 s
23	319° 09' 17"	-0.47"	321° 34' 06"	-15° 04' 53"	0.9863503	16' 12.91"	23° 26' 16"	-14 m 09 s
24	319° 11' 49"	-0.47"	321° 36' 36"	-15° 04' 05"	0.9863570	16' 12.90"	23° 26' 16"	-14 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	30° 34' 04"	-2° 19' 23"	29° 16' 38"	9° 29' 34"	0° 55' 34"	15' 08.64"	250° 25' 09"	0.35005
1	31° 05' 04"	-2° 16' 57"	29° 45' 14"	9° 42' 35"	0° 55' 33"	15' 08.18"	250° 29' 09"	0.35400
2	31° 36' 01"	-2° 14' 31"	30° 13' 50"	9° 55' 32"	0° 55' 31"	15' 07.72"	250° 33' 17"	0.35795
3	32° 06' 56"	-2° 12' 04"	30° 42' 27"	10° 08' 26"	0° 55' 29"	15' 07.27"	250° 37' 33"	0.36191
4	32° 37' 49"	-2° 09' 36"	31° 11' 05"	10° 21' 17"	0° 55' 28"	15' 06.82"	250° 41' 57"	0.36587
5	33° 08' 40"	-2° 07' 08"	31° 39' 43"	10° 34' 04"	0° 55' 26"	15' 06.38"	250° 46' 29"	0.36984
6	33° 39' 28"	-2° 04' 39"	32° 08' 21"	10° 46' 49"	0° 55' 25"	15' 05.94"	250° 51' 08"	0.37381
7	34° 10' 16"	-2° 02' 10"	32° 37' 01"	10° 59' 29"	0° 55' 23"	15' 05.50"	250° 55' 56"	0.37779
8	34° 41' 01"	-1° 59' 41"	33° 05' 41"	11° 12' 07"	0° 55' 21"	15' 05.07"	251° 0' 51"	0.38177
9	35° 11' 44"	-1° 57' 11"	33° 34' 21"	11° 24' 41"	0° 55' 20"	15' 04.65"	251° 5' 54"	0.38576
10	35° 42' 25"	-1° 54' 41"	34° 03' 03"	11° 37' 11"	0° 55' 18"	15' 04.22"	251° 11' 05"	0.38974
11	36° 13' 04"	-1° 52' 10"	34° 31' 45"	11° 49' 38"	0° 55' 17"	15' 03.80"	251° 16' 23"	0.39373
12	36° 43' 42"	-1° 49' 39"	35° 00' 29"	12° 02' 01"	0° 55' 15"	15' 03.39"	251° 21' 49"	0.39773
13	37° 14' 18"	-1° 47' 07"	35° 29' 13"	12° 14' 21"	0° 55' 14"	15' 02.98"	251° 27' 23"	0.40172
14	37° 44' 51"	-1° 44' 35"	35° 57' 59"	12° 26' 37"	0° 55' 12"	15' 02.57"	251° 33' 04"	0.40572
15	38° 15' 24"	-1° 42' 03"	36° 26' 46"	12° 38' 49"	0° 55' 11"	15' 02.17"	251° 38' 53"	0.40972
16	38° 45' 54"	-1° 39' 31"	36° 55' 33"	12° 50' 57"	0° 55' 09"	15' 01.77"	251° 44' 49"	0.41372
17	39° 16' 23"	-1° 36' 58"	37° 24' 23"	13° 03' 02"	0° 55' 08"	15' 01.38"	251° 50' 53"	0.41773
18	39° 46' 49"	-1° 34' 24"	37° 53' 13"	13° 15' 03"	0° 55' 06"	15' 00.99"	251° 57' 04"	0.42173
19	40° 17' 15"	-1° 31' 51"	38° 22' 04"	13° 26' 60"	0° 55' 05"	15' 00.61"	252° 3' 23"	0.42574
20	40° 47' 38"	-1° 29' 17"	38° 50' 57"	13° 38' 53"	0° 55' 04"	15' 00.23"	252° 9' 49"	0.42975
21	41° 18' 00"	-1° 26' 43"	39° 19' 52"	13° 50' 42"	0° 55' 02"	14' 59.86"	252° 16' 22"	0.43376
22	41° 48' 20"	-1° 24' 08"	39° 48' 48"	14° 02' 27"	0° 55' 01"	14' 59.49"	252° 23' 03"	0.43777
23	42° 18' 39"	-1° 21' 34"	40° 17' 45"	14° 14' 08"	0° 54' 60"	14' 59.12"	252° 29' 52"	0.44178
24	42° 48' 56"	-1° 18' 59"	40° 46' 44"	14° 25' 45"	0° 54' 58"	14' 58.76"	252° 36' 47"	0.44579

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	319° 11' 49"	-0.47"	321° 36' 36"	-15° 04' 05"	0.9863570	16' 12.90"	23° 26' 16"	-14 m 09 s
1	319° 14' 21"	-0.46"	321° 39' 05"	-15° 03' 18"	0.9863637	16' 12.90"	23° 26' 16"	-14 m 10 s
2	319° 16' 53"	-0.46"	321° 41' 35"	-15° 02' 31"	0.9863705	16' 12.89"	23° 26' 16"	-14 m 10 s
3	319° 19' 25"	-0.45"	321° 44' 04"	-15° 01' 43"	0.9863772	16' 12.88"	23° 26' 16"	-14 m 10 s
4	319° 21' 56"	-0.45"	321° 46' 34"	-15° 00' 56"	0.9863840	16' 12.88"	23° 26' 16"	-14 m 10 s
5	319° 24' 28"	-0.44"	321° 49' 03"	-15° 00' 08"	0.9863907	16' 12.87"	23° 26' 16"	-14 m 10 s
6	319° 27' 00"	-0.43"	321° 51' 33"	-14° 59' 21"	0.9863975	16' 12.86"	23° 26' 16"	-14 m 10 s
7	319° 29' 32"	-0.43"	321° 54' 02"	-14° 58' 33"	0.9864043	16' 12.86"	23° 26' 16"	-14 m 10 s
8	319° 32' 04"	-0.42"	321° 56' 31"	-14° 57' 46"	0.9864110	16' 12.85"	23° 26' 16"	-14 m 10 s
9	319° 34' 36"	-0.42"	321° 59' 01"	-14° 56' 58"	0.9864178	16' 12.84"	23° 26' 16"	-14 m 10 s
10	319° 37' 08"	-0.41"	322° 01' 30"	-14° 56' 10"	0.9864246	16' 12.84"	23° 26' 16"	-14 m 10 s
11	319° 39' 40"	-0.41"	322° 03' 59"	-14° 55' 23"	0.9864314	16' 12.83"	23° 26' 16"	-14 m 11 s
12	319° 42' 12"	-0.40"	322° 06' 29"	-14° 54' 35"	0.9864382	16' 12.82"	23° 26' 16"	-14 m 11 s
13	319° 44' 44"	-0.40"	322° 08' 58"	-14° 53' 47"	0.9864450	16' 12.82"	23° 26' 16"	-14 m 11 s
14	319° 47' 16"	-0.39"	322° 11' 27"	-14° 52' 60"	0.9864519	16' 12.81"	23° 26' 16"	-14 m 11 s
15	319° 49' 48"	-0.39"	322° 13' 56"	-14° 52' 12"	0.9864587	16' 12.80"	23° 26' 16"	-14 m 11 s
16	319° 52' 20"	-0.38"	322° 16' 26"	-14° 51' 24"	0.9864655	16' 12.80"	23° 26' 16"	-14 m 11 s
17	319° 54' 52"	-0.37"	322° 18' 55"	-14° 50' 36"	0.9864724	16' 12.79"	23° 26' 16"	-14 m 11 s
18	319° 57' 23"	-0.37"	322° 21' 24"	-14° 49' 48"	0.9864792	16' 12.78"	23° 26' 16"	-14 m 11 s
19	319° 59' 55"	-0.36"	322° 23' 53"	-14° 49' 01"	0.9864861	16' 12.78"	23° 26' 16"	-14 m 11 s
20	320° 02' 27"	-0.36"	322° 26' 22"	-14° 48' 13"	0.9864929	16' 12.77"	23° 26' 16"	-14 m 11 s
21	320° 04' 59"	-0.35"	322° 28' 51"	-14° 47' 25"	0.9864998	16' 12.76"	23° 26' 16"	-14 m 11 s
22	320° 07' 31"	-0.35"	322° 31' 20"	-14° 46' 37"	0.9865067	16' 12.76"	23° 26' 16"	-14 m 12 s
23	320° 10' 03"	-0.34"	322° 33' 49"	-14° 45' 49"	0.9865136	16' 12.75"	23° 26' 16"	-14 m 12 s
24	320° 12' 35"	-0.34"	322° 36' 18"	-14° 45' 01"	0.9865204	16' 12.74"	23° 26' 16"	-14 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	42° 48' 56"	-1° 18' 59"	40° 46' 44"	14° 25' 45"	0° 54' 58"	14' 58.76"	252° 36' 47"	0.44579
1	43° 19' 12"	-1° 16' 23"	41° 15' 44"	14° 37' 18"	0° 54' 57"	14' 58.41"	252° 43' 50"	0.44980
2	43° 49' 26"	-1° 13' 48"	41° 44' 46"	14° 48' 46"	0° 54' 56"	14' 58.05"	252° 50' 60"	0.45381
3	44° 19' 38"	-1° 11' 12"	42° 13' 50"	15° 00' 11"	0° 54' 54"	14' 57.71"	252° 58' 17"	0.45782
4	44° 49' 49"	-1° 08' 37"	42° 42' 55"	15° 11' 31"	0° 54' 53"	14' 57.37"	253° 5' 42"	0.46182
5	45° 19' 59"	-1° 06' 00"	43° 12' 03"	15° 22' 47"	0° 54' 52"	14' 57.03"	253° 13' 13"	0.46583
6	45° 50' 07"	-1° 03' 24"	43° 41' 12"	15° 33' 59"	0° 54' 51"	14' 56.70"	253° 20' 52"	0.46984
7	46° 20' 14"	-1° 00' 48"	44° 10' 23"	15° 45' 07"	0° 54' 49"	14' 56.37"	253° 28' 38"	0.47384
8	46° 50' 20"	0°-58' 11"	44° 39' 36"	15° 56' 10"	0° 54' 48"	14' 56.05"	253° 36' 31"	0.47784
9	47° 20' 24"	0°-55' 34"	45° 08' 50"	16° 07' 08"	0° 54' 47"	14' 55.73"	253° 44' 32"	0.48184
10	47° 50' 26"	0°-52' 58"	45° 38' 07"	16° 18' 03"	0° 54' 46"	14' 55.41"	253° 52' 39"	0.48584
11	48° 20' 28"	0°-50' 21"	46° 07' 26"	16° 28' 52"	0° 54' 45"	14' 55.10"	254° 0' 53"	0.48984
12	48° 50' 28"	0°-47' 43"	46° 36' 47"	16° 39' 37"	0° 54' 44"	14' 54.80"	254° 9' 15"	0.49383
13	49° 20' 27"	0°-45' 06"	47° 06' 10"	16° 50' 18"	0° 54' 43"	14' 54.50"	254° 17' 43"	0.49783
14	49° 50' 24"	0°-42' 29"	47° 35' 35"	17° 00' 54"	0° 54' 41"	14' 54.21"	254° 26' 18"	0.50181
15	50° 20' 21"	0°-39' 51"	48° 05' 02"	17° 11' 25"	0° 54' 40"	14' 53.92"	254° 35' 01"	0.50580
16	50° 50' 16"	0°-37' 14"	48° 34' 31"	17° 21' 52"	0° 54' 39"	14' 53.63"	254° 43' 50"	0.50978
17	51° 20' 10"	0°-34' 36"	49° 04' 03"	17° 32' 14"	0° 54' 38"	14' 53.35"	254° 52' 46"	0.51376
18	51° 50' 03"	0°-31' 59"	49° 33' 37"	17° 42' 31"	0° 54' 37"	14' 53.08"	255° 1' 49"	0.51774
19	52° 19' 55"	0°-29' 21"	50° 03' 13"	17° 52' 44"	0° 54' 36"	14' 52.81"	255° 10' 59"	0.52171
20	52° 49' 46"	0°-26' 43"	50° 32' 52"	18° 02' 51"	0° 54' 35"	14' 52.54"	255° 20' 16"	0.52568
21	53° 19' 36"	0°-24' 05"	51° 02' 33"	18° 12' 54"	0° 54' 34"	14' 52.28"	255° 29' 40"	0.52964
22	53° 49' 24"	0°-21' 28"	51° 32' 16"	18° 22' 52"	0° 54' 33"	14' 52.03"	255° 39' 10"	0.53360
23	54° 19' 12"	0°-18' 50"	52° 02' 02"	18° 32' 44"	0° 54' 33"	14' 51.78"	255° 48' 47"	0.53755
24	54° 48' 59"	0°-16' 12"	52° 31' 50"	18° 42' 32"	0° 54' 32"	14' 51.53"	255° 58' 31"	0.54150

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	320° 12' 35"	-0.34"	322° 36' 18"	-14° 45' 01"	0.9865204	16' 12.74"	23° 26' 16"	-14 m 12 s
1	320° 15' 07"	-0.33"	322° 38' 47"	-14° 44' 13"	0.9865273	16' 12.74"	23° 26' 16"	-14 m 12 s
2	320° 17' 39"	-0.32"	322° 41' 16"	-14° 43' 25"	0.9865343	16' 12.73"	23° 26' 16"	-14 m 12 s
3	320° 20' 11"	-0.32"	322° 43' 45"	-14° 42' 37"	0.9865412	16' 12.72"	23° 26' 16"	-14 m 12 s
4	320° 22' 42"	-0.31"	322° 46' 14"	-14° 41' 49"	0.9865481	16' 12.71"	23° 26' 16"	-14 m 12 s
5	320° 25' 14"	-0.31"	322° 48' 43"	-14° 41' 00"	0.9865550	16' 12.71"	23° 26' 16"	-14 m 12 s
6	320° 27' 46"	-0.30"	322° 51' 12"	-14° 40' 12"	0.9865620	16' 12.70"	23° 26' 16"	-14 m 12 s
7	320° 30' 18"	-0.30"	322° 53' 41"	-14° 39' 24"	0.9865689	16' 12.69"	23° 26' 16"	-14 m 12 s
8	320° 32' 50"	-0.29"	322° 56' 10"	-14° 38' 36"	0.9865758	16' 12.69"	23° 26' 16"	-14 m 12 s
9	320° 35' 22"	-0.29"	322° 58' 39"	-14° 37' 48"	0.9865828	16' 12.68"	23° 26' 16"	-14 m 12 s
10	320° 37' 54"	-0.28"	323° 01' 07"	-14° 36' 59"	0.9865898	16' 12.67"	23° 26' 16"	-14 m 12 s
11	320° 40' 25"	-0.27"	323° 03' 36"	-14° 36' 11"	0.9865967	16' 12.67"	23° 26' 16"	-14 m 12 s
12	320° 42' 57"	-0.27"	323° 06' 05"	-14° 35' 23"	0.9866037	16' 12.66"	23° 26' 16"	-14 m 13 s
13	320° 45' 29"	-0.26"	323° 08' 34"	-14° 34' 35"	0.9866107	16' 12.65"	23° 26' 16"	-14 m 13 s
14	320° 48' 01"	-0.26"	323° 11' 03"	-14° 33' 46"	0.9866177	16' 12.65"	23° 26' 16"	-14 m 13 s
15	320° 50' 33"	-0.25"	323° 13' 31"	-14° 32' 58"	0.9866247	16' 12.64"	23° 26' 16"	-14 m 13 s
16	320° 53' 05"	-0.25"	323° 15' 60"	-14° 32' 09"	0.9866317	16' 12.63"	23° 26' 16"	-14 m 13 s
17	320° 55' 37"	-0.24"	323° 18' 29"	-14° 31' 21"	0.9866387	16' 12.63"	23° 26' 16"	-14 m 13 s
18	320° 58' 08"	-0.24"	323° 20' 57"	-14° 30' 33"	0.9866458	16' 12.62"	23° 26' 16"	-14 m 13 s
19	321° 00' 40"	-0.23"	323° 23' 26"	-14° 29' 44"	0.9866528	16' 12.61"	23° 26' 16"	-14 m 13 s
20	321° 03' 12"	-0.22"	323° 25' 55"	-14° 28' 56"	0.9866598	16' 12.60"	23° 26' 16"	-14 m 13 s
21	321° 05' 44"	-0.22"	323° 28' 23"	-14° 28' 07"	0.9866669	16' 12.60"	23° 26' 16"	-14 m 13 s
22	321° 08' 16"	-0.21"	323° 30' 52"	-14° 27' 19"	0.9866739	16' 12.59"	23° 26' 16"	-14 m 13 s
23	321° 10' 48"	-0.21"	323° 33' 20"	-14° 26' 30"	0.9866810	16' 12.58"	23° 26' 16"	-14 m 13 s
24	321° 13' 19"	-0.20"	323° 35' 49"	-14° 25' 41"	0.9866881	16' 12.58"	23° 26' 16"	-14 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	54° 48' 59"	0°-16' 12"	52° 31' 50"	18° 42' 32"	0° 54' 32"	14' 51.53"	255° 58' 31"	0.54150
1	55° 18' 43"	0°-13' 34"	53° 01' 41"	18° 52' 15"	0° 54' 31"	14' 51.29"	256° 8' 22"	0.54545
2	55° 48' 29"	0°-10' 56"	53° 31' 34"	19° 01' 53"	0° 54' 30"	14' 51.06"	256° 18' 19"	0.54938
3	56° 18' 13"	0° -8' 19"	54° 01' 30"	19° 11' 25"	0° 54' 29"	14' 50.82"	256° 28' 24"	0.55332
4	56° 47' 56"	0° -5' 41"	54° 31' 28"	19° 20' 53"	0° 54' 28"	14' 50.60"	256° 38' 35"	0.55725
5	57° 17' 38"	0° -3' 03"	55° 01' 29"	19° 30' 15"	0° 54' 27"	14' 50.38"	256° 48' 52"	0.56117
6	57° 47' 20"	0° 00'-26"	55° 31' 33"	19° 39' 32"	0° 54' 27"	14' 50.16"	256° 59' 16"	0.56509
7	58° 17' 00"	0° 02' 12"	56° 01' 39"	19° 48' 44"	0° 54' 26"	14' 49.95"	257° 9' 47"	0.56900
8	58° 46' 40"	0° 04' 49"	56° 31' 48"	19° 57' 50"	0° 54' 25"	14' 49.74"	257° 20' 24"	0.57290
9	59° 16' 19"	0° 07' 26"	57° 01' 60"	20° 06' 52"	0° 54' 24"	14' 49.54"	257° 31' 08"	0.57680
10	59° 45' 57"	0° 10' 04"	57° 32' 14"	20° 15' 47"	0° 54' 24"	14' 49.35"	257° 41' 59"	0.58069
11	60° 15' 35"	0° 12' 41"	58° 02' 31"	20° 24' 38"	0° 54' 23"	14' 49.16"	257° 52' 56"	0.58457
12	60° 45' 11"	0° 15' 15"	58° 32' 52"	20° 33' 20"	0° 54' 22"	14' 48.97"	258° 3' 59"	0.58845
13	61° 14' 48"	0° 17' 52"	59° 03' 14"	20° 41' 60"	0° 54' 22"	14' 48.79"	258° 15' 09"	0.59232
14	61° 44' 23"	0° 20' 29"	59° 33' 39"	20° 50' 34"	0° 54' 21"	14' 48.61"	258° 26' 26"	0.59618
15	62° 13' 58"	0° 23' 05"	60° 04' 08"	20° 59' 02"	0° 54' 20"	14' 48.44"	258° 37' 49"	0.60004
16	62° 43' 32"	0° 25' 42"	60° 34' 38"	21° 07' 25"	0° 54' 20"	14' 48.27"	258° 49' 18"	0.60388
17	63° 13' 06"	0° 28' 18"	61° 05' 12"	21° 15' 42"	0° 54' 19"	14' 48.11"	259° 0' 54"	0.60772
18	63° 42' 39"	0° 30' 54"	61° 35' 49"	21° 23' 53"	0° 54' 19"	14' 47.95"	259° 12' 36"	0.61155
19	64° 12' 12"	0° 33' 30"	62° 06' 28"	21° 31' 59"	0° 54' 18"	14' 47.80"	259° 24' 24"	0.61538
20	64° 41' 44"	0° 36' 05"	62° 37' 10"	21° 39' 59"	0° 54' 17"	14' 47.65"	259° 36' 19"	0.61919
21	65° 11' 16"	0° 38' 41"	63° 07' 56"	21° 47' 53"	0° 54' 17"	14' 47.51"	259° 48' 20"	0.62300
22	65° 40' 47"	0° 41' 16"	63° 38' 44"	21° 55' 41"	0° 54' 16"	14' 47.37"	260° 0' 27"	0.62679
23	66° 10' 18"	0° 43' 51"	64° 09' 35"	22° 03' 24"	0° 54' 16"	14' 47.24"	260° 12' 41"	0.63058
24	66° 39' 48"	0° 46' 26"	64° 40' 28"	22° 11' 00"	0° 54' 15"	14' 47.11"	260° 25' 00"	0.63436

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	321° 13' 19"	-0.20"	323° 35' 49"	-14° 25' 41"	0.9866881	16' 12.58"	23° 26' 16"	-14 m 13 s
1	321° 15' 51"	-0.20"	323° 38' 17"	-14° 24' 53"	0.9866951	16' 12.57"	23° 26' 16"	-14 m 13 s
2	321° 18' 23"	-0.19"	323° 40' 46"	-14° 24' 04"	0.9867022	16' 12.56"	23° 26' 16"	-14 m 13 s
3	321° 20' 55"	-0.19"	323° 43' 14"	-14° 23' 15"	0.9867093	16' 12.56"	23° 26' 16"	-14 m 13 s
4	321° 23' 27"	-0.18"	323° 45' 43"	-14° 22' 27"	0.9867164	16' 12.55"	23° 26' 16"	-14 m 13 s
5	321° 25' 59"	-0.17"	323° 48' 11"	-14° 21' 38"	0.9867235	16' 12.54"	23° 26' 16"	-14 m 13 s
6	321° 28' 30"	-0.17"	323° 50' 40"	-14° 20' 49"	0.9867306	16' 12.53"	23° 26' 16"	-14 m 13 s
7	321° 31' 02"	-0.16"	323° 53' 08"	-14° 20' 01"	0.9867378	16' 12.53"	23° 26' 16"	-14 m 13 s
8	321° 33' 34"	-0.16"	323° 55' 36"	-14° 19' 12"	0.9867449	16' 12.52"	23° 26' 16"	-14 m 13 s
9	321° 36' 06"	-0.15"	323° 58' 05"	-14° 18' 23"	0.9867520	16' 12.51"	23° 26' 16"	-14 m 14 s
10	321° 38' 38"	-0.15"	324° 00' 33"	-14° 17' 34"	0.9867592	16' 12.51"	23° 26' 16"	-14 m 14 s
11	321° 41' 09"	-0.14"	324° 03' 01"	-14° 16' 45"	0.9867663	16' 12.50"	23° 26' 16"	-14 m 14 s
12	321° 43' 41"	-0.14"	324° 05' 30"	-14° 15' 56"	0.9867735	16' 12.49"	23° 26' 16"	-14 m 14 s
13	321° 46' 13"	-0.13"	324° 07' 58"	-14° 15' 07"	0.9867807	16' 12.49"	23° 26' 16"	-14 m 14 s
14	321° 48' 45"	-0.12"	324° 10' 26"	-14° 14' 18"	0.9867878	16' 12.48"	23° 26' 16"	-14 m 14 s
15	321° 51' 17"	-0.12"	324° 12' 54"	-14° 13' 29"	0.9867950	16' 12.47"	23° 26' 16"	-14 m 14 s
16	321° 53' 48"	-0.11"	324° 15' 22"	-14° 12' 40"	0.9868022	16' 12.46"	23° 26' 16"	-14 m 14 s
17	321° 56' 20"	-0.11"	324° 17' 51"	-14° 11' 51"	0.9868094	16' 12.46"	23° 26' 16"	-14 m 14 s
18	321° 58' 52"	-0.10"	324° 20' 19"	-14° 11' 02"	0.9868166	16' 12.45"	23° 26' 16"	-14 m 14 s
19	322° 01' 24"	-0.10"	324° 22' 47"	-14° 10' 13"	0.9868238	16' 12.44"	23° 26' 16"	-14 m 14 s
20	322° 03' 55"	-0.09"	324° 25' 15"	-14° 09' 24"	0.9868310	16' 12.44"	23° 26' 16"	-14 m 14 s
21	322° 06' 27"	-0.09"	324° 27' 43"	-14° 08' 35"	0.9868383	16' 12.43"	23° 26' 16"	-14 m 14 s
22	322° 08' 59"	-0.08"	324° 30' 11"	-14° 07' 46"	0.9868455	16' 12.42"	23° 26' 16"	-14 m 14 s
23	322° 11' 31"	-0.08"	324° 32' 39"	-14° 06' 57"	0.9868528	16' 12.41"	23° 26' 16"	-14 m 14 s
24	322° 14' 03"	-0.07"	324° 35' 07"	-14° 06' 08"	0.9868600	16' 12.41"	23° 26' 16"	-14 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	66° 39' 48"	0° 46' 26"	64° 40' 28"	22° 11' 00"	0° 54' 15"	14' 47.11"	260° 25' 00"	0.63436
1	67° 09' 18"	0° 49' 00"	65° 11' 25"	22° 18' 31"	0° 54' 15"	14' 46.99"	260° 37' 26"	0.63813
2	67° 38' 48"	0° 51' 34"	65° 42' 25"	22° 25' 55"	0° 54' 15"	14' 46.87"	260° 49' 58"	0.64189
3	68° 08' 17"	0° 54' 08"	66° 13' 27"	22° 33' 14"	0° 54' 14"	14' 46.76"	261° 2' 36"	0.64564
4	68° 37' 46"	0° 56' 42"	66° 44' 32"	22° 40' 26"	0° 54' 14"	14' 46.65"	261° 15' 21"	0.64938
5	69° 07' 15"	0° 59' 15"	67° 15' 41"	22° 47' 33"	0° 54' 13"	14' 46.55"	261° 28' 11"	0.65311
6	69° 36' 43"	1° 01' 49"	67° 46' 52"	22° 54' 33"	0° 54' 13"	14' 46.45"	261° 41' 08"	0.65683
7	70° 06' 11"	1° 04' 21"	68° 18' 06"	23° 01' 27"	0° 54' 13"	14' 46.36"	261° 54' 10"	0.66054
8	70° 35' 39"	1° 06' 54"	68° 49' 23"	23° 08' 15"	0° 54' 12"	14' 46.27"	262° 7' 18"	0.66424
9	71° 05' 07"	1° 09' 26"	69° 20' 43"	23° 14' 57"	0° 54' 12"	14' 46.18"	262° 20' 33"	0.66792
10	71° 34' 35"	1° 11' 58"	69° 52' 06"	23° 21' 32"	0° 54' 12"	14' 46.10"	262° 33' 53"	0.67160
11	72° 04' 02"	1° 14' 29"	70° 23' 31"	23° 28' 01"	0° 54' 11"	14' 46.03"	262° 47' 19"	0.67527
12	72° 33' 30"	1° 17' 00"	70° 54' 60"	23° 34' 24"	0° 54' 11"	14' 45.96"	263° 0' 52"	0.67892
13	73° 02' 57"	1° 19' 31"	71° 26' 31"	23° 40' 40"	0° 54' 11"	14' 45.89"	263° 14' 30"	0.68256
14	73° 32' 24"	1° 22' 02"	71° 58' 05"	23° 46' 50"	0° 54' 11"	14' 45.83"	263° 28' 13"	0.68620
15	74° 01' 51"	1° 24' 32"	72° 29' 43"	23° 52' 53"	0° 54' 11"	14' 45.78"	263° 42' 03"	0.68982
16	74° 31' 19"	1° 27' 01"	73° 01' 22"	23° 58' 50"	0° 54' 10"	14' 45.73"	263° 55' 58"	0.69342
17	75° 00' 46"	1° 29' 30"	73° 33' 05"	24° 04' 40"	0° 54' 10"	14' 45.68"	264° 9' 60"	0.69702
18	75° 30' 13"	1° 31' 59"	74° 04' 51"	24° 10' 24"	0° 54' 10"	14' 45.64"	264° 24' 06"	0.70060
19	75° 59' 40"	1° 34' 28"	74° 36' 39"	24° 16' 01"	0° 54' 10"	14' 45.60"	264° 38' 19"	0.70417
20	76° 29' 07"	1° 36' 56"	75° 08' 30"	24° 21' 32"	0° 54' 10"	14' 45.57"	264° 52' 37"	0.70773
21	76° 58' 34"	1° 39' 23"	75° 40' 24"	24° 26' 56"	0° 54' 10"	14' 45.54"	265° 7' 01"	0.71128
22	77° 28' 02"	1° 41' 50"	76° 12' 21"	24° 32' 13"	0° 54' 10"	14' 45.52"	265° 21' 30"	0.71481
23	77° 57' 29"	1° 44' 17"	76° 44' 20"	24° 37' 23"	0° 54' 10"	14' 45.50"	265° 36' 05"	0.71833
24	78° 26' 57"	1° 46' 43"	77° 16' 22"	24° 42' 27"	0° 54' 09"	14' 45.48"	265° 50' 45"	0.72183

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	322° 14' 03"	-0.07"	324° 35' 07"	-14° 06' 08"	0.9868600	16' 12.41"	23° 26' 16"	-14 m 14 s
1	322° 16' 34"	-0.07"	324° 37' 35"	-14° 05' 18"	0.9868673	16' 12.40"	23° 26' 16"	-14 m 14 s
2	322° 19' 06"	-0.06"	324° 40' 03"	-14° 04' 29"	0.9868745	16' 12.39"	23° 26' 16"	-14 m 14 s
3	322° 21' 38"	-0.06"	324° 42' 31"	-14° 03' 40"	0.9868818	16' 12.39"	23° 26' 16"	-14 m 14 s
4	322° 24' 10"	-0.05"	324° 44' 59"	-14° 02' 51"	0.9868891	16' 12.38"	23° 26' 16"	-14 m 14 s
5	322° 26' 41"	-0.05"	324° 47' 27"	-14° 02' 01"	0.9868964	16' 12.37"	23° 26' 16"	-14 m 14 s
6	322° 29' 13"	-0.04"	324° 49' 55"	-14° 01' 12"	0.9869037	16' 12.36"	23° 26' 16"	-14 m 14 s
7	322° 31' 45"	-0.04"	324° 52' 23"	-14° 00' 23"	0.9869110	16' 12.36"	23° 26' 16"	-14 m 14 s
8	322° 34' 17"	-0.03"	324° 54' 51"	-13° 59' 33"	0.9869183	16' 12.35"	23° 26' 16"	-14 m 14 s
9	322° 36' 48"	-0.03"	324° 57' 19"	-13° 58' 44"	0.9869256	16' 12.34"	23° 26' 16"	-14 m 14 s
10	322° 39' 20"	-0.02"	324° 59' 47"	-13° 57' 54"	0.9869330	16' 12.34"	23° 26' 16"	-14 m 14 s
11	322° 41' 52"	-0.01"	325° 02' 14"	-13° 57' 05"	0.9869403	16' 12.33"	23° 26' 16"	-14 m 14 s
12	322° 44' 23"	-0.01"	325° 04' 42"	-13° 56' 15"	0.9869477	16' 12.32"	23° 26' 16"	-14 m 14 s
13	322° 46' 55"	-0.00"	325° 07' 10"	-13° 55' 26"	0.9869550	16' 12.31"	23° 26' 16"	-14 m 14 s
14	322° 49' 27"	0.00"	325° 09' 38"	-13° 54' 36"	0.9869624	16' 12.31"	23° 26' 16"	-14 m 14 s
15	322° 51' 59"	0.00"	325° 12' 06"	-13° 53' 47"	0.9869697	16' 12.30"	23° 26' 16"	-14 m 14 s
16	322° 54' 30"	0.01"	325° 14' 33"	-13° 52' 57"	0.9869771	16' 12.29"	23° 26' 16"	-14 m 14 s
17	322° 57' 02"	0.01"	325° 17' 01"	-13° 52' 08"	0.9869845	16' 12.28"	23° 26' 16"	-14 m 14 s
18	322° 59' 34"	0.02"	325° 19' 29"	-13° 51' 18"	0.9869919	16' 12.28"	23° 26' 16"	-14 m 14 s
19	323° 02' 06"	0.02"	325° 21' 56"	-13° 50' 28"	0.9869993	16' 12.27"	23° 26' 16"	-14 m 14 s
20	323° 04' 37"	0.03"	325° 24' 24"	-13° 49' 39"	0.9870067	16' 12.26"	23° 26' 16"	-14 m 14 s
21	323° 07' 09"	0.03"	325° 26' 52"	-13° 48' 49"	0.9870141	16' 12.26"	23° 26' 16"	-14 m 14 s
22	323° 09' 41"	0.04"	325° 29' 19"	-13° 47' 59"	0.9870216	16' 12.25"	23° 26' 16"	-14 m 14 s
23	323° 12' 12"	0.04"	325° 31' 47"	-13° 47' 10"	0.9870290	16' 12.24"	23° 26' 16"	-14 m 14 s
24	323° 14' 44"	0.05"	325° 34' 14"	-13° 46' 20"	0.9870364	16' 12.23"	23° 26' 16"	-14 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	78° 26' 57"	1° 46' 43"	77° 16' 22"	24° 42' 27"	0° 54' 09"	14' 45.48"	265° 50' 45"	0.72183
1	78° 56' 25"	1° 49' 09"	77° 48' 27"	24° 47' 24"	0° 54' 09"	14' 45.47"	266° 5' 31"	0.72533
2	79° 25' 53"	1° 51' 34"	78° 20' 34"	24° 52' 14"	0° 54' 09"	14' 45.47"	266° 20' 23"	0.72880
3	79° 55' 21"	1° 53' 58"	78° 52' 44"	24° 56' 57"	0° 54' 09"	14' 45.47"	266° 35' 19"	0.73227
4	80° 24' 49"	1° 56' 23"	79° 24' 56"	25° 01' 33"	0° 54' 09"	14' 45.47"	266° 50' 22"	0.73572
5	80° 54' 18"	1° 58' 46"	79° 57' 11"	25° 06' 02"	0° 54' 09"	14' 45.48"	267° 5' 29"	0.73915
6	81° 23' 47"	2° 01' 09"	80° 29' 29"	25° 10' 25"	0° 54' 10"	14' 45.49"	267° 20' 42"	0.74258
7	81° 53' 16"	2° 03' 32"	81° 01' 49"	25° 14' 40"	0° 54' 10"	14' 45.51"	267° 36' 00"	0.74598
8	82° 22' 45"	2° 05' 54"	81° 34' 12"	25° 18' 48"	0° 54' 10"	14' 45.53"	267° 51' 24"	0.74938
9	82° 52' 15"	2° 08' 16"	82° 06' 37"	25° 22' 50"	0° 54' 10"	14' 45.56"	268° 6' 52"	0.75275
10	83° 21' 45"	2° 10' 37"	82° 39' 04"	25° 26' 44"	0° 54' 10"	14' 45.59"	268° 22' 26"	0.75612
11	83° 51' 16"	2° 12' 57"	83° 11' 34"	25° 30' 31"	0° 54' 10"	14' 45.62"	268° 38' 06"	0.75946
12	84° 20' 47"	2° 15' 17"	83° 44' 06"	25° 34' 11"	0° 54' 10"	14' 45.66"	268° 53' 50"	0.76280
13	84° 50' 18"	2° 17' 36"	84° 16' 41"	25° 37' 43"	0° 54' 10"	14' 45.71"	269° 9' 39"	0.76611
14	85° 19' 50"	2° 19' 55"	84° 49' 17"	25° 41' 09"	0° 54' 10"	14' 45.75"	269° 25' 34"	0.76941
15	85° 49' 22"	2° 22' 13"	85° 21' 56"	25° 44' 27"	0° 54' 11"	14' 45.80"	269° 41' 34"	0.77270
16	86° 18' 55"	2° 24' 30"	85° 54' 37"	25° 47' 38"	0° 54' 11"	14' 45.86"	269° 57' 39"	0.77596
17	86° 48' 28"	2° 26' 47"	86° 27' 21"	25° 50' 42"	0° 54' 11"	14' 45.92"	270° 13' 48"	0.77922
18	87° 18' 02"	2° 29' 03"	87° 00' 06"	25° 53' 38"	0° 54' 11"	14' 45.99"	270° 30' 03"	0.78245
19	87° 47' 36"	2° 31' 18"	87° 32' 54"	25° 56' 27"	0° 54' 12"	14' 46.05"	270° 46' 23"	0.78567
20	88° 17' 10"	2° 33' 33"	88° 05' 43"	25° 59' 09"	0° 54' 12"	14' 46.13"	271° 2' 48"	0.78887
21	88° 46' 46"	2° 35' 47"	88° 38' 35"	26° 01' 43"	0° 54' 12"	14' 46.20"	271° 19' 18"	0.79206
22	89° 16' 22"	2° 38' 01"	89° 11' 28"	26° 04' 10"	0° 54' 12"	14' 46.29"	271° 35' 52"	0.79522
23	89° 45' 58"	2° 40' 14"	89° 44' 23"	26° 06' 29"	0° 54' 13"	14' 46.37"	271° 52' 32"	0.79837
24	90° 15' 35"	2° 42' 26"	90° 17' 20"	26° 08' 41"	0° 54' 13"	14' 46.46"	272° 9' 17"	0.80151

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	323° 14' 44"	0.05"	325° 34' 14"	-13° 46' 20"	0.9870364	16' 12.23"	23° 26' 16"	-14 m 14 s
1	323° 17' 16"	0.05"	325° 36' 42"	-13° 45' 30"	0.9870439	16' 12.23"	23° 26' 16"	-14 m 14 s
2	323° 19' 47"	0.06"	325° 39' 09"	-13° 44' 40"	0.9870513	16' 12.22"	23° 26' 16"	-14 m 14 s
3	323° 22' 19"	0.06"	325° 41' 37"	-13° 43' 50"	0.9870588	16' 12.21"	23° 26' 16"	-14 m 14 s
4	323° 24' 51"	0.07"	325° 44' 04"	-13° 43' 01"	0.9870663	16' 12.20"	23° 26' 16"	-14 m 14 s
5	323° 27' 22"	0.07"	325° 46' 32"	-13° 42' 11"	0.9870738	16' 12.20"	23° 26' 16"	-14 m 14 s
6	323° 29' 54"	0.08"	325° 48' 59"	-13° 41' 21"	0.9870813	16' 12.19"	23° 26' 16"	-14 m 14 s
7	323° 32' 26"	0.08"	325° 51' 27"	-13° 40' 31"	0.9870888	16' 12.18"	23° 26' 16"	-14 m 14 s
8	323° 34' 58"	0.08"	325° 53' 54"	-13° 39' 41"	0.9870963	16' 12.17"	23° 26' 16"	-14 m 14 s
9	323° 37' 29"	0.09"	325° 56' 21"	-13° 38' 51"	0.9871038	16' 12.17"	23° 26' 16"	-14 m 14 s
10	323° 40' 01"	0.09"	325° 58' 49"	-13° 38' 01"	0.9871113	16' 12.16"	23° 26' 16"	-14 m 14 s
11	323° 42' 33"	0.10"	326° 01' 16"	-13° 37' 11"	0.9871188	16' 12.15"	23° 26' 16"	-14 m 13 s
12	323° 45' 04"	0.10"	326° 03' 43"	-13° 36' 21"	0.9871264	16' 12.15"	23° 26' 16"	-14 m 13 s
13	323° 47' 36"	0.11"	326° 06' 11"	-13° 35' 31"	0.9871339	16' 12.14"	23° 26' 16"	-14 m 13 s
14	323° 50' 08"	0.11"	326° 08' 38"	-13° 34' 41"	0.9871415	16' 12.13"	23° 26' 16"	-14 m 13 s
15	323° 52' 39"	0.11"	326° 11' 05"	-13° 33' 51"	0.9871490	16' 12.12"	23° 26' 16"	-14 m 13 s
16	323° 55' 11"	0.12"	326° 13' 32"	-13° 33' 01"	0.9871566	16' 12.12"	23° 26' 16"	-14 m 13 s
17	323° 57' 43"	0.12"	326° 15' 60"	-13° 32' 10"	0.9871642	16' 12.11"	23° 26' 16"	-14 m 13 s
18	324° 00' 14"	0.13"	326° 18' 27"	-13° 31' 20"	0.9871718	16' 12.10"	23° 26' 16"	-14 m 13 s
19	324° 02' 46"	0.13"	326° 20' 54"	-13° 30' 30"	0.9871794	16' 12.09"	23° 26' 16"	-14 m 13 s
20	324° 05' 17"	0.14"	326° 23' 21"	-13° 29' 40"	0.9871870	16' 12.09"	23° 26' 16"	-14 m 13 s
21	324° 07' 49"	0.14"	326° 25' 48"	-13° 28' 50"	0.9871946	16' 12.08"	23° 26' 16"	-14 m 13 s
22	324° 10' 21"	0.14"	326° 28' 15"	-13° 27' 59"	0.9872022	16' 12.07"	23° 26' 16"	-14 m 13 s
23	324° 12' 52"	0.15"	326° 30' 42"	-13° 27' 09"	0.9872098	16' 12.06"	23° 26' 16"	-14 m 13 s
24	324° 15' 24"	0.15"	326° 33' 10"	-13° 26' 19"	0.9872175	16' 12.06"	23° 26' 16"	-14 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	90° 15' 35"	2° 42' 26"	90° 17' 20"	26° 08' 41"	0° 54' 13"	14' 46.46"	272° 9' 17"	0.80151
1	90° 45' 13"	2° 44' 37"	90° 50' 19"	26° 10' 46"	0° 54' 13"	14' 46.55"	272° 26' 06"	0.80462
2	91° 14' 51"	2° 46' 48"	91° 23' 20"	26° 12' 43"	0° 54' 14"	14' 46.65"	272° 43' 01"	0.80772
3	91° 44' 30"	2° 48' 58"	91° 56' 22"	26° 14' 32"	0° 54' 14"	14' 46.75"	272° 59' 60"	0.81080
4	92° 14' 10"	2° 51' 07"	92° 29' 26"	26° 16' 14"	0° 54' 15"	14' 46.86"	273° 17' 04"	0.81386
5	92° 43' 50"	2° 53' 16"	93° 02' 32"	26° 17' 48"	0° 54' 15"	14' 46.96"	273° 34' 13"	0.81690
6	93° 13' 31"	2° 55' 24"	93° 35' 39"	26° 19' 15"	0° 54' 15"	14' 47.08"	273° 51' 27"	0.81992
7	93° 43' 13"	2° 57' 31"	94° 08' 48"	26° 20' 34"	0° 54' 16"	14' 47.19"	274° 8' 46"	0.82293
8	94° 12' 56"	2° 59' 37"	94° 41' 58"	26° 21' 46"	0° 54' 16"	14' 47.31"	274° 26' 10"	0.82591
9	94° 42' 39"	3° 01' 42"	95° 15' 09"	26° 22' 49"	0° 54' 17"	14' 47.44"	274° 43' 38"	0.82888
10	95° 12' 23"	3° 03' 47"	95° 48' 22"	26° 23' 46"	0° 54' 17"	14' 47.57"	275° 1' 12"	0.83183
11	95° 42' 08"	3° 05' 51"	96° 21' 36"	26° 24' 34"	0° 54' 18"	14' 47.70"	275° 18' 50"	0.83475
12	96° 11' 54"	3° 07' 54"	96° 54' 51"	26° 25' 15"	0° 54' 18"	14' 47.83"	275° 36' 34"	0.83766
13	96° 41' 41"	3° 09' 56"	97° 28' 08"	26° 25' 48"	0° 54' 19"	14' 47.97"	275° 54' 22"	0.84055
14	97° 11' 28"	3° 11' 58"	98° 01' 25"	26° 26' 14"	0° 54' 19"	14' 48.12"	276° 12' 15"	0.84342
15	97° 41' 16"	3° 13' 58"	98° 34' 44"	26° 26' 32"	0° 54' 20"	14' 48.26"	276° 30' 14"	0.84626
16	98° 11' 05"	3° 15' 58"	99° 08' 03"	26° 26' 42"	0° 54' 20"	14' 48.41"	276° 48' 17"	0.84909
17	98° 40' 56"	3° 17' 57"	99° 41' 23"	26° 26' 44"	0° 54' 21"	14' 48.57"	277° 6' 25"	0.85190
18	99° 10' 47"	3° 19' 55"	100° 14' 45"	26° 26' 38"	0° 54' 21"	14' 48.72"	277° 24' 39"	0.85468
19	99° 40' 39"	3° 21' 52"	100° 48' 07"	26° 26' 25"	0° 54' 22"	14' 48.88"	277° 42' 58"	0.85745
20	100° 10' 31"	3° 23' 49"	101° 21' 30"	26° 26' 04"	0° 54' 23"	14' 49.05"	278° 1' 22"	0.86019
21	100° 40' 25"	3° 25' 44"	101° 54' 53"	26° 25' 35"	0° 54' 23"	14' 49.21"	278° 19' 51"	0.86291
22	101° 10' 20"	3° 27' 39"	102° 28' 17"	26° 24' 58"	0° 54' 24"	14' 49.39"	278° 38' 26"	0.86561
23	101° 40' 16"	3° 29' 32"	103° 01' 42"	26° 24' 14"	0° 54' 24"	14' 49.56"	278° 57' 06"	0.86829
24	102° 10' 13"	3° 31' 25"	103° 35' 07"	26° 23' 22"	0° 54' 25"	14' 49.74"	279° 15' 52"	0.87095

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	324° 15' 24"	0.15"	326° 33' 10"	-13° 26' 19"	0.9872175	16' 12.06"	23° 26' 16"	-14 m 13 s
1	324° 17' 56"	0.16"	326° 35' 37"	-13° 25' 28"	0.9872251	16' 12.05"	23° 26' 16"	-14 m 13 s
2	324° 20' 27"	0.16"	326° 38' 04"	-13° 24' 38"	0.9872328	16' 12.04"	23° 26' 16"	-14 m 13 s
3	324° 22' 59"	0.16"	326° 40' 31"	-13° 23' 48"	0.9872404	16' 12.03"	23° 26' 16"	-14 m 13 s
4	324° 25' 30"	0.17"	326° 42' 58"	-13° 22' 57"	0.9872481	16' 12.03"	23° 26' 16"	-14 m 13 s
5	324° 28' 02"	0.17"	326° 45' 25"	-13° 22' 07"	0.9872558	16' 12.02"	23° 26' 16"	-14 m 13 s
6	324° 30' 34"	0.17"	326° 47' 52"	-13° 21' 16"	0.9872635	16' 12.01"	23° 26' 16"	-14 m 13 s
7	324° 33' 05"	0.18"	326° 50' 19"	-13° 20' 26"	0.9872712	16' 12.00"	23° 26' 16"	-14 m 13 s
8	324° 35' 37"	0.18"	326° 52' 45"	-13° 19' 35"	0.9872789	16' 11.99"	23° 26' 16"	-14 m 12 s
9	324° 38' 09"	0.18"	326° 55' 12"	-13° 18' 45"	0.9872866	16' 11.99"	23° 26' 16"	-14 m 12 s
10	324° 40' 40"	0.19"	326° 57' 39"	-13° 17' 54"	0.9872943	16' 11.98"	23° 26' 16"	-14 m 12 s
11	324° 43' 12"	0.19"	327° 00' 06"	-13° 17' 04"	0.9873020	16' 11.97"	23° 26' 16"	-14 m 12 s
12	324° 45' 43"	0.19"	327° 02' 33"	-13° 16' 13"	0.9873098	16' 11.96"	23° 26' 16"	-14 m 12 s
13	324° 48' 15"	0.20"	327° 04' 60"	-13° 15' 22"	0.9873175	16' 11.96"	23° 26' 16"	-14 m 12 s
14	324° 50' 47"	0.20"	327° 07' 27"	-13° 14' 32"	0.9873253	16' 11.95"	23° 26' 16"	-14 m 12 s
15	324° 53' 18"	0.20"	327° 09' 53"	-13° 13' 41"	0.9873330	16' 11.94"	23° 26' 16"	-14 m 12 s
16	324° 55' 50"	0.21"	327° 12' 20"	-13° 12' 50"	0.9873408	16' 11.93"	23° 26' 16"	-14 m 12 s
17	324° 58' 21"	0.21"	327° 14' 47"	-13° 11' 60"	0.9873486	16' 11.93"	23° 26' 16"	-14 m 12 s
18	325° 00' 53"	0.21"	327° 17' 14"	-13° 11' 09"	0.9873564	16' 11.92"	23° 26' 16"	-14 m 12 s
19	325° 03' 25"	0.22"	327° 19' 40"	-13° 10' 18"	0.9873642	16' 11.91"	23° 26' 16"	-14 m 12 s
20	325° 05' 56"	0.22"	327° 22' 07"	-13° 09' 28"	0.9873720	16' 11.90"	23° 26' 16"	-14 m 12 s
21	325° 08' 28"	0.22"	327° 24' 34"	-13° 08' 37"	0.9873798	16' 11.90"	23° 26' 16"	-14 m 12 s
22	325° 10' 59"	0.23"	327° 27' 00"	-13° 07' 46"	0.9873876	16' 11.89"	23° 26' 16"	-14 m 11 s
23	325° 13' 31"	0.23"	327° 29' 27"	-13° 06' 55"	0.9873954	16' 11.88"	23° 26' 16"	-14 m 11 s
24	325° 16' 02"	0.23"	327° 31' 53"	-13° 06' 04"	0.9874033	16' 11.87"	23° 26' 16"	-14 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	102° 10' 13"	3° 31' 25"	103° 35' 07"	26° 23' 22"	0° 54' 25"	14' 49.74"	279° 15' 52"	0.87095
1	102° 40' 10"	3° 33' 17"	104° 08' 33"	26° 22' 22"	0° 54' 26"	14' 49.92"	279° 34' 43"	0.87358
2	103° 10' 09"	3° 35' 08"	104° 41' 59"	26° 21' 14"	0° 54' 26"	14' 50.10"	279° 53' 40"	0.87620
3	103° 40' 09"	3° 36' 58"	105° 15' 26"	26° 19' 58"	0° 54' 27"	14' 50.29"	280° 12' 43"	0.87879
4	104° 10' 10"	3° 38' 47"	105° 48' 52"	26° 18' 34"	0° 54' 28"	14' 50.48"	280° 31' 52"	0.88135
5	104° 40' 12"	3° 40' 35"	106° 22' 19"	26° 17' 03"	0° 54' 29"	14' 50.67"	280° 51' 07"	0.88390
6	105° 10' 15"	3° 42' 22"	106° 55' 46"	26° 15' 24"	0° 54' 29"	14' 50.87"	281° 10' 28"	0.88642
7	105° 40' 19"	3° 44' 08"	107° 29' 13"	26° 13' 37"	0° 54' 30"	14' 51.07"	281° 29' 56"	0.88892
8	106° 10' 24"	3° 45' 53"	108° 02' 40"	26° 11' 42"	0° 54' 31"	14' 51.28"	281° 49' 30"	0.89139
9	106° 40' 30"	3° 47' 37"	108° 36' 07"	26° 09' 39"	0° 54' 31"	14' 51.48"	282° 9' 10"	0.89384
10	107° 10' 38"	3° 49' 20"	109° 09' 34"	26° 07' 29"	0° 54' 32"	14' 51.69"	282° 28' 58"	0.89627
11	107° 40' 46"	3° 51' 02"	109° 43' 01"	26° 05' 11"	0° 54' 33"	14' 51.90"	282° 48' 53"	0.89867
12	108° 10' 56"	3° 52' 43"	110° 16' 28"	26° 02' 45"	0° 54' 34"	14' 52.12"	283° 8' 55"	0.90105
13	108° 41' 07"	3° 54' 23"	110° 49' 54"	26° 00' 11"	0° 54' 35"	14' 52.34"	283° 29' 05"	0.90341
14	109° 11' 19"	3° 56' 02"	111° 23' 20"	25° 57' 29"	0° 54' 35"	14' 52.56"	283° 49' 22"	0.90574
15	109° 41' 32"	3° 57' 39"	111° 56' 46"	25° 54' 39"	0° 54' 36"	14' 52.78"	284° 9' 48"	0.90805
16	110° 11' 47"	3° 59' 16"	112° 30' 11"	25° 51' 42"	0° 54' 37"	14' 53.01"	284° 30' 22"	0.91033
17	110° 42' 02"	4° 00' 52"	113° 03' 35"	25° 48' 37"	0° 54' 38"	14' 53.24"	284° 51' 04"	0.91258
18	111° 12' 19"	4° 02' 26"	113° 36' 60"	25° 45' 24"	0° 54' 39"	14' 53.47"	285° 11' 56"	0.91481
19	111° 42' 37"	4° 03' 60"	114° 10' 23"	25° 42' 04"	0° 54' 40"	14' 53.71"	285° 32' 57"	0.91702
20	112° 12' 56"	4° 05' 32"	114° 43' 46"	25° 38' 35"	0° 54' 41"	14' 53.94"	285° 54' 08"	0.91920
21	112° 43' 17"	4° 07' 04"	115° 17' 08"	25° 34' 59"	0° 54' 41"	14' 54.18"	286° 15' 28"	0.92135
22	113° 13' 39"	4° 08' 34"	115° 50' 29"	25° 31' 15"	0° 54' 42"	14' 54.43"	286° 36' 60"	0.92348
23	113° 44' 02"	4° 10' 03"	116° 23' 49"	25° 27' 24"	0° 54' 43"	14' 54.67"	286° 58' 43"	0.92558
24	114° 14' 26"	4° 11' 31"	116° 57' 09"	25° 23' 25"	0° 54' 44"	14' 54.92"	287° 20' 37"	0.92766

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	325° 16' 02"	0.23"	327° 31' 53"	-13° 06' 04"	0.9874033	16' 11.87"	23° 26' 16"	-14 m 11 s
1	325° 18' 34"	0.23"	327° 34' 20"	-13° 05' 13"	0.9874111	16' 11.86"	23° 26' 16"	-14 m 11 s
2	325° 21' 06"	0.24"	327° 36' 47"	-13° 04' 23"	0.9874190	16' 11.86"	23° 26' 16"	-14 m 11 s
3	325° 23' 37"	0.24"	327° 39' 13"	-13° 03' 32"	0.9874268	16' 11.85"	23° 26' 16"	-14 m 11 s
4	325° 26' 09"	0.24"	327° 41' 40"	-13° 02' 41"	0.9874347	16' 11.84"	23° 26' 16"	-14 m 11 s
5	325° 28' 40"	0.25"	327° 44' 06"	-13° 01' 50"	0.9874426	16' 11.83"	23° 26' 16"	-14 m 11 s
6	325° 31' 12"	0.25"	327° 46' 33"	-13° 00' 59"	0.9874505	16' 11.83"	23° 26' 16"	-14 m 11 s
7	325° 33' 43"	0.25"	327° 48' 59"	-13° 00' 08"	0.9874584	16' 11.82"	23° 26' 16"	-14 m 11 s
8	325° 36' 15"	0.25"	327° 51' 26"	-12° 59' 17"	0.9874663	16' 11.81"	23° 26' 16"	-14 m 11 s
9	325° 38' 46"	0.26"	327° 53' 52"	-12° 58' 26"	0.9874742	16' 11.80"	23° 26' 16"	-14 m 11 s
10	325° 41' 18"	0.26"	327° 56' 18"	-12° 57' 35"	0.9874821	16' 11.79"	23° 26' 16"	-14 m 10 s
11	325° 43' 49"	0.26"	327° 58' 45"	-12° 56' 43"	0.9874900	16' 11.79"	23° 26' 16"	-14 m 10 s
12	325° 46' 21"	0.26"	328° 01' 11"	-12° 55' 52"	0.9874980	16' 11.78"	23° 26' 16"	-14 m 10 s
13	325° 48' 53"	0.27"	328° 03' 38"	-12° 55' 01"	0.9875059	16' 11.77"	23° 26' 16"	-14 m 10 s
14	325° 51' 24"	0.27"	328° 06' 04"	-12° 54' 10"	0.9875139	16' 11.76"	23° 26' 16"	-14 m 10 s
15	325° 53' 56"	0.27"	328° 08' 30"	-12° 53' 19"	0.9875218	16' 11.76"	23° 26' 16"	-14 m 10 s
16	325° 56' 27"	0.27"	328° 10' 56"	-12° 52' 28"	0.9875298	16' 11.75"	23° 26' 16"	-14 m 10 s
17	325° 58' 59"	0.27"	328° 13' 23"	-12° 51' 36"	0.9875378	16' 11.74"	23° 26' 16"	-14 m 10 s
18	326° 01' 30"	0.28"	328° 15' 49"	-12° 50' 45"	0.9875458	16' 11.73"	23° 26' 16"	-14 m 10 s
19	326° 04' 02"	0.28"	328° 18' 15"	-12° 49' 54"	0.9875538	16' 11.72"	23° 26' 16"	-14 m 10 s
20	326° 06' 33"	0.28"	328° 20' 41"	-12° 49' 03"	0.9875618	16' 11.72"	23° 26' 16"	-14 m 09 s
21	326° 09' 05"	0.28"	328° 23' 08"	-12° 48' 11"	0.9875698	16' 11.71"	23° 26' 16"	-14 m 09 s
22	326° 11' 36"	0.28"	328° 25' 34"	-12° 47' 20"	0.9875778	16' 11.70"	23° 26' 16"	-14 m 09 s
23	326° 14' 08"	0.28"	328° 28' 00"	-12° 46' 29"	0.9875858	16' 11.69"	23° 26' 16"	-14 m 09 s
24	326° 16' 39"	0.29"	328° 30' 26"	-12° 45' 37"	0.9875939	16' 11.68"	23° 26' 16"	-14 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	114° 14' 26"	4° 11' 31"	116° 57' 09"	25° 23' 25"	0° 54' 44"	14' 54.92"	287° 20' 37"	0.92766
1	114° 44' 51"	4° 12' 58"	117° 30' 27"	25° 19' 18"	0° 54' 45"	14' 55.17"	287° 42' 43"	0.92971
2	115° 15' 18"	4° 14' 23"	118° 03' 44"	25° 15' 03"	0° 54' 46"	14' 55.43"	288° 5' 02"	0.93173
3	115° 45' 46"	4° 15' 48"	118° 37' 01"	25° 10' 41"	0° 54' 47"	14' 55.68"	288° 27' 34"	0.93373
4	116° 16' 16"	4° 17' 11"	119° 10' 16"	25° 06' 11"	0° 54' 48"	14' 55.94"	288° 50' 21"	0.93570
5	116° 46' 47"	4° 18' 33"	119° 43' 30"	25° 01' 33"	0° 54' 49"	14' 56.20"	289° 13' 22"	0.93764
6	117° 17' 19"	4° 19' 54"	120° 16' 43"	24° 56' 48"	0° 54' 50"	14' 56.46"	289° 36' 39"	0.93955
7	117° 47' 52"	4° 21' 14"	120° 49' 54"	24° 51' 56"	0° 54' 51"	14' 56.73"	290° 0' 11"	0.94144
8	118° 18' 27"	4° 22' 32"	121° 23' 05"	24° 46' 55"	0° 54' 52"	14' 56.99"	290° 24' 02"	0.94330
9	118° 49' 03"	4° 23' 50"	121° 56' 13"	24° 41' 48"	0° 54' 53"	14' 57.26"	290° 48' 10"	0.94513
10	119° 19' 40"	4° 25' 06"	122° 29' 21"	24° 36' 33"	0° 54' 54"	14' 57.54"	291° 12' 37"	0.94693
11	119° 50' 19"	4° 26' 21"	123° 02' 27"	24° 31' 10"	0° 54' 55"	14' 57.81"	291° 37' 25"	0.94871
12	120° 20' 59"	4° 27' 34"	123° 35' 31"	24° 25' 40"	0° 54' 56"	14' 58.09"	292° 2' 34"	0.95045
13	120° 51' 41"	4° 28' 46"	124° 08' 34"	24° 20' 02"	0° 54' 57"	14' 58.36"	292° 28' 06"	0.95217
14	121° 22' 24"	4° 29' 58"	124° 41' 35"	24° 14' 17"	0° 54' 58"	14' 58.64"	292° 54' 03"	0.95386
15	121° 53' 08"	4° 31' 07"	125° 14' 35"	24° 08' 24"	0° 54' 59"	14' 58.93"	293° 20' 25"	0.95552
16	122° 23' 53"	4° 32' 16"	125° 47' 33"	24° 02' 25"	0° 54' 60"	14' 59.21"	293° 47' 14"	0.95715
17	122° 54' 40"	4° 33' 23"	126° 20' 29"	23° 56' 18"	0° 55' 01"	14' 59.50"	294° 14' 32"	0.95875
18	123° 25' 29"	4° 34' 29"	126° 53' 23"	23° 50' 03"	0° 55' 02"	14' 59.79"	294° 42' 21"	0.96033
19	123° 56' 19"	4° 35' 34"	127° 26' 16"	23° 43' 41"	0° 55' 03"	15' 00.08"	295° 10' 43"	0.96187
20	124° 27' 10"	4° 36' 37"	127° 59' 07"	23° 37' 12"	0° 55' 04"	15' 00.37"	295° 39' 41"	0.96338
21	124° 58' 02"	4° 37' 39"	128° 31' 56"	23° 30' 36"	0° 55' 05"	15' 00.66"	296° 9' 16"	0.96486
22	125° 28' 57"	4° 38' 40"	129° 04' 42"	23° 23' 53"	0° 55' 06"	15' 00.96"	296° 39' 31"	0.96632
23	125° 59' 52"	4° 39' 39"	129° 37' 27"	23° 17' 03"	0° 55' 07"	15' 01.25"	297° 10' 29"	0.96774
24	126° 30' 49"	4° 40' 38"	130° 10' 10"	23° 10' 05"	0° 55' 08"	15' 01.55"	297° 42' 14"	0.96913

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	326° 16' 39"	0.29"	328° 30' 26"	-12° 45' 37"	0.9875939	16' 11.68"	23° 26' 16"	-14 m 09 s
1	326° 19' 11"	0.29"	328° 32' 52"	-12° 44' 46"	0.9876019	16' 11.68"	23° 26' 16"	-14 m 09 s
2	326° 21' 42"	0.29"	328° 35' 18"	-12° 43' 54"	0.9876100	16' 11.67"	23° 26' 16"	-14 m 09 s
3	326° 24' 14"	0.29"	328° 37' 44"	-12° 43' 03"	0.9876181	16' 11.66"	23° 26' 16"	-14 m 09 s
4	326° 26' 45"	0.29"	328° 40' 11"	-12° 42' 12"	0.9876261	16' 11.65"	23° 26' 16"	-14 m 08 s
5	326° 29' 17"	0.29"	328° 42' 37"	-12° 41' 20"	0.9876342	16' 11.65"	23° 26' 16"	-14 m 08 s
6	326° 31' 48"	0.30"	328° 45' 03"	-12° 40' 29"	0.9876423	16' 11.64"	23° 26' 16"	-14 m 08 s
7	326° 34' 20"	0.30"	328° 47' 29"	-12° 39' 37"	0.9876504	16' 11.63"	23° 26' 16"	-14 m 08 s
8	326° 36' 51"	0.30"	328° 49' 55"	-12° 38' 45"	0.9876585	16' 11.62"	23° 26' 16"	-14 m 08 s
9	326° 39' 23"	0.30"	328° 52' 21"	-12° 37' 54"	0.9876666	16' 11.61"	23° 26' 16"	-14 m 08 s
10	326° 41' 54"	0.30"	328° 54' 47"	-12° 37' 02"	0.9876748	16' 11.61"	23° 26' 16"	-14 m 08 s
11	326° 44' 26"	0.30"	328° 57' 12"	-12° 36' 11"	0.9876829	16' 11.60"	23° 26' 16"	-14 m 08 s
12	326° 46' 57"	0.30"	328° 59' 38"	-12° 35' 19"	0.9876910	16' 11.59"	23° 26' 16"	-14 m 08 s
13	326° 49' 29"	0.30"	329° 02' 04"	-12° 34' 27"	0.9876992	16' 11.58"	23° 26' 16"	-14 m 07 s
14	326° 51' 60"	0.30"	329° 04' 30"	-12° 33' 36"	0.9877073	16' 11.57"	23° 26' 16"	-14 m 07 s
15	326° 54' 31"	0.31"	329° 06' 56"	-12° 32' 44"	0.9877155	16' 11.57"	23° 26' 16"	-14 m 07 s
16	326° 57' 03"	0.31"	329° 09' 22"	-12° 31' 52"	0.9877237	16' 11.56"	23° 26' 16"	-14 m 07 s
17	326° 59' 34"	0.31"	329° 11' 48"	-12° 31' 01"	0.9877319	16' 11.55"	23° 26' 16"	-14 m 07 s
18	327° 02' 06"	0.31"	329° 14' 13"	-12° 30' 09"	0.9877401	16' 11.54"	23° 26' 16"	-14 m 07 s
19	327° 04' 37"	0.31"	329° 16' 39"	-12° 29' 17"	0.9877483	16' 11.53"	23° 26' 16"	-14 m 07 s
20	327° 07' 09"	0.31"	329° 19' 05"	-12° 28' 25"	0.9877565	16' 11.52"	23° 26' 16"	-14 m 06 s
21	327° 09' 40"	0.31"	329° 21' 31"	-12° 27' 33"	0.9877647	16' 11.52"	23° 26' 16"	-14 m 06 s
22	327° 12' 12"	0.31"	329° 23' 56"	-12° 26' 42"	0.9877729	16' 11.51"	23° 26' 16"	-14 m 06 s
23	327° 14' 43"	0.31"	329° 26' 22"	-12° 25' 50"	0.9877812	16' 11.50"	23° 26' 16"	-14 m 06 s
24	327° 17' 15"	0.31"	329° 28' 48"	-12° 24' 58"	0.9877894	16' 11.49"	23° 26' 16"	-14 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	126° 30' 49"	4° 40' 38"	130° 10' 10"	23° 10' 05"	0° 55' 08"	15' 01.55"	297° 42' 14"	0.96913
1	127° 01' 47"	4° 41' 34"	130° 42' 51"	23° 03' 00"	0° 55' 10"	15' 01.85"	298° 14' 48"	0.97049
2	127° 32' 47"	4° 42' 30"	131° 15' 30"	22° 55' 49"	0° 55' 11"	15' 02.16"	298° 48' 16"	0.97182
3	128° 03' 48"	4° 43' 24"	131° 48' 07"	22° 48' 30"	0° 55' 12"	15' 02.46"	299° 22' 42"	0.97312
4	128° 34' 51"	4° 44' 16"	132° 20' 42"	22° 41' 04"	0° 55' 13"	15' 02.77"	299° 58' 09"	0.97439
5	129° 05' 55"	4° 45' 08"	132° 53' 15"	22° 33' 32"	0° 55' 14"	15' 03.07"	300° 34' 44"	0.97563
6	129° 37' 00"	4° 45' 58"	133° 25' 45"	22° 25' 52"	0° 55' 15"	15' 03.38"	301° 12' 31"	0.97683
7	130° 08' 07"	4° 46' 46"	133° 58' 13"	22° 18' 06"	0° 55' 16"	15' 03.69"	301° 51' 36"	0.97801
8	130° 39' 15"	4° 47' 33"	134° 30' 39"	22° 10' 12"	0° 55' 17"	15' 04.00"	302° 32' 07"	0.97915
9	131° 10' 25"	4° 48' 19"	135° 03' 03"	22° 02' 12"	0° 55' 19"	15' 04.32"	303° 14' 10"	0.98026
10	131° 41' 36"	4° 49' 03"	135° 35' 25"	21° 54' 06"	0° 55' 20"	15' 04.63"	303° 57' 54"	0.98134
11	132° 12' 49"	4° 49' 46"	136° 07' 44"	21° 45' 52"	0° 55' 21"	15' 04.95"	304° 43' 27"	0.98238
12	132° 44' 03"	4° 50' 27"	136° 40' 01"	21° 37' 32"	0° 55' 22"	15' 05.26"	305° 31' 01"	0.98340
13	133° 15' 19"	4° 51' 07"	137° 12' 15"	21° 29' 05"	0° 55' 23"	15' 05.58"	306° 20' 46"	0.98438
14	133° 46' 36"	4° 51' 46"	137° 44' 28"	21° 20' 32"	0° 55' 24"	15' 05.90"	307° 12' 55"	0.98533
15	134° 17' 54"	4° 52' 23"	138° 16' 38"	21° 11' 52"	0° 55' 26"	15' 06.22"	308° 7' 41"	0.98624
16	134° 49' 14"	4° 52' 59"	138° 48' 45"	21° 03' 06"	0° 55' 27"	15' 06.54"	309° 5' 22"	0.98712
17	135° 20' 36"	4° 53' 33"	139° 20' 51"	20° 54' 13"	0° 55' 28"	15' 06.86"	310° 6' 15"	0.98797
18	135° 51' 59"	4° 54' 06"	139° 52' 53"	20° 45' 14"	0° 55' 29"	15' 07.19"	311° 10' 41"	0.98879
19	136° 23' 23"	4° 54' 37"	140° 24' 54"	20° 36' 08"	0° 55' 30"	15' 07.51"	312° 19' 01"	0.98957
20	136° 54' 49"	4° 55' 07"	140° 56' 52"	20° 26' 56"	0° 55' 32"	15' 07.84"	313° 31' 43"	0.99032
21	137° 26' 16"	4° 55' 35"	141° 28' 47"	20° 17' 38"	0° 55' 33"	15' 08.17"	314° 49' 16"	0.99104
22	137° 57' 45"	4° 56' 02"	142° 00' 41"	20° 08' 13"	0° 55' 34"	15' 08.49"	316° 12' 13"	0.99172
23	138° 29' 15"	4° 56' 28"	142° 32' 31"	19° 58' 43"	0° 55' 35"	15' 08.82"	317° 41' 13"	0.99237
24	139° 00' 47"	4° 56' 51"	143° 04' 20"	19° 49' 06"	0° 55' 36"	15' 09.15"	319° 16' 58"	0.99299

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	327° 17' 15"	0.31"	329° 28' 48"	-12° 24' 58"	0.9877894	16' 11.49"	23° 26' 16"	-14 m 06 s
1	327° 19' 46"	0.31"	329° 31' 14"	-12° 24' 06"	0.9877977	16' 11.48"	23° 26' 16"	-14 m 06 s
2	327° 22' 17"	0.31"	329° 33' 39"	-12° 23' 14"	0.9878059	16' 11.48"	23° 26' 16"	-14 m 06 s
3	327° 24' 49"	0.31"	329° 36' 05"	-12° 22' 22"	0.9878142	16' 11.47"	23° 26' 16"	-14 m 05 s
4	327° 27' 20"	0.31"	329° 38' 30"	-12° 21' 30"	0.9878225	16' 11.46"	23° 26' 16"	-14 m 05 s
5	327° 29' 52"	0.31"	329° 40' 56"	-12° 20' 38"	0.9878308	16' 11.45"	23° 26' 16"	-14 m 05 s
6	327° 32' 23"	0.31"	329° 43' 22"	-12° 19' 46"	0.9878391	16' 11.44"	23° 26' 16"	-14 m 05 s
7	327° 34' 55"	0.31"	329° 45' 47"	-12° 18' 54"	0.9878474	16' 11.44"	23° 26' 16"	-14 m 05 s
8	327° 37' 26"	0.31"	329° 48' 13"	-12° 18' 02"	0.9878557	16' 11.43"	23° 26' 16"	-14 m 05 s
9	327° 39' 57"	0.31"	329° 50' 38"	-12° 17' 10"	0.9878640	16' 11.42"	23° 26' 16"	-14 m 05 s
10	327° 42' 29"	0.31"	329° 53' 04"	-12° 16' 18"	0.9878723	16' 11.41"	23° 26' 16"	-14 m 04 s
11	327° 45' 00"	0.31"	329° 55' 29"	-12° 15' 26"	0.9878807	16' 11.40"	23° 26' 16"	-14 m 04 s
12	327° 47' 32"	0.31"	329° 57' 55"	-12° 14' 34"	0.9878890	16' 11.39"	23° 26' 16"	-14 m 04 s
13	327° 50' 03"	0.31"	330° 00' 20"	-12° 13' 42"	0.9878974	16' 11.39"	23° 26' 16"	-14 m 04 s
14	327° 52' 34"	0.31"	330° 02' 46"	-12° 12' 49"	0.9879057	16' 11.38"	23° 26' 16"	-14 m 04 s
15	327° 55' 06"	0.31"	330° 05' 11"	-12° 11' 57"	0.9879141	16' 11.37"	23° 26' 16"	-14 m 04 s
16	327° 57' 37"	0.31"	330° 07' 36"	-12° 11' 05"	0.9879225	16' 11.36"	23° 26' 16"	-14 m 03 s
17	328° 00' 09"	0.31"	330° 10' 02"	-12° 10' 13"	0.9879309	16' 11.35"	23° 26' 16"	-14 m 03 s
18	328° 02' 40"	0.31"	330° 12' 27"	-12° 09' 21"	0.9879393	16' 11.35"	23° 26' 16"	-14 m 03 s
19	328° 05' 11"	0.31"	330° 14' 52"	-12° 08' 28"	0.9879477	16' 11.34"	23° 26' 16"	-14 m 03 s
20	328° 07' 43"	0.31"	330° 17' 18"	-12° 07' 36"	0.9879561	16' 11.33"	23° 26' 16"	-14 m 03 s
21	328° 10' 14"	0.31"	330° 19' 43"	-12° 06' 44"	0.9879645	16' 11.32"	23° 26' 16"	-14 m 03 s
22	328° 12' 46"	0.31"	330° 22' 08"	-12° 05' 51"	0.9879730	16' 11.31"	23° 26' 16"	-14 m 02 s
23	328° 15' 17"	0.31"	330° 24' 34"	-12° 04' 59"	0.9879814	16' 11.30"	23° 26' 16"	-14 m 02 s
24	328° 17' 48"	0.31"	330° 26' 59"	-12° 04' 07"	0.9879899	16' 11.30"	23° 26' 16"	-14 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	139° 00' 47"	4° 56' 51"	143° 04' 20"	19° 49' 06"	0° 55' 36"	15' 09.15"	319° 16' 58"	0.99299
1	139° 32' 20"	4° 57' 14"	143° 36' 05"	19° 39' 23"	0° 55' 38"	15' 09.48"	321° 0' 19"	0.99357
2	140° 03' 55"	4° 57' 35"	144° 07' 49"	19° 29' 34"	0° 55' 39"	15' 09.82"	322° 52' 10"	0.99411
3	140° 35' 31"	4° 57' 54"	144° 39' 30"	19° 19' 39"	0° 55' 40"	15' 10.15"	324° 53' 35"	0.99462
4	141° 07' 08"	4° 58' 12"	145° 11' 08"	19° 09' 39"	0° 55' 41"	15' 10.48"	327° 5' 44"	0.99510
5	141° 38' 47"	4° 58' 28"	145° 42' 44"	18° 59' 32"	0° 55' 42"	15' 10.82"	329° 29' 55"	0.99554
6	142° 10' 28"	4° 58' 43"	146° 14' 18"	18° 49' 19"	0° 55' 44"	15' 11.15"	332° 7' 35"	0.99595
7	142° 42' 09"	4° 58' 56"	146° 45' 49"	18° 39' 01"	0° 55' 45"	15' 11.49"	335° 0' 14"	0.99632
8	143° 13' 53"	4° 59' 08"	147° 17' 18"	18° 28' 37"	0° 55' 46"	15' 11.82"	338° 9' 29"	0.99666
9	143° 45' 37"	4° 59' 18"	147° 48' 44"	18° 18' 07"	0° 55' 47"	15' 12.16"	341° 36' 52"	0.99696
10	144° 17' 24"	4° 59' 27"	148° 20' 08"	18° 07' 32"	0° 55' 49"	15' 12.50"	345° 23' 48"	0.99723
11	144° 49' 11"	4° 59' 34"	148° 51' 30"	17° 56' 51"	0° 55' 50"	15' 12.83"	349° 31' 20"	0.99746
12	145° 21' 00"	4° 59' 39"	149° 22' 49"	17° 46' 04"	0° 55' 51"	15' 13.17"	353° 59' 57"	0.99766
13	145° 52' 51"	4° 59' 43"	149° 54' 06"	17° 35' 12"	0° 55' 52"	15' 13.51"	358° 49' 16"	0.99782
14	146° 24' 43"	4° 59' 46"	150° 25' 20"	17° 24' 15"	0° 55' 54"	15' 13.85"	3° 57' 44"	0.99795
15	146° 56' 36"	4° 59' 46"	150° 56' 32"	17° 13' 12"	0° 55' 55"	15' 14.19"	9° 22' 25"	0.99804
16	147° 28' 31"	4° 59' 46"	151° 27' 42"	17° 02' 04"	0° 55' 56"	15' 14.53"	14° 59' 01"	0.99809
17	148° 00' 27"	4° 59' 43"	151° 58' 49"	16° 50' 51"	0° 55' 57"	15' 14.87"	20° 42' 01"	0.99811
18	148° 32' 25"	4° 59' 40"	152° 29' 54"	16° 39' 32"	0° 55' 59"	15' 15.21"	26° 25' 13"	0.99809
19	149° 04' 24"	4° 59' 34"	153° 00' 57"	16° 28' 08"	0° 55' 60"	15' 15.55"	32° 2' 23"	0.99804
20	149° 36' 24"	4° 59' 27"	153° 31' 57"	16° 16' 39"	0° 56' 01"	15' 15.90"	37° 27' 56"	0.99795
21	150° 08' 26"	4° 59' 18"	154° 02' 55"	16° 05' 06"	0° 56' 02"	15' 16.24"	42° 37' 24"	0.99782
22	150° 40' 30"	4° 59' 08"	154° 33' 51"	15° 53' 27"	0° 56' 04"	15' 16.58"	47° 27' 44"	0.99766
23	151° 12' 34"	4° 58' 56"	155° 04' 44"	15° 41' 43"	0° 56' 05"	15' 16.92"	51° 57' 16"	0.99746
24	151° 44' 41"	4° 58' 43"	155° 35' 36"	15° 29' 54"	0° 56' 06"	15' 17.27"	56° 5' 28"	0.99723



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	328° 17' 48"	0.31"	330° 26' 59"	-12° 04' 07"	0.9879899	16' 11.30"	23° 26' 16"	-14 m 02 s
1	328° 20' 20"	0.31"	330° 29' 24"	-12° 03' 14"	0.9879983	16' 11.29"	23° 26' 16"	-14 m 02 s
2	328° 22' 51"	0.30"	330° 31' 49"	-12° 02' 22"	0.9880068	16' 11.28"	23° 26' 16"	-14 m 02 s
3	328° 25' 22"	0.30"	330° 34' 14"	-12° 01' 29"	0.9880153	16' 11.27"	23° 26' 16"	-14 m 02 s
4	328° 27' 54"	0.30"	330° 36' 40"	-12° 00' 37"	0.9880238	16' 11.26"	23° 26' 16"	-14 m 01 s
5	328° 30' 25"	0.30"	330° 39' 05"	-11° 59' 45"	0.9880323	16' 11.25"	23° 26' 16"	-14 m 01 s
6	328° 32' 57"	0.30"	330° 41' 30"	-11° 58' 52"	0.9880408	16' 11.25"	23° 26' 16"	-14 m 01 s
7	328° 35' 28"	0.30"	330° 43' 55"	-11° 57' 60"	0.9880493	16' 11.24"	23° 26' 16"	-14 m 01 s
8	328° 37' 59"	0.30"	330° 46' 20"	-11° 57' 07"	0.9880578	16' 11.23"	23° 26' 16"	-14 m 01 s
9	328° 40' 31"	0.30"	330° 48' 45"	-11° 56' 15"	0.9880663	16' 11.22"	23° 26' 16"	-14 m 00 s
10	328° 43' 02"	0.30"	330° 51' 10"	-11° 55' 22"	0.9880749	16' 11.21"	23° 26' 16"	-14 m 00 s
11	328° 45' 33"	0.29"	330° 53' 35"	-11° 54' 29"	0.9880834	16' 11.20"	23° 26' 16"	-14 m 00 s
12	328° 48' 05"	0.29"	330° 56' 00"	-11° 53' 37"	0.9880920	16' 11.20"	23° 26' 16"	-13 m 60 s
13	328° 50' 36"	0.29"	330° 58' 25"	-11° 52' 44"	0.9881005	16' 11.19"	23° 26' 16"	-13 m 60 s
14	328° 53' 07"	0.29"	331° 00' 50"	-11° 51' 52"	0.9881091	16' 11.18"	23° 26' 16"	-13 m 59 s
15	328° 55' 39"	0.29"	331° 03' 15"	-11° 50' 59"	0.9881177	16' 11.17"	23° 26' 16"	-13 m 59 s
16	328° 58' 10"	0.29"	331° 05' 40"	-11° 50' 06"	0.9881263	16' 11.16"	23° 26' 16"	-13 m 59 s
17	329° 00' 41"	0.28"	331° 08' 05"	-11° 49' 13"	0.9881349	16' 11.15"	23° 26' 16"	-13 m 59 s
18	329° 03' 13"	0.28"	331° 10' 30"	-11° 48' 21"	0.9881435	16' 11.14"	23° 26' 16"	-13 m 59 s
19	329° 05' 44"	0.28"	331° 12' 55"	-11° 47' 28"	0.9881521	16' 11.14"	23° 26' 16"	-13 m 59 s
20	329° 08' 15"	0.28"	331° 15' 20"	-11° 46' 35"	0.9881607	16' 11.13"	23° 26' 16"	-13 m 58 s
21	329° 10' 47"	0.28"	331° 17' 45"	-11° 45' 42"	0.9881693	16' 11.12"	23° 26' 16"	-13 m 58 s
22	329° 13' 18"	0.27"	331° 20' 10"	-11° 44' 50"	0.9881780	16' 11.11"	23° 26' 16"	-13 m 58 s
23	329° 15' 49"	0.27"	331° 22' 34"	-11° 43' 57"	0.9881866	16' 11.10"	23° 26' 16"	-13 m 58 s
24	329° 18' 21"	0.27"	331° 24' 59"	-11° 43' 04"	0.9881953	16' 11.09"	23° 26' 16"	-13 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	151° 44' 41"	4° 58' 43"	155° 35' 36"	15° 29' 54"	0° 56' 06"	15' 17.27"	56° 5' 28"	0.99723
1	152° 16' 48"	4° 58' 28"	156° 06' 25"	15° 18' 01"	0° 56' 07"	15' 17.61"	59° 52' 47"	0.99695
2	152° 48' 57"	4° 58' 11"	156° 37' 12"	15° 06' 02"	0° 56' 09"	15' 17.95"	63° 20' 12"	0.99665
3	153° 21' 07"	4° 57' 53"	157° 07' 57"	14° 53' 59"	0° 56' 10"	15' 18.29"	66° 29' 07"	0.99630
4	153° 53' 19"	4° 57' 33"	157° 38' 40"	14° 41' 52"	0° 56' 11"	15' 18.64"	69° 21' 04"	0.99592
5	154° 25' 32"	4° 57' 12"	158° 09' 21"	14° 29' 39"	0° 56' 12"	15' 18.98"	71° 57' 39"	0.99550
6	154° 57' 46"	4° 56' 49"	158° 39' 59"	14° 17' 22"	0° 56' 14"	15' 19.32"	74° 20' 24"	0.99505
7	155° 30' 02"	4° 56' 24"	159° 10' 36"	14° 05' 01"	0° 56' 15"	15' 19.67"	76° 30' 45"	0.99455
8	156° 02' 19"	4° 55' 58"	159° 41' 11"	13° 52' 35"	0° 56' 16"	15' 20.01"	78° 30' 02"	0.99402
9	156° 34' 38"	4° 55' 30"	160° 11' 43"	13° 40' 05"	0° 56' 17"	15' 20.36"	80° 19' 25"	0.99346
10	157° 06' 58"	4° 55' 01"	160° 42' 14"	13° 27' 31"	0° 56' 19"	15' 20.70"	81° 59' 59"	0.99285
11	157° 39' 19"	4° 54' 30"	161° 12' 43"	13° 14' 52"	0° 56' 20"	15' 21.04"	83° 32' 40"	0.99221
12	158° 11' 42"	4° 53' 57"	161° 43' 10"	13° 02' 10"	0° 56' 21"	15' 21.39"	84° 58' 17"	0.99154
13	158° 44' 06"	4° 53' 23"	162° 13' 35"	12° 49' 23"	0° 56' 22"	15' 21.73"	86° 17' 35"	0.99082
14	159° 16' 31"	4° 52' 47"	162° 43' 58"	12° 36' 32"	0° 56' 24"	15' 22.07"	87° 31' 12"	0.99007
15	159° 48' 58"	4° 52' 10"	163° 14' 20"	12° 23' 37"	0° 56' 25"	15' 22.42"	88° 39' 43"	0.98928
16	160° 21' 25"	4° 51' 30"	163° 44' 40"	12° 10' 38"	0° 56' 26"	15' 22.76"	89° 43' 36"	0.98845
17	160° 53' 55"	4° 50' 50"	164° 14' 58"	11° 57' 35"	0° 56' 28"	15' 23.10"	90° 43' 19"	0.98759
18	161° 26' 25"	4° 50' 07"	164° 45' 14"	11° 44' 28"	0° 56' 29"	15' 23.44"	91° 39' 15"	0.98669
19	161° 58' 57"	4° 49' 23"	165° 15' 29"	11° 31' 18"	0° 56' 30"	15' 23.79"	92° 31' 44"	0.98575
20	162° 31' 30"	4° 48' 38"	165° 45' 42"	11° 18' 03"	0° 56' 31"	15' 24.13"	93° 21' 05"	0.98478
21	163° 04' 05"	4° 47' 51"	166° 15' 54"	11° 04' 46"	0° 56' 33"	15' 24.47"	94° 7' 34"	0.98376
22	163° 36' 41"	4° 47' 02"	166° 46' 05"	10° 51' 24"	0° 56' 34"	15' 24.81"	94° 51' 25"	0.98271
23	164° 09' 18"	4° 46' 12"	167° 16' 13"	10° 37' 59"	0° 56' 35"	15' 25.15"	95° 32' 50"	0.98163
24	164° 41' 56"	4° 45' 20"	167° 46' 21"	10° 24' 31"	0° 56' 36"	15' 25.49"	96° 12' 03"	0.98050

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	329° 18' 21"	0.27"	331° 24' 59"	-11° 43' 04"	0.9881953	16' 11.09"	23° 26' 16"	-13 m 58 s
1	329° 20' 52"	0.27"	331° 27' 24"	-11° 42' 11"	0.9882039	16' 11.08"	23° 26' 16"	-13 m 57 s
2	329° 23' 23"	0.27"	331° 29' 49"	-11° 41' 18"	0.9882126	16' 11.08"	23° 26' 16"	-13 m 57 s
3	329° 25' 55"	0.26"	331° 32' 14"	-11° 40' 25"	0.9882213	16' 11.07"	23° 26' 16"	-13 m 57 s
4	329° 28' 26"	0.26"	331° 34' 38"	-11° 39' 32"	0.9882300	16' 11.06"	23° 26' 16"	-13 m 57 s
5	329° 30' 57"	0.26"	331° 37' 03"	-11° 38' 40"	0.9882387	16' 11.05"	23° 26' 16"	-13 m 56 s
6	329° 33' 28"	0.26"	331° 39' 28"	-11° 37' 47"	0.9882474	16' 11.04"	23° 26' 16"	-13 m 56 s
7	329° 35' 60"	0.26"	331° 41' 52"	-11° 36' 54"	0.9882561	16' 11.03"	23° 26' 16"	-13 m 56 s
8	329° 38' 31"	0.25"	331° 44' 17"	-11° 36' 01"	0.9882648	16' 11.03"	23° 26' 16"	-13 m 56 s
9	329° 41' 02"	0.25"	331° 46' 42"	-11° 35' 08"	0.9882736	16' 11.02"	23° 26' 16"	-13 m 56 s
10	329° 43' 34"	0.25"	331° 49' 06"	-11° 34' 15"	0.9882823	16' 11.01"	23° 26' 16"	-13 m 55 s
11	329° 46' 05"	0.24"	331° 51' 31"	-11° 33' 22"	0.9882911	16' 11.00"	23° 26' 16"	-13 m 55 s
12	329° 48' 36"	0.24"	331° 53' 56"	-11° 32' 28"	0.9882998	16' 10.99"	23° 26' 16"	-13 m 55 s
13	329° 51' 08"	0.24"	331° 56' 20"	-11° 31' 35"	0.9883086	16' 10.98"	23° 26' 16"	-13 m 55 s
14	329° 53' 39"	0.24"	331° 58' 45"	-11° 30' 42"	0.9883174	16' 10.97"	23° 26' 16"	-13 m 55 s
15	329° 56' 10"	0.23"	332° 01' 09"	-11° 29' 49"	0.9883261	16' 10.96"	23° 26' 16"	-13 m 54 s
16	329° 58' 41"	0.23"	332° 03' 34"	-11° 28' 56"	0.9883349	16' 10.96"	23° 26' 16"	-13 m 54 s
17	330° 01' 13"	0.23"	332° 05' 58"	-11° 28' 03"	0.9883437	16' 10.95"	23° 26' 16"	-13 m 54 s
18	330° 03' 44"	0.23"	332° 08' 23"	-11° 27' 10"	0.9883525	16' 10.94"	23° 26' 16"	-13 m 54 s
19	330° 06' 15"	0.22"	332° 10' 47"	-11° 26' 16"	0.9883614	16' 10.93"	23° 26' 16"	-13 m 53 s
20	330° 08' 46"	0.22"	332° 13' 12"	-11° 25' 23"	0.9883702	16' 10.92"	23° 26' 16"	-13 m 53 s
21	330° 11' 18"	0.22"	332° 15' 36"	-11° 24' 30"	0.9883790	16' 10.91"	23° 26' 16"	-13 m 53 s
22	330° 13' 49"	0.21"	332° 18' 01"	-11° 23' 37"	0.9883878	16' 10.90"	23° 26' 16"	-13 m 53 s
23	330° 16' 20"	0.21"	332° 20' 25"	-11° 22' 43"	0.9883967	16' 10.90"	23° 26' 16"	-13 m 53 s
24	330° 18' 51"	0.21"	332° 22' 49"	-11° 21' 50"	0.9884056	16' 10.89"	23° 26' 16"	-13 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	164° 41' 56"	4° 45' 20"	167° 46' 21"	10° 24' 31"	0° 56' 36"	15' 25.49"	96° 12' 03"	0.98050
1	165° 14' 36"	4° 44' 26"	168° 16' 27"	10° 10' 59"	0° 56' 38"	15' 25.83"	96° 49' 12"	0.97934
2	165° 47' 16"	4° 43' 31"	168° 46' 32"	9° 57' 24"	0° 56' 39"	15' 26.17"	97° 24' 27"	0.97814
3	166° 19' 59"	4° 42' 34"	169° 16' 35"	9° 43' 46"	0° 56' 40"	15' 26.51"	97° 57' 57"	0.97690
4	166° 52' 42"	4° 41' 36"	169° 46' 37"	9° 30' 04"	0° 56' 41"	15' 26.85"	98° 29' 48"	0.97563
5	167° 25' 27"	4° 40' 36"	170° 16' 38"	9° 16' 19"	0° 56' 43"	15' 27.19"	99° 0' 09"	0.97432
6	167° 58' 12"	4° 39' 35"	170° 46' 38"	9° 02' 31"	0° 56' 44"	15' 27.53"	99° 29' 03"	0.97297
7	168° 30' 60"	4° 38' 31"	171° 16' 37"	8° 48' 41"	0° 56' 45"	15' 27.87"	99° 56' 39"	0.97158
8	169° 03' 48"	4° 37' 27"	171° 46' 35"	8° 34' 47"	0° 56' 46"	15' 28.21"	100° 22' 59"	0.97016
9	169° 36' 38"	4° 36' 20"	172° 16' 32"	8° 20' 50"	0° 56' 48"	15' 28.54"	100° 48' 10"	0.96870
10	170° 09' 28"	4° 35' 13"	172° 46' 27"	8° 06' 50"	0° 56' 49"	15' 28.88"	101° 12' 15"	0.96720
11	170° 42' 20"	4° 34' 03"	173° 16' 22"	7° 52' 48"	0° 56' 50"	15' 29.22"	101° 35' 17"	0.96567
12	171° 15' 14"	4° 32' 52"	173° 46' 16"	7° 38' 43"	0° 56' 51"	15' 29.55"	101° 57' 22"	0.96410
13	171° 48' 08"	4° 31' 40"	174° 16' 10"	7° 24' 35"	0° 56' 52"	15' 29.89"	102° 18' 31"	0.96249
14	172° 21' 04"	4° 30' 25"	174° 46' 02"	7° 10' 25"	0° 56' 54"	15' 30.22"	102° 38' 47"	0.96084
15	172° 54' 01"	4° 29' 10"	175° 15' 54"	6° 56' 12"	0° 56' 55"	15' 30.56"	102° 58' 14"	0.95916
16	173° 26' 59"	4° 27' 52"	175° 45' 45"	6° 41' 57"	0° 56' 56"	15' 30.89"	103° 16' 54"	0.95744
17	173° 59' 58"	4° 26' 34"	176° 15' 36"	6° 27' 40"	0° 56' 57"	15' 31.22"	103° 34' 49"	0.95569
18	174° 32' 58"	4° 25' 13"	176° 45' 26"	6° 13' 20"	0° 56' 59"	15' 31.56"	103° 52' 02"	0.95390
19	175° 05' 60"	4° 23' 51"	177° 15' 16"	5° 58' 57"	0° 56' 60"	15' 31.89"	104° 8' 34"	0.95207
20	175° 39' 02"	4° 22' 28"	177° 45' 05"	5° 44' 33"	0° 57' 01"	15' 32.22"	104° 24' 27"	0.95020
21	176° 12' 06"	4° 21' 03"	178° 14' 54"	5° 30' 07"	0° 57' 02"	15' 32.55"	104° 39' 43"	0.94830
22	176° 45' 11"	4° 19' 37"	178° 44' 42"	5° 15' 38"	0° 57' 03"	15' 32.88"	104° 54' 23"	0.94636
23	177° 18' 17"	4° 18' 09"	179° 14' 31"	5° 01' 07"	0° 57' 05"	15' 33.21"	105° 8' 30"	0.94438
24	177° 51' 25"	4° 16' 39"	179° 44' 19"	4° 46' 35"	0° 57' 06"	15' 33.54"	105° 22' 03"	0.94237

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	330° 18' 51"	0.21"	332° 22' 49"	-11° 21' 50"	0.9884056	16' 10.89"	23° 26' 16"	-13 m 52 s
1	330° 21' 23"	0.20"	332° 25' 14"	-11° 20' 57"	0.9884144	16' 10.88"	23° 26' 16"	-13 m 52 s
2	330° 23' 54"	0.20"	332° 27' 38"	-11° 20' 04"	0.9884233	16' 10.87"	23° 26' 16"	-13 m 52 s
3	330° 26' 25"	0.20"	332° 30' 02"	-11° 19' 10"	0.9884322	16' 10.86"	23° 26' 16"	-13 m 52 s
4	330° 28' 56"	0.19"	332° 32' 27"	-11° 18' 17"	0.9884411	16' 10.85"	23° 26' 16"	-13 m 51 s
5	330° 31' 28"	0.19"	332° 34' 51"	-11° 17' 23"	0.9884500	16' 10.84"	23° 26' 16"	-13 m 51 s
6	330° 33' 59"	0.19"	332° 37' 15"	-11° 16' 30"	0.9884589	16' 10.83"	23° 26' 16"	-13 m 51 s
7	330° 36' 30"	0.18"	332° 39' 40"	-11° 15' 37"	0.9884678	16' 10.83"	23° 26' 16"	-13 m 51 s
8	330° 39' 01"	0.18"	332° 42' 04"	-11° 14' 43"	0.9884767	16' 10.82"	23° 26' 16"	-13 m 50 s
9	330° 41' 33"	0.18"	332° 44' 28"	-11° 13' 50"	0.9884856	16' 10.81"	23° 26' 16"	-13 m 50 s
10	330° 44' 04"	0.17"	332° 46' 52"	-11° 12' 56"	0.9884946	16' 10.80"	23° 26' 16"	-13 m 50 s
11	330° 46' 35"	0.17"	332° 49' 16"	-11° 12' 03"	0.9885035	16' 10.79"	23° 26' 16"	-13 m 50 s
12	330° 49' 06"	0.17"	332° 51' 41"	-11° 11' 09"	0.9885125	16' 10.78"	23° 26' 16"	-13 m 49 s
13	330° 51' 38"	0.16"	332° 54' 05"	-11° 10' 16"	0.9885214	16' 10.77"	23° 26' 16"	-13 m 49 s
14	330° 54' 09"	0.16"	332° 56' 29"	-11° 09' 22"	0.9885304	16' 10.76"	23° 26' 16"	-13 m 49 s
15	330° 56' 40"	0.15"	332° 58' 53"	-11° 08' 29"	0.9885394	16' 10.76"	23° 26' 16"	-13 m 49 s
16	330° 59' 11"	0.15"	333° 01' 17"	-11° 07' 35"	0.9885484	16' 10.75"	23° 26' 16"	-13 m 48 s
17	331° 01' 42"	0.15"	333° 03' 41"	-11° 06' 41"	0.9885574	16' 10.74"	23° 26' 16"	-13 m 48 s
18	331° 04' 14"	0.14"	333° 06' 05"	-11° 05' 48"	0.9885664	16' 10.73"	23° 26' 16"	-13 m 48 s
19	331° 06' 45"	0.14"	333° 08' 29"	-11° 04' 54"	0.9885754	16' 10.72"	23° 26' 16"	-13 m 48 s
20	331° 09' 16"	0.14"	333° 10' 54"	-11° 04' 00"	0.9885844	16' 10.71"	23° 26' 16"	-13 m 47 s
21	331° 11' 47"	0.13"	333° 13' 18"	-11° 03' 07"	0.9885934	16' 10.70"	23° 26' 16"	-13 m 47 s
22	331° 14' 19"	0.13"	333° 15' 42"	-11° 02' 13"	0.9886025	16' 10.69"	23° 26' 16"	-13 m 47 s
23	331° 16' 50"	0.12"	333° 18' 06"	-11° 01' 19"	0.9886115	16' 10.68"	23° 26' 16"	-13 m 47 s
24	331° 19' 21"	0.12"	333° 20' 30"	-11° 00' 26"	0.9886206	16' 10.68"	23° 26' 16"	-13 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	177° 51' 25"	4° 16' 39"	179° 44' 19"	4° 46' 35"	0° 57' 06"	15' 33.54"	105° 22' 03"	0.94237
1	178° 24' 33"	4° 15' 08"	180° 14' 07"	4° 32' 00"	0° 57' 07"	15' 33.87"	105° 35' 05"	0.94033
2	178° 57' 43"	4° 13' 36"	180° 43' 55"	4° 17' 24"	0° 57' 08"	15' 34.20"	105° 47' 37"	0.93824
3	179° 30' 53"	4° 12' 02"	181° 13' 43"	4° 02' 46"	0° 57' 09"	15' 34.52"	105° 59' 40"	0.93612
4	180° 04' 05"	4° 10' 26"	181° 43' 30"	3° 48' 07"	0° 57' 11"	15' 34.85"	106° 11' 14"	0.93397
5	180° 37' 18"	4° 08' 49"	182° 13' 18"	3° 33' 26"	0° 57' 12"	15' 35.17"	106° 22' 21"	0.93177
6	181° 10' 32"	4° 07' 11"	182° 43' 07"	3° 18' 43"	0° 57' 13"	15' 35.50"	106° 33' 02"	0.92955
7	181° 43' 47"	4° 05' 31"	183° 12' 55"	3° 03' 59"	0° 57' 14"	15' 35.82"	106° 43' 18"	0.92729
8	182° 17' 04"	4° 03' 49"	183° 42' 44"	2° 49' 13"	0° 57' 15"	15' 36.15"	106° 53' 09"	0.92499
9	182° 50' 21"	4° 02' 06"	184° 12' 33"	2° 34' 26"	0° 57' 17"	15' 36.47"	107° 2' 36"	0.92265
10	183° 23' 39"	4° 00' 22"	184° 42' 22"	2° 19' 38"	0° 57' 18"	15' 36.79"	107° 11' 40"	0.92029
11	183° 56' 59"	3° 58' 36"	185° 12' 12"	2° 04' 49"	0° 57' 19"	15' 37.11"	107° 20' 21"	0.91788
12	184° 30' 19"	3° 56' 49"	185° 42' 02"	1° 49' 58"	0° 57' 20"	15' 37.43"	107° 28' 41"	0.91544
13	185° 03' 41"	3° 55' 01"	186° 11' 53"	1° 35' 07"	0° 57' 21"	15' 37.75"	107° 36' 39"	0.91297
14	185° 37' 04"	3° 53' 11"	186° 41' 45"	1° 20' 14"	0° 57' 22"	15' 38.07"	107° 44' 17"	0.91046
15	186° 10' 27"	3° 51' 19"	187° 11' 37"	1° 05' 21"	0° 57' 24"	15' 38.39"	107° 51' 34"	0.90792
16	186° 43' 52"	3° 49' 27"	187° 41' 30"	0° 50' 27"	0° 57' 25"	15' 38.71"	107° 58' 32"	0.90534
17	187° 17' 18"	3° 47' 32"	188° 11' 24"	0° 35' 31"	0° 57' 26"	15' 39.02"	108° 5' 10"	0.90273
18	187° 50' 45"	3° 45' 37"	188° 41' 19"	0° 20' 36"	0° 57' 27"	15' 39.34"	108° 11' 29"	0.90008
19	188° 24' 13"	3° 43' 40"	189° 11' 14"	0° 05' 39"	0° 57' 28"	15' 39.65"	108° 17' 30"	0.89740
20	188° 57' 42"	3° 41' 42"	189° 41' 11"	0° -9' 18"	0° 57' 29"	15' 39.97"	108° 23' 13"	0.89469
21	189° 31' 12"	3° 39' 42"	190° 11' 09"	0° -24' 15"	0° 57' 31"	15' 40.28"	108° 28' 39"	0.89194
22	190° 04' 43"	3° 37' 41"	190° 41' 08"	0° -39' 13"	0° 57' 32"	15' 40.59"	108° 33' 47"	0.88916
23	190° 38' 15"	3° 35' 39"	191° 11' 08"	0° -54' 12"	0° 57' 33"	15' 40.91"	108° 38' 38"	0.88635
24	191° 11' 48"	3° 33' 35"	191° 41' 10"	-1° 09' 10"	0° 57' 34"	15' 41.22"	108° 43' 12"	0.88350

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	331° 19' 21"	0.12"	333° 20' 30"	-11° 00' 26"	0.9886206	16' 10.68"	23° 26' 16"	-13 m 46 s
1	331° 21' 52"	0.11"	333° 22' 53"	-10° 59' 32"	0.9886296	16' 10.67"	23° 26' 16"	-13 m 46 s
2	331° 24' 23"	0.11"	333° 25' 17"	-10° 58' 38"	0.9886387	16' 10.66"	23° 26' 16"	-13 m 46 s
3	331° 26' 55"	0.11"	333° 27' 41"	-10° 57' 44"	0.9886478	16' 10.65"	23° 26' 16"	-13 m 46 s
4	331° 29' 26"	0.10"	333° 30' 05"	-10° 56' 51"	0.9886569	16' 10.64"	23° 26' 16"	-13 m 45 s
5	331° 31' 57"	0.10"	333° 32' 29"	-10° 55' 57"	0.9886659	16' 10.63"	23° 26' 16"	-13 m 45 s
6	331° 34' 28"	0.09"	333° 34' 53"	-10° 55' 03"	0.9886750	16' 10.62"	23° 26' 16"	-13 m 45 s
7	331° 36' 59"	0.09"	333° 37' 17"	-10° 54' 09"	0.9886841	16' 10.61"	23° 26' 16"	-13 m 45 s
8	331° 39' 30"	0.08"	333° 39' 41"	-10° 53' 15"	0.9886933	16' 10.60"	23° 26' 16"	-13 m 44 s
9	331° 42' 02"	0.08"	333° 42' 05"	-10° 52' 21"	0.9887024	16' 10.60"	23° 26' 16"	-13 m 44 s
10	331° 44' 33"	0.08"	333° 44' 28"	-10° 51' 27"	0.9887115	16' 10.59"	23° 26' 16"	-13 m 44 s
11	331° 47' 04"	0.07"	333° 46' 52"	-10° 50' 33"	0.9887206	16' 10.58"	23° 26' 16"	-13 m 43 s
12	331° 49' 35"	0.07"	333° 49' 16"	-10° 49' 39"	0.9887298	16' 10.57"	23° 26' 16"	-13 m 43 s
13	331° 52' 06"	0.06"	333° 51' 40"	-10° 48' 45"	0.9887389	16' 10.56"	23° 26' 16"	-13 m 43 s
14	331° 54' 37"	0.06"	333° 54' 03"	-10° 47' 52"	0.9887481	16' 10.55"	23° 26' 16"	-13 m 43 s
15	331° 57' 09"	0.05"	333° 56' 27"	-10° 46' 58"	0.9887573	16' 10.54"	23° 26' 16"	-13 m 42 s
16	331° 59' 40"	0.05"	333° 58' 51"	-10° 46' 04"	0.9887664	16' 10.53"	23° 26' 16"	-13 m 42 s
17	332° 02' 11"	0.04"	334° 01' 15"	-10° 45' 09"	0.9887756	16' 10.52"	23° 26' 16"	-13 m 42 s
18	332° 04' 42"	0.04"	334° 03' 38"	-10° 44' 15"	0.9887848	16' 10.51"	23° 26' 16"	-13 m 42 s
19	332° 07' 13"	0.03"	334° 06' 02"	-10° 43' 21"	0.9887940	16' 10.51"	23° 26' 16"	-13 m 41 s
20	332° 09' 44"	0.03"	334° 08' 26"	-10° 42' 27"	0.9888032	16' 10.50"	23° 26' 16"	-13 m 41 s
21	332° 12' 16"	0.02"	334° 10' 49"	-10° 41' 33"	0.9888124	16' 10.49"	23° 26' 16"	-13 m 41 s
22	332° 14' 47"	0.02"	334° 13' 13"	-10° 40' 39"	0.9888217	16' 10.48"	23° 26' 16"	-13 m 40 s
23	332° 17' 18"	0.02"	334° 15' 36"	-10° 39' 45"	0.9888309	16' 10.47"	23° 26' 16"	-13 m 40 s
24	332° 19' 49"	0.01"	334° 17' 60"	-10° 38' 51"	0.9888401	16' 10.46"	23° 26' 16"	-13 m 40 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	191° 11' 48"	3° 33' 35"	191° 41' 10"	-1° 09' 10"	0° 57' 34"	15' 41.22"	108° 43' 12"	0.88350
1	191° 45' 22"	3° 31' 30"	192° 11' 13"	-1° 24' 09"	0° 57' 35"	15' 41.53"	108° 47' 30"	0.88062
2	192° 18' 57"	3° 29' 24"	192° 41' 17"	-1° 39' 08"	0° 57' 36"	15' 41.84"	108° 51' 32"	0.87771
3	192° 52' 33"	3° 27' 16"	193° 11' 23"	-1° 54' 07"	0° 57' 37"	15' 42.14"	108° 55' 19"	0.87477
4	193° 26' 10"	3° 25' 07"	193° 41' 30"	-2° 09' 06"	0° 57' 39"	15' 42.45"	108° 58' 49"	0.87179
5	193° 59' 49"	3° 22' 57"	194° 11' 39"	-2° 24' 05"	0° 57' 40"	15' 42.76"	109° 2' 05"	0.86878
6	194° 33' 28"	3° 20' 46"	194° 41' 50"	-2° 39' 04"	0° 57' 41"	15' 43.06"	109° 5' 05"	0.86574
7	195° 07' 08"	3° 18' 33"	195° 12' 02"	-2° 54' 03"	0° 57' 42"	15' 43.37"	109° 7' 50"	0.86266
8	195° 40' 49"	3° 16' 19"	195° 42' 16"	-3° 09' 02"	0° 57' 43"	15' 43.67"	109° 10' 21"	0.85956
9	196° 14' 31"	3° 14' 04"	196° 12' 33"	-3° 23' 60"	0° 57' 44"	15' 43.98"	109° 12' 38"	0.85642
10	196° 48' 14"	3° 11' 48"	196° 42' 51"	-3° 38' 57"	0° 57' 45"	15' 44.28"	109° 14' 40"	0.85325
11	197° 21' 58"	3° 09' 31"	197° 13' 11"	-3° 53' 54"	0° 57' 46"	15' 44.58"	109° 16' 28"	0.85005
12	197° 55' 43"	3° 07' 12"	197° 43' 33"	-4° 08' 51"	0° 57' 47"	15' 44.88"	109° 18' 02"	0.84682
13	198° 29' 29"	3° 04' 52"	198° 13' 57"	-4° 23' 47"	0° 57' 49"	15' 45.18"	109° 19' 22"	0.84356
14	199° 03' 16"	3° 02' 31"	198° 44' 24"	-4° 38' 42"	0° 57' 50"	15' 45.48"	109° 20' 29"	0.84027
15	199° 37' 04"	3° 00' 09"	199° 14' 53"	-4° 53' 37"	0° 57' 51"	15' 45.78"	109° 21' 23"	0.83695
16	200° 10' 53"	2° 57' 46"	199° 45' 24"	-5° 08' 30"	0° 57' 52"	15' 46.08"	109° 22' 03"	0.83360
17	200° 44' 43"	2° 55' 21"	200° 15' 57"	-5° 23' 23"	0° 57' 53"	15' 46.38"	109° 22' 30"	0.83022
18	201° 18' 34"	2° 52' 56"	200° 46' 33"	-5° 38' 14"	0° 57' 54"	15' 46.67"	109° 22' 44"	0.82681
19	201° 52' 26"	2° 50' 29"	201° 17' 12"	-5° 53' 05"	0° 57' 55"	15' 46.97"	109° 22' 45"	0.82337
20	202° 26' 19"	2° 48' 01"	201° 47' 53"	-6° 07' 54"	0° 57' 56"	15' 47.26"	109° 22' 33"	0.81990
21	203° 00' 12"	2° 45' 32"	202° 18' 37"	-6° 22' 42"	0° 57' 57"	15' 47.55"	109° 22' 09"	0.81641
22	203° 34' 07"	2° 43' 02"	202° 49' 24"	-6° 37' 29"	0° 57' 58"	15' 47.85"	109° 21' 32"	0.81288
23	204° 08' 03"	2° 40' 32"	203° 20' 14"	-6° 52' 14"	0° 57' 59"	15' 48.14"	109° 20' 42"	0.80933
24	204° 41' 59"	2° 37' 60"	203° 51' 06"	-7° 06' 58"	0° 58' 00"	15' 48.43"	109° 19' 40"	0.80575

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	332° 19' 49"	0.01"	334° 17' 60"	-10° 38' 51"	0.9888401	16' 10.46"	23° 26' 16"	-13 m 40 s
1	332° 22' 20"	0.01"	334° 20' 24"	-10° 37' 57"	0.9888494	16' 10.45"	23° 26' 16"	-13 m 40 s
2	332° 24' 51"	0.00"	334° 22' 47"	-10° 37' 02"	0.9888586	16' 10.44"	23° 26' 16"	-13 m 39 s
3	332° 27' 22"	-0.00"	334° 25' 11"	-10° 36' 08"	0.9888679	16' 10.43"	23° 26' 16"	-13 m 39 s
4	332° 29' 54"	-0.01"	334° 27' 34"	-10° 35' 14"	0.9888771	16' 10.42"	23° 26' 16"	-13 m 39 s
5	332° 32' 25"	-0.01"	334° 29' 58"	-10° 34' 20"	0.9888864	16' 10.41"	23° 26' 16"	-13 m 38 s
6	332° 34' 56"	-0.02"	334° 32' 21"	-10° 33' 25"	0.9888957	16' 10.41"	23° 26' 16"	-13 m 38 s
7	332° 37' 27"	-0.02"	334° 34' 45"	-10° 32' 31"	0.9889050	16' 10.40"	23° 26' 16"	-13 m 38 s
8	332° 39' 58"	-0.03"	334° 37' 08"	-10° 31' 37"	0.9889143	16' 10.39"	23° 26' 16"	-13 m 37 s
9	332° 42' 29"	-0.03"	334° 39' 31"	-10° 30' 43"	0.9889236	16' 10.38"	23° 26' 16"	-13 m 37 s
10	332° 45' 00"	-0.04"	334° 41' 55"	-10° 29' 48"	0.9889329	16' 10.37"	23° 26' 16"	-13 m 37 s
11	332° 47' 31"	-0.04"	334° 44' 18"	-10° 28' 54"	0.9889422	16' 10.36"	23° 26' 16"	-13 m 37 s
12	332° 50' 03"	-0.05"	334° 46' 42"	-10° 27' 60"	0.9889515	16' 10.35"	23° 26' 16"	-13 m 36 s
13	332° 52' 34"	-0.05"	334° 49' 05"	-10° 27' 05"	0.9889608	16' 10.34"	23° 26' 16"	-13 m 36 s
14	332° 55' 05"	-0.06"	334° 51' 28"	-10° 26' 11"	0.9889702	16' 10.33"	23° 26' 16"	-13 m 36 s
15	332° 57' 36"	-0.06"	334° 53' 52"	-10° 25' 16"	0.9889795	16' 10.32"	23° 26' 16"	-13 m 35 s
16	333° 00' 07"	-0.07"	334° 56' 15"	-10° 24' 22"	0.9889889	16' 10.31"	23° 26' 16"	-13 m 35 s
17	333° 02' 38"	-0.08"	334° 58' 38"	-10° 23' 27"	0.9889982	16' 10.31"	23° 26' 16"	-13 m 35 s
18	333° 05' 09"	-0.08"	335° 01' 02"	-10° 22' 33"	0.9890076	16' 10.30"	23° 26' 16"	-13 m 34 s
19	333° 07' 40"	-0.09"	335° 03' 25"	-10° 21' 39"	0.9890170	16' 10.29"	23° 26' 16"	-13 m 34 s
20	333° 10' 11"	-0.09"	335° 05' 48"	-10° 20' 44"	0.9890263	16' 10.28"	23° 26' 16"	-13 m 34 s
21	333° 12' 43"	-0.10"	335° 08' 11"	-10° 19' 49"	0.9890357	16' 10.27"	23° 26' 16"	-13 m 34 s
22	333° 15' 14"	-0.10"	335° 10' 35"	-10° 18' 55"	0.9890451	16' 10.26"	23° 26' 16"	-13 m 33 s
23	333° 17' 45"	-0.11"	335° 12' 58"	-10° 18' 00"	0.9890545	16' 10.25"	23° 26' 16"	-13 m 33 s
24	333° 20' 16"	-0.11"	335° 15' 21"	-10° 17' 06"	0.9890639	16' 10.24"	23° 26' 16"	-13 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	204° 41' 59"	2° 37' 60"	203° 51' 06"	-7° 06' 58"	0° 58' 00"	15' 48.43"	109° 19' 40"	0.80575
1	205° 15' 57"	2° 35' 27"	204° 22' 02"	-7° 21' 40"	0° 58' 02"	15' 48.72"	109° 18' 26"	0.80214
2	205° 49' 56"	2° 32' 53"	204° 53' 00"	-7° 36' 21"	0° 58' 03"	15' 49.01"	109° 16' 60"	0.79850
3	206° 23' 55"	2° 30' 18"	205° 24' 02"	-7° 50' 60"	0° 58' 04"	15' 49.29"	109° 15' 22"	0.79484
4	206° 57' 55"	2° 27' 42"	205° 55' 06"	-8° 05' 37"	0° 58' 05"	15' 49.58"	109° 13' 31"	0.79115
5	207° 31' 57"	2° 25' 05"	206° 26' 14"	-8° 20' 12"	0° 58' 06"	15' 49.87"	109° 11' 29"	0.78743
6	208° 05' 59"	2° 22' 27"	206° 57' 26"	-8° 34' 46"	0° 58' 07"	15' 50.15"	109° 9' 14"	0.78368
7	208° 40' 02"	2° 19' 48"	207° 28' 40"	-8° 49' 17"	0° 58' 08"	15' 50.44"	109° 6' 48"	0.77991
8	209° 14' 06"	2° 17' 08"	207° 59' 58"	-9° 03' 46"	0° 58' 09"	15' 50.72"	109° 4' 10"	0.77612
9	209° 48' 12"	2° 14' 27"	208° 31' 20"	-9° 18' 13"	0° 58' 10"	15' 51.00"	109° 1' 21"	0.77230
10	210° 22' 18"	2° 11' 46"	209° 02' 45"	-9° 32' 38"	0° 58' 11"	15' 51.28"	108° 58' 20"	0.76845
11	210° 56' 25"	2° 09' 03"	209° 34' 14"	-9° 46' 60"	0° 58' 12"	15' 51.56"	108° 55' 07"	0.76458
12	211° 30' 32"	2° 06' 20"	210° 05' 46"	-10° 01' 20"	0° 58' 13"	15' 51.84"	108° 51' 43"	0.76068
13	212° 04' 41"	2° 03' 36"	210° 37' 23"	-10° 15' 37"	0° 58' 14"	15' 52.12"	108° 48' 07"	0.75676
14	212° 38' 51"	2° 00' 51"	211° 09' 03"	-10° 29' 52"	0° 58' 15"	15' 52.40"	108° 44' 20"	0.75282
15	213° 13' 02"	1° 58' 05"	211° 40' 47"	-10° 44' 04"	0° 58' 16"	15' 52.68"	108° 40' 22"	0.74885
16	213° 47' 14"	1° 55' 19"	212° 12' 34"	-10° 58' 13"	0° 58' 17"	15' 52.95"	108° 36' 12"	0.74486
17	214° 21' 26"	1° 52' 31"	212° 44' 26"	-11° 12' 20"	0° 58' 18"	15' 53.23"	108° 31' 51"	0.74085
18	214° 55' 40"	1° 49' 43"	213° 16' 22"	-11° 26' 23"	0° 58' 19"	15' 53.50"	108° 27' 19"	0.73681
19	215° 29' 54"	1° 46' 54"	213° 48' 22"	-11° 40' 24"	0° 58' 20"	15' 53.77"	108° 22' 36"	0.73275
20	216° 04' 10"	1° 44' 05"	214° 20' 27"	-11° 54' 21"	0° 58' 21"	15' 54.05"	108° 17' 41"	0.72867
21	216° 38' 26"	1° 41' 14"	214° 52' 35"	-12° 08' 15"	0° 58' 22"	15' 54.32"	108° 12' 36"	0.72456
22	217° 12' 43"	1° 38' 23"	215° 24' 48"	-12° 22' 06"	0° 58' 23"	15' 54.59"	108° 7' 19"	0.72044
23	217° 47' 01"	1° 35' 32"	215° 57' 05"	-12° 35' 53"	0° 58' 24"	15' 54.86"	108° 1' 52"	0.71629
24	218° 21' 20"	1° 32' 39"	216° 29' 27"	-12° 49' 37"	0° 58' 25"	15' 55.12"	107° 56' 13"	0.71212

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	333° 20' 16"	-0.11"	335° 15' 21"	-10° 17' 06"	0.9890639	16' 10.24"	23° 26' 16"	-13 m 33 s
1	333° 22' 47"	-0.12"	335° 17' 44"	-10° 16' 11"	0.9890733	16' 10.23"	23° 26' 16"	-13 m 32 s
2	333° 25' 18"	-0.12"	335° 20' 07"	-10° 15' 17"	0.9890827	16' 10.22"	23° 26' 16"	-13 m 32 s
3	333° 27' 49"	-0.13"	335° 22' 31"	-10° 14' 22"	0.9890922	16' 10.21"	23° 26' 16"	-13 m 32 s
4	333° 30' 20"	-0.13"	335° 24' 54"	-10° 13' 27"	0.9891016	16' 10.20"	23° 26' 16"	-13 m 31 s
5	333° 32' 51"	-0.14"	335° 27' 17"	-10° 12' 33"	0.9891110	16' 10.19"	23° 26' 16"	-13 m 31 s
6	333° 35' 22"	-0.14"	335° 29' 40"	-10° 11' 38"	0.9891205	16' 10.19"	23° 26' 16"	-13 m 31 s
7	333° 37' 53"	-0.15"	335° 32' 03"	-10° 10' 43"	0.9891299	16' 10.18"	23° 26' 16"	-13 m 30 s
8	333° 40' 24"	-0.15"	335° 34' 26"	-10° 09' 49"	0.9891394	16' 10.17"	23° 26' 16"	-13 m 30 s
9	333° 42' 55"	-0.16"	335° 36' 49"	-10° 08' 54"	0.9891489	16' 10.16"	23° 26' 16"	-13 m 30 s
10	333° 45' 27"	-0.17"	335° 39' 12"	-10° 07' 59"	0.9891583	16' 10.15"	23° 26' 16"	-13 m 29 s
11	333° 47' 58"	-0.17"	335° 41' 35"	-10° 07' 05"	0.9891678	16' 10.14"	23° 26' 16"	-13 m 29 s
12	333° 50' 29"	-0.18"	335° 43' 58"	-10° 06' 10"	0.9891773	16' 10.13"	23° 26' 16"	-13 m 29 s
13	333° 52' 60"	-0.18"	335° 46' 21"	-10° 05' 15"	0.9891868	16' 10.12"	23° 26' 16"	-13 m 28 s
14	333° 55' 31"	-0.19"	335° 48' 44"	-10° 04' 20"	0.9891963	16' 10.11"	23° 26' 16"	-13 m 28 s
15	333° 58' 02"	-0.19"	335° 51' 07"	-10° 03' 25"	0.9892058	16' 10.10"	23° 26' 16"	-13 m 28 s
16	334° 00' 33"	-0.20"	335° 53' 30"	-10° 02' 31"	0.9892153	16' 10.09"	23° 26' 16"	-13 m 27 s
17	334° 03' 04"	-0.20"	335° 55' 53"	-10° 01' 36"	0.9892248	16' 10.08"	23° 26' 16"	-13 m 27 s
18	334° 05' 35"	-0.21"	335° 58' 16"	-10° 00' 41"	0.9892343	16' 10.07"	23° 26' 16"	-13 m 27 s
19	334° 08' 06"	-0.21"	336° 00' 39"	-9° 59' 46"	0.9892439	16' 10.06"	23° 26' 16"	-13 m 26 s
20	334° 10' 37"	-0.22"	336° 03' 02"	-9° 58' 51"	0.9892534	16' 10.05"	23° 26' 16"	-13 m 26 s
21	334° 13' 08"	-0.23"	336° 05' 24"	-9° 57' 56"	0.9892629	16' 10.05"	23° 26' 16"	-13 m 26 s
22	334° 15' 39"	-0.23"	336° 07' 47"	-9° 57' 01"	0.9892725	16' 10.04"	23° 26' 16"	-13 m 25 s
23	334° 18' 10"	-0.24"	336° 10' 10"	-9° 56' 06"	0.9892820	16' 10.03"	23° 26' 16"	-13 m 25 s
24	334° 20' 41"	-0.24"	336° 12' 33"	-9° 55' 11"	0.9892916	16' 10.02"	23° 26' 16"	-13 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	218° 21' 20"	1° 32' 39"	216° 29' 27"	-12° 49' 37"	0° 58' 25"	15' 55.12"	107° 56' 13"	0.71212
1	218° 55' 41"	1° 29' 46"	217° 01' 53"	-13° 03' 18"	0° 58' 26"	15' 55.39"	107° 50' 24"	0.70793
2	219° 30' 02"	1° 26' 52"	217° 34' 24"	-13° 16' 55"	0° 58' 27"	15' 55.66"	107° 44' 23"	0.70372
3	220° 04' 24"	1° 23' 58"	218° 06' 59"	-13° 30' 28"	0° 58' 28"	15' 55.92"	107° 38' 12"	0.69950
4	220° 38' 46"	1° 21' 03"	218° 39' 39"	-13° 43' 57"	0° 58' 29"	15' 56.19"	107° 31' 50"	0.69525
5	221° 13' 10"	1° 18' 08"	219° 12' 24"	-13° 57' 23"	0° 58' 30"	15' 56.45"	107° 25' 17"	0.69098
6	221° 47' 35"	1° 15' 12"	219° 45' 14"	-14° 10' 44"	0° 58' 31"	15' 56.71"	107° 18' 33"	0.68669
7	222° 22' 01"	1° 12' 15"	220° 18' 08"	-14° 24' 01"	0° 58' 32"	15' 56.97"	107° 11' 39"	0.68239
8	222° 56' 27"	1° 09' 18"	220° 51' 07"	-14° 37' 15"	0° 58' 33"	15' 57.23"	107° 4' 33"	0.67807
9	223° 30' 55"	1° 06' 20"	221° 24' 11"	-14° 50' 24"	0° 58' 34"	15' 57.49"	106° 57' 17"	0.67373
10	224° 05' 23"	1° 03' 22"	221° 57' 21"	-15° 03' 28"	0° 58' 35"	15' 57.75"	106° 49' 51"	0.66937
11	224° 39' 53"	1° 00' 23"	222° 30' 35"	-15° 16' 28"	0° 58' 36"	15' 58.00"	106° 42' 14"	0.66499
12	225° 14' 23"	0° 57' 24"	223° 03' 54"	-15° 29' 24"	0° 58' 37"	15' 58.26"	106° 34' 26"	0.66060
13	225° 48' 55"	0° 54' 25"	223° 37' 18"	-15° 42' 15"	0° 58' 37"	15' 58.51"	106° 26' 27"	0.65619
14	226° 23' 27"	0° 51' 25"	224° 10' 48"	-15° 55' 01"	0° 58' 38"	15' 58.77"	106° 18' 18"	0.65177
15	226° 58' 00"	0° 48' 25"	224° 44' 23"	-16° 07' 43"	0° 58' 39"	15' 59.02"	106° 9' 59"	0.64733
16	227° 32' 34"	0° 45' 24"	225° 18' 03"	-16° 20' 19"	0° 58' 40"	15' 59.27"	106° 1' 29"	0.64287
17	228° 07' 09"	0° 42' 23"	225° 51' 48"	-16° 32' 51"	0° 58' 41"	15' 59.52"	105° 52' 48"	0.63840
18	228° 41' 45"	0° 39' 21"	226° 25' 39"	-16° 45' 18"	0° 58' 42"	15' 59.77"	105° 43' 57"	0.63392
19	229° 16' 22"	0° 36' 19"	226° 59' 35"	-16° 57' 39"	0° 58' 43"	16' 00.01"	105° 34' 56"	0.62942
20	229° 51' 00"	0° 33' 17"	227° 33' 36"	-17° 09' 55"	0° 58' 44"	16' 00.26"	105° 25' 44"	0.62491
21	230° 25' 39"	0° 30' 15"	228° 07' 43"	-17° 22' 06"	0° 58' 45"	16' 00.50"	105° 16' 22"	0.62038
22	231° 00' 19"	0° 27' 12"	228° 41' 55"	-17° 34' 11"	0° 58' 46"	16' 00.75"	105° 6' 49"	0.61584
23	231° 34' 60"	0° 24' 09"	229° 16' 13"	-17° 46' 11"	0° 58' 47"	16' 00.99"	104° 57' 06"	0.61129
24	232° 09' 42"	0° 21' 06"	229° 50' 37"	-17° 58' 05"	0° 58' 47"	16' 01.23"	104° 47' 13"	0.60672

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	334° 20' 41"	-0.24"	336° 12' 33"	-9° 55' 11"	0.9892916	16' 10.02"	23° 26' 16"	-13 m 25 s
1	334° 23' 12"	-0.25"	336° 14' 56"	-9° 54' 16"	0.9893012	16' 10.01"	23° 26' 16"	-13 m 24 s
2	334° 25' 43"	-0.25"	336° 17' 19"	-9° 53' 21"	0.9893107	16' 10.00"	23° 26' 16"	-13 m 24 s
3	334° 28' 14"	-0.26"	336° 19' 41"	-9° 52' 26"	0.9893203	16' 09.99"	23° 26' 16"	-13 m 24 s
4	334° 30' 45"	-0.26"	336° 22' 04"	-9° 51' 31"	0.9893299	16' 09.98"	23° 26' 16"	-13 m 23 s
5	334° 33' 16"	-0.27"	336° 24' 27"	-9° 50' 36"	0.9893395	16' 09.97"	23° 26' 16"	-13 m 23 s
6	334° 35' 47"	-0.27"	336° 26' 50"	-9° 49' 41"	0.9893491	16' 09.96"	23° 26' 16"	-13 m 23 s
7	334° 38' 18"	-0.28"	336° 29' 12"	-9° 48' 46"	0.9893587	16' 09.95"	23° 26' 16"	-13 m 22 s
8	334° 40' 49"	-0.29"	336° 31' 35"	-9° 47' 51"	0.9893683	16' 09.94"	23° 26' 16"	-13 m 22 s
9	334° 43' 20"	-0.29"	336° 33' 58"	-9° 46' 56"	0.9893779	16' 09.93"	23° 26' 16"	-13 m 22 s
10	334° 45' 51"	-0.30"	336° 36' 20"	-9° 46' 01"	0.9893875	16' 09.92"	23° 26' 16"	-13 m 21 s
11	334° 48' 22"	-0.30"	336° 38' 43"	-9° 45' 06"	0.9893972	16' 09.91"	23° 26' 16"	-13 m 21 s
12	334° 50' 53"	-0.31"	336° 41' 06"	-9° 44' 11"	0.9894068	16' 09.90"	23° 26' 16"	-13 m 21 s
13	334° 53' 24"	-0.31"	336° 43' 28"	-9° 43' 15"	0.9894164	16' 09.89"	23° 26' 16"	-13 m 20 s
14	334° 55' 55"	-0.32"	336° 45' 51"	-9° 42' 20"	0.9894261	16' 09.89"	23° 26' 16"	-13 m 20 s
15	334° 58' 26"	-0.32"	336° 48' 13"	-9° 41' 25"	0.9894357	16' 09.88"	23° 26' 16"	-13 m 20 s
16	335° 00' 57"	-0.33"	336° 50' 36"	-9° 40' 30"	0.9894454	16' 09.87"	23° 26' 16"	-13 m 19 s
17	335° 03' 28"	-0.33"	336° 52' 59"	-9° 39' 35"	0.9894550	16' 09.86"	23° 26' 16"	-13 m 19 s
18	335° 05' 59"	-0.34"	336° 55' 21"	-9° 38' 39"	0.9894647	16' 09.85"	23° 26' 16"	-13 m 18 s
19	335° 08' 30"	-0.35"	336° 57' 44"	-9° 37' 44"	0.9894744	16' 09.84"	23° 26' 16"	-13 m 18 s
20	335° 11' 01"	-0.35"	337° 00' 06"	-9° 36' 49"	0.9894840	16' 09.83"	23° 26' 16"	-13 m 18 s
21	335° 13' 32"	-0.36"	337° 02' 29"	-9° 35' 54"	0.9894937	16' 09.82"	23° 26' 16"	-13 m 17 s
22	335° 16' 03"	-0.36"	337° 04' 51"	-9° 34' 58"	0.9895034	16' 09.81"	23° 26' 16"	-13 m 17 s
23	335° 18' 34"	-0.37"	337° 07' 14"	-9° 34' 03"	0.9895131	16' 09.80"	23° 26' 16"	-13 m 17 s
24	335° 21' 05"	-0.37"	337° 09' 36"	-9° 33' 08"	0.9895228	16' 09.79"	23° 26' 16"	-13 m 16 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	232° 09' 42"	0° 21' 06"	229° 50' 37"	-17° 58' 05"	0° 58' 47"	16' 01.23"	104° 47' 13"	0.60672
1	232° 44' 24"	0° 18' 03"	230° 25' 06"	-18° 09' 54"	0° 58' 48"	16' 01.47"	104° 37' 10"	0.60215
2	233° 19' 08"	0° 14' 59"	230° 59' 41"	-18° 21' 36"	0° 58' 49"	16' 01.71"	104° 26' 56"	0.59756
3	233° 53' 53"	0° 11' 55"	231° 34' 21"	-18° 33' 13"	0° 58' 50"	16' 01.95"	104° 16' 33"	0.59296
4	234° 28' 38"	0° 08' 51"	232° 09' 07"	-18° 44' 43"	0° 58' 51"	16' 02.18"	104° 5' 59"	0.58835
5	235° 03' 25"	0° 05' 47"	232° 43' 59"	-18° 56' 08"	0° 58' 52"	16' 02.42"	103° 55' 15"	0.58373
6	235° 38' 12"	0° 02' 43"	233° 18' 56"	-19° 07' 26"	0° 58' 53"	16' 02.65"	103° 44' 21"	0.57911
7	236° 13' 01"	0° 00' 22"	233° 53' 59"	-19° 18' 38"	0° 58' 54"	16' 02.88"	103° 33' 17"	0.57447
8	236° 47' 50"	0° -3' 26"	234° 29' 08"	-19° 29' 44"	0° 58' 54"	16' 03.11"	103° 22' 02"	0.56982
9	237° 22' 40"	0° -6' 30"	235° 04' 23"	-19° 40' 43"	0° 58' 55"	16' 03.34"	103° 10' 38"	0.56516
10	237° 57' 32"	0° -9' 35"	235° 39' 43"	-19° 51' 35"	0° 58' 56"	16' 03.57"	102° 59' 04"	0.56050
11	238° 32' 24"	0° -12' 40"	236° 15' 09"	-20° 02' 21"	0° 58' 57"	16' 03.80"	102° 47' 21"	0.55583
12	239° 07' 17"	0° -15' 44"	236° 50' 41"	-20° 13' 00"	0° 58' 58"	16' 04.02"	102° 35' 27"	0.55115
13	239° 42' 11"	0° -18' 49"	237° 26' 19"	-20° 23' 32"	0° 58' 59"	16' 04.24"	102° 23' 23"	0.54646
14	240° 17' 06"	0° -21' 53"	238° 02' 03"	-20° 33' 57"	0° 58' 59"	16' 04.47"	102° 11' 10"	0.54177
15	240° 52' 02"	0° -24' 58"	238° 37' 52"	-20° 44' 16"	0° 59' 00"	16' 04.69"	101° 58' 47"	0.53707
16	241° 26' 59"	0° -28' 02"	239° 13' 47"	-20° 54' 27"	0° 59' 01"	16' 04.91"	101° 46' 14"	0.53237
17	242° 01' 57"	0° -31' 07"	239° 49' 48"	-21° 04' 30"	0° 59' 02"	16' 05.12"	101° 33' 32"	0.52766
18	242° 36' 56"	0° -34' 11"	240° 25' 55"	-21° 14' 27"	0° 59' 03"	16' 05.34"	101° 20' 40"	0.52294
19	243° 11' 56"	0° -37' 15"	241° 02' 08"	-21° 24' 15"	0° 59' 03"	16' 05.55"	101° 7' 39"	0.51822
20	243° 46' 57"	0° -40' 19"	241° 38' 26"	-21° 33' 57"	0° 59' 04"	16' 05.76"	100° 54' 28"	0.51350
21	244° 21' 59"	0° -43' 23"	242° 14' 50"	-21° 43' 31"	0° 59' 05"	16' 05.97"	100° 41' 08"	0.50877
22	244° 57' 02"	0° -46' 26"	242° 51' 20"	-21° 52' 57"	0° 59' 06"	16' 06.18"	100° 27' 38"	0.50404
23	245° 32' 05"	0° -49' 29"	243° 27' 56"	-22° 02' 15"	0° 59' 06"	16' 06.39"	100° 13' 59"	0.49931
24	246° 07' 10"	0° -52' 33"	244° 04' 37"	-22° 11' 25"	0° 59' 07"	16' 06.60"	100° 0' 11"	0.49457

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	335° 21' 05"	-0.37"	337° 09' 36"	-9° 33' 08"	0.9895228	16' 09.79"	23° 26' 16"	-13 m 16 s
1	335° 23' 36"	-0.38"	337° 11' 59"	-9° 32' 12"	0.9895325	16' 09.78"	23° 26' 16"	-13 m 16 s
2	335° 26' 07"	-0.38"	337° 14' 21"	-9° 31' 17"	0.9895422	16' 09.77"	23° 26' 16"	-13 m 16 s
3	335° 28' 38"	-0.39"	337° 16' 43"	-9° 30' 22"	0.9895519	16' 09.76"	23° 26' 16"	-13 m 15 s
4	335° 31' 09"	-0.39"	337° 19' 06"	-9° 29' 26"	0.9895616	16' 09.75"	23° 26' 16"	-13 m 15 s
5	335° 33' 40"	-0.40"	337° 21' 28"	-9° 28' 31"	0.9895714	16' 09.74"	23° 26' 16"	-13 m 14 s
6	335° 36' 11"	-0.40"	337° 23' 50"	-9° 27' 35"	0.9895811	16' 09.73"	23° 26' 16"	-13 m 14 s
7	335° 38' 42"	-0.41"	337° 26' 13"	-9° 26' 40"	0.9895908	16' 09.72"	23° 26' 16"	-13 m 14 s
8	335° 41' 13"	-0.42"	337° 28' 35"	-9° 25' 44"	0.9896006	16' 09.71"	23° 26' 16"	-13 m 13 s
9	335° 43' 44"	-0.42"	337° 30' 58"	-9° 24' 49"	0.9896103	16' 09.70"	23° 26' 16"	-13 m 13 s
10	335° 46' 15"	-0.43"	337° 33' 20"	-9° 23' 54"	0.9896201	16' 09.70"	23° 26' 16"	-13 m 13 s
11	335° 48' 46"	-0.43"	337° 35' 42"	-9° 22' 58"	0.9896298	16' 09.69"	23° 26' 16"	-13 m 12 s
12	335° 51' 17"	-0.44"	337° 38' 04"	-9° 22' 03"	0.9896396	16' 09.68"	23° 26' 16"	-13 m 12 s
13	335° 53' 48"	-0.44"	337° 40' 27"	-9° 21' 07"	0.9896493	16' 09.67"	23° 26' 16"	-13 m 11 s
14	335° 56' 19"	-0.45"	337° 42' 49"	-9° 20' 11"	0.9896591	16' 09.66"	23° 26' 16"	-13 m 11 s
15	335° 58' 50"	-0.45"	337° 45' 11"	-9° 19' 16"	0.9896689	16' 09.65"	23° 26' 16"	-13 m 11 s
16	336° 01' 21"	-0.46"	337° 47' 33"	-9° 18' 20"	0.9896787	16' 09.64"	23° 26' 16"	-13 m 10 s
17	336° 03' 52"	-0.46"	337° 49' 56"	-9° 17' 25"	0.9896884	16' 09.63"	23° 26' 16"	-13 m 10 s
18	336° 06' 23"	-0.47"	337° 52' 18"	-9° 16' 29"	0.9896982	16' 09.62"	23° 26' 16"	-13 m 10 s
19	336° 08' 54"	-0.47"	337° 54' 40"	-9° 15' 33"	0.9897080	16' 09.61"	23° 26' 16"	-13 m 09 s
20	336° 11' 24"	-0.48"	337° 57' 02"	-9° 14' 38"	0.9897178	16' 09.60"	23° 26' 16"	-13 m 09 s
21	336° 13' 55"	-0.48"	337° 59' 24"	-9° 13' 42"	0.9897276	16' 09.59"	23° 26' 16"	-13 m 08 s
22	336° 16' 26"	-0.49"	338° 01' 46"	-9° 12' 47"	0.9897374	16' 09.58"	23° 26' 16"	-13 m 08 s
23	336° 18' 57"	-0.49"	338° 04' 08"	-9° 11' 51"	0.9897472	16' 09.57"	23° 26' 16"	-13 m 08 s
24	336° 21' 28"	-0.50"	338° 06' 31"	-9° 10' 55"	0.9897571	16' 09.56"	23° 26' 16"	-13 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	246° 07' 10"	0°-52' 33"	244° 04' 37"	-22° 11' 25"	0° 59' 07"	16' 06.60"	100° 0' 11"	0.49457
1	246° 42' 16"	0°-55' 35"	244° 41' 24"	-22° 20' 27"	0° 59' 08"	16' 06.80"	99° 46' 14"	0.48984
2	247° 17' 22"	0°-58' 38"	245° 18' 17"	-22° 29' 21"	0° 59' 09"	16' 07.00"	99° 32' 08"	0.48510
3	247° 52' 30"	-1° 01' 40"	245° 55' 16"	-22° 38' 07"	0° 59' 09"	16' 07.20"	99° 17' 52"	0.48036
4	248° 27' 38"	-1° 04' 42"	246° 32' 20"	-22° 46' 45"	0° 59' 10"	16' 07.40"	99° 3' 28"	0.47562
5	249° 02' 48"	-1° 07' 44"	247° 09' 29"	-22° 55' 14"	0° 59' 11"	16' 07.60"	98° 48' 55"	0.47088
6	249° 37' 58"	-1° 10' 45"	247° 46' 44"	-23° 03' 35"	0° 59' 12"	16' 07.79"	98° 34' 13"	0.46614
7	250° 13' 09"	-1° 13' 46"	248° 24' 05"	-23° 11' 47"	0° 59' 12"	16' 07.98"	98° 19' 22"	0.46141
8	250° 48' 22"	-1° 16' 47"	249° 01' 31"	-23° 19' 51"	0° 59' 13"	16' 08.17"	98° 4' 23"	0.45667
9	251° 23' 35"	-1° 19' 47"	249° 39' 03"	-23° 27' 46"	0° 59' 14"	16' 08.36"	97° 49' 15"	0.45193
10	251° 58' 49"	-1° 22' 47"	250° 16' 40"	-23° 35' 32"	0° 59' 14"	16' 08.55"	97° 33' 58"	0.44720
11	252° 34' 04"	-1° 25' 46"	250° 54' 22"	-23° 43' 09"	0° 59' 15"	16' 08.73"	97° 18' 33"	0.44247
12	253° 09' 20"	-1° 28' 45"	251° 32' 09"	-23° 50' 38"	0° 59' 16"	16' 08.91"	97° 2' 60"	0.43774
13	253° 44' 37"	-1° 31' 43"	252° 10' 02"	-23° 57' 57"	0° 59' 16"	16' 09.09"	96° 47' 18"	0.43302
14	254° 19' 55"	-1° 34' 41"	252° 48' 00"	-24° 05' 07"	0° 59' 17"	16' 09.27"	96° 31' 28"	0.42830
15	254° 55' 13"	-1° 37' 38"	253° 26' 03"	-24° 12' 08"	0° 59' 18"	16' 09.45"	96° 15' 30"	0.42359
16	255° 30' 33"	-1° 40' 35"	254° 04' 11"	-24° 18' 59"	0° 59' 18"	16' 09.62"	95° 59' 25"	0.41888
17	256° 05' 54"	-1° 43' 31"	254° 42' 24"	-24° 25' 41"	0° 59' 19"	16' 09.79"	95° 43' 11"	0.41417
18	256° 41' 15"	-1° 46' 26"	255° 20' 42"	-24° 32' 14"	0° 59' 20"	16' 09.96"	95° 26' 49"	0.40947
19	257° 16' 37"	-1° 49' 21"	255° 59' 04"	-24° 38' 37"	0° 59' 20"	16' 10.13"	95° 10' 20"	0.40478
20	257° 52' 01"	-1° 52' 16"	256° 37' 32"	-24° 44' 50"	0° 59' 21"	16' 10.30"	94° 53' 43"	0.40009
21	258° 27' 25"	-1° 55' 09"	257° 16' 04"	-24° 50' 54"	0° 59' 21"	16' 10.46"	94° 36' 59"	0.39542
22	259° 02' 50"	-1° 58' 02"	257° 54' 40"	-24° 56' 48"	0° 59' 22"	16' 10.62"	94° 20' 07"	0.39074
23	259° 38' 16"	-2° 00' 54"	258° 33' 21"	-25° 02' 32"	0° 59' 23"	16' 10.77"	94° 3' 08"	0.38608
24	260° 13' 43"	-2° 03' 46"	259° 12' 07"	-25° 08' 06"	0° 59' 23"	16' 10.93"	93° 46' 02"	0.38143

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	336° 21' 28"	-0.50"	338° 06' 31"	-9° 10' 55"	0.9897571	16' 09.56"	23° 26' 16"	-13 m 07 s
1	336° 23' 59"	-0.50"	338° 08' 53"	-9° 09' 59"	0.9897669	16' 09.55"	23° 26' 16"	-13 m 07 s
2	336° 26' 30"	-0.51"	338° 11' 15"	-9° 09' 04"	0.9897767	16' 09.54"	23° 26' 16"	-13 m 06 s
3	336° 29' 01"	-0.51"	338° 13' 37"	-9° 08' 08"	0.9897865	16' 09.53"	23° 26' 16"	-13 m 06 s
4	336° 31' 32"	-0.52"	338° 15' 59"	-9° 07' 12"	0.9897964	16' 09.52"	23° 26' 16"	-13 m 06 s
5	336° 34' 03"	-0.52"	338° 18' 21"	-9° 06' 17"	0.9898062	16' 09.51"	23° 26' 16"	-13 m 05 s
6	336° 36' 34"	-0.53"	338° 20' 43"	-9° 05' 21"	0.9898160	16' 09.50"	23° 26' 16"	-13 m 05 s
7	336° 39' 05"	-0.53"	338° 23' 05"	-9° 04' 25"	0.9898259	16' 09.49"	23° 26' 16"	-13 m 04 s
8	336° 41' 35"	-0.54"	338° 25' 27"	-9° 03' 29"	0.9898357	16' 09.48"	23° 26' 16"	-13 m 04 s
9	336° 44' 06"	-0.54"	338° 27' 49"	-9° 02' 33"	0.9898456	16' 09.47"	23° 26' 16"	-13 m 04 s
10	336° 46' 37"	-0.55"	338° 30' 11"	-9° 01' 37"	0.9898555	16' 09.46"	23° 26' 16"	-13 m 03 s
11	336° 49' 08"	-0.55"	338° 32' 33"	-9° 00' 42"	0.9898653	16' 09.46"	23° 26' 16"	-13 m 03 s
12	336° 51' 39"	-0.55"	338° 34' 55"	-8° 59' 46"	0.9898752	16' 09.45"	23° 26' 16"	-13 m 02 s
13	336° 54' 10"	-0.56"	338° 37' 17"	-8° 58' 50"	0.9898851	16' 09.44"	23° 26' 16"	-13 m 02 s
14	336° 56' 41"	-0.56"	338° 39' 38"	-8° 57' 54"	0.9898950	16' 09.43"	23° 26' 16"	-13 m 02 s
15	336° 59' 12"	-0.57"	338° 42' 00"	-8° 56' 58"	0.9899048	16' 09.42"	23° 26' 16"	-13 m 01 s
16	337° 01' 43"	-0.57"	338° 44' 22"	-8° 56' 02"	0.9899147	16' 09.41"	23° 26' 16"	-13 m 01 s
17	337° 04' 13"	-0.58"	338° 46' 44"	-8° 55' 06"	0.9899246	16' 09.40"	23° 26' 16"	-13 m 00 s
18	337° 06' 44"	-0.58"	338° 49' 06"	-8° 54' 10"	0.9899345	16' 09.39"	23° 26' 16"	-13 m 00 s
19	337° 09' 15"	-0.59"	338° 51' 28"	-8° 53' 14"	0.9899444	16' 09.38"	23° 26' 16"	-12 m 60 s
20	337° 11' 46"	-0.59"	338° 53' 50"	-8° 52' 18"	0.9899543	16' 09.37"	23° 26' 16"	-12 m 59 s
21	337° 14' 17"	-0.59"	338° 56' 11"	-8° 51' 22"	0.9899642	16' 09.36"	23° 26' 16"	-12 m 59 s
22	337° 16' 48"	-0.60"	338° 58' 33"	-8° 50' 26"	0.9899741	16' 09.35"	23° 26' 16"	-12 m 58 s
23	337° 19' 19"	-0.60"	339° 00' 55"	-8° 49' 30"	0.9899840	16' 09.34"	23° 26' 16"	-12 m 58 s
24	337° 21' 50"	-0.61"	339° 03' 17"	-8° 48' 34"	0.9899940	16' 09.33"	23° 26' 16"	-12 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	260° 13' 43"	-2° 03' 46"	259° 12' 07"	-25° 08' 06"	0° 59' 23"	16' 10.93"	93° 46' 02"	0.38143
1	260° 49' 11"	-2° 06' 37"	259° 50' 57"	-25° 13' 31"	0° 59' 24"	16' 11.08"	93° 28' 48"	0.37678
2	261° 24' 39"	-2° 09' 27"	260° 29' 51"	-25° 18' 45"	0° 59' 24"	16' 11.23"	93° 11' 28"	0.37215
3	262° 00' 09"	-2° 12' 16"	261° 08' 49"	-25° 23' 49"	0° 59' 25"	16' 11.38"	92° 54' 01"	0.36752
4	262° 35' 39"	-2° 15' 04"	261° 47' 51"	-25° 28' 43"	0° 59' 25"	16' 11.52"	92° 36' 27"	0.36291
5	263° 11' 06"	-2° 17' 52"	262° 26' 53"	-25° 33' 26"	0° 59' 26"	16' 11.67"	92° 18' 48"	0.35831
6	263° 46' 38"	-2° 20' 39"	263° 06' 03"	-25° 37' 59"	0° 59' 26"	16' 11.81"	92° 0' 01"	0.35372
7	264° 22' 11"	-2° 23' 25"	263° 45' 16"	-25° 42' 22"	0° 59' 27"	16' 11.94"	91° 43' 08"	0.34914
8	264° 57' 45"	-2° 26' 10"	264° 24' 33"	-25° 46' 34"	0° 59' 27"	16' 12.08"	91° 25' 08"	0.34457
9	265° 33' 19"	-2° 28' 54"	265° 03' 54"	-25° 50' 36"	0° 59' 28"	16' 12.21"	91° 7' 02"	0.34001
10	266° 08' 55"	-2° 31' 37"	265° 43' 18"	-25° 54' 28"	0° 59' 28"	16' 12.34"	90° 48' 50"	0.33547
11	266° 44' 31"	-2° 34' 19"	266° 22' 45"	-25° 58' 08"	0° 59' 29"	16' 12.47"	90° 30' 32"	0.33094
12	267° 20' 08"	-2° 37' 01"	267° 02' 15"	-26° 01' 39"	0° 59' 29"	16' 12.59"	90° 12' 09"	0.32643
13	267° 55' 46"	-2° 39' 41"	267° 41' 49"	-26° 04' 58"	0° 59' 30"	16' 12.71"	89° 53' 39"	0.32192
14	268° 31' 24"	-2° 42' 21"	268° 21' 25"	-26° 08' 07"	0° 59' 30"	16' 12.83"	89° 35' 05"	0.31744
15	269° 07' 03"	-2° 44' 59"	269° 01' 04"	-26° 11' 05"	0° 59' 30"	16' 12.94"	89° 16' 24"	0.31297
16	269° 42' 44"	-2° 47' 37"	269° 40' 46"	-26° 13' 52"	0° 59' 31"	16' 13.05"	88° 57' 39"	0.30852
17	270° 18' 24"	-2° 50' 13"	270° 20' 30"	-26° 16' 28"	0° 59' 31"	16' 13.16"	88° 38' 48"	0.30408
18	270° 54' 06"	-2° 52' 48"	271° 00' 17"	-26° 18' 53"	0° 59' 32"	16' 13.26"	88° 19' 52"	0.29966
19	271° 29' 48"	-2° 55' 22"	271° 40' 05"	-26° 21' 08"	0° 59' 32"	16' 13.37"	88° 0' 51"	0.29525
20	272° 05' 31"	-2° 57' 55"	272° 19' 56"	-26° 23' 11"	0° 59' 32"	16' 13.46"	87° 41' 46"	0.29087
21	272° 41' 15"	-3° 00' 27"	272° 59' 49"	-26° 25' 03"	0° 59' 33"	16' 13.56"	87° 22' 35"	0.28650
22	273° 16' 60"	-3° 02' 58"	273° 39' 44"	-26° 26' 44"	0° 59' 33"	16' 13.65"	87° 3' 20"	0.28215
23	273° 52' 45"	-3° 05' 28"	274° 19' 40"	-26° 28' 15"	0° 59' 33"	16' 13.74"	86° 44' 01"	0.27782
24	274° 28' 31"	-3° 07' 56"	274° 59' 38"	-26° 29' 34"	0° 59' 34"	16' 13.83"	86° 24' 37"	0.27352

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	337° 21' 50"	-0.61"	339° 03' 17"	-8° 48' 34"	0.9899940	16' 09.33"	23° 26' 16"	-12 m 58 s
1	337° 24' 20"	-0.61"	339° 05' 38"	-8° 47' 38"	0.9900039	16' 09.32"	23° 26' 16"	-12 m 57 s
2	337° 26' 51"	-0.62"	339° 08' 00"	-8° 46' 42"	0.9900138	16' 09.31"	23° 26' 16"	-12 m 57 s
3	337° 29' 22"	-0.62"	339° 10' 22"	-8° 45' 46"	0.9900237	16' 09.30"	23° 26' 16"	-12 m 56 s
4	337° 31' 53"	-0.62"	339° 12' 44"	-8° 44' 50"	0.9900337	16' 09.29"	23° 26' 16"	-12 m 56 s
5	337° 34' 24"	-0.63"	339° 15' 05"	-8° 43' 54"	0.9900436	16' 09.28"	23° 26' 16"	-12 m 55 s
6	337° 36' 55"	-0.63"	339° 17' 27"	-8° 42' 58"	0.9900535	16' 09.27"	23° 26' 16"	-12 m 55 s
7	337° 39' 26"	-0.64"	339° 19' 49"	-8° 42' 02"	0.9900635	16' 09.26"	23° 26' 16"	-12 m 55 s
8	337° 41' 56"	-0.64"	339° 22' 10"	-8° 41' 06"	0.9900734	16' 09.25"	23° 26' 16"	-12 m 54 s
9	337° 44' 27"	-0.64"	339° 24' 32"	-8° 40' 09"	0.9900834	16' 09.24"	23° 26' 16"	-12 m 54 s
10	337° 46' 58"	-0.65"	339° 26' 53"	-8° 39' 13"	0.9900933	16' 09.23"	23° 26' 16"	-12 m 53 s
11	337° 49' 29"	-0.65"	339° 29' 15"	-8° 38' 17"	0.9901033	16' 09.22"	23° 26' 16"	-12 m 53 s
12	337° 51' 60"	-0.66"	339° 31' 37"	-8° 37' 21"	0.9901133	16' 09.21"	23° 26' 16"	-12 m 52 s
13	337° 54' 31"	-0.66"	339° 33' 58"	-8° 36' 25"	0.9901232	16' 09.20"	23° 26' 16"	-12 m 52 s
14	337° 57' 01"	-0.66"	339° 36' 20"	-8° 35' 28"	0.9901332	16' 09.19"	23° 26' 16"	-12 m 52 s
15	337° 59' 32"	-0.67"	339° 38' 41"	-8° 34' 32"	0.9901432	16' 09.18"	23° 26' 16"	-12 m 51 s
16	338° 02' 03"	-0.67"	339° 41' 03"	-8° 33' 36"	0.9901532	16' 09.17"	23° 26' 16"	-12 m 51 s
17	338° 04' 34"	-0.68"	339° 43' 24"	-8° 32' 40"	0.9901631	16' 09.16"	23° 26' 16"	-12 m 50 s
18	338° 07' 05"	-0.68"	339° 45' 46"	-8° 31' 43"	0.9901731	16' 09.15"	23° 26' 16"	-12 m 50 s
19	338° 09' 36"	-0.68"	339° 48' 07"	-8° 30' 47"	0.9901831	16' 09.14"	23° 26' 16"	-12 m 49 s
20	338° 12' 06"	-0.69"	339° 50' 29"	-8° 29' 51"	0.9901931	16' 09.13"	23° 26' 16"	-12 m 49 s
21	338° 14' 37"	-0.69"	339° 52' 50"	-8° 28' 54"	0.9902031	16' 09.12"	23° 26' 16"	-12 m 49 s
22	338° 17' 08"	-0.69"	339° 55' 12"	-8° 27' 58"	0.9902131	16' 09.11"	23° 26' 16"	-12 m 48 s
23	338° 19' 39"	-0.70"	339° 57' 33"	-8° 27' 02"	0.9902231	16' 09.10"	23° 26' 16"	-12 m 48 s
24	338° 22' 10"	-0.70"	339° 59' 54"	-8° 26' 05"	0.9902331	16' 09.10"	23° 26' 16"	-12 m 47 s

(*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	274° 28' 31"	-3° 07' 56"	274° 59' 38"	-26° 29' 34"	0° 59' 34"	16' 13.83"	86° 24' 37"	0.27352
1	275° 04' 17"	-3° 10' 24"	275° 39' 38"	-26° 30' 41"	0° 59' 34"	16' 13.91"	86° 5' 09"	0.26923
2	275° 40' 04"	-3° 12' 50"	276° 19' 38"	-26° 31' 38"	0° 59' 34"	16' 13.99"	85° 45' 37"	0.26496
3	276° 15' 52"	-3° 15' 14"	276° 59' 40"	-26° 32' 24"	0° 59' 35"	16' 14.06"	85° 26' 02"	0.26071
4	276° 51' 41"	-3° 17' 38"	277° 39' 43"	-26° 32' 58"	0° 59' 35"	16' 14.14"	85° 6' 22"	0.25648
5	277° 27' 30"	-3° 20' 00"	278° 19' 47"	-26° 33' 21"	0° 59' 35"	16' 14.20"	84° 46' 38"	0.25228
6	278° 03' 19"	-3° 22' 21"	278° 59' 51"	-26° 33' 33"	0° 59' 35"	16' 14.27"	84° 26' 51"	0.24809
7	278° 39' 10"	-3° 24' 41"	279° 39' 56"	-26° 33' 34"	0° 59' 36"	16' 14.33"	84° 7' 00"	0.24393
8	279° 15' 00"	-3° 26' 60"	280° 20' 01"	-26° 33' 24"	0° 59' 36"	16' 14.39"	83° 47' 06"	0.23980
9	279° 50' 52"	-3° 29' 17"	281° 00' 06"	-26° 33' 02"	0° 59' 36"	16' 14.44"	83° 27' 09"	0.23569
10	280° 26' 44"	-3° 31' 32"	281° 40' 12"	-26° 32' 29"	0° 59' 36"	16' 14.49"	83° 7' 08"	0.23160
11	281° 02' 36"	-3° 33' 47"	282° 20' 18"	-26° 31' 45"	0° 59' 36"	16' 14.54"	82° 47' 04"	0.22753
12	281° 38' 29"	-3° 35' 60"	283° 00' 23"	-26° 30' 49"	0° 59' 36"	16' 14.58"	82° 26' 58"	0.22349
13	282° 14' 23"	-3° 38' 11"	283° 40' 28"	-26° 29' 43"	0° 59' 37"	16' 14.62"	82° 6' 48"	0.21948
14	282° 50' 17"	-3° 40' 21"	284° 20' 33"	-26° 28' 25"	0° 59' 37"	16' 14.66"	81° 46' 35"	0.21549
15	283° 26' 12"	-3° 42' 30"	285° 00' 36"	-26° 26' 56"	0° 59' 37"	16' 14.69"	81° 26' 20"	0.21153
16	284° 02' 07"	-3° 44' 37"	285° 40' 40"	-26° 25' 16"	0° 59' 37"	16' 14.72"	81° 6' 02"	0.20759
17	284° 38' 02"	-3° 46' 43"	286° 20' 42"	-26° 23' 24"	0° 59' 37"	16' 14.74"	80° 45' 41"	0.20368
18	285° 13' 58"	-3° 48' 47"	287° 00' 43"	-26° 21' 21"	0° 59' 37"	16' 14.76"	80° 25' 18"	0.19980
19	285° 49' 54"	-3° 50' 50"	287° 40' 43"	-26° 19' 08"	0° 59' 37"	16' 14.78"	80° 4' 52"	0.19595
20	286° 25' 51"	-3° 52' 51"	288° 20' 41"	-26° 16' 43"	0° 59' 37"	16' 14.79"	79° 44' 24"	0.19212
21	287° 01' 48"	-3° 54' 51"	289° 00' 38"	-26° 14' 07"	0° 59' 37"	16' 14.80"	79° 23' 53"	0.18833
22	287° 37' 45"	-3° 56' 49"	289° 40' 34"	-26° 11' 20"	0° 59' 37"	16' 14.80"	79° 3' 20"	0.18456
23	288° 13' 43"	-3° 58' 46"	290° 20' 27"	-26° 08' 22"	0° 59' 37"	16' 14.80"	78° 42' 45"	0.18082
24	288° 49' 41"	-4° 00' 41"	291° 00' 19"	-26° 05' 12"	0° 59' 37"	16' 14.80"	78° 22' 07"	0.17711

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	338° 22' 10"	-0.70"	339° 59' 54"	-8° 26' 05"	0.9902331	16' 09.10"	23° 26' 16"	-12 m 47 s
1	338° 24' 40"	-0.70"	340° 02' 16"	-8° 25' 09"	0.9902431	16' 09.09"	23° 26' 16"	-12 m 47 s
2	338° 27' 11"	-0.71"	340° 04' 37"	-8° 24' 13"	0.9902531	16' 09.08"	23° 26' 16"	-12 m 46 s
3	338° 29' 42"	-0.71"	340° 06' 59"	-8° 23' 16"	0.9902631	16' 09.07"	23° 26' 16"	-12 m 46 s
4	338° 32' 13"	-0.71"	340° 09' 20"	-8° 22' 20"	0.9902731	16' 09.06"	23° 26' 16"	-12 m 46 s
5	338° 34' 44"	-0.72"	340° 11' 41"	-8° 21' 23"	0.9902832	16' 09.05"	23° 26' 16"	-12 m 45 s
6	338° 37' 14"	-0.72"	340° 14' 03"	-8° 20' 27"	0.9902932	16' 09.04"	23° 26' 16"	-12 m 45 s
7	338° 39' 45"	-0.72"	340° 16' 24"	-8° 19' 31"	0.9903032	16' 09.03"	23° 26' 16"	-12 m 44 s
8	338° 42' 16"	-0.73"	340° 18' 45"	-8° 18' 34"	0.9903132	16' 09.02"	23° 26' 16"	-12 m 44 s
9	338° 44' 47"	-0.73"	340° 21' 07"	-8° 17' 38"	0.9903233	16' 09.01"	23° 26' 16"	-12 m 43 s
10	338° 47' 18"	-0.73"	340° 23' 28"	-8° 16' 41"	0.9903333	16' 09.00"	23° 26' 16"	-12 m 43 s
11	338° 49' 48"	-0.73"	340° 25' 49"	-8° 15' 45"	0.9903433	16' 08.99"	23° 26' 16"	-12 m 42 s
12	338° 52' 19"	-0.74"	340° 28' 10"	-8° 14' 48"	0.9903534	16' 08.98"	23° 26' 16"	-12 m 42 s
13	338° 54' 50"	-0.74"	340° 30' 32"	-8° 13' 52"	0.9903634	16' 08.97"	23° 26' 16"	-12 m 42 s
14	338° 57' 21"	-0.74"	340° 32' 53"	-8° 12' 55"	0.9903735	16' 08.96"	23° 26' 16"	-12 m 41 s
15	338° 59' 51"	-0.75"	340° 35' 14"	-8° 11' 59"	0.9903835	16' 08.95"	23° 26' 16"	-12 m 41 s
16	339° 02' 22"	-0.75"	340° 37' 35"	-8° 11' 02"	0.9903936	16' 08.94"	23° 26' 16"	-12 m 40 s
17	339° 04' 53"	-0.75"	340° 39' 56"	-8° 10' 05"	0.9904036	16' 08.93"	23° 26' 16"	-12 m 40 s
18	339° 07' 24"	-0.75"	340° 42' 18"	-8° 09' 09"	0.9904137	16' 08.92"	23° 26' 16"	-12 m 39 s
19	339° 09' 54"	-0.76"	340° 44' 39"	-8° 08' 12"	0.9904237	16' 08.91"	23° 26' 16"	-12 m 39 s
20	339° 12' 25"	-0.76"	340° 46' 60"	-8° 07' 16"	0.9904338	16' 08.90"	23° 26' 16"	-12 m 38 s
21	339° 14' 56"	-0.76"	340° 49' 21"	-8° 06' 19"	0.9904439	16' 08.89"	23° 26' 16"	-12 m 38 s
22	339° 17' 27"	-0.76"	340° 51' 42"	-8° 05' 22"	0.9904539	16' 08.88"	23° 26' 16"	-12 m 37 s
23	339° 19' 57"	-0.77"	340° 54' 03"	-8° 04' 26"	0.9904640	16' 08.87"	23° 26' 16"	-12 m 37 s
24	339° 22' 28"	-0.77"	340° 56' 24"	-8° 03' 29"	0.9904741	16' 08.86"	23° 26' 16"	-12 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	288° 49' 41"	-4° 00' 41"	291° 00' 19"	-26° 05' 12"	0° 59' 37"	16' 14.80"	78° 22' 07"	0.17711
1	289° 25' 39"	-4° 02' 35"	291° 40' 09"	-26° 01' 52"	0° 59' 37"	16' 14.79"	78° 1' 27"	0.17344
2	290° 01' 38"	-4° 04' 26"	292° 19' 56"	-25° 58' 21"	0° 59' 37"	16' 14.78"	77° 40' 44"	0.16979
3	290° 37' 37"	-4° 06' 17"	292° 59' 41"	-25° 54' 39"	0° 59' 37"	16' 14.76"	77° 19' 60"	0.16617
4	291° 13' 36"	-4° 08' 05"	293° 39' 24"	-25° 50' 47"	0° 59' 37"	16' 14.74"	76° 59' 13"	0.16259
5	291° 49' 35"	-4° 09' 52"	294° 19' 04"	-25° 46' 43"	0° 59' 37"	16' 14.71"	76° 38' 24"	0.15903
6	292° 25' 35"	-4° 11' 38"	294° 58' 41"	-25° 42' 29"	0° 59' 37"	16' 14.68"	76° 17' 32"	0.15551
7	293° 01' 35"	-4° 13' 21"	295° 38' 16"	-25° 38' 04"	0° 59' 37"	16' 14.65"	75° 56' 38"	0.15203
8	293° 37' 35"	-4° 15' 03"	296° 17' 47"	-25° 33' 28"	0° 59' 37"	16' 14.61"	75° 35' 41"	0.14857
9	294° 13' 35"	-4° 16' 44"	296° 57' 15"	-25° 28' 42"	0° 59' 36"	16' 14.57"	75° 14' 42"	0.14515
10	294° 49' 35"	-4° 18' 22"	297° 36' 41"	-25° 23' 45"	0° 59' 36"	16' 14.52"	74° 53' 40"	0.14176
11	295° 25' 35"	-4° 19' 59"	298° 16' 02"	-25° 18' 37"	0° 59' 36"	16' 14.47"	74° 32' 36"	0.13840
12	296° 01' 35"	-4° 21' 34"	298° 55' 21"	-25° 13' 19"	0° 59' 36"	16' 14.41"	74° 11' 29"	0.13508
13	296° 37' 36"	-4° 23' 08"	299° 34' 35"	-25° 07' 51"	0° 59' 36"	16' 14.35"	73° 50' 18"	0.13180
14	297° 13' 36"	-4° 24' 39"	300° 13' 46"	-25° 02' 13"	0° 59' 35"	16' 14.29"	73° 29' 05"	0.12855
15	297° 49' 37"	-4° 26' 09"	300° 52' 54"	-24° 56' 24"	0° 59' 35"	16' 14.22"	73° 7' 48"	0.12533
16	298° 25' 37"	-4° 27' 37"	301° 31' 57"	-24° 50' 25"	0° 59' 35"	16' 14.14"	72° 46' 28"	0.12215
17	299° 01' 38"	-4° 29' 04"	302° 10' 56"	-24° 44' 16"	0° 59' 35"	16' 14.07"	72° 25' 04"	0.11901
18	299° 37' 38"	-4° 30' 28"	302° 49' 51"	-24° 37' 56"	0° 59' 34"	16' 13.98"	72° 3' 36"	0.11590
19	300° 13' 38"	-4° 31' 51"	303° 28' 42"	-24° 31' 27"	0° 59' 34"	16' 13.89"	71° 42' 04"	0.11283
20	300° 49' 38"	-4° 33' 12"	304° 07' 29"	-24° 24' 48"	0° 59' 34"	16' 13.80"	71° 20' 28"	0.10980
21	301° 25' 38"	-4° 34' 31"	304° 46' 11"	-24° 17' 59"	0° 59' 33"	16' 13.71"	70° 58' 47"	0.10680
22	302° 01' 38"	-4° 35' 48"	305° 24' 49"	-24° 11' 01"	0° 59' 33"	16' 13.60"	70° 37' 01"	0.10385
23	302° 37' 38"	-4° 37' 04"	306° 03' 22"	-24° 03' 52"	0° 59' 32"	16' 13.50"	70° 15' 09"	0.10093
24	303° 13' 37"	-4° 38' 17"	306° 41' 50"	-23° 56' 34"	0° 59' 32"	16' 13.39"	69° 53' 12"	0.09804

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	339° 22' 28"	-0.77"	340° 56' 24"	-8° 03' 29"	0.9904741	16' 08.86"	23° 26' 16"	-12 m 37 s
1	339° 24' 59"	-0.77"	340° 58' 45"	-8° 02' 32"	0.9904842	16' 08.85"	23° 26' 16"	-12 m 36 s
2	339° 27' 30"	-0.77"	341° 01' 06"	-8° 01' 36"	0.9904943	16' 08.84"	23° 26' 16"	-12 m 36 s
3	339° 30' 00"	-0.77"	341° 03' 27"	-8° 00' 39"	0.9905043	16' 08.83"	23° 26' 17"	-12 m 35 s
4	339° 32' 31"	-0.78"	341° 05' 49"	-7° 59' 42"	0.9905144	16' 08.82"	23° 26' 17"	-12 m 35 s
5	339° 35' 02"	-0.78"	341° 08' 10"	-7° 58' 46"	0.9905245	16' 08.81"	23° 26' 17"	-12 m 34 s
6	339° 37' 33"	-0.78"	341° 10' 31"	-7° 57' 49"	0.9905346	16' 08.80"	23° 26' 17"	-12 m 34 s
7	339° 40' 03"	-0.78"	341° 12' 52"	-7° 56' 52"	0.9905447	16' 08.79"	23° 26' 17"	-12 m 33 s
8	339° 42' 34"	-0.78"	341° 15' 13"	-7° 55' 55"	0.9905548	16' 08.78"	23° 26' 17"	-12 m 33 s
9	339° 45' 05"	-0.79"	341° 17' 33"	-7° 54' 59"	0.9905649	16' 08.77"	23° 26' 17"	-12 m 32 s
10	339° 47' 35"	-0.79"	341° 19' 54"	-7° 54' 02"	0.9905750	16' 08.76"	23° 26' 17"	-12 m 32 s
11	339° 50' 06"	-0.79"	341° 22' 15"	-7° 53' 05"	0.9905851	16' 08.75"	23° 26' 17"	-12 m 31 s
12	339° 52' 37"	-0.79"	341° 24' 36"	-7° 52' 08"	0.9905952	16' 08.74"	23° 26' 17"	-12 m 31 s
13	339° 55' 08"	-0.79"	341° 26' 57"	-7° 51' 11"	0.9906053	16' 08.73"	23° 26' 17"	-12 m 30 s
14	339° 57' 38"	-0.79"	341° 29' 18"	-7° 50' 14"	0.9906154	16' 08.72"	23° 26' 17"	-12 m 30 s
15	340° 00' 09"	-0.80"	341° 31' 39"	-7° 49' 18"	0.9906255	16' 08.71"	23° 26' 17"	-12 m 30 s
16	340° 02' 40"	-0.80"	341° 33' 60"	-7° 48' 21"	0.9906357	16' 08.70"	23° 26' 17"	-12 m 29 s
17	340° 05' 10"	-0.80"	341° 36' 21"	-7° 47' 24"	0.9906458	16' 08.69"	23° 26' 17"	-12 m 29 s
18	340° 07' 41"	-0.80"	341° 38' 42"	-7° 46' 27"	0.9906559	16' 08.68"	23° 26' 17"	-12 m 28 s
19	340° 10' 12"	-0.80"	341° 41' 02"	-7° 45' 30"	0.9906660	16' 08.67"	23° 26' 17"	-12 m 28 s
20	340° 12' 42"	-0.80"	341° 43' 23"	-7° 44' 33"	0.9906761	16' 08.66"	23° 26' 17"	-12 m 27 s
21	340° 15' 13"	-0.80"	341° 45' 44"	-7° 43' 36"	0.9906863	16' 08.65"	23° 26' 17"	-12 m 27 s
22	340° 17' 44"	-0.81"	341° 48' 05"	-7° 42' 39"	0.9906964	16' 08.64"	23° 26' 17"	-12 m 26 s
23	340° 20' 14"	-0.81"	341° 50' 26"	-7° 41' 42"	0.9907065	16' 08.63"	23° 26' 17"	-12 m 26 s
24	340° 22' 45"	-0.81"	341° 52' 46"	-7° 40' 45"	0.9907167	16' 08.62"	23° 26' 17"	-12 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	303° 13' 37"	-4° 38' 17"	306° 41' 50"	-23° 56' 34"	0° 59' 32"	16' 13.39"	69° 53' 12"	0.09804
1	303° 49' 37"	-4° 39' 29"	307° 20' 14"	-23° 49' 07"	0° 59' 32"	16' 13.27"	69° 31' 08"	0.09520
2	304° 25' 36"	-4° 40' 39"	307° 58' 32"	-23° 41' 30"	0° 59' 31"	16' 13.15"	69° 8' 58"	0.09239
3	305° 01' 35"	-4° 41' 47"	308° 36' 46"	-23° 33' 44"	0° 59' 31"	16' 13.02"	68° 46' 41"	0.08963
4	305° 37' 33"	-4° 42' 53"	309° 14' 55"	-23° 25' 48"	0° 59' 30"	16' 12.89"	68° 24' 16"	0.08690
5	306° 13' 31"	-4° 43' 57"	309° 52' 59"	-23° 17' 44"	0° 59' 30"	16' 12.76"	68° 1' 42"	0.08421
6	306° 49' 29"	-4° 44' 60"	310° 30' 57"	-23° 09' 30"	0° 59' 29"	16' 12.62"	67° 39' 00"	0.08157
7	307° 25' 26"	-4° 46' 00"	311° 08' 51"	-23° 01' 07"	0° 59' 29"	16' 12.47"	67° 16' 08"	0.07896
8	308° 01' 23"	-4° 46' 59"	311° 46' 39"	-22° 52' 36"	0° 59' 28"	16' 12.33"	66° 53' 06"	0.07639
9	308° 37' 20"	-4° 47' 55"	312° 24' 21"	-22° 43' 55"	0° 59' 28"	16' 12.17"	66° 29' 53"	0.07386
10	309° 13' 16"	-4° 48' 50"	313° 01' 59"	-22° 35' 06"	0° 59' 27"	16' 12.01"	66° 6' 28"	0.07138
11	309° 49' 12"	-4° 49' 43"	313° 39' 31"	-22° 26' 08"	0° 59' 26"	16' 11.85"	65° 42' 50"	0.06893
12	310° 25' 07"	-4° 50' 34"	314° 16' 57"	-22° 17' 02"	0° 59' 26"	16' 11.68"	65° 18' 58"	0.06653
13	311° 01' 02"	-4° 51' 23"	314° 54' 18"	-22° 07' 47"	0° 59' 25"	16' 11.51"	64° 54' 51"	0.06417
14	311° 36' 56"	-4° 52' 10"	315° 31' 33"	-21° 58' 24"	0° 59' 25"	16' 11.33"	64° 30' 28"	0.06185
15	312° 12' 49"	-4° 52' 55"	316° 08' 43"	-21° 48' 53"	0° 59' 24"	16' 11.15"	64° 5' 47"	0.05957
16	312° 48' 42"	-4° 53' 38"	316° 45' 46"	-21° 39' 14"	0° 59' 23"	16' 10.96"	63° 40' 48"	0.05733
17	313° 24' 34"	-4° 54' 19"	317° 22' 45"	-21° 29' 26"	0° 59' 22"	16' 10.77"	63° 15' 28"	0.05514
18	314° 00' 26"	-4° 54' 58"	317° 59' 37"	-21° 19' 31"	0° 59' 22"	16' 10.57"	62° 49' 47"	0.05299
19	314° 36' 17"	-4° 55' 35"	318° 36' 24"	-21° 09' 28"	0° 59' 21"	16' 10.37"	62° 23' 42"	0.05088
20	315° 12' 07"	-4° 56' 11"	319° 13' 04"	-20° 59' 17"	0° 59' 20"	16' 10.16"	61° 57' 12"	0.04881
21	315° 47' 57"	-4° 56' 44"	319° 49' 39"	-20° 48' 58"	0° 59' 19"	16' 09.95"	61° 30' 14"	0.04679
22	316° 23' 45"	-4° 57' 16"	320° 26' 08"	-20° 38' 32"	0° 59' 19"	16' 09.74"	61° 2' 46"	0.04481
23	316° 59' 33"	-4° 57' 45"	321° 02' 31"	-20° 27' 59"	0° 59' 18"	16' 09.52"	60° 34' 45"	0.04287
24	317° 35' 20"	-4° 58' 12"	321° 38' 49"	-20° 17' 18"	0° 59' 17"	16' 09.29"	60° 6' 10"	0.04098

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	340° 22' 45"	-0.81"	341° 52' 46"	-7° 40' 45"	0.9907167	16' 08.62"	23° 26' 17"	-12 m 25 s
1	340° 25' 16"	-0.81"	341° 55' 07"	-7° 39' 49"	0.9907268	16' 08.61"	23° 26' 17"	-12 m 25 s
2	340° 27' 46"	-0.81"	341° 57' 28"	-7° 38' 52"	0.9907370	16' 08.60"	23° 26' 17"	-12 m 24 s
3	340° 30' 17"	-0.81"	341° 59' 49"	-7° 37' 55"	0.9907471	16' 08.59"	23° 26' 17"	-12 m 24 s
4	340° 32' 48"	-0.81"	342° 02' 09"	-7° 36' 58"	0.9907572	16' 08.58"	23° 26' 17"	-12 m 23 s
5	340° 35' 18"	-0.81"	342° 04' 30"	-7° 36' 01"	0.9907674	16' 08.57"	23° 26' 17"	-12 m 23 s
6	340° 37' 49"	-0.81"	342° 06' 51"	-7° 35' 04"	0.9907775	16' 08.56"	23° 26' 17"	-12 m 22 s
7	340° 40' 20"	-0.81"	342° 09' 11"	-7° 34' 07"	0.9907877	16' 08.55"	23° 26' 17"	-12 m 22 s
8	340° 42' 50"	-0.81"	342° 11' 32"	-7° 33' 09"	0.9907978	16' 08.54"	23° 26' 17"	-12 m 21 s
9	340° 45' 21"	-0.82"	342° 13' 53"	-7° 32' 12"	0.9908080	16' 08.53"	23° 26' 17"	-12 m 21 s
10	340° 47' 52"	-0.82"	342° 16' 13"	-7° 31' 15"	0.9908182	16' 08.52"	23° 26' 17"	-12 m 20 s
11	340° 50' 22"	-0.82"	342° 18' 34"	-7° 30' 18"	0.9908283	16' 08.51"	23° 26' 17"	-12 m 20 s
12	340° 52' 53"	-0.82"	342° 20' 54"	-7° 29' 21"	0.9908385	16' 08.50"	23° 26' 17"	-12 m 19 s
13	340° 55' 24"	-0.82"	342° 23' 15"	-7° 28' 24"	0.9908487	16' 08.49"	23° 26' 17"	-12 m 19 s
14	340° 57' 54"	-0.82"	342° 25' 36"	-7° 27' 27"	0.9908588	16' 08.48"	23° 26' 17"	-12 m 18 s
15	341° 00' 25"	-0.82"	342° 27' 56"	-7° 26' 30"	0.9908690	16' 08.47"	23° 26' 17"	-12 m 18 s
16	341° 02' 56"	-0.82"	342° 30' 17"	-7° 25' 33"	0.9908792	16' 08.46"	23° 26' 17"	-12 m 17 s
17	341° 05' 26"	-0.82"	342° 32' 37"	-7° 24' 36"	0.9908893	16' 08.45"	23° 26' 17"	-12 m 17 s
18	341° 07' 57"	-0.82"	342° 34' 58"	-7° 23' 38"	0.9908995	16' 08.44"	23° 26' 17"	-12 m 16 s
19	341° 10' 27"	-0.82"	342° 37' 18"	-7° 22' 41"	0.9909097	16' 08.43"	23° 26' 17"	-12 m 16 s
20	341° 12' 58"	-0.82"	342° 39' 39"	-7° 21' 44"	0.9909199	16' 08.42"	23° 26' 17"	-12 m 15 s
21	341° 15' 29"	-0.82"	342° 41' 59"	-7° 20' 47"	0.9909301	16' 08.41"	23° 26' 17"	-12 m 15 s
22	341° 17' 59"	-0.82"	342° 44' 20"	-7° 19' 50"	0.9909402	16' 08.40"	23° 26' 17"	-12 m 14 s
23	341° 20' 30"	-0.82"	342° 46' 40"	-7° 18' 52"	0.9909504	16' 08.39"	23° 26' 17"	-12 m 14 s
24	341° 23' 00"	-0.82"	342° 49' 01"	-7° 17' 55"	0.9909606	16' 08.38"	23° 26' 17"	-12 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	317° 35' 20"	-4° 58' 12"	321° 38' 49"	-20° 17' 18"	0° 59' 17"	16' 09.29"	60° 6' 10"	0.04098
1	318° 11' 06"	-4° 58' 38"	322° 14' 60"	-20° 06' 30"	0° 59' 16"	16' 09.06"	59° 36' 57"	0.03913
2	318° 46' 52"	-4° 59' 01"	322° 51' 05"	-19° 55' 35"	0° 59' 15"	16' 08.82"	59° 7' 03"	0.03733
3	319° 22' 36"	-4° 59' 23"	323° 27' 05"	-19° 44' 32"	0° 59' 14"	16' 08.58"	58° 36' 24"	0.03556
4	319° 58' 20"	-4° 59' 43"	324° 02' 58"	-19° 33' 23"	0° 59' 14"	16' 08.34"	58° 4' 56"	0.03385
5	320° 34' 02"	-5° 00' 00"	324° 38' 45"	-19° 22' 08"	0° 59' 13"	16' 08.09"	57° 32' 36"	0.03217
6	321° 09' 44"	-5° 00' 16"	325° 14' 27"	-19° 10' 45"	0° 59' 12"	16' 07.84"	56° 59' 18"	0.03054
7	321° 45' 25"	-5° 00' 30"	325° 50' 02"	-18° 59' 16"	0° 59' 11"	16' 07.58"	56° 24' 57"	0.02896
8	322° 21' 04"	-5° 00' 41"	326° 25' 32"	-18° 47' 40"	0° 59' 10"	16' 07.32"	55° 49' 28"	0.02742
9	322° 56' 43"	-5° 00' 51"	327° 00' 55"	-18° 35' 58"	0° 59' 09"	16' 07.05"	55° 12' 44"	0.02592
10	323° 32' 20"	-5° 00' 59"	327° 36' 13"	-18° 24' 10"	0° 59' 08"	16' 06.78"	54° 34' 38"	0.02447
11	324° 07' 57"	-5° 01' 05"	328° 11' 24"	-18° 12' 16"	0° 59' 07"	16' 06.50"	53° 55' 02"	0.02306
12	324° 43' 32"	-5° 01' 09"	328° 46' 30"	-18° 00' 16"	0° 59' 06"	16' 06.22"	53° 13' 48"	0.02170
13	325° 19' 06"	-5° 01' 11"	329° 21' 30"	-17° 48' 09"	0° 59' 05"	16' 05.93"	52° 30' 45"	0.02039
14	325° 54' 39"	-5° 01' 11"	329° 56' 23"	-17° 35' 57"	0° 59' 04"	16' 05.64"	51° 45' 42"	0.01911
15	326° 30' 11"	-5° 01' 09"	330° 31' 11"	-17° 23' 40"	0° 59' 03"	16' 05.35"	50° 58' 27"	0.01789
16	327° 05' 41"	-5° 01' 05"	331° 05' 53"	-17° 11' 16"	0° 59' 01"	16' 05.05"	50° 8' 45"	0.01670
17	327° 41' 10"	-5° 00' 59"	331° 40' 29"	-16° 58' 47"	0° 59' 00"	16' 04.74"	49° 16' 21"	0.01557
18	328° 16' 38"	-5° 00' 51"	332° 14' 59"	-16° 46' 13"	0° 58' 59"	16' 04.44"	48° 20' 57"	0.01448
19	328° 52' 05"	-5° 00' 41"	332° 49' 23"	-16° 33' 33"	0° 58' 58"	16' 04.12"	47° 22' 11"	0.01343
20	329° 27' 30"	-5° 00' 30"	333° 23' 42"	-16° 20' 48"	0° 58' 57"	16' 03.81"	46° 19' 41"	0.01243
21	330° 02' 54"	-5° 00' 16"	333° 57' 55"	-16° 07' 59"	0° 58' 56"	16' 03.49"	45° 12' 59"	0.01147
22	330° 38' 16"	-5° 00' 01"	334° 32' 02"	-15° 55' 04"	0° 58' 55"	16' 03.16"	44° 1' 34"	0.01056
23	331° 13' 37"	-4° 59' 43"	335° 06' 03"	-15° 42' 04"	0° 58' 53"	16' 02.83"	42° 44' 50"	0.00969
24	331° 48' 57"	-4° 59' 24"	335° 39' 58"	-15° 28' 60"	0° 58' 52"	16' 02.50"	41° 22' 07"	0.00887

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	341° 23' 00"	-0.82"	342° 49' 01"	-7° 17' 55"	0.9909606	16' 08.38"	23° 26' 17"	-12 m 13 s
1	341° 25' 31"	-0.82"	342° 51' 21"	-7° 16' 58"	0.9909708	16' 08.37"	23° 26' 17"	-12 m 13 s
2	341° 28' 02"	-0.82"	342° 53' 42"	-7° 16' 01"	0.9909810	16' 08.36"	23° 26' 17"	-12 m 12 s
3	341° 30' 32"	-0.82"	342° 56' 02"	-7° 15' 03"	0.9909912	16' 08.35"	23° 26' 17"	-12 m 12 s
4	341° 33' 03"	-0.82"	342° 58' 22"	-7° 14' 06"	0.9910014	16' 08.34"	23° 26' 17"	-12 m 11 s
5	341° 35' 33"	-0.82"	343° 00' 43"	-7° 13' 09"	0.9910116	16' 08.33"	23° 26' 17"	-12 m 11 s
6	341° 38' 04"	-0.82"	343° 03' 03"	-7° 12' 12"	0.9910218	16' 08.32"	23° 26' 17"	-12 m 10 s
7	341° 40' 35"	-0.82"	343° 05' 23"	-7° 11' 14"	0.9910320	16' 08.31"	23° 26' 17"	-12 m 10 s
8	341° 43' 05"	-0.81"	343° 07' 44"	-7° 10' 17"	0.9910422	16' 08.30"	23° 26' 17"	-12 m 09 s
9	341° 45' 36"	-0.81"	343° 10' 04"	-7° 09' 20"	0.9910524	16' 08.29"	23° 26' 17"	-12 m 09 s
10	341° 48' 06"	-0.81"	343° 12' 24"	-7° 08' 22"	0.9910626	16' 08.28"	23° 26' 17"	-12 m 08 s
11	341° 50' 37"	-0.81"	343° 14' 45"	-7° 07' 25"	0.9910728	16' 08.27"	23° 26' 17"	-12 m 08 s
12	341° 53' 08"	-0.81"	343° 17' 05"	-7° 06' 28"	0.9910831	16' 08.26"	23° 26' 17"	-12 m 07 s
13	341° 55' 38"	-0.81"	343° 19' 25"	-7° 05' 30"	0.9910933	16' 08.25"	23° 26' 17"	-12 m 07 s
14	341° 58' 09"	-0.81"	343° 21' 46"	-7° 04' 33"	0.9911035	16' 08.24"	23° 26' 17"	-12 m 06 s
15	342° 00' 39"	-0.81"	343° 24' 06"	-7° 03' 36"	0.9911137	16' 08.23"	23° 26' 17"	-12 m 06 s
16	342° 03' 10"	-0.81"	343° 26' 26"	-7° 02' 38"	0.9911239	16' 08.22"	23° 26' 17"	-12 m 05 s
17	342° 05' 40"	-0.81"	343° 28' 46"	-7° 01' 41"	0.9911342	16' 08.21"	23° 26' 17"	-12 m 05 s
18	342° 08' 11"	-0.81"	343° 31' 07"	-7° 00' 43"	0.9911444	16' 08.20"	23° 26' 17"	-12 m 04 s
19	342° 10' 41"	-0.80"	343° 33' 27"	-6° 59' 46"	0.9911546	16' 08.19"	23° 26' 17"	-12 m 04 s
20	342° 13' 12"	-0.80"	343° 35' 47"	-6° 58' 49"	0.9911648	16' 08.18"	23° 26' 17"	-12 m 03 s
21	342° 15' 43"	-0.80"	343° 38' 07"	-6° 57' 51"	0.9911751	16' 08.17"	23° 26' 17"	-12 m 03 s
22	342° 18' 13"	-0.80"	343° 40' 27"	-6° 56' 54"	0.9911853	16' 08.16"	23° 26' 17"	-12 m 02 s
23	342° 20' 44"	-0.80"	343° 42' 47"	-6° 55' 56"	0.9911956	16' 08.15"	23° 26' 17"	-12 m 02 s
24	342° 23' 14"	-0.80"	343° 45' 08"	-6° 54' 59"	0.9912058	16' 08.14"	23° 26' 17"	-12 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	331° 48' 57"	-4° 59' 24"	335° 39' 58"	-15° 28' 60"	0° 58' 52"	16' 02.50"	41° 22' 07"	0.00887
1	332° 24' 15"	-4° 59' 03"	336° 13' 48"	-15° 15' 51"	0° 58' 51"	16' 02.16"	39° 52' 36"	0.00810
2	332° 59' 32"	-4° 58' 40"	336° 47' 32"	-15° 02' 37"	0° 58' 50"	16' 01.82"	38° 15' 22"	0.00736
3	333° 34' 47"	-4° 58' 15"	337° 21' 11"	-14° 49' 19"	0° 58' 48"	16' 01.47"	36° 29' 22"	0.00668
4	334° 10' 00"	-4° 57' 48"	337° 54' 44"	-14° 35' 57"	0° 58' 47"	16' 01.12"	34° 33' 22"	0.00604
5	334° 45' 12"	-4° 57' 19"	338° 28' 11"	-14° 22' 30"	0° 58' 46"	16' 00.77"	32° 25' 57"	0.00544
6	335° 20' 23"	-4° 56' 49"	339° 01' 33"	-14° 08' 59"	0° 58' 44"	16' 00.41"	30° 5' 29"	0.00489
7	335° 55' 32"	-4° 56' 16"	339° 34' 50"	-13° 55' 24"	0° 58' 43"	16' 00.05"	27° 30' 09"	0.00439
8	336° 30' 39"	-4° 55' 42"	340° 08' 01"	-13° 41' 46"	0° 58' 42"	15' 59.68"	24° 37' 51"	0.00393
9	337° 05' 45"	-4° 55' 06"	340° 41' 07"	-13° 28' 03"	0° 58' 40"	15' 59.31"	21° 26' 23"	0.00351
10	337° 40' 49"	-4° 54' 28"	341° 14' 07"	-13° 14' 17"	0° 58' 39"	15' 58.94"	17° 53' 22"	0.00314
11	338° 15' 51"	-4° 53' 48"	341° 47' 02"	-13° 00' 27"	0° 58' 38"	15' 58.56"	13° 56' 30"	0.00281
12	338° 50' 52"	-4° 53' 06"	342° 19' 52"	-12° 46' 34"	0° 58' 36"	15' 58.18"	9° 33' 48"	0.00253
13	339° 25' 50"	-4° 52' 23"	342° 52' 37"	-12° 32' 37"	0° 58' 35"	15' 57.80"	4° 43' 54"	0.00229
14	340° 00' 47"	-4° 51' 38"	343° 25' 16"	-12° 18' 37"	0° 58' 33"	15' 57.41"	359° 26' 40"	0.00210
15	340° 35' 43"	-4° 50' 51"	343° 57' 51"	-12° 04' 33"	0° 58' 32"	15' 57.02"	353° 43' 41"	0.00195
16	341° 10' 36"	-4° 50' 02"	344° 30' 21"	-11° 50' 27"	0° 58' 31"	15' 56.62"	347° 38' 47"	0.00185
17	341° 45' 28"	-4° 49' 11"	345° 02' 45"	-11° 36' 18"	0° 58' 29"	15' 56.22"	341° 18' 08"	0.00179
18	342° 20' 18"	-4° 48' 19"	345° 35' 05"	-11° 22' 05"	0° 58' 28"	15' 55.82"	334° 49' 58"	0.00177
19	342° 55' 06"	-4° 47' 25"	346° 07' 19"	-11° 07' 50"	0° 58' 26"	15' 55.41"	328° 23' 32"	0.00180
20	343° 29' 52"	-4° 46' 29"	346° 39' 29"	-10° 53' 32"	0° 58' 25"	15' 55.01"	322° 7' 53"	0.00187
21	344° 04' 36"	-4° 45' 32"	347° 11' 35"	-10° 39' 12"	0° 58' 23"	15' 54.59"	316° 10' 37"	0.00198
22	344° 39' 18"	-4° 44' 32"	347° 43' 35"	-10° 24' 49"	0° 58' 22"	15' 54.18"	310° 37' 08"	0.00214
23	345° 13' 59"	-4° 43' 32"	348° 15' 31"	-10° 10' 23"	0° 58' 20"	15' 53.76"	305° 30' 27"	0.00234
24	345° 48' 36"	-4° 42' 29"	348° 47' 21"	-9° 55' 56"	0° 58' 18"	15' 53.34"	300° 51' 38"	0.00259

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	342° 23' 14"	-0.80"	343° 45' 08"	-6° 54' 59"	0.9912058	16' 08.14"	23° 26' 17"	-12 m 01 s
1	342° 25' 45"	-0.80"	343° 47' 28"	-6° 54' 01"	0.9912160	16' 08.13"	23° 26' 17"	-12 m 01 s
2	342° 28' 15"	-0.79"	343° 49' 48"	-6° 53' 04"	0.9912263	16' 08.12"	23° 26' 17"	-12 m 00 s
3	342° 30' 46"	-0.79"	343° 52' 08"	-6° 52' 06"	0.9912365	16' 08.11"	23° 26' 17"	-11 m 60 s
4	342° 33' 16"	-0.79"	343° 54' 28"	-6° 51' 09"	0.9912468	16' 08.10"	23° 26' 17"	-11 m 59 s
5	342° 35' 47"	-0.79"	343° 56' 48"	-6° 50' 11"	0.9912570	16' 08.09"	23° 26' 17"	-11 m 58 s
6	342° 38' 17"	-0.79"	343° 59' 08"	-6° 49' 14"	0.9912673	16' 08.08"	23° 26' 17"	-11 m 58 s
7	342° 40' 48"	-0.79"	344° 01' 28"	-6° 48' 16"	0.9912775	16' 08.07"	23° 26' 17"	-11 m 57 s
8	342° 43' 18"	-0.78"	344° 03' 48"	-6° 47' 18"	0.9912878	16' 08.06"	23° 26' 17"	-11 m 57 s
9	342° 45' 49"	-0.78"	344° 06' 08"	-6° 46' 21"	0.9912980	16' 08.05"	23° 26' 17"	-11 m 56 s
10	342° 48' 19"	-0.78"	344° 08' 28"	-6° 45' 23"	0.9913083	16' 08.04"	23° 26' 17"	-11 m 56 s
11	342° 50' 50"	-0.78"	344° 10' 48"	-6° 44' 26"	0.9913186	16' 08.03"	23° 26' 17"	-11 m 55 s
12	342° 53' 20"	-0.78"	344° 13' 08"	-6° 43' 28"	0.9913288	16' 08.02"	23° 26' 17"	-11 m 55 s
13	342° 55' 51"	-0.77"	344° 15' 28"	-6° 42' 31"	0.9913391	16' 08.01"	23° 26' 17"	-11 m 54 s
14	342° 58' 21"	-0.77"	344° 17' 48"	-6° 41' 33"	0.9913494	16' 08.00"	23° 26' 17"	-11 m 54 s
15	343° 00' 52"	-0.77"	344° 20' 08"	-6° 40' 35"	0.9913596	16' 07.99"	23° 26' 17"	-11 m 53 s
16	343° 03' 22"	-0.77"	344° 22' 28"	-6° 39' 38"	0.9913699	16' 07.98"	23° 26' 17"	-11 m 53 s
17	343° 05' 53"	-0.77"	344° 24' 48"	-6° 38' 40"	0.9913802	16' 07.97"	23° 26' 17"	-11 m 52 s
18	343° 08' 23"	-0.76"	344° 27' 08"	-6° 37' 42"	0.9913905	16' 07.96"	23° 26' 17"	-11 m 52 s
19	343° 10' 54"	-0.76"	344° 29' 28"	-6° 36' 45"	0.9914007	16' 07.95"	23° 26' 17"	-11 m 51 s
20	343° 13' 24"	-0.76"	344° 31' 48"	-6° 35' 47"	0.9914110	16' 07.94"	23° 26' 17"	-11 m 50 s
21	343° 15' 55"	-0.76"	344° 34' 08"	-6° 34' 49"	0.9914213	16' 07.93"	23° 26' 17"	-11 m 50 s
22	343° 18' 25"	-0.75"	344° 36' 28"	-6° 33' 52"	0.9914316	16' 07.92"	23° 26' 17"	-11 m 49 s
23	343° 20' 55"	-0.75"	344° 38' 48"	-6° 32' 54"	0.9914419	16' 07.91"	23° 26' 17"	-11 m 49 s
24	343° 23' 26"	-0.75"	344° 41' 07"	-6° 31' 56"	0.9914522	16' 07.90"	23° 26' 17"	-11 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	345° 48' 36"	-4° 42' 29"	348° 47' 21"	-9° 55' 56"	0° 58' 18"	15' 53.34"	300° 51' 38"	0.00259
1	346° 23' 13"	-4° 41' 25"	349° 19' 08"	-9° 41' 26"	0° 58' 17"	15' 52.91"	296° 39' 49"	0.00288
2	346° 57' 47"	-4° 40' 19"	349° 50' 50"	-9° 26' 53"	0° 58' 15"	15' 52.48"	292° 53' 32"	0.00321
3	347° 32' 20"	-4° 39' 11"	350° 22' 28"	-9° 12' 19"	0° 58' 14"	15' 52.05"	289° 30' 36"	0.00358
4	348° 06' 50"	-4° 38' 02"	350° 54' 01"	-8° 57' 43"	0° 58' 12"	15' 51.62"	286° 28' 42"	0.00400
5	348° 41' 18"	-4° 36' 51"	351° 25' 30"	-8° 43' 05"	0° 58' 11"	15' 51.18"	283° 45' 31"	0.00446
6	349° 15' 43"	-4° 35' 38"	351° 56' 55"	-8° 28' 25"	0° 58' 09"	15' 50.75"	281° 18' 50"	0.00496
7	349° 50' 09"	-4° 34' 24"	352° 28' 16"	-8° 13' 43"	0° 58' 07"	15' 50.30"	279° 6' 40"	0.00550
8	350° 24' 31"	-4° 33' 08"	352° 59' 32"	-7° 59' 00"	0° 58' 06"	15' 49.86"	277° 7' 17"	0.00609
9	350° 58' 51"	-4° 31' 51"	353° 30' 45"	-7° 44' 15"	0° 58' 04"	15' 49.41"	275° 19' 05"	0.00672
10	351° 33' 09"	-4° 30' 32"	354° 01' 53"	-7° 29' 29"	0° 58' 02"	15' 48.97"	273° 40' 45"	0.00739
11	352° 07' 25"	-4° 29' 12"	354° 32' 58"	-7° 14' 42"	0° 58' 01"	15' 48.51"	272° 11' 06"	0.00810
12	352° 41' 39"	-4° 27' 50"	355° 03' 59"	-6° 59' 53"	0° 57' 59"	15' 48.06"	270° 49' 08"	0.00885
13	353° 15' 50"	-4° 26' 26"	355° 34' 55"	-6° 45' 03"	0° 57' 57"	15' 47.60"	269° 33' 57"	0.00964
14	353° 49' 60"	-4° 25' 01"	356° 05' 48"	-6° 30' 12"	0° 57' 56"	15' 47.15"	268° 24' 49"	0.01047
15	354° 24' 07"	-4° 23' 34"	356° 36' 38"	-6° 15' 20"	0° 57' 54"	15' 46.68"	267° 21' 03"	0.01134
16	354° 58' 12"	-4° 22' 06"	357° 07' 24"	-6° 00' 27"	0° 57' 52"	15' 46.22"	266° 22' 07"	0.01226
17	355° 32' 15"	-4° 20' 37"	357° 38' 06"	-5° 45' 33"	0° 57' 51"	15' 45.76"	265° 27' 31"	0.01321
18	356° 06' 16"	-4° 19' 06"	358° 08' 45"	-5° 30' 38"	0° 57' 49"	15' 45.29"	264° 36' 48"	0.01421
19	356° 40' 14"	-4° 17' 33"	358° 39' 20"	-5° 15' 43"	0° 57' 47"	15' 44.82"	263° 49' 36"	0.01524
20	357° 14' 10"	-4° 15' 59"	359° 09' 52"	-5° 00' 47"	0° 57' 46"	15' 44.35"	263° 5' 35"	0.01631
21	357° 48' 04"	-4° 14' 24"	359° 40' 21"	-4° 45' 51"	0° 57' 44"	15' 43.88"	262° 24' 28"	0.01742
22	358° 21' 56"	-4° 12' 48"	0° 10' 46"	-4° 30' 54"	0° 57' 42"	15' 43.40"	261° 45' 59"	0.01858
23	358° 55' 45"	-4° 11' 09"	0° 41' 08"	-4° 15' 57"	0° 57' 40"	15' 42.93"	261° 9' 55"	0.01976
24	359° 29' 32"	-4° 09' 30"	1° 11' 27"	-4° 00' 60"	0° 57' 39"	15' 42.45"	260° 36' 04"	0.02099

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	343° 23' 26"	-0.75"	344° 41' 07"	-6° 31' 56"	0.9914522	16' 07.90"	23° 26' 17"	-11 m 48 s
1	343° 25' 56"	-0.75"	344° 43' 27"	-6° 30' 59"	0.9914624	16' 07.89"	23° 26' 17"	-11 m 48 s
2	343° 28' 27"	-0.74"	344° 45' 47"	-6° 30' 01"	0.9914727	16' 07.88"	23° 26' 17"	-11 m 47 s
3	343° 30' 57"	-0.74"	344° 48' 07"	-6° 29' 03"	0.9914830	16' 07.87"	23° 26' 17"	-11 m 47 s
4	343° 33' 28"	-0.74"	344° 50' 27"	-6° 28' 05"	0.9914933	16' 07.86"	23° 26' 17"	-11 m 46 s
5	343° 35' 58"	-0.73"	344° 52' 46"	-6° 27' 08"	0.9915036	16' 07.85"	23° 26' 17"	-11 m 46 s
6	343° 38' 29"	-0.73"	344° 55' 06"	-6° 26' 10"	0.9915139	16' 07.84"	23° 26' 17"	-11 m 45 s
7	343° 40' 59"	-0.73"	344° 57' 26"	-6° 25' 12"	0.9915242	16' 07.83"	23° 26' 17"	-11 m 44 s
8	343° 43' 29"	-0.72"	344° 59' 46"	-6° 24' 14"	0.9915345	16' 07.82"	23° 26' 17"	-11 m 44 s
9	343° 45' 60"	-0.72"	345° 02' 05"	-6° 23' 16"	0.9915448	16' 07.81"	23° 26' 17"	-11 m 43 s
10	343° 48' 30"	-0.72"	345° 04' 25"	-6° 22' 19"	0.9915552	16' 07.80"	23° 26' 17"	-11 m 43 s
11	343° 51' 01"	-0.72"	345° 06' 45"	-6° 21' 21"	0.9915655	16' 07.79"	23° 26' 17"	-11 m 42 s
12	343° 53' 31"	-0.71"	345° 09' 05"	-6° 20' 23"	0.9915758	16' 07.78"	23° 26' 17"	-11 m 42 s
13	343° 56' 02"	-0.71"	345° 11' 24"	-6° 19' 25"	0.9915861	16' 07.77"	23° 26' 17"	-11 m 41 s
14	343° 58' 32"	-0.71"	345° 13' 44"	-6° 18' 27"	0.9915964	16' 07.76"	23° 26' 17"	-11 m 41 s
15	344° 01' 02"	-0.70"	345° 16' 04"	-6° 17' 29"	0.9916067	16' 07.75"	23° 26' 17"	-11 m 40 s
16	344° 03' 33"	-0.70"	345° 18' 23"	-6° 16' 32"	0.9916171	16' 07.74"	23° 26' 17"	-11 m 40 s
17	344° 06' 03"	-0.70"	345° 20' 43"	-6° 15' 34"	0.9916274	16' 07.73"	23° 26' 17"	-11 m 39 s
18	344° 08' 34"	-0.69"	345° 23' 03"	-6° 14' 36"	0.9916377	16' 07.72"	23° 26' 17"	-11 m 38 s
19	344° 11' 04"	-0.69"	345° 25' 22"	-6° 13' 38"	0.9916480	16' 07.71"	23° 26' 17"	-11 m 38 s
20	344° 13' 34"	-0.69"	345° 27' 42"	-6° 12' 40"	0.9916584	16' 07.70"	23° 26' 17"	-11 m 37 s
21	344° 16' 05"	-0.68"	345° 30' 01"	-6° 11' 42"	0.9916687	16' 07.69"	23° 26' 17"	-11 m 37 s
22	344° 18' 35"	-0.68"	345° 32' 21"	-6° 10' 44"	0.9916790	16' 07.68"	23° 26' 17"	-11 m 36 s
23	344° 21' 05"	-0.67"	345° 34' 41"	-6° 09' 46"	0.9916894	16' 07.67"	23° 26' 17"	-11 m 36 s
24	344° 23' 36"	-0.67"	345° 37' 00"	-6° 08' 48"	0.9916997	16' 07.66"	23° 26' 17"	-11 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	359° 29' 32"	-4° 09' 30"	1° 11' 27"	-4° 00' 60"	0° 57' 39"	15' 42.45"	260° 36' 04"	0.02099
1	0° 03' 17"	-4° 07' 49"	1° 41' 43"	-3° 46' 02"	0° 57' 37"	15' 41.97"	260° 4' 14"	0.02226
2	0° 36' 59"	-4° 06' 07"	2° 11' 56"	-3° 31' 05"	0° 57' 35"	15' 41.49"	259° 34' 17"	0.02356
3	1° 10' 40"	-4° 04' 24"	2° 42' 07"	-3° 16' 07"	0° 57' 33"	15' 41.01"	259° 6' 04"	0.02491
4	1° 44' 17"	-4° 02' 39"	3° 12' 14"	-3° 01' 09"	0° 57' 31"	15' 40.53"	258° 39' 27"	0.02629
5	2° 17' 53"	-4° 00' 53"	3° 42' 19"	-2° 46' 11"	0° 57' 30"	15' 40.04"	258° 14' 20"	0.02770
6	2° 51' 26"	-3° 59' 05"	4° 12' 20"	-2° 31' 14"	0° 57' 28"	15' 39.56"	257° 50' 35"	0.02916
7	3° 24' 57"	-3° 57' 17"	4° 42' 20"	-2° 16' 17"	0° 57' 26"	15' 39.07"	257° 28' 08"	0.03065
8	3° 58' 26"	-3° 55' 27"	5° 12' 16"	-2° 01' 20"	0° 57' 24"	15' 38.58"	257° 6' 53"	0.03217
9	4° 31' 52"	-3° 53' 36"	5° 42' 10"	-1° 46' 24"	0° 57' 23"	15' 38.10"	256° 46' 45"	0.03374
10	5° 05' 16"	-3° 51' 43"	6° 12' 02"	-1° 31' 28"	0° 57' 21"	15' 37.61"	256° 27' 42"	0.03534
11	5° 38' 37"	-3° 49' 50"	6° 41' 51"	-1° 16' 32"	0° 57' 19"	15' 37.12"	256° 9' 37"	0.03697
12	6° 11' 57"	-3° 47' 55"	7° 11' 38"	-1° 01' 38"	0° 57' 17"	15' 36.62"	255° 52' 30"	0.03864
13	6° 45' 13"	-3° 45' 59"	7° 41' 23"	0°-46' 44"	0° 57' 15"	15' 36.13"	255° 36' 15"	0.04035
14	7° 18' 28"	-3° 44' 02"	8° 11' 05"	0°-31' 50"	0° 57' 14"	15' 35.64"	255° 20' 50"	0.04209
15	7° 51' 40"	-3° 42' 03"	8° 40' 45"	0°-16' 58"	0° 57' 12"	15' 35.15"	255° 6' 12"	0.04386
16	8° 24' 50"	-3° 40' 04"	9° 10' 23"	0° -2' 06"	0° 57' 10"	15' 34.65"	254° 52' 20"	0.04567
17	8° 57' 57"	-3° 38' 04"	9° 39' 60"	0° 12' 44"	0° 57' 08"	15' 34.16"	254° 39' 10"	0.04751
18	9° 31' 02"	-3° 36' 02"	10° 09' 34"	0° 27' 34"	0° 57' 06"	15' 33.66"	254° 26' 40"	0.04939
19	10° 04' 05"	-3° 33' 59"	10° 39' 06"	0° 42' 22"	0° 57' 04"	15' 33.17"	254° 14' 49"	0.05130
20	10° 37' 05"	-3° 31' 56"	11° 08' 37"	0° 57' 10"	0° 57' 03"	15' 32.67"	254° 3' 35"	0.05324
21	11° 10' 03"	-3° 29' 51"	11° 38' 06"	1° 11' 56"	0° 57' 01"	15' 32.18"	253° 52' 56"	0.05522
22	11° 42' 58"	-3° 27' 45"	12° 07' 33"	1° 26' 41"	0° 56' 59"	15' 31.68"	253° 42' 51"	0.05723
23	12° 15' 51"	-3° 25' 38"	12° 36' 58"	1° 41' 24"	0° 56' 57"	15' 31.19"	253° 33' 18"	0.05927
24	12° 48' 42"	-3° 23' 30"	13° 06' 22"	1° 56' 06"	0° 56' 55"	15' 30.69"	253° 24' 15"	0.06134

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	344° 23' 36"	-0.67"	345° 37' 00"	-6° 08' 48"	0.9916997	16' 07.66"	23° 26' 17"	-11 m 35 s
1	344° 26' 06"	-0.67"	345° 39' 20"	-6° 07' 50"	0.9917100	16' 07.65"	23° 26' 17"	-11 m 35 s
2	344° 28' 37"	-0.66"	345° 41' 39"	-6° 06' 52"	0.9917204	16' 07.64"	23° 26' 17"	-11 m 34 s
3	344° 31' 07"	-0.66"	345° 43' 59"	-6° 05' 54"	0.9917307	16' 07.63"	23° 26' 17"	-11 m 33 s
4	344° 33' 37"	-0.66"	345° 46' 18"	-6° 04' 56"	0.9917411	16' 07.62"	23° 26' 17"	-11 m 33 s
5	344° 36' 08"	-0.65"	345° 48' 38"	-6° 03' 59"	0.9917514	16' 07.61"	23° 26' 17"	-11 m 32 s
6	344° 38' 38"	-0.65"	345° 50' 57"	-6° 03' 01"	0.9917618	16' 07.60"	23° 26' 17"	-11 m 32 s
7	344° 41' 08"	-0.64"	345° 53' 17"	-6° 02' 03"	0.9917721	16' 07.59"	23° 26' 17"	-11 m 31 s
8	344° 43' 39"	-0.64"	345° 55' 36"	-6° 01' 05"	0.9917825	16' 07.58"	23° 26' 17"	-11 m 31 s
9	344° 46' 09"	-0.64"	345° 57' 56"	-6° 00' 07"	0.9917929	16' 07.57"	23° 26' 17"	-11 m 30 s
10	344° 48' 39"	-0.63"	346° 00' 15"	-5° 59' 09"	0.9918032	16' 07.56"	23° 26' 17"	-11 m 29 s
11	344° 51' 10"	-0.63"	346° 02' 35"	-5° 58' 10"	0.9918136	16' 07.55"	23° 26' 17"	-11 m 29 s
12	344° 53' 40"	-0.62"	346° 04' 54"	-5° 57' 12"	0.9918240	16' 07.54"	23° 26' 17"	-11 m 28 s
13	344° 56' 10"	-0.62"	346° 07' 13"	-5° 56' 14"	0.9918343	16' 07.53"	23° 26' 17"	-11 m 28 s
14	344° 58' 41"	-0.61"	346° 09' 33"	-5° 55' 16"	0.9918447	16' 07.52"	23° 26' 17"	-11 m 27 s
15	345° 01' 11"	-0.61"	346° 11' 52"	-5° 54' 18"	0.9918551	16' 07.51"	23° 26' 17"	-11 m 27 s
16	345° 03' 41"	-0.61"	346° 14' 12"	-5° 53' 20"	0.9918654	16' 07.50"	23° 26' 17"	-11 m 26 s
17	345° 06' 12"	-0.60"	346° 16' 31"	-5° 52' 22"	0.9918758	16' 07.49"	23° 26' 17"	-11 m 25 s
18	345° 08' 42"	-0.60"	346° 18' 50"	-5° 51' 24"	0.9918862	16' 07.48"	23° 26' 17"	-11 m 25 s
19	345° 11' 12"	-0.59"	346° 21' 10"	-5° 50' 26"	0.9918966	16' 07.47"	23° 26' 17"	-11 m 24 s
20	345° 13' 43"	-0.59"	346° 23' 29"	-5° 49' 28"	0.9919070	16' 07.46"	23° 26' 17"	-11 m 24 s
21	345° 16' 13"	-0.58"	346° 25' 48"	-5° 48' 30"	0.9919174	16' 07.45"	23° 26' 17"	-11 m 23 s
22	345° 18' 43"	-0.58"	346° 28' 08"	-5° 47' 32"	0.9919277	16' 07.44"	23° 26' 17"	-11 m 23 s
23	345° 21' 13"	-0.58"	346° 30' 27"	-5° 46' 33"	0.9919381	16' 07.43"	23° 26' 17"	-11 m 22 s
24	345° 23' 44"	-0.57"	346° 32' 46"	-5° 45' 35"	0.9919485	16' 07.42"	23° 26' 17"	-11 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	12° 48' 42"	-3° 23' 30"	13° 06' 22"	1° 56' 06"	0° 56' 55"	15' 30.69"	253° 24' 15"	0.06134
1	13° 21' 30"	-3° 21' 21"	13° 35' 45"	2° 10' 47"	0° 56' 54"	15' 30.20"	253° 15' 42"	0.06345
2	13° 54' 16"	-3° 19' 11"	14° 05' 06"	2° 25' 26"	0° 56' 52"	15' 29.70"	253° 7' 38"	0.06558
3	14° 26' 60"	-3° 17' 01"	14° 34' 25"	2° 40' 03"	0° 56' 50"	15' 29.21"	253° 0' 01"	0.06775
4	14° 59' 41"	-3° 14' 49"	15° 03' 44"	2° 54' 39"	0° 56' 48"	15' 28.71"	252° 52' 50"	0.06995
5	15° 32' 20"	-3° 12' 36"	15° 33' 01"	3° 09' 13"	0° 56' 46"	15' 28.22"	252° 46' 04"	0.07218
6	16° 04' 56"	-3° 10' 23"	16° 02' 16"	3° 23' 45"	0° 56' 45"	15' 27.73"	252° 39' 43"	0.07444
7	16° 37' 30"	-3° 08' 08"	16° 31' 31"	3° 38' 15"	0° 56' 43"	15' 27.23"	252° 33' 46"	0.07673
8	17° 10' 02"	-3° 05' 53"	17° 00' 45"	3° 52' 44"	0° 56' 41"	15' 26.74"	252° 28' 11"	0.07904
9	17° 42' 32"	-3° 03' 37"	17° 29' 58"	4° 07' 10"	0° 56' 39"	15' 26.25"	252° 22' 59"	0.08139
10	18° 14' 59"	-3° 01' 20"	17° 59' 09"	4° 21' 34"	0° 56' 37"	15' 25.76"	252° 18' 08"	0.08377
11	18° 47' 23"	-2° 59' 02"	18° 28' 20"	4° 35' 57"	0° 56' 35"	15' 25.27"	252° 13' 37"	0.08617
12	19° 19' 46"	-2° 56' 43"	18° 57' 30"	4° 50' 17"	0° 56' 34"	15' 24.78"	252° 9' 27"	0.08861
13	19° 52' 06"	-2° 54' 24"	19° 26' 39"	5° 04' 35"	0° 56' 32"	15' 24.29"	252° 5' 37"	0.09107
14	20° 24' 23"	-2° 52' 03"	19° 55' 48"	5° 18' 51"	0° 56' 30"	15' 23.80"	252° 2' 05"	0.09356
15	20° 56' 38"	-2° 49' 42"	20° 24' 56"	5° 33' 04"	0° 56' 28"	15' 23.31"	251° 58' 52"	0.09608
16	21° 28' 51"	-2° 47' 20"	20° 54' 03"	5° 47' 15"	0° 56' 27"	15' 22.83"	251° 55' 57"	0.09862
17	22° 01' 02"	-2° 44' 58"	21° 23' 10"	6° 01' 24"	0° 56' 25"	15' 22.34"	251° 53' 19"	0.10120
18	22° 33' 11"	-2° 42' 35"	21° 52' 16"	6° 15' 30"	0° 56' 23"	15' 21.86"	251° 50' 59"	0.10380
19	23° 05' 17"	-2° 40' 11"	22° 21' 22"	6° 29' 33"	0° 56' 21"	15' 21.38"	251° 48' 55"	0.10642
20	23° 37' 20"	-2° 37' 46"	22° 50' 28"	6° 43' 34"	0° 56' 19"	15' 20.90"	251° 47' 07"	0.10907
21	24° 09' 22"	-2° 35' 21"	23° 19' 33"	6° 57' 33"	0° 56' 18"	15' 20.42"	251° 45' 35"	0.11175
22	24° 41' 21"	-2° 32' 55"	23° 48' 38"	7° 11' 28"	0° 56' 16"	15' 19.94"	251° 44' 19"	0.11445
23	25° 13' 18"	-2° 30' 28"	24° 17' 43"	7° 25' 21"	0° 56' 14"	15' 19.46"	251° 43' 18"	0.11718
24	25° 45' 13"	-2° 28' 01"	24° 46' 48"	7° 39' 11"	0° 56' 12"	15' 18.99"	251° 42' 32"	0.11993

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	345° 23' 44"	-0.57"	346° 32' 46"	-5° 45' 35"	0.9919485	16' 07.42"	23° 26' 17"	-11 m 21 s
1	345° 26' 14"	-0.57"	346° 35' 06"	-5° 44' 37"	0.9919589	16' 07.41"	23° 26' 17"	-11 m 21 s
2	345° 28' 44"	-0.56"	346° 37' 25"	-5° 43' 39"	0.9919693	16' 07.40"	23° 26' 17"	-11 m 20 s
3	345° 31' 15"	-0.56"	346° 39' 44"	-5° 42' 41"	0.9919797	16' 07.39"	23° 26' 17"	-11 m 20 s
4	345° 33' 45"	-0.55"	346° 42' 03"	-5° 41' 43"	0.9919901	16' 07.38"	23° 26' 17"	-11 m 19 s
5	345° 36' 15"	-0.55"	346° 44' 23"	-5° 40' 45"	0.9920005	16' 07.37"	23° 26' 17"	-11 m 18 s
6	345° 38' 45"	-0.54"	346° 46' 42"	-5° 39' 46"	0.9920109	16' 07.36"	23° 26' 17"	-11 m 18 s
7	345° 41' 16"	-0.54"	346° 49' 01"	-5° 38' 48"	0.9920214	16' 07.35"	23° 26' 17"	-11 m 17 s
8	345° 43' 46"	-0.53"	346° 51' 20"	-5° 37' 50"	0.9920318	16' 07.34"	23° 26' 17"	-11 m 17 s
9	345° 46' 16"	-0.53"	346° 53' 39"	-5° 36' 52"	0.9920422	16' 07.33"	23° 26' 17"	-11 m 16 s
10	345° 48' 46"	-0.52"	346° 55' 59"	-5° 35' 54"	0.9920526	16' 07.32"	23° 26' 17"	-11 m 16 s
11	345° 51' 17"	-0.52"	346° 58' 18"	-5° 34' 55"	0.9920630	16' 07.31"	23° 26' 17"	-11 m 15 s
12	345° 53' 47"	-0.51"	347° 00' 37"	-5° 33' 57"	0.9920735	16' 07.30"	23° 26' 17"	-11 m 14 s
13	345° 56' 17"	-0.51"	347° 02' 56"	-5° 32' 59"	0.9920839	16' 07.29"	23° 26' 17"	-11 m 14 s
14	345° 58' 47"	-0.50"	347° 05' 15"	-5° 32' 01"	0.9920943	16' 07.28"	23° 26' 17"	-11 m 13 s
15	346° 01' 18"	-0.50"	347° 07' 34"	-5° 31' 02"	0.9921047	16' 07.27"	23° 26' 17"	-11 m 13 s
16	346° 03' 48"	-0.49"	347° 09' 53"	-5° 30' 04"	0.9921152	16' 07.26"	23° 26' 17"	-11 m 12 s
17	346° 06' 18"	-0.49"	347° 12' 13"	-5° 29' 06"	0.9921256	16' 07.25"	23° 26' 17"	-11 m 11 s
18	346° 08' 48"	-0.48"	347° 14' 32"	-5° 28' 08"	0.9921360	16' 07.24"	23° 26' 17"	-11 m 11 s
19	346° 11' 19"	-0.48"	347° 16' 51"	-5° 27' 09"	0.9921465	16' 07.23"	23° 26' 17"	-11 m 10 s
20	346° 13' 49"	-0.47"	347° 19' 10"	-5° 26' 11"	0.9921569	16' 07.22"	23° 26' 17"	-11 m 10 s
21	346° 16' 19"	-0.47"	347° 21' 29"	-5° 25' 13"	0.9921674	16' 07.21"	23° 26' 17"	-11 m 09 s
22	346° 18' 49"	-0.46"	347° 23' 48"	-5° 24' 14"	0.9921778	16' 07.20"	23° 26' 17"	-11 m 08 s
23	346° 21' 19"	-0.46"	347° 26' 07"	-5° 23' 16"	0.9921883	16' 07.19"	23° 26' 17"	-11 m 08 s
24	346° 23' 50"	-0.45"	347° 28' 26"	-5° 22' 18"	0.9921987	16' 07.18"	23° 26' 17"	-11 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	25° 45' 13"	-2° 28' 01"	24° 46' 48"	7° 39' 11"	0° 56' 12"	15' 18.99"	251° 42' 32"	0.11993
1	26° 17' 05"	-2° 25' 33"	25° 15' 52"	7° 52' 58"	0° 56' 11"	15' 18.52"	251° 42' 00"	0.12271
2	26° 48' 55"	-2° 23' 04"	25° 44' 57"	8° 06' 43"	0° 56' 09"	15' 18.05"	251° 41' 43"	0.12551
3	27° 20' 43"	-2° 20' 35"	26° 14' 02"	8° 20' 24"	0° 56' 07"	15' 17.58"	251° 41' 39"	0.12834
4	27° 52' 29"	-2° 18' 05"	26° 43' 06"	8° 34' 03"	0° 56' 06"	15' 17.11"	251° 41' 49"	0.13119
5	28° 24' 12"	-2° 15' 35"	27° 12' 11"	8° 47' 38"	0° 56' 04"	15' 16.64"	251° 42' 13"	0.13406
6	28° 55' 54"	-2° 13' 04"	27° 41' 16"	9° 01' 10"	0° 56' 02"	15' 16.18"	251° 42' 50"	0.13696
7	29° 27' 33"	-2° 10' 33"	28° 10' 22"	9° 14' 39"	0° 56' 00"	15' 15.72"	251° 43' 40"	0.13988
8	29° 59' 10"	-2° 08' 01"	28° 39' 28"	9° 28' 05"	0° 55' 59"	15' 15.26"	251° 44' 42"	0.14282
9	30° 30' 44"	-2° 05' 29"	29° 08' 34"	9° 41' 28"	0° 55' 57"	15' 14.80"	251° 45' 57"	0.14578
10	31° 02' 17"	-2° 02' 56"	29° 37' 40"	9° 54' 47"	0° 55' 55"	15' 14.34"	251° 47' 24"	0.14877
11	31° 33' 47"	-2° 00' 23"	30° 06' 47"	10° 08' 03"	0° 55' 54"	15' 13.89"	251° 49' 04"	0.15177
12	32° 05' 16"	-1° 57' 49"	30° 35' 54"	10° 21' 15"	0° 55' 52"	15' 13.44"	251° 50' 55"	0.15480
13	32° 36' 42"	-1° 55' 15"	31° 05' 03"	10° 34' 24"	0° 55' 50"	15' 12.99"	251° 52' 58"	0.15785
14	33° 08' 06"	-1° 52' 40"	31° 34' 11"	10° 47' 30"	0° 55' 49"	15' 12.54"	251° 55' 13"	0.16092
15	33° 39' 28"	-1° 50' 05"	32° 03' 20"	11° 00' 32"	0° 55' 47"	15' 12.10"	251° 57' 39"	0.16402
16	34° 10' 48"	-1° 47' 29"	32° 32' 31"	11° 13' 31"	0° 55' 46"	15' 11.66"	252° 0' 16"	0.16713
17	34° 42' 06"	-1° 44' 54"	33° 01' 41"	11° 26' 25"	0° 55' 44"	15' 11.22"	252° 3' 04"	0.17026
18	35° 13' 22"	-1° 42' 17"	33° 30' 53"	11° 39' 17"	0° 55' 42"	15' 10.78"	252° 6' 03"	0.17341
19	35° 44' 35"	-1° 39' 41"	34° 00' 05"	11° 52' 04"	0° 55' 41"	15' 10.35"	252° 9' 13"	0.17658
20	36° 15' 47"	-1° 37' 04"	34° 29' 19"	12° 04' 48"	0° 55' 39"	15' 09.92"	252° 12' 33"	0.17977
21	36° 46' 57"	-1° 34' 26"	34° 58' 33"	12° 17' 27"	0° 55' 38"	15' 09.49"	252° 16' 04"	0.18298
22	37° 18' 05"	-1° 31' 49"	35° 27' 49"	12° 30' 03"	0° 55' 36"	15' 09.07"	252° 19' 45"	0.18621
23	37° 49' 10"	-1° 29' 11"	35° 57' 05"	12° 42' 35"	0° 55' 34"	15' 08.64"	252° 23' 37"	0.18945
24	38° 20' 14"	-1° 26' 33"	36° 26' 22"	12° 55' 04"	0° 55' 33"	15' 08.22"	252° 27' 38"	0.19272

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	346° 23' 50"	-0.45"	347° 28' 26"	-5° 22' 18"	0.9921987	16' 07.18"	23° 26' 17"	-11 m 07 s
1	346° 26' 20"	-0.45"	347° 30' 45"	-5° 21' 19"	0.9922092	16' 07.16"	23° 26' 17"	-11 m 07 s
2	346° 28' 50"	-0.44"	347° 33' 04"	-5° 20' 21"	0.9922197	16' 07.15"	23° 26' 17"	-11 m 06 s
3	346° 31' 20"	-0.44"	347° 35' 23"	-5° 19' 23"	0.9922301	16' 07.14"	23° 26' 17"	-11 m 06 s
4	346° 33' 50"	-0.43"	347° 37' 42"	-5° 18' 24"	0.9922406	16' 07.13"	23° 26' 17"	-11 m 05 s
5	346° 36' 21"	-0.43"	347° 40' 01"	-5° 17' 26"	0.9922510	16' 07.12"	23° 26' 17"	-11 m 04 s
6	346° 38' 51"	-0.42"	347° 42' 20"	-5° 16' 28"	0.9922615	16' 07.11"	23° 26' 17"	-11 m 04 s
7	346° 41' 21"	-0.42"	347° 44' 39"	-5° 15' 29"	0.9922720	16' 07.10"	23° 26' 17"	-11 m 03 s
8	346° 43' 51"	-0.41"	347° 46' 58"	-5° 14' 31"	0.9922825	16' 07.09"	23° 26' 17"	-11 m 03 s
9	346° 46' 21"	-0.41"	347° 49' 17"	-5° 13' 32"	0.9922929	16' 07.08"	23° 26' 17"	-11 m 02 s
10	346° 48' 52"	-0.40"	347° 51' 36"	-5° 12' 34"	0.9923034	16' 07.07"	23° 26' 17"	-11 m 01 s
11	346° 51' 22"	-0.39"	347° 53' 55"	-5° 11' 36"	0.9923139	16' 07.06"	23° 26' 17"	-11 m 01 s
12	346° 53' 52"	-0.39"	347° 56' 13"	-5° 10' 37"	0.9923244	16' 07.05"	23° 26' 17"	-11 m 00 s
13	346° 56' 22"	-0.38"	347° 58' 32"	-5° 09' 39"	0.9923349	16' 07.04"	23° 26' 17"	-10 m 59 s
14	346° 58' 52"	-0.38"	348° 00' 51"	-5° 08' 40"	0.9923454	16' 07.03"	23° 26' 17"	-10 m 59 s
15	347° 01' 22"	-0.37"	348° 03' 10"	-5° 07' 42"	0.9923559	16' 07.02"	23° 26' 17"	-10 m 58 s
16	347° 03' 52"	-0.37"	348° 05' 29"	-5° 06' 44"	0.9923664	16' 07.01"	23° 26' 17"	-10 m 58 s
17	347° 06' 23"	-0.36"	348° 07' 48"	-5° 05' 45"	0.9923769	16' 07.00"	23° 26' 17"	-10 m 57 s
18	347° 08' 53"	-0.36"	348° 10' 07"	-5° 04' 47"	0.9923874	16' 06.99"	23° 26' 17"	-10 m 56 s
19	347° 11' 23"	-0.35"	348° 12' 26"	-5° 03' 48"	0.9923979	16' 06.98"	23° 26' 17"	-10 m 56 s
20	347° 13' 53"	-0.35"	348° 14' 44"	-5° 02' 50"	0.9924084	16' 06.97"	23° 26' 17"	-10 m 55 s
21	347° 16' 23"	-0.34"	348° 17' 03"	-5° 01' 51"	0.9924189	16' 06.96"	23° 26' 17"	-10 m 55 s
22	347° 18' 53"	-0.33"	348° 19' 22"	-5° 00' 53"	0.9924294	16' 06.95"	23° 26' 17"	-10 m 54 s
23	347° 21' 23"	-0.33"	348° 21' 41"	-4° 59' 54"	0.9924399	16' 06.94"	23° 26' 17"	-10 m 53 s
24	347° 23' 53"	-0.32"	348° 23' 59"	-4° 58' 56"	0.9924504	16' 06.93"	23° 26' 17"	-10 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	38° 20' 14"	-1° 26' 33"	36° 26' 22"	12° 55' 04"	0° 55' 33"	15' 08.22"	252° 27' 38"	0.19272
1	38° 51' 16"	-1° 23' 54"	36° 55' 41"	13° 07' 28"	0° 55' 31"	15' 07.81"	252° 31' 50"	0.19600
2	39° 22' 16"	-1° 21' 16"	37° 25' 01"	13° 19' 48"	0° 55' 30"	15' 07.39"	252° 36' 11"	0.19930
3	39° 53' 14"	-1° 18' 37"	37° 54' 22"	13° 32' 04"	0° 55' 28"	15' 06.98"	252° 40' 42"	0.20262
4	40° 24' 10"	-1° 15' 57"	38° 23' 44"	13° 44' 15"	0° 55' 27"	15' 06.58"	252° 45' 23"	0.20595
5	40° 55' 05"	-1° 13' 18"	38° 53' 08"	13° 56' 23"	0° 55' 25"	15' 06.17"	252° 50' 13"	0.20930
6	41° 25' 57"	-1° 10' 38"	39° 22' 33"	14° 08' 27"	0° 55' 24"	15' 05.77"	252° 55' 13"	0.21267
7	41° 56' 48"	-1° 07' 58"	39° 51' 60"	14° 20' 26"	0° 55' 22"	15' 05.37"	253° 0' 22"	0.21605
8	42° 27' 36"	-1° 05' 18"	40° 21' 28"	14° 32' 21"	0° 55' 21"	15' 04.98"	253° 5' 40"	0.21945
9	42° 58' 23"	-1° 02' 38"	40° 50' 57"	14° 44' 11"	0° 55' 20"	15' 04.59"	253° 11' 07"	0.22286
10	43° 29' 08"	0°-59' 57"	41° 20' 28"	14° 55' 57"	0° 55' 18"	15' 04.20"	253° 16' 44"	0.22629
11	43° 59' 52"	0°-57' 17"	41° 50' 00"	15° 07' 39"	0° 55' 17"	15' 03.82"	253° 22' 29"	0.22974
12	44° 30' 33"	0°-54' 36"	42° 19' 34"	15° 19' 16"	0° 55' 15"	15' 03.44"	253° 28' 23"	0.23320
13	45° 01' 13"	0°-51' 55"	42° 49' 10"	15° 30' 49"	0° 55' 14"	15' 03.06"	253° 34' 26"	0.23667
14	45° 31' 51"	0°-49' 14"	43° 18' 47"	15° 42' 17"	0° 55' 13"	15' 02.69"	253° 40' 38"	0.24016
15	46° 02' 28"	0°-46' 33"	43° 48' 27"	15° 53' 41"	0° 55' 11"	15' 02.32"	253° 46' 58"	0.24366
16	46° 33' 02"	0°-43' 52"	44° 18' 07"	16° 04' 59"	0° 55' 10"	15' 01.95"	253° 53' 27"	0.24718
17	47° 03' 36"	0°-41' 11"	44° 47' 50"	16° 16' 14"	0° 55' 09"	15' 01.59"	254° 0' 04"	0.25071
18	47° 34' 07"	0°-38' 30"	45° 17' 35"	16° 27' 23"	0° 55' 07"	15' 01.23"	254° 6' 50"	0.25425
19	48° 04' 37"	0°-35' 48"	45° 47' 21"	16° 38' 28"	0° 55' 06"	15' 00.87"	254° 13' 44"	0.25781
20	48° 35' 05"	0°-33' 07"	46° 17' 09"	16° 49' 28"	0° 55' 05"	15' 00.52"	254° 20' 46"	0.26138
21	49° 05' 32"	0°-30' 26"	46° 46' 59"	17° 00' 23"	0° 55' 03"	15' 00.17"	254° 27' 57"	0.26496
22	49° 35' 57"	0°-27' 44"	47° 16' 51"	17° 11' 13"	0° 55' 02"	14' 59.83"	254° 35' 15"	0.26855
23	50° 06' 20"	0°-25' 03"	47° 46' 45"	17° 21' 58"	0° 55' 01"	14' 59.49"	254° 42' 42"	0.27216
24	50° 36' 42"	0°-22' 21"	48° 16' 41"	17° 32' 39"	0° 54' 60"	14' 59.15"	254° 50' 16"	0.27578

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	347° 23' 53"	-0.32"	348° 23' 59"	-4° 58' 56"	0.9924504	16' 06.93"	23° 26' 17"	-10 m 53 s
1	347° 26' 24"	-0.32"	348° 26' 18"	-4° 57' 57"	0.9924610	16' 06.92"	23° 26' 17"	-10 m 52 s
2	347° 28' 54"	-0.31"	348° 28' 37"	-4° 56' 59"	0.9924715	16' 06.91"	23° 26' 17"	-10 m 52 s
3	347° 31' 24"	-0.31"	348° 30' 56"	-4° 56' 00"	0.9924820	16' 06.90"	23° 26' 17"	-10 m 51 s
4	347° 33' 54"	-0.30"	348° 33' 15"	-4° 55' 02"	0.9924926	16' 06.89"	23° 26' 17"	-10 m 50 s
5	347° 36' 24"	-0.30"	348° 35' 33"	-4° 54' 03"	0.9925031	16' 06.88"	23° 26' 17"	-10 m 50 s
6	347° 38' 54"	-0.29"	348° 37' 52"	-4° 53' 05"	0.9925136	16' 06.87"	23° 26' 17"	-10 m 49 s
7	347° 41' 24"	-0.28"	348° 40' 11"	-4° 52' 06"	0.9925242	16' 06.86"	23° 26' 17"	-10 m 49 s
8	347° 43' 54"	-0.28"	348° 42' 29"	-4° 51' 08"	0.9925347	16' 06.85"	23° 26' 17"	-10 m 48 s
9	347° 46' 24"	-0.27"	348° 44' 48"	-4° 50' 09"	0.9925453	16' 06.84"	23° 26' 17"	-10 m 47 s
10	347° 48' 54"	-0.27"	348° 47' 07"	-4° 49' 11"	0.9925558	16' 06.83"	23° 26' 17"	-10 m 47 s
11	347° 51' 25"	-0.26"	348° 49' 25"	-4° 48' 12"	0.9925664	16' 06.82"	23° 26' 17"	-10 m 46 s
12	347° 53' 55"	-0.26"	348° 51' 44"	-4° 47' 13"	0.9925769	16' 06.81"	23° 26' 17"	-10 m 45 s
13	347° 56' 25"	-0.25"	348° 54' 03"	-4° 46' 15"	0.9925875	16' 06.80"	23° 26' 17"	-10 m 45 s
14	347° 58' 55"	-0.24"	348° 56' 21"	-4° 45' 16"	0.9925980	16' 06.79"	23° 26' 17"	-10 m 44 s
15	348° 01' 25"	-0.24"	348° 58' 40"	-4° 44' 18"	0.9926086	16' 06.78"	23° 26' 17"	-10 m 44 s
16	348° 03' 55"	-0.23"	349° 00' 59"	-4° 43' 19"	0.9926192	16' 06.77"	23° 26' 17"	-10 m 43 s
17	348° 06' 25"	-0.23"	349° 03' 17"	-4° 42' 20"	0.9926297	16' 06.76"	23° 26' 17"	-10 m 42 s
18	348° 08' 55"	-0.22"	349° 05' 36"	-4° 41' 22"	0.9926403	16' 06.74"	23° 26' 17"	-10 m 42 s
19	348° 11' 25"	-0.22"	349° 07' 54"	-4° 40' 23"	0.9926509	16' 06.73"	23° 26' 17"	-10 m 41 s
20	348° 13' 55"	-0.21"	349° 10' 13"	-4° 39' 25"	0.9926615	16' 06.72"	23° 26' 17"	-10 m 40 s
21	348° 16' 25"	-0.21"	349° 12' 32"	-4° 38' 26"	0.9926721	16' 06.71"	23° 26' 17"	-10 m 40 s
22	348° 18' 55"	-0.20"	349° 14' 50"	-4° 37' 27"	0.9926826	16' 06.70"	23° 26' 17"	-10 m 39 s
23	348° 21' 25"	-0.19"	349° 17' 09"	-4° 36' 29"	0.9926932	16' 06.69"	23° 26' 17"	-10 m 39 s
24	348° 23' 55"	-0.19"	349° 19' 27"	-4° 35' 30"	0.9927038	16' 06.68"	23° 26' 17"	-10 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	50° 36' 42"	0°-22' 21"	48° 16' 41"	17° 32' 39"	0° 54' 60"	14' 59.15"	254° 50' 16"	0.27578
1	51° 07' 03"	0°-19' 40"	48° 46' 40"	17° 43' 14"	0° 54' 58"	14' 58.82"	254° 57' 59"	0.27940
2	51° 37' 22"	0°-16' 58"	49° 16' 40"	17° 53' 44"	0° 54' 57"	14' 58.49"	255° 5' 49"	0.28305
3	52° 07' 39"	0°-14' 17"	49° 46' 42"	18° 04' 09"	0° 54' 56"	14' 58.17"	255° 13' 47"	0.28670
4	52° 37' 56"	0°-11' 36"	50° 16' 47"	18° 14' 29"	0° 54' 55"	14' 57.85"	255° 21' 52"	0.29036
5	53° 08' 10"	0° -8' 54"	50° 46' 53"	18° 24' 44"	0° 54' 54"	14' 57.53"	255° 30' 06"	0.29403
6	53° 38' 24"	0° -6' 13"	51° 17' 02"	18° 34' 54"	0° 54' 53"	14' 57.22"	255° 38' 27"	0.29772
7	54° 08' 36"	0° -3' 32"	51° 47' 13"	18° 44' 58"	0° 54' 51"	14' 56.91"	255° 46' 55"	0.30141
8	54° 38' 46"	0° 00'-51"	52° 17' 26"	18° 54' 57"	0° 54' 50"	14' 56.61"	255° 55' 31"	0.30512
9	55° 08' 55"	0° 01' 50"	52° 47' 42"	19° 04' 51"	0° 54' 49"	14' 56.31"	256° 4' 14"	0.30883
10	55° 39' 03"	0° 04' 31"	53° 17' 59"	19° 14' 40"	0° 54' 48"	14' 56.01"	256° 13' 05"	0.31255
11	56° 09' 10"	0° 07' 11"	53° 48' 19"	19° 24' 23"	0° 54' 47"	14' 55.72"	256° 22' 02"	0.31629
12	56° 39' 15"	0° 09' 52"	54° 18' 42"	19° 34' 00"	0° 54' 46"	14' 55.44"	256° 31' 08"	0.32003
13	57° 09' 19"	0° 12' 32"	54° 49' 07"	19° 43' 32"	0° 54' 45"	14' 55.15"	256° 40' 20"	0.32378
14	57° 39' 22"	0° 15' 12"	55° 19' 34"	19° 52' 59"	0° 54' 44"	14' 54.88"	256° 49' 39"	0.32754
15	58° 09' 24"	0° 17' 53"	55° 50' 03"	20° 02' 20"	0° 54' 43"	14' 54.60"	256° 59' 05"	0.33130
16	58° 39' 25"	0° 20' 32"	56° 20' 35"	20° 11' 35"	0° 54' 42"	14' 54.33"	257° 8' 39"	0.33508
17	59° 09' 24"	0° 23' 10"	56° 51' 10"	20° 20' 43"	0° 54' 41"	14' 54.07"	257° 18' 20"	0.33886
18	59° 39' 22"	0° 25' 49"	57° 21' 47"	20° 29' 47"	0° 54' 40"	14' 53.81"	257° 28' 07"	0.34265
19	60° 09' 19"	0° 28' 28"	57° 52' 26"	20° 38' 45"	0° 54' 39"	14' 53.55"	257° 38' 01"	0.34645
20	60° 39' 15"	0° 31' 07"	58° 23' 07"	20° 47' 38"	0° 54' 38"	14' 53.30"	257° 48' 02"	0.35026
21	61° 09' 10"	0° 33' 46"	58° 53' 51"	20° 56' 25"	0° 54' 37"	14' 53.06"	257° 58' 09"	0.35407
22	61° 39' 04"	0° 36' 25"	59° 24' 38"	21° 05' 06"	0° 54' 36"	14' 52.81"	258° 8' 23"	0.35789
23	62° 08' 57"	0° 39' 03"	59° 55' 27"	21° 13' 41"	0° 54' 36"	14' 52.58"	258° 18' 44"	0.36172
24	62° 38' 49"	0° 41' 41"	60° 26' 19"	21° 22' 11"	0° 54' 35"	14' 52.34"	258° 29' 11"	0.36555



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	348° 23' 55"	-0.19"	349° 19' 27"	-4° 35' 30"	0.9927038	16' 06.68"	23° 26' 17"	-10 m 38 s
1	348° 26' 25"	-0.18"	349° 21' 46"	-4° 34' 31"	0.9927144	16' 06.67"	23° 26' 17"	-10 m 37 s
2	348° 28' 55"	-0.18"	349° 24' 04"	-4° 33' 33"	0.9927250	16' 06.66"	23° 26' 17"	-10 m 37 s
3	348° 31' 25"	-0.17"	349° 26' 23"	-4° 32' 34"	0.9927356	16' 06.65"	23° 26' 17"	-10 m 36 s
4	348° 33' 55"	-0.17"	349° 28' 41"	-4° 31' 35"	0.9927462	16' 06.64"	23° 26' 17"	-10 m 35 s
5	348° 36' 25"	-0.16"	349° 30' 60"	-4° 30' 37"	0.9927568	16' 06.63"	23° 26' 17"	-10 m 35 s
6	348° 38' 55"	-0.16"	349° 33' 18"	-4° 29' 38"	0.9927674	16' 06.62"	23° 26' 17"	-10 m 34 s
7	348° 41' 25"	-0.15"	349° 35' 37"	-4° 28' 39"	0.9927781	16' 06.61"	23° 26' 17"	-10 m 34 s
8	348° 43' 55"	-0.14"	349° 37' 55"	-4° 27' 41"	0.9927887	16' 06.60"	23° 26' 17"	-10 m 33 s
9	348° 46' 25"	-0.14"	349° 40' 14"	-4° 26' 42"	0.9927993	16' 06.59"	23° 26' 17"	-10 m 32 s
10	348° 48' 55"	-0.13"	349° 42' 32"	-4° 25' 43"	0.9928099	16' 06.58"	23° 26' 17"	-10 m 32 s
11	348° 51' 25"	-0.13"	349° 44' 50"	-4° 24' 45"	0.9928205	16' 06.57"	23° 26' 17"	-10 m 31 s
12	348° 53' 55"	-0.12"	349° 47' 09"	-4° 23' 46"	0.9928312	16' 06.56"	23° 26' 17"	-10 m 30 s
13	348° 56' 25"	-0.12"	349° 49' 27"	-4° 22' 47"	0.9928418	16' 06.55"	23° 26' 17"	-10 m 30 s
14	348° 58' 55"	-0.11"	349° 51' 46"	-4° 21' 48"	0.9928524	16' 06.54"	23° 26' 17"	-10 m 29 s
15	349° 01' 25"	-0.11"	349° 54' 04"	-4° 20' 50"	0.9928631	16' 06.53"	23° 26' 17"	-10 m 28 s
16	349° 03' 55"	-0.10"	349° 56' 22"	-4° 19' 51"	0.9928737	16' 06.52"	23° 26' 17"	-10 m 28 s
17	349° 06' 25"	-0.09"	349° 58' 41"	-4° 18' 52"	0.9928844	16' 06.51"	23° 26' 17"	-10 m 27 s
18	349° 08' 55"	-0.09"	350° 00' 59"	-4° 17' 54"	0.9928950	16' 06.50"	23° 26' 17"	-10 m 27 s
19	349° 11' 25"	-0.08"	350° 03' 18"	-4° 16' 55"	0.9929057	16' 06.49"	23° 26' 17"	-10 m 26 s
20	349° 13' 55"	-0.08"	350° 05' 36"	-4° 15' 56"	0.9929163	16' 06.48"	23° 26' 17"	-10 m 25 s
21	349° 16' 25"	-0.07"	350° 07' 54"	-4° 14' 57"	0.9929270	16' 06.47"	23° 26' 17"	-10 m 25 s
22	349° 18' 55"	-0.07"	350° 10' 13"	-4° 13' 58"	0.9929377	16' 06.46"	23° 26' 17"	-10 m 24 s
23	349° 21' 25"	-0.06"	350° 12' 31"	-4° 12' 60"	0.9929483	16' 06.45"	23° 26' 17"	-10 m 23 s
24	349° 23' 55"	-0.06"	350° 14' 49"	-4° 12' 01"	0.9929590	16' 06.43"	23° 26' 17"	-10 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	62° 38' 49"	0° 41' 41"	60° 26' 19"	21° 22' 11"	0° 54' 35"	14' 52.34"	258° 29' 11"	0.36555
1	63° 08' 40"	0° 44' 19"	60° 57' 13"	21° 30' 34"	0° 54' 34"	14' 52.12"	258° 39' 44"	0.36939
2	63° 38' 30"	0° 46' 57"	61° 28' 09"	21° 38' 52"	0° 54' 33"	14' 51.89"	258° 50' 24"	0.37323
3	64° 08' 19"	0° 49' 34"	61° 59' 08"	21° 47' 03"	0° 54' 32"	14' 51.67"	259° 1' 11"	0.37708
4	64° 38' 07"	0° 52' 11"	62° 30' 10"	21° 55' 08"	0° 54' 31"	14' 51.46"	259° 12' 03"	0.38094
5	65° 07' 54"	0° 54' 47"	63° 01' 14"	22° 03' 08"	0° 54' 31"	14' 51.25"	259° 23' 02"	0.38480
6	65° 37' 40"	0° 57' 24"	63° 32' 21"	22° 11' 01"	0° 54' 30"	14' 51.04"	259° 34' 07"	0.38867
7	66° 07' 26"	0° 59' 60"	64° 03' 30"	22° 18' 48"	0° 54' 29"	14' 50.84"	259° 45' 19"	0.39254
8	66° 37' 11"	1° 02' 35"	64° 34' 42"	22° 26' 29"	0° 54' 28"	14' 50.65"	259° 56' 36"	0.39641
9	67° 06' 55"	1° 05' 11"	65° 05' 56"	22° 34' 04"	0° 54' 28"	14' 50.46"	260° 7' 59"	0.40029
10	67° 36' 38"	1° 07' 46"	65° 37' 13"	22° 41' 32"	0° 54' 27"	14' 50.27"	260° 19' 29"	0.40418
11	68° 06' 20"	1° 10' 20"	66° 08' 33"	22° 48' 55"	0° 54' 26"	14' 50.09"	260° 31' 04"	0.40807
12	68° 36' 02"	1° 12' 54"	66° 39' 55"	22° 56' 11"	0° 54' 26"	14' 49.92"	260° 42' 45"	0.41196
13	69° 05' 43"	1° 15' 28"	67° 11' 20"	23° 03' 20"	0° 54' 25"	14' 49.74"	260° 54' 32"	0.41586
14	69° 35' 23"	1° 18' 02"	67° 42' 47"	23° 10' 23"	0° 54' 25"	14' 49.58"	261° 6' 24"	0.41976
15	70° 05' 03"	1° 20' 35"	68° 14' 16"	23° 17' 20"	0° 54' 24"	14' 49.42"	261° 18' 22"	0.42366
16	70° 34' 42"	1° 23' 07"	68° 45' 49"	23° 24' 10"	0° 54' 23"	14' 49.26"	261° 30' 26"	0.42757
17	71° 04' 20"	1° 25' 39"	69° 17' 23"	23° 30' 54"	0° 54' 23"	14' 49.11"	261° 42' 36"	0.43148
18	71° 33' 58"	1° 28' 11"	69° 49' 01"	23° 37' 31"	0° 54' 22"	14' 48.96"	261° 54' 50"	0.43539
19	72° 03' 36"	1° 30' 42"	70° 20' 40"	23° 44' 02"	0° 54' 22"	14' 48.82"	262° 7' 11"	0.43930
20	72° 33' 12"	1° 33' 13"	70° 52' 23"	23° 50' 26"	0° 54' 21"	14' 48.68"	262° 19' 36"	0.44322
21	73° 02' 49"	1° 35' 44"	71° 24' 07"	23° 56' 44"	0° 54' 21"	14' 48.55"	262° 32' 07"	0.44714
22	73° 32' 24"	1° 38' 13"	71° 55' 54"	24° 02' 55"	0° 54' 20"	14' 48.42"	262° 44' 43"	0.45106
23	74° 01' 60"	1° 40' 43"	72° 27' 44"	24° 08' 59"	0° 54' 20"	14' 48.30"	262° 57' 25"	0.45498
24	74° 31' 35"	1° 43' 12"	72° 59' 36"	24° 14' 57"	0° 54' 19"	14' 48.18"	263° 10' 11"	0.45890

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	349° 23' 55"	-0.06"	350° 14' 49"	-4° 12' 01"	0.9929590	16' 06.43"	23° 26' 17"	-10 m 23 s
1	349° 26' 25"	-0.05"	350° 17' 08"	-4° 11' 02"	0.9929697	16' 06.42"	23° 26' 17"	-10 m 22 s
2	349° 28' 55"	-0.05"	350° 19' 26"	-4° 10' 03"	0.9929803	16' 06.41"	23° 26' 17"	-10 m 21 s
3	349° 31' 25"	-0.04"	350° 21' 44"	-4° 09' 05"	0.9929910	16' 06.40"	23° 26' 17"	-10 m 21 s
4	349° 33' 55"	-0.03"	350° 24' 02"	-4° 08' 06"	0.9930017	16' 06.39"	23° 26' 17"	-10 m 20 s
5	349° 36' 24"	-0.03"	350° 26' 21"	-4° 07' 07"	0.9930124	16' 06.38"	23° 26' 17"	-10 m 20 s
6	349° 38' 54"	-0.02"	350° 28' 39"	-4° 06' 08"	0.9930231	16' 06.37"	23° 26' 17"	-10 m 19 s
7	349° 41' 24"	-0.02"	350° 30' 57"	-4° 05' 09"	0.9930338	16' 06.36"	23° 26' 17"	-10 m 18 s
8	349° 43' 54"	-0.01"	350° 33' 15"	-4° 04' 10"	0.9930445	16' 06.35"	23° 26' 17"	-10 m 18 s
9	349° 46' 24"	-0.01"	350° 35' 34"	-4° 03' 12"	0.9930552	16' 06.34"	23° 26' 17"	-10 m 17 s
10	349° 48' 54"	-0.00"	350° 37' 52"	-4° 02' 13"	0.9930659	16' 06.33"	23° 26' 17"	-10 m 16 s
11	349° 51' 24"	0.00"	350° 40' 10"	-4° 01' 14"	0.9930766	16' 06.32"	23° 26' 17"	-10 m 16 s
12	349° 53' 54"	0.01"	350° 42' 28"	-4° 00' 15"	0.9930873	16' 06.31"	23° 26' 17"	-10 m 15 s
13	349° 56' 24"	0.01"	350° 44' 46"	-3° 59' 16"	0.9930980	16' 06.30"	23° 26' 17"	-10 m 14 s
14	349° 58' 54"	0.02"	350° 47' 05"	-3° 58' 17"	0.9931087	16' 06.29"	23° 26' 17"	-10 m 14 s
15	350° 01' 23"	0.02"	350° 49' 23"	-3° 57' 19"	0.9931195	16' 06.28"	23° 26' 17"	-10 m 13 s
16	350° 03' 53"	0.03"	350° 51' 41"	-3° 56' 20"	0.9931302	16' 06.27"	23° 26' 17"	-10 m 12 s
17	350° 06' 23"	0.03"	350° 53' 59"	-3° 55' 21"	0.9931409	16' 06.26"	23° 26' 17"	-10 m 12 s
18	350° 08' 53"	0.04"	350° 56' 17"	-3° 54' 22"	0.9931516	16' 06.25"	23° 26' 17"	-10 m 11 s
19	350° 11' 23"	0.04"	350° 58' 35"	-3° 53' 23"	0.9931624	16' 06.24"	23° 26' 17"	-10 m 10 s
20	350° 13' 53"	0.05"	351° 00' 54"	-3° 52' 24"	0.9931731	16' 06.23"	23° 26' 17"	-10 m 10 s
21	350° 16' 23"	0.05"	351° 03' 12"	-3° 51' 25"	0.9931839	16' 06.22"	23° 26' 17"	-10 m 09 s
22	350° 18' 52"	0.06"	351° 05' 30"	-3° 50' 26"	0.9931946	16' 06.21"	23° 26' 17"	-10 m 08 s
23	350° 21' 22"	0.06"	351° 07' 48"	-3° 49' 28"	0.9932054	16' 06.19"	23° 26' 17"	-10 m 08 s
24	350° 23' 52"	0.07"	351° 10' 06"	-3° 48' 29"	0.9932161	16' 06.18"	23° 26' 17"	-10 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	74° 31' 35"	1° 43' 12"	72° 59' 36"	24° 14' 57"	0° 54' 19"	14' 48.18"	263° 10' 11"	0.45890
1	75° 01' 09"	1° 45' 40"	73° 31' 31"	24° 20' 47"	0° 54' 19"	14' 48.07"	263° 23' 03"	0.46283
2	75° 30' 43"	1° 48' 08"	74° 03' 28"	24° 26' 31"	0° 54' 19"	14' 47.96"	263° 35' 59"	0.46676
3	76° 00' 17"	1° 50' 36"	74° 35' 27"	24° 32' 08"	0° 54' 18"	14' 47.86"	263° 49' 01"	0.47068
4	76° 29' 51"	1° 53' 03"	75° 07' 29"	24° 37' 39"	0° 54' 18"	14' 47.76"	264° 2' 07"	0.47461
5	76° 59' 24"	1° 55' 29"	75° 39' 33"	24° 43' 02"	0° 54' 17"	14' 47.67"	264° 15' 18"	0.47854
6	77° 28' 56"	1° 57' 55"	76° 11' 40"	24° 48' 19"	0° 54' 17"	14' 47.58"	264° 28' 34"	0.48247
7	77° 58' 29"	2° 00' 20"	76° 43' 48"	24° 53' 29"	0° 54' 17"	14' 47.49"	264° 41' 54"	0.48640
8	78° 28' 01"	2° 02' 45"	77° 15' 60"	24° 58' 31"	0° 54' 17"	14' 47.42"	264° 55' 20"	0.49033
9	78° 57' 33"	2° 05' 09"	77° 48' 13"	25° 03' 27"	0° 54' 16"	14' 47.34"	265° 8' 49"	0.49426
10	79° 27' 05"	2° 07' 32"	78° 20' 29"	25° 08' 16"	0° 54' 16"	14' 47.28"	265° 22' 23"	0.49819
11	79° 56' 37"	2° 09' 55"	78° 52' 46"	25° 12' 58"	0° 54' 16"	14' 47.21"	265° 36' 02"	0.50211
12	80° 26' 08"	2° 12' 18"	79° 25' 06"	25° 17' 32"	0° 54' 16"	14' 47.16"	265° 49' 44"	0.50604
13	80° 55' 40"	2° 14' 40"	79° 57' 29"	25° 21' 60"	0° 54' 15"	14' 47.10"	266° 3' 31"	0.50997
14	81° 25' 11"	2° 17' 01"	80° 29' 53"	25° 26' 20"	0° 54' 15"	14' 47.05"	266° 17' 23"	0.51389
15	81° 54' 42"	2° 19' 21"	81° 02' 19"	25° 30' 34"	0° 54' 15"	14' 47.01"	266° 31' 18"	0.51782
16	82° 24' 14"	2° 21' 41"	81° 34' 48"	25° 34' 40"	0° 54' 15"	14' 46.97"	266° 45' 17"	0.52174
17	82° 53' 45"	2° 24' 01"	82° 07' 19"	25° 38' 39"	0° 54' 15"	14' 46.94"	266° 59' 21"	0.52566
18	83° 23' 16"	2° 26' 19"	82° 39' 51"	25° 42' 30"	0° 54' 15"	14' 46.91"	267° 13' 28"	0.52958
19	83° 52' 47"	2° 28' 37"	83° 12' 26"	25° 46' 15"	0° 54' 15"	14' 46.89"	267° 27' 39"	0.53350
20	84° 22' 18"	2° 30' 55"	83° 45' 02"	25° 49' 52"	0° 54' 15"	14' 46.87"	267° 41' 54"	0.53741
21	84° 51' 50"	2° 33' 11"	84° 17' 41"	25° 53' 22"	0° 54' 15"	14' 46.86"	267° 56' 12"	0.54132
22	85° 21' 21"	2° 35' 27"	84° 50' 21"	25° 56' 44"	0° 54' 14"	14' 46.85"	268° 10' 34"	0.54523
23	85° 50' 53"	2° 37' 43"	85° 23' 04"	25° 59' 60"	0° 54' 14"	14' 46.85"	268° 24' 60"	0.54914
24	86° 20' 24"	2° 39' 57"	85° 55' 48"	26° 03' 08"	0° 54' 14"	14' 46.85"	268° 39' 29"	0.55304

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	350° 23' 52"	0.07"	351° 10' 06"	-3° 48' 29"	0.9932161	16' 06.18"	23° 26' 17"	-10 m 07 s
1	350° 26' 22"	0.07"	351° 12' 24"	-3° 47' 30"	0.9932269	16' 06.17"	23° 26' 17"	-10 m 07 s
2	350° 28' 52"	0.08"	351° 14' 42"	-3° 46' 31"	0.9932376	16' 06.16"	23° 26' 17"	-10 m 06 s
3	350° 31' 22"	0.08"	351° 17' 00"	-3° 45' 32"	0.9932484	16' 06.15"	23° 26' 17"	-10 m 05 s
4	350° 33' 52"	0.09"	351° 19' 18"	-3° 44' 33"	0.9932592	16' 06.14"	23° 26' 17"	-10 m 05 s
5	350° 36' 21"	0.09"	351° 21' 36"	-3° 43' 34"	0.9932699	16' 06.13"	23° 26' 17"	-10 m 04 s
6	350° 38' 51"	0.10"	351° 23' 54"	-3° 42' 35"	0.9932807	16' 06.12"	23° 26' 17"	-10 m 03 s
7	350° 41' 21"	0.10"	351° 26' 12"	-3° 41' 36"	0.9932915	16' 06.11"	23° 26' 17"	-10 m 03 s
8	350° 43' 51"	0.10"	351° 28' 30"	-3° 40' 37"	0.9933023	16' 06.10"	23° 26' 17"	-10 m 02 s
9	350° 46' 21"	0.11"	351° 30' 48"	-3° 39' 38"	0.9933131	16' 06.09"	23° 26' 17"	-10 m 01 s
10	350° 48' 50"	0.11"	351° 33' 07"	-3° 38' 39"	0.9933239	16' 06.08"	23° 26' 17"	-10 m 01 s
11	350° 51' 20"	0.12"	351° 35' 25"	-3° 37' 41"	0.9933346	16' 06.07"	23° 26' 17"	-9 m 60 s
12	350° 53' 50"	0.12"	351° 37' 43"	-3° 36' 42"	0.9933454	16' 06.06"	23° 26' 17"	-9 m 59 s
13	350° 56' 20"	0.13"	351° 40' 00"	-3° 35' 43"	0.9933562	16' 06.05"	23° 26' 17"	-9 m 59 s
14	350° 58' 50"	0.13"	351° 42' 18"	-3° 34' 44"	0.9933671	16' 06.04"	23° 26' 17"	-9 m 58 s
15	351° 01' 19"	0.14"	351° 44' 36"	-3° 33' 45"	0.9933779	16' 06.03"	23° 26' 17"	-9 m 57 s
16	351° 03' 49"	0.14"	351° 46' 54"	-3° 32' 46"	0.9933887	16' 06.02"	23° 26' 17"	-9 m 57 s
17	351° 06' 19"	0.15"	351° 49' 12"	-3° 31' 47"	0.9933995	16' 06.01"	23° 26' 17"	-9 m 56 s
18	351° 08' 49"	0.15"	351° 51' 30"	-3° 30' 48"	0.9934103	16' 06.00"	23° 26' 17"	-9 m 55 s
19	351° 11' 19"	0.15"	351° 53' 48"	-3° 29' 49"	0.9934211	16' 05.99"	23° 26' 17"	-9 m 55 s
20	351° 13' 48"	0.16"	351° 56' 06"	-3° 28' 50"	0.9934320	16' 05.97"	23° 26' 17"	-9 m 54 s
21	351° 16' 18"	0.16"	351° 58' 24"	-3° 27' 51"	0.9934428	16' 05.96"	23° 26' 17"	-9 m 53 s
22	351° 18' 48"	0.17"	352° 00' 42"	-3° 26' 52"	0.9934536	16' 05.95"	23° 26' 17"	-9 m 53 s
23	351° 21' 18"	0.17"	352° 02' 60"	-3° 25' 53"	0.9934645	16' 05.94"	23° 26' 17"	-9 m 52 s
24	351° 23' 47"	0.17"	352° 05' 18"	-3° 24' 54"	0.9934753	16' 05.93"	23° 26' 17"	-9 m 51 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	86° 20' 24"	2° 39' 57"	85° 55' 48"	26° 03' 08"	0° 54' 14"	14' 46.85"	268° 39' 29"	0.55304
1	86° 49' 56"	2° 42' 11"	86° 28' 33"	26° 06' 08"	0° 54' 15"	14' 46.86"	268° 54' 01"	0.55694
2	87° 19' 28"	2° 44' 24"	87° 01' 21"	26° 09' 01"	0° 54' 15"	14' 46.87"	269° 8' 37"	0.56084
3	87° 49' 00"	2° 46' 37"	87° 34' 10"	26° 11' 47"	0° 54' 15"	14' 46.89"	269° 23' 16"	0.56473
4	88° 18' 33"	2° 48' 48"	88° 07' 01"	26° 14' 25"	0° 54' 15"	14' 46.91"	269° 37' 58"	0.56862
5	88° 48' 05"	2° 50' 59"	88° 39' 54"	26° 16' 56"	0° 54' 15"	14' 46.93"	269° 52' 44"	0.57251
6	89° 17' 38"	2° 53' 10"	89° 12' 48"	26° 19' 19"	0° 54' 15"	14' 46.97"	270° 7' 32"	0.57639
7	89° 47' 11"	2° 55' 19"	89° 45' 43"	26° 21' 35"	0° 54' 15"	14' 47.00"	270° 22' 23"	0.58026
8	90° 16' 45"	2° 57' 28"	90° 18' 40"	26° 23' 43"	0° 54' 15"	14' 47.04"	270° 37' 17"	0.58414
9	90° 46' 19"	2° 59' 36"	90° 51' 39"	26° 25' 44"	0° 54' 15"	14' 47.09"	270° 52' 14"	0.58800
10	91° 15' 53"	3° 01' 43"	91° 24' 39"	26° 27' 37"	0° 54' 16"	14' 47.14"	271° 7' 14"	0.59187
11	91° 45' 28"	3° 03' 49"	91° 57' 40"	26° 29' 23"	0° 54' 16"	14' 47.20"	271° 22' 16"	0.59572
12	92° 15' 03"	3° 05' 55"	92° 30' 43"	26° 31' 01"	0° 54' 16"	14' 47.26"	271° 37' 20"	0.59958
13	92° 44' 38"	3° 07' 59"	93° 03' 46"	26° 32' 31"	0° 54' 16"	14' 47.33"	271° 52' 28"	0.60342
14	93° 14' 14"	3° 10' 03"	93° 36' 52"	26° 33' 54"	0° 54' 16"	14' 47.40"	272° 7' 37"	0.60726
15	93° 43' 51"	3° 12' 07"	94° 09' 58"	26° 35' 09"	0° 54' 17"	14' 47.47"	272° 22' 49"	0.61110
16	94° 13' 28"	3° 14' 09"	94° 43' 05"	26° 36' 17"	0° 54' 17"	14' 47.55"	272° 38' 03"	0.61493
17	94° 43' 05"	3° 16' 10"	95° 16' 13"	26° 37' 16"	0° 54' 17"	14' 47.64"	272° 53' 20"	0.61875
18	95° 12' 43"	3° 18' 11"	95° 49' 23"	26° 38' 08"	0° 54' 18"	14' 47.73"	273° 8' 38"	0.62257
19	95° 42' 22"	3° 20' 11"	96° 22' 33"	26° 38' 53"	0° 54' 18"	14' 47.82"	273° 23' 58"	0.62638
20	96° 12' 01"	3° 22' 09"	96° 55' 45"	26° 39' 30"	0° 54' 18"	14' 47.92"	273° 39' 21"	0.63018
21	96° 41' 40"	3° 24' 07"	97° 28' 57"	26° 39' 59"	0° 54' 19"	14' 48.03"	273° 54' 45"	0.63398
22	97° 11' 21"	3° 26' 05"	98° 02' 10"	26° 40' 20"	0° 54' 19"	14' 48.14"	274° 10' 11"	0.63777
23	97° 41' 02"	3° 28' 01"	98° 35' 23"	26° 40' 34"	0° 54' 20"	14' 48.25"	274° 25' 38"	0.64155
24	98° 10' 44"	3° 29' 56"	99° 08' 38"	26° 40' 40"	0° 54' 20"	14' 48.37"	274° 41' 08"	0.64532

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	351° 23' 47"	0.17"	352° 05' 18"	-3° 24' 54"	0.9934753	16' 05.93"	23° 26' 17"	-9 m 51 s
1	351° 26' 17"	0.18"	352° 07' 36"	-3° 23' 55"	0.9934862	16' 05.92"	23° 26' 17"	-9 m 51 s
2	351° 28' 47"	0.18"	352° 09' 54"	-3° 22' 56"	0.9934970	16' 05.91"	23° 26' 17"	-9 m 50 s
3	351° 31' 17"	0.19"	352° 12' 11"	-3° 21' 57"	0.9935079	16' 05.90"	23° 26' 17"	-9 m 49 s
4	351° 33' 46"	0.19"	352° 14' 29"	-3° 20' 58"	0.9935187	16' 05.89"	23° 26' 17"	-9 m 49 s
5	351° 36' 16"	0.19"	352° 16' 47"	-3° 19' 59"	0.9935296	16' 05.88"	23° 26' 17"	-9 m 48 s
6	351° 38' 46"	0.20"	352° 19' 05"	-3° 18' 60"	0.9935405	16' 05.87"	23° 26' 17"	-9 m 47 s
7	351° 41' 16"	0.20"	352° 21' 23"	-3° 18' 01"	0.9935513	16' 05.86"	23° 26' 17"	-9 m 47 s
8	351° 43' 45"	0.21"	352° 23' 41"	-3° 17' 02"	0.9935622	16' 05.85"	23° 26' 17"	-9 m 46 s
9	351° 46' 15"	0.21"	352° 25' 58"	-3° 16' 03"	0.9935731	16' 05.84"	23° 26' 17"	-9 m 45 s
10	351° 48' 45"	0.21"	352° 28' 16"	-3° 15' 04"	0.9935840	16' 05.83"	23° 26' 17"	-9 m 45 s
11	351° 51' 15"	0.22"	352° 30' 34"	-3° 14' 05"	0.9935949	16' 05.82"	23° 26' 17"	-9 m 44 s
12	351° 53' 44"	0.22"	352° 32' 52"	-3° 13' 05"	0.9936057	16' 05.81"	23° 26' 17"	-9 m 43 s
13	351° 56' 14"	0.22"	352° 35' 10"	-3° 12' 06"	0.9936166	16' 05.80"	23° 26' 17"	-9 m 43 s
14	351° 58' 44"	0.23"	352° 37' 27"	-3° 11' 07"	0.9936275	16' 05.78"	23° 26' 17"	-9 m 42 s
15	352° 01' 13"	0.23"	352° 39' 45"	-3° 10' 08"	0.9936384	16' 05.77"	23° 26' 17"	-9 m 41 s
16	352° 03' 43"	0.24"	352° 42' 03"	-3° 09' 09"	0.9936493	16' 05.76"	23° 26' 17"	-9 m 41 s
17	352° 06' 13"	0.24"	352° 44' 21"	-3° 08' 10"	0.9936603	16' 05.75"	23° 26' 17"	-9 m 40 s
18	352° 08' 42"	0.24"	352° 46' 38"	-3° 07' 11"	0.9936712	16' 05.74"	23° 26' 17"	-9 m 39 s
19	352° 11' 12"	0.25"	352° 48' 56"	-3° 06' 12"	0.9936821	16' 05.73"	23° 26' 17"	-9 m 39 s
20	352° 13' 42"	0.25"	352° 51' 14"	-3° 05' 13"	0.9936930	16' 05.72"	23° 26' 17"	-9 m 38 s
21	352° 16' 12"	0.25"	352° 53' 32"	-3° 04' 14"	0.9937039	16' 05.71"	23° 26' 17"	-9 m 37 s
22	352° 18' 41"	0.26"	352° 55' 49"	-3° 03' 15"	0.9937149	16' 05.70"	23° 26' 17"	-9 m 37 s
23	352° 21' 11"	0.26"	352° 58' 07"	-3° 02' 16"	0.9937258	16' 05.69"	23° 26' 17"	-9 m 36 s
24	352° 23' 41"	0.26"	353° 00' 25"	-3° 01' 17"	0.9937367	16' 05.68"	23° 26' 17"	-9 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	98° 10' 44"	3° 29' 56"	99° 08' 38"	26° 40' 40"	0° 54' 20"	14' 48.37"	274° 41' 08"	0.64532
1	98° 40' 26"	3° 31' 50"	99° 41' 53"	26° 40' 38"	0° 54' 21"	14' 48.50"	274° 56' 39"	0.64909
2	99° 10' 09"	3° 33' 44"	100° 15' 09"	26° 40' 28"	0° 54' 21"	14' 48.62"	275° 12' 11"	0.65285
3	99° 39' 53"	3° 35' 37"	100° 48' 25"	26° 40' 11"	0° 54' 21"	14' 48.76"	275° 27' 45"	0.65660
4	100° 09' 38"	3° 37' 28"	101° 21' 42"	26° 39' 43"	0° 54' 22"	14' 48.90"	275° 43' 20"	0.66034
5	100° 39' 23"	3° 39' 19"	101° 54' 59"	26° 39' 13"	0° 54' 23"	14' 49.04"	275° 58' 56"	0.66407
6	101° 09' 09"	3° 41' 09"	102° 28' 17"	26° 38' 32"	0° 54' 23"	14' 49.18"	276° 14' 33"	0.66779
7	101° 38' 56"	3° 42' 57"	103° 01' 35"	26° 37' 43"	0° 54' 24"	14' 49.34"	276° 30' 12"	0.67151
8	102° 08' 44"	3° 44' 45"	103° 34' 53"	26° 36' 47"	0° 54' 24"	14' 49.49"	276° 45' 51"	0.67521
9	102° 38' 33"	3° 46' 32"	104° 08' 12"	26° 35' 43"	0° 54' 25"	14' 49.65"	277° 1' 32"	0.67891
10	103° 08' 23"	3° 48' 18"	104° 41' 30"	26° 34' 31"	0° 54' 25"	14' 49.82"	277° 17' 13"	0.68260
11	103° 38' 13"	3° 50' 03"	105° 14' 49"	26° 33' 11"	0° 54' 26"	14' 49.99"	277° 32' 56"	0.68628
12	104° 08' 05"	3° 51' 47"	105° 48' 08"	26° 31' 44"	0° 54' 27"	14' 50.16"	277° 48' 39"	0.68994
13	104° 37' 57"	3° 53' 29"	106° 21' 27"	26° 30' 09"	0° 54' 27"	14' 50.34"	278° 4' 22"	0.69360
14	105° 07' 51"	3° 55' 11"	106° 54' 46"	26° 28' 26"	0° 54' 28"	14' 50.53"	278° 20' 07"	0.69725
15	105° 37' 45"	3° 56' 52"	107° 28' 05"	26° 26' 35"	0° 54' 29"	14' 50.71"	278° 35' 51"	0.70088
16	106° 07' 40"	3° 58' 32"	108° 01' 24"	26° 24' 36"	0° 54' 29"	14' 50.91"	278° 51' 37"	0.70451
17	106° 37' 37"	4° 00' 11"	108° 34' 43"	26° 22' 30"	0° 54' 30"	14' 51.10"	279° 7' 22"	0.70812
18	107° 07' 34"	4° 01' 48"	109° 08' 01"	26° 20' 16"	0° 54' 31"	14' 51.30"	279° 23' 08"	0.71172
19	107° 37' 33"	4° 03' 25"	109° 41' 19"	26° 17' 54"	0° 54' 32"	14' 51.51"	279° 38' 55"	0.71532
20	108° 07' 32"	4° 05' 01"	110° 14' 37"	26° 15' 24"	0° 54' 32"	14' 51.72"	279° 54' 41"	0.71890
21	108° 37' 33"	4° 06' 35"	110° 47' 55"	26° 12' 46"	0° 54' 33"	14' 51.93"	280° 10' 28"	0.72246
22	109° 07' 35"	4° 08' 08"	111° 21' 12"	26° 10' 01"	0° 54' 34"	14' 52.15"	280° 26' 14"	0.72602
23	109° 37' 38"	4° 09' 41"	111° 54' 28"	26° 07' 08"	0° 54' 35"	14' 52.37"	280° 42' 01"	0.72956
24	110° 07' 42"	4° 11' 12"	112° 27' 44"	26° 04' 07"	0° 54' 36"	14' 52.60"	280° 57' 48"	0.73309



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	352° 23' 41"	0.26"	353° 00' 25"	-3° 01' 17"	0.9937367	16' 05.68"	23° 26' 17"	-9 m 35 s
1	352° 26' 10"	0.26"	353° 02' 43"	-3° 00' 18"	0.9937477	16' 05.67"	23° 26' 17"	-9 m 34 s
2	352° 28' 40"	0.27"	353° 05' 00"	-2° 59' 18"	0.9937586	16' 05.66"	23° 26' 17"	-9 m 34 s
3	352° 31' 10"	0.27"	353° 07' 18"	-2° 58' 19"	0.9937696	16' 05.65"	23° 26' 17"	-9 m 33 s
4	352° 33' 39"	0.27"	353° 09' 36"	-2° 57' 20"	0.9937805	16' 05.64"	23° 26' 17"	-9 m 32 s
5	352° 36' 09"	0.28"	353° 11' 53"	-2° 56' 21"	0.9937915	16' 05.63"	23° 26' 17"	-9 m 32 s
6	352° 38' 38"	0.28"	353° 14' 11"	-2° 55' 22"	0.9938025	16' 05.61"	23° 26' 17"	-9 m 31 s
7	352° 41' 08"	0.28"	353° 16' 29"	-2° 54' 23"	0.9938134	16' 05.60"	23° 26' 17"	-9 m 30 s
8	352° 43' 38"	0.28"	353° 18' 46"	-2° 53' 24"	0.9938244	16' 05.59"	23° 26' 17"	-9 m 30 s
9	352° 46' 07"	0.29"	353° 21' 04"	-2° 52' 25"	0.9938354	16' 05.58"	23° 26' 17"	-9 m 29 s
10	352° 48' 37"	0.29"	353° 23' 21"	-2° 51' 26"	0.9938464	16' 05.57"	23° 26' 17"	-9 m 28 s
11	352° 51' 07"	0.29"	353° 25' 39"	-2° 50' 26"	0.9938574	16' 05.56"	23° 26' 17"	-9 m 28 s
12	352° 53' 36"	0.30"	353° 27' 57"	-2° 49' 27"	0.9938683	16' 05.55"	23° 26' 17"	-9 m 27 s
13	352° 56' 06"	0.30"	353° 30' 14"	-2° 48' 28"	0.9938793	16' 05.54"	23° 26' 17"	-9 m 26 s
14	352° 58' 35"	0.30"	353° 32' 32"	-2° 47' 29"	0.9938903	16' 05.53"	23° 26' 17"	-9 m 26 s
15	353° 01' 05"	0.30"	353° 34' 49"	-2° 46' 30"	0.9939013	16' 05.52"	23° 26' 17"	-9 m 25 s
16	353° 03' 35"	0.31"	353° 37' 07"	-2° 45' 31"	0.9939123	16' 05.51"	23° 26' 17"	-9 m 24 s
17	353° 06' 04"	0.31"	353° 39' 25"	-2° 44' 32"	0.9939234	16' 05.50"	23° 26' 17"	-9 m 24 s
18	353° 08' 34"	0.31"	353° 41' 42"	-2° 43' 32"	0.9939344	16' 05.49"	23° 26' 17"	-9 m 23 s
19	353° 11' 04"	0.31"	353° 43' 60"	-2° 42' 33"	0.9939454	16' 05.48"	23° 26' 17"	-9 m 22 s
20	353° 13' 33"	0.31"	353° 46' 17"	-2° 41' 34"	0.9939564	16' 05.46"	23° 26' 17"	-9 m 21 s
21	353° 16' 03"	0.32"	353° 48' 35"	-2° 40' 35"	0.9939674	16' 05.45"	23° 26' 17"	-9 m 21 s
22	353° 18' 32"	0.32"	353° 50' 52"	-2° 39' 36"	0.9939785	16' 05.44"	23° 26' 17"	-9 m 20 s
23	353° 21' 02"	0.32"	353° 53' 10"	-2° 38' 37"	0.9939895	16' 05.43"	23° 26' 17"	-9 m 19 s
24	353° 23' 31"	0.32"	353° 55' 27"	-2° 37' 38"	0.9940005	16' 05.42"	23° 26' 17"	-9 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	110° 07' 42"	4° 11' 12"	112° 27' 44"	26° 04' 07"	0° 54' 36"	14' 52.60"	280° 57' 48"	0.73309
1	110° 37' 47"	4° 12' 42"	113° 00' 59"	26° 00' 59"	0° 54' 36"	14' 52.83"	281° 13' 35"	0.73661
2	111° 07' 54"	4° 14' 11"	113° 34' 14"	25° 57' 42"	0° 54' 37"	14' 53.06"	281° 29' 21"	0.74012
3	111° 38' 01"	4° 15' 39"	114° 07' 28"	25° 54' 18"	0° 54' 38"	14' 53.30"	281° 45' 08"	0.74361
4	112° 08' 10"	4° 17' 06"	114° 40' 42"	25° 50' 47"	0° 54' 39"	14' 53.55"	282° 0' 54"	0.74709
5	112° 38' 20"	4° 18' 31"	115° 13' 54"	25° 47' 07"	0° 54' 40"	14' 53.79"	282° 16' 40"	0.75056
6	113° 08' 32"	4° 19' 56"	115° 47' 06"	25° 43' 20"	0° 54' 41"	14' 54.05"	282° 32' 25"	0.75401
7	113° 38' 45"	4° 21' 19"	116° 20' 17"	25° 39' 25"	0° 54' 42"	14' 54.30"	282° 48' 10"	0.75745
8	114° 08' 59"	4° 22' 41"	116° 53' 27"	25° 35' 23"	0° 54' 43"	14' 54.56"	283° 3' 55"	0.76087
9	114° 39' 14"	4° 24' 02"	117° 26' 36"	25° 31' 13"	0° 54' 44"	14' 54.82"	283° 19' 39"	0.76428
10	115° 09' 31"	4° 25' 22"	117° 59' 44"	25° 26' 55"	0° 54' 45"	14' 55.09"	283° 35' 23"	0.76767
11	115° 39' 49"	4° 26' 40"	118° 32' 51"	25° 22' 30"	0° 54' 46"	14' 55.36"	283° 51' 07"	0.77105
12	116° 10' 08"	4° 27' 58"	119° 05' 57"	25° 17' 57"	0° 54' 47"	14' 55.64"	284° 6' 49"	0.77442
13	116° 40' 29"	4° 29' 14"	119° 39' 02"	25° 13' 16"	0° 54' 48"	14' 55.91"	284° 22' 31"	0.77777
14	117° 10' 51"	4° 30' 29"	120° 12' 05"	25° 08' 28"	0° 54' 49"	14' 56.20"	284° 38' 13"	0.78110
15	117° 41' 14"	4° 31' 42"	120° 45' 08"	25° 03' 33"	0° 54' 50"	14' 56.48"	284° 53' 54"	0.78442
16	118° 11' 39"	4° 32' 55"	121° 18' 09"	24° 58' 29"	0° 54' 51"	14' 56.77"	285° 9' 34"	0.78772
17	118° 42' 06"	4° 34' 06"	121° 51' 09"	24° 53' 19"	0° 54' 52"	14' 57.07"	285° 25' 13"	0.79101
18	119° 12' 34"	4° 35' 16"	122° 24' 07"	24° 48' 00"	0° 54' 53"	14' 57.36"	285° 40' 52"	0.79428
19	119° 43' 03"	4° 36' 25"	122° 57' 04"	24° 42' 35"	0° 54' 54"	14' 57.66"	285° 56' 30"	0.79753
20	120° 13' 34"	4° 37' 32"	123° 30' 00"	24° 37' 01"	0° 54' 55"	14' 57.97"	286° 12' 07"	0.80077
21	120° 44' 06"	4° 38' 39"	124° 02' 54"	24° 31' 21"	0° 54' 56"	14' 58.28"	286° 27' 44"	0.80398
22	121° 14' 40"	4° 39' 44"	124° 35' 47"	24° 25' 33"	0° 54' 58"	14' 58.59"	286° 43' 20"	0.80719
23	121° 45' 15"	4° 40' 47"	125° 08' 38"	24° 19' 37"	0° 54' 59"	14' 58.90"	286° 58' 55"	0.81037
24	122° 15' 52"	4° 41' 50"	125° 41' 28"	24° 13' 35"	0° 54' 60"	14' 59.22"	287° 14' 29"	0.81353

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	353° 23' 31"	0.32"	353° 55' 27"	-2° 37' 38"	0.9940005	16' 05.42"	23° 26' 17"	-9 m 19 s
1	353° 26' 01"	0.32"	353° 57' 45"	-2° 36' 38"	0.9940116	16' 05.41"	23° 26' 17"	-9 m 18 s
2	353° 28' 31"	0.33"	354° 00' 03"	-2° 35' 39"	0.9940226	16' 05.40"	23° 26' 17"	-9 m 17 s
3	353° 31' 00"	0.33"	354° 02' 20"	-2° 34' 40"	0.9940337	16' 05.39"	23° 26' 17"	-9 m 17 s
4	353° 33' 30"	0.33"	354° 04' 38"	-2° 33' 41"	0.9940448	16' 05.38"	23° 26' 17"	-9 m 16 s
5	353° 35' 59"	0.33"	354° 06' 55"	-2° 32' 42"	0.9940558	16' 05.37"	23° 26' 17"	-9 m 15 s
6	353° 38' 29"	0.33"	354° 09' 13"	-2° 31' 43"	0.9940669	16' 05.36"	23° 26' 17"	-9 m 15 s
7	353° 40' 58"	0.34"	354° 11' 30"	-2° 30' 43"	0.9940780	16' 05.35"	23° 26' 17"	-9 m 14 s
8	353° 43' 28"	0.34"	354° 13' 47"	-2° 29' 44"	0.9940890	16' 05.34"	23° 26' 17"	-9 m 13 s
9	353° 45' 57"	0.34"	354° 16' 05"	-2° 28' 45"	0.9941001	16' 05.33"	23° 26' 17"	-9 m 13 s
10	353° 48' 27"	0.34"	354° 18' 22"	-2° 27' 46"	0.9941112	16' 05.31"	23° 26' 17"	-9 m 12 s
11	353° 50' 57"	0.34"	354° 20' 40"	-2° 26' 47"	0.9941223	16' 05.30"	23° 26' 17"	-9 m 11 s
12	353° 53' 26"	0.34"	354° 22' 57"	-2° 25' 47"	0.9941334	16' 05.29"	23° 26' 17"	-9 m 10 s
13	353° 55' 56"	0.34"	354° 25' 15"	-2° 24' 48"	0.9941445	16' 05.28"	23° 26' 17"	-9 m 10 s
14	353° 58' 25"	0.35"	354° 27' 32"	-2° 23' 49"	0.9941556	16' 05.27"	23° 26' 17"	-9 m 09 s
15	354° 00' 55"	0.35"	354° 29' 50"	-2° 22' 50"	0.9941667	16' 05.26"	23° 26' 17"	-9 m 08 s
16	354° 03' 24"	0.35"	354° 32' 07"	-2° 21' 51"	0.9941778	16' 05.25"	23° 26' 17"	-9 m 08 s
17	354° 05' 54"	0.35"	354° 34' 24"	-2° 20' 51"	0.9941889	16' 05.24"	23° 26' 17"	-9 m 07 s
18	354° 08' 23"	0.35"	354° 36' 42"	-2° 19' 52"	0.9942000	16' 05.23"	23° 26' 17"	-9 m 06 s
19	354° 10' 53"	0.35"	354° 38' 59"	-2° 18' 53"	0.9942112	16' 05.22"	23° 26' 17"	-9 m 06 s
20	354° 13' 22"	0.35"	354° 41' 17"	-2° 17' 54"	0.9942223	16' 05.21"	23° 26' 17"	-9 m 05 s
21	354° 15' 52"	0.35"	354° 43' 34"	-2° 16' 55"	0.9942334	16' 05.20"	23° 26' 17"	-9 m 04 s
22	354° 18' 21"	0.35"	354° 45' 51"	-2° 15' 55"	0.9942446	16' 05.19"	23° 26' 17"	-9 m 03 s
23	354° 20' 51"	0.35"	354° 48' 09"	-2° 14' 56"	0.9942557	16' 05.17"	23° 26' 17"	-9 m 03 s
24	354° 23' 20"	0.36"	354° 50' 26"	-2° 13' 57"	0.9942668	16' 05.16"	23° 26' 17"	-9 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	122° 15' 52"	4° 41' 50"	125° 41' 28"	24° 13' 35"	0° 54' 60"	14' 59.22"	287° 14' 29"	0.81353
1	122° 46' 31"	4° 42' 51"	126° 14' 16"	24° 07' 25"	0° 55' 01"	14' 59.54"	287° 30' 03"	0.81668
2	123° 17' 11"	4° 43' 50"	126° 47' 03"	24° 01' 07"	0° 55' 02"	14' 59.87"	287° 45' 35"	0.81981
3	123° 47' 52"	4° 44' 49"	127° 19' 48"	23° 54' 42"	0° 55' 03"	15' 00.19"	288° 1' 08"	0.82292
4	124° 18' 35"	4° 45' 46"	127° 52' 31"	23° 48' 10"	0° 55' 05"	15' 00.53"	288° 16' 39"	0.82601
5	124° 49' 20"	4° 46' 42"	128° 25' 12"	23° 41' 31"	0° 55' 06"	15' 00.86"	288° 32' 10"	0.82909
6	125° 20' 07"	4° 47' 36"	128° 57' 52"	23° 34' 43"	0° 55' 07"	15' 01.20"	288° 47' 40"	0.83214
7	125° 50' 55"	4° 48' 29"	129° 30' 30"	23° 27' 51"	0° 55' 08"	15' 01.54"	289° 3' 09"	0.83518
8	126° 21' 45"	4° 49' 21"	130° 03' 06"	23° 20' 50"	0° 55' 10"	15' 01.88"	289° 18' 38"	0.83819
9	126° 52' 36"	4° 50' 11"	130° 35' 41"	23° 13' 43"	0° 55' 11"	15' 02.23"	289° 34' 06"	0.84119
10	127° 23' 29"	4° 51' 00"	131° 08' 13"	23° 06' 28"	0° 55' 12"	15' 02.58"	289° 49' 34"	0.84416
11	127° 54' 24"	4° 51' 48"	131° 40' 44"	22° 59' 06"	0° 55' 14"	15' 02.93"	290° 5' 02"	0.84711
12	128° 25' 20"	4° 52' 34"	132° 13' 13"	22° 51' 37"	0° 55' 15"	15' 03.29"	290° 20' 29"	0.85005
13	128° 56' 18"	4° 53' 19"	132° 45' 40"	22° 44' 00"	0° 55' 16"	15' 03.65"	290° 35' 55"	0.85296
14	129° 27' 18"	4° 54' 02"	133° 18' 05"	22° 36' 17"	0° 55' 17"	15' 04.01"	290° 51' 22"	0.85585
15	129° 58' 20"	4° 54' 44"	133° 50' 28"	22° 28' 27"	0° 55' 19"	15' 04.37"	291° 6' 48"	0.85872
16	130° 29' 23"	4° 55' 25"	134° 22' 49"	22° 20' 31"	0° 55' 20"	15' 04.74"	291° 22' 14"	0.86157
17	131° 00' 28"	4° 56' 04"	134° 55' 09"	22° 12' 27"	0° 55' 21"	15' 05.11"	291° 37' 41"	0.86439
18	131° 31' 35"	4° 56' 42"	135° 27' 26"	22° 04' 16"	0° 55' 23"	15' 05.48"	291° 53' 07"	0.86720
19	132° 02' 43"	4° 57' 18"	135° 59' 41"	21° 55' 59"	0° 55' 24"	15' 05.85"	292° 8' 34"	0.86998
20	132° 33' 53"	4° 57' 53"	136° 31' 54"	21° 47' 35"	0° 55' 26"	15' 06.23"	292° 24' 01"	0.87274
21	133° 05' 05"	4° 58' 26"	137° 04' 05"	21° 39' 04"	0° 55' 27"	15' 06.61"	292° 39' 29"	0.87548
22	133° 36' 19"	4° 58' 58"	137° 36' 14"	21° 30' 26"	0° 55' 28"	15' 06.99"	292° 54' 57"	0.87819
23	134° 07' 35"	4° 59' 29"	138° 08' 21"	21° 21' 42"	0° 55' 30"	15' 07.38"	293° 10' 26"	0.88088
24	134° 38' 52"	4° 59' 58"	138° 40' 26"	21° 12' 51"	0° 55' 31"	15' 07.76"	293° 25' 57"	0.88354



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	354° 23' 20"	0.36"	354° 50' 26"	-2° 13' 57"	0.9942668	16' 05.16"	23° 26' 17"	-9 m 02 s
1	354° 25' 50"	0.36"	354° 52' 43"	-2° 12' 58"	0.9942780	16' 05.15"	23° 26' 17"	-9 m 01 s
2	354° 28' 19"	0.36"	354° 55' 01"	-2° 11' 59"	0.9942891	16' 05.14"	23° 26' 17"	-9 m 01 s
3	354° 30' 49"	0.36"	354° 57' 18"	-2° 10' 59"	0.9943003	16' 05.13"	23° 26' 17"	-8 m 60 s
4	354° 33' 18"	0.36"	354° 59' 35"	-2° 10' 00"	0.9943115	16' 05.12"	23° 26' 17"	-8 m 59 s
5	354° 35' 48"	0.36"	355° 01' 53"	-2° 09' 01"	0.9943226	16' 05.11"	23° 26' 17"	-8 m 59 s
6	354° 38' 17"	0.36"	355° 04' 10"	-2° 08' 02"	0.9943338	16' 05.10"	23° 26' 17"	-8 m 58 s
7	354° 40' 46"	0.36"	355° 06' 27"	-2° 07' 02"	0.9943450	16' 05.09"	23° 26' 17"	-8 m 57 s
8	354° 43' 16"	0.36"	355° 08' 45"	-2° 06' 03"	0.9943562	16' 05.08"	23° 26' 17"	-8 m 56 s
9	354° 45' 45"	0.36"	355° 11' 02"	-2° 05' 04"	0.9943674	16' 05.07"	23° 26' 17"	-8 m 56 s
10	354° 48' 15"	0.36"	355° 13' 19"	-2° 04' 05"	0.9943786	16' 05.05"	23° 26' 17"	-8 m 55 s
11	354° 50' 44"	0.36"	355° 15' 37"	-2° 03' 05"	0.9943898	16' 05.04"	23° 26' 17"	-8 m 54 s
12	354° 53' 14"	0.36"	355° 17' 54"	-2° 02' 06"	0.9944010	16' 05.03"	23° 26' 17"	-8 m 54 s
13	354° 55' 43"	0.36"	355° 20' 11"	-2° 01' 07"	0.9944122	16' 05.02"	23° 26' 17"	-8 m 53 s
14	354° 58' 13"	0.36"	355° 22' 28"	-2° 00' 08"	0.9944234	16' 05.01"	23° 26' 17"	-8 m 52 s
15	355° 00' 42"	0.36"	355° 24' 46"	-1° 59' 08"	0.9944346	16' 05.00"	23° 26' 17"	-8 m 52 s
16	355° 03' 11"	0.36"	355° 27' 03"	-1° 58' 09"	0.9944458	16' 04.99"	23° 26' 17"	-8 m 51 s
17	355° 05' 41"	0.36"	355° 29' 20"	-1° 57' 10"	0.9944570	16' 04.98"	23° 26' 17"	-8 m 50 s
18	355° 08' 10"	0.36"	355° 31' 37"	-1° 56' 11"	0.9944683	16' 04.97"	23° 26' 17"	-8 m 49 s
19	355° 10' 40"	0.36"	355° 33' 55"	-1° 55' 11"	0.9944795	16' 04.96"	23° 26' 17"	-8 m 49 s
20	355° 13' 09"	0.36"	355° 36' 12"	-1° 54' 12"	0.9944907	16' 04.95"	23° 26' 17"	-8 m 48 s
21	355° 15' 39"	0.36"	355° 38' 29"	-1° 53' 13"	0.9945020	16' 04.94"	23° 26' 17"	-8 m 47 s
22	355° 18' 08"	0.36"	355° 40' 46"	-1° 52' 14"	0.9945132	16' 04.92"	23° 26' 17"	-8 m 47 s
23	355° 20' 37"	0.36"	355° 43' 04"	-1° 51' 14"	0.9945245	16' 04.91"	23° 26' 17"	-8 m 46 s
24	355° 23' 07"	0.36"	355° 45' 21"	-1° 50' 15"	0.9945358	16' 04.90"	23° 26' 17"	-8 m 45 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	134° 38' 52"	4° 59' 58"	138° 40' 26"	21° 12' 51"	0° 55' 31"	15' 07.76"	293° 25' 57"	0.88354
1	135° 10' 12"	5° 00' 25"	139° 12' 29"	21° 03' 54"	0° 55' 33"	15' 08.15"	293° 41' 28"	0.88618
2	135° 41' 33"	5° 00' 51"	139° 44' 30"	20° 54' 50"	0° 55' 34"	15' 08.55"	293° 57' 01"	0.88880
3	136° 12' 56"	5° 01' 16"	140° 16' 29"	20° 45' 40"	0° 55' 36"	15' 08.94"	294° 12' 35"	0.89140
4	136° 44' 20"	5° 01' 39"	140° 48' 26"	20° 36' 23"	0° 55' 37"	15' 09.33"	294° 28' 11"	0.89396
5	137° 15' 47"	5° 02' 01"	141° 20' 20"	20° 26' 60"	0° 55' 38"	15' 09.73"	294° 43' 49"	0.89651
6	137° 47' 15"	5° 02' 21"	141° 52' 13"	20° 17' 30"	0° 55' 40"	15' 10.13"	294° 59' 29"	0.89903
7	138° 18' 46"	5° 02' 39"	142° 24' 03"	20° 07' 54"	0° 55' 41"	15' 10.53"	295° 15' 12"	0.90152
8	138° 50' 18"	5° 02' 56"	142° 55' 52"	19° 58' 12"	0° 55' 43"	15' 10.94"	295° 30' 57"	0.90399
9	139° 21' 52"	5° 03' 12"	143° 27' 38"	19° 48' 23"	0° 55' 44"	15' 11.34"	295° 46' 46"	0.90643
10	139° 53' 28"	5° 03' 26"	143° 59' 22"	19° 38' 29"	0° 55' 46"	15' 11.75"	296° 2' 38"	0.90884
11	140° 25' 05"	5° 03' 38"	144° 31' 04"	19° 28' 28"	0° 55' 47"	15' 12.16"	296° 18' 34"	0.91123
12	140° 56' 45"	5° 03' 49"	145° 02' 44"	19° 18' 21"	0° 55' 49"	15' 12.57"	296° 34' 34"	0.91360
13	141° 28' 26"	5° 03' 58"	145° 34' 22"	19° 08' 08"	0° 55' 50"	15' 12.99"	296° 50' 39"	0.91593
14	142° 00' 10"	5° 04' 06"	146° 05' 58"	18° 57' 49"	0° 55' 52"	15' 13.40"	297° 6' 48"	0.91824
15	142° 31' 55"	5° 04' 12"	146° 37' 32"	18° 47' 24"	0° 55' 53"	15' 13.82"	297° 23' 03"	0.92052
16	143° 03' 42"	5° 04' 17"	147° 09' 04"	18° 36' 53"	0° 55' 55"	15' 14.23"	297° 39' 24"	0.92277
17	143° 35' 31"	5° 04' 20"	147° 40' 33"	18° 26' 16"	0° 55' 57"	15' 14.65"	297° 55' 51"	0.92500
18	144° 07' 22"	5° 04' 21"	148° 12' 01"	18° 15' 33"	0° 55' 58"	15' 15.07"	298° 12' 25"	0.92720
19	144° 39' 15"	5° 04' 21"	148° 43' 26"	18° 04' 44"	0° 55' 60"	15' 15.50"	298° 29' 07"	0.92936
20	145° 11' 10"	5° 04' 20"	149° 14' 50"	17° 53' 50"	0° 56' 01"	15' 15.92"	298° 45' 57"	0.93150
21	145° 43' 07"	5° 04' 16"	149° 46' 12"	17° 42' 50"	0° 56' 03"	15' 16.34"	299° 2' 56"	0.93361
22	146° 15' 05"	5° 04' 12"	150° 17' 31"	17° 31' 44"	0° 56' 04"	15' 16.77"	299° 20' 05"	0.93570
23	146° 47' 06"	5° 04' 05"	150° 48' 49"	17° 20' 33"	0° 56' 06"	15' 17.20"	299° 37' 23"	0.93775
24	147° 19' 08"	5° 03' 57"	151° 20' 05"	17° 09' 16"	0° 56' 07"	15' 17.62"	299° 54' 53"	0.93977

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	355° 23' 07"	0.36"	355° 45' 21"	-1° 50' 15"	0.9945358	16' 04.90"	23° 26' 17"	-8 m 45 s
1	355° 25' 36"	0.36"	355° 47' 38"	-1° 49' 16"	0.9945470	16' 04.89"	23° 26' 17"	-8 m 44 s
2	355° 28' 06"	0.36"	355° 49' 55"	-1° 48' 17"	0.9945583	16' 04.88"	23° 26' 17"	-8 m 44 s
3	355° 30' 35"	0.36"	355° 52' 12"	-1° 47' 17"	0.9945696	16' 04.87"	23° 26' 17"	-8 m 43 s
4	355° 33' 04"	0.35"	355° 54' 30"	-1° 46' 18"	0.9945808	16' 04.86"	23° 26' 17"	-8 m 42 s
5	355° 35' 34"	0.35"	355° 56' 47"	-1° 45' 19"	0.9945921	16' 04.85"	23° 26' 17"	-8 m 42 s
6	355° 38' 03"	0.35"	355° 59' 04"	-1° 44' 20"	0.9946034	16' 04.84"	23° 26' 17"	-8 m 41 s
7	355° 40' 32"	0.35"	356° 01' 21"	-1° 43' 20"	0.9946147	16' 04.83"	23° 26' 17"	-8 m 40 s
8	355° 43' 02"	0.35"	356° 03' 38"	-1° 42' 21"	0.9946260	16' 04.81"	23° 26' 17"	-8 m 39 s
9	355° 45' 31"	0.35"	356° 05' 56"	-1° 41' 22"	0.9946373	16' 04.80"	23° 26' 17"	-8 m 39 s
10	355° 48' 01"	0.35"	356° 08' 13"	-1° 40' 23"	0.9946486	16' 04.79"	23° 26' 17"	-8 m 38 s
11	355° 50' 30"	0.35"	356° 10' 30"	-1° 39' 23"	0.9946599	16' 04.78"	23° 26' 17"	-8 m 37 s
12	355° 52' 59"	0.35"	356° 12' 47"	-1° 38' 24"	0.9946712	16' 04.77"	23° 26' 17"	-8 m 37 s
13	355° 55' 29"	0.35"	356° 15' 04"	-1° 37' 25"	0.9946825	16' 04.76"	23° 26' 17"	-8 m 36 s
14	355° 57' 58"	0.34"	356° 17' 21"	-1° 36' 25"	0.9946939	16' 04.75"	23° 26' 17"	-8 m 35 s
15	356° 00' 27"	0.34"	356° 19' 38"	-1° 35' 26"	0.9947052	16' 04.74"	23° 26' 17"	-8 m 34 s
16	356° 02' 57"	0.34"	356° 21' 55"	-1° 34' 27"	0.9947165	16' 04.73"	23° 26' 17"	-8 m 34 s
17	356° 05' 26"	0.34"	356° 24' 13"	-1° 33' 28"	0.9947279	16' 04.72"	23° 26' 17"	-8 m 33 s
18	356° 07' 55"	0.34"	356° 26' 30"	-1° 32' 28"	0.9947392	16' 04.71"	23° 26' 17"	-8 m 32 s
19	356° 10' 25"	0.34"	356° 28' 47"	-1° 31' 29"	0.9947506	16' 04.69"	23° 26' 17"	-8 m 32 s
20	356° 12' 54"	0.34"	356° 31' 04"	-1° 30' 30"	0.9947619	16' 04.68"	23° 26' 17"	-8 m 31 s
21	356° 15' 23"	0.33"	356° 33' 21"	-1° 29' 30"	0.9947733	16' 04.67"	23° 26' 17"	-8 m 30 s
22	356° 17' 53"	0.33"	356° 35' 38"	-1° 28' 31"	0.9947846	16' 04.66"	23° 26' 17"	-8 m 29 s
23	356° 20' 22"	0.33"	356° 37' 55"	-1° 27' 32"	0.9947960	16' 04.65"	23° 26' 17"	-8 m 29 s
24	356° 22' 51"	0.33"	356° 40' 12"	-1° 26' 33"	0.9948074	16' 04.64"	23° 26' 17"	-8 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	147° 19' 08"	5° 03' 57"	151° 20' 05"	17° 09' 16"	0° 56' 07"	15' 17.62"	299° 54' 53"	0.93977
1	147° 51' 12"	5° 03' 47"	151° 51' 18"	16° 57' 54"	0° 56' 09"	15' 18.05"	300° 12' 35"	0.94176
2	148° 23' 19"	5° 03' 36"	152° 22' 30"	16° 46' 26"	0° 56' 11"	15' 18.48"	300° 30' 31"	0.94373
3	148° 55' 27"	5° 03' 23"	152° 53' 40"	16° 34' 53"	0° 56' 12"	15' 18.91"	300° 48' 40"	0.94566
4	149° 27' 37"	5° 03' 09"	153° 24' 48"	16° 23' 15"	0° 56' 14"	15' 19.35"	301° 7' 04"	0.94756
5	149° 59' 49"	5° 02' 53"	153° 55' 54"	16° 11' 31"	0° 56' 15"	15' 19.78"	301° 25' 45"	0.94943
6	150° 32' 03"	5° 02' 35"	154° 26' 59"	15° 59' 42"	0° 56' 17"	15' 20.21"	301° 44' 44"	0.95127
7	151° 04' 19"	5° 02' 16"	154° 58' 01"	15° 47' 47"	0° 56' 19"	15' 20.65"	302° 4' 02"	0.95308
8	151° 36' 36"	5° 01' 55"	155° 29' 02"	15° 35' 48"	0° 56' 20"	15' 21.08"	302° 23' 40"	0.95486
9	152° 08' 56"	5° 01' 32"	156° 00' 01"	15° 23' 44"	0° 56' 22"	15' 21.52"	302° 43' 41"	0.95660
10	152° 41' 18"	5° 01' 08"	156° 30' 58"	15° 11' 34"	0° 56' 23"	15' 21.95"	303° 4' 06"	0.95831
11	153° 13' 41"	5° 00' 42"	157° 01' 54"	14° 59' 20"	0° 56' 25"	15' 22.39"	303° 24' 57"	0.95999
12	153° 46' 07"	5° 00' 14"	157° 32' 47"	14° 47' 00"	0° 56' 27"	15' 22.83"	303° 46' 16"	0.96164
13	154° 18' 34"	4° 59' 45"	158° 03' 40"	14° 34' 36"	0° 56' 28"	15' 23.27"	304° 8' 06"	0.96326
14	154° 51' 03"	4° 59' 14"	158° 34' 30"	14° 22' 07"	0° 56' 30"	15' 23.70"	304° 30' 28"	0.96484
15	155° 23' 34"	4° 58' 41"	159° 05' 19"	14° 09' 33"	0° 56' 31"	15' 24.14"	304° 53' 27"	0.96639
16	155° 56' 07"	4° 58' 07"	159° 36' 06"	13° 56' 54"	0° 56' 33"	15' 24.58"	305° 17' 04"	0.96790
17	156° 28' 42"	4° 57' 31"	160° 06' 52"	13° 44' 11"	0° 56' 35"	15' 25.02"	305° 41' 23"	0.96938
18	157° 01' 19"	4° 56' 54"	160° 37' 36"	13° 31' 23"	0° 56' 36"	15' 25.46"	306° 6' 28"	0.97083
19	157° 33' 58"	4° 56' 15"	161° 08' 19"	13° 18' 31"	0° 56' 38"	15' 25.90"	306° 32' 23"	0.97225
20	158° 06' 38"	4° 55' 34"	161° 39' 00"	13° 05' 34"	0° 56' 39"	15' 26.34"	306° 59' 12"	0.97362
21	158° 39' 21"	4° 54' 52"	162° 09' 40"	12° 52' 33"	0° 56' 41"	15' 26.77"	307° 27' 01"	0.97497
22	159° 12' 05"	4° 54' 07"	162° 40' 19"	12° 39' 27"	0° 56' 43"	15' 27.21"	307° 55' 53"	0.97628
23	159° 44' 52"	4° 53' 22"	163° 10' 56"	12° 26' 17"	0° 56' 44"	15' 27.65"	308° 25' 57"	0.97755
24	160° 17' 40"	4° 52' 34"	163° 41' 32"	12° 13' 03"	0° 56' 46"	15' 28.09"	308° 57' 17"	0.97879



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	356° 22' 51"	0.33"	356° 40' 12"	-1° 26' 33"	0.9948074	16' 04.64"	23° 26' 17"	-8 m 28 s
1	356° 25' 21"	0.33"	356° 42' 29"	-1° 25' 33"	0.9948188	16' 04.63"	23° 26' 17"	-8 m 27 s
2	356° 27' 50"	0.33"	356° 44' 46"	-1° 24' 34"	0.9948301	16' 04.62"	23° 26' 17"	-8 m 27 s
3	356° 30' 19"	0.32"	356° 47' 03"	-1° 23' 35"	0.9948415	16' 04.61"	23° 26' 17"	-8 m 26 s
4	356° 32' 48"	0.32"	356° 49' 21"	-1° 22' 35"	0.9948529	16' 04.59"	23° 26' 17"	-8 m 25 s
5	356° 35' 18"	0.32"	356° 51' 38"	-1° 21' 36"	0.9948643	16' 04.58"	23° 26' 17"	-8 m 24 s
6	356° 37' 47"	0.32"	356° 53' 55"	-1° 20' 37"	0.9948757	16' 04.57"	23° 26' 17"	-8 m 24 s
7	356° 40' 16"	0.32"	356° 56' 12"	-1° 19' 38"	0.9948871	16' 04.56"	23° 26' 17"	-8 m 23 s
8	356° 42' 46"	0.31"	356° 58' 29"	-1° 18' 38"	0.9948985	16' 04.55"	23° 26' 17"	-8 m 22 s
9	356° 45' 15"	0.31"	357° 00' 46"	-1° 17' 39"	0.9949099	16' 04.54"	23° 26' 17"	-8 m 22 s
10	356° 47' 44"	0.31"	357° 03' 03"	-1° 16' 40"	0.9949214	16' 04.53"	23° 26' 17"	-8 m 21 s
11	356° 50' 13"	0.31"	357° 05' 20"	-1° 15' 40"	0.9949328	16' 04.52"	23° 26' 17"	-8 m 20 s
12	356° 52' 43"	0.30"	357° 07' 37"	-1° 14' 41"	0.9949442	16' 04.51"	23° 26' 17"	-8 m 19 s
13	356° 55' 12"	0.30"	357° 09' 54"	-1° 13' 42"	0.9949557	16' 04.50"	23° 26' 17"	-8 m 19 s
14	356° 57' 41"	0.30"	357° 12' 11"	-1° 12' 43"	0.9949671	16' 04.48"	23° 26' 17"	-8 m 18 s
15	357° 00' 11"	0.30"	357° 14' 28"	-1° 11' 43"	0.9949785	16' 04.47"	23° 26' 17"	-8 m 17 s
16	357° 02' 40"	0.29"	357° 16' 45"	-1° 10' 44"	0.9949900	16' 04.46"	23° 26' 17"	-8 m 16 s
17	357° 05' 09"	0.29"	357° 19' 02"	-1° 09' 45"	0.9950015	16' 04.45"	23° 26' 17"	-8 m 16 s
18	357° 07' 38"	0.29"	357° 21' 19"	-1° 08' 45"	0.9950129	16' 04.44"	23° 26' 17"	-8 m 15 s
19	357° 10' 08"	0.29"	357° 23' 36"	-1° 07' 46"	0.9950244	16' 04.43"	23° 26' 17"	-8 m 14 s
20	357° 12' 37"	0.28"	357° 25' 53"	-1° 06' 47"	0.9950358	16' 04.42"	23° 26' 17"	-8 m 14 s
21	357° 15' 06"	0.28"	357° 28' 10"	-1° 05' 47"	0.9950473	16' 04.41"	23° 26' 17"	-8 m 13 s
22	357° 17' 35"	0.28"	357° 30' 27"	-1° 04' 48"	0.9950588	16' 04.40"	23° 26' 17"	-8 m 12 s
23	357° 20' 04"	0.27"	357° 32' 44"	-1° 03' 49"	0.9950703	16' 04.38"	23° 26' 17"	-8 m 11 s
24	357° 22' 34"	0.27"	357° 35' 01"	-1° 02' 50"	0.9950818	16' 04.37"	23° 26' 17"	-8 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	160° 17' 40"	4° 52' 34"	163° 41' 32"	12° 13' 03"	0° 56' 46"	15' 28.09"	308° 57' 17"	0.97879
1	160° 50' 30"	4° 51' 45"	164° 12' 07"	11° 59' 44"	0° 56' 47"	15' 28.53"	309° 30' 03"	0.98000
2	161° 23' 22"	4° 50' 54"	164° 42' 40"	11° 46' 22"	0° 56' 49"	15' 28.97"	310° 4' 21"	0.98116
3	161° 56' 15"	4° 50' 02"	165° 13' 12"	11° 32' 55"	0° 56' 51"	15' 29.40"	310° 40' 23"	0.98230
4	162° 29' 11"	4° 49' 08"	165° 43' 44"	11° 19' 25"	0° 56' 52"	15' 29.84"	311° 18' 18"	0.98339
5	163° 02' 08"	4° 48' 12"	166° 14' 14"	11° 05' 50"	0° 56' 54"	15' 30.28"	311° 58' 18"	0.98445
6	163° 35' 07"	4° 47' 14"	166° 44' 42"	10° 52' 12"	0° 56' 55"	15' 30.71"	312° 40' 37"	0.98547
7	164° 08' 09"	4° 46' 15"	167° 15' 10"	10° 38' 30"	0° 56' 57"	15' 31.15"	313° 25' 31"	0.98646
8	164° 41' 11"	4° 45' 15"	167° 45' 37"	10° 24' 44"	0° 56' 59"	15' 31.58"	314° 13' 16"	0.98741
9	165° 14' 16"	4° 44' 12"	168° 16' 03"	10° 10' 54"	0° 57' 00"	15' 32.02"	315° 4' 15"	0.98832
10	165° 47' 23"	4° 43' 08"	168° 46' 28"	9° 57' 01"	0° 57' 02"	15' 32.45"	315° 58' 49"	0.98920
11	166° 20' 31"	4° 42' 02"	169° 16' 53"	9° 43' 04"	0° 57' 03"	15' 32.88"	316° 57' 25"	0.99003
12	166° 53' 41"	4° 40' 55"	169° 47' 16"	9° 29' 03"	0° 57' 05"	15' 33.32"	318° 0' 36"	0.99083
13	167° 26' 53"	4° 39' 46"	170° 17' 39"	9° 14' 60"	0° 57' 07"	15' 33.75"	319° 8' 55"	0.99160
14	168° 00' 07"	4° 38' 35"	170° 48' 01"	9° 00' 52"	0° 57' 08"	15' 34.18"	320° 23' 06"	0.99232
15	168° 33' 22"	4° 37' 23"	171° 18' 22"	8° 46' 42"	0° 57' 10"	15' 34.61"	321° 43' 58"	0.99300
16	169° 06' 39"	4° 36' 09"	171° 48' 43"	8° 32' 28"	0° 57' 11"	15' 35.03"	323° 12' 27"	0.99365
17	169° 39' 58"	4° 34' 53"	172° 19' 03"	8° 18' 11"	0° 57' 13"	15' 35.46"	324° 49' 42"	0.99426
18	170° 13' 19"	4° 33' 36"	172° 49' 22"	8° 03' 51"	0° 57' 14"	15' 35.89"	326° 37' 01"	0.99483
19	170° 46' 41"	4° 32' 17"	173° 19' 41"	7° 49' 28"	0° 57' 16"	15' 36.31"	328° 35' 57"	0.99536
20	171° 20' 06"	4° 30' 57"	173° 49' 60"	7° 35' 02"	0° 57' 18"	15' 36.73"	330° 48' 19"	0.99585
21	171° 53' 32"	4° 29' 35"	174° 20' 18"	7° 20' 33"	0° 57' 19"	15' 37.16"	333° 16' 13"	0.99630
22	172° 26' 59"	4° 28' 11"	174° 50' 36"	7° 06' 01"	0° 57' 21"	15' 37.58"	336° 2' 07"	0.99672
23	173° 00' 28"	4° 26' 46"	175° 20' 54"	6° 51' 26"	0° 57' 22"	15' 37.99"	339° 8' 45"	0.99709
24	173° 33' 59"	4° 25' 19"	175° 51' 11"	6° 36' 49"	0° 57' 24"	15' 38.41"	342° 39' 09"	0.99742

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	357° 22' 34"	0.27"	357° 35' 01"	-1° 02' 50"	0.9950818	16' 04.37"	23° 26' 17"	-8 m 11 s
1	357° 25' 03"	0.27"	357° 37' 18"	-1° 01' 50"	0.9950933	16' 04.36"	23° 26' 17"	-8 m 10 s
2	357° 27' 32"	0.27"	357° 39' 34"	-1° 00' 51"	0.9951048	16' 04.35"	23° 26' 17"	-8 m 09 s
3	357° 30' 01"	0.26"	357° 41' 51"	0°-59' 52"	0.9951163	16' 04.34"	23° 26' 17"	-8 m 09 s
4	357° 32' 31"	0.26"	357° 44' 08"	0°-58' 52"	0.9951278	16' 04.33"	23° 26' 17"	-8 m 08 s
5	357° 34' 60"	0.26"	357° 46' 25"	0°-57' 53"	0.9951393	16' 04.32"	23° 26' 17"	-8 m 07 s
6	357° 37' 29"	0.25"	357° 48' 42"	0°-56' 54"	0.9951508	16' 04.31"	23° 26' 17"	-8 m 06 s
7	357° 39' 58"	0.25"	357° 50' 59"	0°-55' 55"	0.9951623	16' 04.29"	23° 26' 17"	-8 m 06 s
8	357° 42' 27"	0.25"	357° 53' 16"	0°-54' 55"	0.9951739	16' 04.28"	23° 26' 17"	-8 m 05 s
9	357° 44' 57"	0.24"	357° 55' 33"	0°-53' 56"	0.9951854	16' 04.27"	23° 26' 17"	-8 m 04 s
10	357° 47' 26"	0.24"	357° 57' 50"	0°-52' 57"	0.9951969	16' 04.26"	23° 26' 17"	-8 m 03 s
11	357° 49' 55"	0.24"	358° 00' 07"	0°-51' 57"	0.9952085	16' 04.25"	23° 26' 17"	-8 m 03 s
12	357° 52' 24"	0.23"	358° 02' 24"	0°-50' 58"	0.9952200	16' 04.24"	23° 26' 17"	-8 m 02 s
13	357° 54' 53"	0.23"	358° 04' 41"	0°-49' 59"	0.9952316	16' 04.23"	23° 26' 17"	-8 m 01 s
14	357° 57' 23"	0.23"	358° 06' 57"	0°-48' 59"	0.9952431	16' 04.22"	23° 26' 17"	-8 m 01 s
15	357° 59' 52"	0.22"	358° 09' 14"	0°-48' 00"	0.9952547	16' 04.21"	23° 26' 17"	-7 m 60 s
16	358° 02' 21"	0.22"	358° 11' 31"	0°-47' 01"	0.9952663	16' 04.19"	23° 26' 17"	-7 m 59 s
17	358° 04' 50"	0.22"	358° 13' 48"	0°-46' 02"	0.9952778	16' 04.18"	23° 26' 17"	-7 m 58 s
18	358° 07' 19"	0.21"	358° 16' 05"	0°-45' 02"	0.9952894	16' 04.17"	23° 26' 17"	-7 m 58 s
19	358° 09' 48"	0.21"	358° 18' 22"	0°-44' 03"	0.9953010	16' 04.16"	23° 26' 17"	-7 m 57 s
20	358° 12' 18"	0.20"	358° 20' 39"	0°-43' 04"	0.9953126	16' 04.15"	23° 26' 17"	-7 m 56 s
21	358° 14' 47"	0.20"	358° 22' 56"	0°-42' 04"	0.9953242	16' 04.14"	23° 26' 17"	-7 m 55 s
22	358° 17' 16"	0.20"	358° 25' 13"	0°-41' 05"	0.9953358	16' 04.13"	23° 26' 17"	-7 m 55 s
23	358° 19' 45"	0.19"	358° 27' 29"	0°-40' 06"	0.9953474	16' 04.12"	23° 26' 17"	-7 m 54 s
24	358° 22' 14"	0.19"	358° 29' 46"	0°-39' 06"	0.9953590	16' 04.10"	23° 26' 17"	-7 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	173° 33' 59"	4° 25' 19"	175° 51' 11"	6° 36' 49"	0° 57' 24"	15' 38.41"	342° 39' 09"	0.99742
1	174° 07' 32"	4° 23' 50"	176° 21' 29"	6° 22' 09"	0° 57' 25"	15' 38.83"	346° 36' 28"	0.99772
2	174° 41' 06"	4° 22' 20"	176° 51' 46"	6° 07' 26"	0° 57' 27"	15' 39.24"	351° 3' 43"	0.99797
3	175° 14' 42"	4° 20' 48"	177° 22' 03"	5° 52' 41"	0° 57' 28"	15' 39.66"	356° 3' 19"	0.99819
4	175° 48' 20"	4° 19' 14"	177° 52' 20"	5° 37' 54"	0° 57' 30"	15' 40.07"	1° 36' 22"	0.99836
5	176° 21' 59"	4° 17' 39"	178° 22' 37"	5° 23' 04"	0° 57' 31"	15' 40.48"	7° 41' 45"	0.99849
6	176° 55' 40"	4° 16' 03"	178° 52' 54"	5° 08' 12"	0° 57' 33"	15' 40.89"	14° 15' 18"	0.99858
7	177° 29' 23"	4° 14' 25"	179° 23' 12"	4° 53' 17"	0° 57' 34"	15' 41.29"	21° 9' 21"	0.99864
8	178° 03' 07"	4° 12' 45"	179° 53' 29"	4° 38' 21"	0° 57' 36"	15' 41.70"	28° 13' 08"	0.99865
9	178° 36' 52"	4° 11' 04"	180° 23' 47"	4° 23' 22"	0° 57' 37"	15' 42.10"	35° 14' 15"	0.99862
10	179° 10' 40"	4° 09' 21"	180° 54' 05"	4° 08' 22"	0° 57' 39"	15' 42.50"	42° 0' 42"	0.99855
11	179° 44' 28"	4° 07' 36"	181° 24' 24"	3° 53' 19"	0° 57' 40"	15' 42.90"	48° 22' 54"	0.99843
12	180° 18' 19"	4° 05' 50"	181° 54' 43"	3° 38' 15"	0° 57' 42"	15' 43.29"	54° 14' 33"	0.99828
13	180° 52' 11"	4° 04' 03"	182° 25' 02"	3° 23' 08"	0° 57' 43"	15' 43.69"	59° 32' 51"	0.99809
14	181° 26' 04"	4° 02' 14"	182° 55' 22"	3° 08' 00"	0° 57' 45"	15' 44.08"	64° 17' 40"	0.99785
15	181° 59' 59"	4° 00' 23"	183° 25' 43"	2° 52' 51"	0° 57' 46"	15' 44.47"	68° 30' 44"	0.99757
16	182° 33' 56"	3° 58' 31"	183° 56' 04"	2° 37' 40"	0° 57' 47"	15' 44.86"	72° 14' 46"	0.99725
17	183° 07' 53"	3° 56' 38"	184° 26' 26"	2° 22' 27"	0° 57' 49"	15' 45.25"	75° 32' 54"	0.99689
18	183° 41' 53"	3° 54' 42"	184° 56' 49"	2° 07' 13"	0° 57' 50"	15' 45.63"	78° 28' 16"	0.99649
19	184° 15' 54"	3° 52' 46"	185° 27' 12"	1° 51' 58"	0° 57' 52"	15' 46.01"	81° 3' 47"	0.99605
20	184° 49' 56"	3° 50' 48"	185° 57' 37"	1° 36' 41"	0° 57' 53"	15' 46.39"	83° 22' 04"	0.99556
21	185° 23' 60"	3° 48' 48"	186° 28' 02"	1° 21' 23"	0° 57' 54"	15' 46.77"	85° 25' 26"	0.99503
22	185° 58' 05"	3° 46' 47"	186° 58' 29"	1° 06' 04"	0° 57' 56"	15' 47.14"	87° 15' 53"	0.99446
23	186° 32' 12"	3° 44' 45"	187° 28' 57"	0° 50' 44"	0° 57' 57"	15' 47.51"	88° 55' 06"	0.99385
24	187° 06' 20"	3° 42' 41"	187° 59' 25"	0° 35' 23"	0° 57' 58"	15' 47.88"	90° 24' 32"	0.99320



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	358° 22' 14"	0.19"	358° 29' 46"	0°-39' 06"	0.9953590	16' 04.10"	23° 26' 17"	-7 m 53 s
1	358° 24' 43"	0.19"	358° 32' 03"	0°-38' 07"	0.9953706	16' 04.09"	23° 26' 17"	-7 m 52 s
2	358° 27' 12"	0.18"	358° 34' 20"	0°-37' 08"	0.9953822	16' 04.08"	23° 26' 17"	-7 m 52 s
3	358° 29' 42"	0.18"	358° 36' 37"	0°-36' 09"	0.9953938	16' 04.07"	23° 26' 17"	-7 m 51 s
4	358° 32' 11"	0.17"	358° 38' 54"	0°-35' 09"	0.9954054	16' 04.06"	23° 26' 17"	-7 m 50 s
5	358° 34' 40"	0.17"	358° 41' 10"	0°-34' 10"	0.9954171	16' 04.05"	23° 26' 17"	-7 m 50 s
6	358° 37' 09"	0.17"	358° 43' 27"	0°-33' 11"	0.9954287	16' 04.04"	23° 26' 17"	-7 m 49 s
7	358° 39' 38"	0.16"	358° 45' 44"	0°-32' 11"	0.9954403	16' 04.03"	23° 26' 17"	-7 m 48 s
8	358° 42' 07"	0.16"	358° 48' 01"	0°-31' 12"	0.9954520	16' 04.01"	23° 26' 17"	-7 m 47 s
9	358° 44' 36"	0.15"	358° 50' 18"	0°-30' 13"	0.9954636	16' 04.00"	23° 26' 17"	-7 m 47 s
10	358° 47' 05"	0.15"	358° 52' 35"	0°-29' 14"	0.9954753	16' 03.99"	23° 26' 17"	-7 m 46 s
11	358° 49' 34"	0.14"	358° 54' 51"	0°-28' 14"	0.9954869	16' 03.98"	23° 26' 17"	-7 m 45 s
12	358° 52' 04"	0.14"	358° 57' 08"	0°-27' 15"	0.9954986	16' 03.97"	23° 26' 17"	-7 m 44 s
13	358° 54' 33"	0.14"	358° 59' 25"	0°-26' 16"	0.9955103	16' 03.96"	23° 26' 17"	-7 m 44 s
14	358° 57' 02"	0.13"	359° 01' 42"	0°-25' 16"	0.9955219	16' 03.95"	23° 26' 17"	-7 m 43 s
15	358° 59' 31"	0.13"	359° 03' 59"	0°-24' 17"	0.9955336	16' 03.94"	23° 26' 17"	-7 m 42 s
16	359° 01' 60"	0.12"	359° 06' 15"	0°-23' 18"	0.9955453	16' 03.92"	23° 26' 17"	-7 m 41 s
17	359° 04' 29"	0.12"	359° 08' 32"	0°-22' 18"	0.9955570	16' 03.91"	23° 26' 17"	-7 m 41 s
18	359° 06' 58"	0.11"	359° 10' 49"	0°-21' 19"	0.9955687	16' 03.90"	23° 26' 17"	-7 m 40 s
19	359° 09' 27"	0.11"	359° 13' 06"	0°-20' 20"	0.9955804	16' 03.89"	23° 26' 17"	-7 m 39 s
20	359° 11' 56"	0.10"	359° 15' 22"	0°-19' 21"	0.9955920	16' 03.88"	23° 26' 17"	-7 m 39 s
21	359° 14' 25"	0.10"	359° 17' 39"	0°-18' 21"	0.9956038	16' 03.87"	23° 26' 17"	-7 m 38 s
22	359° 16' 54"	0.10"	359° 19' 56"	0°-17' 22"	0.9956155	16' 03.86"	23° 26' 17"	-7 m 37 s
23	359° 19' 24"	0.09"	359° 22' 13"	0°-16' 23"	0.9956272	16' 03.84"	23° 26' 17"	-7 m 36 s
24	359° 21' 53"	0.09"	359° 24' 30"	0°-15' 23"	0.9956389	16' 03.83"	23° 26' 17"	-7 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	187° 06' 20"	3° 42' 41"	187° 59' 25"	0° 35' 23"	0° 57' 58"	15' 47.88"	90° 24' 32"	0.99320
1	187° 40' 29"	3° 40' 36"	188° 29' 55"	0° 20' 01"	0° 57' 60"	15' 48.25"	91° 45' 27"	0.99250
2	188° 14' 40"	3° 38' 29"	189° 00' 26"	0° 04' 38"	0° 58' 01"	15' 48.61"	92° 58' 51"	0.99176
3	188° 48' 52"	3° 36' 21"	189° 30' 59"	0°-10' 45"	0° 58' 02"	15' 48.98"	94° 5' 41"	0.99098
4	189° 23' 05"	3° 34' 11"	190° 01' 33"	0°-26' 09"	0° 58' 04"	15' 49.34"	95° 6' 41"	0.99016
5	189° 57' 20"	3° 32' 00"	190° 32' 08"	0°-41' 34"	0° 58' 05"	15' 49.69"	96° 2' 31"	0.98929
6	190° 31' 36"	3° 29' 48"	191° 02' 45"	0°-56' 59"	0° 58' 06"	15' 50.05"	96° 53' 44"	0.98838
7	191° 05' 54"	3° 27' 34"	191° 33' 23"	-1° 12' 24"	0° 58' 08"	15' 50.40"	97° 40' 51"	0.98743
8	191° 40' 12"	3° 25' 19"	192° 04' 03"	-1° 27' 50"	0° 58' 09"	15' 50.75"	98° 24' 16"	0.98644
9	192° 14' 32"	3° 23' 03"	192° 34' 45"	-1° 43' 16"	0° 58' 10"	15' 51.09"	99° 4' 22"	0.98541
10	192° 48' 53"	3° 20' 45"	193° 05' 29"	-1° 58' 42"	0° 58' 12"	15' 51.43"	99° 41' 27"	0.98433
11	193° 23' 16"	3° 18' 26"	193° 36' 14"	-2° 14' 09"	0° 58' 13"	15' 51.77"	100° 15' 48"	0.98321
12	193° 57' 39"	3° 16' 06"	194° 07' 01"	-2° 29' 35"	0° 58' 14"	15' 52.11"	100° 47' 41"	0.98205
13	194° 32' 04"	3° 13' 44"	194° 37' 50"	-2° 45' 01"	0° 58' 15"	15' 52.45"	101° 17' 17"	0.98085
14	195° 06' 30"	3° 11' 21"	195° 08' 41"	-3° 00' 27"	0° 58' 16"	15' 52.78"	101° 44' 49"	0.97960
15	195° 40' 58"	3° 08' 57"	195° 39' 35"	-3° 15' 53"	0° 58' 18"	15' 53.11"	102° 10' 26"	0.97831
16	196° 15' 26"	3° 06' 32"	196° 10' 30"	-3° 31' 19"	0° 58' 19"	15' 53.43"	102° 34' 18"	0.97698
17	196° 49' 56"	3° 04' 05"	196° 41' 28"	-3° 46' 44"	0° 58' 20"	15' 53.75"	102° 56' 33"	0.97561
18	197° 24' 26"	3° 01' 37"	197° 12' 27"	-4° 02' 08"	0° 58' 21"	15' 54.07"	103° 17' 17"	0.97419
19	197° 58' 58"	2° 59' 08"	197° 43' 29"	-4° 17' 33"	0° 58' 22"	15' 54.39"	103° 36' 38"	0.97274
20	198° 33' 31"	2° 56' 38"	198° 14' 34"	-4° 32' 56"	0° 58' 24"	15' 54.70"	103° 54' 41"	0.97124
21	199° 08' 05"	2° 54' 07"	198° 45' 41"	-4° 48' 18"	0° 58' 25"	15' 55.01"	104° 11' 31"	0.96970
22	199° 42' 41"	2° 51' 34"	199° 16' 50"	-5° 03' 40"	0° 58' 26"	15' 55.32"	104° 27' 14"	0.96812
23	200° 17' 17"	2° 49' 00"	199° 48' 02"	-5° 19' 01"	0° 58' 27"	15' 55.62"	104° 41' 52"	0.96649
24	200° 51' 54"	2° 46' 25"	200° 19' 17"	-5° 34' 21"	0° 58' 28"	15' 55.92"	104° 55' 31"	0.96483

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	359° 21' 53"	0.09"	359° 24' 30"	0°-15' 23"	0.9956389	16' 03.83"	23° 26' 17"	-7 m 36 s
1	359° 24' 22"	0.08"	359° 26' 46"	0°-14' 24"	0.9956506	16' 03.82"	23° 26' 17"	-7 m 35 s
2	359° 26' 51"	0.08"	359° 29' 03"	0°-13' 25"	0.9956623	16' 03.81"	23° 26' 17"	-7 m 34 s
3	359° 29' 20"	0.07"	359° 31' 20"	0°-12' 26"	0.9956741	16' 03.80"	23° 26' 17"	-7 m 33 s
4	359° 31' 49"	0.07"	359° 33' 37"	0°-11' 26"	0.9956858	16' 03.79"	23° 26' 17"	-7 m 33 s
5	359° 34' 18"	0.06"	359° 35' 53"	0°-10' 27"	0.9956975	16' 03.78"	23° 26' 17"	-7 m 32 s
6	359° 36' 47"	0.06"	359° 38' 10"	0° -9' 28"	0.9957093	16' 03.77"	23° 26' 17"	-7 m 31 s
7	359° 39' 16"	0.05"	359° 40' 27"	0° -8' 29"	0.9957210	16' 03.75"	23° 26' 17"	-7 m 30 s
8	359° 41' 45"	0.05"	359° 42' 44"	0° -7' 29"	0.9957328	16' 03.74"	23° 26' 17"	-7 m 30 s
9	359° 44' 14"	0.04"	359° 45' 00"	0° -6' 30"	0.9957445	16' 03.73"	23° 26' 17"	-7 m 29 s
10	359° 46' 43"	0.04"	359° 47' 17"	0° -5' 31"	0.9957563	16' 03.72"	23° 26' 17"	-7 m 28 s
11	359° 49' 12"	0.03"	359° 49' 34"	0° -4' 31"	0.9957681	16' 03.71"	23° 26' 17"	-7 m 27 s
12	359° 51' 41"	0.03"	359° 51' 50"	0° -3' 32"	0.9957798	16' 03.70"	23° 26' 17"	-7 m 27 s
13	359° 54' 10"	0.02"	359° 54' 07"	0° -2' 33"	0.9957916	16' 03.69"	23° 26' 17"	-7 m 26 s
14	359° 56' 39"	0.02"	359° 56' 24"	0° -1' 34"	0.9958034	16' 03.67"	23° 26' 17"	-7 m 25 s
15	359° 59' 08"	0.01"	359° 58' 41"	0° 00'-34"	0.9958152	16' 03.66"	23° 26' 17"	-7 m 24 s
16	0° 01' 37"	0.01"	0° 00' 57"	0° 00' 25"	0.9958270	16' 03.65"	23° 26' 17"	-7 m 24 s
17	0° 04' 06"	0.00"	0° 03' 14"	0° 01' 24"	0.9958388	16' 03.64"	23° 26' 17"	-7 m 23 s
18	0° 06' 35"	-0.00"	0° 05' 31"	0° 02' 23"	0.9958506	16' 03.63"	23° 26' 17"	-7 m 22 s
19	0° 09' 04"	-0.01"	0° 07' 47"	0° 03' 23"	0.9958624	16' 03.62"	23° 26' 17"	-7 m 22 s
20	0° 11' 33"	-0.01"	0° 10' 04"	0° 04' 22"	0.9958742	16' 03.61"	23° 26' 17"	-7 m 21 s
21	0° 14' 02"	-0.02"	0° 12' 21"	0° 05' 21"	0.9958860	16' 03.59"	23° 26' 17"	-7 m 20 s
22	0° 16' 31"	-0.02"	0° 14' 38"	0° 06' 20"	0.9958978	16' 03.58"	23° 26' 17"	-7 m 19 s
23	0° 19' 00"	-0.03"	0° 16' 54"	0° 07' 20"	0.9959096	16' 03.57"	23° 26' 17"	-7 m 19 s
24	0° 21' 29"	-0.03"	0° 19' 11"	0° 08' 19"	0.9959214	16' 03.56"	23° 26' 17"	-7 m 18 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	200° 51' 54"	2° 46' 25"	200° 19' 17"	-5° 34' 21"	0° 58' 28"	15' 55.92"	104° 55' 31"	0.96483
1	201° 26' 32"	2° 43' 49"	200° 50' 35"	-5° 49' 39"	0° 58' 29"	15' 56.22"	105° 8' 13"	0.96312
2	202° 01' 12"	2° 41' 12"	201° 21' 55"	-6° 04' 57"	0° 58' 30"	15' 56.52"	105° 20' 02"	0.96137
3	202° 35' 52"	2° 38' 34"	201° 53' 18"	-6° 20' 13"	0° 58' 31"	15' 56.81"	105° 31' 02"	0.95958
4	203° 10' 33"	2° 35' 54"	202° 24' 44"	-6° 35' 28"	0° 58' 32"	15' 57.09"	105° 41' 13"	0.95775
5	203° 45' 16"	2° 33' 14"	202° 56' 12"	-6° 50' 41"	0° 58' 33"	15' 57.38"	105° 50' 40"	0.95587
6	204° 19' 59"	2° 30' 33"	203° 27' 44"	-7° 05' 53"	0° 58' 34"	15' 57.66"	105° 59' 23"	0.95396
7	204° 54' 43"	2° 27' 50"	203° 59' 19"	-7° 21' 04"	0° 58' 35"	15' 57.94"	106° 7' 26"	0.95200
8	205° 29' 29"	2° 25' 07"	204° 30' 57"	-7° 36' 12"	0° 58' 36"	15' 58.21"	106° 14' 50"	0.95001
9	206° 04' 15"	2° 22' 22"	205° 02' 38"	-7° 51' 19"	0° 58' 37"	15' 58.49"	106° 21' 37"	0.94797
10	206° 39' 02"	2° 19' 37"	205° 34' 23"	-8° 06' 24"	0° 58' 38"	15' 58.75"	106° 27' 49"	0.94589
11	207° 13' 50"	2° 16' 50"	206° 06' 11"	-8° 21' 26"	0° 58' 39"	15' 59.02"	106° 33' 26"	0.94377
12	207° 48' 38"	2° 14' 03"	206° 38' 02"	-8° 36' 27"	0° 58' 40"	15' 59.28"	106° 38' 31"	0.94161
13	208° 23' 28"	2° 11' 15"	207° 09' 56"	-8° 51' 26"	0° 58' 41"	15' 59.54"	106° 43' 04"	0.93941
14	208° 58' 19"	2° 08' 26"	207° 41' 54"	-9° 06' 22"	0° 58' 42"	15' 59.79"	106° 47' 08"	0.93717
15	209° 33' 10"	2° 05' 36"	208° 13' 56"	-9° 21' 16"	0° 58' 43"	16' 00.05"	106° 50' 42"	0.93490
16	210° 08' 02"	2° 02' 45"	208° 46' 01"	-9° 36' 07"	0° 58' 44"	16' 00.29"	106° 53' 48"	0.93258
17	210° 42' 55"	1° 59' 53"	209° 18' 10"	-9° 50' 56"	0° 58' 45"	16' 00.54"	106° 56' 28"	0.93022
18	211° 17' 49"	1° 57' 00"	209° 50' 23"	-10° 05' 43"	0° 58' 46"	16' 00.78"	106° 58' 41"	0.92782
19	211° 52' 44"	1° 54' 07"	210° 22' 39"	-10° 20' 26"	0° 58' 47"	16' 01.02"	107° 0' 29"	0.92538
20	212° 27' 39"	1° 51' 13"	210° 54' 60"	-10° 35' 07"	0° 58' 48"	16' 01.25"	107° 1' 52"	0.92290
21	213° 02' 35"	1° 48' 18"	211° 27' 24"	-10° 49' 45"	0° 58' 48"	16' 01.49"	107° 2' 52"	0.92039
22	213° 37' 32"	1° 45' 22"	211° 59' 52"	-11° 04' 19"	0° 58' 49"	16' 01.71"	107° 3' 29"	0.91784
23	214° 12' 29"	1° 42' 25"	212° 32' 24"	-11° 18' 51"	0° 58' 50"	16' 01.94"	107° 3' 43"	0.91524
24	214° 47' 28"	1° 39' 28"	213° 05' 00"	-11° 33' 20"	0° 58' 51"	16' 02.16"	107° 3' 35"	0.91261



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	0° 21' 29"	-0.03"	0° 19' 11"	0° 08' 19"	0.9959214	16' 03.56"	23° 26' 17"	-7 m 18 s
1	0° 23' 58"	-0.04"	0° 21' 28"	0° 09' 18"	0.9959332	16' 03.55"	23° 26' 17"	-7 m 17 s
2	0° 26' 27"	-0.04"	0° 23' 44"	0° 10' 17"	0.9959451	16' 03.54"	23° 26' 17"	-7 m 16 s
3	0° 28' 56"	-0.05"	0° 26' 01"	0° 11' 17"	0.9959569	16' 03.53"	23° 26' 17"	-7 m 16 s
4	0° 31' 25"	-0.05"	0° 28' 18"	0° 12' 16"	0.9959688	16' 03.51"	23° 26' 17"	-7 m 15 s
5	0° 33' 54"	-0.06"	0° 30' 34"	0° 13' 15"	0.9959806	16' 03.50"	23° 26' 17"	-7 m 14 s
6	0° 36' 23"	-0.06"	0° 32' 51"	0° 14' 14"	0.9959924	16' 03.49"	23° 26' 17"	-7 m 13 s
7	0° 38' 52"	-0.07"	0° 35' 08"	0° 15' 14"	0.9960043	16' 03.48"	23° 26' 17"	-7 m 13 s
8	0° 41' 21"	-0.08"	0° 37' 24"	0° 16' 13"	0.9960161	16' 03.47"	23° 26' 17"	-7 m 12 s
9	0° 43' 50"	-0.08"	0° 39' 41"	0° 17' 12"	0.9960280	16' 03.46"	23° 26' 17"	-7 m 11 s
10	0° 46' 19"	-0.09"	0° 41' 58"	0° 18' 11"	0.9960399	16' 03.45"	23° 26' 17"	-7 m 10 s
11	0° 48' 48"	-0.09"	0° 44' 14"	0° 19' 11"	0.9960517	16' 03.43"	23° 26' 17"	-7 m 10 s
12	0° 51' 17"	-0.10"	0° 46' 31"	0° 20' 10"	0.9960636	16' 03.42"	23° 26' 17"	-7 m 09 s
13	0° 53' 46"	-0.10"	0° 48' 48"	0° 21' 09"	0.9960755	16' 03.41"	23° 26' 17"	-7 m 08 s
14	0° 56' 15"	-0.11"	0° 51' 04"	0° 22' 08"	0.9960874	16' 03.40"	23° 26' 17"	-7 m 07 s
15	0° 58' 44"	-0.11"	0° 53' 21"	0° 23' 08"	0.9960992	16' 03.39"	23° 26' 17"	-7 m 07 s
16	1° 01' 12"	-0.12"	0° 55' 38"	0° 24' 07"	0.9961111	16' 03.38"	23° 26' 17"	-7 m 06 s
17	1° 03' 41"	-0.12"	0° 57' 54"	0° 25' 06"	0.9961230	16' 03.36"	23° 26' 17"	-7 m 05 s
18	1° 06' 10"	-0.13"	1° 00' 11"	0° 26' 05"	0.9961349	16' 03.35"	23° 26' 17"	-7 m 04 s
19	1° 08' 39"	-0.13"	1° 02' 28"	0° 27' 04"	0.9961468	16' 03.34"	23° 26' 17"	-7 m 04 s
20	1° 11' 08"	-0.14"	1° 04' 44"	0° 28' 04"	0.9961587	16' 03.33"	23° 26' 17"	-7 m 03 s
21	1° 13' 37"	-0.14"	1° 07' 01"	0° 29' 03"	0.9961706	16' 03.32"	23° 26' 17"	-7 m 02 s
22	1° 16' 06"	-0.15"	1° 09' 18"	0° 30' 02"	0.9961825	16' 03.31"	23° 26' 17"	-7 m 01 s
23	1° 18' 35"	-0.16"	1° 11' 34"	0° 31' 01"	0.9961944	16' 03.30"	23° 26' 17"	-7 m 01 s
24	1° 21' 04"	-0.16"	1° 13' 51"	0° 32' 01"	0.9962064	16' 03.28"	23° 26' 17"	-6 m 60 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	214° 47' 28"	1° 39' 28"	213° 05' 00"	-11° 33' 20"	0° 58' 51"	16' 02.16"	107° 3' 35"	0.91261
1	215° 22' 27"	1° 36' 30"	213° 37' 40"	-11° 47' 45"	0° 58' 52"	16' 02.38"	107° 3' 06"	0.90994
2	215° 57' 26"	1° 33' 31"	214° 10' 25"	-12° 02' 07"	0° 58' 52"	16' 02.59"	107° 2' 16"	0.90724
3	216° 32' 27"	1° 30' 32"	214° 43' 13"	-12° 16' 25"	0° 58' 53"	16' 02.80"	107° 1' 06"	0.90449
4	217° 07' 28"	1° 27' 32"	215° 16' 06"	-12° 30' 40"	0° 58' 54"	16' 03.01"	106° 59' 37"	0.90171
5	217° 42' 30"	1° 24' 32"	215° 49' 04"	-12° 44' 51"	0° 58' 55"	16' 03.21"	106° 57' 48"	0.89889
6	218° 17' 32"	1° 21' 30"	216° 22' 05"	-12° 58' 58"	0° 58' 55"	16' 03.41"	106° 55' 40"	0.89603
7	218° 52' 35"	1° 18' 29"	216° 55' 11"	-13° 13' 01"	0° 58' 56"	16' 03.61"	106° 53' 14"	0.89314
8	219° 27' 38"	1° 15' 26"	217° 28' 22"	-13° 27' 01"	0° 58' 57"	16' 03.81"	106° 50' 29"	0.89021
9	220° 02' 43"	1° 12' 24"	218° 01' 37"	-13° 40' 56"	0° 58' 58"	16' 04.00"	106° 47' 27"	0.88724
10	220° 37' 47"	1° 09' 20"	218° 34' 56"	-13° 54' 47"	0° 58' 58"	16' 04.18"	106° 44' 08"	0.88424
11	221° 12' 53"	1° 06' 16"	219° 08' 21"	-14° 08' 34"	0° 58' 59"	16' 04.37"	106° 40' 31"	0.88121
12	221° 47' 59"	1° 03' 12"	219° 41' 49"	-14° 22' 17"	0° 58' 60"	16' 04.55"	106° 36' 38"	0.87813
13	222° 23' 05"	1° 00' 07"	220° 15' 23"	-14° 35' 55"	0° 59' 00"	16' 04.72"	106° 32' 28"	0.87502
14	222° 58' 12"	0° 57' 02"	220° 49' 01"	-14° 49' 29"	0° 59' 01"	16' 04.90"	106° 28' 03"	0.87188
15	223° 33' 19"	0° 53' 56"	221° 22' 44"	-15° 02' 57"	0° 59' 02"	16' 05.07"	106° 23' 21"	0.86870
16	224° 08' 28"	0° 50' 50"	221° 56' 32"	-15° 16' 22"	0° 59' 02"	16' 05.24"	106° 18' 24"	0.86549
17	224° 43' 36"	0° 47' 43"	222° 30' 25"	-15° 29' 41"	0° 59' 03"	16' 05.40"	106° 13' 11"	0.86224
18	225° 18' 45"	0° 44' 36"	223° 04' 22"	-15° 42' 55"	0° 59' 03"	16' 05.56"	106° 7' 43"	0.85896
19	225° 53' 55"	0° 41' 29"	223° 38' 25"	-15° 56' 05"	0° 59' 04"	16' 05.72"	106° 2' 00"	0.85565
20	226° 29' 05"	0° 38' 21"	224° 12' 32"	-16° 09' 09"	0° 59' 04"	16' 05.87"	105° 56' 03"	0.85230
21	227° 04' 15"	0° 35' 14"	224° 46' 44"	-16° 22' 08"	0° 59' 05"	16' 06.02"	105° 49' 51"	0.84892
22	227° 39' 26"	0° 32' 05"	225° 21' 02"	-16° 35' 01"	0° 59' 06"	16' 06.17"	105° 43' 24"	0.84551
23	228° 14' 37"	0° 28' 57"	225° 55' 24"	-16° 47' 50"	0° 59' 06"	16' 06.31"	105° 36' 44"	0.84207
24	228° 49' 49"	0° 25' 48"	226° 29' 52"	-17° 00' 32"	0° 59' 07"	16' 06.45"	105° 29' 50"	0.83859

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	1° 21' 04"	-0.16"	1° 13' 51"	0° 32' 01"	0.9962064	16' 03.28"	23° 26' 17"	-6 m 60 s
1	1° 23' 33"	-0.17"	1° 16' 08"	0° 32' 60"	0.9962183	16' 03.27"	23° 26' 17"	-6 m 59 s
2	1° 26' 02"	-0.17"	1° 18' 24"	0° 33' 59"	0.9962302	16' 03.26"	23° 26' 17"	-6 m 58 s
3	1° 28' 31"	-0.18"	1° 20' 41"	0° 34' 58"	0.9962421	16' 03.25"	23° 26' 17"	-6 m 58 s
4	1° 30' 59"	-0.18"	1° 22' 57"	0° 35' 57"	0.9962541	16' 03.24"	23° 26' 17"	-6 m 57 s
5	1° 33' 28"	-0.19"	1° 25' 14"	0° 36' 57"	0.9962660	16' 03.23"	23° 26' 17"	-6 m 56 s
6	1° 35' 57"	-0.19"	1° 27' 31"	0° 37' 56"	0.9962779	16' 03.22"	23° 26' 17"	-6 m 55 s
7	1° 38' 26"	-0.20"	1° 29' 47"	0° 38' 55"	0.9962899	16' 03.20"	23° 26' 17"	-6 m 55 s
8	1° 40' 55"	-0.20"	1° 32' 04"	0° 39' 54"	0.9963018	16' 03.19"	23° 26' 17"	-6 m 54 s
9	1° 43' 24"	-0.21"	1° 34' 21"	0° 40' 53"	0.9963138	16' 03.18"	23° 26' 17"	-6 m 53 s
10	1° 45' 53"	-0.22"	1° 36' 37"	0° 41' 53"	0.9963257	16' 03.17"	23° 26' 17"	-6 m 52 s
11	1° 48' 22"	-0.22"	1° 38' 54"	0° 42' 52"	0.9963377	16' 03.16"	23° 26' 17"	-6 m 52 s
12	1° 50' 51"	-0.23"	1° 41' 10"	0° 43' 51"	0.9963496	16' 03.15"	23° 26' 17"	-6 m 51 s
13	1° 53' 19"	-0.23"	1° 43' 27"	0° 44' 50"	0.9963616	16' 03.13"	23° 26' 17"	-6 m 50 s
14	1° 55' 48"	-0.24"	1° 45' 44"	0° 45' 49"	0.9963736	16' 03.12"	23° 26' 17"	-6 m 49 s
15	1° 58' 17"	-0.24"	1° 48' 00"	0° 46' 48"	0.9963855	16' 03.11"	23° 26' 17"	-6 m 49 s
16	2° 00' 46"	-0.25"	1° 50' 17"	0° 47' 48"	0.9963975	16' 03.10"	23° 26' 17"	-6 m 48 s
17	2° 03' 15"	-0.25"	1° 52' 33"	0° 48' 47"	0.9964095	16' 03.09"	23° 26' 17"	-6 m 47 s
18	2° 05' 44"	-0.26"	1° 54' 50"	0° 49' 46"	0.9964214	16' 03.08"	23° 26' 17"	-6 m 46 s
19	2° 08' 13"	-0.26"	1° 57' 07"	0° 50' 45"	0.9964334	16' 03.06"	23° 26' 17"	-6 m 46 s
20	2° 10' 41"	-0.27"	1° 59' 23"	0° 51' 44"	0.9964454	16' 03.05"	23° 26' 17"	-6 m 45 s
21	2° 13' 10"	-0.27"	2° 01' 40"	0° 52' 43"	0.9964574	16' 03.04"	23° 26' 17"	-6 m 44 s
22	2° 15' 39"	-0.28"	2° 03' 56"	0° 53' 43"	0.9964694	16' 03.03"	23° 26' 17"	-6 m 43 s
23	2° 18' 08"	-0.29"	2° 06' 13"	0° 54' 42"	0.9964814	16' 03.02"	23° 26' 17"	-6 m 43 s
24	2° 20' 37"	-0.29"	2° 08' 30"	0° 55' 41"	0.9964934	16' 03.01"	23° 26' 17"	-6 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	228° 49' 49"	0° 25' 48"	226° 29' 52"	-17° 00' 32"	0° 59' 07"	16' 06.45"	105° 29' 50"	0.83859
1	229° 25' 01"	0° 22' 40"	227° 04' 24"	-17° 13' 09"	0° 59' 07"	16' 06.59"	105° 22' 42"	0.83508
2	230° 00' 14"	0° 19' 30"	227° 39' 02"	-17° 25' 40"	0° 59' 08"	16' 06.72"	105° 15' 20"	0.83154
3	230° 35' 27"	0° 16' 21"	228° 13' 45"	-17° 38' 06"	0° 59' 08"	16' 06.85"	105° 7' 45"	0.82797
4	231° 10' 40"	0° 13' 12"	228° 48' 33"	-17° 50' 25"	0° 59' 09"	16' 06.98"	104° 59' 57"	0.82437
5	231° 45' 54"	0° 10' 02"	229° 23' 26"	-18° 02' 39"	0° 59' 09"	16' 07.10"	104° 51' 56"	0.82073
6	232° 21' 08"	0° 06' 53"	229° 58' 25"	-18° 14' 46"	0° 59' 09"	16' 07.22"	104° 43' 41"	0.81707
7	232° 56' 22"	0° 03' 43"	230° 33' 28"	-18° 26' 47"	0° 59' 10"	16' 07.34"	104° 35' 15"	0.81338
8	233° 31' 37"	0° 00' 33"	231° 08' 37"	-18° 38' 42"	0° 59' 10"	16' 07.46"	104° 26' 35"	0.80966
9	234° 06' 52"	0° -2' 37"	231° 43' 51"	-18° 50' 30"	0° 59' 11"	16' 07.57"	104° 17' 43"	0.80591
10	234° 42' 08"	0° -5' 47"	232° 19' 11"	-19° 02' 12"	0° 59' 11"	16' 07.68"	104° 8' 39"	0.80213
11	235° 17' 24"	0° -8' 56"	232° 54' 36"	-19° 13' 47"	0° 59' 12"	16' 07.78"	103° 59' 22"	0.79832
12	235° 52' 40"	0° -12' 06"	233° 30' 06"	-19° 25' 16"	0° 59' 12"	16' 07.88"	103° 49' 54"	0.79449
13	236° 27' 56"	0° -15' 16"	234° 05' 41"	-19° 36' 38"	0° 59' 12"	16' 07.98"	103° 40' 13"	0.79063
14	237° 03' 13"	0° -18' 26"	234° 41' 21"	-19° 47' 52"	0° 59' 13"	16' 08.08"	103° 30' 21"	0.78674
15	237° 38' 30"	0° -21' 36"	235° 17' 07"	-19° 59' 00"	0° 59' 13"	16' 08.17"	103° 20' 17"	0.78282
16	238° 13' 47"	0° -24' 45"	235° 52' 58"	-20° 10' 01"	0° 59' 13"	16' 08.26"	103° 10' 02"	0.77887
17	238° 49' 05"	0° -27' 55"	236° 28' 55"	-20° 20' 54"	0° 59' 14"	16' 08.35"	102° 59' 35"	0.77491
18	239° 24' 22"	0° -31' 04"	237° 04' 56"	-20° 31' 41"	0° 59' 14"	16' 08.43"	102° 48' 58"	0.77091
19	239° 59' 41"	0° -34' 13"	237° 41' 03"	-20° 42' 19"	0° 59' 14"	16' 08.51"	102° 38' 09"	0.76689
20	240° 34' 59"	0° -37' 22"	238° 17' 15"	-20° 52' 51"	0° 59' 14"	16' 08.59"	102° 27' 09"	0.76284
21	241° 10' 17"	0° -40' 31"	238° 53' 33"	-21° 03' 15"	0° 59' 15"	16' 08.66"	102° 15' 58"	0.75877
22	241° 45' 36"	0° -43' 39"	239° 29' 55"	-21° 13' 31"	0° 59' 15"	16' 08.73"	102° 4' 36"	0.75468
23	242° 20' 55"	0° -46' 47"	240° 06' 23"	-21° 23' 39"	0° 59' 15"	16' 08.80"	101° 53' 04"	0.75056
24	242° 56' 14"	0° -49' 55"	240° 42' 56"	-21° 33' 40"	0° 59' 16"	16' 08.87"	101° 41' 21"	0.74642

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	2° 20' 37"	-0.29"	2° 08' 30"	0° 55' 41"	0.9964934	16' 03.01"	23° 26' 17"	-6 m 42 s
1	2° 23' 06"	-0.30"	2° 10' 46"	0° 56' 40"	0.9965054	16' 03.00"	23° 26' 17"	-6 m 41 s
2	2° 25' 34"	-0.30"	2° 13' 03"	0° 57' 39"	0.9965174	16' 02.98"	23° 26' 17"	-6 m 40 s
3	2° 28' 03"	-0.31"	2° 15' 19"	0° 58' 38"	0.9965294	16' 02.97"	23° 26' 17"	-6 m 40 s
4	2° 30' 32"	-0.31"	2° 17' 36"	0° 59' 38"	0.9965414	16' 02.96"	23° 26' 17"	-6 m 39 s
5	2° 33' 01"	-0.32"	2° 19' 53"	1° 00' 37"	0.9965534	16' 02.95"	23° 26' 17"	-6 m 38 s
6	2° 35' 30"	-0.32"	2° 22' 09"	1° 01' 36"	0.9965654	16' 02.94"	23° 26' 17"	-6 m 37 s
7	2° 37' 59"	-0.33"	2° 24' 26"	1° 02' 35"	0.9965774	16' 02.93"	23° 26' 17"	-6 m 37 s
8	2° 40' 27"	-0.33"	2° 26' 42"	1° 03' 34"	0.9965895	16' 02.91"	23° 26' 17"	-6 m 36 s
9	2° 42' 56"	-0.34"	2° 28' 59"	1° 04' 33"	0.9966015	16' 02.90"	23° 26' 17"	-6 m 35 s
10	2° 45' 25"	-0.34"	2° 31' 16"	1° 05' 32"	0.9966135	16' 02.89"	23° 26' 17"	-6 m 34 s
11	2° 47' 54"	-0.35"	2° 33' 32"	1° 06' 31"	0.9966255	16' 02.88"	23° 26' 17"	-6 m 34 s
12	2° 50' 23"	-0.35"	2° 35' 49"	1° 07' 31"	0.9966376	16' 02.87"	23° 26' 17"	-6 m 33 s
13	2° 52' 51"	-0.36"	2° 38' 05"	1° 08' 30"	0.9966496	16' 02.86"	23° 26' 17"	-6 m 32 s
14	2° 55' 20"	-0.36"	2° 40' 22"	1° 09' 29"	0.9966616	16' 02.84"	23° 26' 17"	-6 m 31 s
15	2° 57' 49"	-0.37"	2° 42' 38"	1° 10' 28"	0.9966737	16' 02.83"	23° 26' 17"	-6 m 31 s
16	3° 00' 18"	-0.38"	2° 44' 55"	1° 11' 27"	0.9966857	16' 02.82"	23° 26' 17"	-6 m 30 s
17	3° 02' 47"	-0.38"	2° 47' 12"	1° 12' 26"	0.9966978	16' 02.81"	23° 26' 17"	-6 m 29 s
18	3° 05' 15"	-0.39"	2° 49' 28"	1° 13' 25"	0.9967098	16' 02.80"	23° 26' 17"	-6 m 28 s
19	3° 07' 44"	-0.39"	2° 51' 45"	1° 14' 24"	0.9967219	16' 02.79"	23° 26' 17"	-6 m 28 s
20	3° 10' 13"	-0.40"	2° 54' 01"	1° 15' 23"	0.9967339	16' 02.77"	23° 26' 17"	-6 m 27 s
21	3° 12' 42"	-0.40"	2° 56' 18"	1° 16' 23"	0.9967460	16' 02.76"	23° 26' 17"	-6 m 26 s
22	3° 15' 10"	-0.41"	2° 58' 34"	1° 17' 22"	0.9967580	16' 02.75"	23° 26' 17"	-6 m 25 s
23	3° 17' 39"	-0.41"	3° 00' 51"	1° 18' 21"	0.9967701	16' 02.74"	23° 26' 17"	-6 m 25 s
24	3° 20' 08"	-0.42"	3° 03' 08"	1° 19' 20"	0.9967822	16' 02.73"	23° 26' 17"	-6 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	242° 56' 14"	0°-49' 55"	240° 42' 56"	-21° 33' 40"	0° 59' 16"	16' 08.87"	101° 41' 21"	0.74642
1	243° 31' 33"	0°-53' 03"	241° 19' 34"	-21° 43' 32"	0° 59' 16"	16' 08.93"	101° 29' 28"	0.74226
2	244° 06' 53"	0°-56' 11"	241° 56' 18"	-21° 53' 17"	0° 59' 16"	16' 08.99"	101° 17' 25"	0.73807
3	244° 42' 13"	0°-59' 18"	242° 33' 06"	-22° 02' 53"	0° 59' 16"	16' 09.05"	101° 5' 11"	0.73386
4	245° 17' 33"	-1° 02' 24"	243° 09' 59"	-22° 12' 22"	0° 59' 16"	16' 09.10"	100° 52' 48"	0.72963
5	245° 52' 53"	-1° 05' 31"	243° 46' 58"	-22° 21' 42"	0° 59' 17"	16' 09.15"	100° 40' 14"	0.72537
6	246° 28' 13"	-1° 08' 37"	244° 24' 02"	-22° 30' 53"	0° 59' 17"	16' 09.20"	100° 27' 31"	0.72110
7	247° 03' 33"	-1° 11' 42"	245° 01' 10"	-22° 39' 56"	0° 59' 17"	16' 09.25"	100° 14' 39"	0.71681
8	247° 38' 54"	-1° 14' 47"	245° 38' 24"	-22° 48' 51"	0° 59' 17"	16' 09.29"	100° 1' 37"	0.71249
9	248° 14' 14"	-1° 17' 52"	246° 15' 42"	-22° 57' 37"	0° 59' 17"	16' 09.33"	99° 48' 25"	0.70816
10	248° 49' 35"	-1° 20' 56"	246° 53' 05"	-23° 06' 14"	0° 59' 17"	16' 09.37"	99° 35' 04"	0.70380
11	249° 24' 56"	-1° 23' 60"	247° 30' 33"	-23° 14' 42"	0° 59' 17"	16' 09.40"	99° 21' 35"	0.69943
12	250° 00' 17"	-1° 27' 03"	248° 08' 06"	-23° 23' 02"	0° 59' 18"	16' 09.43"	99° 7' 56"	0.69504
13	250° 35' 38"	-1° 30' 05"	248° 45' 44"	-23° 31' 12"	0° 59' 18"	16' 09.46"	98° 54' 08"	0.69063
14	251° 10' 60"	-1° 33' 07"	249° 23' 26"	-23° 39' 14"	0° 59' 18"	16' 09.49"	98° 40' 12"	0.68620
15	251° 46' 21"	-1° 36' 09"	250° 01' 12"	-23° 47' 06"	0° 59' 18"	16' 09.51"	98° 26' 07"	0.68176
16	252° 21' 42"	-1° 39' 09"	250° 39' 04"	-23° 54' 49"	0° 59' 18"	16' 09.53"	98° 11' 54"	0.67730
17	252° 57' 04"	-1° 42' 10"	251° 16' 59"	-24° 02' 23"	0° 59' 18"	16' 09.55"	97° 57' 33"	0.67282
18	253° 32' 26"	-1° 45' 09"	251° 54' 60"	-24° 09' 48"	0° 59' 18"	16' 09.57"	97° 43' 03"	0.66833
19	254° 07' 47"	-1° 48' 08"	252° 33' 04"	-24° 17' 03"	0° 59' 18"	16' 09.58"	97° 28' 25"	0.66382
20	254° 43' 09"	-1° 51' 06"	253° 11' 13"	-24° 24' 08"	0° 59' 18"	16' 09.59"	97° 13' 40"	0.65930
21	255° 18' 31"	-1° 54' 04"	253° 49' 25"	-24° 31' 04"	0° 59' 18"	16' 09.60"	96° 58' 47"	0.65476
22	255° 53' 53"	-1° 57' 01"	254° 27' 42"	-24° 37' 51"	0° 59' 18"	16' 09.61"	96° 43' 46"	0.65021
23	256° 29' 15"	-1° 59' 57"	255° 06' 03"	-24° 44' 27"	0° 59' 18"	16' 09.61"	96° 28' 38"	0.64564
24	257° 04' 37"	-2° 02' 52"	255° 44' 28"	-24° 50' 54"	0° 59' 18"	16' 09.61"	96° 13' 22"	0.64106

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	3° 20' 08"	-0.42"	3° 03' 08"	1° 19' 20"	0.9967822	16' 02.73"	23° 26' 17"	-6 m 24 s
1	3° 22' 37"	-0.42"	3° 05' 24"	1° 20' 19"	0.9967942	16' 02.72"	23° 26' 17"	-6 m 23 s
2	3° 25' 06"	-0.43"	3° 07' 41"	1° 21' 18"	0.9968063	16' 02.70"	23° 26' 17"	-6 m 22 s
3	3° 27' 34"	-0.43"	3° 09' 57"	1° 22' 17"	0.9968184	16' 02.69"	23° 26' 17"	-6 m 22 s
4	3° 30' 03"	-0.44"	3° 12' 14"	1° 23' 16"	0.9968304	16' 02.68"	23° 26' 17"	-6 m 21 s
5	3° 32' 32"	-0.44"	3° 14' 30"	1° 24' 15"	0.9968425	16' 02.67"	23° 26' 17"	-6 m 20 s
6	3° 35' 01"	-0.45"	3° 16' 47"	1° 25' 14"	0.9968546	16' 02.66"	23° 26' 17"	-6 m 19 s
7	3° 37' 29"	-0.45"	3° 19' 04"	1° 26' 13"	0.9968666	16' 02.65"	23° 26' 17"	-6 m 19 s
8	3° 39' 58"	-0.46"	3° 21' 20"	1° 27' 12"	0.9968787	16' 02.63"	23° 26' 17"	-6 m 18 s
9	3° 42' 27"	-0.46"	3° 23' 37"	1° 28' 11"	0.9968908	16' 02.62"	23° 26' 17"	-6 m 17 s
10	3° 44' 56"	-0.46"	3° 25' 53"	1° 29' 11"	0.9969029	16' 02.61"	23° 26' 17"	-6 m 16 s
11	3° 47' 24"	-0.47"	3° 28' 10"	1° 30' 10"	0.9969150	16' 02.60"	23° 26' 17"	-6 m 16 s
12	3° 49' 53"	-0.47"	3° 30' 26"	1° 31' 09"	0.9969271	16' 02.59"	23° 26' 17"	-6 m 15 s
13	3° 52' 22"	-0.48"	3° 32' 43"	1° 32' 08"	0.9969392	16' 02.58"	23° 26' 17"	-6 m 14 s
14	3° 54' 50"	-0.48"	3° 34' 59"	1° 33' 07"	0.9969512	16' 02.56"	23° 26' 17"	-6 m 13 s
15	3° 57' 19"	-0.49"	3° 37' 16"	1° 34' 06"	0.9969633	16' 02.55"	23° 26' 17"	-6 m 13 s
16	3° 59' 48"	-0.49"	3° 39' 33"	1° 35' 05"	0.9969754	16' 02.54"	23° 26' 17"	-6 m 12 s
17	4° 02' 17"	-0.50"	3° 41' 49"	1° 36' 04"	0.9969875	16' 02.53"	23° 26' 17"	-6 m 11 s
18	4° 04' 45"	-0.50"	3° 44' 06"	1° 37' 03"	0.9969996	16' 02.52"	23° 26' 17"	-6 m 10 s
19	4° 07' 14"	-0.51"	3° 46' 22"	1° 38' 02"	0.9970117	16' 02.51"	23° 26' 17"	-6 m 10 s
20	4° 09' 43"	-0.51"	3° 48' 39"	1° 39' 01"	0.9970238	16' 02.49"	23° 26' 17"	-6 m 09 s
21	4° 12' 11"	-0.52"	3° 50' 55"	1° 39' 60"	0.9970359	16' 02.48"	23° 26' 17"	-6 m 08 s
22	4° 14' 40"	-0.52"	3° 53' 12"	1° 40' 59"	0.9970480	16' 02.47"	23° 26' 17"	-6 m 07 s
23	4° 17' 09"	-0.52"	3° 55' 28"	1° 41' 58"	0.9970601	16' 02.46"	23° 26' 17"	-6 m 07 s
24	4° 19' 38"	-0.53"	3° 57' 45"	1° 42' 57"	0.9970723	16' 02.45"	23° 26' 17"	-6 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	257° 04' 37"	-2° 02' 52"	255° 44' 28"	-24° 50' 54"	0° 59' 18"	16' 09.61"	96° 13' 22"	0.64106
1	257° 39' 59"	-2° 05' 46"	256° 22' 57"	-24° 57' 11"	0° 59' 18"	16' 09.61"	95° 57' 59"	0.63647
2	258° 15' 21"	-2° 08' 40"	257° 01' 30"	-25° 03' 18"	0° 59' 18"	16' 09.60"	95° 42' 30"	0.63186
3	258° 50' 43"	-2° 11' 33"	257° 40' 06"	-25° 09' 15"	0° 59' 18"	16' 09.60"	95° 26' 53"	0.62725
4	259° 26' 05"	-2° 14' 25"	258° 18' 46"	-25° 15' 02"	0° 59' 18"	16' 09.59"	95° 11' 10"	0.62262
5	260° 01' 27"	-2° 17' 16"	258° 57' 29"	-25° 20' 39"	0° 59' 18"	16' 09.57"	94° 55' 21"	0.61798
6	260° 36' 49"	-2° 20' 07"	259° 36' 16"	-25° 26' 06"	0° 59' 18"	16' 09.56"	94° 39' 25"	0.61333
7	261° 12' 12"	-2° 22' 56"	260° 15' 06"	-25° 31' 23"	0° 59' 18"	16' 09.54"	94° 23' 22"	0.60867
8	261° 47' 34"	-2° 25' 45"	260° 53' 59"	-25° 36' 29"	0° 59' 18"	16' 09.52"	94° 7' 14"	0.60400
9	262° 22' 56"	-2° 28' 32"	261° 32' 55"	-25° 41' 25"	0° 59' 18"	16' 09.50"	93° 50' 60"	0.59932
10	262° 58' 18"	-2° 31' 19"	262° 11' 55"	-25° 46' 11"	0° 59' 18"	16' 09.48"	93° 34' 40"	0.59463
11	263° 33' 40"	-2° 34' 04"	262° 50' 57"	-25° 50' 46"	0° 59' 18"	16' 09.45"	93° 18' 15"	0.58993
12	264° 09' 02"	-2° 36' 49"	263° 30' 02"	-25° 55' 11"	0° 59' 18"	16' 09.42"	93° 1' 44"	0.58523
13	264° 44' 24"	-2° 39' 33"	264° 09' 09"	-25° 59' 25"	0° 59' 17"	16' 09.39"	92° 45' 08"	0.58051
14	265° 19' 46"	-2° 42' 15"	264° 48' 20"	-26° 03' 29"	0° 59' 17"	16' 09.36"	92° 28' 27"	0.57579
15	265° 55' 08"	-2° 44' 57"	265° 27' 32"	-26° 07' 22"	0° 59' 17"	16' 09.32"	92° 11' 41"	0.57107
16	266° 30' 30"	-2° 47' 37"	266° 06' 47"	-26° 11' 05"	0° 59' 17"	16' 09.29"	91° 54' 50"	0.56633
17	267° 05' 52"	-2° 50' 17"	266° 46' 04"	-26° 14' 36"	0° 59' 17"	16' 09.25"	91° 37' 55"	0.56160
18	267° 41' 14"	-2° 52' 55"	267° 25' 24"	-26° 17' 58"	0° 59' 17"	16' 09.20"	91° 20' 55"	0.55685
19	268° 16' 32"	-2° 55' 32"	268° 04' 41"	-26° 21' 08"	0° 59' 17"	16' 09.16"	91° 3' 53"	0.55211
20	268° 51' 53"	-2° 58' 08"	268° 44' 04"	-26° 24' 07"	0° 59' 16"	16' 09.11"	90° 46' 45"	0.54736
21	269° 27' 15"	-3° 00' 43"	269° 23' 28"	-26° 26' 56"	0° 59' 16"	16' 09.06"	90° 29' 33"	0.54260
22	270° 02' 37"	-3° 03' 17"	270° 02' 55"	-26° 29' 34"	0° 59' 16"	16' 09.01"	90° 12' 17"	0.53784
23	270° 37' 58"	-3° 05' 50"	270° 42' 22"	-26° 32' 01"	0° 59' 16"	16' 08.96"	89° 54' 58"	0.53308
24	271° 13' 19"	-3° 08' 21"	271° 21' 52"	-26° 34' 17"	0° 59' 16"	16' 08.90"	89° 37' 36"	0.52832



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	4° 19' 38"	-0.53"	3° 57' 45"	1° 42' 57"	0.9970723	16' 02.45"	23° 26' 17"	-6 m 06 s
1	4° 22' 06"	-0.53"	4° 00' 02"	1° 43' 56"	0.9970844	16' 02.44"	23° 26' 17"	-6 m 05 s
2	4° 24' 35"	-0.54"	4° 02' 18"	1° 44' 55"	0.9970965	16' 02.42"	23° 26' 17"	-6 m 04 s
3	4° 27' 04"	-0.54"	4° 04' 35"	1° 45' 54"	0.9971086	16' 02.41"	23° 26' 17"	-6 m 04 s
4	4° 29' 32"	-0.55"	4° 06' 51"	1° 46' 53"	0.9971207	16' 02.40"	23° 26' 17"	-6 m 03 s
5	4° 32' 01"	-0.55"	4° 09' 08"	1° 47' 52"	0.9971328	16' 02.39"	23° 26' 17"	-6 m 02 s
6	4° 34' 30"	-0.55"	4° 11' 24"	1° 48' 51"	0.9971449	16' 02.38"	23° 26' 17"	-6 m 01 s
7	4° 36' 58"	-0.56"	4° 13' 41"	1° 49' 50"	0.9971571	16' 02.37"	23° 26' 17"	-6 m 01 s
8	4° 39' 27"	-0.56"	4° 15' 57"	1° 50' 49"	0.9971692	16' 02.35"	23° 26' 17"	-5 m 60 s
9	4° 41' 56"	-0.57"	4° 18' 14"	1° 51' 48"	0.9971813	16' 02.34"	23° 26' 17"	-5 m 59 s
10	4° 44' 24"	-0.57"	4° 20' 31"	1° 52' 47"	0.9971934	16' 02.33"	23° 26' 17"	-5 m 58 s
11	4° 46' 53"	-0.58"	4° 22' 47"	1° 53' 46"	0.9972055	16' 02.32"	23° 26' 17"	-5 m 58 s
12	4° 49' 22"	-0.58"	4° 25' 04"	1° 54' 45"	0.9972177	16' 02.31"	23° 26' 17"	-5 m 57 s
13	4° 51' 50"	-0.58"	4° 27' 20"	1° 55' 44"	0.9972298	16' 02.30"	23° 26' 17"	-5 m 56 s
14	4° 54' 19"	-0.59"	4° 29' 37"	1° 56' 43"	0.9972419	16' 02.28"	23° 26' 17"	-5 m 55 s
15	4° 56' 48"	-0.59"	4° 31' 53"	1° 57' 41"	0.9972540	16' 02.27"	23° 26' 17"	-5 m 55 s
16	4° 59' 16"	-0.59"	4° 34' 10"	1° 58' 40"	0.9972662	16' 02.26"	23° 26' 17"	-5 m 54 s
17	5° 01' 45"	-0.60"	4° 36' 26"	1° 59' 39"	0.9972783	16' 02.25"	23° 26' 17"	-5 m 53 s
18	5° 04' 14"	-0.60"	4° 38' 43"	2° 00' 38"	0.9972904	16' 02.24"	23° 26' 17"	-5 m 52 s
19	5° 06' 42"	-0.61"	4° 40' 59"	2° 01' 37"	0.9973026	16' 02.23"	23° 26' 17"	-5 m 52 s
20	5° 09' 11"	-0.61"	4° 43' 16"	2° 02' 36"	0.9973147	16' 02.21"	23° 26' 17"	-5 m 51 s
21	5° 11' 39"	-0.61"	4° 45' 33"	2° 03' 35"	0.9973268	16' 02.20"	23° 26' 17"	-5 m 50 s
22	5° 14' 08"	-0.62"	4° 47' 49"	2° 04' 34"	0.9973390	16' 02.19"	23° 26' 17"	-5 m 49 s
23	5° 16' 37"	-0.62"	4° 50' 06"	2° 05' 33"	0.9973511	16' 02.18"	23° 26' 17"	-5 m 49 s
24	5° 19' 05"	-0.62"	4° 52' 22"	2° 06' 32"	0.9973632	16' 02.17"	23° 26' 17"	-5 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	271° 13' 19"	-3° 08' 21"	271° 21' 52"	-26° 34' 17"	0° 59' 16"	16' 08.90"	89° 37' 36"	0.52832
1	271° 48' 41"	-3° 10' 52"	272° 01' 22"	-26° 36' 23"	0° 59' 15"	16' 08.85"	89° 20' 10"	0.52355
2	272° 24' 02"	-3° 13' 21"	272° 40' 53"	-26° 38' 17"	0° 59' 15"	16' 08.79"	89° 2' 42"	0.51878
3	272° 59' 23"	-3° 15' 48"	273° 20' 26"	-26° 40' 00"	0° 59' 15"	16' 08.72"	88° 45' 10"	0.51401
4	273° 34' 44"	-3° 18' 15"	273° 59' 59"	-26° 41' 33"	0° 59' 15"	16' 08.66"	88° 27' 36"	0.50924
5	274° 10' 05"	-3° 20' 40"	274° 39' 33"	-26° 42' 54"	0° 59' 14"	16' 08.59"	88° 9' 60"	0.50447
6	274° 45' 25"	-3° 23' 04"	275° 19' 07"	-26° 44' 05"	0° 59' 14"	16' 08.52"	87° 52' 21"	0.49969
7	275° 20' 46"	-3° 25' 27"	275° 58' 42"	-26° 45' 04"	0° 59' 14"	16' 08.45"	87° 34' 40"	0.49492
8	275° 56' 06"	-3° 27' 48"	276° 38' 17"	-26° 45' 53"	0° 59' 14"	16' 08.38"	87° 16' 57"	0.49015
9	276° 31' 27"	-3° 30' 08"	277° 17' 52"	-26° 46' 30"	0° 59' 13"	16' 08.31"	86° 59' 12"	0.48539
10	277° 06' 47"	-3° 32' 27"	277° 57' 28"	-26° 46' 57"	0° 59' 13"	16' 08.23"	86° 41' 26"	0.48062
11	277° 42' 07"	-3° 34' 44"	278° 37' 03"	-26° 47' 12"	0° 59' 13"	16' 08.15"	86° 23' 38"	0.47586
12	278° 17' 27"	-3° 36' 60"	279° 16' 38"	-26° 47' 17"	0° 59' 13"	16' 08.07"	86° 5' 49"	0.47109
13	278° 52' 46"	-3° 39' 14"	279° 56' 12"	-26° 47' 10"	0° 59' 12"	16' 07.99"	85° 47' 59"	0.46634
14	279° 28' 06"	-3° 41' 28"	280° 35' 46"	-26° 46' 53"	0° 59' 12"	16' 07.90"	85° 30' 08"	0.46158
15	280° 03' 25"	-3° 43' 39"	281° 15' 19"	-26° 46' 24"	0° 59' 12"	16' 07.81"	85° 12' 17"	0.45683
16	280° 38' 44"	-3° 45' 49"	281° 54' 52"	-26° 45' 45"	0° 59' 11"	16' 07.72"	84° 54' 25"	0.45209
17	281° 14' 03"	-3° 47' 58"	282° 34' 23"	-26° 44' 55"	0° 59' 11"	16' 07.63"	84° 36' 32"	0.44735
18	281° 49' 22"	-3° 50' 06"	283° 13' 54"	-26° 43' 53"	0° 59' 11"	16' 07.54"	84° 18' 39"	0.44261
19	282° 24' 40"	-3° 52' 11"	283° 53' 23"	-26° 42' 41"	0° 59' 10"	16' 07.44"	84° 0' 46"	0.43789
20	282° 59' 59"	-3° 54' 16"	284° 32' 51"	-26° 41' 18"	0° 59' 10"	16' 07.34"	83° 42' 54"	0.43316
21	283° 35' 17"	-3° 56' 19"	285° 12' 18"	-26° 39' 44"	0° 59' 10"	16' 07.25"	83° 25' 01"	0.42845
22	284° 10' 35"	-3° 58' 20"	285° 51' 43"	-26° 37' 59"	0° 59' 09"	16' 07.14"	83° 7' 09"	0.42374
23	284° 45' 52"	-4° 00' 20"	286° 31' 06"	-26° 36' 03"	0° 59' 09"	16' 07.04"	82° 49' 18"	0.41904
24	285° 21' 10"	-4° 02' 18"	287° 10' 27"	-26° 33' 56"	0° 59' 08"	16' 06.93"	82° 31' 27"	0.41435

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	5° 19' 05"	-0.62"	4° 52' 22"	2° 06' 32"	0.9973632	16' 02.17"	23° 26' 17"	-5 m 48 s
1	5° 21' 34"	-0.63"	4° 54' 39"	2° 07' 31"	0.9973754	16' 02.16"	23° 26' 17"	-5 m 47 s
2	5° 24' 03"	-0.63"	4° 56' 55"	2° 08' 30"	0.9973875	16' 02.14"	23° 26' 17"	-5 m 46 s
3	5° 26' 31"	-0.63"	4° 59' 12"	2° 09' 28"	0.9973996	16' 02.13"	23° 26' 17"	-5 m 46 s
4	5° 28' 60"	-0.64"	5° 01' 28"	2° 10' 27"	0.9974118	16' 02.12"	23° 26' 17"	-5 m 45 s
5	5° 31' 28"	-0.64"	5° 03' 45"	2° 11' 26"	0.9974239	16' 02.11"	23° 26' 17"	-5 m 44 s
6	5° 33' 57"	-0.64"	5° 06' 01"	2° 12' 25"	0.9974361	16' 02.10"	23° 26' 17"	-5 m 43 s
7	5° 36' 26"	-0.65"	5° 08' 18"	2° 13' 24"	0.9974482	16' 02.09"	23° 26' 17"	-5 m 42 s
8	5° 38' 54"	-0.65"	5° 10' 35"	2° 14' 23"	0.9974603	16' 02.07"	23° 26' 17"	-5 m 42 s
9	5° 41' 23"	-0.65"	5° 12' 51"	2° 15' 22"	0.9974725	16' 02.06"	23° 26' 17"	-5 m 41 s
10	5° 43' 51"	-0.66"	5° 15' 08"	2° 16' 20"	0.9974846	16' 02.05"	23° 26' 17"	-5 m 40 s
11	5° 46' 20"	-0.66"	5° 17' 24"	2° 17' 19"	0.9974968	16' 02.04"	23° 26' 17"	-5 m 39 s
12	5° 48' 49"	-0.66"	5° 19' 41"	2° 18' 18"	0.9975089	16' 02.03"	23° 26' 17"	-5 m 39 s
13	5° 51' 17"	-0.67"	5° 21' 57"	2° 19' 17"	0.9975211	16' 02.01"	23° 26' 17"	-5 m 38 s
14	5° 53' 46"	-0.67"	5° 24' 14"	2° 20' 16"	0.9975332	16' 02.00"	23° 26' 17"	-5 m 37 s
15	5° 56' 14"	-0.67"	5° 26' 30"	2° 21' 15"	0.9975453	16' 01.99"	23° 26' 17"	-5 m 36 s
16	5° 58' 43"	-0.68"	5° 28' 47"	2° 22' 14"	0.9975575	16' 01.98"	23° 26' 17"	-5 m 36 s
17	6° 01' 11"	-0.68"	5° 31' 04"	2° 23' 12"	0.9975696	16' 01.97"	23° 26' 17"	-5 m 35 s
18	6° 03' 40"	-0.68"	5° 33' 20"	2° 24' 11"	0.9975818	16' 01.96"	23° 26' 17"	-5 m 34 s
19	6° 06' 09"	-0.68"	5° 35' 37"	2° 25' 10"	0.9975939	16' 01.94"	23° 26' 17"	-5 m 33 s
20	6° 08' 37"	-0.69"	5° 37' 53"	2° 26' 09"	0.9976061	16' 01.93"	23° 26' 17"	-5 m 33 s
21	6° 11' 06"	-0.69"	5° 40' 10"	2° 27' 08"	0.9976182	16' 01.92"	23° 26' 17"	-5 m 32 s
22	6° 13' 34"	-0.69"	5° 42' 26"	2° 28' 06"	0.9976304	16' 01.91"	23° 26' 17"	-5 m 31 s
23	6° 16' 03"	-0.69"	5° 44' 43"	2° 29' 05"	0.9976425	16' 01.90"	23° 26' 17"	-5 m 30 s
24	6° 18' 31"	-0.70"	5° 46' 59"	2° 30' 04"	0.9976546	16' 01.89"	23° 26' 17"	-5 m 30 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	285° 21' 10"	-4° 02' 18"	287° 10' 27"	-26° 33' 56"	0° 59' 08"	16' 06.93"	82° 31' 27"	0.41435
1	285° 56' 27"	-4° 04' 15"	287° 49' 47"	-26° 31' 39"	0° 59' 08"	16' 06.83"	82° 13' 37"	0.40967
2	286° 31' 44"	-4° 06' 10"	288° 29' 04"	-26° 29' 11"	0° 59' 08"	16' 06.72"	81° 55' 49"	0.40499
3	287° 07' 01"	-4° 08' 03"	289° 08' 19"	-26° 26' 32"	0° 59' 07"	16' 06.60"	81° 38' 01"	0.40033
4	287° 42' 17"	-4° 09' 55"	289° 47' 32"	-26° 23' 42"	0° 59' 07"	16' 06.49"	81° 20' 15"	0.39567
5	288° 17' 33"	-4° 11' 46"	290° 26' 42"	-26° 20' 42"	0° 59' 06"	16' 06.37"	81° 2' 31"	0.39103
6	288° 52' 49"	-4° 13' 35"	291° 05' 50"	-26° 17' 31"	0° 59' 06"	16' 06.26"	80° 44' 48"	0.38639
7	289° 28' 05"	-4° 15' 22"	291° 44' 55"	-26° 14' 10"	0° 59' 05"	16' 06.14"	80° 27' 07"	0.38177
8	290° 03' 20"	-4° 17' 07"	292° 23' 57"	-26° 10' 38"	0° 59' 05"	16' 06.02"	80° 9' 28"	0.37716
9	290° 38' 35"	-4° 18' 51"	293° 02' 56"	-26° 06' 56"	0° 59' 05"	16' 05.89"	79° 51' 51"	0.37256
10	291° 13' 50"	-4° 20' 33"	293° 41' 52"	-26° 03' 03"	0° 59' 04"	16' 05.77"	79° 34' 16"	0.36798
11	291° 49' 04"	-4° 22' 14"	294° 20' 45"	-25° 58' 60"	0° 59' 04"	16' 05.64"	79° 16' 44"	0.36340
12	292° 24' 18"	-4° 23' 53"	294° 59' 35"	-25° 54' 46"	0° 59' 03"	16' 05.51"	78° 59' 15"	0.35884
13	292° 59' 32"	-4° 25' 30"	295° 38' 21"	-25° 50' 23"	0° 59' 03"	16' 05.38"	78° 41' 47"	0.35430
14	293° 34' 45"	-4° 27' 05"	296° 17' 04"	-25° 45' 49"	0° 59' 02"	16' 05.24"	78° 24' 23"	0.34976
15	294° 09' 58"	-4° 28' 39"	296° 55' 43"	-25° 41' 05"	0° 59' 02"	16' 05.11"	78° 7' 02"	0.34525
16	294° 45' 11"	-4° 30' 11"	297° 34' 19"	-25° 36' 10"	0° 59' 01"	16' 04.97"	77° 49' 44"	0.34074
17	295° 20' 23"	-4° 31' 42"	298° 12' 51"	-25° 31' 06"	0° 59' 01"	16' 04.83"	77° 32' 28"	0.33626
18	295° 55' 35"	-4° 33' 10"	298° 51' 19"	-25° 25' 52"	0° 59' 00"	16' 04.69"	77° 15' 16"	0.33179
19	296° 30' 46"	-4° 34' 37"	299° 29' 43"	-25° 20' 28"	0° 58' 60"	16' 04.54"	76° 58' 08"	0.32733
20	297° 05' 58"	-4° 36' 02"	300° 08' 03"	-25° 14' 54"	0° 58' 59"	16' 04.40"	76° 41' 03"	0.32289
21	297° 41' 08"	-4° 37' 26"	300° 46' 19"	-25° 09' 10"	0° 58' 59"	16' 04.25"	76° 24' 01"	0.31847
22	298° 16' 19"	-4° 38' 47"	301° 24' 30"	-25° 03' 16"	0° 58' 58"	16' 04.10"	76° 7' 04"	0.31407
23	298° 51' 29"	-4° 40' 07"	302° 02' 38"	-24° 57' 13"	0° 58' 57"	16' 03.95"	75° 50' 10"	0.30968
24	299° 26' 38"	-4° 41' 25"	302° 40' 40"	-24° 50' 60"	0° 58' 57"	16' 03.79"	75° 33' 19"	0.30531

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Oblliquity	Equation Of Time
0	6° 18' 31"	-0.70"	5° 46' 59"	2° 30' 04"	0.9976546	16' 01.89"	23° 26' 17"	-5 m 30 s
1	6° 20' 60"	-0.70"	5° 49' 16"	2° 31' 03"	0.9976668	16' 01.87"	23° 26' 17"	-5 m 29 s
2	6° 23' 28"	-0.70"	5° 51' 33"	2° 32' 02"	0.9976789	16' 01.86"	23° 26' 17"	-5 m 28 s
3	6° 25' 57"	-0.70"	5° 53' 49"	2° 33' 00"	0.9976911	16' 01.85"	23° 26' 17"	-5 m 27 s
4	6° 28' 26"	-0.71"	5° 56' 06"	2° 33' 59"	0.9977032	16' 01.84"	23° 26' 17"	-5 m 27 s
5	6° 30' 54"	-0.71"	5° 58' 22"	2° 34' 58"	0.9977154	16' 01.83"	23° 26' 17"	-5 m 26 s
6	6° 33' 23"	-0.71"	6° 00' 39"	2° 35' 57"	0.9977275	16' 01.82"	23° 26' 17"	-5 m 25 s
7	6° 35' 51"	-0.71"	6° 02' 55"	2° 36' 55"	0.9977397	16' 01.80"	23° 26' 17"	-5 m 24 s
8	6° 38' 20"	-0.71"	6° 05' 12"	2° 37' 54"	0.9977518	16' 01.79"	23° 26' 17"	-5 m 24 s
9	6° 40' 48"	-0.72"	6° 07' 28"	2° 38' 53"	0.9977639	16' 01.78"	23° 26' 17"	-5 m 23 s
10	6° 43' 17"	-0.72"	6° 09' 45"	2° 39' 52"	0.9977761	16' 01.77"	23° 26' 17"	-5 m 22 s
11	6° 45' 45"	-0.72"	6° 12' 02"	2° 40' 50"	0.9977882	16' 01.76"	23° 26' 17"	-5 m 21 s
12	6° 48' 14"	-0.72"	6° 14' 18"	2° 41' 49"	0.9978004	16' 01.75"	23° 26' 17"	-5 m 21 s
13	6° 50' 42"	-0.72"	6° 16' 35"	2° 42' 48"	0.9978125	16' 01.73"	23° 26' 17"	-5 m 20 s
14	6° 53' 11"	-0.73"	6° 18' 51"	2° 43' 46"	0.9978247	16' 01.72"	23° 26' 17"	-5 m 19 s
15	6° 55' 39"	-0.73"	6° 21' 08"	2° 44' 45"	0.9978368	16' 01.71"	23° 26' 17"	-5 m 18 s
16	6° 58' 08"	-0.73"	6° 23' 24"	2° 45' 44"	0.9978489	16' 01.70"	23° 26' 17"	-5 m 18 s
17	7° 00' 36"	-0.73"	6° 25' 41"	2° 46' 43"	0.9978611	16' 01.69"	23° 26' 17"	-5 m 17 s
18	7° 03' 05"	-0.73"	6° 27' 58"	2° 47' 41"	0.9978732	16' 01.68"	23° 26' 17"	-5 m 16 s
19	7° 05' 33"	-0.73"	6° 30' 14"	2° 48' 40"	0.9978854	16' 01.66"	23° 26' 17"	-5 m 15 s
20	7° 08' 02"	-0.74"	6° 32' 31"	2° 49' 39"	0.9978975	16' 01.65"	23° 26' 17"	-5 m 15 s
21	7° 10' 30"	-0.74"	6° 34' 47"	2° 50' 37"	0.9979096	16' 01.64"	23° 26' 17"	-5 m 14 s
22	7° 12' 59"	-0.74"	6° 37' 04"	2° 51' 36"	0.9979218	16' 01.63"	23° 26' 17"	-5 m 13 s
23	7° 15' 27"	-0.74"	6° 39' 20"	2° 52' 35"	0.9979339	16' 01.62"	23° 26' 17"	-5 m 12 s
24	7° 17' 56"	-0.74"	6° 41' 37"	2° 53' 33"	0.9979461	16' 01.61"	23° 26' 17"	-5 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	299° 26' 38"	-4° 41' 25"	302° 40' 40"	-24° 50' 60"	0° 58' 57"	16' 03.79"	75° 33' 19"	0.30531
1	300° 01' 47"	-4° 42' 41"	303° 18' 39"	-24° 44' 38"	0° 58' 56"	16' 03.64"	75° 16' 33"	0.30096
2	300° 36' 56"	-4° 43' 56"	303° 56' 33"	-24° 38' 06"	0° 58' 56"	16' 03.48"	74° 59' 51"	0.29663
3	301° 12' 04"	-4° 45' 08"	304° 34' 22"	-24° 31' 25"	0° 58' 55"	16' 03.32"	74° 43' 13"	0.29232
4	301° 47' 12"	-4° 46' 19"	305° 12' 06"	-24° 24' 34"	0° 58' 55"	16' 03.16"	74° 26' 40"	0.28803
5	302° 22' 19"	-4° 47' 28"	305° 49' 46"	-24° 17' 34"	0° 58' 54"	16' 02.99"	74° 10' 10"	0.28376
6	302° 57' 26"	-4° 48' 36"	306° 27' 21"	-24° 10' 25"	0° 58' 53"	16' 02.83"	73° 53' 45"	0.27951
7	303° 32' 32"	-4° 49' 41"	307° 04' 51"	-24° 03' 07"	0° 58' 53"	16' 02.66"	73° 37' 25"	0.27528
8	304° 07' 38"	-4° 50' 45"	307° 42' 16"	-23° 55' 40"	0° 58' 52"	16' 02.49"	73° 21' 08"	0.27107
9	304° 42' 43"	-4° 51' 46"	308° 19' 36"	-23° 48' 05"	0° 58' 51"	16' 02.32"	73° 4' 57"	0.26689
10	305° 17' 48"	-4° 52' 46"	308° 56' 51"	-23° 40' 20"	0° 58' 51"	16' 02.14"	72° 48' 50"	0.26272
11	305° 52' 52"	-4° 53' 44"	309° 34' 01"	-23° 32' 26"	0° 58' 50"	16' 01.97"	72° 32' 48"	0.25858
12	306° 27' 56"	-4° 54' 40"	310° 11' 05"	-23° 24' 24"	0° 58' 50"	16' 01.79"	72° 16' 51"	0.25446
13	307° 02' 59"	-4° 55' 35"	310° 48' 05"	-23° 16' 14"	0° 58' 49"	16' 01.61"	72° 0' 58"	0.25037
14	307° 38' 01"	-4° 56' 27"	311° 24' 59"	-23° 07' 54"	0° 58' 48"	16' 01.42"	71° 45' 10"	0.24630
15	308° 13' 03"	-4° 57' 18"	312° 01' 48"	-22° 59' 27"	0° 58' 48"	16' 01.24"	71° 29' 27"	0.24225
16	308° 48' 05"	-4° 58' 07"	312° 38' 31"	-22° 50' 51"	0° 58' 47"	16' 01.05"	71° 13' 49"	0.23822
17	309° 23' 06"	-4° 58' 54"	313° 15' 09"	-22° 42' 07"	0° 58' 46"	16' 00.86"	70° 58' 16"	0.23422
18	309° 58' 06"	-4° 59' 38"	313° 51' 42"	-22° 33' 14"	0° 58' 45"	16' 00.67"	70° 42' 47"	0.23025
19	310° 33' 05"	-5° 00' 22"	314° 28' 09"	-22° 24' 14"	0° 58' 45"	16' 00.48"	70° 27' 24"	0.22630
20	311° 08' 04"	-5° 01' 03"	315° 04' 31"	-22° 15' 05"	0° 58' 44"	16' 00.29"	70° 12' 06"	0.22238
21	311° 43' 03"	-5° 01' 42"	315° 40' 47"	-22° 05' 49"	0° 58' 43"	16' 00.09"	69° 56' 52"	0.21848
22	312° 18' 00"	-5° 02' 20"	316° 16' 58"	-21° 56' 25"	0° 58' 43"	15' 59.89"	69° 41' 44"	0.21461
23	312° 52' 57"	-5° 02' 55"	316° 53' 03"	-21° 46' 53"	0° 58' 42"	15' 59.69"	69° 26' 40"	0.21077
24	313° 27' 54"	-5° 03' 29"	317° 29' 03"	-21° 37' 14"	0° 58' 41"	15' 59.49"	69° 11' 42"	0.20695

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	7° 17' 56"	-0.74"	6° 41' 37"	2° 53' 33"	0.9979461	16' 01.61"	23° 26' 17"	-5 m 12 s
1	7° 20' 24"	-0.74"	6° 43' 54"	2° 54' 32"	0.9979582	16' 01.59"	23° 26' 17"	-5 m 11 s
2	7° 22' 53"	-0.74"	6° 46' 10"	2° 55' 31"	0.9979703	16' 01.58"	23° 26' 17"	-5 m 10 s
3	7° 25' 21"	-0.74"	6° 48' 27"	2° 56' 29"	0.9979825	16' 01.57"	23° 26' 17"	-5 m 09 s
4	7° 27' 50"	-0.75"	6° 50' 43"	2° 57' 28"	0.9979946	16' 01.56"	23° 26' 17"	-5 m 09 s
5	7° 30' 18"	-0.75"	6° 52' 60"	2° 58' 26"	0.9980067	16' 01.55"	23° 26' 17"	-5 m 08 s
6	7° 32' 46"	-0.75"	6° 55' 16"	2° 59' 25"	0.9980189	16' 01.53"	23° 26' 17"	-5 m 07 s
7	7° 35' 15"	-0.75"	6° 57' 33"	3° 00' 24"	0.9980310	16' 01.52"	23° 26' 17"	-5 m 06 s
8	7° 37' 43"	-0.75"	6° 59' 50"	3° 01' 22"	0.9980431	16' 01.51"	23° 26' 17"	-5 m 06 s
9	7° 40' 12"	-0.75"	7° 02' 06"	3° 02' 21"	0.9980553	16' 01.50"	23° 26' 17"	-5 m 05 s
10	7° 42' 40"	-0.75"	7° 04' 23"	3° 03' 20"	0.9980674	16' 01.49"	23° 26' 17"	-5 m 04 s
11	7° 45' 09"	-0.75"	7° 06' 39"	3° 04' 18"	0.9980795	16' 01.48"	23° 26' 17"	-5 m 03 s
12	7° 47' 37"	-0.75"	7° 08' 56"	3° 05' 17"	0.9980917	16' 01.46"	23° 26' 17"	-5 m 03 s
13	7° 50' 06"	-0.75"	7° 11' 13"	3° 06' 15"	0.9981038	16' 01.45"	23° 26' 17"	-5 m 02 s
14	7° 52' 34"	-0.75"	7° 13' 29"	3° 07' 14"	0.9981159	16' 01.44"	23° 26' 17"	-5 m 01 s
15	7° 55' 02"	-0.75"	7° 15' 46"	3° 08' 12"	0.9981280	16' 01.43"	23° 26' 17"	-5 m 00 s
16	7° 57' 31"	-0.75"	7° 18' 02"	3° 09' 11"	0.9981402	16' 01.42"	23° 26' 17"	-4 m 60 s
17	7° 59' 59"	-0.76"	7° 20' 19"	3° 10' 10"	0.9981523	16' 01.41"	23° 26' 17"	-4 m 59 s
18	8° 02' 28"	-0.76"	7° 22' 35"	3° 11' 08"	0.9981644	16' 01.39"	23° 26' 17"	-4 m 58 s
19	8° 04' 56"	-0.76"	7° 24' 52"	3° 12' 07"	0.9981765	16' 01.38"	23° 26' 17"	-4 m 57 s
20	8° 07' 25"	-0.76"	7° 27' 09"	3° 13' 05"	0.9981886	16' 01.37"	23° 26' 17"	-4 m 57 s
21	8° 09' 53"	-0.76"	7° 29' 25"	3° 14' 04"	0.9982008	16' 01.36"	23° 26' 17"	-4 m 56 s
22	8° 12' 21"	-0.76"	7° 31' 42"	3° 15' 02"	0.9982129	16' 01.35"	23° 26' 17"	-4 m 55 s
23	8° 14' 50"	-0.76"	7° 33' 58"	3° 16' 01"	0.9982250	16' 01.34"	23° 26' 17"	-4 m 54 s
24	8° 17' 18"	-0.76"	7° 36' 15"	3° 16' 59"	0.9982371	16' 01.32"	23° 26' 17"	-4 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	313° 27' 54"	-5° 03' 29"	317° 29' 03"	-21° 37' 14"	0° 58' 41"	15' 59.49"	69° 11' 42"	0.20695
1	314° 02' 49"	-5° 04' 01"	318° 04' 57"	-21° 27' 27"	0° 58' 40"	15' 59.28"	68° 56' 48"	0.20316
2	314° 37' 44"	-5° 04' 31"	318° 40' 45"	-21° 17' 32"	0° 58' 40"	15' 59.07"	68° 41' 60"	0.19940
3	315° 12' 39"	-5° 04' 59"	319° 16' 28"	-21° 07' 30"	0° 58' 39"	15' 58.86"	68° 27' 16"	0.19566
4	315° 47' 32"	-5° 05' 25"	319° 52' 05"	-20° 57' 21"	0° 58' 38"	15' 58.65"	68° 12' 37"	0.19195
5	316° 22' 25"	-5° 05' 49"	320° 27' 36"	-20° 47' 05"	0° 58' 37"	15' 58.44"	67° 58' 04"	0.18828
6	316° 57' 17"	-5° 06' 11"	321° 03' 02"	-20° 36' 42"	0° 58' 36"	15' 58.22"	67° 43' 34"	0.18463
7	317° 32' 09"	-5° 06' 31"	321° 38' 22"	-20° 26' 12"	0° 58' 36"	15' 58.00"	67° 29' 10"	0.18101
8	318° 06' 59"	-5° 06' 50"	322° 13' 36"	-20° 15' 34"	0° 58' 35"	15' 57.78"	67° 14' 51"	0.17742
9	318° 41' 49"	-5° 07' 07"	322° 48' 45"	-20° 04' 51"	0° 58' 34"	15' 57.56"	67° 0' 36"	0.17386
10	319° 16' 38"	-5° 07' 21"	323° 23' 48"	-19° 53' 60"	0° 58' 33"	15' 57.34"	66° 46' 25"	0.17033
11	319° 51' 26"	-5° 07' 34"	323° 58' 46"	-19° 43' 03"	0° 58' 32"	15' 57.11"	66° 32' 20"	0.16683
12	320° 26' 14"	-5° 07' 45"	324° 33' 38"	-19° 31' 59"	0° 58' 32"	15' 56.88"	66° 18' 18"	0.16336
13	321° 01' 00"	-5° 07' 54"	325° 08' 24"	-19° 20' 49"	0° 58' 31"	15' 56.65"	66° 4' 21"	0.15992
14	321° 35' 46"	-5° 08' 01"	325° 43' 04"	-19° 09' 32"	0° 58' 30"	15' 56.42"	65° 50' 29"	0.15651
15	322° 10' 31"	-5° 08' 06"	326° 17' 39"	-18° 58' 10"	0° 58' 29"	15' 56.19"	65° 36' 40"	0.15314
16	322° 45' 15"	-5° 08' 09"	326° 52' 09"	-18° 46' 41"	0° 58' 28"	15' 55.95"	65° 22' 56"	0.14980
17	323° 19' 58"	-5° 08' 11"	327° 26' 33"	-18° 35' 06"	0° 58' 27"	15' 55.71"	65° 9' 15"	0.14649
18	323° 54' 41"	-5° 08' 10"	328° 00' 51"	-18° 23' 25"	0° 58' 26"	15' 55.47"	64° 55' 39"	0.14321
19	324° 29' 22"	-5° 08' 08"	328° 35' 03"	-18° 11' 39"	0° 58' 25"	15' 55.23"	64° 42' 06"	0.13996
20	325° 04' 02"	-5° 08' 04"	329° 09' 10"	-17° 59' 47"	0° 58' 25"	15' 54.98"	64° 28' 37"	0.13675
21	325° 38' 42"	-5° 07' 58"	329° 43' 12"	-17° 47' 49"	0° 58' 24"	15' 54.73"	64° 15' 11"	0.13357
22	326° 13' 21"	-5° 07' 50"	330° 17' 08"	-17° 35' 45"	0° 58' 23"	15' 54.48"	64° 1' 48"	0.13042
23	326° 47' 58"	-5° 07' 40"	330° 50' 59"	-17° 23' 36"	0° 58' 22"	15' 54.23"	63° 48' 29"	0.12731
24	327° 22' 35"	-5° 07' 28"	331° 24' 44"	-17° 11' 22"	0° 58' 21"	15' 53.98"	63° 35' 12"	0.12423

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	8° 17' 18"	-0.76"	7° 36' 15"	3° 16' 59"	0.9982371	16' 01.32"	23° 26' 17"	-4 m 53 s
1	8° 19' 47"	-0.76"	7° 38' 32"	3° 17' 58"	0.9982492	16' 01.31"	23° 26' 17"	-4 m 53 s
2	8° 22' 15"	-0.76"	7° 40' 48"	3° 18' 56"	0.9982613	16' 01.30"	23° 26' 17"	-4 m 52 s
3	8° 24' 43"	-0.76"	7° 43' 05"	3° 19' 55"	0.9982734	16' 01.29"	23° 26' 17"	-4 m 51 s
4	8° 27' 12"	-0.76"	7° 45' 21"	3° 20' 53"	0.9982856	16' 01.28"	23° 26' 17"	-4 m 50 s
5	8° 29' 40"	-0.76"	7° 47' 38"	3° 21' 52"	0.9982977	16' 01.27"	23° 26' 17"	-4 m 50 s
6	8° 32' 09"	-0.76"	7° 49' 55"	3° 22' 50"	0.9983098	16' 01.25"	23° 26' 17"	-4 m 49 s
7	8° 34' 37"	-0.76"	7° 52' 11"	3° 23' 49"	0.9983219	16' 01.24"	23° 26' 17"	-4 m 48 s
8	8° 37' 05"	-0.76"	7° 54' 28"	3° 24' 47"	0.9983340	16' 01.23"	23° 26' 17"	-4 m 47 s
9	8° 39' 34"	-0.75"	7° 56' 45"	3° 25' 46"	0.9983461	16' 01.22"	23° 26' 17"	-4 m 47 s
10	8° 42' 02"	-0.75"	7° 59' 01"	3° 26' 44"	0.9983582	16' 01.21"	23° 26' 17"	-4 m 46 s
11	8° 44' 30"	-0.75"	8° 01' 18"	3° 27' 42"	0.9983703	16' 01.20"	23° 26' 17"	-4 m 45 s
12	8° 46' 59"	-0.75"	8° 03' 34"	3° 28' 41"	0.9983824	16' 01.18"	23° 26' 17"	-4 m 44 s
13	8° 49' 27"	-0.75"	8° 05' 51"	3° 29' 39"	0.9983945	16' 01.17"	23° 26' 17"	-4 m 44 s
14	8° 51' 56"	-0.75"	8° 08' 08"	3° 30' 38"	0.9984066	16' 01.16"	23° 26' 17"	-4 m 43 s
15	8° 54' 24"	-0.75"	8° 10' 24"	3° 31' 36"	0.9984187	16' 01.15"	23° 26' 17"	-4 m 42 s
16	8° 56' 52"	-0.75"	8° 12' 41"	3° 32' 35"	0.9984308	16' 01.14"	23° 26' 17"	-4 m 41 s
17	8° 59' 21"	-0.75"	8° 14' 58"	3° 33' 33"	0.9984429	16' 01.13"	23° 26' 17"	-4 m 41 s
18	9° 01' 49"	-0.75"	8° 17' 14"	3° 34' 31"	0.9984550	16' 01.11"	23° 26' 17"	-4 m 40 s
19	9° 04' 17"	-0.75"	8° 19' 31"	3° 35' 30"	0.9984670	16' 01.10"	23° 26' 17"	-4 m 39 s
20	9° 06' 46"	-0.75"	8° 21' 47"	3° 36' 28"	0.9984791	16' 01.09"	23° 26' 17"	-4 m 38 s
21	9° 09' 14"	-0.75"	8° 24' 04"	3° 37' 26"	0.9984912	16' 01.08"	23° 26' 17"	-4 m 38 s
22	9° 11' 42"	-0.74"	8° 26' 21"	3° 38' 25"	0.9985033	16' 01.07"	23° 26' 17"	-4 m 37 s
23	9° 14' 11"	-0.74"	8° 28' 37"	3° 39' 23"	0.9985154	16' 01.06"	23° 26' 17"	-4 m 36 s
24	9° 16' 39"	-0.74"	8° 30' 54"	3° 40' 22"	0.9985275	16' 01.05"	23° 26' 17"	-4 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	327° 22' 35"	-5° 07' 28"	331° 24' 44"	-17° 11' 22"	0° 58' 21"	15' 53.98"	63° 35' 12"	0.12423
1	327° 57' 11"	-5° 07' 14"	331° 58' 24"	-16° 59' 02"	0° 58' 20"	15' 53.72"	63° 21' 58"	0.12118
2	328° 31' 46"	-5° 06' 59"	332° 31' 58"	-16° 46' 37"	0° 58' 19"	15' 53.46"	63° 8' 47"	0.11817
3	329° 06' 19"	-5° 06' 41"	333° 05' 27"	-16° 34' 07"	0° 58' 18"	15' 53.20"	62° 55' 38"	0.11519
4	329° 40' 52"	-5° 06' 22"	333° 38' 51"	-16° 21' 32"	0° 58' 17"	15' 52.94"	62° 42' 31"	0.11225
5	330° 15' 24"	-5° 06' 01"	334° 12' 10"	-16° 08' 52"	0° 58' 16"	15' 52.68"	62° 29' 26"	0.10935
6	330° 49' 55"	-5° 05' 38"	334° 45' 23"	-15° 56' 08"	0° 58' 15"	15' 52.41"	62° 16' 23"	0.10647
7	331° 24' 24"	-5° 05' 13"	335° 18' 31"	-15° 43' 18"	0° 58' 14"	15' 52.14"	62° 3' 21"	0.10364
8	331° 58' 53"	-5° 04' 47"	335° 51' 34"	-15° 30' 24"	0° 58' 13"	15' 51.87"	61° 50' 20"	0.10084
9	332° 33' 20"	-5° 04' 18"	336° 24' 32"	-15° 17' 26"	0° 58' 12"	15' 51.60"	61° 37' 19"	0.09807
10	333° 07' 47"	-5° 03' 48"	336° 57' 25"	-15° 04' 23"	0° 58' 11"	15' 51.32"	61° 24' 19"	0.09534
11	333° 42' 12"	-5° 03' 16"	337° 30' 12"	-14° 51' 16"	0° 58' 10"	15' 51.05"	61° 11' 19"	0.09265
12	334° 16' 36"	-5° 02' 42"	338° 02' 55"	-14° 38' 04"	0° 58' 09"	15' 50.77"	60° 58' 19"	0.09000
13	334° 50' 59"	-5° 02' 07"	338° 35' 33"	-14° 24' 48"	0° 58' 08"	15' 50.49"	60° 45' 18"	0.08738
14	335° 25' 21"	-5° 01' 29"	339° 08' 05"	-14° 11' 29"	0° 58' 07"	15' 50.20"	60° 32' 15"	0.08479
15	335° 59' 42"	-5° 00' 50"	339° 40' 33"	-13° 58' 05"	0° 58' 06"	15' 49.92"	60° 19' 12"	0.08225
16	336° 34' 02"	-5° 00' 09"	340° 12' 56"	-13° 44' 37"	0° 58' 05"	15' 49.63"	60° 6' 06"	0.07974
17	337° 08' 20"	-4° 59' 26"	340° 45' 15"	-13° 31' 06"	0° 58' 04"	15' 49.34"	59° 52' 57"	0.07727
18	337° 42' 37"	-4° 58' 41"	341° 17' 28"	-13° 17' 31"	0° 58' 03"	15' 49.05"	59° 39' 46"	0.07484
19	338° 16' 53"	-4° 57' 55"	341° 49' 37"	-13° 03' 52"	0° 58' 02"	15' 48.75"	59° 26' 31"	0.07244
20	338° 51' 08"	-4° 57' 07"	342° 21' 42"	-12° 50' 10"	0° 58' 01"	15' 48.46"	59° 13' 11"	0.07008
21	339° 25' 22"	-4° 56' 17"	342° 53' 41"	-12° 36' 24"	0° 57' 60"	15' 48.16"	58° 59' 47"	0.06776
22	339° 59' 34"	-4° 55' 25"	343° 25' 37"	-12° 22' 35"	0° 57' 58"	15' 47.86"	58° 46' 17"	0.06548
23	340° 33' 45"	-4° 54' 32"	343° 57' 27"	-12° 08' 43"	0° 57' 57"	15' 47.56"	58° 32' 40"	0.06324
24	341° 07' 55"	-4° 53' 37"	344° 29' 14"	-11° 54' 47"	0° 57' 56"	15' 47.26"	58° 18' 57"	0.06103

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	9° 16' 39"	-0.74"	8° 30' 54"	3° 40' 22"	0.9985275	16' 01.05"	23° 26' 17"	-4 m 35 s
1	9° 19' 07"	-0.74"	8° 33' 11"	3° 41' 20"	0.9985395	16' 01.03"	23° 26' 17"	-4 m 35 s
2	9° 21' 36"	-0.74"	8° 35' 27"	3° 42' 18"	0.9985516	16' 01.02"	23° 26' 17"	-4 m 34 s
3	9° 24' 04"	-0.74"	8° 37' 44"	3° 43' 17"	0.9985637	16' 01.01"	23° 26' 17"	-4 m 33 s
4	9° 26' 32"	-0.74"	8° 40' 01"	3° 44' 15"	0.9985758	16' 01.00"	23° 26' 17"	-4 m 32 s
5	9° 29' 00"	-0.73"	8° 42' 17"	3° 45' 13"	0.9985878	16' 00.99"	23° 26' 17"	-4 m 32 s
6	9° 31' 29"	-0.73"	8° 44' 34"	3° 46' 11"	0.9985999	16' 00.98"	23° 26' 17"	-4 m 31 s
7	9° 33' 57"	-0.73"	8° 46' 50"	3° 47' 10"	0.9986120	16' 00.96"	23° 26' 17"	-4 m 30 s
8	9° 36' 25"	-0.73"	8° 49' 07"	3° 48' 08"	0.9986241	16' 00.95"	23° 26' 17"	-4 m 29 s
9	9° 38' 54"	-0.73"	8° 51' 24"	3° 49' 06"	0.9986361	16' 00.94"	23° 26' 17"	-4 m 29 s
10	9° 41' 22"	-0.73"	8° 53' 40"	3° 50' 05"	0.9986482	16' 00.93"	23° 26' 17"	-4 m 28 s
11	9° 43' 50"	-0.72"	8° 55' 57"	3° 51' 03"	0.9986602	16' 00.92"	23° 26' 17"	-4 m 27 s
12	9° 46' 19"	-0.72"	8° 58' 14"	3° 52' 01"	0.9986723	16' 00.91"	23° 26' 17"	-4 m 26 s
13	9° 48' 47"	-0.72"	9° 00' 30"	3° 52' 59"	0.9986844	16' 00.89"	23° 26' 17"	-4 m 26 s
14	9° 51' 15"	-0.72"	9° 02' 47"	3° 53' 58"	0.9986964	16' 00.88"	23° 26' 17"	-4 m 25 s
15	9° 53' 43"	-0.72"	9° 05' 04"	3° 54' 56"	0.9987085	16' 00.87"	23° 26' 17"	-4 m 24 s
16	9° 56' 12"	-0.71"	9° 07' 20"	3° 55' 54"	0.9987205	16' 00.86"	23° 26' 17"	-4 m 23 s
17	9° 58' 40"	-0.71"	9° 09' 37"	3° 56' 52"	0.9987326	16' 00.85"	23° 26' 17"	-4 m 23 s
18	10° 01' 08"	-0.71"	9° 11' 54"	3° 57' 51"	0.9987446	16' 00.84"	23° 26' 17"	-4 m 22 s
19	10° 03' 36"	-0.71"	9° 14' 10"	3° 58' 49"	0.9987567	16' 00.82"	23° 26' 17"	-4 m 21 s
20	10° 06' 05"	-0.71"	9° 16' 27"	3° 59' 47"	0.9987687	16' 00.81"	23° 26' 17"	-4 m 21 s
21	10° 08' 33"	-0.70"	9° 18' 44"	4° 00' 45"	0.9987808	16' 00.80"	23° 26' 17"	-4 m 20 s
22	10° 11' 01"	-0.70"	9° 21' 01"	4° 01' 43"	0.9987928	16' 00.79"	23° 26' 17"	-4 m 19 s
23	10° 13' 29"	-0.70"	9° 23' 17"	4° 02' 42"	0.9988049	16' 00.78"	23° 26' 17"	-4 m 18 s
24	10° 15' 58"	-0.70"	9° 25' 34"	4° 03' 40"	0.9988169	16' 00.77"	23° 26' 17"	-4 m 18 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	341° 07' 55"	-4° 53' 37"	344° 29' 14"	-11° 54' 47"	0° 57' 56"	15' 47.26"	58° 18' 57"	0.06103
1	341° 42' 04"	-4° 52' 40"	345° 00' 56"	-11° 40' 49"	0° 57' 55"	15' 46.95"	58° 5' 05"	0.05887
2	342° 16' 11"	-4° 51' 41"	345° 32' 33"	-11° 26' 47"	0° 57' 54"	15' 46.64"	57° 51' 04"	0.05674
3	342° 50' 17"	-4° 50' 41"	346° 04' 07"	-11° 12' 43"	0° 57' 53"	15' 46.34"	57° 36' 54"	0.05465
4	343° 24' 22"	-4° 49' 39"	346° 35' 36"	-10° 58' 35"	0° 57' 52"	15' 46.02"	57° 22' 33"	0.05260
5	343° 58' 25"	-4° 48' 36"	347° 07' 01"	-10° 44' 25"	0° 57' 51"	15' 45.71"	57° 7' 59"	0.05059
6	344° 32' 27"	-4° 47' 30"	347° 38' 22"	-10° 30' 13"	0° 57' 49"	15' 45.40"	56° 53' 12"	0.04861
7	345° 06' 27"	-4° 46' 24"	348° 09' 39"	-10° 15' 57"	0° 57' 48"	15' 45.08"	56° 38' 10"	0.04668
8	345° 40' 27"	-4° 45' 15"	348° 40' 51"	-10° 01' 40"	0° 57' 47"	15' 44.76"	56° 22' 52"	0.04479
9	346° 14' 25"	-4° 44' 05"	349° 12' 00"	-9° 47' 19"	0° 57' 46"	15' 44.44"	56° 7' 17"	0.04293
10	346° 48' 21"	-4° 42' 53"	349° 43' 06"	-9° 32' 57"	0° 57' 45"	15' 44.12"	55° 51' 22"	0.04112
11	347° 22' 16"	-4° 41' 40"	350° 14' 07"	-9° 18' 32"	0° 57' 43"	15' 43.79"	55° 35' 05"	0.03934
12	347° 56' 10"	-4° 40' 24"	350° 45' 04"	-9° 04' 06"	0° 57' 42"	15' 43.47"	55° 18' 26"	0.03761
13	348° 30' 02"	-4° 39' 08"	351° 15' 58"	-8° 49' 37"	0° 57' 41"	15' 43.14"	55° 1' 21"	0.03591
14	349° 03' 53"	-4° 37' 50"	351° 46' 49"	-8° 35' 06"	0° 57' 40"	15' 42.81"	54° 43' 48"	0.03425
15	349° 37' 42"	-4° 36' 30"	352° 17' 35"	-8° 20' 33"	0° 57' 39"	15' 42.48"	54° 25' 45"	0.03264
16	350° 11' 30"	-4° 35' 08"	352° 48' 19"	-8° 05' 59"	0° 57' 37"	15' 42.14"	54° 7' 08"	0.03106
17	350° 45' 17"	-4° 33' 45"	353° 18' 58"	-7° 51' 22"	0° 57' 36"	15' 41.81"	53° 47' 55"	0.02952
18	351° 19' 02"	-4° 32' 21"	353° 49' 35"	-7° 36' 44"	0° 57' 35"	15' 41.47"	53° 28' 01"	0.02803
19	351° 52' 45"	-4° 30' 55"	354° 20' 08"	-7° 22' 05"	0° 57' 34"	15' 41.13"	53° 7' 24"	0.02657
20	352° 26' 27"	-4° 29' 28"	354° 50' 38"	-7° 07' 24"	0° 57' 32"	15' 40.79"	52° 45' 59"	0.02515
21	353° 00' 08"	-4° 27' 58"	355° 21' 04"	-6° 52' 41"	0° 57' 31"	15' 40.45"	52° 23' 41"	0.02378
22	353° 33' 47"	-4° 26' 28"	355° 51' 28"	-6° 37' 58"	0° 57' 30"	15' 40.11"	52° 0' 24"	0.02244
23	354° 07' 24"	-4° 24' 56"	356° 21' 48"	-6° 23' 13"	0° 57' 29"	15' 39.76"	51° 36' 04"	0.02115
24	354° 41' 00"	-4° 23' 23"	356° 52' 05"	-6° 08' 27"	0° 57' 27"	15' 39.42"	51° 10' 32"	0.01989



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	10° 15' 58"	-0.70"	9° 25' 34"	4° 03' 40"	0.9988169	16' 00.77"	23° 26' 17"	-4 m 18 s
1	10° 18' 26"	-0.69"	9° 27' 51"	4° 04' 38"	0.9988289	16' 00.76"	23° 26' 17"	-4 m 17 s
2	10° 20' 54"	-0.69"	9° 30' 07"	4° 05' 36"	0.9988410	16' 00.74"	23° 26' 17"	-4 m 16 s
3	10° 23' 22"	-0.69"	9° 32' 24"	4° 06' 34"	0.9988530	16' 00.73"	23° 26' 17"	-4 m 15 s
4	10° 25' 51"	-0.69"	9° 34' 41"	4° 07' 32"	0.9988650	16' 00.72"	23° 26' 17"	-4 m 15 s
5	10° 28' 19"	-0.68"	9° 36' 57"	4° 08' 30"	0.9988771	16' 00.71"	23° 26' 17"	-4 m 14 s
6	10° 30' 47"	-0.68"	9° 39' 14"	4° 09' 29"	0.9988891	16' 00.70"	23° 26' 17"	-4 m 13 s
7	10° 33' 15"	-0.68"	9° 41' 31"	4° 10' 27"	0.9989011	16' 00.69"	23° 26' 17"	-4 m 12 s
8	10° 35' 44"	-0.67"	9° 43' 48"	4° 11' 25"	0.9989131	16' 00.67"	23° 26' 17"	-4 m 12 s
9	10° 38' 12"	-0.67"	9° 46' 04"	4° 12' 23"	0.9989252	16' 00.66"	23° 26' 17"	-4 m 11 s
10	10° 40' 40"	-0.67"	9° 48' 21"	4° 13' 21"	0.9989372	16' 00.65"	23° 26' 17"	-4 m 10 s
11	10° 43' 08"	-0.67"	9° 50' 38"	4° 14' 19"	0.9989492	16' 00.64"	23° 26' 17"	-4 m 09 s
12	10° 45' 36"	-0.66"	9° 52' 54"	4° 15' 17"	0.9989612	16' 00.63"	23° 26' 17"	-4 m 09 s
13	10° 48' 05"	-0.66"	9° 55' 11"	4° 16' 15"	0.9989732	16' 00.62"	23° 26' 17"	-4 m 08 s
14	10° 50' 33"	-0.66"	9° 57' 28"	4° 17' 13"	0.9989852	16' 00.60"	23° 26' 17"	-4 m 07 s
15	10° 53' 01"	-0.65"	9° 59' 45"	4° 18' 11"	0.9989972	16' 00.59"	23° 26' 17"	-4 m 06 s
16	10° 55' 29"	-0.65"	10° 02' 01"	4° 19' 09"	0.9990093	16' 00.58"	23° 26' 17"	-4 m 06 s
17	10° 57' 57"	-0.65"	10° 04' 18"	4° 20' 07"	0.9990213	16' 00.57"	23° 26' 17"	-4 m 05 s
18	11° 00' 25"	-0.64"	10° 06' 35"	4° 21' 05"	0.9990333	16' 00.56"	23° 26' 17"	-4 m 04 s
19	11° 02' 54"	-0.64"	10° 08' 51"	4° 22' 03"	0.9990453	16' 00.55"	23° 26' 17"	-4 m 03 s
20	11° 05' 22"	-0.64"	10° 11' 08"	4° 23' 01"	0.9990573	16' 00.54"	23° 26' 17"	-4 m 03 s
21	11° 07' 50"	-0.63"	10° 13' 25"	4° 23' 60"	0.9990693	16' 00.52"	23° 26' 17"	-4 m 02 s
22	11° 10' 18"	-0.63"	10° 15' 42"	4° 24' 58"	0.9990813	16' 00.51"	23° 26' 17"	-4 m 01 s
23	11° 12' 46"	-0.63"	10° 17' 58"	4° 25' 55"	0.9990932	16' 00.50"	23° 26' 17"	-4 m 00 s
24	11° 15' 14"	-0.62"	10° 20' 15"	4° 26' 53"	0.9991052	16' 00.49"	23° 26' 17"	-3 m 60 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	354° 41' 00"	-4° 23' 23"	356° 52' 05"	-6° 08' 27"	0° 57' 27"	15' 39.42"	51° 10' 32"	0.01989
1	355° 14' 35"	-4° 21' 48"	357° 22' 20"	-5° 53' 39"	0° 57' 26"	15' 39.07"	50° 43' 43"	0.01868
2	355° 48' 08"	-4° 20' 11"	357° 52' 31"	-5° 38' 51"	0° 57' 25"	15' 38.72"	50° 15' 27"	0.01750
3	356° 21' 39"	-4° 18' 33"	358° 22' 40"	-5° 24' 02"	0° 57' 24"	15' 38.37"	49° 45' 35"	0.01637
4	356° 55' 08"	-4° 16' 54"	358° 52' 46"	-5° 09' 12"	0° 57' 22"	15' 38.02"	49° 13' 56"	0.01527
5	357° 28' 37"	-4° 15' 14"	359° 22' 49"	-4° 54' 21"	0° 57' 21"	15' 37.66"	48° 40' 19"	0.01422
6	358° 02' 03"	-4° 13' 32"	359° 52' 50"	-4° 39' 29"	0° 57' 20"	15' 37.31"	48° 4' 29"	0.01321
7	358° 35' 28"	-4° 11' 48"	0° 22' 47"	-4° 24' 37"	0° 57' 18"	15' 36.95"	47° 26' 09"	0.01223
8	359° 08' 51"	-4° 10' 04"	0° 52' 43"	-4° 09' 44"	0° 57' 17"	15' 36.59"	46° 45' 03"	0.01130
9	359° 42' 13"	-4° 08' 17"	1° 22' 36"	-3° 54' 51"	0° 57' 16"	15' 36.23"	46° 0' 48"	0.01041
10	0° 15' 33"	-4° 06' 30"	1° 52' 27"	-3° 39' 57"	0° 57' 14"	15' 35.87"	45° 12' 59"	0.00955
11	0° 48' 51"	-4° 04' 41"	2° 22' 15"	-3° 25' 03"	0° 57' 13"	15' 35.51"	44° 21' 08"	0.00874
12	1° 22' 08"	-4° 02' 51"	2° 52' 01"	-3° 10' 09"	0° 57' 12"	15' 35.14"	43° 24' 40"	0.00797
13	1° 55' 23"	-4° 00' 60"	3° 21' 45"	-2° 55' 14"	0° 57' 10"	15' 34.78"	42° 22' 54"	0.00724
14	2° 28' 37"	-3° 59' 07"	3° 51' 26"	-2° 40' 19"	0° 57' 09"	15' 34.41"	41° 15' 05"	0.00655
15	3° 01' 48"	-3° 57' 13"	4° 21' 06"	-2° 25' 25"	0° 57' 08"	15' 34.05"	40° 0' 13"	0.00590
16	3° 34' 58"	-3° 55' 18"	4° 50' 43"	-2° 10' 30"	0° 57' 06"	15' 33.68"	38° 37' 12"	0.00529
17	4° 08' 07"	-3° 53' 22"	5° 20' 19"	-1° 55' 35"	0° 57' 05"	15' 33.31"	37° 4' 38"	0.00472
18	4° 41' 13"	-3° 51' 24"	5° 49' 52"	-1° 40' 41"	0° 57' 04"	15' 32.94"	35° 20' 53"	0.00418
19	5° 14' 18"	-3° 49' 25"	6° 19' 24"	-1° 25' 47"	0° 57' 02"	15' 32.56"	33° 23' 56"	0.00369
20	5° 47' 22"	-3° 47' 25"	6° 48' 54"	-1° 10' 53"	0° 57' 01"	15' 32.19"	31° 11' 22"	0.00324
21	6° 20' 23"	-3° 45' 24"	7° 18' 23"	0°-55' 59"	0° 56' 60"	15' 31.82"	28° 40' 13"	0.00283
22	6° 53' 23"	-3° 43' 22"	7° 47' 49"	0°-41' 06"	0° 56' 58"	15' 31.44"	25° 46' 56"	0.00246
23	7° 26' 21"	-3° 41' 18"	8° 17' 14"	0°-26' 14"	0° 56' 57"	15' 31.07"	22° 27' 19"	0.00213
24	7° 59' 18"	-3° 39' 13"	8° 46' 38"	0°-11' 22"	0° 56' 55"	15' 30.69"	18° 36' 30"	0.00184

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	11° 15' 14"	-0.62"	10° 20' 15"	4° 26' 53"	0.9991052	16' 00.49"	23° 26' 17"	-3 m 60 s
1	11° 17' 43"	-0.62"	10° 22' 32"	4° 27' 51"	0.9991172	16' 00.48"	23° 26' 17"	-3 m 59 s
2	11° 20' 11"	-0.62"	10° 24' 49"	4° 28' 49"	0.9991292	16' 00.47"	23° 26' 17"	-3 m 58 s
3	11° 22' 39"	-0.61"	10° 27' 05"	4° 29' 47"	0.9991412	16' 00.45"	23° 26' 17"	-3 m 57 s
4	11° 25' 07"	-0.61"	10° 29' 22"	4° 30' 45"	0.9991532	16' 00.44"	23° 26' 17"	-3 m 57 s
5	11° 27' 35"	-0.60"	10° 31' 39"	4° 31' 43"	0.9991652	16' 00.43"	23° 26' 17"	-3 m 56 s
6	11° 30' 03"	-0.60"	10° 33' 56"	4° 32' 41"	0.9991771	16' 00.42"	23° 26' 17"	-3 m 55 s
7	11° 32' 32"	-0.60"	10° 36' 12"	4° 33' 39"	0.9991891	16' 00.41"	23° 26' 17"	-3 m 54 s
8	11° 34' 60"	-0.59"	10° 38' 29"	4° 34' 37"	0.9992011	16' 00.40"	23° 26' 17"	-3 m 54 s
9	11° 37' 28"	-0.59"	10° 40' 46"	4° 35' 35"	0.9992131	16' 00.39"	23° 26' 17"	-3 m 53 s
10	11° 39' 56"	-0.59"	10° 43' 03"	4° 36' 33"	0.9992250	16' 00.37"	23° 26' 17"	-3 m 52 s
11	11° 42' 24"	-0.58"	10° 45' 20"	4° 37' 31"	0.9992370	16' 00.36"	23° 26' 17"	-3 m 52 s
12	11° 44' 52"	-0.58"	10° 47' 36"	4° 38' 29"	0.9992490	16' 00.35"	23° 26' 17"	-3 m 51 s
13	11° 47' 20"	-0.57"	10° 49' 53"	4° 39' 26"	0.9992609	16' 00.34"	23° 26' 17"	-3 m 50 s
14	11° 49' 48"	-0.57"	10° 52' 10"	4° 40' 24"	0.9992729	16' 00.33"	23° 26' 17"	-3 m 49 s
15	11° 52' 16"	-0.57"	10° 54' 27"	4° 41' 22"	0.9992849	16' 00.32"	23° 26' 17"	-3 m 49 s
16	11° 54' 45"	-0.56"	10° 56' 44"	4° 42' 20"	0.9992968	16' 00.31"	23° 26' 17"	-3 m 48 s
17	11° 57' 13"	-0.56"	10° 59' 00"	4° 43' 18"	0.9993088	16' 00.29"	23° 26' 17"	-3 m 47 s
18	11° 59' 41"	-0.55"	11° 01' 17"	4° 44' 16"	0.9993207	16' 00.28"	23° 26' 17"	-3 m 46 s
19	12° 02' 09"	-0.55"	11° 03' 34"	4° 45' 13"	0.9993327	16' 00.27"	23° 26' 17"	-3 m 46 s
20	12° 04' 37"	-0.54"	11° 05' 51"	4° 46' 11"	0.9993446	16' 00.26"	23° 26' 17"	-3 m 45 s
21	12° 07' 05"	-0.54"	11° 08' 08"	4° 47' 09"	0.9993566	16' 00.25"	23° 26' 17"	-3 m 44 s
22	12° 09' 33"	-0.54"	11° 10' 24"	4° 48' 07"	0.9993685	16' 00.24"	23° 26' 17"	-3 m 43 s
23	12° 12' 01"	-0.53"	11° 12' 41"	4° 49' 05"	0.9993805	16' 00.22"	23° 26' 17"	-3 m 43 s
24	12° 14' 29"	-0.53"	11° 14' 58"	4° 50' 02"	0.9993924	16' 00.21"	23° 26' 17"	-3 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	7° 59' 18"	-3° 39' 13"	8° 46' 38"	0°-11' 22"	0° 56' 55"	15' 30.69"	18° 36' 30"	0.00184
1	8° 32' 12"	-3° 37' 08"	9° 16' 00"	0° 03' 30"	0° 56' 54"	15' 30.31"	14° 9' 07"	0.00158
2	9° 05' 05"	-3° 35' 01"	9° 45' 21"	0° 18' 20"	0° 56' 53"	15' 29.94"	8° 59' 49"	0.00137
3	9° 37' 56"	-3° 32' 53"	10° 14' 40"	0° 33' 10"	0° 56' 51"	15' 29.56"	3° 4' 10"	0.00120
4	10° 10' 46"	-3° 30' 44"	10° 43' 58"	0° 47' 59"	0° 56' 50"	15' 29.18"	356° 20' 20"	0.00106
5	10° 43' 34"	-3° 28' 34"	11° 13' 15"	1° 02' 47"	0° 56' 48"	15' 28.80"	348° 51' 14"	0.00097
6	11° 16' 19"	-3° 26' 22"	11° 42' 31"	1° 17' 34"	0° 56' 47"	15' 28.41"	340° 46' 26"	0.00091
7	11° 49' 04"	-3° 24' 10"	12° 11' 45"	1° 32' 20"	0° 56' 46"	15' 28.03"	332° 22' 33"	0.00089
8	12° 21' 46"	-3° 21' 57"	12° 40' 59"	1° 47' 05"	0° 56' 44"	15' 27.65"	324° 0' 32"	0.00091
9	12° 54' 27"	-3° 19' 43"	13° 10' 11"	2° 01' 49"	0° 56' 43"	15' 27.27"	316° 0' 58"	0.00097
10	13° 27' 05"	-3° 17' 28"	13° 39' 23"	2° 16' 32"	0° 56' 41"	15' 26.88"	308° 39' 23"	0.00107
11	13° 59' 42"	-3° 15' 11"	14° 08' 33"	2° 31' 13"	0° 56' 40"	15' 26.50"	302° 4' 13"	0.00121
12	14° 32' 18"	-3° 12' 54"	14° 37' 43"	2° 45' 53"	0° 56' 39"	15' 26.11"	296° 17' 26"	0.00139
13	15° 04' 51"	-3° 10' 36"	15° 06' 52"	3° 00' 31"	0° 56' 37"	15' 25.73"	291° 16' 43"	0.00160
14	15° 37' 23"	-3° 08' 17"	15° 36' 01"	3° 15' 08"	0° 56' 36"	15' 25.34"	286° 57' 17"	0.00186
15	16° 09' 52"	-3° 05' 57"	16° 05' 08"	3° 29' 43"	0° 56' 34"	15' 24.95"	283° 13' 45"	0.00215
16	16° 42' 21"	-3° 03' 37"	16° 34' 16"	3° 44' 17"	0° 56' 33"	15' 24.57"	280° 0' 51"	0.00248
17	17° 14' 47"	-3° 01' 15"	17° 03' 22"	3° 58' 49"	0° 56' 32"	15' 24.18"	277° 13' 48"	0.00284
18	17° 47' 11"	-2° 58' 52"	17° 32' 28"	4° 13' 19"	0° 56' 30"	15' 23.79"	274° 48' 30"	0.00325
19	18° 19' 34"	-2° 56' 29"	18° 01' 34"	4° 27' 48"	0° 56' 29"	15' 23.41"	272° 41' 32"	0.00369
20	18° 51' 55"	-2° 54' 05"	18° 30' 40"	4° 42' 14"	0° 56' 27"	15' 23.02"	270° 49' 60"	0.00417
21	19° 24' 14"	-2° 51' 40"	18° 59' 45"	4° 56' 39"	0° 56' 26"	15' 22.63"	269° 11' 33"	0.00468
22	19° 56' 31"	-2° 49' 14"	19° 28' 50"	5° 11' 02"	0° 56' 24"	15' 22.25"	267° 44' 16"	0.00524
23	20° 28' 47"	-2° 46' 47"	19° 57' 54"	5° 25' 22"	0° 56' 23"	15' 21.86"	266° 26' 31"	0.00583
24	21° 01' 00"	-2° 44' 20"	20° 26' 59"	5° 39' 41"	0° 56' 22"	15' 21.47"	265° 16' 59"	0.00646

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	12° 14' 29"	-0.53"	11° 14' 58"	4° 50' 02"	0.9993924	16' 00.21"	23° 26' 17"	-3 m 42 s
1	12° 16' 57"	-0.52"	11° 17' 15"	4° 51' 00"	0.9994043	16' 00.20"	23° 26' 17"	-3 m 41 s
2	12° 19' 25"	-0.52"	11° 19' 32"	4° 51' 58"	0.9994163	16' 00.19"	23° 26' 17"	-3 m 40 s
3	12° 21' 53"	-0.51"	11° 21' 48"	4° 52' 56"	0.9994282	16' 00.18"	23° 26' 17"	-3 m 40 s
4	12° 24' 22"	-0.51"	11° 24' 05"	4° 53' 53"	0.9994401	16' 00.17"	23° 26' 17"	-3 m 39 s
5	12° 26' 50"	-0.50"	11° 26' 22"	4° 54' 51"	0.9994521	16' 00.16"	23° 26' 17"	-3 m 38 s
6	12° 29' 18"	-0.50"	11° 28' 39"	4° 55' 49"	0.9994640	16' 00.14"	23° 26' 17"	-3 m 37 s
7	12° 31' 46"	-0.49"	11° 30' 56"	4° 56' 47"	0.9994759	16' 00.13"	23° 26' 17"	-3 m 37 s
8	12° 34' 14"	-0.49"	11° 33' 13"	4° 57' 44"	0.9994879	16' 00.12"	23° 26' 17"	-3 m 36 s
9	12° 36' 42"	-0.48"	11° 35' 30"	4° 58' 42"	0.9994998	16' 00.11"	23° 26' 17"	-3 m 35 s
10	12° 39' 10"	-0.48"	11° 37' 46"	4° 59' 40"	0.9995117	16' 00.10"	23° 26' 17"	-3 m 35 s
11	12° 41' 38"	-0.47"	11° 40' 03"	5° 00' 37"	0.9995236	16' 00.09"	23° 26' 17"	-3 m 34 s
12	12° 44' 06"	-0.47"	11° 42' 20"	5° 01' 35"	0.9995355	16' 00.08"	23° 26' 17"	-3 m 33 s
13	12° 46' 34"	-0.47"	11° 44' 37"	5° 02' 33"	0.9995474	16' 00.06"	23° 26' 17"	-3 m 32 s
14	12° 49' 02"	-0.46"	11° 46' 54"	5° 03' 30"	0.9995594	16' 00.05"	23° 26' 17"	-3 m 32 s
15	12° 51' 30"	-0.46"	11° 49' 11"	5° 04' 28"	0.9995713	16' 00.04"	23° 26' 17"	-3 m 31 s
16	12° 53' 58"	-0.45"	11° 51' 28"	5° 05' 26"	0.9995832	16' 00.03"	23° 26' 17"	-3 m 30 s
17	12° 56' 26"	-0.45"	11° 53' 44"	5° 06' 23"	0.9995951	16' 00.02"	23° 26' 17"	-3 m 29 s
18	12° 58' 54"	-0.44"	11° 56' 01"	5° 07' 21"	0.9996070	16' 00.01"	23° 26' 17"	-3 m 29 s
19	13° 01' 22"	-0.44"	11° 58' 18"	5° 08' 18"	0.9996189	15' 60.00"	23° 26' 17"	-3 m 28 s
20	13° 03' 50"	-0.43"	12° 00' 35"	5° 09' 16"	0.9996308	15' 59.98"	23° 26' 17"	-3 m 27 s
21	13° 06' 18"	-0.43"	12° 02' 52"	5° 10' 14"	0.9996427	15' 59.97"	23° 26' 17"	-3 m 26 s
22	13° 08' 46"	-0.42"	12° 05' 09"	5° 11' 11"	0.9996546	15' 59.96"	23° 26' 17"	-3 m 26 s
23	13° 11' 14"	-0.42"	12° 07' 26"	5° 12' 09"	0.9996665	15' 59.95"	23° 26' 17"	-3 m 25 s
24	13° 13' 42"	-0.41"	12° 09' 43"	5° 13' 06"	0.9996784	15' 59.94"	23° 26' 17"	-3 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	21° 01' 00"	-2° 44' 20"	20° 26' 59"	5° 39' 41"	0° 56' 22"	15' 21.47"	265° 16' 59"	0.00646
1	21° 33' 12"	-2° 41' 52"	20° 56' 03"	5° 53' 57"	0° 56' 20"	15' 21.08"	264° 14' 34"	0.00712
2	22° 05' 22"	-2° 39' 23"	21° 25' 08"	6° 08' 11"	0° 56' 19"	15' 20.70"	263° 18' 20"	0.00782
3	22° 37' 31"	-2° 36' 53"	21° 54' 12"	6° 22' 23"	0° 56' 17"	15' 20.31"	262° 27' 31"	0.00856
4	23° 09' 37"	-2° 34' 23"	22° 23' 17"	6° 36' 33"	0° 56' 16"	15' 19.92"	261° 41' 28"	0.00933
5	23° 41' 42"	-2° 31' 52"	22° 52' 21"	6° 50' 40"	0° 56' 14"	15' 19.53"	260° 59' 37"	0.01014
6	24° 13' 44"	-2° 29' 20"	23° 21' 26"	7° 04' 44"	0° 56' 13"	15' 19.15"	260° 21' 31"	0.01099
7	24° 45' 45"	-2° 26' 48"	23° 50' 31"	7° 18' 46"	0° 56' 12"	15' 18.76"	259° 46' 44"	0.01187
8	25° 17' 45"	-2° 24' 15"	24° 19' 37"	7° 32' 46"	0° 56' 10"	15' 18.38"	259° 14' 57"	0.01279
9	25° 49' 42"	-2° 21' 41"	24° 48' 43"	7° 46' 43"	0° 56' 09"	15' 17.99"	258° 45' 50"	0.01374
10	26° 21' 38"	-2° 19' 07"	25° 17' 49"	8° 00' 37"	0° 56' 07"	15' 17.60"	258° 19' 09"	0.01473
11	26° 53' 32"	-2° 16' 32"	25° 46' 55"	8° 14' 28"	0° 56' 06"	15' 17.22"	257° 54' 40"	0.01575
12	27° 25' 24"	-2° 13' 56"	26° 16' 02"	8° 28' 17"	0° 56' 05"	15' 16.83"	257° 32' 10"	0.01681
13	27° 57' 14"	-2° 11' 20"	26° 45' 10"	8° 42' 02"	0° 56' 03"	15' 16.45"	257° 11' 30"	0.01790
14	28° 29' 02"	-2° 08' 44"	27° 14' 18"	8° 55' 45"	0° 56' 02"	15' 16.07"	256° 52' 29"	0.01902
15	29° 00' 49"	-2° 06' 07"	27° 43' 27"	9° 09' 25"	0° 56' 00"	15' 15.68"	256° 35' 01"	0.02019
16	29° 32' 34"	-2° 03' 29"	28° 12' 37"	9° 23' 02"	0° 55' 59"	15' 15.30"	256° 18' 57"	0.02138
17	30° 04' 17"	-2° 00' 51"	28° 41' 47"	9° 36' 35"	0° 55' 58"	15' 14.92"	256° 4' 11"	0.02261
18	30° 35' 58"	-1° 58' 12"	29° 10' 58"	9° 50' 06"	0° 55' 56"	15' 14.54"	255° 50' 38"	0.02387
19	31° 07' 38"	-1° 55' 33"	29° 40' 10"	10° 03' 33"	0° 55' 55"	15' 14.16"	255° 38' 11"	0.02517
20	31° 39' 16"	-1° 52' 54"	30° 09' 23"	10° 16' 57"	0° 55' 53"	15' 13.78"	255° 26' 47"	0.02650
21	32° 10' 52"	-1° 50' 14"	30° 38' 37"	10° 30' 18"	0° 55' 52"	15' 13.40"	255° 16' 21"	0.02786
22	32° 42' 26"	-1° 47' 33"	31° 07' 51"	10° 43' 36"	0° 55' 51"	15' 13.03"	255° 6' 49"	0.02926
23	33° 13' 58"	-1° 44' 52"	31° 37' 07"	10° 56' 50"	0° 55' 49"	15' 12.65"	254° 58' 09"	0.03068
24	33° 45' 29"	-1° 42' 11"	32° 06' 24"	11° 10' 00"	0° 55' 48"	15' 12.28"	254° 50' 16"	0.03214

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	13° 13' 42"	-0.41"	12° 09' 43"	5° 13' 06"	0.9996784	15' 59.94"	23° 26' 17"	-3 m 24 s
1	13° 16' 10"	-0.40"	12° 11' 60"	5° 14' 04"	0.9996902	15' 59.93"	23° 26' 17"	-3 m 24 s
2	13° 18' 38"	-0.40"	12° 14' 16"	5° 15' 01"	0.9997021	15' 59.92"	23° 26' 17"	-3 m 23 s
3	13° 21' 06"	-0.39"	12° 16' 33"	5° 15' 59"	0.9997140	15' 59.90"	23° 26' 17"	-3 m 22 s
4	13° 23' 34"	-0.39"	12° 18' 50"	5° 16' 56"	0.9997259	15' 59.89"	23° 26' 17"	-3 m 21 s
5	13° 26' 02"	-0.38"	12° 21' 07"	5° 17' 54"	0.9997378	15' 59.88"	23° 26' 17"	-3 m 21 s
6	13° 28' 30"	-0.38"	12° 23' 24"	5° 18' 51"	0.9997497	15' 59.87"	23° 26' 17"	-3 m 20 s
7	13° 30' 58"	-0.37"	12° 25' 41"	5° 19' 49"	0.9997615	15' 59.86"	23° 26' 17"	-3 m 19 s
8	13° 33' 26"	-0.37"	12° 27' 58"	5° 20' 46"	0.9997734	15' 59.85"	23° 26' 17"	-3 m 18 s
9	13° 35' 54"	-0.36"	12° 30' 15"	5° 21' 44"	0.9997853	15' 59.84"	23° 26' 17"	-3 m 18 s
10	13° 38' 22"	-0.36"	12° 32' 32"	5° 22' 41"	0.9997972	15' 59.82"	23° 26' 17"	-3 m 17 s
11	13° 40' 50"	-0.35"	12° 34' 49"	5° 23' 39"	0.9998090	15' 59.81"	23° 26' 17"	-3 m 16 s
12	13° 43' 17"	-0.35"	12° 37' 06"	5° 24' 36"	0.9998209	15' 59.80"	23° 26' 17"	-3 m 16 s
13	13° 45' 45"	-0.34"	12° 39' 23"	5° 25' 33"	0.9998328	15' 59.79"	23° 26' 17"	-3 m 15 s
14	13° 48' 13"	-0.34"	12° 41' 40"	5° 26' 31"	0.9998446	15' 59.78"	23° 26' 17"	-3 m 14 s
15	13° 50' 41"	-0.33"	12° 43' 57"	5° 27' 28"	0.9998565	15' 59.77"	23° 26' 17"	-3 m 13 s
16	13° 53' 09"	-0.33"	12° 46' 14"	5° 28' 26"	0.9998683	15' 59.76"	23° 26' 17"	-3 m 13 s
17	13° 55' 37"	-0.32"	12° 48' 31"	5° 29' 23"	0.9998802	15' 59.74"	23° 26' 17"	-3 m 12 s
18	13° 58' 05"	-0.31"	12° 50' 47"	5° 30' 20"	0.9998920	15' 59.73"	23° 26' 17"	-3 m 11 s
19	14° 00' 33"	-0.31"	12° 53' 04"	5° 31' 18"	0.9999039	15' 59.72"	23° 26' 17"	-3 m 10 s
20	14° 03' 01"	-0.30"	12° 55' 21"	5° 32' 15"	0.9999157	15' 59.71"	23° 26' 17"	-3 m 10 s
21	14° 05' 29"	-0.30"	12° 57' 38"	5° 33' 12"	0.9999276	15' 59.70"	23° 26' 17"	-3 m 09 s
22	14° 07' 57"	-0.29"	12° 59' 55"	5° 34' 10"	0.9999394	15' 59.69"	23° 26' 17"	-3 m 08 s
23	14° 10' 25"	-0.29"	13° 02' 12"	5° 35' 07"	0.9999513	15' 59.68"	23° 26' 17"	-3 m 08 s
24	14° 12' 52"	-0.28"	13° 04' 29"	5° 36' 04"	0.9999631	15' 59.67"	23° 26' 17"	-3 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	33° 45' 29"	-1° 42' 11"	32° 06' 24"	11° 10' 00"	0° 55' 48"	15' 12.28"	254° 50' 16"	0.03214
1	34° 16' 58"	-1° 39' 29"	32° 35' 42"	11° 23' 07"	0° 55' 46"	15' 11.90"	254° 43' 08"	0.03364
2	34° 48' 25"	-1° 36' 47"	33° 05' 01"	11° 36' 11"	0° 55' 45"	15' 11.53"	254° 36' 42"	0.03516
3	35° 19' 51"	-1° 34' 05"	33° 34' 21"	11° 49' 10"	0° 55' 44"	15' 11.16"	254° 30' 57"	0.03672
4	35° 51' 15"	-1° 31' 22"	34° 03' 42"	12° 02' 07"	0° 55' 42"	15' 10.79"	254° 25' 50"	0.03831
5	36° 22' 37"	-1° 28' 39"	34° 33' 05"	12° 14' 59"	0° 55' 41"	15' 10.42"	254° 21' 18"	0.03993
6	36° 53' 57"	-1° 25' 55"	35° 02' 29"	12° 27' 48"	0° 55' 40"	15' 10.05"	254° 17' 20"	0.04158
7	37° 25' 16"	-1° 23' 12"	35° 31' 55"	12° 40' 32"	0° 55' 38"	15' 09.68"	254° 13' 55"	0.04327
8	37° 56' 33"	-1° 20' 28"	36° 01' 21"	12° 53' 13"	0° 55' 37"	15' 09.32"	254° 11' 01"	0.04498
9	38° 27' 48"	-1° 17' 43"	36° 30' 50"	13° 05' 50"	0° 55' 36"	15' 08.95"	254° 8' 36"	0.04672
10	38° 59' 02"	-1° 14' 59"	37° 00' 19"	13° 18' 23"	0° 55' 34"	15' 08.59"	254° 6' 39"	0.04850
11	39° 30' 13"	-1° 12' 14"	37° 29' 51"	13° 30' 52"	0° 55' 33"	15' 08.23"	254° 5' 09"	0.05031
12	40° 01' 24"	-1° 09' 29"	37° 59' 23"	13° 43' 17"	0° 55' 32"	15' 07.87"	254° 4' 05"	0.05214
13	40° 32' 32"	-1° 06' 44"	38° 28' 58"	13° 55' 38"	0° 55' 30"	15' 07.51"	254° 3' 25"	0.05401
14	41° 03' 39"	-1° 03' 58"	38° 58' 34"	14° 07' 54"	0° 55' 29"	15' 07.16"	254° 3' 10"	0.05590
15	41° 34' 44"	-1° 01' 13"	39° 28' 12"	14° 20' 07"	0° 55' 28"	15' 06.80"	254° 3' 16"	0.05783
16	42° 05' 48"	0°-58' 27"	39° 57' 51"	14° 32' 15"	0° 55' 26"	15' 06.45"	254° 3' 45"	0.05978
17	42° 36' 50"	0°-55' 41"	40° 27' 32"	14° 44' 18"	0° 55' 25"	15' 06.10"	254° 4' 35"	0.06176
18	43° 07' 50"	0°-52' 55"	40° 57' 15"	14° 56' 18"	0° 55' 24"	15' 05.75"	254° 5' 45"	0.06378
19	43° 38' 49"	0°-50' 09"	41° 26' 60"	15° 08' 13"	0° 55' 23"	15' 05.40"	254° 7' 15"	0.06582
20	44° 09' 46"	0°-47' 22"	41° 56' 46"	15° 20' 03"	0° 55' 21"	15' 05.06"	254° 9' 04"	0.06789
21	44° 40' 42"	0°-44' 36"	42° 26' 35"	15° 31' 49"	0° 55' 20"	15' 04.71"	254° 11' 11"	0.06998
22	45° 11' 36"	0°-41' 49"	42° 56' 25"	15° 43' 30"	0° 55' 19"	15' 04.37"	254° 13' 36"	0.07211
23	45° 42' 28"	0°-39' 03"	43° 26' 17"	15° 55' 07"	0° 55' 18"	15' 04.03"	254° 16' 18"	0.07426
24	46° 13' 19"	0°-36' 16"	43° 56' 11"	16° 06' 39"	0° 55' 16"	15' 03.69"	254° 19' 17"	0.07644



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	14° 12' 52"	-0.28"	13° 04' 29"	5° 36' 04"	0.9999631	15' 59.67"	23° 26' 17"	-3 m 07 s
1	14° 15' 20"	-0.28"	13° 06' 46"	5° 37' 02"	0.9999750	15' 59.65"	23° 26' 17"	-3 m 06 s
2	14° 17' 48"	-0.27"	13° 09' 03"	5° 37' 59"	0.9999868	15' 59.64"	23° 26' 17"	-3 m 05 s
3	14° 20' 16"	-0.26"	13° 11' 20"	5° 38' 56"	0.9999986	15' 59.63"	23° 26' 17"	-3 m 05 s
4	14° 22' 44"	-0.26"	13° 13' 37"	5° 39' 54"	1.0000105	15' 59.62"	23° 26' 17"	-3 m 04 s
5	14° 25' 12"	-0.25"	13° 15' 54"	5° 40' 51"	1.0000223	15' 59.61"	23° 26' 17"	-3 m 03 s
6	14° 27' 40"	-0.25"	13° 18' 11"	5° 41' 48"	1.0000341	15' 59.60"	23° 26' 17"	-3 m 02 s
7	14° 30' 08"	-0.24"	13° 20' 28"	5° 42' 45"	1.0000460	15' 59.59"	23° 26' 17"	-3 m 02 s
8	14° 32' 35"	-0.24"	13° 22' 45"	5° 43' 42"	1.0000578	15' 59.57"	23° 26' 17"	-3 m 01 s
9	14° 35' 03"	-0.23"	13° 25' 02"	5° 44' 40"	1.0000696	15' 59.56"	23° 26' 17"	-3 m 00 s
10	14° 37' 31"	-0.22"	13° 27' 19"	5° 45' 37"	1.0000814	15' 59.55"	23° 26' 17"	-2 m 60 s
11	14° 39' 59"	-0.22"	13° 29' 37"	5° 46' 34"	1.0000933	15' 59.54"	23° 26' 17"	-2 m 59 s
12	14° 42' 27"	-0.21"	13° 31' 54"	5° 47' 31"	1.0001051	15' 59.53"	23° 26' 17"	-2 m 58 s
13	14° 44' 55"	-0.21"	13° 34' 11"	5° 48' 28"	1.0001169	15' 59.52"	23° 26' 17"	-2 m 57 s
14	14° 47' 23"	-0.20"	13° 36' 28"	5° 49' 26"	1.0001287	15' 59.51"	23° 26' 17"	-2 m 57 s
15	14° 49' 50"	-0.20"	13° 38' 45"	5° 50' 23"	1.0001405	15' 59.50"	23° 26' 17"	-2 m 56 s
16	14° 52' 18"	-0.19"	13° 41' 02"	5° 51' 20"	1.0001523	15' 59.48"	23° 26' 17"	-2 m 55 s
17	14° 54' 46"	-0.19"	13° 43' 19"	5° 52' 17"	1.0001642	15' 59.47"	23° 26' 17"	-2 m 55 s
18	14° 57' 14"	-0.18"	13° 45' 36"	5° 53' 14"	1.0001760	15' 59.46"	23° 26' 17"	-2 m 54 s
19	14° 59' 42"	-0.17"	13° 47' 53"	5° 54' 11"	1.0001878	15' 59.45"	23° 26' 17"	-2 m 53 s
20	15° 02' 10"	-0.17"	13° 50' 10"	5° 55' 08"	1.0001996	15' 59.44"	23° 26' 17"	-2 m 52 s
21	15° 04' 37"	-0.16"	13° 52' 27"	5° 56' 05"	1.0002114	15' 59.43"	23° 26' 17"	-2 m 52 s
22	15° 07' 05"	-0.16"	13° 54' 44"	5° 57' 03"	1.0002232	15' 59.42"	23° 26' 17"	-2 m 51 s
23	15° 09' 33"	-0.15"	13° 57' 01"	5° 57' 60"	1.0002350	15' 59.40"	23° 26' 17"	-2 m 50 s
24	15° 12' 01"	-0.15"	13° 59' 18"	5° 58' 57"	1.0002468	15' 59.39"	23° 26' 17"	-2 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	46° 13' 19"	0°-36' 16"	43° 56' 11"	16° 06' 39"	0° 55' 16"	15' 03.69"	254° 19' 17"	0.07644
1	46° 44' 08"	0°-33' 29"	44° 26' 08"	16° 18' 06"	0° 55' 15"	15' 03.36"	254° 22' 33"	0.07865
2	47° 14' 56"	0°-30' 42"	44° 56' 06"	16° 29' 29"	0° 55' 14"	15' 03.03"	254° 26' 04"	0.08088
3	47° 45' 42"	0°-27' 55"	45° 26' 06"	16° 40' 46"	0° 55' 13"	15' 02.69"	254° 29' 50"	0.08314
4	48° 16' 27"	0°-25' 09"	45° 56' 08"	16° 51' 59"	0° 55' 11"	15' 02.37"	254° 33' 51"	0.08543
5	48° 47' 10"	0°-22' 22"	46° 26' 13"	17° 03' 07"	0° 55' 10"	15' 02.04"	254° 38' 07"	0.08774
6	49° 17' 52"	0°-19' 35"	46° 56' 19"	17° 14' 10"	0° 55' 09"	15' 01.72"	254° 42' 37"	0.09008
7	49° 48' 32"	0°-16' 48"	47° 26' 28"	17° 25' 08"	0° 55' 08"	15' 01.39"	254° 47' 21"	0.09245
8	50° 19' 11"	0°-14' 01"	47° 56' 39"	17° 36' 01"	0° 55' 07"	15' 01.07"	254° 52' 18"	0.09484
9	50° 49' 48"	0°-11' 15"	48° 26' 52"	17° 46' 49"	0° 55' 06"	15' 00.76"	254° 57' 28"	0.09726
10	51° 20' 24"	0° -8' 28"	48° 57' 07"	17° 57' 32"	0° 55' 04"	15' 00.44"	255° 2' 51"	0.09970
11	51° 50' 58"	0° -5' 41"	49° 27' 24"	18° 08' 09"	0° 55' 03"	15' 00.13"	255° 8' 27"	0.10217
12	52° 21' 31"	0° -2' 55"	49° 57' 44"	18° 18' 42"	0° 55' 02"	14' 59.82"	255° 14' 15"	0.10466
13	52° 52' 03"	0° 00' -9"	50° 28' 06"	18° 29' 09"	0° 55' 01"	14' 59.51"	255° 20' 15"	0.10718
14	53° 22' 33"	0° 02' 38"	50° 58' 30"	18° 39' 31"	0° 54' 60"	14' 59.21"	255° 26' 27"	0.10972
15	53° 53' 01"	0° 05' 24"	51° 28' 57"	18° 49' 47"	0° 54' 59"	14' 58.91"	255° 32' 51"	0.11229
16	54° 23' 29"	0° 08' 10"	51° 59' 26"	18° 59' 58"	0° 54' 58"	14' 58.61"	255° 39' 25"	0.11488
17	54° 53' 55"	0° 10' 56"	52° 29' 57"	19° 10' 04"	0° 54' 57"	14' 58.31"	255° 46' 11"	0.11749
18	55° 24' 20"	0° 13' 42"	53° 00' 31"	19° 20' 04"	0° 54' 55"	14' 58.02"	255° 53' 07"	0.12013
19	55° 54' 43"	0° 16' 27"	53° 31' 07"	19° 29' 58"	0° 54' 54"	14' 57.73"	256° 0' 15"	0.12279
20	56° 25' 05"	0° 19' 12"	54° 01' 45"	19° 39' 47"	0° 54' 53"	14' 57.44"	256° 7' 32"	0.12547
21	56° 55' 26"	0° 21' 58"	54° 32' 26"	19° 49' 31"	0° 54' 52"	14' 57.16"	256° 14' 60"	0.12818
22	57° 25' 45"	0° 24' 40"	55° 03' 10"	19° 59' 06"	0° 54' 51"	14' 56.88"	256° 22' 41"	0.13090
23	57° 56' 03"	0° 27' 25"	55° 33' 56"	20° 08' 38"	0° 54' 50"	14' 56.60"	256° 30' 28"	0.13366
24	58° 26' 20"	0° 30' 09"	56° 04' 44"	20° 18' 05"	0° 54' 49"	14' 56.32"	256° 38' 26"	0.13643

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	15° 12' 01"	-0.15"	13° 59' 18"	5° 58' 57"	1.0002468	15' 59.39"	23° 26' 17"	-2 m 49 s
1	15° 14' 29"	-0.14"	14° 01' 35"	5° 59' 54"	1.0002586	15' 59.38"	23° 26' 17"	-2 m 49 s
2	15° 16' 56"	-0.13"	14° 03' 53"	6° 00' 51"	1.0002704	15' 59.37"	23° 26' 17"	-2 m 48 s
3	15° 19' 24"	-0.13"	14° 06' 10"	6° 01' 48"	1.0002822	15' 59.36"	23° 26' 17"	-2 m 47 s
4	15° 21' 52"	-0.12"	14° 08' 27"	6° 02' 45"	1.0002939	15' 59.35"	23° 26' 17"	-2 m 47 s
5	15° 24' 20"	-0.12"	14° 10' 44"	6° 03' 42"	1.0003057	15' 59.34"	23° 26' 17"	-2 m 46 s
6	15° 26' 48"	-0.11"	14° 13' 01"	6° 04' 39"	1.0003175	15' 59.33"	23° 26' 17"	-2 m 45 s
7	15° 29' 15"	-0.11"	14° 15' 18"	6° 05' 36"	1.0003293	15' 59.31"	23° 26' 17"	-2 m 44 s
8	15° 31' 43"	-0.10"	14° 17' 35"	6° 06' 33"	1.0003411	15' 59.30"	23° 26' 17"	-2 m 44 s
9	15° 34' 11"	-0.09"	14° 19' 52"	6° 07' 30"	1.0003529	15' 59.29"	23° 26' 17"	-2 m 43 s
10	15° 36' 39"	-0.09"	14° 22' 10"	6° 08' 27"	1.0003646	15' 59.28"	23° 26' 17"	-2 m 42 s
11	15° 39' 06"	-0.08"	14° 24' 27"	6° 09' 24"	1.0003764	15' 59.27"	23° 26' 17"	-2 m 42 s
12	15° 41' 34"	-0.08"	14° 26' 44"	6° 10' 20"	1.0003882	15' 59.26"	23° 26' 17"	-2 m 41 s
13	15° 44' 02"	-0.07"	14° 29' 01"	6° 11' 17"	1.0004000	15' 59.25"	23° 26' 17"	-2 m 40 s
14	15° 46' 30"	-0.07"	14° 31' 18"	6° 12' 14"	1.0004117	15' 59.24"	23° 26' 17"	-2 m 39 s
15	15° 48' 57"	-0.06"	14° 33' 35"	6° 13' 11"	1.0004235	15' 59.22"	23° 26' 17"	-2 m 39 s
16	15° 51' 25"	-0.06"	14° 35' 52"	6° 14' 08"	1.0004353	15' 59.21"	23° 26' 17"	-2 m 38 s
17	15° 53' 53"	-0.05"	14° 38' 10"	6° 15' 05"	1.0004471	15' 59.20"	23° 26' 17"	-2 m 37 s
18	15° 56' 21"	-0.04"	14° 40' 27"	6° 16' 02"	1.0004588	15' 59.19"	23° 26' 17"	-2 m 37 s
19	15° 58' 48"	-0.04"	14° 42' 44"	6° 16' 59"	1.0004706	15' 59.18"	23° 26' 17"	-2 m 36 s
20	16° 01' 16"	-0.03"	14° 45' 01"	6° 17' 55"	1.0004823	15' 59.17"	23° 26' 17"	-2 m 35 s
21	16° 03' 44"	-0.03"	14° 47' 18"	6° 18' 52"	1.0004941	15' 59.16"	23° 26' 17"	-2 m 34 s
22	16° 06' 12"	-0.02"	14° 49' 36"	6° 19' 49"	1.0005059	15' 59.14"	23° 26' 17"	-2 m 34 s
23	16° 08' 39"	-0.02"	14° 51' 53"	6° 20' 46"	1.0005176	15' 59.13"	23° 26' 17"	-2 m 33 s
24	16° 11' 07"	-0.01"	14° 54' 10"	6° 21' 43"	1.0005294	15' 59.12"	23° 26' 17"	-2 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	58° 26' 20"	0° 30' 09"	56° 04' 44"	20° 18' 05"	0° 54' 49"	14' 56.32"	256° 38' 26"	0.13643
1	58° 56' 36"	0° 32' 54"	56° 35' 34"	20° 27' 25"	0° 54' 48"	14' 56.05"	256° 46' 33"	0.13922
2	59° 26' 50"	0° 35' 38"	57° 06' 27"	20° 36' 40"	0° 54' 47"	14' 55.78"	256° 54' 49"	0.14204
3	59° 57' 04"	0° 38' 21"	57° 37' 23"	20° 45' 49"	0° 54' 46"	14' 55.52"	257° 3' 14"	0.14488
4	60° 27' 16"	0° 41' 05"	58° 08' 21"	20° 54' 52"	0° 54' 45"	14' 55.25"	257° 11' 49"	0.14774
5	60° 57' 26"	0° 43' 48"	58° 39' 21"	21° 03' 49"	0° 54' 44"	14' 54.99"	257° 20' 32"	0.15062
6	61° 27' 36"	0° 46' 31"	59° 10' 24"	21° 12' 40"	0° 54' 43"	14' 54.74"	257° 29' 24"	0.15352
7	61° 57' 45"	0° 49' 13"	59° 41' 29"	21° 21' 25"	0° 54' 43"	14' 54.48"	257° 38' 24"	0.15644
8	62° 27' 52"	0° 51' 56"	60° 12' 37"	21° 30' 04"	0° 54' 42"	14' 54.23"	257° 47' 34"	0.15939
9	62° 57' 58"	0° 54' 38"	60° 43' 47"	21° 38' 37"	0° 54' 41"	14' 53.99"	257° 56' 51"	0.16235
10	63° 28' 04"	0° 57' 19"	61° 14' 60"	21° 47' 03"	0° 54' 40"	14' 53.74"	258° 6' 17"	0.16533
11	63° 58' 08"	1° 00' 00"	61° 46' 15"	21° 55' 24"	0° 54' 39"	14' 53.51"	258° 15' 50"	0.16834
12	64° 28' 11"	1° 02' 41"	62° 17' 33"	22° 03' 38"	0° 54' 38"	14' 53.27"	258° 25' 32"	0.17136
13	64° 58' 13"	1° 05' 22"	62° 48' 53"	22° 11' 47"	0° 54' 37"	14' 53.04"	258° 35' 21"	0.17440
14	65° 28' 14"	1° 08' 02"	63° 20' 16"	22° 19' 48"	0° 54' 36"	14' 52.81"	258° 45' 18"	0.17746
15	65° 58' 13"	1° 10' 41"	63° 51' 41"	22° 27' 44"	0° 54' 36"	14' 52.58"	258° 55' 23"	0.18054
16	66° 28' 12"	1° 13' 21"	64° 23' 08"	22° 35' 33"	0° 54' 35"	14' 52.36"	259° 5' 35"	0.18364
17	66° 58' 10"	1° 15' 60"	64° 54' 38"	22° 43' 16"	0° 54' 34"	14' 52.14"	259° 15' 54"	0.18676
18	67° 28' 07"	1° 18' 38"	65° 26' 11"	22° 50' 52"	0° 54' 33"	14' 51.93"	259° 26' 20"	0.18989
19	67° 58' 03"	1° 21' 16"	65° 57' 46"	22° 58' 22"	0° 54' 32"	14' 51.72"	259° 36' 54"	0.19304
20	68° 27' 58"	1° 23' 54"	66° 29' 23"	23° 05' 45"	0° 54' 32"	14' 51.51"	259° 47' 35"	0.19622
21	68° 57' 52"	1° 26' 31"	67° 01' 03"	23° 13' 02"	0° 54' 31"	14' 51.31"	259° 58' 22"	0.19940
22	69° 27' 46"	1° 29' 08"	67° 32' 45"	23° 20' 12"	0° 54' 30"	14' 51.11"	260° 9' 16"	0.20261
23	69° 57' 38"	1° 31' 44"	68° 04' 29"	23° 27' 16"	0° 54' 29"	14' 50.91"	260° 20' 17"	0.20583
24	70° 27' 30"	1° 34' 19"	68° 36' 16"	23° 34' 13"	0° 54' 29"	14' 50.72"	260° 31' 24"	0.20907

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	16° 11' 07"	-0.01"	14° 54' 10"	6° 21' 43"	1.0005294	15' 59.12"	23° 26' 17"	-2 m 32 s
1	16° 13' 35"	-0.01"	14° 56' 27"	6° 22' 39"	1.0005411	15' 59.11"	23° 26' 17"	-2 m 32 s
2	16° 16' 02"	0.00"	14° 58' 44"	6° 23' 36"	1.0005529	15' 59.10"	23° 26' 17"	-2 m 31 s
3	16° 18' 30"	0.01"	15° 01' 02"	6° 24' 33"	1.0005646	15' 59.09"	23° 26' 17"	-2 m 30 s
4	16° 20' 58"	0.01"	15° 03' 19"	6° 25' 30"	1.0005764	15' 59.08"	23° 26' 17"	-2 m 29 s
5	16° 23' 25"	0.02"	15° 05' 36"	6° 26' 26"	1.0005881	15' 59.07"	23° 26' 17"	-2 m 29 s
6	16° 25' 53"	0.02"	15° 07' 53"	6° 27' 23"	1.0005999	15' 59.05"	23° 26' 17"	-2 m 28 s
7	16° 28' 21"	0.03"	15° 10' 10"	6° 28' 20"	1.0006116	15' 59.04"	23° 26' 17"	-2 m 27 s
8	16° 30' 48"	0.03"	15° 12' 28"	6° 29' 17"	1.0006234	15' 59.03"	23° 26' 17"	-2 m 27 s
9	16° 33' 16"	0.04"	15° 14' 45"	6° 30' 13"	1.0006351	15' 59.02"	23° 26' 17"	-2 m 26 s
10	16° 35' 44"	0.04"	15° 17' 02"	6° 31' 10"	1.0006468	15' 59.01"	23° 26' 17"	-2 m 25 s
11	16° 38' 11"	0.05"	15° 19' 19"	6° 32' 07"	1.0006586	15' 59.00"	23° 26' 17"	-2 m 25 s
12	16° 40' 39"	0.05"	15° 21' 37"	6° 33' 03"	1.0006703	15' 58.99"	23° 26' 17"	-2 m 24 s
13	16° 43' 07"	0.06"	15° 23' 54"	6° 33' 60"	1.0006821	15' 58.98"	23° 26' 17"	-2 m 23 s
14	16° 45' 34"	0.07"	15° 26' 11"	6° 34' 56"	1.0006938	15' 58.96"	23° 26' 17"	-2 m 22 s
15	16° 48' 02"	0.07"	15° 28' 29"	6° 35' 53"	1.0007055	15' 58.95"	23° 26' 17"	-2 m 22 s
16	16° 50' 30"	0.08"	15° 30' 46"	6° 36' 50"	1.0007172	15' 58.94"	23° 26' 17"	-2 m 21 s
17	16° 52' 57"	0.08"	15° 33' 03"	6° 37' 46"	1.0007290	15' 58.93"	23° 26' 17"	-2 m 20 s
18	16° 55' 25"	0.09"	15° 35' 20"	6° 38' 43"	1.0007407	15' 58.92"	23° 26' 17"	-2 m 20 s
19	16° 57' 53"	0.09"	15° 37' 38"	6° 39' 39"	1.0007524	15' 58.91"	23° 26' 17"	-2 m 19 s
20	17° 00' 20"	0.10"	15° 39' 55"	6° 40' 36"	1.0007642	15' 58.90"	23° 26' 17"	-2 m 18 s
21	17° 02' 48"	0.10"	15° 42' 12"	6° 41' 32"	1.0007759	15' 58.89"	23° 26' 17"	-2 m 18 s
22	17° 05' 16"	0.11"	15° 44' 30"	6° 42' 29"	1.0007876	15' 58.87"	23° 26' 17"	-2 m 17 s
23	17° 07' 43"	0.11"	15° 46' 47"	6° 43' 26"	1.0007993	15' 58.86"	23° 26' 17"	-2 m 16 s
24	17° 10' 11"	0.12"	15° 49' 04"	6° 44' 22"	1.0008110	15' 58.85"	23° 26' 17"	-2 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	70° 27' 30"	1° 34' 19"	68° 36' 16"	23° 34' 13"	0° 54' 29"	14' 50.72"	260° 31' 24"	0.20907
1	70° 57' 20"	1° 36' 55"	69° 08' 06"	23° 41' 03"	0° 54' 28"	14' 50.53"	260° 42' 38"	0.21233
2	71° 27' 10"	1° 39' 29"	69° 39' 57"	23° 47' 47"	0° 54' 27"	14' 50.35"	260° 53' 58"	0.21561
3	71° 56' 59"	1° 42' 03"	70° 11' 51"	23° 54' 24"	0° 54' 27"	14' 50.17"	261° 5' 24"	0.21890
4	72° 26' 48"	1° 44' 37"	70° 43' 47"	24° 00' 54"	0° 54' 26"	14' 49.99"	261° 16' 57"	0.22220
5	72° 56' 35"	1° 47' 10"	71° 15' 46"	24° 07' 18"	0° 54' 25"	14' 49.82"	261° 28' 35"	0.22553
6	73° 26' 22"	1° 49' 43"	71° 47' 47"	24° 13' 34"	0° 54' 25"	14' 49.65"	261° 40' 19"	0.22886
7	73° 56' 08"	1° 52' 15"	72° 19' 50"	24° 19' 44"	0° 54' 24"	14' 49.49"	261° 52' 09"	0.23222
8	74° 25' 53"	1° 54' 46"	72° 51' 55"	24° 25' 46"	0° 54' 24"	14' 49.33"	262° 4' 05"	0.23559
9	74° 55' 38"	1° 57' 17"	73° 24' 03"	24° 31' 42"	0° 54' 23"	14' 49.17"	262° 16' 06"	0.23897
10	75° 25' 22"	1° 59' 47"	73° 56' 13"	24° 37' 31"	0° 54' 22"	14' 49.02"	262° 28' 13"	0.24237
11	75° 55' 05"	2° 02' 17"	74° 28' 24"	24° 43' 13"	0° 54' 22"	14' 48.87"	262° 40' 26"	0.24579
12	76° 24' 48"	2° 04' 46"	75° 00' 38"	24° 48' 48"	0° 54' 21"	14' 48.73"	262° 52' 43"	0.24921
13	76° 54' 30"	2° 07' 15"	75° 32' 55"	24° 54' 16"	0° 54' 21"	14' 48.59"	263° 5' 06"	0.25266
14	77° 24' 12"	2° 09' 43"	76° 05' 13"	24° 59' 37"	0° 54' 20"	14' 48.45"	263° 17' 34"	0.25611
15	77° 53' 52"	2° 12' 10"	76° 37' 33"	25° 04' 50"	0° 54' 20"	14' 48.32"	263° 30' 07"	0.25959
16	78° 23' 33"	2° 14' 37"	77° 09' 55"	25° 09' 57"	0° 54' 19"	14' 48.19"	263° 42' 44"	0.26307
17	78° 53' 13"	2° 17' 03"	77° 42' 20"	25° 14' 56"	0° 54' 19"	14' 48.07"	263° 55' 27"	0.26657
18	79° 22' 52"	2° 19' 28"	78° 14' 46"	25° 19' 49"	0° 54' 19"	14' 47.95"	264° 8' 14"	0.27008
19	79° 52' 31"	2° 21' 53"	78° 47' 14"	25° 24' 34"	0° 54' 18"	14' 47.84"	264° 21' 06"	0.27361
20	80° 22' 09"	2° 24' 17"	79° 19' 44"	25° 29' 12"	0° 54' 18"	14' 47.73"	264° 34' 02"	0.27715
21	80° 51' 47"	2° 26' 40"	79° 52' 16"	25° 33' 42"	0° 54' 17"	14' 47.63"	264° 47' 03"	0.28070
22	81° 21' 25"	2° 29' 02"	80° 24' 50"	25° 38' 05"	0° 54' 17"	14' 47.53"	265° 0' 08"	0.28426
23	81° 51' 02"	2° 31' 24"	80° 57' 25"	25° 42' 22"	0° 54' 17"	14' 47.43"	265° 13' 17"	0.28784
24	82° 20' 38"	2° 33' 46"	81° 30' 03"	25° 46' 30"	0° 54' 16"	14' 47.34"	265° 26' 31"	0.29142

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	17° 10' 11"	0.12"	15° 49' 04"	6° 44' 22"	1.0008110	15' 58.85"	23° 26' 17"	-2 m 15 s
1	17° 12' 38"	0.12"	15° 51' 22"	6° 45' 19"	1.0008228	15' 58.84"	23° 26' 17"	-2 m 15 s
2	17° 15' 06"	0.13"	15° 53' 39"	6° 46' 15"	1.0008345	15' 58.83"	23° 26' 17"	-2 m 14 s
3	17° 17' 34"	0.13"	15° 55' 56"	6° 47' 11"	1.0008462	15' 58.82"	23° 26' 17"	-2 m 13 s
4	17° 20' 01"	0.14"	15° 58' 14"	6° 48' 08"	1.0008579	15' 58.81"	23° 26' 17"	-2 m 13 s
5	17° 22' 29"	0.14"	16° 00' 31"	6° 49' 04"	1.0008696	15' 58.80"	23° 26' 17"	-2 m 12 s
6	17° 24' 56"	0.15"	16° 02' 48"	6° 50' 01"	1.0008813	15' 58.78"	23° 26' 17"	-2 m 11 s
7	17° 27' 24"	0.15"	16° 05' 06"	6° 50' 57"	1.0008930	15' 58.77"	23° 26' 17"	-2 m 10 s
8	17° 29' 52"	0.16"	16° 07' 23"	6° 51' 54"	1.0009047	15' 58.76"	23° 26' 17"	-2 m 10 s
9	17° 32' 19"	0.16"	16° 09' 40"	6° 52' 50"	1.0009164	15' 58.75"	23° 26' 17"	-2 m 09 s
10	17° 34' 47"	0.17"	16° 11' 58"	6° 53' 46"	1.0009282	15' 58.74"	23° 26' 17"	-2 m 08 s
11	17° 37' 14"	0.17"	16° 14' 15"	6° 54' 43"	1.0009399	15' 58.73"	23° 26' 17"	-2 m 08 s
12	17° 39' 42"	0.18"	16° 16' 33"	6° 55' 39"	1.0009516	15' 58.72"	23° 26' 17"	-2 m 07 s
13	17° 42' 09"	0.18"	16° 18' 50"	6° 56' 35"	1.0009633	15' 58.71"	23° 26' 17"	-2 m 06 s
14	17° 44' 37"	0.18"	16° 21' 07"	6° 57' 32"	1.0009750	15' 58.70"	23° 26' 17"	-2 m 06 s
15	17° 47' 05"	0.19"	16° 23' 25"	6° 58' 28"	1.0009867	15' 58.68"	23° 26' 17"	-2 m 05 s
16	17° 49' 32"	0.19"	16° 25' 42"	6° 59' 24"	1.0009984	15' 58.67"	23° 26' 17"	-2 m 04 s
17	17° 51' 60"	0.20"	16° 27' 60"	7° 00' 21"	1.0010100	15' 58.66"	23° 26' 17"	-2 m 04 s
18	17° 54' 27"	0.20"	16° 30' 17"	7° 01' 17"	1.0010217	15' 58.65"	23° 26' 17"	-2 m 03 s
19	17° 56' 55"	0.21"	16° 32' 34"	7° 02' 13"	1.0010334	15' 58.64"	23° 26' 17"	-2 m 02 s
20	17° 59' 22"	0.21"	16° 34' 52"	7° 03' 09"	1.0010451	15' 58.63"	23° 26' 17"	-2 m 01 s
21	18° 01' 50"	0.22"	16° 37' 09"	7° 04' 06"	1.0010568	15' 58.62"	23° 26' 17"	-2 m 01 s
22	18° 04' 17"	0.22"	16° 39' 27"	7° 05' 02"	1.0010685	15' 58.61"	23° 26' 17"	-2 m 00 s
23	18° 06' 45"	0.23"	16° 41' 44"	7° 05' 58"	1.0010802	15' 58.59"	23° 26' 17"	-1 m 59 s
24	18° 09' 12"	0.23"	16° 44' 02"	7° 06' 54"	1.0010919	15' 58.58"	23° 26' 17"	-1 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	82° 20' 38"	2° 33' 46"	81° 30' 03"	25° 46' 30"	0° 54' 16"	14' 47.34"	265° 26' 31"	0.29142
1	82° 50' 15"	2° 36' 06"	82° 02' 42"	25° 50' 32"	0° 54' 16"	14' 47.25"	265° 39' 48"	0.29502
2	83° 19' 51"	2° 38' 26"	82° 35' 22"	25° 54' 26"	0° 54' 16"	14' 47.17"	265° 53' 09"	0.29864
3	83° 49' 26"	2° 40' 45"	83° 08' 05"	25° 58' 12"	0° 54' 15"	14' 47.09"	266° 6' 34"	0.30226
4	84° 19' 02"	2° 43' 03"	83° 40' 49"	26° 01' 52"	0° 54' 15"	14' 47.02"	266° 20' 03"	0.30589
5	84° 48' 37"	2° 45' 21"	84° 13' 34"	26° 05' 23"	0° 54' 15"	14' 46.95"	266° 33' 36"	0.30954
6	85° 18' 11"	2° 47' 38"	84° 46' 21"	26° 08' 48"	0° 54' 15"	14' 46.89"	266° 47' 11"	0.31320
7	85° 47' 46"	2° 49' 54"	85° 19' 10"	26° 12' 05"	0° 54' 14"	14' 46.83"	267° 0' 51"	0.31687
8	86° 17' 20"	2° 52' 09"	85° 51' 60"	26° 15' 14"	0° 54' 14"	14' 46.77"	267° 14' 34"	0.32054
9	86° 46' 54"	2° 54' 23"	86° 24' 51"	26° 18' 16"	0° 54' 14"	14' 46.72"	267° 28' 19"	0.32423
10	87° 16' 28"	2° 56' 37"	86° 57' 44"	26° 21' 10"	0° 54' 14"	14' 46.68"	267° 42' 08"	0.32793
11	87° 46' 02"	2° 58' 50"	87° 30' 38"	26° 23' 57"	0° 54' 14"	14' 46.63"	267° 56' 01"	0.33164
12	88° 15' 36"	3° 01' 02"	88° 03' 33"	26° 26' 37"	0° 54' 14"	14' 46.60"	268° 9' 56"	0.33536
13	88° 45' 09"	3° 03' 13"	88° 36' 30"	26° 29' 09"	0° 54' 13"	14' 46.57"	268° 23' 53"	0.33909
14	89° 14' 43"	3° 05' 24"	89° 09' 27"	26° 31' 33"	0° 54' 13"	14' 46.54"	268° 37' 54"	0.34283
15	89° 44' 16"	3° 07' 34"	89° 42' 26"	26° 33' 49"	0° 54' 13"	14' 46.52"	268° 51' 57"	0.34658
16	90° 13' 49"	3° 09' 42"	90° 15' 26"	26° 35' 58"	0° 54' 13"	14' 46.50"	269° 6' 03"	0.35034
17	90° 43' 23"	3° 11' 50"	90° 48' 27"	26° 37' 60"	0° 54' 13"	14' 46.49"	269° 20' 11"	0.35410
18	91° 12' 56"	3° 13' 57"	91° 21' 29"	26° 39' 54"	0° 54' 13"	14' 46.48"	269° 34' 22"	0.35788
19	91° 42' 29"	3° 16' 04"	91° 54' 32"	26° 41' 40"	0° 54' 13"	14' 46.47"	269° 48' 34"	0.36166
20	92° 12' 02"	3° 18' 09"	92° 27' 35"	26° 43' 18"	0° 54' 13"	14' 46.48"	270° 2' 49"	0.36545
21	92° 41' 36"	3° 20' 14"	93° 00' 40"	26° 44' 49"	0° 54' 13"	14' 46.48"	270° 17' 06"	0.36925
22	93° 11' 09"	3° 22' 17"	93° 33' 45"	26° 46' 12"	0° 54' 13"	14' 46.49"	270° 31' 25"	0.37306
23	93° 40' 43"	3° 24' 20"	94° 06' 52"	26° 47' 28"	0° 54' 13"	14' 46.51"	270° 45' 46"	0.37687
24	94° 10' 16"	3° 26' 22"	94° 39' 58"	26° 48' 35"	0° 54' 13"	14' 46.53"	271° 0' 08"	0.38070



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	18° 09' 12"	0.23"	16° 44' 02"	7° 06' 54"	1.0010919	15' 58.58"	23° 26' 17"	-1 m 59 s
1	18° 11' 40"	0.23"	16° 46' 19"	7° 07' 51"	1.0011036	15' 58.57"	23° 26' 17"	-1 m 58 s
2	18° 14' 07"	0.24"	16° 48' 37"	7° 08' 47"	1.0011153	15' 58.56"	23° 26' 17"	-1 m 57 s
3	18° 16' 35"	0.24"	16° 50' 54"	7° 09' 43"	1.0011269	15' 58.55"	23° 26' 17"	-1 m 57 s
4	18° 19' 02"	0.25"	16° 53' 12"	7° 10' 39"	1.0011386	15' 58.54"	23° 26' 17"	-1 m 56 s
5	18° 21' 30"	0.25"	16° 55' 29"	7° 11' 35"	1.0011503	15' 58.53"	23° 26' 17"	-1 m 55 s
6	18° 23' 57"	0.26"	16° 57' 46"	7° 12' 31"	1.0011620	15' 58.52"	23° 26' 17"	-1 m 55 s
7	18° 26' 25"	0.26"	17° 00' 04"	7° 13' 27"	1.0011737	15' 58.51"	23° 26' 17"	-1 m 54 s
8	18° 28' 52"	0.26"	17° 02' 21"	7° 14' 24"	1.0011853	15' 58.49"	23° 26' 17"	-1 m 53 s
9	18° 31' 20"	0.27"	17° 04' 39"	7° 15' 20"	1.0011970	15' 58.48"	23° 26' 17"	-1 m 52 s
10	18° 33' 47"	0.27"	17° 06' 57"	7° 16' 16"	1.0012087	15' 58.47"	23° 26' 17"	-1 m 52 s
11	18° 36' 15"	0.28"	17° 09' 14"	7° 17' 12"	1.0012204	15' 58.46"	23° 26' 17"	-1 m 51 s
12	18° 38' 42"	0.28"	17° 11' 32"	7° 18' 08"	1.0012320	15' 58.45"	23° 26' 17"	-1 m 50 s
13	18° 41' 10"	0.28"	17° 13' 49"	7° 19' 04"	1.0012437	15' 58.44"	23° 26' 17"	-1 m 50 s
14	18° 43' 37"	0.29"	17° 16' 07"	7° 19' 60"	1.0012554	15' 58.43"	23° 26' 17"	-1 m 49 s
15	18° 46' 05"	0.29"	17° 18' 24"	7° 20' 56"	1.0012670	15' 58.42"	23° 26' 17"	-1 m 48 s
16	18° 48' 32"	0.29"	17° 20' 42"	7° 21' 52"	1.0012787	15' 58.40"	23° 26' 17"	-1 m 48 s
17	18° 50' 60"	0.30"	17° 22' 59"	7° 22' 48"	1.0012904	15' 58.39"	23° 26' 17"	-1 m 47 s
18	18° 53' 27"	0.30"	17° 25' 17"	7° 23' 44"	1.0013021	15' 58.38"	23° 26' 17"	-1 m 46 s
19	18° 55' 55"	0.31"	17° 27' 34"	7° 24' 40"	1.0013137	15' 58.37"	23° 26' 17"	-1 m 46 s
20	18° 58' 22"	0.31"	17° 29' 52"	7° 25' 36"	1.0013254	15' 58.36"	23° 26' 17"	-1 m 45 s
21	19° 00' 49"	0.31"	17° 32' 10"	7° 26' 32"	1.0013370	15' 58.35"	23° 26' 17"	-1 m 44 s
22	19° 03' 17"	0.32"	17° 34' 27"	7° 27' 28"	1.0013487	15' 58.34"	23° 26' 17"	-1 m 44 s
23	19° 05' 44"	0.32"	17° 36' 45"	7° 28' 23"	1.0013604	15' 58.33"	23° 26' 17"	-1 m 43 s
24	19° 08' 12"	0.32"	17° 39' 02"	7° 29' 19"	1.0013720	15' 58.32"	23° 26' 17"	-1 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	94° 10' 16"	3° 26' 22"	94° 39' 58"	26° 48' 35"	0° 54' 13"	14' 46.53"	271° 0' 08"	0.38070
1	94° 39' 50"	3° 28' 23"	95° 13' 06"	26° 49' 35"	0° 54' 13"	14' 46.56"	271° 14' 32"	0.38453
2	95° 09' 24"	3° 30' 23"	95° 46' 14"	26° 50' 28"	0° 54' 14"	14' 46.59"	271° 28' 58"	0.38837
3	95° 38' 58"	3° 32' 22"	96° 19' 23"	26° 51' 12"	0° 54' 14"	14' 46.62"	271° 43' 25"	0.39221
4	96° 08' 33"	3° 34' 20"	96° 52' 32"	26° 51' 49"	0° 54' 14"	14' 46.66"	271° 57' 53"	0.39606
5	96° 38' 07"	3° 36' 17"	97° 25' 41"	26° 52' 18"	0° 54' 14"	14' 46.71"	272° 12' 23"	0.39992
6	97° 07' 42"	3° 38' 13"	97° 58' 51"	26° 52' 40"	0° 54' 14"	14' 46.76"	272° 26' 54"	0.40379
7	97° 37' 17"	3° 40' 09"	98° 32' 01"	26° 52' 54"	0° 54' 14"	14' 46.81"	272° 41' 26"	0.40766
8	98° 06' 53"	3° 42' 03"	99° 05' 12"	26° 52' 60"	0° 54' 15"	14' 46.87"	272° 55' 59"	0.41154
9	98° 36' 29"	3° 43' 56"	99° 38' 23"	26° 52' 58"	0° 54' 15"	14' 46.94"	273° 10' 33"	0.41542
10	99° 06' 05"	3° 45' 49"	100° 11' 34"	26° 52' 48"	0° 54' 15"	14' 47.01"	273° 25' 07"	0.41931
11	99° 35' 41"	3° 47' 40"	100° 44' 45"	26° 52' 31"	0° 54' 15"	14' 47.08"	273° 39' 42"	0.42320
12	100° 05' 18"	3° 49' 30"	101° 17' 56"	26° 52' 06"	0° 54' 16"	14' 47.16"	273° 54' 18"	0.42710
13	100° 34' 55"	3° 51' 20"	101° 51' 07"	26° 51' 33"	0° 54' 16"	14' 47.24"	274° 8' 54"	0.43101
14	101° 04' 33"	3° 53' 08"	102° 24' 18"	26° 50' 53"	0° 54' 16"	14' 47.33"	274° 23' 31"	0.43492
15	101° 34' 11"	3° 54' 56"	102° 57' 29"	26° 50' 04"	0° 54' 17"	14' 47.43"	274° 38' 08"	0.43883
16	102° 03' 50"	3° 56' 42"	103° 30' 40"	26° 49' 08"	0° 54' 17"	14' 47.53"	274° 52' 45"	0.44275
17	102° 33' 29"	3° 58' 27"	104° 03' 51"	26° 48' 04"	0° 54' 17"	14' 47.63"	275° 7' 22"	0.44668
18	103° 03' 08"	4° 00' 12"	104° 37' 02"	26° 46' 53"	0° 54' 18"	14' 47.74"	275° 21' 59"	0.45060
19	103° 32' 49"	4° 01' 55"	105° 10' 12"	26° 45' 34"	0° 54' 18"	14' 47.85"	275° 36' 37"	0.45454
20	104° 02' 29"	4° 03' 37"	105° 43' 22"	26° 44' 07"	0° 54' 19"	14' 47.97"	275° 51' 14"	0.45847
21	104° 32' 11"	4° 05' 18"	106° 16' 32"	26° 42' 32"	0° 54' 19"	14' 48.09"	276° 5' 50"	0.46241
22	105° 01' 53"	4° 06' 58"	106° 49' 41"	26° 40' 49"	0° 54' 20"	14' 48.22"	276° 20' 27"	0.46636
23	105° 31' 35"	4° 08' 37"	107° 22' 50"	26° 38' 59"	0° 54' 20"	14' 48.36"	276° 35' 03"	0.47030
24	106° 01' 18"	4° 10' 15"	107° 55' 58"	26° 37' 01"	0° 54' 21"	14' 48.50"	276° 49' 38"	0.47425

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	19° 08' 12"	0.32"	17° 39' 02"	7° 29' 19"	1.0013720	15' 58.32"	23° 26' 17"	-1 m 42 s
1	19° 10' 39"	0.33"	17° 41' 20"	7° 30' 15"	1.0013837	15' 58.30"	23° 26' 17"	-1 m 42 s
2	19° 13' 07"	0.33"	17° 43' 38"	7° 31' 11"	1.0013953	15' 58.29"	23° 26' 17"	-1 m 41 s
3	19° 15' 34"	0.33"	17° 45' 55"	7° 32' 07"	1.0014070	15' 58.28"	23° 26' 17"	-1 m 40 s
4	19° 18' 01"	0.34"	17° 48' 13"	7° 33' 03"	1.0014187	15' 58.27"	23° 26' 17"	-1 m 39 s
5	19° 20' 29"	0.34"	17° 50' 30"	7° 33' 59"	1.0014303	15' 58.26"	23° 26' 17"	-1 m 39 s
6	19° 22' 56"	0.34"	17° 52' 48"	7° 34' 54"	1.0014420	15' 58.25"	23° 26' 17"	-1 m 38 s
7	19° 25' 24"	0.35"	17° 55' 06"	7° 35' 50"	1.0014536	15' 58.24"	23° 26' 17"	-1 m 37 s
8	19° 27' 51"	0.35"	17° 57' 23"	7° 36' 46"	1.0014653	15' 58.23"	23° 26' 17"	-1 m 37 s
9	19° 30' 18"	0.35"	17° 59' 41"	7° 37' 42"	1.0014769	15' 58.21"	23° 26' 17"	-1 m 36 s
10	19° 32' 46"	0.35"	18° 01' 59"	7° 38' 38"	1.0014886	15' 58.20"	23° 26' 17"	-1 m 35 s
11	19° 35' 13"	0.36"	18° 04' 16"	7° 39' 33"	1.0015002	15' 58.19"	23° 26' 17"	-1 m 35 s
12	19° 37' 41"	0.36"	18° 06' 34"	7° 40' 29"	1.0015119	15' 58.18"	23° 26' 17"	-1 m 34 s
13	19° 40' 08"	0.36"	18° 08' 52"	7° 41' 25"	1.0015235	15' 58.17"	23° 26' 17"	-1 m 33 s
14	19° 42' 35"	0.37"	18° 11' 09"	7° 42' 20"	1.0015352	15' 58.16"	23° 26' 17"	-1 m 33 s
15	19° 45' 03"	0.37"	18° 13' 27"	7° 43' 16"	1.0015468	15' 58.15"	23° 26' 17"	-1 m 32 s
16	19° 47' 30"	0.37"	18° 15' 45"	7° 44' 12"	1.0015585	15' 58.14"	23° 26' 17"	-1 m 31 s
17	19° 49' 57"	0.37"	18° 18' 02"	7° 45' 07"	1.0015701	15' 58.13"	23° 26' 17"	-1 m 31 s
18	19° 52' 25"	0.38"	18° 20' 20"	7° 46' 03"	1.0015818	15' 58.11"	23° 26' 17"	-1 m 30 s
19	19° 54' 52"	0.38"	18° 22' 38"	7° 46' 59"	1.0015934	15' 58.10"	23° 26' 17"	-1 m 29 s
20	19° 57' 19"	0.38"	18° 24' 56"	7° 47' 54"	1.0016051	15' 58.09"	23° 26' 17"	-1 m 29 s
21	19° 59' 47"	0.38"	18° 27' 13"	7° 48' 50"	1.0016167	15' 58.08"	23° 26' 17"	-1 m 28 s
22	20° 02' 14"	0.39"	18° 29' 31"	7° 49' 45"	1.0016283	15' 58.07"	23° 26' 17"	-1 m 27 s
23	20° 04' 41"	0.39"	18° 31' 49"	7° 50' 41"	1.0016400	15' 58.06"	23° 26' 17"	-1 m 27 s
24	20° 07' 09"	0.39"	18° 34' 06"	7° 51' 37"	1.0016516	15' 58.05"	23° 26' 17"	-1 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	106° 01' 18"	4° 10' 15"	107° 55' 58"	26° 37' 01"	0° 54' 21"	14' 48.50"	276° 49' 38"	0.47425
1	106° 31' 02"	4° 11' 52"	108° 29' 06"	26° 34' 56"	0° 54' 21"	14' 48.64"	277° 4' 13"	0.47820
2	107° 00' 47"	4° 13' 28"	109° 02' 13"	26° 32' 42"	0° 54' 22"	14' 48.79"	277° 18' 46"	0.48216
3	107° 30' 32"	4° 15' 03"	109° 35' 19"	26° 30' 21"	0° 54' 22"	14' 48.94"	277° 33' 20"	0.48612
4	108° 00' 18"	4° 16' 36"	110° 08' 25"	26° 27' 53"	0° 54' 23"	14' 49.10"	277° 47' 52"	0.49008
5	108° 30' 05"	4° 18' 09"	110° 41' 30"	26° 25' 16"	0° 54' 23"	14' 49.26"	278° 2' 23"	0.49404
6	108° 59' 52"	4° 19' 40"	111° 14' 34"	26° 22' 32"	0° 54' 24"	14' 49.43"	278° 16' 53"	0.49800
7	109° 29' 41"	4° 21' 10"	111° 47' 38"	26° 19' 40"	0° 54' 25"	14' 49.60"	278° 31' 22"	0.50197
8	109° 59' 30"	4° 22' 39"	112° 20' 40"	26° 16' 41"	0° 54' 25"	14' 49.78"	278° 45' 50"	0.50594
9	110° 29' 20"	4° 24' 07"	112° 53' 42"	26° 13' 34"	0° 54' 26"	14' 49.96"	279° 0' 16"	0.50991
10	110° 59' 11"	4° 25' 34"	113° 26' 42"	26° 10' 19"	0° 54' 27"	14' 50.15"	279° 14' 41"	0.51388
11	111° 29' 03"	4° 26' 59"	113° 59' 42"	26° 06' 57"	0° 54' 27"	14' 50.34"	279° 29' 05"	0.51785
12	111° 58' 55"	4° 28' 24"	114° 32' 40"	26° 03' 27"	0° 54' 28"	14' 50.54"	279° 43' 27"	0.52182
13	112° 28' 49"	4° 29' 47"	115° 05' 37"	25° 59' 50"	0° 54' 29"	14' 50.74"	279° 57' 47"	0.52579
14	112° 58' 43"	4° 31' 09"	115° 38' 34"	25° 56' 05"	0° 54' 30"	14' 50.95"	280° 12' 05"	0.52976
15	113° 28' 39"	4° 32' 30"	116° 11' 29"	25° 52' 12"	0° 54' 30"	14' 51.16"	280° 26' 22"	0.53373
16	113° 58' 36"	4° 33' 49"	116° 44' 22"	25° 48' 12"	0° 54' 31"	14' 51.38"	280° 40' 36"	0.53771
17	114° 28' 33"	4° 35' 08"	117° 17' 15"	25° 44' 05"	0° 54' 32"	14' 51.60"	280° 54' 49"	0.54168
18	114° 58' 32"	4° 36' 25"	117° 50' 06"	25° 39' 50"	0° 54' 33"	14' 51.83"	281° 8' 59"	0.54565
19	115° 28' 31"	4° 37' 41"	118° 22' 56"	25° 35' 27"	0° 54' 34"	14' 52.06"	281° 23' 08"	0.54962
20	115° 58' 32"	4° 38' 56"	118° 55' 45"	25° 30' 57"	0° 54' 34"	14' 52.30"	281° 37' 14"	0.55359
21	116° 28' 34"	4° 40' 09"	119° 28' 32"	25° 26' 19"	0° 54' 35"	14' 52.54"	281° 51' 18"	0.55756
22	116° 58' 37"	4° 41' 22"	120° 01' 18"	25° 21' 35"	0° 54' 36"	14' 52.78"	282° 5' 19"	0.56153
23	117° 28' 41"	4° 42' 33"	120° 34' 02"	25° 16' 42"	0° 54' 37"	14' 53.03"	282° 19' 18"	0.56550
24	117° 58' 46"	4° 43' 43"	121° 06' 45"	25° 11' 42"	0° 54' 38"	14' 53.29"	282° 33' 15"	0.56946

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	20° 07' 09"	0.39"	18° 34' 06"	7° 51' 37"	1.0016516	15' 58.05"	23° 26' 17"	-1 m 26 s
1	20° 09' 36"	0.39"	18° 36' 24"	7° 52' 32"	1.0016633	15' 58.04"	23° 26' 17"	-1 m 25 s
2	20° 12' 03"	0.40"	18° 38' 42"	7° 53' 28"	1.0016749	15' 58.03"	23° 26' 17"	-1 m 25 s
3	20° 14' 31"	0.40"	18° 40' 60"	7° 54' 23"	1.0016865	15' 58.01"	23° 26' 17"	-1 m 24 s
4	20° 16' 58"	0.40"	18° 43' 18"	7° 55' 19"	1.0016982	15' 58.00"	23° 26' 17"	-1 m 23 s
5	20° 19' 25"	0.40"	18° 45' 35"	7° 56' 14"	1.0017098	15' 57.99"	23° 26' 17"	-1 m 23 s
6	20° 21' 53"	0.40"	18° 47' 53"	7° 57' 10"	1.0017214	15' 57.98"	23° 26' 17"	-1 m 22 s
7	20° 24' 20"	0.41"	18° 50' 11"	7° 58' 05"	1.0017331	15' 57.97"	23° 26' 17"	-1 m 21 s
8	20° 26' 47"	0.41"	18° 52' 29"	7° 59' 01"	1.0017447	15' 57.96"	23° 26' 17"	-1 m 21 s
9	20° 29' 15"	0.41"	18° 54' 46"	7° 59' 56"	1.0017563	15' 57.95"	23° 26' 17"	-1 m 20 s
10	20° 31' 42"	0.41"	18° 57' 04"	8° 00' 51"	1.0017680	15' 57.94"	23° 26' 17"	-1 m 19 s
11	20° 34' 09"	0.41"	18° 59' 22"	8° 01' 47"	1.0017796	15' 57.93"	23° 26' 17"	-1 m 19 s
12	20° 36' 36"	0.42"	19° 01' 40"	8° 02' 42"	1.0017912	15' 57.91"	23° 26' 17"	-1 m 18 s
13	20° 39' 04"	0.42"	19° 03' 58"	8° 03' 38"	1.0018029	15' 57.90"	23° 26' 17"	-1 m 17 s
14	20° 41' 31"	0.42"	19° 06' 16"	8° 04' 33"	1.0018145	15' 57.89"	23° 26' 17"	-1 m 17 s
15	20° 43' 58"	0.42"	19° 08' 33"	8° 05' 28"	1.0018261	15' 57.88"	23° 26' 17"	-1 m 16 s
16	20° 46' 26"	0.42"	19° 10' 51"	8° 06' 24"	1.0018378	15' 57.87"	23° 26' 17"	-1 m 15 s
17	20° 48' 53"	0.42"	19° 13' 09"	8° 07' 19"	1.0018494	15' 57.86"	23° 26' 17"	-1 m 15 s
18	20° 51' 20"	0.42"	19° 15' 27"	8° 08' 14"	1.0018610	15' 57.85"	23° 26' 17"	-1 m 14 s
19	20° 53' 47"	0.43"	19° 17' 45"	8° 09' 10"	1.0018727	15' 57.84"	23° 26' 17"	-1 m 13 s
20	20° 56' 15"	0.43"	19° 20' 03"	8° 10' 05"	1.0018843	15' 57.83"	23° 26' 17"	-1 m 13 s
21	20° 58' 42"	0.43"	19° 22' 21"	8° 11' 00"	1.0018959	15' 57.81"	23° 26' 17"	-1 m 12 s
22	21° 01' 09"	0.43"	19° 24' 39"	8° 11' 55"	1.0019075	15' 57.80"	23° 26' 17"	-1 m 11 s
23	21° 03' 36"	0.43"	19° 26' 56"	8° 12' 51"	1.0019192	15' 57.79"	23° 26' 17"	-1 m 11 s
24	21° 06' 04"	0.43"	19° 29' 14"	8° 13' 46"	1.0019308	15' 57.78"	23° 26' 17"	-1 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	117° 58' 46"	4° 43' 43"	121° 06' 45"	25° 11' 42"	0° 54' 38"	14' 53.29"	282° 33' 15"	0.56946
1	118° 28' 53"	4° 44' 51"	121° 39' 26"	25° 06' 35"	0° 54' 39"	14' 53.55"	282° 47' 09"	0.57342
2	118° 59' 00"	4° 45' 59"	122° 12' 05"	25° 01' 21"	0° 54' 40"	14' 53.81"	283° 0' 60"	0.57738
3	119° 29' 09"	4° 47' 05"	122° 44' 43"	24° 55' 59"	0° 54' 41"	14' 54.08"	283° 14' 48"	0.58134
4	119° 59' 19"	4° 48' 09"	123° 17' 20"	24° 50' 30"	0° 54' 42"	14' 54.36"	283° 28' 34"	0.58530
5	120° 29' 31"	4° 49' 13"	123° 49' 54"	24° 44' 54"	0° 54' 43"	14' 54.64"	283° 42' 17"	0.58925
6	120° 59' 44"	4° 50' 15"	124° 22' 28"	24° 39' 10"	0° 54' 44"	14' 54.92"	283° 55' 57"	0.59320
7	121° 29' 58"	4° 51' 16"	124° 54' 59"	24° 33' 19"	0° 54' 45"	14' 55.21"	284° 9' 33"	0.59715
8	122° 00' 13"	4° 52' 15"	125° 27' 28"	24° 27' 21"	0° 54' 46"	14' 55.50"	284° 23' 07"	0.60109
9	122° 30' 30"	4° 53' 14"	125° 59' 56"	24° 21' 16"	0° 54' 47"	14' 55.80"	284° 36' 38"	0.60503
10	123° 00' 48"	4° 54' 11"	126° 32' 22"	24° 15' 03"	0° 54' 48"	14' 56.10"	284° 50' 05"	0.60897
11	123° 31' 07"	4° 55' 06"	127° 04' 47"	24° 08' 43"	0° 54' 50"	14' 56.40"	285° 3' 29"	0.61290
12	124° 01' 28"	4° 56' 00"	127° 37' 09"	24° 02' 17"	0° 54' 51"	14' 56.72"	285° 16' 50"	0.61682
13	124° 31' 50"	4° 56' 53"	128° 09' 30"	23° 55' 43"	0° 54' 52"	14' 57.03"	285° 30' 07"	0.62075
14	125° 02' 14"	4° 57' 45"	128° 41' 48"	23° 49' 02"	0° 54' 53"	14' 57.35"	285° 43' 21"	0.62467
15	125° 32' 39"	4° 58' 35"	129° 14' 05"	23° 42' 14"	0° 54' 54"	14' 57.68"	285° 56' 31"	0.62858
16	126° 03' 06"	4° 59' 24"	129° 46' 20"	23° 35' 19"	0° 54' 55"	14' 58.00"	286° 9' 38"	0.63249
17	126° 33' 34"	5° 00' 11"	130° 18' 33"	23° 28' 17"	0° 54' 57"	14' 58.34"	286° 22' 41"	0.63639
18	127° 04' 03"	5° 01' 58"	130° 50' 44"	23° 21' 08"	0° 54' 58"	14' 58.67"	286° 35' 41"	0.64029
19	127° 34' 35"	5° 02' 42"	131° 22' 53"	23° 13' 53"	0° 54' 59"	14' 59.02"	286° 48' 37"	0.64418
20	128° 05' 07"	5° 03' 26"	131° 55' 01"	23° 06' 30"	0° 55' 00"	14' 59.36"	287° 1' 29"	0.64806
21	128° 35' 42"	5° 04' 08"	132° 27' 06"	22° 59' 00"	0° 55' 02"	14' 59.71"	287° 14' 17"	0.65194
22	129° 06' 18"	5° 04' 48"	132° 59' 09"	22° 51' 24"	0° 55' 03"	15' 00.07"	287° 27' 01"	0.65581
23	129° 36' 55"	5° 05' 27"	133° 31' 10"	22° 43' 41"	0° 55' 04"	15' 00.43"	287° 39' 42"	0.65968
24	130° 07' 34"	5° 06' 05"	134° 03' 09"	22° 35' 51"	0° 55' 06"	15' 00.79"	287° 52' 18"	0.66354

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	21° 06' 04"	0.43"	19° 29' 14"	8° 13' 46"	1.0019308	15' 57.78"	23° 26' 17"	-1 m 10 s
1	21° 08' 31"	0.43"	19° 31' 32"	8° 14' 41"	1.0019424	15' 57.77"	23° 26' 17"	-1 m 09 s
2	21° 10' 58"	0.43"	19° 33' 50"	8° 15' 36"	1.0019540	15' 57.76"	23° 26' 17"	-1 m 09 s
3	21° 13' 25"	0.43"	19° 36' 08"	8° 16' 31"	1.0019657	15' 57.75"	23° 26' 17"	-1 m 08 s
4	21° 15' 52"	0.44"	19° 38' 26"	8° 17' 27"	1.0019773	15' 57.74"	23° 26' 17"	-1 m 07 s
5	21° 18' 20"	0.44"	19° 40' 44"	8° 18' 22"	1.0019889	15' 57.73"	23° 26' 17"	-1 m 07 s
6	21° 20' 47"	0.44"	19° 43' 02"	8° 19' 17"	1.0020005	15' 57.71"	23° 26' 17"	-1 m 06 s
7	21° 23' 14"	0.44"	19° 45' 20"	8° 20' 12"	1.0020122	15' 57.70"	23° 26' 17"	-1 m 05 s
8	21° 25' 41"	0.44"	19° 47' 38"	8° 21' 07"	1.0020238	15' 57.69"	23° 26' 17"	-1 m 05 s
9	21° 28' 09"	0.44"	19° 49' 56"	8° 22' 02"	1.0020354	15' 57.68"	23° 26' 17"	-1 m 04 s
10	21° 30' 36"	0.44"	19° 52' 14"	8° 22' 57"	1.0020470	15' 57.67"	23° 26' 17"	-1 m 03 s
11	21° 33' 03"	0.44"	19° 54' 32"	8° 23' 52"	1.0020587	15' 57.66"	23° 26' 17"	-1 m 03 s
12	21° 35' 30"	0.44"	19° 56' 50"	8° 24' 47"	1.0020703	15' 57.65"	23° 26' 17"	-1 m 02 s
13	21° 37' 57"	0.44"	19° 59' 08"	8° 25' 42"	1.0020819	15' 57.64"	23° 26' 17"	-1 m 01 s
14	21° 40' 24"	0.44"	20° 01' 26"	8° 26' 37"	1.0020935	15' 57.63"	23° 26' 17"	-1 m 01 s
15	21° 42' 52"	0.44"	20° 03' 44"	8° 27' 32"	1.0021051	15' 57.61"	23° 26' 17"	-1 m 00 s
16	21° 45' 19"	0.44"	20° 06' 02"	8° 28' 27"	1.0021168	15' 57.60"	23° 26' 17"	0 m -59 s
17	21° 47' 46"	0.44"	20° 08' 20"	8° 29' 22"	1.0021284	15' 57.59"	23° 26' 17"	0 m -59 s
18	21° 50' 13"	0.44"	20° 10' 38"	8° 30' 17"	1.0021400	15' 57.58"	23° 26' 17"	0 m -58 s
19	21° 52' 40"	0.44"	20° 12' 56"	8° 31' 12"	1.0021516	15' 57.57"	23° 26' 17"	0 m -58 s
20	21° 55' 07"	0.44"	20° 15' 14"	8° 32' 07"	1.0021633	15' 57.56"	23° 26' 17"	0 m -57 s
21	21° 57' 35"	0.44"	20° 17' 32"	8° 33' 02"	1.0021749	15' 57.55"	23° 26' 17"	0 m -56 s
22	22° 00' 02"	0.44"	20° 19' 50"	8° 33' 57"	1.0021865	15' 57.54"	23° 26' 17"	0 m -56 s
23	22° 02' 29"	0.44"	20° 22' 08"	8° 34' 52"	1.0021981	15' 57.53"	23° 26' 17"	0 m -55 s
24	22° 04' 56"	0.44"	20° 24' 26"	8° 35' 47"	1.0022097	15' 57.51"	23° 26' 17"	0 m -54 s

(*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	130° 07' 34"	5° 05' 05"	134° 03' 09"	22° 35' 51"	0° 55' 06"	15' 00.79"	287° 52' 18"	0.66354
1	130° 38' 15"	5° 05' 41"	134° 35' 07"	22° 27' 54"	0° 55' 07"	15' 01.16"	288° 4' 51"	0.66739
2	131° 08' 58"	5° 06' 16"	135° 07' 02"	22° 19' 51"	0° 55' 08"	15' 01.53"	288° 17' 19"	0.67123
3	131° 39' 42"	5° 06' 49"	135° 38' 55"	22° 11' 41"	0° 55' 10"	15' 01.90"	288° 29' 43"	0.67506
4	132° 10' 28"	5° 07' 21"	136° 10' 46"	22° 03' 24"	0° 55' 11"	15' 02.28"	288° 42' 03"	0.67889
5	132° 41' 15"	5° 07' 52"	136° 42' 35"	21° 55' 00"	0° 55' 13"	15' 02.67"	288° 54' 19"	0.68271
6	133° 12' 05"	5° 08' 21"	137° 14' 23"	21° 46' 30"	0° 55' 14"	15' 03.06"	289° 6' 31"	0.68652
7	133° 42' 56"	5° 08' 49"	137° 46' 08"	21° 37' 54"	0° 55' 15"	15' 03.45"	289° 18' 38"	0.69032
8	134° 13' 49"	5° 09' 15"	138° 17' 51"	21° 29' 11"	0° 55' 17"	15' 03.84"	289° 30' 42"	0.69411
9	134° 44' 43"	5° 09' 39"	138° 49' 32"	21° 20' 22"	0° 55' 18"	15' 04.24"	289° 42' 40"	0.69790
10	135° 15' 40"	5° 10' 03"	139° 21' 11"	21° 11' 26"	0° 55' 20"	15' 04.65"	289° 54' 35"	0.70167
11	135° 46' 38"	5° 10' 24"	139° 52' 48"	21° 02' 23"	0° 55' 21"	15' 05.05"	290° 6' 25"	0.70543
12	136° 17' 38"	5° 10' 45"	140° 24' 23"	20° 53' 15"	0° 55' 23"	15' 05.46"	290° 18' 10"	0.70919
13	136° 48' 40"	5° 11' 03"	140° 55' 55"	20° 43' 60"	0° 55' 24"	15' 05.88"	290° 29' 51"	0.71293
14	137° 19' 44"	5° 11' 21"	141° 27' 26"	20° 34' 38"	0° 55' 26"	15' 06.30"	290° 41' 28"	0.71666
15	137° 50' 50"	5° 11' 36"	141° 58' 55"	20° 25' 11"	0° 55' 27"	15' 06.72"	290° 52' 60"	0.72039
16	138° 21' 57"	5° 11' 50"	142° 30' 22"	20° 15' 37"	0° 55' 29"	15' 07.15"	291° 4' 27"	0.72410
17	138° 53' 07"	5° 12' 03"	143° 01' 47"	20° 05' 57"	0° 55' 31"	15' 07.58"	291° 15' 50"	0.72780
18	139° 24' 18"	5° 12' 14"	143° 33' 10"	19° 56' 11"	0° 55' 32"	15' 08.01"	291° 27' 08"	0.73148
19	139° 55' 31"	5° 12' 24"	144° 04' 31"	19° 46' 18"	0° 55' 34"	15' 08.44"	291° 38' 22"	0.73516
20	140° 26' 47"	5° 12' 32"	144° 35' 50"	19° 36' 20"	0° 55' 35"	15' 08.88"	291° 49' 31"	0.73882
21	140° 58' 04"	5° 12' 39"	145° 07' 07"	19° 26' 15"	0° 55' 37"	15' 09.33"	292° 0' 35"	0.74247
22	141° 29' 23"	5° 12' 44"	145° 38' 22"	19° 16' 05"	0° 55' 39"	15' 09.77"	292° 11' 35"	0.74611
23	142° 00' 45"	5° 12' 47"	146° 09' 35"	19° 05' 49"	0° 55' 40"	15' 10.23"	292° 22' 30"	0.74974
24	142° 32' 08"	5° 12' 49"	146° 40' 47"	18° 55' 26"	0° 55' 42"	15' 10.68"	292° 33' 20"	0.75335

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	22° 04' 56"	0.44"	20° 24' 26"	8° 35' 47"	1.0022097	15' 57.51"	23° 26' 17"	0 m-54 s
1	22° 07' 23"	0.44"	20° 26' 44"	8° 36' 41"	1.0022213	15' 57.50"	23° 26' 17"	0 m-54 s
2	22° 09' 50"	0.44"	20° 29' 02"	8° 37' 36"	1.0022330	15' 57.49"	23° 26' 17"	0 m-53 s
3	22° 12' 17"	0.44"	20° 31' 21"	8° 38' 31"	1.0022446	15' 57.48"	23° 26' 17"	0 m-52 s
4	22° 14' 45"	0.44"	20° 33' 39"	8° 39' 26"	1.0022562	15' 57.47"	23° 26' 17"	0 m-52 s
5	22° 17' 12"	0.44"	20° 35' 57"	8° 40' 21"	1.0022678	15' 57.46"	23° 26' 17"	0 m-51 s
6	22° 19' 39"	0.44"	20° 38' 15"	8° 41' 15"	1.0022794	15' 57.45"	23° 26' 17"	0 m-50 s
7	22° 22' 06"	0.44"	20° 40' 33"	8° 42' 10"	1.0022911	15' 57.44"	23° 26' 17"	0 m-50 s
8	22° 24' 33"	0.44"	20° 42' 51"	8° 43' 05"	1.0023027	15' 57.43"	23° 26' 17"	0 m-49 s
9	22° 27' 00"	0.44"	20° 45' 09"	8° 43' 60"	1.0023143	15' 57.41"	23° 26' 17"	0 m-49 s
10	22° 29' 27"	0.44"	20° 47' 28"	8° 44' 54"	1.0023259	15' 57.40"	23° 26' 17"	0 m-48 s
11	22° 31' 54"	0.44"	20° 49' 46"	8° 45' 49"	1.0023375	15' 57.39"	23° 26' 17"	0 m-47 s
12	22° 34' 22"	0.44"	20° 52' 04"	8° 46' 44"	1.0023492	15' 57.38"	23° 26' 17"	0 m-47 s
13	22° 36' 49"	0.43"	20° 54' 22"	8° 47' 38"	1.0023608	15' 57.37"	23° 26' 17"	0 m-46 s
14	22° 39' 16"	0.43"	20° 56' 40"	8° 48' 33"	1.0023724	15' 57.36"	23° 26' 17"	0 m-45 s
15	22° 41' 43"	0.43"	20° 58' 58"	8° 49' 28"	1.0023840	15' 57.35"	23° 26' 17"	0 m-45 s
16	22° 44' 10"	0.43"	21° 01' 17"	8° 50' 22"	1.0023956	15' 57.34"	23° 26' 17"	0 m-44 s
17	22° 46' 37"	0.43"	21° 03' 35"	8° 51' 17"	1.0024072	15' 57.33"	23° 26' 17"	0 m-43 s
18	22° 49' 04"	0.43"	21° 05' 53"	8° 52' 11"	1.0024189	15' 57.31"	23° 26' 17"	0 m-43 s
19	22° 51' 31"	0.43"	21° 08' 11"	8° 53' 06"	1.0024305	15' 57.30"	23° 26' 17"	0 m-42 s
20	22° 53' 58"	0.43"	21° 10' 29"	8° 54' 01"	1.0024421	15' 57.29"	23° 26' 17"	0 m-41 s
21	22° 56' 25"	0.43"	21° 12' 48"	8° 54' 55"	1.0024537	15' 57.28"	23° 26' 17"	0 m-41 s
22	22° 58' 52"	0.42"	21° 15' 06"	8° 55' 50"	1.0024653	15' 57.27"	23° 26' 17"	0 m-40 s
23	23° 01' 19"	0.42"	21° 17' 24"	8° 56' 44"	1.0024770	15' 57.26"	23° 26' 17"	0 m-40 s
24	23° 03' 46"	0.42"	21° 19' 43"	8° 57' 39"	1.0024886	15' 57.25"	23° 26' 17"	0 m-39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	142° 32' 08"	5° 12' 49"	146° 40' 47"	18° 55' 26"	0° 55' 42"	15' 10.68"	292° 33' 20"	0.75335
1	143° 03' 33"	5° 12' 49"	147° 11' 56"	18° 44' 58"	0° 55' 44"	15' 11.14"	292° 44' 06"	0.75695
2	143° 35' 00"	5° 12' 48"	147° 43' 03"	18° 34' 24"	0° 55' 45"	15' 11.59"	292° 54' 46"	0.76053
3	144° 06' 30"	5° 12' 45"	148° 14' 09"	18° 23' 44"	0° 55' 47"	15' 12.06"	293° 5' 22"	0.76410
4	144° 38' 01"	5° 12' 41"	148° 45' 13"	18° 12' 59"	0° 55' 49"	15' 12.52"	293° 15' 54"	0.76766
5	145° 09' 35"	5° 12' 35"	149° 16' 15"	18° 02' 07"	0° 55' 50"	15' 12.99"	293° 26' 20"	0.77120
6	145° 41' 10"	5° 12' 27"	149° 47' 15"	17° 51' 11"	0° 55' 52"	15' 13.47"	293° 36' 42"	0.77472
7	146° 12' 48"	5° 12' 18"	150° 18' 14"	17° 40' 08"	0° 55' 54"	15' 13.94"	293° 46' 58"	0.77823
8	146° 44' 28"	5° 12' 07"	150° 49' 11"	17° 28' 60"	0° 55' 56"	15' 14.42"	293° 57' 11"	0.78173
9	147° 16' 10"	5° 11' 55"	151° 20' 06"	17° 17' 46"	0° 55' 57"	15' 14.90"	294° 7' 18"	0.78521
10	147° 47' 54"	5° 11' 41"	151° 50' 59"	17° 06' 27"	0° 55' 59"	15' 15.38"	294° 17' 20"	0.78867
11	148° 19' 40"	5° 11' 25"	152° 21' 51"	16° 55' 02"	0° 56' 01"	15' 15.87"	294° 27' 18"	0.79212
12	148° 51' 28"	5° 11' 08"	152° 52' 41"	16° 43' 32"	0° 56' 03"	15' 16.36"	294° 37' 11"	0.79555
13	149° 23' 19"	5° 10' 49"	153° 23' 29"	16° 31' 56"	0° 56' 05"	15' 16.85"	294° 46' 59"	0.79896
14	149° 55' 12"	5° 10' 29"	153° 54' 16"	16° 20' 16"	0° 56' 06"	15' 17.34"	294° 56' 43"	0.80236
15	150° 27' 07"	5° 10' 07"	154° 25' 02"	16° 08' 29"	0° 56' 08"	15' 17.84"	295° 6' 22"	0.80573
16	150° 59' 04"	5° 09' 43"	154° 55' 45"	15° 56' 38"	0° 56' 10"	15' 18.34"	295° 15' 56"	0.80909
17	151° 31' 03"	5° 09' 18"	155° 26' 28"	15° 44' 42"	0° 56' 12"	15' 18.84"	295° 25' 25"	0.81243
18	152° 03' 04"	5° 08' 51"	155° 57' 08"	15° 32' 40"	0° 56' 14"	15' 19.34"	295° 34' 50"	0.81576
19	152° 35' 08"	5° 08' 22"	156° 27' 48"	15° 20' 33"	0° 56' 16"	15' 19.85"	295° 44' 09"	0.81906
20	153° 07' 14"	5° 07' 52"	156° 58' 26"	15° 08' 21"	0° 56' 17"	15' 20.36"	295° 53' 25"	0.82234
21	153° 39' 22"	5° 07' 20"	157° 29' 03"	14° 56' 04"	0° 56' 19"	15' 20.87"	296° 2' 35"	0.82561
22	154° 11' 33"	5° 06' 46"	157° 59' 38"	14° 43' 43"	0° 56' 21"	15' 21.38"	296° 11' 42"	0.82885
23	154° 43' 45"	5° 06' 11"	158° 30' 12"	14° 31' 16"	0° 56' 23"	15' 21.90"	296° 20' 43"	0.83208
24	155° 16' 00"	5° 05' 34"	159° 00' 45"	14° 18' 44"	0° 56' 25"	15' 22.41"	296° 29' 40"	0.83528

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	23° 03' 46"	0.42"	21° 19' 43"	8° 57' 39"	1.0024886	15' 57.25"	23° 26' 17"	0 m-39 s
1	23° 06' 13"	0.42"	21° 22' 01"	8° 58' 33"	1.0025002	15' 57.24"	23° 26' 17"	0 m-38 s
2	23° 08' 40"	0.42"	21° 24' 19"	8° 59' 28"	1.0025118	15' 57.23"	23° 26' 17"	0 m-38 s
3	23° 11' 07"	0.42"	21° 26' 37"	9° 00' 22"	1.0025234	15' 57.21"	23° 26' 17"	0 m-37 s
4	23° 13' 35"	0.42"	21° 28' 56"	9° 01' 16"	1.0025351	15' 57.20"	23° 26' 17"	0 m-36 s
5	23° 16' 02"	0.41"	21° 31' 14"	9° 02' 11"	1.0025467	15' 57.19"	23° 26' 17"	0 m-36 s
6	23° 18' 29"	0.41"	21° 33' 32"	9° 03' 05"	1.0025583	15' 57.18"	23° 26' 17"	0 m-35 s
7	23° 20' 56"	0.41"	21° 35' 51"	9° 03' 60"	1.0025699	15' 57.17"	23° 26' 17"	0 m-34 s
8	23° 23' 23"	0.41"	21° 38' 09"	9° 04' 54"	1.0025815	15' 57.16"	23° 26' 17"	0 m-34 s
9	23° 25' 50"	0.41"	21° 40' 27"	9° 05' 48"	1.0025932	15' 57.15"	23° 26' 17"	0 m-33 s
10	23° 28' 17"	0.40"	21° 42' 46"	9° 06' 43"	1.0026048	15' 57.14"	23° 26' 17"	0 m-33 s
11	23° 30' 44"	0.40"	21° 45' 04"	9° 07' 37"	1.0026164	15' 57.13"	23° 26' 17"	0 m-32 s
12	23° 33' 11"	0.40"	21° 47' 22"	9° 08' 31"	1.0026280	15' 57.11"	23° 26' 17"	0 m-31 s
13	23° 35' 38"	0.40"	21° 49' 41"	9° 09' 26"	1.0026396	15' 57.10"	23° 26' 17"	0 m-31 s
14	23° 38' 05"	0.40"	21° 51' 59"	9° 10' 20"	1.0026513	15' 57.09"	23° 26' 17"	0 m-30 s
15	23° 40' 32"	0.39"	21° 54' 17"	9° 11' 14"	1.0026629	15' 57.08"	23° 26' 17"	0 m-29 s
16	23° 42' 59"	0.39"	21° 56' 36"	9° 12' 08"	1.0026745	15' 57.07"	23° 26' 17"	0 m-29 s
17	23° 45' 26"	0.39"	21° 58' 54"	9° 13' 03"	1.0026861	15' 57.06"	23° 26' 17"	0 m-28 s
18	23° 47' 53"	0.39"	22° 01' 13"	9° 13' 57"	1.0026978	15' 57.05"	23° 26' 17"	0 m-28 s
19	23° 50' 20"	0.38"	22° 03' 31"	9° 14' 51"	1.0027094	15' 57.04"	23° 26' 17"	0 m-27 s
20	23° 52' 47"	0.38"	22° 05' 49"	9° 15' 45"	1.0027210	15' 57.03"	23° 26' 17"	0 m-26 s
21	23° 55' 14"	0.38"	22° 08' 08"	9° 16' 39"	1.0027326	15' 57.01"	23° 26' 17"	0 m-26 s
22	23° 57' 40"	0.38"	22° 10' 26"	9° 17' 33"	1.0027443	15' 57.00"	23° 26' 17"	0 m-25 s
23	24° 00' 07"	0.37"	22° 12' 45"	9° 18' 28"	1.0027559	15' 56.99"	23° 26' 17"	0 m-24 s
24	24° 02' 34"	0.37"	22° 15' 03"	9° 19' 22"	1.0027675	15' 56.98"	23° 26' 17"	0 m-24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	155° 16' 00"	5° 05' 34"	159° 00' 45"	14° 18' 44"	0° 56' 25"	15' 22.41"	296° 29' 40"	0.83528
1	155° 48' 17"	5° 04' 56"	159° 31' 16"	14° 06' 08"	0° 56' 27"	15' 22.93"	296° 38' 33"	0.83847
2	156° 20' 37"	5° 04' 15"	160° 01' 47"	13° 53' 27"	0° 56' 29"	15' 23.45"	296° 47' 21"	0.84163
3	156° 52' 59"	5° 03' 33"	160° 32' 16"	13° 40' 41"	0° 56' 31"	15' 23.97"	296° 56' 05"	0.84477
4	157° 25' 23"	5° 02' 50"	161° 02' 44"	13° 27' 50"	0° 56' 33"	15' 24.50"	297° 4' 44"	0.84789
5	157° 57' 49"	5° 02' 05"	161° 33' 11"	13° 14' 55"	0° 56' 35"	15' 25.02"	297° 13' 19"	0.85099
6	158° 30' 18"	5° 01' 18"	162° 03' 37"	13° 01' 55"	0° 56' 37"	15' 25.55"	297° 21' 50"	0.85406
7	159° 02' 49"	5° 00' 29"	162° 34' 02"	12° 48' 51"	0° 56' 38"	15' 26.08"	297° 30' 17"	0.85711
8	159° 35' 22"	4° 59' 39"	163° 04' 27"	12° 35' 43"	0° 56' 40"	15' 26.61"	297° 38' 40"	0.86014
9	160° 07' 57"	4° 58' 47"	163° 34' 50"	12° 22' 29"	0° 56' 42"	15' 27.14"	297° 46' 58"	0.86315
10	160° 40' 35"	4° 57' 53"	164° 05' 12"	12° 09' 12"	0° 56' 44"	15' 27.67"	297° 55' 13"	0.86613
11	161° 13' 15"	4° 56' 58"	164° 35' 34"	11° 55' 50"	0° 56' 46"	15' 28.21"	298° 3' 24"	0.86909
12	161° 45' 58"	4° 56' 01"	165° 05' 55"	11° 42' 24"	0° 56' 48"	15' 28.74"	298° 11' 31"	0.87202
13	162° 18' 43"	4° 55' 02"	165° 36' 15"	11° 28' 54"	0° 56' 50"	15' 29.28"	298° 19' 35"	0.87493
14	162° 51' 30"	4° 54' 02"	166° 06' 34"	11° 15' 20"	0° 56' 52"	15' 29.82"	298° 27' 35"	0.87781
15	163° 24' 19"	4° 53' 00"	166° 36' 53"	11° 01' 41"	0° 56' 54"	15' 30.35"	298° 35' 31"	0.88067
16	163° 57' 11"	4° 51' 56"	167° 07' 11"	10° 47' 59"	0° 56' 56"	15' 30.89"	298° 43' 25"	0.88351
17	164° 30' 05"	4° 50' 51"	167° 37' 29"	10° 34' 12"	0° 56' 58"	15' 31.43"	298° 51' 15"	0.88631
18	165° 03' 02"	4° 49' 44"	168° 07' 46"	10° 20' 22"	0° 57' 00"	15' 31.97"	298° 59' 01"	0.88909
19	165° 36' 01"	4° 48' 35"	168° 38' 03"	10° 06' 27"	0° 57' 02"	15' 32.51"	299° 6' 45"	0.89185
20	166° 09' 02"	4° 47' 25"	169° 08' 20"	9° 52' 29"	0° 57' 04"	15' 33.06"	299° 14' 27"	0.89457
21	166° 42' 05"	4° 46' 13"	169° 38' 36"	9° 38' 28"	0° 57' 06"	15' 33.60"	299° 22' 05"	0.89727
22	167° 15' 11"	4° 44' 59"	170° 08' 52"	9° 24' 22"	0° 57' 08"	15' 34.14"	299° 29' 41"	0.89994
23	167° 48' 20"	4° 43' 43"	170° 39' 07"	9° 10' 13"	0° 57' 10"	15' 34.69"	299° 37' 15"	0.90259
24	168° 21' 30"	4° 42' 26"	171° 09' 23"	8° 56' 00"	0° 57' 12"	15' 35.23"	299° 44' 47"	0.90520

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	24° 02' 34"	0.37"	22° 15' 03"	9° 19' 22"	1.0027675	15' 56.98"	23° 26' 17"	0 m-24 s
1	24° 05' 01"	0.37"	22° 17' 22"	9° 20' 16"	1.0027791	15' 56.97"	23° 26' 17"	0 m-23 s
2	24° 07' 28"	0.37"	22° 19' 40"	9° 21' 10"	1.0027908	15' 56.96"	23° 26' 17"	0 m-23 s
3	24° 09' 55"	0.36"	22° 21' 59"	9° 22' 04"	1.0028024	15' 56.95"	23° 26' 17"	0 m-22 s
4	24° 12' 22"	0.36"	22° 24' 17"	9° 22' 58"	1.0028140	15' 56.94"	23° 26' 17"	0 m-21 s
5	24° 14' 49"	0.36"	22° 26' 36"	9° 23' 52"	1.0028256	15' 56.93"	23° 26' 17"	0 m-21 s
6	24° 17' 16"	0.36"	22° 28' 54"	9° 24' 46"	1.0028373	15' 56.91"	23° 26' 17"	0 m-20 s
7	24° 19' 43"	0.35"	22° 31' 13"	9° 25' 40"	1.0028489	15' 56.90"	23° 26' 17"	0 m-20 s
8	24° 22' 10"	0.35"	22° 33' 31"	9° 26' 34"	1.0028605	15' 56.89"	23° 26' 17"	0 m-19 s
9	24° 24' 37"	0.35"	22° 35' 50"	9° 27' 28"	1.0028722	15' 56.88"	23° 26' 17"	0 m-18 s
10	24° 27' 04"	0.34"	22° 38' 08"	9° 28' 22"	1.0028838	15' 56.87"	23° 26' 17"	0 m-18 s
11	24° 29' 31"	0.34"	22° 40' 27"	9° 29' 16"	1.0028954	15' 56.86"	23° 26' 17"	0 m-17 s
12	24° 31' 58"	0.34"	22° 42' 45"	9° 30' 10"	1.0029070	15' 56.85"	23° 26' 17"	0 m-16 s
13	24° 34' 25"	0.33"	22° 45' 04"	9° 31' 03"	1.0029187	15' 56.84"	23° 26' 17"	0 m-16 s
14	24° 36' 51"	0.33"	22° 47' 23"	9° 31' 57"	1.0029303	15' 56.83"	23° 26' 17"	0 m-15 s
15	24° 39' 18"	0.33"	22° 49' 41"	9° 32' 51"	1.0029419	15' 56.82"	23° 26' 17"	0 m-15 s
16	24° 41' 45"	0.32"	22° 51' 60"	9° 33' 45"	1.0029536	15' 56.80"	23° 26' 17"	0 m-14 s
17	24° 44' 12"	0.32"	22° 54' 18"	9° 34' 39"	1.0029652	15' 56.79"	23° 26' 17"	0 m-13 s
18	24° 46' 39"	0.32"	22° 56' 37"	9° 35' 33"	1.0029768	15' 56.78"	23° 26' 17"	0 m-13 s
19	24° 49' 06"	0.31"	22° 58' 56"	9° 36' 26"	1.0029885	15' 56.77"	23° 26' 17"	0 m-12 s
20	24° 51' 33"	0.31"	23° 01' 14"	9° 37' 20"	1.0030001	15' 56.76"	23° 26' 17"	0 m-12 s
21	24° 53' 60"	0.31"	23° 03' 33"	9° 38' 14"	1.0030117	15' 56.75"	23° 26' 17"	0 m-11 s
22	24° 56' 27"	0.30"	23° 05' 51"	9° 39' 08"	1.0030234	15' 56.74"	23° 26' 17"	0 m-10 s
23	24° 58' 53"	0.30"	23° 08' 10"	9° 40' 01"	1.0030350	15' 56.73"	23° 26' 17"	0 m-10 s
24	25° 01' 20"	0.30"	23° 10' 29"	9° 40' 55"	1.0030467	15' 56.72"	23° 26' 17"	0 m -9 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	168° 21' 30"	4° 42' 26"	171° 09' 23"	8° 56' 00"	0° 57' 12"	15' 35.23"	299° 44' 47"	0.90520
1	168° 54' 43"	4° 41' 07"	171° 39' 38"	8° 41' 44"	0° 57' 14"	15' 35.77"	299° 52' 17"	0.90779
2	169° 27' 58"	4° 39' 47"	172° 09' 53"	8° 27' 24"	0° 57' 16"	15' 36.32"	299° 59' 45"	0.91035
3	170° 01' 16"	4° 38' 24"	172° 40' 09"	8° 13' 01"	0° 57' 18"	15' 36.86"	300° 7' 12"	0.91288
4	170° 34' 36"	4° 37' 01"	173° 10' 24"	7° 58' 35"	0° 57' 20"	15' 37.41"	300° 14' 38"	0.91538
5	171° 07' 58"	4° 35' 35"	173° 40' 39"	7° 44' 05"	0° 57' 22"	15' 37.95"	300° 22' 03"	0.91785
6	171° 41' 22"	4° 34' 08"	174° 10' 55"	7° 29' 32"	0° 57' 24"	15' 38.49"	300° 29' 27"	0.92029
7	172° 14' 49"	4° 32' 39"	174° 41' 10"	7° 14' 56"	0° 57' 26"	15' 39.04"	300° 36' 52"	0.92269
8	172° 48' 19"	4° 31' 08"	175° 11' 26"	7° 00' 17"	0° 57' 28"	15' 39.58"	300° 44' 16"	0.92507
9	173° 21' 50"	4° 29' 36"	175° 41' 43"	6° 45' 34"	0° 57' 30"	15' 40.12"	300° 51' 41"	0.92742
10	173° 55' 24"	4° 28' 02"	176° 11' 59"	6° 30' 49"	0° 57' 32"	15' 40.67"	300° 59' 06"	0.92973
11	174° 29' 00"	4° 26' 27"	176° 42' 17"	6° 16' 01"	0° 57' 34"	15' 41.21"	301° 6' 33"	0.93201
12	175° 02' 39"	4° 24' 49"	177° 12' 34"	6° 01' 10"	0° 57' 36"	15' 41.75"	301° 14' 02"	0.93426
13	175° 36' 19"	4° 23' 10"	177° 42' 52"	5° 46' 17"	0° 57' 38"	15' 42.29"	301° 21' 33"	0.93648
14	176° 10' 03"	4° 21' 30"	178° 13' 11"	5° 31' 20"	0° 57' 40"	15' 42.83"	301° 29' 06"	0.93867
15	176° 43' 48"	4° 19' 48"	178° 43' 30"	5° 16' 21"	0° 57' 42"	15' 43.37"	301° 36' 43"	0.94082
16	177° 17' 36"	4° 18' 04"	179° 13' 51"	5° 01' 20"	0° 57' 44"	15' 43.91"	301° 44' 24"	0.94293
17	177° 51' 26"	4° 16' 19"	179° 44' 11"	4° 46' 16"	0° 57' 46"	15' 44.45"	301° 52' 09"	0.94502
18	178° 25' 18"	4° 14' 32"	180° 14' 33"	4° 31' 09"	0° 57' 48"	15' 44.98"	302° 0' 00"	0.94707
19	178° 59' 12"	4° 12' 43"	180° 44' 56"	4° 16' 00"	0° 57' 50"	15' 45.52"	302° 7' 57"	0.94908
20	179° 33' 09"	4° 10' 53"	181° 15' 20"	4° 00' 49"	0° 57' 52"	15' 46.05"	302° 16' 01"	0.95106
21	180° 07' 08"	4° 09' 01"	181° 45' 44"	3° 45' 36"	0° 57' 54"	15' 46.58"	302° 24' 13"	0.95301
22	180° 41' 10"	4° 07' 07"	182° 16' 10"	3° 30' 20"	0° 57' 56"	15' 47.11"	302° 32' 33"	0.95492
23	181° 15' 13"	4° 05' 12"	182° 46' 37"	3° 15' 03"	0° 57' 58"	15' 47.64"	302° 41' 04"	0.95679
24	181° 49' 19"	4° 03' 16"	183° 17' 05"	2° 59' 43"	0° 57' 60"	15' 48.17"	302° 49' 45"	0.95863

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	25° 01' 20"	0.30"	23° 10' 29"	9° 40' 55"	1.0030467	15' 56.72"	23° 26' 17"	0 m -9 s
1	25° 03' 47"	0.29"	23° 12' 47"	9° 41' 49"	1.0030583	15' 56.70"	23° 26' 17"	0 m -9 s
2	25° 06' 14"	0.29"	23° 15' 06"	9° 42' 43"	1.0030699	15' 56.69"	23° 26' 17"	0 m -8 s
3	25° 08' 41"	0.29"	23° 17' 25"	9° 43' 36"	1.0030816	15' 56.68"	23° 26' 17"	0 m -7 s
4	25° 11' 08"	0.28"	23° 19' 44"	9° 44' 30"	1.0030932	15' 56.67"	23° 26' 17"	0 m -7 s
5	25° 13' 35"	0.28"	23° 22' 02"	9° 45' 23"	1.0031048	15' 56.66"	23° 26' 17"	0 m -6 s
6	25° 16' 01"	0.27"	23° 24' 21"	9° 46' 17"	1.0031165	15' 56.65"	23° 26' 17"	0 m -5 s
7	25° 18' 28"	0.27"	23° 26' 40"	9° 47' 11"	1.0031281	15' 56.64"	23° 26' 17"	0 m -5 s
8	25° 20' 55"	0.27"	23° 28' 58"	9° 48' 04"	1.0031398	15' 56.63"	23° 26' 17"	0 m -4 s
9	25° 23' 22"	0.26"	23° 31' 17"	9° 48' 58"	1.0031514	15' 56.62"	23° 26' 17"	0 m -4 s
10	25° 25' 49"	0.26"	23° 33' 36"	9° 49' 51"	1.0031631	15' 56.60"	23° 26' 17"	0 m -3 s
11	25° 28' 16"	0.25"	23° 35' 55"	9° 50' 45"	1.0031747	15' 56.59"	23° 26' 17"	0 m -2 s
12	25° 30' 42"	0.25"	23° 38' 13"	9° 51' 38"	1.0031863	15' 56.58"	23° 26' 17"	0 m -2 s
13	25° 33' 09"	0.25"	23° 40' 32"	9° 52' 32"	1.0031980	15' 56.57"	23° 26' 17"	0 m -1 s
14	25° 35' 36"	0.24"	23° 42' 51"	9° 53' 25"	1.0032096	15' 56.56"	23° 26' 17"	0 m -1 s
15	25° 38' 03"	0.24"	23° 45' 10"	9° 54' 19"	1.0032213	15' 56.55"	23° 26' 17"	0 m -0 s
16	25° 40' 30"	0.23"	23° 47' 29"	9° 55' 12"	1.0032329	15' 56.54"	23° 26' 17"	0 m 01 s
17	25° 42' 57"	0.23"	23° 49' 47"	9° 56' 06"	1.0032446	15' 56.53"	23° 26' 17"	0 m 01 s
18	25° 45' 23"	0.22"	23° 52' 06"	9° 56' 59"	1.0032562	15' 56.52"	23° 26' 17"	0 m 02 s
19	25° 47' 50"	0.22"	23° 54' 25"	9° 57' 52"	1.0032679	15' 56.50"	23° 26' 17"	0 m 02 s
20	25° 50' 17"	0.22"	23° 56' 44"	9° 58' 46"	1.0032795	15' 56.49"	23° 26' 17"	0 m 03 s
21	25° 52' 44"	0.21"	23° 59' 03"	9° 59' 39"	1.0032912	15' 56.48"	23° 26' 17"	0 m 03 s
22	25° 55' 11"	0.21"	24° 01' 22"	10° 00' 32"	1.0033028	15' 56.47"	23° 26' 17"	0 m 04 s
23	25° 57' 37"	0.20"	24° 03' 41"	10° 01' 26"	1.0033145	15' 56.46"	23° 26' 17"	0 m 05 s
24	26° 00' 04"	0.20"	24° 05' 59"	10° 02' 19"	1.0033261	15' 56.45"	23° 26' 17"	0 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	181° 49' 19"	4° 03' 16"	183° 17' 05"	2° 59' 43"	0° 57' 60"	15' 48.17"	302° 49' 45"	0.95863
1	182° 23' 27"	4° 01' 17"	183° 47' 34"	2° 44' 22"	0° 58' 01"	15' 48.70"	302° 58' 40"	0.96043
2	182° 57' 37"	3° 59' 18"	184° 18' 05"	2° 28' 58"	0° 58' 03"	15' 49.22"	303° 7' 48"	0.96220
3	183° 31' 50"	3° 57' 16"	184° 48' 37"	2° 13' 33"	0° 58' 05"	15' 49.75"	303° 17' 11"	0.96392
4	184° 06' 04"	3° 55' 13"	185° 19' 11"	1° 58' 06"	0° 58' 07"	15' 50.27"	303° 26' 52"	0.96561
5	184° 40' 21"	3° 53' 09"	185° 49' 46"	1° 42' 38"	0° 58' 09"	15' 50.79"	303° 36' 52"	0.96727
6	185° 14' 40"	3° 51' 03"	186° 20' 23"	1° 27' 08"	0° 58' 11"	15' 51.30"	303° 47' 14"	0.96888
7	185° 49' 01"	3° 48' 55"	186° 51' 01"	1° 11' 36"	0° 58' 13"	15' 51.82"	303° 57' 59"	0.97046
8	186° 23' 24"	3° 46' 46"	187° 21' 41"	0° 56' 03"	0° 58' 15"	15' 52.33"	304° 9' 11"	0.97200
9	186° 57' 50"	3° 44' 35"	187° 52' 23"	0° 40' 29"	0° 58' 17"	15' 52.84"	304° 20' 51"	0.97350
10	187° 32' 17"	3° 42' 23"	188° 23' 07"	0° 24' 53"	0° 58' 19"	15' 53.35"	304° 33' 05"	0.97496
11	188° 06' 47"	3° 40' 10"	188° 53' 52"	0° 09' 17"	0° 58' 20"	15' 53.85"	304° 45' 55"	0.97638
12	188° 41' 19"	3° 37' 55"	189° 24' 40"	0° -6' 21"	0° 58' 22"	15' 54.36"	304° 59' 25"	0.97776
13	189° 15' 53"	3° 35' 38"	189° 55' 30"	0° -21' 60"	0° 58' 24"	15' 54.86"	305° 13' 40"	0.97910
14	189° 50' 29"	3° 33' 20"	190° 26' 21"	0° -37' 40"	0° 58' 26"	15' 55.36"	305° 28' 45"	0.98040
15	190° 25' 07"	3° 31' 00"	190° 57' 15"	0° -53' 20"	0° 58' 28"	15' 55.85"	305° 44' 47"	0.98166
16	190° 59' 47"	3° 28' 40"	191° 28' 12"	-1° 09' 01"	0° 58' 30"	15' 56.34"	306° 1' 53"	0.98288
17	191° 34' 29"	3° 26' 17"	191° 59' 10"	-1° 24' 43"	0° 58' 31"	15' 56.83"	306° 20' 09"	0.98406
18	192° 09' 13"	3° 23' 53"	192° 30' 11"	-1° 40' 26"	0° 58' 33"	15' 57.32"	306° 39' 46"	0.98520
19	192° 43' 59"	3° 21' 28"	193° 01' 14"	-1° 56' 09"	0° 58' 35"	15' 57.80"	307° 0' 54"	0.98630
20	193° 18' 47"	3° 19' 02"	193° 32' 20"	-2° 11' 53"	0° 58' 37"	15' 58.28"	307° 23' 45"	0.98735
21	193° 53' 38"	3° 16' 33"	194° 03' 29"	-2° 27' 36"	0° 58' 38"	15' 58.76"	307° 48' 33"	0.98837
22	194° 28' 30"	3° 14' 04"	194° 34' 40"	-2° 43' 21"	0° 58' 40"	15' 59.23"	308° 15' 36"	0.98934
23	195° 03' 24"	3° 11' 33"	195° 05' 54"	-2° 59' 05"	0° 58' 42"	15' 59.70"	308° 45' 13"	0.99027
24	195° 38' 20"	3° 09' 01"	195° 37' 10"	-3° 14' 49"	0° 58' 44"	16' 00.17"	309° 17' 49"	0.99115

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	26° 00' 04"	0.20"	24° 05' 59"	10° 02' 19"	1.0033261	15' 56.45"	23° 26' 17"	0 m 05 s
1	26° 02' 31"	0.19"	24° 08' 18"	10° 03' 12"	1.0033378	15' 56.44"	23° 26' 17"	0 m 06 s
2	26° 04' 58"	0.19"	24° 10' 37"	10° 04' 06"	1.0033494	15' 56.43"	23° 26' 17"	0 m 06 s
3	26° 07' 24"	0.19"	24° 12' 56"	10° 04' 59"	1.0033611	15' 56.42"	23° 26' 17"	0 m 07 s
4	26° 09' 51"	0.18"	24° 15' 15"	10° 05' 52"	1.0033727	15' 56.40"	23° 26' 17"	0 m 08 s
5	26° 12' 18"	0.18"	24° 17' 34"	10° 06' 45"	1.0033844	15' 56.39"	23° 26' 17"	0 m 08 s
6	26° 14' 45"	0.17"	24° 19' 53"	10° 07' 38"	1.0033960	15' 56.38"	23° 26' 17"	0 m 09 s
7	26° 17' 12"	0.17"	24° 22' 12"	10° 08' 32"	1.0034077	15' 56.37"	23° 26' 17"	0 m 09 s
8	26° 19' 38"	0.16"	24° 24' 31"	10° 09' 25"	1.0034194	15' 56.36"	23° 26' 17"	0 m 10 s
9	26° 22' 05"	0.16"	24° 26' 50"	10° 10' 18"	1.0034310	15' 56.35"	23° 26' 17"	0 m 11 s
10	26° 24' 32"	0.15"	24° 29' 09"	10° 11' 11"	1.0034427	15' 56.34"	23° 26' 17"	0 m 11 s
11	26° 26' 59"	0.15"	24° 31' 28"	10° 12' 04"	1.0034543	15' 56.33"	23° 26' 17"	0 m 12 s
12	26° 29' 25"	0.14"	24° 33' 47"	10° 12' 57"	1.0034660	15' 56.32"	23° 26' 17"	0 m 12 s
13	26° 31' 52"	0.14"	24° 36' 06"	10° 13' 50"	1.0034777	15' 56.30"	23° 26' 17"	0 m 13 s
14	26° 34' 19"	0.13"	24° 38' 25"	10° 14' 43"	1.0034893	15' 56.29"	23° 26' 17"	0 m 13 s
15	26° 36' 45"	0.13"	24° 40' 44"	10° 15' 36"	1.0035010	15' 56.28"	23° 26' 17"	0 m 14 s
16	26° 39' 12"	0.12"	24° 43' 03"	10° 16' 29"	1.0035126	15' 56.27"	23° 26' 17"	0 m 15 s
17	26° 41' 39"	0.12"	24° 45' 22"	10° 17' 22"	1.0035243	15' 56.26"	23° 26' 17"	0 m 15 s
18	26° 44' 06"	0.11"	24° 47' 41"	10° 18' 15"	1.0035360	15' 56.25"	23° 26' 17"	0 m 16 s
19	26° 46' 32"	0.11"	24° 50' 00"	10° 19' 08"	1.0035476	15' 56.24"	23° 26' 17"	0 m 16 s
20	26° 48' 59"	0.10"	24° 52' 19"	10° 20' 01"	1.0035593	15' 56.23"	23° 26' 17"	0 m 17 s
21	26° 51' 26"	0.10"	24° 54' 38"	10° 20' 54"	1.0035710	15' 56.22"	23° 26' 17"	0 m 18 s
22	26° 53' 52"	0.09"	24° 56' 57"	10° 21' 47"	1.0035826	15' 56.20"	23° 26' 17"	0 m 18 s
23	26° 56' 19"	0.09"	24° 59' 16"	10° 22' 40"	1.0035943	15' 56.19"	23° 26' 17"	0 m 19 s
24	26° 58' 46"	0.08"	25° 01' 36"	10° 23' 33"	1.0036060	15' 56.18"	23° 26' 17"	0 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	195° 38' 20"	3° 09' 01"	195° 37' 10"	-3° 14' 49"	0° 58' 44"	16' 00.17"	309° 17' 49"	0.99115
1	196° 13' 18"	3° 06' 28"	196° 08' 30"	-3° 30' 33"	0° 58' 45"	16' 00.64"	309° 53' 52"	0.99200
2	196° 48' 17"	3° 03' 53"	196° 39' 52"	-3° 46' 18"	0° 58' 47"	16' 01.10"	310° 33' 57"	0.99280
3	197° 23' 19"	3° 01' 17"	197° 11' 17"	-4° 02' 02"	0° 58' 49"	16' 01.55"	311° 18' 47"	0.99355
4	197° 58' 23"	2° 58' 40"	197° 42' 45"	-4° 17' 45"	0° 58' 50"	16' 02.00"	312° 9' 14"	0.99427
5	198° 33' 28"	2° 56' 01"	198° 14' 17"	-4° 33' 29"	0° 58' 52"	16' 02.45"	313° 6' 25"	0.99493
6	199° 08' 35"	2° 53' 21"	198° 45' 52"	-4° 49' 12"	0° 58' 54"	16' 02.90"	314° 11' 42"	0.99556
7	199° 43' 44"	2° 50' 40"	199° 17' 29"	-5° 04' 54"	0° 58' 55"	16' 03.34"	315° 26' 51"	0.99614
8	200° 18' 55"	2° 47' 58"	199° 49' 10"	-5° 20' 36"	0° 58' 57"	16' 03.78"	316° 54' 09"	0.99668
9	200° 54' 08"	2° 45' 14"	200° 20' 55"	-5° 36' 17"	0° 58' 58"	16' 04.21"	318° 36' 35"	0.99717
10	201° 29' 22"	2° 42' 29"	200° 52' 43"	-5° 51' 57"	0° 58' 60"	16' 04.64"	320° 38' 08"	0.99762
11	202° 04' 38"	2° 39' 43"	201° 24' 34"	-6° 07' 36"	0° 59' 02"	16' 05.06"	323° 4' 10"	0.99802
12	202° 39' 56"	2° 36' 56"	201° 56' 29"	-6° 23' 14"	0° 59' 03"	16' 05.49"	326° 1' 57"	0.99838
13	203° 15' 16"	2° 34' 08"	202° 28' 28"	-6° 38' 51"	0° 59' 05"	16' 05.90"	329° 41' 30"	0.99869
14	203° 50' 37"	2° 31' 18"	203° 00' 30"	-6° 54' 27"	0° 59' 06"	16' 06.31"	334° 16' 30"	0.99896
15	204° 25' 60"	2° 28' 28"	203° 32' 36"	-7° 10' 01"	0° 59' 08"	16' 06.72"	340° 5' 13"	0.99918
16	205° 01' 24"	2° 25' 36"	204° 04' 46"	-7° 25' 34"	0° 59' 09"	16' 07.13"	347° 30' 12"	0.99935
17	205° 36' 50"	2° 22' 44"	204° 37' 00"	-7° 41' 05"	0° 59' 11"	16' 07.52"	356° 54' 07"	0.99948
18	206° 12' 18"	2° 19' 50"	205° 09' 18"	-7° 56' 35"	0° 59' 12"	16' 07.92"	8° 26' 28"	0.99957
19	206° 47' 48"	2° 16' 55"	205° 41' 39"	-8° 12' 03"	0° 59' 13"	16' 08.31"	21° 41' 17"	0.99961
20	207° 23' 18"	2° 13' 59"	206° 14' 05"	-8° 27' 29"	0° 59' 15"	16' 08.69"	35° 25' 41"	0.99960
21	207° 58' 51"	2° 11' 02"	206° 46' 35"	-8° 42' 54"	0° 59' 16"	16' 09.07"	48° 10' 02"	0.99954
22	208° 34' 25"	2° 08' 04"	207° 19' 09"	-8° 58' 16"	0° 59' 18"	16' 09.45"	58° 57' 01"	0.99944
23	209° 10' 00"	2° 05' 05"	207° 51' 48"	-9° 13' 36"	0° 59' 19"	16' 09.82"	67° 35' 48"	0.99929
24	209° 45' 37"	2° 02' 06"	208° 24' 30"	-9° 28' 54"	0° 59' 20"	16' 10.18"	74° 22' 47"	0.99910

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	26° 58' 46"	0.08"	25° 01' 36"	10° 23' 33"	1.0036060	15' 56.18"	23° 26' 17"	0 m 19 s
1	27° 01' 13"	0.08"	25° 03' 55"	10° 24' 26"	1.0036176	15' 56.17"	23° 26' 17"	0 m 20 s
2	27° 03' 39"	0.07"	25° 06' 14"	10° 25' 19"	1.0036293	15' 56.16"	23° 26' 17"	0 m 20 s
3	27° 06' 06"	0.07"	25° 08' 33"	10° 26' 11"	1.0036410	15' 56.15"	23° 26' 17"	0 m 21 s
4	27° 08' 33"	0.06"	25° 10' 52"	10° 27' 04"	1.0036526	15' 56.14"	23° 26' 17"	0 m 22 s
5	27° 10' 59"	0.06"	25° 13' 11"	10° 27' 57"	1.0036643	15' 56.13"	23° 26' 17"	0 m 22 s
6	27° 13' 26"	0.05"	25° 15' 30"	10° 28' 50"	1.0036760	15' 56.12"	23° 26' 17"	0 m 23 s
7	27° 15' 53"	0.05"	25° 17' 50"	10° 29' 43"	1.0036876	15' 56.10"	23° 26' 17"	0 m 23 s
8	27° 18' 19"	0.04"	25° 20' 09"	10° 30' 35"	1.0036993	15' 56.09"	23° 26' 17"	0 m 24 s
9	27° 20' 46"	0.04"	25° 22' 28"	10° 31' 28"	1.0037110	15' 56.08"	23° 26' 17"	0 m 24 s
10	27° 23' 13"	0.03"	25° 24' 47"	10° 32' 21"	1.0037227	15' 56.07"	23° 26' 17"	0 m 25 s
11	27° 25' 39"	0.03"	25° 27' 06"	10° 33' 13"	1.0037343	15' 56.06"	23° 26' 17"	0 m 26 s
12	27° 28' 06"	0.02"	25° 29' 26"	10° 34' 06"	1.0037460	15' 56.05"	23° 26' 17"	0 m 26 s
13	27° 30' 33"	0.02"	25° 31' 45"	10° 34' 59"	1.0037577	15' 56.04"	23° 26' 17"	0 m 27 s
14	27° 32' 59"	0.01"	25° 34' 04"	10° 35' 51"	1.0037694	15' 56.03"	23° 26' 17"	0 m 27 s
15	27° 35' 26"	0.01"	25° 36' 23"	10° 36' 44"	1.0037810	15' 56.02"	23° 26' 17"	0 m 28 s
16	27° 37' 53"	0.00"	25° 38' 43"	10° 37' 36"	1.0037927	15' 56.00"	23° 26' 17"	0 m 28 s
17	27° 40' 19"	-0.00"	25° 41' 02"	10° 38' 29"	1.0038044	15' 55.99"	23° 26' 17"	0 m 29 s
18	27° 42' 46"	-0.01"	25° 43' 21"	10° 39' 22"	1.0038161	15' 55.98"	23° 26' 17"	0 m 30 s
19	27° 45' 13"	-0.01"	25° 45' 41"	10° 40' 14"	1.0038277	15' 55.97"	23° 26' 17"	0 m 30 s
20	27° 47' 39"	-0.02"	25° 47' 60"	10° 41' 07"	1.0038394	15' 55.96"	23° 26' 17"	0 m 31 s
21	27° 50' 06"	-0.02"	25° 50' 19"	10° 41' 59"	1.0038511	15' 55.95"	23° 26' 17"	0 m 31 s
22	27° 52' 32"	-0.03"	25° 52' 39"	10° 42' 52"	1.0038628	15' 55.94"	23° 26' 17"	0 m 32 s
23	27° 54' 59"	-0.04"	25° 54' 58"	10° 43' 44"	1.0038745	15' 55.93"	23° 26' 17"	0 m 32 s
24	27° 57' 26"	-0.04"	25° 57' 17"	10° 44' 36"	1.0038861	15' 55.92"	23° 26' 17"	0 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	209° 45' 37"	2° 02' 06"	208° 24' 30"	-9° 28' 54"	0° 59' 20"	16' 10.18"	74° 22' 47"	0.99910
1	210° 21' 15"	1° 59' 05"	208° 57' 17"	-9° 44' 10"	0° 59' 22"	16' 10.54"	79° 41' 31"	0.99886
2	210° 56' 55"	1° 56' 03"	209° 30' 09"	-9° 59' 23"	0° 59' 23"	16' 10.90"	83° 53' 13"	0.99857
3	211° 32' 36"	1° 53' 01"	210° 03' 05"	-10° 14' 33"	0° 59' 24"	16' 11.25"	87° 14' 28"	0.99823
4	212° 08' 19"	1° 49' 57"	210° 36' 05"	-10° 29' 41"	0° 59' 26"	16' 11.59"	89° 57' 33"	0.99785
5	212° 44' 03"	1° 46' 53"	211° 09' 10"	-10° 44' 46"	0° 59' 27"	16' 11.93"	92° 11' 25"	0.99742
6	213° 19' 48"	1° 43' 48"	211° 42' 20"	-10° 59' 48"	0° 59' 28"	16' 12.27"	94° 2' 34"	0.99695
7	213° 55' 35"	1° 40' 42"	212° 15' 35"	-11° 14' 47"	0° 59' 29"	16' 12.60"	95° 35' 50"	0.99642
8	214° 31' 23"	1° 37' 36"	212° 48' 54"	-11° 29' 44"	0° 59' 30"	16' 12.92"	96° 54' 49"	0.99585
9	215° 07' 12"	1° 34' 28"	213° 22' 18"	-11° 44' 36"	0° 59' 32"	16' 13.24"	98° 2' 13"	0.99524
10	215° 43' 02"	1° 31' 20"	213° 55' 47"	-11° 59' 26"	0° 59' 33"	16' 13.56"	99° 0' 07"	0.99457
11	216° 18' 54"	1° 28' 11"	214° 29' 21"	-12° 14' 12"	0° 59' 34"	16' 13.86"	99° 50' 07"	0.99386
12	216° 54' 47"	1° 25' 01"	215° 02' 59"	-12° 28' 55"	0° 59' 35"	16' 14.17"	100° 33' 32"	0.99310
13	217° 30' 41"	1° 21' 51"	215° 36' 43"	-12° 43' 34"	0° 59' 36"	16' 14.46"	101° 11' 20"	0.99229
14	218° 06' 36"	1° 18' 40"	216° 10' 32"	-12° 58' 09"	0° 59' 37"	16' 14.75"	101° 44' 21"	0.99144
15	218° 42' 32"	1° 15' 28"	216° 44' 26"	-13° 12' 40"	0° 59' 38"	16' 15.04"	102° 13' 15"	0.99054
16	219° 18' 30"	1° 12' 16"	217° 18' 25"	-13° 27' 08"	0° 59' 39"	16' 15.32"	102° 38' 35"	0.98959
17	219° 54' 28"	1° 09' 03"	217° 52' 29"	-13° 41' 31"	0° 59' 40"	16' 15.59"	103° 0' 47"	0.98859
18	220° 30' 28"	1° 05' 50"	218° 26' 39"	-13° 55' 50"	0° 59' 41"	16' 15.86"	103° 20' 14"	0.98755
19	221° 06' 28"	1° 02' 36"	219° 00' 54"	-14° 10' 05"	0° 59' 42"	16' 16.13"	103° 37' 14"	0.98646
20	221° 42' 30"	0° 59' 22"	219° 35' 14"	-14° 24' 15"	0° 59' 43"	16' 16.38"	103° 52' 04"	0.98532
21	222° 18' 33"	0° 56' 07"	220° 09' 39"	-14° 38' 21"	0° 59' 44"	16' 16.64"	104° 4' 57"	0.98413
22	222° 54' 36"	0° 52' 51"	220° 44' 10"	-14° 52' 22"	0° 59' 45"	16' 16.88"	104° 16' 06"	0.98290
23	223° 30' 41"	0° 49' 36"	221° 18' 47"	-15° 06' 18"	0° 59' 46"	16' 17.12"	104° 25' 39"	0.98162
24	224° 06' 46"	0° 46' 19"	221° 53' 28"	-15° 20' 10"	0° 59' 47"	16' 17.36"	104° 33' 46"	0.98030

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	27° 57' 26"	-0.04"	25° 57' 17"	10° 44' 36"	1.0038861	15' 55.92"	23° 26' 17"	0 m 33 s
1	27° 59' 52"	-0.05"	25° 59' 37"	10° 45' 29"	1.0038978	15' 55.90"	23° 26' 17"	0 m 33 s
2	28° 02' 19"	-0.05"	26° 01' 56"	10° 46' 21"	1.0039095	15' 55.89"	23° 26' 17"	0 m 34 s
3	28° 04' 46"	-0.06"	26° 04' 16"	10° 47' 14"	1.0039212	15' 55.88"	23° 26' 17"	0 m 35 s
4	28° 07' 12"	-0.06"	26° 06' 35"	10° 48' 06"	1.0039329	15' 55.87"	23° 26' 17"	0 m 35 s
5	28° 09' 39"	-0.07"	26° 08' 54"	10° 48' 58"	1.0039445	15' 55.86"	23° 26' 17"	0 m 36 s
6	28° 12' 05"	-0.07"	26° 11' 14"	10° 49' 51"	1.0039562	15' 55.85"	23° 26' 17"	0 m 36 s
7	28° 14' 32"	-0.08"	26° 13' 33"	10° 50' 43"	1.0039679	15' 55.84"	23° 26' 17"	0 m 37 s
8	28° 16' 59"	-0.08"	26° 15' 53"	10° 51' 35"	1.0039796	15' 55.83"	23° 26' 17"	0 m 37 s
9	28° 19' 25"	-0.09"	26° 18' 12"	10° 52' 28"	1.0039913	15' 55.82"	23° 26' 17"	0 m 38 s
10	28° 21' 52"	-0.09"	26° 20' 32"	10° 53' 20"	1.0040030	15' 55.80"	23° 26' 17"	0 m 38 s
11	28° 24' 18"	-0.10"	26° 22' 51"	10° 54' 12"	1.0040147	15' 55.79"	23° 26' 17"	0 m 39 s
12	28° 26' 45"	-0.10"	26° 25' 11"	10° 55' 04"	1.0040263	15' 55.78"	23° 26' 17"	0 m 40 s
13	28° 29' 11"	-0.11"	26° 27' 30"	10° 55' 57"	1.0040380	15' 55.77"	23° 26' 17"	0 m 40 s
14	28° 31' 38"	-0.12"	26° 29' 50"	10° 56' 49"	1.0040497	15' 55.76"	23° 26' 17"	0 m 41 s
15	28° 34' 05"	-0.12"	26° 32' 09"	10° 57' 41"	1.0040614	15' 55.75"	23° 26' 17"	0 m 41 s
16	28° 36' 31"	-0.13"	26° 34' 29"	10° 58' 33"	1.0040731	15' 55.74"	23° 26' 17"	0 m 42 s
17	28° 38' 58"	-0.13"	26° 36' 48"	10° 59' 25"	1.0040848	15' 55.73"	23° 26' 17"	0 m 42 s
18	28° 41' 24"	-0.14"	26° 39' 08"	11° 00' 17"	1.0040964	15' 55.71"	23° 26' 17"	0 m 43 s
19	28° 43' 51"	-0.14"	26° 41' 27"	11° 01' 09"	1.0041081	15' 55.70"	23° 26' 17"	0 m 43 s
20	28° 46' 17"	-0.15"	26° 43' 47"	11° 02' 01"	1.0041198	15' 55.69"	23° 26' 17"	0 m 44 s
21	28° 48' 44"	-0.15"	26° 46' 06"	11° 02' 53"	1.0041315	15' 55.68"	23° 26' 17"	0 m 45 s
22	28° 51' 11"	-0.16"	26° 48' 26"	11° 03' 45"	1.0041432	15' 55.67"	23° 26' 17"	0 m 45 s
23	28° 53' 37"	-0.16"	26° 50' 46"	11° 04' 37"	1.0041549	15' 55.66"	23° 26' 17"	0 m 46 s
24	28° 56' 04"	-0.17"	26° 53' 05"	11° 05' 29"	1.0041666	15' 55.65"	23° 26' 17"	0 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	224° 06' 46"	0° 46' 19"	221° 53' 28"	-15° 20' 10"	0° 59' 47"	16' 17.36"	104° 33' 46"	0.98030
1	224° 42' 52"	0° 43' 03"	222° 28' 16"	-15° 33' 56"	0° 59' 47"	16' 17.59"	104° 40' 34"	0.97892
2	225° 18' 59"	0° 39' 46"	223° 03' 08"	-15° 47' 38"	0° 59' 48"	16' 17.81"	104° 46' 10"	0.97750
3	225° 55' 07"	0° 36' 28"	223° 38' 07"	-16° 01' 14"	0° 59' 49"	16' 18.02"	104° 50' 40"	0.97604
4	226° 31' 16"	0° 33' 10"	224° 13' 11"	-16° 14' 44"	0° 59' 50"	16' 18.24"	104° 54' 08"	0.97452
5	227° 07' 26"	0° 29' 52"	224° 48' 20"	-16° 28' 10"	0° 59' 51"	16' 18.44"	104° 56' 40"	0.97297
6	227° 43' 36"	0° 26' 34"	225° 23' 36"	-16° 41' 29"	0° 59' 51"	16' 18.64"	104° 58' 19"	0.97136
7	228° 19' 47"	0° 23' 15"	225° 58' 57"	-16° 54' 43"	0° 59' 52"	16' 18.83"	104° 59' 09"	0.96971
8	228° 55' 59"	0° 19' 57"	226° 34' 23"	-17° 07' 52"	0° 59' 53"	16' 19.02"	104° 59' 14"	0.96801
9	229° 32' 11"	0° 16' 37"	227° 09' 55"	-17° 20' 54"	0° 59' 53"	16' 19.20"	104° 58' 35"	0.96626
10	230° 08' 24"	0° 13' 18"	227° 45' 33"	-17° 33' 50"	0° 59' 54"	16' 19.38"	104° 57' 15"	0.96447
11	230° 44' 38"	0° 09' 59"	228° 21' 17"	-17° 46' 40"	0° 59' 55"	16' 19.55"	104° 55' 18"	0.96264
12	231° 20' 53"	0° 06' 39"	228° 57' 06"	-17° 59' 24"	0° 59' 55"	16' 19.71"	104° 52' 45"	0.96076
13	231° 57' 08"	0° 03' 20"	229° 33' 02"	-18° 12' 02"	0° 59' 56"	16' 19.87"	104° 49' 37"	0.95883
14	232° 33' 23"	0° 00' 00"	230° 09' 02"	-18° 24' 33"	0° 59' 56"	16' 20.02"	104° 45' 57"	0.95686
15	233° 09' 39"	0° -3' 20"	230° 45' 09"	-18° 36' 57"	0° 59' 57"	16' 20.16"	104° 41' 47"	0.95484
16	233° 45' 56"	0° -6' 40"	231° 21' 22"	-18° 49' 15"	0° 59' 57"	16' 20.30"	104° 37' 07"	0.95278
17	234° 22' 13"	0° -9' 59"	231° 57' 40"	-19° 01' 26"	0° 59' 58"	16' 20.43"	104° 31' 59"	0.95068
18	234° 58' 30"	0° -13' 19"	232° 34' 04"	-19° 13' 29"	0° 59' 58"	16' 20.56"	104° 26' 25"	0.94853
19	235° 34' 48"	0° -16' 39"	233° 10' 33"	-19° 25' 26"	0° 59' 59"	16' 20.68"	104° 20' 25"	0.94633
20	236° 11' 07"	0° -19' 59"	233° 47' 09"	-19° 37' 16"	0° 59' 59"	16' 20.80"	104° 14' 01"	0.94409
21	236° 47' 26"	0° -23' 18"	234° 23' 50"	-19° 48' 58"	0° 59' 60"	16' 20.91"	104° 7' 13"	0.94181
22	237° 23' 45"	0° -26' 38"	235° 00' 37"	-20° 00' 33"	1° 00' 00"	16' 21.01"	104° 0' 02"	0.93948
23	238° 00' 04"	0° -29' 57"	235° 37' 29"	-20° 12' 01"	1° 00' 00"	16' 21.11"	103° 52' 29"	0.93711
24	238° 36' 24"	0° -33' 16"	236° 14' 28"	-20° 23' 21"	1° 00' 01"	16' 21.20"	103° 44' 36"	0.93470

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	28° 56' 04"	-0.17"	26° 53' 05"	11° 05' 29"	1.0041666	15' 55.65"	23° 26' 17"	0 m 46 s
1	28° 58' 30"	-0.17"	26° 55' 25"	11° 06' 21"	1.0041783	15' 55.64"	23° 26' 17"	0 m 47 s
2	29° 00' 57"	-0.18"	26° 57' 44"	11° 07' 13"	1.0041899	15' 55.63"	23° 26' 17"	0 m 47 s
3	29° 03' 23"	-0.19"	27° 00' 04"	11° 08' 05"	1.0042016	15' 55.61"	23° 26' 17"	0 m 48 s
4	29° 05' 50"	-0.19"	27° 02' 24"	11° 08' 57"	1.0042133	15' 55.60"	23° 26' 17"	0 m 48 s
5	29° 08' 16"	-0.20"	27° 04' 43"	11° 09' 49"	1.0042250	15' 55.59"	23° 26' 17"	0 m 49 s
6	29° 10' 43"	-0.20"	27° 07' 03"	11° 10' 41"	1.0042367	15' 55.58"	23° 26' 17"	0 m 49 s
7	29° 13' 09"	-0.21"	27° 09' 23"	11° 11' 33"	1.0042484	15' 55.57"	23° 26' 17"	0 m 50 s
8	29° 15' 36"	-0.21"	27° 11' 43"	11° 12' 25"	1.0042601	15' 55.56"	23° 26' 17"	0 m 50 s
9	29° 18' 02"	-0.22"	27° 14' 02"	11° 13' 17"	1.0042718	15' 55.55"	23° 26' 17"	0 m 51 s
10	29° 20' 29"	-0.22"	27° 16' 22"	11° 14' 08"	1.0042834	15' 55.54"	23° 26' 17"	0 m 52 s
11	29° 22' 55"	-0.23"	27° 18' 42"	11° 15' 00"	1.0042951	15' 55.53"	23° 26' 17"	0 m 52 s
12	29° 25' 22"	-0.23"	27° 21' 02"	11° 15' 52"	1.0043068	15' 55.51"	23° 26' 17"	0 m 53 s
13	29° 27' 48"	-0.24"	27° 23' 21"	11° 16' 44"	1.0043185	15' 55.50"	23° 26' 17"	0 m 53 s
14	29° 30' 15"	-0.24"	27° 25' 41"	11° 17' 35"	1.0043302	15' 55.49"	23° 26' 17"	0 m 54 s
15	29° 32' 41"	-0.25"	27° 28' 01"	11° 18' 27"	1.0043419	15' 55.48"	23° 26' 17"	0 m 54 s
16	29° 35' 08"	-0.25"	27° 30' 21"	11° 19' 19"	1.0043536	15' 55.47"	23° 26' 17"	0 m 55 s
17	29° 37' 34"	-0.26"	27° 32' 40"	11° 20' 10"	1.0043652	15' 55.46"	23° 26' 17"	0 m 55 s
18	29° 40' 01"	-0.26"	27° 35' 00"	11° 21' 02"	1.0043769	15' 55.45"	23° 26' 17"	0 m 56 s
19	29° 42' 27"	-0.27"	27° 37' 20"	11° 21' 54"	1.0043886	15' 55.44"	23° 26' 17"	0 m 56 s
20	29° 44' 54"	-0.27"	27° 39' 40"	11° 22' 45"	1.0044003	15' 55.43"	23° 26' 17"	0 m 57 s
21	29° 47' 20"	-0.28"	27° 41' 60"	11° 23' 37"	1.0044120	15' 55.41"	23° 26' 17"	0 m 57 s
22	29° 49' 47"	-0.28"	27° 44' 20"	11° 24' 28"	1.0044237	15' 55.40"	23° 26' 17"	0 m 58 s
23	29° 52' 13"	-0.29"	27° 46' 39"	11° 25' 20"	1.0044354	15' 55.39"	23° 26' 17"	0 m 58 s
24	29° 54' 40"	-0.29"	27° 48' 59"	11° 26' 12"	1.0044470	15' 55.38"	23° 26' 17"	0 m 59 s

(*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	238° 36' 24"	0°-33' 16"	236° 14' 28"	-20° 23' 21"	1° 00' 01"	16' 21.20"	103° 44' 36"	0.93470
1	239° 12' 44"	0°-36' 35"	236° 51' 32"	-20° 34' 33"	1° 00' 01"	16' 21.28"	103° 36' 22"	0.93225
2	239° 49' 05"	0°-39' 54"	237° 28' 41"	-20° 45' 37"	1° 00' 01"	16' 21.36"	103° 27' 49"	0.92975
3	240° 25' 26"	0°-43' 13"	238° 05' 57"	-20° 56' 34"	1° 00' 02"	16' 21.44"	103° 18' 57"	0.92721
4	241° 01' 47"	0°-46' 31"	238° 43' 17"	-21° 07' 22"	1° 00' 02"	16' 21.50"	103° 9' 46"	0.92463
5	241° 38' 08"	0°-49' 49"	239° 20' 44"	-21° 18' 02"	1° 00' 02"	16' 21.57"	103° 0' 17"	0.92200
6	242° 14' 29"	0°-53' 07"	239° 58' 16"	-21° 28' 34"	1° 00' 02"	16' 21.62"	102° 50' 32"	0.91934
7	242° 50' 50"	0°-56' 24"	240° 35' 53"	-21° 38' 58"	1° 00' 02"	16' 21.67"	102° 40' 29"	0.91663
8	243° 27' 12"	0°-59' 41"	241° 13' 36"	-21° 49' 13"	1° 00' 03"	16' 21.72"	102° 30' 11"	0.91389
9	244° 03' 34"	-1° 02' 58"	241° 51' 24"	-21° 59' 19"	1° 00' 03"	16' 21.76"	102° 19' 36"	0.91110
10	244° 39' 55"	-1° 06' 14"	242° 29' 18"	-22° 09' 17"	1° 00' 03"	16' 21.79"	102° 8' 46"	0.90827
11	245° 16' 17"	-1° 09' 30"	243° 07' 17"	-22° 19' 06"	1° 00' 03"	16' 21.81"	101° 57' 42"	0.90540
12	245° 52' 39"	-1° 12' 45"	243° 45' 21"	-22° 28' 47"	1° 00' 03"	16' 21.84"	101° 46' 22"	0.90249
13	246° 29' 01"	-1° 15' 60"	244° 23' 31"	-22° 38' 18"	1° 00' 03"	16' 21.85"	101° 34' 49"	0.89955
14	247° 05' 23"	-1° 19' 14"	245° 01' 45"	-22° 47' 40"	1° 00' 03"	16' 21.86"	101° 23' 02"	0.89656
15	247° 41' 45"	-1° 22' 28"	245° 40' 05"	-22° 56' 53"	1° 00' 03"	16' 21.87"	101° 11' 01"	0.89354
16	248° 18' 07"	-1° 25' 41"	246° 18' 30"	-23° 05' 57"	1° 00' 03"	16' 21.86"	100° 58' 48"	0.89047
17	248° 54' 29"	-1° 28' 54"	246° 56' 59"	-23° 14' 51"	1° 00' 03"	16' 21.86"	100° 46' 22"	0.88737
18	249° 30' 50"	-1° 32' 06"	247° 35' 34"	-23° 23' 36"	1° 00' 03"	16' 21.84"	100° 33' 43"	0.88424
19	250° 07' 12"	-1° 35' 17"	248° 14' 13"	-23° 32' 12"	1° 00' 03"	16' 21.83"	100° 20' 52"	0.88106
20	250° 43' 33"	-1° 38' 28"	248° 52' 57"	-23° 40' 38"	1° 00' 03"	16' 21.80"	100° 7' 50"	0.87785
21	251° 19' 54"	-1° 41' 38"	249° 31' 46"	-23° 48' 54"	1° 00' 03"	16' 21.77"	99° 54' 36"	0.87460
22	251° 56' 16"	-1° 44' 47"	250° 10' 40"	-23° 57' 00"	1° 00' 03"	16' 21.74"	99° 41' 10"	0.87131
23	252° 32' 36"	-1° 47' 56"	250° 49' 37"	-24° 04' 57"	1° 00' 03"	16' 21.70"	99° 27' 34"	0.86799
24	253° 08' 57"	-1° 51' 04"	251° 28' 40"	-24° 12' 43"	1° 00' 02"	16' 21.65"	99° 13' 48"	0.86463



20 April 2022

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	29° 54' 40"	-0.29"	27° 48' 59"	11° 26' 12"	1.0044470	15' 55.38"	23° 26' 17"	0 m 59 s
1	29° 57' 06"	-0.30"	27° 51' 19"	11° 27' 03"	1.0044587	15' 55.37"	23° 26' 17"	0 m 60 s
2	29° 59' 33"	-0.30"	27° 53' 39"	11° 27' 55"	1.0044704	15' 55.36"	23° 26' 17"	1 m 00 s
3	30° 01' 59"	-0.31"	27° 55' 59"	11° 28' 46"	1.0044821	15' 55.35"	23° 26' 17"	1 m 01 s
4	30° 04' 26"	-0.31"	27° 58' 19"	11° 29' 38"	1.0044938	15' 55.34"	23° 26' 17"	1 m 01 s
5	30° 06' 52"	-0.32"	28° 00' 39"	11° 30' 29"	1.0045055	15' 55.33"	23° 26' 17"	1 m 02 s
6	30° 09' 19"	-0.32"	28° 02' 59"	11° 31' 20"	1.0045171	15' 55.31"	23° 26' 17"	1 m 02 s
7	30° 11' 45"	-0.33"	28° 05' 19"	11° 32' 12"	1.0045288	15' 55.30"	23° 26' 17"	1 m 03 s
8	30° 14' 11"	-0.33"	28° 07' 39"	11° 33' 03"	1.0045405	15' 55.29"	23° 26' 17"	1 m 03 s
9	30° 16' 38"	-0.34"	28° 09' 59"	11° 33' 54"	1.0045522	15' 55.28"	23° 26' 17"	1 m 04 s
10	30° 19' 04"	-0.34"	28° 12' 19"	11° 34' 46"	1.0045639	15' 55.27"	23° 26' 17"	1 m 04 s
11	30° 21' 31"	-0.35"	28° 14' 39"	11° 35' 37"	1.0045755	15' 55.26"	23° 26' 17"	1 m 05 s
12	30° 23' 57"	-0.35"	28° 16' 59"	11° 36' 28"	1.0045872	15' 55.25"	23° 26' 17"	1 m 05 s
13	30° 26' 24"	-0.36"	28° 19' 19"	11° 37' 20"	1.0045989	15' 55.24"	23° 26' 17"	1 m 06 s
14	30° 28' 50"	-0.36"	28° 21' 39"	11° 38' 11"	1.0046106	15' 55.23"	23° 26' 17"	1 m 06 s
15	30° 31' 17"	-0.37"	28° 23' 59"	11° 39' 02"	1.0046222	15' 55.21"	23° 26' 17"	1 m 07 s
16	30° 33' 43"	-0.37"	28° 26' 19"	11° 39' 53"	1.0046339	15' 55.20"	23° 26' 17"	1 m 07 s
17	30° 36' 09"	-0.38"	28° 28' 39"	11° 40' 45"	1.0046456	15' 55.19"	23° 26' 17"	1 m 08 s
18	30° 38' 36"	-0.38"	28° 30' 59"	11° 41' 36"	1.0046573	15' 55.18"	23° 26' 17"	1 m 08 s
19	30° 41' 02"	-0.39"	28° 33' 19"	11° 42' 27"	1.0046689	15' 55.17"	23° 26' 17"	1 m 09 s
20	30° 43' 29"	-0.39"	28° 35' 39"	11° 43' 18"	1.0046806	15' 55.16"	23° 26' 17"	1 m 09 s
21	30° 45' 55"	-0.40"	28° 37' 60"	11° 44' 09"	1.0046923	15' 55.15"	23° 26' 17"	1 m 10 s
22	30° 48' 21"	-0.40"	28° 40' 20"	11° 45' 00"	1.0047040	15' 55.14"	23° 26' 17"	1 m 10 s
23	30° 50' 48"	-0.40"	28° 42' 40"	11° 45' 51"	1.0047156	15' 55.13"	23° 26' 17"	1 m 11 s
24	30° 53' 14"	-0.41"	28° 45' 00"	11° 46' 42"	1.0047273	15' 55.11"	23° 26' 17"	1 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	253° 08' 57"	-1° 51' 04"	251° 28' 40"	-24° 12' 43"	1° 00' 02"	16' 21.65"	99° 13' 48"	0.86463
1	253° 45' 18"	-1° 54' 11"	252° 07' 46"	-24° 20' 20"	1° 00' 02"	16' 21.60"	98° 59' 51"	0.86124
2	254° 21' 38"	-1° 57' 17"	252° 46' 57"	-24° 27' 46"	1° 00' 02"	16' 21.55"	98° 45' 44"	0.85782
3	254° 57' 58"	-2° 00' 23"	253° 26' 12"	-24° 35' 02"	1° 00' 02"	16' 21.49"	98° 31' 27"	0.85436
4	255° 34' 17"	-2° 03' 27"	254° 05' 31"	-24° 42' 08"	1° 00' 02"	16' 21.42"	98° 17' 01"	0.85086
5	256° 10' 36"	-2° 06' 31"	254° 44' 54"	-24° 49' 04"	1° 00' 01"	16' 21.35"	98° 2' 25"	0.84733
6	256° 46' 55"	-2° 09' 34"	255° 24' 21"	-24° 55' 49"	1° 00' 01"	16' 21.27"	97° 47' 41"	0.84377
7	257° 23' 14"	-2° 12' 36"	256° 03' 51"	-25° 02' 24"	1° 00' 01"	16' 21.19"	97° 32' 47"	0.84018
8	257° 59' 32"	-2° 15' 37"	256° 43' 25"	-25° 08' 48"	1° 00' 00"	16' 21.10"	97° 17' 46"	0.83655
9	258° 35' 50"	-2° 18' 37"	257° 23' 03"	-25° 15' 01"	1° 00' 00"	16' 21.01"	97° 2' 35"	0.83290
10	259° 12' 07"	-2° 21' 37"	258° 02' 44"	-25° 21' 04"	0° 59' 60"	16' 20.91"	96° 47' 17"	0.82921
11	259° 48' 24"	-2° 24' 35"	258° 42' 28"	-25° 26' 56"	0° 59' 59"	16' 20.81"	96° 31' 52"	0.82549
12	260° 24' 40"	-2° 27' 32"	259° 22' 15"	-25° 32' 37"	0° 59' 59"	16' 20.71"	96° 16' 18"	0.82174
13	261° 00' 56"	-2° 30' 28"	260° 02' 06"	-25° 38' 08"	0° 59' 59"	16' 20.59"	96° 0' 38"	0.81796
14	261° 37' 12"	-2° 33' 23"	260° 41' 59"	-25° 43' 27"	0° 59' 58"	16' 20.48"	95° 44' 50"	0.81415
15	262° 13' 27"	-2° 36' 17"	261° 21' 55"	-25° 48' 36"	0° 59' 58"	16' 20.36"	95° 28' 56"	0.81031
16	262° 49' 41"	-2° 39' 10"	262° 01' 53"	-25° 53' 34"	0° 59' 57"	16' 20.23"	95° 12' 55"	0.80644
17	263° 25' 55"	-2° 42' 02"	262° 41' 55"	-25° 58' 20"	0° 59' 57"	16' 20.10"	94° 56' 48"	0.80254
18	264° 02' 09"	-2° 44' 53"	263° 21' 58"	-26° 02' 56"	0° 59' 56"	16' 19.97"	94° 40' 34"	0.79862
19	264° 38' 21"	-2° 47' 43"	264° 02' 04"	-26° 07' 20"	0° 59' 56"	16' 19.83"	94° 24' 15"	0.79466
20	265° 14' 33"	-2° 50' 31"	264° 42' 12"	-26° 11' 33"	0° 59' 55"	16' 19.69"	94° 7' 50"	0.79068
21	265° 50' 45"	-2° 53' 18"	265° 22' 22"	-26° 15' 35"	0° 59' 55"	16' 19.54"	93° 51' 20"	0.78668
22	266° 26' 56"	-2° 56' 04"	266° 02' 33"	-26° 19' 25"	0° 59' 54"	16' 19.39"	93° 34' 45"	0.78265
23	267° 03' 06"	-2° 58' 49"	266° 42' 46"	-26° 23' 05"	0° 59' 54"	16' 19.23"	93° 18' 05"	0.77859
24	267° 39' 16"	-3° 01' 33"	267° 23' 01"	-26° 26' 33"	0° 59' 53"	16' 19.07"	93° 1' 20"	0.77451

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	30° 53' 14"	-0.41"	28° 45' 00"	11° 46' 42"	1.0047273	15' 55.11"	23° 26' 17"	1 m 11 s
1	30° 55' 41"	-0.41"	28° 47' 20"	11° 47' 34"	1.0047390	15' 55.10"	23° 26' 17"	1 m 12 s
2	30° 58' 07"	-0.42"	28° 49' 40"	11° 48' 25"	1.0047506	15' 55.09"	23° 26' 17"	1 m 12 s
3	31° 00' 33"	-0.42"	28° 52' 01"	11° 49' 16"	1.0047623	15' 55.08"	23° 26' 17"	1 m 13 s
4	31° 02' 60"	-0.43"	28° 54' 21"	11° 50' 07"	1.0047739	15' 55.07"	23° 26' 17"	1 m 13 s
5	31° 05' 26"	-0.43"	28° 56' 41"	11° 50' 57"	1.0047856	15' 55.06"	23° 26' 17"	1 m 14 s
6	31° 07' 53"	-0.43"	28° 59' 01"	11° 51' 48"	1.0047973	15' 55.05"	23° 26' 17"	1 m 14 s
7	31° 10' 19"	-0.44"	29° 01' 22"	11° 52' 39"	1.0048089	15' 55.04"	23° 26' 17"	1 m 15 s
8	31° 12' 45"	-0.44"	29° 03' 42"	11° 53' 30"	1.0048206	15' 55.03"	23° 26' 17"	1 m 15 s
9	31° 15' 12"	-0.45"	29° 06' 02"	11° 54' 21"	1.0048322	15' 55.02"	23° 26' 17"	1 m 16 s
10	31° 17' 38"	-0.45"	29° 08' 22"	11° 55' 12"	1.0048439	15' 55.00"	23° 26' 17"	1 m 16 s
11	31° 20' 04"	-0.46"	29° 10' 43"	11° 56' 03"	1.0048556	15' 54.99"	23° 26' 17"	1 m 17 s
12	31° 22' 31"	-0.46"	29° 13' 03"	11° 56' 54"	1.0048672	15' 54.98"	23° 26' 17"	1 m 17 s
13	31° 24' 57"	-0.46"	29° 15' 23"	11° 57' 44"	1.0048789	15' 54.97"	23° 26' 17"	1 m 18 s
14	31° 27' 24"	-0.47"	29° 17' 44"	11° 58' 35"	1.0048905	15' 54.96"	23° 26' 17"	1 m 18 s
15	31° 29' 50"	-0.47"	29° 20' 04"	11° 59' 26"	1.0049022	15' 54.95"	23° 26' 17"	1 m 19 s
16	31° 32' 16"	-0.48"	29° 22' 24"	12° 00' 17"	1.0049138	15' 54.94"	23° 26' 17"	1 m 19 s
17	31° 34' 43"	-0.48"	29° 24' 45"	12° 01' 07"	1.0049255	15' 54.93"	23° 26' 17"	1 m 20 s
18	31° 37' 09"	-0.48"	29° 27' 05"	12° 01' 58"	1.0049371	15' 54.92"	23° 26' 17"	1 m 20 s
19	31° 39' 35"	-0.49"	29° 29' 25"	12° 02' 49"	1.0049488	15' 54.90"	23° 26' 17"	1 m 21 s
20	31° 42' 02"	-0.49"	29° 31' 46"	12° 03' 39"	1.0049604	15' 54.89"	23° 26' 17"	1 m 21 s
21	31° 44' 28"	-0.50"	29° 34' 06"	12° 04' 30"	1.0049720	15' 54.88"	23° 26' 17"	1 m 22 s
22	31° 46' 54"	-0.50"	29° 36' 27"	12° 05' 21"	1.0049837	15' 54.87"	23° 26' 17"	1 m 22 s
23	31° 49' 21"	-0.50"	29° 38' 47"	12° 06' 11"	1.0049953	15' 54.86"	23° 26' 17"	1 m 23 s
24	31° 51' 47"	-0.51"	29° 41' 08"	12° 07' 02"	1.0050070	15' 54.85"	23° 26' 17"	1 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	267° 39' 16"	-3° 01' 33"	267° 23' 01"	-26° 26' 33"	0° 59' 53"	16' 19.07"	93° 1' 20"	0.77451
1	268° 15' 24"	-3° 04' 15"	268° 03' 18"	-26° 29' 49"	0° 59' 52"	16' 18.90"	92° 44' 31"	0.77040
2	268° 51' 33"	-3° 06' 56"	268° 43' 35"	-26° 32' 54"	0° 59' 52"	16' 18.73"	92° 27' 37"	0.76627
3	269° 27' 40"	-3° 09' 36"	269° 23' 54"	-26° 35' 48"	0° 59' 51"	16' 18.56"	92° 10' 40"	0.76211
4	270° 03' 47"	-3° 12' 14"	270° 04' 13"	-26° 38' 31"	0° 59' 50"	16' 18.38"	91° 53' 38"	0.75793
5	270° 39' 53"	-3° 14' 51"	270° 44' 34"	-26° 41' 02"	0° 59' 50"	16' 18.20"	91° 36' 34"	0.75373
6	271° 15' 58"	-3° 17' 27"	271° 24' 55"	-26° 43' 21"	0° 59' 49"	16' 18.02"	91° 19' 26"	0.74950
7	271° 52' 02"	-3° 20' 01"	272° 05' 16"	-26° 45' 29"	0° 59' 48"	16' 17.83"	91° 2' 14"	0.74526
8	272° 28' 02"	-3° 22' 34"	272° 45' 34"	-26° 47' 25"	0° 59' 48"	16' 17.63"	90° 45' 02"	0.74100
9	273° 04' 05"	-3° 25' 05"	273° 25' 56"	-26° 49' 10"	0° 59' 47"	16' 17.43"	90° 27' 46"	0.73671
10	273° 40' 07"	-3° 27' 36"	274° 06' 18"	-26° 50' 44"	0° 59' 46"	16' 17.23"	90° 10' 27"	0.73240
11	274° 16' 08"	-3° 30' 04"	274° 46' 40"	-26° 52' 06"	0° 59' 45"	16' 17.03"	89° 53' 06"	0.72807
12	274° 52' 09"	-3° 32' 32"	275° 27' 02"	-26° 53' 17"	0° 59' 45"	16' 16.82"	89° 35' 42"	0.72372
13	275° 28' 08"	-3° 34' 57"	276° 07' 23"	-26° 54' 16"	0° 59' 44"	16' 16.61"	89° 18' 18"	0.71935
14	276° 04' 07"	-3° 37' 22"	276° 47' 44"	-26° 55' 03"	0° 59' 43"	16' 16.40"	89° 0' 51"	0.71496
15	276° 40' 04"	-3° 39' 45"	277° 28' 04"	-26° 55' 40"	0° 59' 42"	16' 16.18"	88° 43' 24"	0.71056
16	277° 16' 01"	-3° 42' 06"	278° 08' 23"	-26° 56' 04"	0° 59' 42"	16' 15.95"	88° 25' 55"	0.70614
17	277° 51' 57"	-3° 44' 26"	278° 48' 41"	-26° 56' 17"	0° 59' 41"	16' 15.73"	88° 8' 25"	0.70170
18	278° 27' 52"	-3° 46' 44"	279° 28' 58"	-26° 56' 19"	0° 59' 40"	16' 15.50"	87° 50' 55"	0.69724
19	279° 03' 46"	-3° 49' 01"	280° 09' 14"	-26° 56' 10"	0° 59' 39"	16' 15.27"	87° 33' 24"	0.69277
20	279° 39' 39"	-3° 51' 16"	280° 49' 28"	-26° 55' 48"	0° 59' 38"	16' 15.03"	87° 15' 53"	0.68828
21	280° 15' 31"	-3° 53' 30"	281° 29' 41"	-26° 55' 16"	0° 59' 37"	16' 14.80"	86° 58' 22"	0.68377
22	280° 51' 22"	-3° 55' 42"	282° 09' 52"	-26° 54' 32"	0° 59' 36"	16' 14.55"	86° 40' 52"	0.67925
23	281° 27' 12"	-3° 57' 52"	282° 50' 01"	-26° 53' 37"	0° 59' 35"	16' 14.31"	86° 23' 21"	0.67472
24	282° 03' 01"	-4° 00' 01"	283° 30' 08"	-26° 52' 31"	0° 59' 35"	16' 14.06"	86° 5' 52"	0.67017

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	31° 51' 47"	-0.51"	29° 41' 08"	12° 07' 02"	1.0050070	15' 54.85"	23° 26' 17"	1 m 23 s
1	31° 54' 13"	-0.51"	29° 43' 28"	12° 07' 52"	1.0050186	15' 54.84"	23° 26' 17"	1 m 24 s
2	31° 56' 40"	-0.51"	29° 45' 48"	12° 08' 43"	1.0050302	15' 54.83"	23° 26' 17"	1 m 24 s
3	31° 59' 06"	-0.52"	29° 48' 09"	12° 09' 33"	1.0050418	15' 54.82"	23° 26' 17"	1 m 25 s
4	32° 01' 32"	-0.52"	29° 50' 29"	12° 10' 24"	1.0050535	15' 54.80"	23° 26' 17"	1 m 25 s
5	32° 03' 59"	-0.52"	29° 52' 50"	12° 11' 14"	1.0050651	15' 54.79"	23° 26' 17"	1 m 26 s
6	32° 06' 25"	-0.53"	29° 55' 10"	12° 12' 05"	1.0050767	15' 54.78"	23° 26' 17"	1 m 26 s
7	32° 08' 51"	-0.53"	29° 57' 31"	12° 12' 55"	1.0050884	15' 54.77"	23° 26' 17"	1 m 27 s
8	32° 11' 18"	-0.53"	29° 59' 52"	12° 13' 46"	1.0051000	15' 54.76"	23° 26' 17"	1 m 27 s
9	32° 13' 44"	-0.54"	30° 02' 12"	12° 14' 36"	1.0051116	15' 54.75"	23° 26' 17"	1 m 28 s
10	32° 16' 10"	-0.54"	30° 04' 33"	12° 15' 26"	1.0051232	15' 54.74"	23° 26' 17"	1 m 28 s
11	32° 18' 37"	-0.54"	30° 06' 53"	12° 16' 17"	1.0051348	15' 54.73"	23° 26' 17"	1 m 29 s
12	32° 21' 03"	-0.55"	30° 09' 14"	12° 17' 07"	1.0051464	15' 54.72"	23° 26' 17"	1 m 29 s
13	32° 23' 29"	-0.55"	30° 11' 34"	12° 17' 57"	1.0051581	15' 54.71"	23° 26' 17"	1 m 30 s
14	32° 25' 55"	-0.55"	30° 13' 55"	12° 18' 48"	1.0051697	15' 54.69"	23° 26' 17"	1 m 30 s
15	32° 28' 22"	-0.56"	30° 16' 16"	12° 19' 38"	1.0051813	15' 54.68"	23° 26' 17"	1 m 31 s
16	32° 30' 48"	-0.56"	30° 18' 36"	12° 20' 28"	1.0051929	15' 54.67"	23° 26' 17"	1 m 31 s
17	32° 33' 14"	-0.56"	30° 20' 57"	12° 21' 18"	1.0052045	15' 54.66"	23° 26' 17"	1 m 32 s
18	32° 35' 41"	-0.57"	30° 23' 18"	12° 22' 09"	1.0052161	15' 54.65"	23° 26' 17"	1 m 32 s
19	32° 38' 07"	-0.57"	30° 25' 38"	12° 22' 59"	1.0052277	15' 54.64"	23° 26' 17"	1 m 33 s
20	32° 40' 33"	-0.57"	30° 27' 59"	12° 23' 49"	1.0052393	15' 54.63"	23° 26' 17"	1 m 33 s
21	32° 42' 59"	-0.57"	30° 30' 20"	12° 24' 39"	1.0052509	15' 54.62"	23° 26' 17"	1 m 34 s
22	32° 45' 26"	-0.58"	30° 32' 40"	12° 25' 29"	1.0052625	15' 54.61"	23° 26' 17"	1 m 34 s
23	32° 47' 52"	-0.58"	30° 35' 01"	12° 26' 19"	1.0052740	15' 54.60"	23° 26' 17"	1 m 35 s
24	32° 50' 18"	-0.58"	30° 37' 22"	12° 27' 09"	1.0052856	15' 54.58"	23° 26' 17"	1 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	282° 03' 01"	-4° 00' 01"	283° 30' 08"	-26° 52' 31"	0° 59' 35"	16' 14.06"	86° 5' 52"	0.67017
1	282° 38' 50"	-4° 02' 08"	284° 10' 12"	-26° 51' 13"	0° 59' 34"	16' 13.81"	85° 48' 23"	0.66561
2	283° 14' 37"	-4° 04' 14"	284° 50' 15"	-26° 49' 44"	0° 59' 33"	16' 13.56"	85° 30' 55"	0.66104
3	283° 50' 23"	-4° 06' 17"	285° 30' 15"	-26° 48' 04"	0° 59' 32"	16' 13.30"	85° 13' 28"	0.65645
4	284° 26' 08"	-4° 08' 20"	286° 10' 12"	-26° 46' 12"	0° 59' 31"	16' 13.04"	84° 56' 02"	0.65185
5	285° 01' 52"	-4° 10' 20"	286° 50' 06"	-26° 44' 10"	0° 59' 30"	16' 12.78"	84° 38' 39"	0.64724
6	285° 37' 35"	-4° 12' 19"	287° 29' 58"	-26° 41' 56"	0° 59' 29"	16' 12.52"	84° 21' 17"	0.64262
7	286° 13' 16"	-4° 14' 16"	288° 09' 47"	-26° 39' 32"	0° 59' 28"	16' 12.25"	84° 3' 56"	0.63799
8	286° 48' 57"	-4° 16' 12"	288° 49' 32"	-26° 36' 56"	0° 59' 27"	16' 11.98"	83° 46' 38"	0.63335
9	287° 24' 37"	-4° 18' 06"	289° 29' 14"	-26° 34' 10"	0° 59' 26"	16' 11.71"	83° 29' 23"	0.62870
10	288° 00' 15"	-4° 19' 58"	290° 08' 53"	-26° 31' 12"	0° 59' 25"	16' 11.43"	83° 12' 10"	0.62404
11	288° 35' 53"	-4° 21' 48"	290° 48' 28"	-26° 28' 04"	0° 59' 24"	16' 11.16"	82° 54' 59"	0.61937
12	289° 11' 29"	-4° 23' 36"	291° 27' 60"	-26° 24' 45"	0° 59' 23"	16' 10.88"	82° 37' 52"	0.61470
13	289° 47' 04"	-4° 25' 23"	292° 07' 28"	-26° 21' 16"	0° 59' 22"	16' 10.59"	82° 20' 47"	0.61001
14	290° 22' 38"	-4° 27' 08"	292° 46' 52"	-26° 17' 35"	0° 59' 21"	16' 10.31"	82° 3' 46"	0.60532
15	290° 58' 11"	-4° 28' 52"	293° 26' 11"	-26° 13' 44"	0° 59' 20"	16' 10.02"	81° 46' 48"	0.60062
16	291° 33' 43"	-4° 30' 33"	294° 05' 27"	-26° 09' 43"	0° 59' 19"	16' 09.74"	81° 29' 53"	0.59592
17	292° 09' 13"	-4° 32' 13"	294° 44' 39"	-26° 05' 31"	0° 59' 18"	16' 09.44"	81° 13' 03"	0.59121
18	292° 44' 42"	-4° 33' 51"	295° 23' 46"	-26° 01' 08"	0° 59' 17"	16' 09.15"	80° 56' 16"	0.58649
19	293° 20' 11"	-4° 35' 27"	296° 02' 49"	-25° 56' 36"	0° 59' 15"	16' 08.86"	80° 39' 33"	0.58177
20	293° 55' 38"	-4° 37' 01"	296° 41' 47"	-25° 51' 53"	0° 59' 14"	16' 08.56"	80° 22' 54"	0.57705
21	294° 31' 03"	-4° 38' 34"	297° 20' 40"	-25° 46' 60"	0° 59' 13"	16' 08.26"	80° 6' 19"	0.57232
22	295° 06' 28"	-4° 40' 04"	297° 59' 29"	-25° 41' 56"	0° 59' 12"	16' 07.96"	79° 49' 49"	0.56759
23	295° 41' 51"	-4° 41' 33"	298° 38' 13"	-25° 36' 43"	0° 59' 11"	16' 07.66"	79° 33' 24"	0.56285
24	296° 17' 13"	-4° 43' 00"	299° 16' 52"	-25° 31' 20"	0° 59' 10"	16' 07.35"	79° 17' 03"	0.55811

23 April 2022

DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	32° 50' 18"	-0.58"	30° 37' 22"	12° 27' 09"	1.0052856	15' 54.58"	23° 26' 17"	1 m 35 s
1	32° 52' 44"	-0.58"	30° 39' 43"	12° 27' 60"	1.0052972	15' 54.57"	23° 26' 17"	1 m 35 s
2	32° 55' 11"	-0.59"	30° 42' 03"	12° 28' 50"	1.0053088	15' 54.56"	23° 26' 17"	1 m 36 s
3	32° 57' 37"	-0.59"	30° 44' 24"	12° 29' 40"	1.0053204	15' 54.55"	23° 26' 17"	1 m 36 s
4	33° 00' 03"	-0.59"	30° 46' 45"	12° 30' 30"	1.0053320	15' 54.54"	23° 26' 17"	1 m 37 s
5	33° 02' 30"	-0.59"	30° 49' 06"	12° 31' 20"	1.0053435	15' 54.53"	23° 26' 17"	1 m 37 s
6	33° 04' 56"	-0.60"	30° 51' 27"	12° 32' 09"	1.0053551	15' 54.52"	23° 26' 17"	1 m 38 s
7	33° 07' 22"	-0.60"	30° 53' 47"	12° 32' 59"	1.0053667	15' 54.51"	23° 26' 17"	1 m 38 s
8	33° 09' 48"	-0.60"	30° 56' 08"	12° 33' 49"	1.0053782	15' 54.50"	23° 26' 17"	1 m 39 s
9	33° 12' 15"	-0.60"	30° 58' 29"	12° 34' 39"	1.0053898	15' 54.49"	23° 26' 17"	1 m 39 s
10	33° 14' 41"	-0.61"	31° 00' 50"	12° 35' 29"	1.0054014	15' 54.47"	23° 26' 17"	1 m 40 s
11	33° 17' 07"	-0.61"	31° 03' 11"	12° 36' 19"	1.0054129	15' 54.46"	23° 26' 17"	1 m 40 s
12	33° 19' 33"	-0.61"	31° 05' 32"	12° 37' 09"	1.0054245	15' 54.45"	23° 26' 17"	1 m 41 s
13	33° 21' 59"	-0.61"	31° 07' 53"	12° 37' 58"	1.0054360	15' 54.44"	23° 26' 17"	1 m 41 s
14	33° 24' 26"	-0.61"	31° 10' 14"	12° 38' 48"	1.0054476	15' 54.43"	23° 26' 17"	1 m 42 s
15	33° 26' 52"	-0.62"	31° 12' 34"	12° 39' 38"	1.0054591	15' 54.42"	23° 26' 17"	1 m 42 s
16	33° 29' 18"	-0.62"	31° 14' 55"	12° 40' 28"	1.0054707	15' 54.41"	23° 26' 17"	1 m 42 s
17	33° 31' 44"	-0.62"	31° 17' 16"	12° 41' 17"	1.0054822	15' 54.40"	23° 26' 17"	1 m 43 s
18	33° 34' 11"	-0.62"	31° 19' 37"	12° 42' 07"	1.0054937	15' 54.39"	23° 26' 17"	1 m 43 s
19	33° 36' 37"	-0.62"	31° 21' 58"	12° 42' 57"	1.0055053	15' 54.38"	23° 26' 17"	1 m 44 s
20	33° 39' 03"	-0.63"	31° 24' 19"	12° 43' 46"	1.0055168	15' 54.36"	23° 26' 17"	1 m 44 s
21	33° 41' 29"	-0.63"	31° 26' 40"	12° 44' 36"	1.0055283	15' 54.35"	23° 26' 17"	1 m 45 s
22	33° 43' 55"	-0.63"	31° 29' 01"	12° 45' 26"	1.0055399	15' 54.34"	23° 26' 17"	1 m 45 s
23	33° 46' 22"	-0.63"	31° 31' 22"	12° 46' 15"	1.0055514	15' 54.33"	23° 26' 17"	1 m 46 s
24	33° 48' 48"	-0.63"	31° 33' 43"	12° 47' 05"	1.0055629	15' 54.32"	23° 26' 17"	1 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	296° 17' 13"	-4° 43' 00"	299° 16' 52"	-25° 31' 20"	0° 59' 10"	16' 07.35"	79° 17' 03"	0.55811
1	296° 52' 34"	-4° 44' 25"	299° 55' 26"	-25° 25' 46"	0° 59' 09"	16' 07.05"	79° 0' 47"	0.55337
2	297° 27' 54"	-4° 45' 49"	300° 33' 55"	-25° 20' 03"	0° 59' 08"	16' 06.74"	78° 44' 36"	0.54863
3	298° 03' 12"	-4° 47' 10"	301° 12' 19"	-25° 14' 10"	0° 59' 07"	16' 06.43"	78° 28' 30"	0.54389
4	298° 38' 30"	-4° 48' 30"	301° 50' 37"	-25° 08' 08"	0° 59' 05"	16' 06.12"	78° 12' 30"	0.53914
5	299° 13' 46"	-4° 49' 47"	302° 28' 50"	-25° 01' 56"	0° 59' 04"	16' 05.80"	77° 56' 35"	0.53440
6	299° 49' 00"	-4° 51' 03"	303° 06' 58"	-24° 55' 34"	0° 59' 03"	16' 05.49"	77° 40' 45"	0.52965
7	300° 24' 14"	-4° 52' 17"	303° 44' 60"	-24° 49' 03"	0° 59' 02"	16' 05.17"	77° 25' 01"	0.52491
8	300° 59' 26"	-4° 53' 29"	304° 22' 57"	-24° 42' 23"	0° 59' 01"	16' 04.86"	77° 9' 23"	0.52017
9	301° 34' 37"	-4° 54' 40"	305° 00' 48"	-24° 35' 34"	0° 58' 60"	16' 04.54"	76° 53' 50"	0.51543
10	302° 09' 46"	-4° 55' 48"	305° 38' 33"	-24° 28' 35"	0° 58' 58"	16' 04.22"	76° 38' 24"	0.51069
11	302° 44' 54"	-4° 56' 54"	306° 16' 12"	-24° 21' 27"	0° 58' 57"	16' 03.90"	76° 23' 03"	0.50595
12	303° 20' 01"	-4° 57' 59"	306° 53' 46"	-24° 14' 10"	0° 58' 56"	16' 03.57"	76° 7' 49"	0.50122
13	303° 55' 07"	-4° 59' 02"	307° 31' 14"	-24° 06' 45"	0° 58' 55"	16' 03.25"	75° 52' 40"	0.49648
14	304° 30' 11"	-5° 00' 02"	308° 08' 36"	-23° 59' 10"	0° 58' 54"	16' 02.92"	75° 37' 38"	0.49176
15	305° 05' 14"	-5° 01' 01"	308° 45' 52"	-23° 51' 27"	0° 58' 52"	16' 02.60"	75° 22' 43"	0.48703
16	305° 40' 16"	-5° 01' 58"	309° 23' 02"	-23° 43' 35"	0° 58' 51"	16' 02.27"	75° 7' 54"	0.48231
17	306° 15' 16"	-5° 02' 53"	310° 00' 06"	-23° 35' 35"	0° 58' 50"	16' 01.94"	74° 53' 12"	0.47760
18	306° 50' 15"	-5° 03' 46"	310° 37' 04"	-23° 27' 26"	0° 58' 49"	16' 01.61"	74° 38' 36"	0.47289
19	307° 25' 13"	-5° 04' 37"	311° 13' 56"	-23° 19' 09"	0° 58' 48"	16' 01.28"	74° 24' 07"	0.46819
20	308° 00' 10"	-5° 05' 27"	311° 50' 42"	-23° 10' 43"	0° 58' 46"	16' 00.94"	74° 9' 45"	0.46349
21	308° 35' 05"	-5° 06' 14"	312° 27' 22"	-23° 02' 10"	0° 58' 45"	16' 00.61"	73° 55' 30"	0.45880
22	309° 09' 58"	-5° 06' 60"	313° 03' 55"	-22° 53' 28"	0° 58' 44"	16' 00.28"	73° 41' 21"	0.45412
23	309° 44' 51"	-5° 07' 43"	313° 40' 22"	-22° 44' 39"	0° 58' 43"	15' 59.94"	73° 27' 20"	0.44944
24	310° 19' 42"	-5° 08' 25"	314° 16' 43"	-22° 35' 41"	0° 58' 42"	15' 59.60"	73° 13' 26"	0.44477

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	33° 48' 48"	-0.63"	31° 33' 43"	12° 47' 05"	1.0055629	15' 54.32"	23° 26' 17"	1 m 46 s
1	33° 51' 14"	-0.63"	31° 36' 04"	12° 47' 54"	1.0055744	15' 54.31"	23° 26' 17"	1 m 47 s
2	33° 53' 40"	-0.63"	31° 38' 26"	12° 48' 44"	1.0055859	15' 54.30"	23° 26' 17"	1 m 47 s
3	33° 56' 06"	-0.64"	31° 40' 47"	12° 49' 33"	1.0055974	15' 54.29"	23° 26' 17"	1 m 47 s
4	33° 58' 33"	-0.64"	31° 43' 08"	12° 50' 23"	1.0056089	15' 54.28"	23° 26' 17"	1 m 48 s
5	34° 00' 59"	-0.64"	31° 45' 29"	12° 51' 12"	1.0056204	15' 54.27"	23° 26' 17"	1 m 48 s
6	34° 03' 25"	-0.64"	31° 47' 50"	12° 52' 02"	1.0056319	15' 54.26"	23° 26' 17"	1 m 49 s
7	34° 05' 51"	-0.64"	31° 50' 11"	12° 52' 51"	1.0056434	15' 54.24"	23° 26' 17"	1 m 49 s
8	34° 08' 17"	-0.64"	31° 52' 32"	12° 53' 41"	1.0056549	15' 54.23"	23° 26' 17"	1 m 50 s
9	34° 10' 44"	-0.64"	31° 54' 53"	12° 54' 30"	1.0056664	15' 54.22"	23° 26' 17"	1 m 50 s
10	34° 13' 10"	-0.64"	31° 57' 15"	12° 55' 19"	1.0056779	15' 54.21"	23° 26' 17"	1 m 51 s
11	34° 15' 36"	-0.64"	31° 59' 36"	12° 56' 09"	1.0056894	15' 54.20"	23° 26' 17"	1 m 51 s
12	34° 18' 02"	-0.65"	32° 01' 57"	12° 56' 58"	1.0057009	15' 54.19"	23° 26' 17"	1 m 51 s
13	34° 20' 28"	-0.65"	32° 04' 18"	12° 57' 47"	1.0057123	15' 54.18"	23° 26' 17"	1 m 52 s
14	34° 22' 54"	-0.65"	32° 06' 39"	12° 58' 36"	1.0057238	15' 54.17"	23° 26' 17"	1 m 52 s
15	34° 25' 21"	-0.65"	32° 09' 01"	12° 59' 26"	1.0057353	15' 54.16"	23° 26' 17"	1 m 53 s
16	34° 27' 47"	-0.65"	32° 11' 22"	13° 00' 15"	1.0057467	15' 54.15"	23° 26' 17"	1 m 53 s
17	34° 30' 13"	-0.65"	32° 13' 43"	13° 01' 04"	1.0057582	15' 54.14"	23° 26' 17"	1 m 54 s
18	34° 32' 39"	-0.65"	32° 16' 04"	13° 01' 53"	1.0057697	15' 54.13"	23° 26' 17"	1 m 54 s
19	34° 35' 05"	-0.65"	32° 18' 26"	13° 02' 42"	1.0057811	15' 54.11"	23° 26' 17"	1 m 55 s
20	34° 37' 31"	-0.65"	32° 20' 47"	13° 03' 31"	1.0057926	15' 54.10"	23° 26' 17"	1 m 55 s
21	34° 39' 57"	-0.65"	32° 23' 08"	13° 04' 21"	1.0058040	15' 54.09"	23° 26' 17"	1 m 55 s
22	34° 42' 24"	-0.65"	32° 25' 30"	13° 05' 10"	1.0058154	15' 54.08"	23° 26' 17"	1 m 56 s
23	34° 44' 50"	-0.65"	32° 27' 51"	13° 05' 59"	1.0058269	15' 54.07"	23° 26' 17"	1 m 56 s
24	34° 47' 16"	-0.65"	32° 30' 12"	13° 06' 48"	1.0058383	15' 54.06"	23° 26' 17"	1 m 57 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	310° 19' 42"	-5° 08' 25"	314° 16' 43"	-22° 35' 41"	0° 58' 42"	15' 59.60"	73° 13' 26"	0.44477
1	310° 54' 31"	-5° 09' 05"	314° 52' 58"	-22° 26' 36"	0° 58' 40"	15' 59.27"	72° 59' 39"	0.44011
2	311° 29' 20"	-5° 09' 42"	315° 29' 06"	-22° 17' 23"	0° 58' 39"	15' 58.93"	72° 45' 59"	0.43546
3	312° 04' 06"	-5° 10' 18"	316° 05' 09"	-22° 08' 02"	0° 58' 38"	15' 58.59"	72° 32' 27"	0.43082
4	312° 38' 52"	-5° 10' 52"	316° 41' 05"	-21° 58' 34"	0° 58' 37"	15' 58.25"	72° 19' 02"	0.42618
5	313° 13' 36"	-5° 11' 24"	317° 16' 54"	-21° 48' 59"	0° 58' 35"	15' 57.91"	72° 5' 44"	0.42156
6	313° 48' 19"	-5° 11' 54"	317° 52' 37"	-21° 39' 16"	0° 58' 34"	15' 57.57"	71° 52' 34"	0.41695
7	314° 23' 00"	-5° 12' 22"	318° 28' 14"	-21° 29' 26"	0° 58' 33"	15' 57.23"	71° 39' 31"	0.41234
8	314° 57' 40"	-5° 12' 49"	319° 03' 45"	-21° 19' 29"	0° 58' 32"	15' 56.89"	71° 26' 36"	0.40775
9	315° 32' 19"	-5° 13' 13"	319° 39' 09"	-21° 09' 25"	0° 58' 30"	15' 56.54"	71° 13' 48"	0.40317
10	316° 06' 56"	-5° 13' 36"	320° 14' 28"	-20° 59' 14"	0° 58' 29"	15' 56.20"	71° 1' 08"	0.39860
11	316° 41' 32"	-5° 13' 56"	320° 49' 39"	-20° 48' 56"	0° 58' 28"	15' 55.85"	70° 48' 35"	0.39404
12	317° 16' 07"	-5° 14' 15"	321° 24' 45"	-20° 38' 31"	0° 58' 26"	15' 55.51"	70° 36' 10"	0.38950
13	317° 50' 40"	-5° 14' 31"	321° 59' 44"	-20° 27' 60"	0° 58' 25"	15' 55.16"	70° 23' 53"	0.38497
14	318° 25' 11"	-5° 14' 46"	322° 34' 37"	-20° 17' 22"	0° 58' 24"	15' 54.82"	70° 11' 43"	0.38045
15	318° 59' 42"	-5° 14' 59"	323° 09' 24"	-20° 06' 38"	0° 58' 23"	15' 54.47"	69° 59' 41"	0.37594
16	319° 34' 10"	-5° 15' 10"	323° 44' 04"	-19° 55' 47"	0° 58' 21"	15' 54.12"	69° 47' 47"	0.37145
17	320° 08' 38"	-5° 15' 19"	324° 18' 39"	-19° 44' 50"	0° 58' 20"	15' 53.78"	69° 36' 01"	0.36697
18	320° 43' 04"	-5° 15' 26"	324° 53' 07"	-19° 33' 47"	0° 58' 19"	15' 53.43"	69° 24' 23"	0.36251
19	321° 17' 29"	-5° 15' 32"	325° 27' 29"	-19° 22' 38"	0° 58' 18"	15' 53.08"	69° 12' 52"	0.35806
20	321° 51' 52"	-5° 15' 35"	326° 01' 44"	-19° 11' 23"	0° 58' 16"	15' 52.73"	69° 1' 29"	0.35363
21	322° 26' 14"	-5° 15' 37"	326° 35' 58"	-19° 00' 02"	0° 58' 15"	15' 52.38"	68° 50' 14"	0.34922
22	323° 00' 34"	-5° 15' 36"	327° 09' 58"	-18° 48' 35"	0° 58' 14"	15' 52.03"	68° 39' 07"	0.34482
23	323° 34' 53"	-5° 15' 34"	327° 43' 55"	-18° 37' 03"	0° 58' 12"	15' 51.69"	68° 28' 08"	0.34043
24	324° 09' 10"	-5° 15' 30"	328° 17' 47"	-18° 25' 25"	0° 58' 11"	15' 51.34"	68° 17' 17"	0.33606

25 April 2022

DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	34° 47' 16"	-0.65"	32° 30' 12"	13° 06' 48"	1.0058383	15' 54.06"	23° 26' 17"	1 m 57 s
1	34° 49' 42"	-0.65"	32° 32' 34"	13° 07' 37"	1.0058497	15' 54.05"	23° 26' 17"	1 m 57 s
2	34° 52' 08"	-0.65"	32° 34' 55"	13° 08' 26"	1.0058612	15' 54.04"	23° 26' 17"	1 m 58 s
3	34° 54' 34"	-0.65"	32° 37' 16"	13° 09' 15"	1.0058726	15' 54.03"	23° 26' 17"	1 m 58 s
4	34° 57' 00"	-0.65"	32° 39' 38"	13° 10' 04"	1.0058840	15' 54.02"	23° 26' 17"	1 m 58 s
5	34° 59' 27"	-0.65"	32° 41' 59"	13° 10' 53"	1.0058954	15' 54.01"	23° 26' 17"	1 m 59 s
6	35° 01' 53"	-0.65"	32° 44' 21"	13° 11' 41"	1.0059068	15' 53.99"	23° 26' 17"	1 m 59 s
7	35° 04' 19"	-0.65"	32° 46' 42"	13° 12' 30"	1.0059182	15' 53.98"	23° 26' 17"	1 m 60 s
8	35° 06' 45"	-0.65"	32° 49' 03"	13° 13' 19"	1.0059296	15' 53.97"	23° 26' 17"	2 m 00 s
9	35° 09' 11"	-0.65"	32° 51' 25"	13° 14' 08"	1.0059410	15' 53.96"	23° 26' 17"	2 m 01 s
10	35° 11' 37"	-0.65"	32° 53' 46"	13° 14' 57"	1.0059524	15' 53.95"	23° 26' 17"	2 m 01 s
11	35° 14' 03"	-0.65"	32° 56' 08"	13° 15' 46"	1.0059638	15' 53.94"	23° 26' 17"	2 m 01 s
12	35° 16' 29"	-0.65"	32° 58' 29"	13° 16' 34"	1.0059752	15' 53.93"	23° 26' 17"	2 m 02 s
13	35° 18' 55"	-0.65"	33° 00' 51"	13° 17' 23"	1.0059866	15' 53.92"	23° 26' 17"	2 m 02 s
14	35° 21' 22"	-0.65"	33° 03' 12"	13° 18' 12"	1.0059979	15' 53.91"	23° 26' 17"	2 m 03 s
15	35° 23' 48"	-0.65"	33° 05' 34"	13° 19' 01"	1.0060093	15' 53.90"	23° 26' 17"	2 m 03 s
16	35° 26' 14"	-0.65"	33° 07' 56"	13° 19' 49"	1.0060207	15' 53.89"	23° 26' 17"	2 m 04 s
17	35° 28' 40"	-0.65"	33° 10' 17"	13° 20' 38"	1.0060320	15' 53.88"	23° 26' 17"	2 m 04 s
18	35° 31' 06"	-0.65"	33° 12' 39"	13° 21' 26"	1.0060434	15' 53.87"	23° 26' 17"	2 m 04 s
19	35° 33' 32"	-0.65"	33° 15' 00"	13° 22' 15"	1.0060548	15' 53.85"	23° 26' 17"	2 m 05 s
20	35° 35' 58"	-0.65"	33° 17' 22"	13° 23' 04"	1.0060661	15' 53.84"	23° 26' 17"	2 m 05 s
21	35° 38' 24"	-0.64"	33° 19' 43"	13° 23' 52"	1.0060774	15' 53.83"	23° 26' 17"	2 m 06 s
22	35° 40' 50"	-0.64"	33° 22' 05"	13° 24' 41"	1.0060888	15' 53.82"	23° 26' 17"	2 m 06 s
23	35° 43' 16"	-0.64"	33° 24' 27"	13° 25' 29"	1.0061001	15' 53.81"	23° 26' 17"	2 m 06 s
24	35° 45' 42"	-0.64"	33° 26' 48"	13° 26' 18"	1.0061115	15' 53.80"	23° 26' 17"	2 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	324° 09' 10"	-5° 15' 30"	328° 17' 47"	-18° 25' 25"	0° 58' 11"	15' 51.34"	68° 17' 17"	0.33606
1	324° 43' 27"	-5° 15' 24"	328° 51' 32"	-18° 13' 41"	0° 58' 10"	15' 50.99"	68° 6' 33"	0.33171
2	325° 17' 41"	-5° 15' 16"	329° 25' 12"	-18° 01' 53"	0° 58' 09"	15' 50.64"	67° 55' 58"	0.32738
3	325° 51' 54"	-5° 15' 06"	329° 58' 46"	-17° 49' 58"	0° 58' 07"	15' 50.28"	67° 45' 30"	0.32307
4	326° 26' 06"	-5° 14' 55"	330° 32' 13"	-17° 37' 59"	0° 58' 06"	15' 49.93"	67° 35' 10"	0.31877
5	327° 00' 17"	-5° 14' 41"	331° 05' 35"	-17° 25' 54"	0° 58' 05"	15' 49.58"	67° 24' 58"	0.31449
6	327° 34' 26"	-5° 14' 26"	331° 38' 51"	-17° 13' 45"	0° 58' 03"	15' 49.23"	67° 14' 54"	0.31023
7	328° 08' 33"	-5° 14' 09"	332° 12' 02"	-17° 01' 30"	0° 58' 02"	15' 48.88"	67° 4' 58"	0.30599
8	328° 42' 39"	-5° 13' 50"	332° 45' 06"	-16° 49' 11"	0° 58' 01"	15' 48.53"	66° 55' 10"	0.30177
9	329° 16' 44"	-5° 13' 29"	333° 18' 05"	-16° 36' 46"	0° 57' 60"	15' 48.18"	66° 45' 30"	0.29757
10	329° 50' 47"	-5° 13' 07"	333° 50' 59"	-16° 24' 17"	0° 57' 58"	15' 47.83"	66° 35' 57"	0.29339
11	330° 24' 49"	-5° 12' 42"	334° 23' 47"	-16° 11' 44"	0° 57' 57"	15' 47.47"	66° 26' 33"	0.28923
12	330° 58' 49"	-5° 12' 16"	334° 56' 29"	-15° 59' 06"	0° 57' 56"	15' 47.12"	66° 17' 16"	0.28508
13	331° 32' 48"	-5° 11' 48"	335° 29' 06"	-15° 46' 24"	0° 57' 54"	15' 46.77"	66° 8' 07"	0.28096
14	332° 06' 46"	-5° 11' 18"	336° 01' 37"	-15° 33' 37"	0° 57' 53"	15' 46.42"	65° 59' 06"	0.27687
15	332° 40' 42"	-5° 10' 46"	336° 34' 03"	-15° 20' 46"	0° 57' 52"	15' 46.07"	65° 50' 13"	0.27279
16	333° 14' 36"	-5° 10' 13"	337° 06' 24"	-15° 07' 51"	0° 57' 51"	15' 45.71"	65° 41' 27"	0.26873
17	333° 48' 29"	-5° 09' 38"	337° 38' 39"	-14° 54' 52"	0° 57' 49"	15' 45.36"	65° 32' 50"	0.26470
18	334° 22' 21"	-5° 09' 01"	338° 10' 49"	-14° 41' 48"	0° 57' 48"	15' 45.01"	65° 24' 20"	0.26069
19	334° 56' 11"	-5° 08' 22"	338° 42' 54"	-14° 28' 41"	0° 57' 47"	15' 44.66"	65° 15' 58"	0.25670
20	335° 29' 60"	-5° 07' 42"	339° 14' 54"	-14° 15' 31"	0° 57' 45"	15' 44.30"	65° 7' 43"	0.25274
21	336° 03' 47"	-5° 06' 59"	339° 46' 49"	-14° 02' 16"	0° 57' 44"	15' 43.95"	64° 59' 36"	0.24879
22	336° 37' 33"	-5° 06' 15"	340° 18' 39"	-13° 48' 58"	0° 57' 43"	15' 43.60"	64° 51' 37"	0.24488
23	337° 11' 17"	-5° 05' 30"	340° 50' 24"	-13° 35' 36"	0° 57' 41"	15' 43.25"	64° 43' 46"	0.24098
24	337° 45' 00"	-5° 04' 42"	341° 22' 04"	-13° 22' 11"	0° 57' 40"	15' 42.90"	64° 36' 02"	0.23711

26 April 2022

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	35° 45' 42"	-0.64"	33° 26' 48"	13° 26' 18"	1.0061115	15' 53.80"	23° 26' 17"	2 m 07 s
1	35° 48' 08"	-0.64"	33° 29' 10"	13° 27' 06"	1.0061228	15' 53.79"	23° 26' 17"	2 m 07 s
2	35° 50' 34"	-0.64"	33° 31' 32"	13° 27' 55"	1.0061341	15' 53.78"	23° 26' 17"	2 m 08 s
3	35° 53' 01"	-0.64"	33° 33' 53"	13° 28' 43"	1.0061454	15' 53.77"	23° 26' 17"	2 m 08 s
4	35° 55' 27"	-0.64"	33° 36' 15"	13° 29' 32"	1.0061567	15' 53.76"	23° 26' 17"	2 m 09 s
5	35° 57' 53"	-0.64"	33° 38' 37"	13° 30' 20"	1.0061680	15' 53.75"	23° 26' 17"	2 m 09 s
6	36° 00' 19"	-0.63"	33° 40' 59"	13° 31' 08"	1.0061793	15' 53.74"	23° 26' 17"	2 m 09 s
7	36° 02' 45"	-0.63"	33° 43' 20"	13° 31' 57"	1.0061906	15' 53.73"	23° 26' 17"	2 m 10 s
8	36° 05' 11"	-0.63"	33° 45' 42"	13° 32' 45"	1.0062019	15' 53.72"	23° 26' 17"	2 m 10 s
9	36° 07' 37"	-0.63"	33° 48' 04"	13° 33' 33"	1.0062132	15' 53.70"	23° 26' 17"	2 m 11 s
10	36° 10' 03"	-0.63"	33° 50' 26"	13° 34' 21"	1.0062245	15' 53.69"	23° 26' 17"	2 m 11 s
11	36° 12' 29"	-0.63"	33° 52' 48"	13° 35' 10"	1.0062358	15' 53.68"	23° 26' 17"	2 m 11 s
12	36° 14' 55"	-0.62"	33° 55' 09"	13° 35' 58"	1.0062471	15' 53.67"	23° 26' 17"	2 m 12 s
13	36° 17' 21"	-0.62"	33° 57' 31"	13° 36' 46"	1.0062583	15' 53.66"	23° 26' 17"	2 m 12 s
14	36° 19' 47"	-0.62"	33° 59' 53"	13° 37' 34"	1.0062696	15' 53.65"	23° 26' 17"	2 m 13 s
15	36° 22' 13"	-0.62"	34° 02' 15"	13° 38' 22"	1.0062809	15' 53.64"	23° 26' 17"	2 m 13 s
16	36° 24' 39"	-0.62"	34° 04' 37"	13° 39' 11"	1.0062921	15' 53.63"	23° 26' 17"	2 m 13 s
17	36° 27' 05"	-0.62"	34° 06' 59"	13° 39' 59"	1.0063034	15' 53.62"	23° 26' 17"	2 m 14 s
18	36° 29' 31"	-0.61"	34° 09' 21"	13° 40' 47"	1.0063146	15' 53.61"	23° 26' 17"	2 m 14 s
19	36° 31' 57"	-0.61"	34° 11' 42"	13° 41' 35"	1.0063258	15' 53.60"	23° 26' 17"	2 m 15 s
20	36° 34' 23"	-0.61"	34° 14' 04"	13° 42' 23"	1.0063371	15' 53.59"	23° 26' 17"	2 m 15 s
21	36° 36' 49"	-0.61"	34° 16' 26"	13° 43' 11"	1.0063483	15' 53.58"	23° 26' 17"	2 m 15 s
22	36° 39' 15"	-0.61"	34° 18' 48"	13° 43' 59"	1.0063595	15' 53.57"	23° 26' 17"	2 m 16 s
23	36° 41' 41"	-0.60"	34° 21' 10"	13° 44' 47"	1.0063708	15' 53.56"	23° 26' 17"	2 m 16 s
24	36° 44' 07"	-0.60"	34° 23' 32"	13° 45' 35"	1.0063820	15' 53.54"	23° 26' 17"	2 m 17 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	337° 45' 00"	-5° 04' 42"	341° 22' 04"	-13° 22' 11"	0° 57' 40"	15' 42.90"	64° 36' 02"	0.23711
1	338° 18' 42"	-5° 03' 53"	341° 53' 39"	-13° 08' 42"	0° 57' 39"	15' 42.54"	64° 28' 26"	0.23327
2	338° 52' 22"	-5° 03' 02"	342° 25' 10"	-12° 55' 10"	0° 57' 38"	15' 42.19"	64° 20' 57"	0.22944
3	339° 26' 00"	-5° 02' 09"	342° 56' 36"	-12° 41' 35"	0° 57' 36"	15' 41.84"	64° 13' 36"	0.22565
4	339° 59' 38"	-5° 01' 15"	343° 27' 57"	-12° 27' 57"	0° 57' 35"	15' 41.49"	64° 6' 23"	0.22188
5	340° 33' 13"	-5° 00' 19"	343° 59' 14"	-12° 14' 16"	0° 57' 34"	15' 41.14"	63° 59' 16"	0.21813
6	341° 06' 48"	-4° 59' 22"	344° 30' 26"	-12° 00' 31"	0° 57' 32"	15' 40.79"	63° 52' 18"	0.21441
7	341° 40' 20"	-4° 58' 22"	345° 01' 33"	-11° 46' 44"	0° 57' 31"	15' 40.43"	63° 45' 27"	0.21072
8	342° 13' 52"	-4° 57' 21"	345° 32' 37"	-11° 32' 54"	0° 57' 30"	15' 40.08"	63° 38' 43"	0.20705
9	342° 47' 21"	-4° 56' 19"	346° 03' 35"	-11° 19' 01"	0° 57' 29"	15' 39.73"	63° 32' 06"	0.20341
10	343° 20' 50"	-4° 55' 14"	346° 34' 30"	-11° 05' 06"	0° 57' 27"	15' 39.38"	63° 25' 37"	0.19979
11	343° 54' 17"	-4° 54' 08"	347° 05' 21"	-10° 51' 08"	0° 57' 26"	15' 39.03"	63° 19' 15"	0.19620
12	344° 27' 42"	-4° 53' 01"	347° 36' 07"	-10° 37' 07"	0° 57' 25"	15' 38.68"	63° 13' 01"	0.19264
13	345° 01' 06"	-4° 51' 52"	348° 06' 49"	-10° 23' 04"	0° 57' 23"	15' 38.33"	63° 6' 53"	0.18911
14	345° 34' 29"	-4° 50' 41"	348° 37' 28"	-10° 08' 59"	0° 57' 22"	15' 37.98"	63° 0' 53"	0.18560
15	346° 07' 50"	-4° 49' 29"	349° 08' 02"	-9° 54' 52"	0° 57' 21"	15' 37.63"	62° 54' 60"	0.18212
16	346° 41' 10"	-4° 48' 15"	349° 38' 33"	-9° 40' 42"	0° 57' 20"	15' 37.28"	62° 49' 14"	0.17867
17	347° 14' 28"	-4° 46' 59"	350° 08' 59"	-9° 26' 30"	0° 57' 18"	15' 36.93"	62° 43' 35"	0.17525
18	347° 47' 44"	-4° 45' 42"	350° 39' 22"	-9° 12' 16"	0° 57' 17"	15' 36.58"	62° 38' 03"	0.17186
19	348° 20' 60"	-4° 44' 24"	351° 09' 42"	-8° 58' 00"	0° 57' 16"	15' 36.23"	62° 32' 38"	0.16849
20	348° 54' 14"	-4° 43' 04"	351° 39' 57"	-8° 43' 42"	0° 57' 14"	15' 35.88"	62° 27' 19"	0.16516
21	349° 27' 26"	-4° 41' 42"	352° 10' 09"	-8° 29' 23"	0° 57' 13"	15' 35.53"	62° 22' 08"	0.16185
22	350° 00' 37"	-4° 40' 19"	352° 40' 18"	-8° 15' 01"	0° 57' 12"	15' 35.18"	62° 17' 04"	0.15857
23	350° 33' 46"	-4° 38' 54"	353° 10' 24"	-8° 00' 38"	0° 57' 11"	15' 34.83"	62° 12' 06"	0.15532
24	351° 06' 54"	-4° 37' 28"	353° 40' 25"	-7° 46' 14"	0° 57' 09"	15' 34.49"	62° 7' 15"	0.15211

27 April 2022

DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	36° 44' 07"	-0.60"	34° 23' 32"	13° 45' 35"	1.0063820	15' 53.54"	23° 26' 17"	2 m 17 s
1	36° 46' 33"	-0.60"	34° 25' 54"	13° 46' 23"	1.0063932	15' 53.53"	23° 26' 17"	2 m 17 s
2	36° 48' 59"	-0.60"	34° 28' 16"	13° 47' 10"	1.0064044	15' 53.52"	23° 26' 17"	2 m 17 s
3	36° 51' 25"	-0.59"	34° 30' 38"	13° 47' 58"	1.0064156	15' 53.51"	23° 26' 17"	2 m 18 s
4	36° 53' 51"	-0.59"	34° 33' 00"	13° 48' 46"	1.0064268	15' 53.50"	23° 26' 17"	2 m 18 s
5	36° 56' 17"	-0.59"	34° 35' 22"	13° 49' 34"	1.0064380	15' 53.49"	23° 26' 17"	2 m 18 s
6	36° 58' 43"	-0.59"	34° 37' 44"	13° 50' 22"	1.0064491	15' 53.48"	23° 26' 17"	2 m 19 s
7	37° 01' 09"	-0.58"	34° 40' 06"	13° 51' 10"	1.0064603	15' 53.47"	23° 26' 17"	2 m 19 s
8	37° 03' 35"	-0.58"	34° 42' 29"	13° 51' 57"	1.0064715	15' 53.46"	23° 26' 17"	2 m 20 s
9	37° 06' 01"	-0.58"	34° 44' 51"	13° 52' 45"	1.0064827	15' 53.45"	23° 26' 17"	2 m 20 s
10	37° 08' 27"	-0.58"	34° 47' 13"	13° 53' 33"	1.0064938	15' 53.44"	23° 26' 17"	2 m 20 s
11	37° 10' 53"	-0.57"	34° 49' 35"	13° 54' 20"	1.0065050	15' 53.43"	23° 26' 17"	2 m 21 s
12	37° 13' 19"	-0.57"	34° 51' 57"	13° 55' 08"	1.0065161	15' 53.42"	23° 26' 17"	2 m 21 s
13	37° 15' 45"	-0.57"	34° 54' 19"	13° 55' 56"	1.0065273	15' 53.41"	23° 26' 17"	2 m 22 s
14	37° 18' 11"	-0.56"	34° 56' 41"	13° 56' 43"	1.0065384	15' 53.40"	23° 26' 17"	2 m 22 s
15	37° 20' 37"	-0.56"	34° 59' 03"	13° 57' 31"	1.0065496	15' 53.39"	23° 26' 17"	2 m 22 s
16	37° 23' 03"	-0.56"	35° 01' 26"	13° 58' 18"	1.0065607	15' 53.38"	23° 26' 17"	2 m 23 s
17	37° 25' 29"	-0.55"	35° 03' 48"	13° 59' 06"	1.0065718	15' 53.36"	23° 26' 17"	2 m 23 s
18	37° 27' 55"	-0.55"	35° 06' 10"	13° 59' 53"	1.0065829	15' 53.35"	23° 26' 17"	2 m 23 s
19	37° 30' 21"	-0.55"	35° 08' 32"	14° 00' 41"	1.0065940	15' 53.34"	23° 26' 17"	2 m 24 s
20	37° 32' 47"	-0.55"	35° 10' 55"	14° 01' 28"	1.0066052	15' 53.33"	23° 26' 17"	2 m 24 s
21	37° 35' 13"	-0.54"	35° 13' 17"	14° 02' 16"	1.0066163	15' 53.32"	23° 26' 17"	2 m 25 s
22	37° 37' 39"	-0.54"	35° 15' 39"	14° 03' 03"	1.0066274	15' 53.31"	23° 26' 17"	2 m 25 s
23	37° 40' 05"	-0.54"	35° 18' 01"	14° 03' 51"	1.0066384	15' 53.30"	23° 26' 17"	2 m 25 s
24	37° 42' 30"	-0.53"	35° 20' 24"	14° 04' 38"	1.0066495	15' 53.29"	23° 26' 17"	2 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	351° 06' 54"	-4° 37' 28"	353° 40' 25"	-7° 46' 14"	0° 57' 09"	15' 34.49"	62° 7' 15"	0.15211
1	351° 40' 01"	-4° 36' 00"	354° 10' 24"	-7° 31' 47"	0° 57' 08"	15' 34.14"	62° 2' 30"	0.14892
2	352° 13' 06"	-4° 34' 31"	354° 40' 20"	-7° 17' 20"	0° 57' 07"	15' 33.79"	61° 57' 52"	0.14576
3	352° 46' 09"	-4° 33' 00"	355° 10' 12"	-7° 02' 51"	0° 57' 05"	15' 33.44"	61° 53' 21"	0.14263
4	353° 19' 11"	-4° 31' 28"	355° 40' 02"	-6° 48' 20"	0° 57' 04"	15' 33.09"	61° 48' 56"	0.13953
5	353° 52' 12"	-4° 29' 55"	356° 09' 48"	-6° 33' 49"	0° 57' 03"	15' 32.75"	61° 44' 38"	0.13647
6	354° 25' 11"	-4° 28' 20"	356° 39' 31"	-6° 19' 16"	0° 57' 02"	15' 32.40"	61° 40' 25"	0.13343
7	354° 58' 09"	-4° 26' 43"	357° 09' 12"	-6° 04' 42"	0° 57' 00"	15' 32.05"	61° 36' 20"	0.13043
8	355° 31' 05"	-4° 25' 06"	357° 38' 50"	-5° 50' 07"	0° 56' 59"	15' 31.71"	61° 32' 20"	0.12745
9	356° 04' 00"	-4° 23' 27"	358° 08' 25"	-5° 35' 31"	0° 56' 58"	15' 31.36"	61° 28' 26"	0.12451
10	356° 36' 54"	-4° 21' 46"	358° 37' 57"	-5° 20' 55"	0° 56' 57"	15' 31.02"	61° 24' 39"	0.12160
11	357° 09' 45"	-4° 20' 04"	359° 07' 27"	-5° 06' 17"	0° 56' 55"	15' 30.67"	61° 20' 57"	0.11872
12	357° 42' 36"	-4° 18' 21"	359° 36' 54"	-4° 51' 38"	0° 56' 54"	15' 30.33"	61° 17' 22"	0.11588
13	358° 15' 25"	-4° 16' 36"	0° 06' 19"	-4° 36' 59"	0° 56' 53"	15' 29.98"	61° 13' 52"	0.11306
14	358° 48' 12"	-4° 14' 50"	0° 35' 41"	-4° 22' 20"	0° 56' 52"	15' 29.64"	61° 10' 28"	0.11028
15	359° 20' 59"	-4° 13' 03"	1° 05' 02"	-4° 07' 39"	0° 56' 50"	15' 29.29"	61° 7' 10"	0.10753
16	359° 53' 43"	-4° 11' 14"	1° 34' 19"	-3° 52' 59"	0° 56' 49"	15' 28.95"	61° 3' 57"	0.10481
17	0° 26' 26"	-4° 09' 25"	2° 03' 35"	-3° 38' 17"	0° 56' 48"	15' 28.61"	61° 0' 50"	0.10212
18	0° 59' 08"	-4° 07' 33"	2° 32' 49"	-3° 23' 36"	0° 56' 46"	15' 28.26"	60° 57' 48"	0.09947
19	1° 31' 48"	-4° 05' 41"	3° 02' 00"	-3° 08' 54"	0° 56' 45"	15' 27.92"	60° 54' 51"	0.09685
20	2° 04' 27"	-4° 03' 47"	3° 31' 10"	-2° 54' 12"	0° 56' 44"	15' 27.58"	60° 51' 59"	0.09427
21	2° 37' 05"	-4° 01' 52"	4° 00' 17"	-2° 39' 29"	0° 56' 43"	15' 27.23"	60° 49' 13"	0.09171
22	3° 09' 40"	-3° 59' 56"	4° 29' 23"	-2° 24' 47"	0° 56' 41"	15' 26.89"	60° 46' 31"	0.08919
23	3° 42' 15"	-3° 57' 59"	4° 58' 27"	-2° 10' 04"	0° 56' 40"	15' 26.55"	60° 43' 54"	0.08671
24	4° 14' 48"	-3° 56' 00"	5° 27' 29"	-1° 55' 22"	0° 56' 39"	15' 26.21"	60° 41' 22"	0.08425

28 April 2022

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	37° 42' 30"	-0.53"	35° 20' 24"	14° 04' 38"	1.0066495	15' 53.29"	23° 26' 17"	2 m 26 s
1	37° 44' 56"	-0.53"	35° 22' 46"	14° 05' 25"	1.0066606	15' 53.28"	23° 26' 17"	2 m 26 s
2	37° 47' 22"	-0.52"	35° 25' 08"	14° 06' 13"	1.0066717	15' 53.27"	23° 26' 17"	2 m 26 s
3	37° 49' 48"	-0.52"	35° 27' 31"	14° 06' 60"	1.0066828	15' 53.26"	23° 26' 17"	2 m 27 s
4	37° 52' 14"	-0.52"	35° 29' 53"	14° 07' 47"	1.0066938	15' 53.25"	23° 26' 17"	2 m 27 s
5	37° 54' 40"	-0.51"	35° 32' 15"	14° 08' 34"	1.0067049	15' 53.24"	23° 26' 17"	2 m 28 s
6	37° 57' 06"	-0.51"	35° 34' 38"	14° 09' 22"	1.0067159	15' 53.23"	23° 26' 17"	2 m 28 s
7	37° 59' 32"	-0.51"	35° 37' 00"	14° 10' 09"	1.0067270	15' 53.22"	23° 26' 17"	2 m 28 s
8	38° 01' 58"	-0.50"	35° 39' 23"	14° 10' 56"	1.0067380	15' 53.21"	23° 26' 17"	2 m 29 s
9	38° 04' 24"	-0.50"	35° 41' 45"	14° 11' 43"	1.0067491	15' 53.20"	23° 26' 17"	2 m 29 s
10	38° 06' 50"	-0.50"	35° 44' 07"	14° 12' 30"	1.0067601	15' 53.19"	23° 26' 17"	2 m 29 s
11	38° 09' 16"	-0.49"	35° 46' 30"	14° 13' 17"	1.0067711	15' 53.18"	23° 26' 17"	2 m 30 s
12	38° 11' 41"	-0.49"	35° 48' 52"	14° 14' 04"	1.0067821	15' 53.17"	23° 26' 17"	2 m 30 s
13	38° 14' 07"	-0.48"	35° 51' 15"	14° 14' 51"	1.0067931	15' 53.16"	23° 26' 17"	2 m 30 s
14	38° 16' 33"	-0.48"	35° 53' 37"	14° 15' 39"	1.0068042	15' 53.14"	23° 26' 17"	2 m 31 s
15	38° 18' 59"	-0.48"	35° 55' 60"	14° 16' 26"	1.0068152	15' 53.13"	23° 26' 17"	2 m 31 s
16	38° 21' 25"	-0.47"	35° 58' 22"	14° 17' 12"	1.0068261	15' 53.12"	23° 26' 17"	2 m 32 s
17	38° 23' 51"	-0.47"	36° 00' 45"	14° 17' 59"	1.0068371	15' 53.11"	23° 26' 17"	2 m 32 s
18	38° 26' 17"	-0.46"	36° 03' 07"	14° 18' 46"	1.0068481	15' 53.10"	23° 26' 17"	2 m 32 s
19	38° 28' 43"	-0.46"	36° 05' 30"	14° 19' 33"	1.0068591	15' 53.09"	23° 26' 17"	2 m 33 s
20	38° 31' 09"	-0.46"	36° 07' 53"	14° 20' 20"	1.0068701	15' 53.08"	23° 26' 17"	2 m 33 s
21	38° 33' 34"	-0.45"	36° 10' 15"	14° 21' 07"	1.0068810	15' 53.07"	23° 26' 17"	2 m 33 s
22	38° 36' 00"	-0.45"	36° 12' 38"	14° 21' 54"	1.0068920	15' 53.06"	23° 26' 17"	2 m 34 s
23	38° 38' 26"	-0.44"	36° 15' 00"	14° 22' 41"	1.0069030	15' 53.05"	23° 26' 17"	2 m 34 s
24	38° 40' 52"	-0.44"	36° 17' 23"	14° 23' 27"	1.0069139	15' 53.04"	23° 26' 17"	2 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	4° 14' 48"	-3° 56' 00"	5° 27' 29"	-1° 55' 22"	0° 56' 39"	15' 26.21"	60° 41' 22"	0.08425
1	4° 47' 20"	-3° 54' 00"	5° 56' 30"	-1° 40' 40"	0° 56' 38"	15' 25.87"	60° 38' 55"	0.08183
2	5° 19' 50"	-3° 51' 60"	6° 25' 29"	-1° 25' 57"	0° 56' 36"	15' 25.53"	60° 36' 31"	0.07945
3	5° 52' 18"	-3° 49' 57"	6° 54' 26"	-1° 11' 15"	0° 56' 35"	15' 25.19"	60° 34' 12"	0.07710
4	6° 24' 46"	-3° 47' 54"	7° 23' 22"	0° -56' 34"	0° 56' 34"	15' 24.85"	60° 31' 57"	0.07478
5	6° 57' 11"	-3° 45' 50"	7° 52' 17"	0° -41' 52"	0° 56' 33"	15' 24.51"	60° 29' 46"	0.07250
6	7° 29' 36"	-3° 43' 44"	8° 21' 10"	0° -27' 11"	0° 56' 31"	15' 24.17"	60° 27' 39"	0.07025
7	8° 01' 59"	-3° 41' 38"	8° 50' 02"	0° -12' 31"	0° 56' 30"	15' 23.83"	60° 25' 35"	0.06803
8	8° 34' 20"	-3° 39' 30"	9° 18' 53"	0° 02' 09"	0° 56' 29"	15' 23.50"	60° 23' 35"	0.06585
9	9° 06' 40"	-3° 37' 21"	9° 47' 43"	0° 16' 48"	0° 56' 28"	15' 23.16"	60° 21' 37"	0.06371
10	9° 38' 59"	-3° 35' 11"	10° 16' 31"	0° 31' 27"	0° 56' 27"	15' 22.82"	60° 19' 43"	0.06160
11	10° 11' 16"	-3° 33' 00"	10° 45' 19"	0° 46' 05"	0° 56' 25"	15' 22.48"	60° 17' 51"	0.05952
12	10° 43' 32"	-3° 30' 48"	11° 14' 06"	1° 00' 43"	0° 56' 24"	15' 22.15"	60° 16' 01"	0.05748
13	11° 15' 46"	-3° 28' 35"	11° 42' 51"	1° 15' 19"	0° 56' 23"	15' 21.81"	60° 14' 14"	0.05548
14	11° 47' 59"	-3° 26' 21"	12° 11' 36"	1° 29' 55"	0° 56' 22"	15' 21.48"	60° 12' 28"	0.05350
15	12° 20' 10"	-3° 24' 06"	12° 40' 21"	1° 44' 29"	0° 56' 20"	15' 21.14"	60° 10' 44"	0.05157
16	12° 52' 20"	-3° 21' 50"	13° 09' 04"	1° 59' 03"	0° 56' 19"	15' 20.81"	60° 9' 01"	0.04967
17	13° 24' 29"	-3° 19' 33"	13° 37' 47"	2° 13' 35"	0° 56' 18"	15' 20.47"	60° 7' 19"	0.04780
18	13° 56' 36"	-3° 17' 15"	14° 06' 29"	2° 28' 07"	0° 56' 17"	15' 20.14"	60° 5' 38"	0.04597
19	14° 28' 41"	-3° 14' 56"	14° 35' 11"	2° 42' 37"	0° 56' 15"	15' 19.81"	60° 3' 56"	0.04418
20	15° 00' 46"	-3° 12' 36"	15° 03' 52"	2° 57' 06"	0° 56' 14"	15' 19.47"	60° 2' 13"	0.04242
21	15° 32' 48"	-3° 10' 16"	15° 32' 33"	3° 11' 33"	0° 56' 13"	15' 19.14"	60° 0' 30"	0.04069
22	16° 04' 50"	-3° 07' 54"	16° 01' 13"	3° 25' 60"	0° 56' 12"	15' 18.81"	59° 58' 46"	0.03900
23	16° 36' 50"	-3° 05' 32"	16° 29' 54"	3° 40' 25"	0° 56' 11"	15' 18.48"	59° 56' 59"	0.03735
24	17° 08' 48"	-3° 03' 08"	16° 58' 34"	3° 54' 48"	0° 56' 09"	15' 18.15"	59° 55' 09"	0.03573

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	38° 40' 52"	-0.44"	36° 17' 23"	14° 23' 27"	1.0069139	15' 53.04"	23° 26' 17"	2 m 34 s
1	38° 43' 18"	-0.43"	36° 19' 46"	14° 24' 14"	1.0069249	15' 53.03"	23° 26' 17"	2 m 35 s
2	38° 45' 44"	-0.43"	36° 22' 08"	14° 25' 01"	1.0069358	15' 53.02"	23° 26' 17"	2 m 35 s
3	38° 48' 10"	-0.42"	36° 24' 31"	14° 25' 48"	1.0069467	15' 53.01"	23° 26' 17"	2 m 35 s
4	38° 50' 35"	-0.42"	36° 26' 54"	14° 26' 34"	1.0069576	15' 53.00"	23° 26' 17"	2 m 36 s
5	38° 53' 01"	-0.42"	36° 29' 16"	14° 27' 21"	1.0069686	15' 52.99"	23° 26' 17"	2 m 36 s
6	38° 55' 27"	-0.41"	36° 31' 39"	14° 28' 08"	1.0069795	15' 52.98"	23° 26' 17"	2 m 36 s
7	38° 57' 53"	-0.41"	36° 34' 02"	14° 28' 54"	1.0069904	15' 52.97"	23° 26' 17"	2 m 37 s
8	39° 00' 19"	-0.40"	36° 36' 25"	14° 29' 41"	1.0070013	15' 52.96"	23° 26' 17"	2 m 37 s
9	39° 02' 45"	-0.40"	36° 38' 47"	14° 30' 27"	1.0070122	15' 52.95"	23° 26' 17"	2 m 37 s
10	39° 05' 11"	-0.39"	36° 41' 10"	14° 31' 14"	1.0070231	15' 52.94"	23° 26' 17"	2 m 38 s
11	39° 07' 36"	-0.39"	36° 43' 33"	14° 32' 00"	1.0070340	15' 52.93"	23° 26' 17"	2 m 38 s
12	39° 10' 02"	-0.38"	36° 45' 56"	14° 32' 47"	1.0070448	15' 52.92"	23° 26' 17"	2 m 38 s
13	39° 12' 28"	-0.38"	36° 48' 18"	14° 33' 33"	1.0070557	15' 52.91"	23° 26' 17"	2 m 39 s
14	39° 14' 54"	-0.37"	36° 50' 41"	14° 34' 20"	1.0070666	15' 52.90"	23° 26' 17"	2 m 39 s
15	39° 17' 20"	-0.37"	36° 53' 04"	14° 35' 06"	1.0070774	15' 52.89"	23° 26' 17"	2 m 39 s
16	39° 19' 45"	-0.36"	36° 55' 27"	14° 35' 53"	1.0070883	15' 52.88"	23° 26' 17"	2 m 40 s
17	39° 22' 11"	-0.36"	36° 57' 50"	14° 36' 39"	1.0070992	15' 52.87"	23° 26' 17"	2 m 40 s
18	39° 24' 37"	-0.35"	37° 00' 13"	14° 37' 25"	1.0071100	15' 52.86"	23° 26' 17"	2 m 40 s
19	39° 27' 03"	-0.35"	37° 02' 36"	14° 38' 12"	1.0071208	15' 52.84"	23° 26' 17"	2 m 41 s
20	39° 29' 29"	-0.34"	37° 04' 58"	14° 38' 58"	1.0071317	15' 52.83"	23° 26' 17"	2 m 41 s
21	39° 31' 55"	-0.34"	37° 07' 21"	14° 39' 44"	1.0071425	15' 52.82"	23° 26' 17"	2 m 41 s
22	39° 34' 20"	-0.33"	37° 09' 44"	14° 40' 30"	1.0071533	15' 52.81"	23° 26' 17"	2 m 42 s
23	39° 36' 46"	-0.33"	37° 12' 07"	14° 41' 16"	1.0071641	15' 52.80"	23° 26' 17"	2 m 42 s
24	39° 39' 12"	-0.32"	37° 14' 30"	14° 42' 03"	1.0071749	15' 52.79"	23° 26' 17"	2 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	17° 08' 48"	-3° 03' 08"	16° 58' 34"	3° 54' 48"	0° 56' 09"	15' 18.15"	59° 55' 09"	0.03573
1	17° 40' 46"	-3° 00' 44"	17° 27' 14"	4° 09' 10"	0° 56' 08"	15' 17.82"	59° 53' 16"	0.03415
2	18° 12' 41"	-2° 58' 19"	17° 55' 53"	4° 23' 30"	0° 56' 07"	15' 17.49"	59° 51' 19"	0.03261
3	18° 44' 36"	-2° 55' 53"	18° 24' 33"	4° 37' 48"	0° 56' 06"	15' 17.16"	59° 49' 17"	0.03110
4	19° 16' 29"	-2° 53' 26"	18° 53' 13"	4° 52' 05"	0° 56' 05"	15' 16.83"	59° 47' 10"	0.02962
5	19° 48' 20"	-2° 50' 59"	19° 21' 53"	5° 06' 20"	0° 56' 03"	15' 16.50"	59° 44' 55"	0.02818
6	20° 20' 10"	-2° 48' 30"	19° 50' 33"	5° 20' 34"	0° 56' 02"	15' 16.18"	59° 42' 32"	0.02678
7	20° 51' 59"	-2° 46' 01"	20° 19' 13"	5° 34' 45"	0° 56' 01"	15' 15.85"	59° 40' 01"	0.02541
8	21° 23' 46"	-2° 43' 31"	20° 47' 53"	5° 48' 54"	0° 55' 60"	15' 15.52"	59° 37' 19"	0.02408
9	21° 55' 32"	-2° 41' 01"	21° 16' 34"	6° 03' 02"	0° 55' 59"	15' 15.20"	59° 34' 25"	0.02279
10	22° 27' 17"	-2° 38' 29"	21° 45' 15"	6° 17' 07"	0° 55' 57"	15' 14.87"	59° 31' 17"	0.02153
11	22° 58' 60"	-2° 35' 57"	22° 13' 56"	6° 31' 10"	0° 55' 56"	15' 14.55"	59° 27' 55"	0.02031
12	23° 30' 42"	-2° 33' 24"	22° 42' 38"	6° 45' 11"	0° 55' 55"	15' 14.23"	59° 24' 14"	0.01912
13	24° 02' 22"	-2° 30' 51"	23° 11' 20"	6° 59' 10"	0° 55' 54"	15' 13.90"	59° 20' 14"	0.01797
14	24° 34' 01"	-2° 28' 17"	23° 40' 03"	7° 13' 07"	0° 55' 53"	15' 13.58"	59° 15' 52"	0.01685
15	25° 05' 38"	-2° 25' 42"	24° 08' 47"	7° 27' 01"	0° 55' 51"	15' 13.26"	59° 11' 05"	0.01577
16	25° 37' 15"	-2° 23' 07"	24° 37' 31"	7° 40' 53"	0° 55' 50"	15' 12.94"	59° 5' 49"	0.01473
17	26° 08' 49"	-2° 20' 31"	25° 06' 16"	7° 54' 42"	0° 55' 49"	15' 12.62"	59° 0' 00"	0.01373
18	26° 40' 23"	-2° 17' 54"	25° 35' 02"	8° 08' 29"	0° 55' 48"	15' 12.30"	58° 53' 35"	0.01276
19	27° 11' 55"	-2° 15' 17"	26° 03' 49"	8° 22' 13"	0° 55' 47"	15' 11.98"	58° 46' 28"	0.01182
20	27° 43' 26"	-2° 12' 39"	26° 32' 36"	8° 35' 55"	0° 55' 46"	15' 11.67"	58° 38' 33"	0.01092
21	28° 14' 55"	-2° 10' 00"	27° 01' 24"	8° 49' 33"	0° 55' 44"	15' 11.35"	58° 29' 44"	0.01006
22	28° 46' 23"	-2° 07' 21"	27° 30' 14"	9° 03' 10"	0° 55' 43"	15' 11.03"	58° 19' 52"	0.00923
23	29° 17' 50"	-2° 04' 42"	27° 59' 04"	9° 16' 43"	0° 55' 42"	15' 10.72"	58° 8' 48"	0.00844
24	29° 49' 15"	-2° 02' 02"	28° 27' 56"	9° 30' 14"	0° 55' 41"	15' 10.40"	57° 56' 21"	0.00769



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	39° 39' 12"	-0.32"	37° 14' 30"	14° 42' 03"	1.0071749	15' 52.79"	23° 26' 17"	2 m 42 s
1	39° 41' 38"	-0.32"	37° 16' 53"	14° 42' 49"	1.0071857	15' 52.78"	23° 26' 17"	2 m 43 s
2	39° 44' 03"	-0.31"	37° 19' 16"	14° 43' 35"	1.0071965	15' 52.77"	23° 26' 17"	2 m 43 s
3	39° 46' 29"	-0.31"	37° 21' 39"	14° 44' 21"	1.0072073	15' 52.76"	23° 26' 17"	2 m 43 s
4	39° 48' 55"	-0.30"	37° 24' 02"	14° 45' 07"	1.0072181	15' 52.75"	23° 26' 17"	2 m 44 s
5	39° 51' 21"	-0.30"	37° 26' 25"	14° 45' 53"	1.0072289	15' 52.74"	23° 26' 17"	2 m 44 s
6	39° 53' 47"	-0.29"	37° 28' 48"	14° 46' 39"	1.0072396	15' 52.73"	23° 26' 17"	2 m 44 s
7	39° 56' 12"	-0.29"	37° 31' 11"	14° 47' 25"	1.0072504	15' 52.72"	23° 26' 17"	2 m 45 s
8	39° 58' 38"	-0.28"	37° 33' 34"	14° 48' 11"	1.0072612	15' 52.71"	23° 26' 17"	2 m 45 s
9	40° 01' 04"	-0.28"	37° 35' 57"	14° 48' 57"	1.0072719	15' 52.70"	23° 26' 17"	2 m 45 s
10	40° 03' 30"	-0.27"	37° 38' 21"	14° 49' 43"	1.0072827	15' 52.69"	23° 26' 17"	2 m 46 s
11	40° 05' 55"	-0.27"	37° 40' 44"	14° 50' 29"	1.0072934	15' 52.68"	23° 26' 17"	2 m 46 s
12	40° 08' 21"	-0.26"	37° 43' 07"	14° 51' 15"	1.0073041	15' 52.67"	23° 26' 17"	2 m 46 s
13	40° 10' 47"	-0.26"	37° 45' 30"	14° 52' 01"	1.0073149	15' 52.66"	23° 26' 17"	2 m 47 s
14	40° 13' 13"	-0.25"	37° 47' 53"	14° 52' 47"	1.0073256	15' 52.65"	23° 26' 17"	2 m 47 s
15	40° 15' 38"	-0.24"	37° 50' 16"	14° 53' 32"	1.0073363	15' 52.64"	23° 26' 17"	2 m 47 s
16	40° 18' 04"	-0.24"	37° 52' 39"	14° 54' 18"	1.0073470	15' 52.63"	23° 26' 17"	2 m 48 s
17	40° 20' 30"	-0.23"	37° 55' 03"	14° 55' 04"	1.0073577	15' 52.62"	23° 26' 17"	2 m 48 s
18	40° 22' 56"	-0.23"	37° 57' 26"	14° 55' 50"	1.0073684	15' 52.61"	23° 26' 17"	2 m 48 s
19	40° 25' 21"	-0.22"	37° 59' 49"	14° 56' 35"	1.0073791	15' 52.60"	23° 26' 17"	2 m 49 s
20	40° 27' 47"	-0.22"	38° 02' 12"	14° 57' 21"	1.0073898	15' 52.59"	23° 26' 17"	2 m 49 s
21	40° 30' 13"	-0.21"	38° 04' 36"	14° 58' 07"	1.0074005	15' 52.58"	23° 26' 17"	2 m 49 s
22	40° 32' 39"	-0.21"	38° 06' 59"	14° 58' 52"	1.0074112	15' 52.57"	23° 26' 17"	2 m 49 s
23	40° 35' 04"	-0.20"	38° 09' 22"	14° 59' 38"	1.0074218	15' 52.56"	23° 26' 17"	2 m 50 s
24	40° 37' 30"	-0.20"	38° 11' 45"	15° 00' 23"	1.0074325	15' 52.55"	23° 26' 17"	2 m 50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	29° 49' 15"	-2° 02' 02"	28° 27' 56"	9° 30' 14"	0° 55' 41"	15' 10.40"	57° 56' 21"	0.00769
1	30° 20' 39"	-1° 59' 21"	28° 56' 48"	9° 43' 41"	0° 55' 40"	15' 10.09"	57° 42' 17"	0.00697
2	30° 52' 01"	-1° 56' 40"	29° 25' 42"	9° 57' 06"	0° 55' 39"	15' 09.78"	57° 26' 20"	0.00629
3	31° 23' 23"	-1° 53' 59"	29° 54' 37"	10° 10' 28"	0° 55' 37"	15' 09.47"	57° 8' 10"	0.00564
4	31° 54' 42"	-1° 51' 17"	30° 23' 33"	10° 23' 46"	0° 55' 36"	15' 09.15"	56° 47' 23"	0.00503
5	32° 26' 01"	-1° 48' 34"	30° 52' 31"	10° 37' 02"	0° 55' 35"	15' 08.84"	56° 23' 27"	0.00445
6	32° 57' 18"	-1° 45' 52"	31° 21' 30"	10° 50' 14"	0° 55' 34"	15' 08.54"	55° 55' 45"	0.00392
7	33° 28' 34"	-1° 43' 08"	31° 50' 30"	11° 03' 24"	0° 55' 33"	15' 08.23"	55° 23' 26"	0.00341
8	33° 59' 49"	-1° 40' 24"	32° 19' 32"	11° 16' 29"	0° 55' 32"	15' 07.92"	54° 45' 28"	0.00294
9	34° 31' 02"	-1° 37' 40"	32° 48' 35"	11° 29' 32"	0° 55' 31"	15' 07.61"	54° 0' 24"	0.00251
10	35° 02' 14"	-1° 34' 56"	33° 17' 40"	11° 42' 31"	0° 55' 30"	15' 07.31"	53° 6' 21"	0.00212
11	35° 33' 24"	-1° 32' 11"	33° 46' 47"	11° 55' 27"	0° 55' 28"	15' 07.00"	52° 0' 39"	0.00175
12	36° 04' 34"	-1° 29' 26"	34° 15' 55"	12° 08' 19"	0° 55' 27"	15' 06.70"	50° 39' 36"	0.00143
13	36° 35' 42"	-1° 26' 40"	34° 45' 04"	12° 21' 08"	0° 55' 26"	15' 06.40"	48° 57' 42"	0.00114
14	37° 06' 48"	-1° 23' 54"	35° 14' 16"	12° 33' 53"	0° 55' 25"	15' 06.10"	46° 46' 43"	0.00089
15	37° 37' 54"	-1° 21' 08"	35° 43' 29"	12° 46' 34"	0° 55' 24"	15' 05.80"	43° 53' 40"	0.00067
16	38° 08' 58"	-1° 18' 22"	36° 12' 44"	12° 59' 12"	0° 55' 23"	15' 05.50"	39° 57' 12"	0.00048
17	38° 40' 01"	-1° 15' 35"	36° 42' 01"	13° 11' 46"	0° 55' 22"	15' 05.20"	34° 20' 47"	0.00033
18	39° 11' 02"	-1° 12' 48"	37° 11' 19"	13° 24' 16"	0° 55' 21"	15' 04.91"	26° 0' 14"	0.00022
19	39° 42' 03"	-1° 10' 01"	37° 40' 40"	13° 36' 42"	0° 55' 20"	15' 04.61"	13° 8' 59"	0.00014
20	40° 13' 02"	-1° 07' 13"	38° 10' 02"	13° 49' 05"	0° 55' 19"	15' 04.32"	353° 49' 20"	0.00010
21	40° 43' 59"	-1° 04' 25"	38° 39' 26"	14° 01' 23"	0° 55' 18"	15' 04.02"	329° 28' 50"	0.00009
22	41° 14' 56"	-1° 01' 38"	39° 08' 53"	14° 13' 37"	0° 55' 16"	15' 03.73"	307° 18' 30"	0.00012
23	41° 45' 51"	0°-58' 49"	39° 38' 21"	14° 25' 48"	0° 55' 15"	15' 03.44"	291° 43' 12"	0.00018
24	42° 16' 45"	0°-56' 01"	40° 07' 52"	14° 37' 54"	0° 55' 14"	15' 03.15"	281° 37' 22"	0.00028

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	40° 37' 30"	-0.20"	38° 11' 45"	15° 00' 23"	1.0074325	15' 52.55"	23° 26' 17"	2 m 50 s
1	40° 39' 56"	-0.19"	38° 14' 09"	15° 01' 09"	1.0074431	15' 52.54"	23° 26' 17"	2 m 50 s
2	40° 42' 21"	-0.18"	38° 16' 32"	15° 01' 54"	1.0074538	15' 52.53"	23° 26' 17"	2 m 51 s
3	40° 44' 47"	-0.18"	38° 18' 55"	15° 02' 40"	1.0074644	15' 52.52"	23° 26' 17"	2 m 51 s
4	40° 47' 13"	-0.17"	38° 21' 19"	15° 03' 25"	1.0074751	15' 52.51"	23° 26' 17"	2 m 51 s
5	40° 49' 39"	-0.17"	38° 23' 42"	15° 04' 11"	1.0074857	15' 52.50"	23° 26' 17"	2 m 52 s
6	40° 52' 04"	-0.16"	38° 26' 05"	15° 04' 56"	1.0074963	15' 52.49"	23° 26' 17"	2 m 52 s
7	40° 54' 30"	-0.16"	38° 28' 29"	15° 05' 42"	1.0075069	15' 52.48"	23° 26' 17"	2 m 52 s
8	40° 56' 56"	-0.15"	38° 30' 52"	15° 06' 27"	1.0075176	15' 52.47"	23° 26' 17"	2 m 53 s
9	40° 59' 21"	-0.14"	38° 33' 16"	15° 07' 12"	1.0075282	15' 52.46"	23° 26' 17"	2 m 53 s
10	41° 01' 47"	-0.14"	38° 35' 39"	15° 07' 58"	1.0075388	15' 52.45"	23° 26' 17"	2 m 53 s
11	41° 04' 13"	-0.13"	38° 38' 03"	15° 08' 43"	1.0075494	15' 52.44"	23° 26' 17"	2 m 53 s
12	41° 06' 38"	-0.13"	38° 40' 26"	15° 09' 28"	1.0075599	15' 52.43"	23° 26' 17"	2 m 54 s
13	41° 09' 04"	-0.12"	38° 42' 49"	15° 10' 13"	1.0075705	15' 52.42"	23° 26' 17"	2 m 54 s
14	41° 11' 30"	-0.12"	38° 45' 13"	15° 10' 59"	1.0075811	15' 52.41"	23° 26' 17"	2 m 54 s
15	41° 13' 55"	-0.11"	38° 47' 36"	15° 11' 44"	1.0075917	15' 52.40"	23° 26' 17"	2 m 55 s
16	41° 16' 21"	-0.10"	38° 49' 60"	15° 12' 29"	1.0076022	15' 52.39"	23° 26' 17"	2 m 55 s
17	41° 18' 47"	-0.10"	38° 52' 24"	15° 13' 14"	1.0076128	15' 52.38"	23° 26' 17"	2 m 55 s
18	41° 21' 12"	-0.09"	38° 54' 47"	15° 13' 59"	1.0076233	15' 52.37"	23° 26' 17"	2 m 55 s
19	41° 23' 38"	-0.09"	38° 57' 11"	15° 14' 44"	1.0076339	15' 52.36"	23° 26' 17"	2 m 56 s
20	41° 26' 04"	-0.08"	38° 59' 34"	15° 15' 29"	1.0076444	15' 52.35"	23° 26' 17"	2 m 56 s
21	41° 28' 29"	-0.08"	39° 01' 58"	15° 16' 14"	1.0076550	15' 52.34"	23° 26' 17"	2 m 56 s
22	41° 30' 55"	-0.07"	39° 04' 21"	15° 16' 59"	1.0076655	15' 52.33"	23° 26' 17"	2 m 57 s
23	41° 33' 21"	-0.06"	39° 06' 45"	15° 17' 44"	1.0076760	15' 52.32"	23° 26' 17"	2 m 57 s
24	41° 35' 46"	-0.06"	39° 09' 09"	15° 18' 29"	1.0076865	15' 52.31"	23° 26' 17"	2 m 57 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	42° 16' 45"	0°-56' 01"	40° 07' 52"	14° 37' 54"	0° 55' 14"	15' 03.15"	281° 37' 22"	0.00028
1	42° 47' 38"	0°-53' 13"	40° 37' 25"	14° 49' 56"	0° 55' 13"	15' 02.86"	274° 58' 12"	0.00041
2	43° 18' 30"	0°-50' 24"	41° 06' 59"	15° 01' 53"	0° 55' 12"	15' 02.57"	270° 23' 39"	0.00057
3	43° 49' 20"	0°-47' 35"	41° 36' 36"	15° 13' 47"	0° 55' 11"	15' 02.29"	267° 6' 41"	0.00078
4	44° 20' 09"	0°-44' 46"	42° 06' 15"	15° 25' 36"	0° 55' 10"	15' 02.00"	264° 40' 16"	0.00101
5	44° 50' 57"	0°-41' 57"	42° 35' 57"	15° 37' 21"	0° 55' 09"	15' 01.72"	262° 48' 14"	0.00128
6	45° 21' 43"	0°-39' 08"	43° 05' 40"	15° 49' 01"	0° 55' 08"	15' 01.44"	261° 20' 32"	0.00158
7	45° 52' 29"	0°-36' 19"	43° 35' 26"	16° 00' 37"	0° 55' 07"	15' 01.16"	260° 10' 37"	0.00192
8	46° 23' 13"	0°-33' 30"	44° 05' 14"	16° 12' 08"	0° 55' 06"	15' 00.88"	259° 14' 04"	0.00229
9	46° 53' 56"	0°-30' 40"	44° 35' 05"	16° 23' 35"	0° 55' 05"	15' 00.60"	258° 27' 48"	0.00270
10	47° 24' 38"	0°-27' 51"	45° 04' 58"	16° 34' 57"	0° 55' 04"	15' 00.33"	257° 49' 38"	0.00314
11	47° 55' 18"	0°-25' 01"	45° 34' 53"	16° 46' 14"	0° 55' 03"	15' 00.05"	257° 17' 56"	0.00361
12	48° 25' 58"	0°-22' 12"	46° 04' 51"	16° 57' 27"	0° 55' 02"	14' 59.78"	256° 51' 30"	0.00412
13	48° 56' 36"	0°-19' 23"	46° 34' 51"	17° 08' 34"	0° 55' 01"	14' 59.51"	256° 29' 24"	0.00466
14	49° 27' 13"	0°-16' 33"	47° 04' 53"	17° 19' 37"	0° 54' 60"	14' 59.24"	256° 10' 56"	0.00523
15	49° 57' 49"	0°-13' 44"	47° 34' 59"	17° 30' 35"	0° 54' 59"	14' 58.97"	255° 55' 31"	0.00584
16	50° 28' 24"	0°-10' 54"	48° 05' 06"	17° 41' 29"	0° 54' 58"	14' 58.71"	255° 42' 42"	0.00648
17	50° 58' 58"	0° -8' 05"	48° 35' 16"	17° 52' 17"	0° 54' 57"	14' 58.44"	255° 32' 08"	0.00715
18	51° 29' 30"	0° -5' 16"	49° 05' 29"	18° 02' 60"	0° 54' 56"	14' 58.18"	255° 23' 31"	0.00786
19	52° 00' 01"	0° -2' 26"	49° 35' 44"	18° 13' 38"	0° 54' 55"	14' 57.92"	255° 16' 36"	0.00860
20	52° 30' 32"	0° 00' 23"	50° 06' 02"	18° 24' 11"	0° 54' 54"	14' 57.66"	255° 11' 10"	0.00937
21	53° 01' 01"	0° 03' 12"	50° 36' 22"	18° 34' 39"	0° 54' 53"	14' 57.40"	255° 7' 04"	0.01018
22	53° 31' 29"	0° 06' 01"	51° 06' 45"	18° 45' 01"	0° 54' 52"	14' 57.14"	255° 4' 09"	0.01101
23	54° 01' 56"	0° 08' 49"	51° 37' 11"	18° 55' 18"	0° 54' 51"	14' 56.89"	255° 2' 18"	0.01188
24	54° 32' 22"	0° 11' 38"	52° 07' 39"	19° 05' 30"	0° 54' 50"	14' 56.64"	255° 1' 23"	0.01279



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	41° 35' 46"	-0.06"	39° 09' 09"	15° 18' 29"	1.0076865	15' 52.31"	23° 26' 17"	2 m 57 s
1	41° 38' 12"	-0.05"	39° 11' 32"	15° 19' 14"	1.0076970	15' 52.30"	23° 26' 17"	2 m 57 s
2	41° 40' 38"	-0.05"	39° 13' 56"	15° 19' 59"	1.0077075	15' 52.29"	23° 26' 17"	2 m 58 s
3	41° 43' 03"	-0.04"	39° 16' 20"	15° 20' 44"	1.0077180	15' 52.28"	23° 26' 17"	2 m 58 s
4	41° 45' 29"	-0.04"	39° 18' 43"	15° 21' 29"	1.0077285	15' 52.27"	23° 26' 17"	2 m 58 s
5	41° 47' 55"	-0.03"	39° 21' 07"	15° 22' 13"	1.0077390	15' 52.26"	23° 26' 17"	2 m 59 s
6	41° 50' 20"	-0.02"	39° 23' 31"	15° 22' 58"	1.0077495	15' 52.25"	23° 26' 17"	2 m 59 s
7	41° 52' 46"	-0.02"	39° 25' 54"	15° 23' 43"	1.0077599	15' 52.24"	23° 26' 17"	2 m 59 s
8	41° 55' 11"	-0.01"	39° 28' 18"	15° 24' 28"	1.0077704	15' 52.23"	23° 26' 17"	2 m 59 s
9	41° 57' 37"	-0.01"	39° 30' 42"	15° 25' 12"	1.0077809	15' 52.22"	23° 26' 17"	2 m 60 s
10	42° 00' 03"	-0.00"	39° 33' 06"	15° 25' 57"	1.0077913	15' 52.21"	23° 26' 17"	2 m 60 s
11	42° 02' 28"	0.00"	39° 35' 29"	15° 26' 42"	1.0078018	15' 52.20"	23° 26' 17"	3 m 00 s
12	42° 04' 54"	0.01"	39° 37' 53"	15° 27' 26"	1.0078122	15' 52.19"	23° 26' 17"	3 m 01 s
13	42° 07' 19"	0.02"	39° 40' 17"	15° 28' 11"	1.0078227	15' 52.18"	23° 26' 17"	3 m 01 s
14	42° 09' 45"	0.02"	39° 42' 41"	15° 28' 56"	1.0078331	15' 52.17"	23° 26' 17"	3 m 01 s
15	42° 12' 11"	0.03"	39° 45' 05"	15° 29' 40"	1.0078435	15' 52.16"	23° 26' 17"	3 m 01 s
16	42° 14' 36"	0.03"	39° 47' 29"	15° 30' 25"	1.0078539	15' 52.15"	23° 26' 17"	3 m 02 s
17	42° 17' 02"	0.04"	39° 49' 52"	15° 31' 09"	1.0078643	15' 52.14"	23° 26' 17"	3 m 02 s
18	42° 19' 27"	0.04"	39° 52' 16"	15° 31' 54"	1.0078747	15' 52.13"	23° 26' 17"	3 m 02 s
19	42° 21' 53"	0.05"	39° 54' 40"	15° 32' 38"	1.0078851	15' 52.12"	23° 26' 17"	3 m 02 s
20	42° 24' 19"	0.06"	39° 57' 04"	15° 33' 22"	1.0078955	15' 52.11"	23° 26' 17"	3 m 03 s
21	42° 26' 44"	0.06"	39° 59' 28"	15° 34' 07"	1.0079059	15' 52.10"	23° 26' 17"	3 m 03 s
22	42° 29' 10"	0.07"	40° 01' 52"	15° 34' 51"	1.0079163	15' 52.09"	23° 26' 17"	3 m 03 s
23	42° 31' 35"	0.07"	40° 04' 16"	15° 35' 35"	1.0079267	15' 52.08"	23° 26' 17"	3 m 03 s
24	42° 34' 01"	0.08"	40° 06' 40"	15° 36' 20"	1.0079370	15' 52.07"	23° 26' 17"	3 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	54° 32' 22"	0° 11' 38"	52° 07' 39"	19° 05' 30"	0° 54' 50"	14' 56.64"	255° 1' 23"	0.01279
1	55° 02' 47"	0° 14' 27"	52° 38' 10"	19° 15' 37"	0° 54' 49"	14' 56.39"	255° 1' 21"	0.01372
2	55° 33' 10"	0° 17' 15"	53° 08' 43"	19° 25' 38"	0° 54' 49"	14' 56.14"	255° 2' 06"	0.01469
3	56° 03' 33"	0° 20' 01"	53° 39' 20"	19° 35' 31"	0° 54' 48"	14' 55.89"	255° 3' 43"	0.01569
4	56° 33' 55"	0° 22' 49"	54° 09' 59"	19° 45' 21"	0° 54' 47"	14' 55.64"	255° 5' 50"	0.01672
5	57° 04' 15"	0° 25' 36"	54° 40' 41"	19° 55' 06"	0° 54' 46"	14' 55.40"	255° 8' 33"	0.01778
6	57° 34' 35"	0° 28' 24"	55° 11' 25"	20° 04' 44"	0° 54' 45"	14' 55.16"	255° 11' 50"	0.01887
7	58° 04' 53"	0° 31' 11"	55° 42' 12"	20° 18' 18"	0° 54' 44"	14' 54.92"	255° 15' 38"	0.02000
8	58° 35' 11"	0° 33' 58"	56° 13' 01"	20° 23' 45"	0° 54' 43"	14' 54.68"	255° 19' 55"	0.02116
9	59° 05' 27"	0° 36' 45"	56° 43' 54"	20° 33' 07"	0° 54' 42"	14' 54.45"	255° 24' 38"	0.02234
10	59° 35' 42"	0° 39' 32"	57° 14' 49"	20° 42' 23"	0° 54' 42"	14' 54.22"	255° 29' 48"	0.02356
11	60° 05' 57"	0° 42' 18"	57° 45' 46"	20° 51' 33"	0° 54' 41"	14' 53.99"	255° 35' 20"	0.02481
12	60° 36' 10"	0° 45' 04"	58° 16' 47"	21° 00' 38"	0° 54' 40"	14' 53.76"	255° 41' 15"	0.02609
13	61° 06' 23"	0° 47' 50"	58° 47' 50"	21° 09' 36"	0° 54' 39"	14' 53.53"	255° 47' 31"	0.02740
14	61° 36' 34"	0° 50' 35"	59° 18' 56"	21° 18' 28"	0° 54' 38"	14' 53.31"	255° 54' 07"	0.02875
15	62° 06' 45"	0° 53' 20"	59° 50' 04"	21° 27' 15"	0° 54' 37"	14' 53.08"	256° 1' 02"	0.03012
16	62° 36' 54"	0° 56' 05"	60° 21' 15"	21° 35' 55"	0° 54' 37"	14' 52.86"	256° 8' 14"	0.03152
17	63° 07' 03"	0° 58' 50"	60° 52' 29"	21° 44' 29"	0° 54' 36"	14' 52.64"	256° 15' 44"	0.03295
18	63° 37' 11"	1° 01' 34"	61° 23' 46"	21° 52' 58"	0° 54' 35"	14' 52.43"	256° 23' 29"	0.03442
19	64° 07' 17"	1° 04' 17"	61° 55' 05"	22° 01' 19"	0° 54' 34"	14' 52.22"	256° 31' 30"	0.03591
20	64° 37' 23"	1° 07' 01"	62° 26' 27"	22° 09' 35"	0° 54' 33"	14' 52.01"	256° 39' 45"	0.03743
21	65° 07' 28"	1° 09' 44"	62° 57' 52"	22° 17' 45"	0° 54' 33"	14' 51.80"	256° 48' 15"	0.03898
22	65° 37' 32"	1° 12' 26"	63° 29' 19"	22° 25' 48"	0° 54' 32"	14' 51.59"	256° 56' 57"	0.04056
23	66° 07' 36"	1° 15' 08"	64° 00' 49"	22° 33' 45"	0° 54' 31"	14' 51.39"	257° 5' 53"	0.04217
24	66° 37' 38"	1° 17' 50"	64° 32' 22"	22° 41' 35"	0° 54' 30"	14' 51.19"	257° 15' 01"	0.04381

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	42° 34' 01"	0.08"	40° 06' 40"	15° 36' 20"	1.0079370	15' 52.07"	23° 26' 17"	3 m 04 s
1	42° 36' 26"	0.08"	40° 09' 04"	15° 37' 04"	1.0079474	15' 52.06"	23° 26' 17"	3 m 04 s
2	42° 38' 52"	0.09"	40° 11' 28"	15° 37' 48"	1.0079578	15' 52.05"	23° 26' 17"	3 m 04 s
3	42° 41' 18"	0.09"	40° 13' 52"	15° 38' 32"	1.0079681	15' 52.04"	23° 26' 17"	3 m 04 s
4	42° 43' 43"	0.10"	40° 16' 16"	15° 39' 17"	1.0079784	15' 52.03"	23° 26' 17"	3 m 05 s
5	42° 46' 09"	0.11"	40° 18' 40"	15° 40' 01"	1.0079888	15' 52.02"	23° 26' 17"	3 m 05 s
6	42° 48' 34"	0.11"	40° 21' 04"	15° 40' 45"	1.0079991	15' 52.01"	23° 26' 17"	3 m 05 s
7	42° 50' 60"	0.12"	40° 23' 28"	15° 41' 29"	1.0080094	15' 52.00"	23° 26' 17"	3 m 06 s
8	42° 53' 25"	0.12"	40° 25' 52"	15° 42' 13"	1.0080198	15' 52.00"	23° 26' 17"	3 m 06 s
9	42° 55' 51"	0.13"	40° 28' 16"	15° 42' 57"	1.0080301	15' 51.99"	23° 26' 17"	3 m 06 s
10	42° 58' 16"	0.13"	40° 30' 40"	15° 43' 41"	1.0080404	15' 51.98"	23° 26' 17"	3 m 06 s
11	43° 00' 42"	0.14"	40° 33' 05"	15° 44' 25"	1.0080507	15' 51.97"	23° 26' 17"	3 m 07 s
12	43° 03' 07"	0.14"	40° 35' 29"	15° 45' 09"	1.0080610	15' 51.96"	23° 26' 17"	3 m 07 s
13	43° 05' 33"	0.15"	40° 37' 53"	15° 45' 53"	1.0080713	15' 51.95"	23° 26' 17"	3 m 07 s
14	43° 07' 58"	0.16"	40° 40' 17"	15° 46' 37"	1.0080815	15' 51.94"	23° 26' 17"	3 m 07 s
15	43° 10' 24"	0.16"	40° 42' 41"	15° 47' 21"	1.0080918	15' 51.93"	23° 26' 17"	3 m 08 s
16	43° 12' 49"	0.17"	40° 45' 05"	15° 48' 05"	1.0081021	15' 51.92"	23° 26' 17"	3 m 08 s
17	43° 15' 15"	0.17"	40° 47' 30"	15° 48' 49"	1.0081124	15' 51.91"	23° 26' 17"	3 m 08 s
18	43° 17' 40"	0.18"	40° 49' 54"	15° 49' 32"	1.0081226	15' 51.90"	23° 26' 17"	3 m 08 s
19	43° 20' 06"	0.18"	40° 52' 18"	15° 50' 16"	1.0081329	15' 51.89"	23° 26' 17"	3 m 08 s
20	43° 22' 32"	0.19"	40° 54' 42"	15° 51' 00"	1.0081431	15' 51.88"	23° 26' 17"	3 m 09 s
21	43° 24' 57"	0.19"	40° 57' 07"	15° 51' 44"	1.0081534	15' 51.87"	23° 26' 17"	3 m 09 s
22	43° 27' 22"	0.20"	40° 59' 31"	15° 52' 27"	1.0081636	15' 51.86"	23° 26' 17"	3 m 09 s
23	43° 29' 48"	0.20"	41° 01' 55"	15° 53' 11"	1.0081738	15' 51.85"	23° 26' 17"	3 m 09 s
24	43° 32' 13"	0.21"	41° 04' 19"	15° 53' 55"	1.0081841	15' 51.84"	23° 26' 17"	3 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	66° 37' 38"	1° 17' 50"	64° 32' 22"	22° 41' 35"	0° 54' 30"	14' 51.19"	257° 15' 01"	0.04381
1	67° 07' 39"	1° 20' 31"	65° 03' 57"	22° 49' 19"	0° 54' 30"	14' 50.99"	257° 24' 22"	0.04548
2	67° 37' 40"	1° 23' 12"	65° 35' 35"	22° 56' 56"	0° 54' 29"	14' 50.79"	257° 33' 53"	0.04717
3	68° 07' 40"	1° 25' 52"	66° 07' 15"	23° 04' 28"	0° 54' 28"	14' 50.60"	257° 43' 36"	0.04890
4	68° 37' 39"	1° 28' 32"	66° 38' 58"	23° 11' 52"	0° 54' 28"	14' 50.41"	257° 53' 29"	0.05065
5	69° 07' 37"	1° 31' 12"	67° 10' 43"	23° 19' 10"	0° 54' 27"	14' 50.22"	258° 3' 33"	0.05243
6	69° 37' 34"	1° 33' 51"	67° 42' 31"	23° 26' 21"	0° 54' 26"	14' 50.03"	258° 13' 46"	0.05424
7	70° 07' 31"	1° 36' 29"	68° 14' 22"	23° 33' 26"	0° 54' 25"	14' 49.85"	258° 24' 09"	0.05608
8	70° 37' 26"	1° 39' 07"	68° 46' 15"	23° 40' 24"	0° 54' 25"	14' 49.67"	258° 34' 42"	0.05795
9	71° 07' 21"	1° 41' 44"	69° 18' 10"	23° 47' 15"	0° 54' 24"	14' 49.49"	258° 45' 23"	0.05984
10	71° 37' 15"	1° 44' 21"	69° 50' 08"	23° 53' 59"	0° 54' 24"	14' 49.31"	258° 56' 13"	0.06176
11	72° 07' 09"	1° 46' 58"	70° 22' 09"	24° 00' 37"	0° 54' 23"	14' 49.14"	259° 7' 12"	0.06371
12	72° 37' 02"	1° 49' 33"	70° 54' 11"	24° 07' 08"	0° 54' 22"	14' 48.97"	259° 18' 18"	0.06568
13	73° 06' 54"	1° 52' 09"	71° 26' 16"	24° 13' 32"	0° 54' 22"	14' 48.80"	259° 29' 33"	0.06768
14	73° 36' 45"	1° 54' 43"	71° 58' 24"	24° 19' 49"	0° 54' 21"	14' 48.64"	259° 40' 56"	0.06971
15	74° 06' 35"	1° 57' 17"	72° 30' 33"	24° 25' 59"	0° 54' 20"	14' 48.48"	259° 52' 26"	0.07177
16	74° 36' 25"	1° 59' 51"	73° 02' 45"	24° 32' 02"	0° 54' 20"	14' 48.32"	260° 4' 03"	0.07385
17	75° 06' 14"	2° 02' 24"	73° 34' 60"	24° 37' 58"	0° 54' 19"	14' 48.17"	260° 15' 47"	0.07596
18	75° 36' 03"	2° 04' 56"	74° 07' 16"	24° 43' 48"	0° 54' 19"	14' 48.01"	260° 27' 38"	0.07810
19	76° 05' 51"	2° 07' 27"	74° 39' 35"	24° 49' 30"	0° 54' 18"	14' 47.86"	260° 39' 36"	0.08026
20	76° 35' 38"	2° 09' 58"	75° 11' 55"	24° 55' 05"	0° 54' 18"	14' 47.72"	260° 51' 40"	0.08244
21	77° 05' 25"	2° 12' 29"	75° 44' 18"	25° 00' 33"	0° 54' 17"	14' 47.57"	261° 3' 51"	0.08466
22	77° 35' 11"	2° 14' 58"	76° 16' 43"	25° 05' 53"	0° 54' 17"	14' 47.43"	261° 16' 08"	0.08689
23	78° 04' 56"	2° 17' 28"	76° 49' 10"	25° 11' 07"	0° 54' 16"	14' 47.30"	261° 28' 30"	0.08916
24	78° 34' 41"	2° 19' 56"	77° 21' 39"	25° 16' 13"	0° 54' 16"	14' 47.16"	261° 40' 59"	0.09145



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	43° 32' 13"	0.21"	41° 04' 19"	15° 53' 55"	1.0081841	15' 51.84"	23° 26' 17"	3 m 10 s
1	43° 34' 39"	0.21"	41° 06' 44"	15° 54' 38"	1.0081943	15' 51.83"	23° 26' 17"	3 m 10 s
2	43° 37' 04"	0.22"	41° 09' 08"	15° 55' 22"	1.0082045	15' 51.82"	23° 26' 16"	3 m 10 s
3	43° 39' 30"	0.22"	41° 11' 32"	15° 56' 06"	1.0082147	15' 51.81"	23° 26' 16"	3 m 10 s
4	43° 41' 55"	0.23"	41° 13' 57"	15° 56' 49"	1.0082249	15' 51.80"	23° 26' 16"	3 m 11 s
5	43° 44' 21"	0.23"	41° 16' 21"	15° 57' 33"	1.0082351	15' 51.79"	23° 26' 16"	3 m 11 s
6	43° 46' 46"	0.24"	41° 18' 46"	15° 58' 16"	1.0082453	15' 51.78"	23° 26' 16"	3 m 11 s
7	43° 49' 12"	0.24"	41° 21' 10"	15° 58' 60"	1.0082554	15' 51.77"	23° 26' 16"	3 m 11 s
8	43° 51' 37"	0.25"	41° 23' 34"	15° 59' 43"	1.0082656	15' 51.76"	23° 26' 16"	3 m 12 s
9	43° 54' 03"	0.26"	41° 25' 59"	16° 00' 26"	1.0082758	15' 51.75"	23° 26' 16"	3 m 12 s
10	43° 56' 28"	0.26"	41° 28' 23"	16° 01' 10"	1.0082860	15' 51.74"	23° 26' 16"	3 m 12 s
11	43° 58' 54"	0.27"	41° 30' 48"	16° 01' 53"	1.0082961	15' 51.73"	23° 26' 16"	3 m 12 s
12	44° 01' 19"	0.27"	41° 33' 12"	16° 02' 36"	1.0083063	15' 51.72"	23° 26' 16"	3 m 12 s
13	44° 03' 45"	0.27"	41° 35' 37"	16° 03' 20"	1.0083164	15' 51.72"	23° 26' 16"	3 m 13 s
14	44° 06' 10"	0.28"	41° 38' 01"	16° 04' 03"	1.0083266	15' 51.71"	23° 26' 16"	3 m 13 s
15	44° 08' 35"	0.28"	41° 40' 26"	16° 04' 46"	1.0083367	15' 51.70"	23° 26' 16"	3 m 13 s
16	44° 11' 01"	0.29"	41° 42' 50"	16° 05' 29"	1.0083468	15' 51.69"	23° 26' 16"	3 m 13 s
17	44° 13' 26"	0.29"	41° 45' 15"	16° 06' 13"	1.0083569	15' 51.68"	23° 26' 16"	3 m 14 s
18	44° 15' 52"	0.30"	41° 47' 39"	16° 06' 56"	1.0083671	15' 51.67"	23° 26' 16"	3 m 14 s
19	44° 18' 17"	0.30"	41° 50' 04"	16° 07' 39"	1.0083772	15' 51.66"	23° 26' 16"	3 m 14 s
20	44° 20' 43"	0.31"	41° 52' 29"	16° 08' 22"	1.0083873	15' 51.65"	23° 26' 16"	3 m 14 s
21	44° 23' 08"	0.31"	41° 54' 53"	16° 09' 05"	1.0083974	15' 51.64"	23° 26' 16"	3 m 14 s
22	44° 25' 33"	0.32"	41° 57' 18"	16° 09' 48"	1.0084075	15' 51.63"	23° 26' 16"	3 m 15 s
23	44° 27' 59"	0.32"	41° 59' 42"	16° 10' 31"	1.0084176	15' 51.62"	23° 26' 16"	3 m 15 s
24	44° 30' 24"	0.33"	42° 02' 07"	16° 11' 14"	1.0084276	15' 51.61"	23° 26' 16"	3 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	78° 34' 41"	2° 19' 56"	77° 21' 39"	25° 16' 13"	0° 54' 16"	14' 47.16"	261° 40' 59"	0.09145
1	79° 04' 25"	2° 22' 24"	77° 54' 10"	25° 21' 13"	0° 54' 15"	14' 47.03"	261° 53' 33"	0.09376
2	79° 34' 09"	2° 24' 51"	78° 26' 43"	25° 26' 04"	0° 54' 15"	14' 46.90"	262° 6' 12"	0.09610
3	80° 03' 52"	2° 27' 17"	78° 59' 18"	25° 30' 49"	0° 54' 14"	14' 46.78"	262° 18' 57"	0.09846
4	80° 33' 34"	2° 29' 42"	79° 31' 54"	25° 35' 26"	0° 54' 14"	14' 46.66"	262° 31' 47"	0.10085
5	81° 03' 16"	2° 32' 07"	80° 04' 33"	25° 39' 56"	0° 54' 13"	14' 46.54"	262° 44' 41"	0.10327
6	81° 32' 58"	2° 34' 31"	80° 37' 13"	25° 44' 19"	0° 54' 13"	14' 46.42"	262° 57' 41"	0.10570
7	82° 02' 39"	2° 36' 55"	81° 09' 55"	25° 48' 34"	0° 54' 13"	14' 46.31"	263° 10' 46"	0.10816
8	82° 32' 19"	2° 39' 18"	81° 42' 38"	25° 52' 42"	0° 54' 12"	14' 46.20"	263° 23' 54"	0.11065
9	83° 01' 60"	2° 41' 39"	82° 15' 23"	25° 56' 42"	0° 54' 12"	14' 46.10"	263° 37' 08"	0.11316
10	83° 31' 39"	2° 44' 01"	82° 48' 10"	26° 00' 35"	0° 54' 11"	14' 46.00"	263° 50' 25"	0.11569
11	84° 01' 18"	2° 46' 21"	83° 20' 58"	26° 04' 21"	0° 54' 11"	14' 45.90"	264° 3' 47"	0.11825
12	84° 30' 57"	2° 48' 41"	83° 53' 48"	26° 07' 59"	0° 54' 11"	14' 45.80"	264° 17' 13"	0.12083
13	85° 00' 36"	2° 50' 59"	84° 26' 39"	26° 11' 30"	0° 54' 10"	14' 45.71"	264° 30' 42"	0.12343
14	85° 30' 14"	2° 53' 17"	84° 59' 31"	26° 14' 53"	0° 54' 10"	14' 45.62"	264° 44' 16"	0.12605
15	85° 59' 51"	2° 55' 35"	85° 32' 25"	26° 18' 08"	0° 54' 10"	14' 45.54"	264° 57' 53"	0.12870
16	86° 29' 28"	2° 57' 51"	86° 05' 20"	26° 21' 16"	0° 54' 09"	14' 45.46"	265° 11' 33"	0.13137
17	86° 59' 05"	3° 00' 06"	86° 38' 16"	26° 24' 16"	0° 54' 09"	14' 45.38"	265° 25' 17"	0.13407
18	87° 28' 42"	3° 02' 21"	87° 11' 14"	26° 27' 09"	0° 54' 09"	14' 45.31"	265° 39' 04"	0.13678
19	87° 58' 18"	3° 04' 35"	87° 44' 12"	26° 29' 54"	0° 54' 09"	14' 45.24"	265° 52' 54"	0.13952
20	88° 27' 54"	3° 06' 48"	88° 17' 12"	26° 32' 32"	0° 54' 08"	14' 45.17"	266° 6' 47"	0.14228
21	88° 57' 30"	3° 09' 00"	88° 50' 12"	26° 35' 02"	0° 54' 08"	14' 45.11"	266° 20' 42"	0.14506
22	89° 27' 05"	3° 11' 12"	89° 23' 14"	26° 37' 24"	0° 54' 08"	14' 45.05"	266° 34' 41"	0.14786
23	89° 56' 40"	3° 13' 22"	89° 56' 17"	26° 39' 38"	0° 54' 08"	14' 44.99"	266° 48' 42"	0.15069
24	90° 26' 15"	3° 15' 32"	90° 29' 20"	26° 41' 45"	0° 54' 07"	14' 44.94"	267° 2' 46"	0.15353



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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	44° 30' 24"	0.33"	42° 02' 07"	16° 11' 14"	1.0084276	15' 51.61"	23° 26' 16"	3 m 15 s
1	44° 32' 50"	0.33"	42° 04' 32"	16° 11' 57"	1.0084377	15' 51.60"	23° 26' 16"	3 m 15 s
2	44° 35' 15"	0.34"	42° 06' 56"	16° 12' 40"	1.0084478	15' 51.59"	23° 26' 16"	3 m 16 s
3	44° 37' 40"	0.34"	42° 09' 21"	16° 13' 23"	1.0084578	15' 51.58"	23° 26' 16"	3 m 16 s
4	44° 40' 06"	0.35"	42° 11' 46"	16° 14' 06"	1.0084679	15' 51.57"	23° 26' 16"	3 m 16 s
5	44° 42' 31"	0.35"	42° 14' 11"	16° 14' 48"	1.0084780	15' 51.56"	23° 26' 16"	3 m 16 s
6	44° 44' 57"	0.35"	42° 16' 35"	16° 15' 31"	1.0084880	15' 51.55"	23° 26' 16"	3 m 16 s
7	44° 47' 22"	0.36"	42° 19' 00"	16° 16' 14"	1.0084980	15' 51.54"	23° 26' 16"	3 m 17 s
8	44° 49' 47"	0.36"	42° 21' 25"	16° 16' 57"	1.0085081	15' 51.53"	23° 26' 16"	3 m 17 s
9	44° 52' 13"	0.37"	42° 23' 50"	16° 17' 39"	1.0085181	15' 51.52"	23° 26' 16"	3 m 17 s
10	44° 54' 38"	0.37"	42° 26' 14"	16° 18' 22"	1.0085281	15' 51.52"	23° 26' 16"	3 m 17 s
11	44° 57' 04"	0.38"	42° 28' 39"	16° 19' 05"	1.0085381	15' 51.51"	23° 26' 16"	3 m 17 s
12	44° 59' 29"	0.38"	42° 31' 04"	16° 19' 47"	1.0085482	15' 51.50"	23° 26' 16"	3 m 18 s
13	45° 01' 54"	0.38"	42° 33' 29"	16° 20' 30"	1.0085582	15' 51.49"	23° 26' 16"	3 m 18 s
14	45° 04' 20"	0.39"	42° 35' 54"	16° 21' 13"	1.0085682	15' 51.48"	23° 26' 16"	3 m 18 s
15	45° 06' 45"	0.39"	42° 38' 19"	16° 21' 55"	1.0085782	15' 51.47"	23° 26' 16"	3 m 18 s
16	45° 09' 10"	0.40"	42° 40' 43"	16° 22' 38"	1.0085881	15' 51.46"	23° 26' 16"	3 m 18 s
17	45° 11' 36"	0.40"	42° 43' 08"	16° 23' 20"	1.0085981	15' 51.45"	23° 26' 16"	3 m 19 s
18	45° 14' 01"	0.40"	42° 45' 33"	16° 24' 03"	1.0086081	15' 51.44"	23° 26' 16"	3 m 19 s
19	45° 16' 26"	0.41"	42° 47' 58"	16° 24' 45"	1.0086181	15' 51.43"	23° 26' 16"	3 m 19 s
20	45° 18' 52"	0.41"	42° 50' 23"	16° 25' 28"	1.0086280	15' 51.42"	23° 26' 16"	3 m 19 s
21	45° 21' 17"	0.42"	42° 52' 48"	16° 26' 10"	1.0086380	15' 51.41"	23° 26' 16"	3 m 19 s
22	45° 23' 42"	0.42"	42° 55' 13"	16° 26' 52"	1.0086480	15' 51.40"	23° 26' 16"	3 m 20 s
23	45° 26' 08"	0.42"	42° 57' 38"	16° 27' 35"	1.0086579	15' 51.39"	23° 26' 16"	3 m 20 s
24	45° 28' 33"	0.43"	43° 00' 03"	16° 28' 17"	1.0086679	15' 51.38"	23° 26' 16"	3 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	90° 26' 15"	3° 15' 32"	90° 29' 20"	26° 41' 45"	0° 54' 07"	14' 44.94"	267° 2' 46"	0.15353
1	90° 55' 49"	3° 17' 40"	91° 02' 24"	26° 43' 45"	0° 54' 07"	14' 44.89"	267° 16' 51"	0.15640
2	91° 25' 24"	3° 19' 48"	91° 35' 29"	26° 45' 36"	0° 54' 07"	14' 44.85"	267° 30' 60"	0.15929
3	91° 54' 58"	3° 21' 55"	92° 08' 34"	26° 47' 20"	0° 54' 07"	14' 44.81"	267° 45' 10"	0.16219
4	92° 24' 32"	3° 24' 01"	92° 41' 41"	26° 48' 56"	0° 54' 07"	14' 44.77"	267° 59' 22"	0.16512
5	92° 54' 06"	3° 26' 06"	93° 14' 47"	26° 50' 25"	0° 54' 07"	14' 44.74"	268° 13' 36"	0.16807
6	93° 23' 40"	3° 28' 10"	93° 47' 55"	26° 51' 45"	0° 54' 07"	14' 44.71"	268° 27' 52"	0.17104
7	93° 53' 13"	3° 30' 13"	94° 21' 02"	26° 52' 58"	0° 54' 07"	14' 44.68"	268° 42' 10"	0.17403
8	94° 22' 47"	3° 32' 15"	94° 54' 10"	26° 54' 04"	0° 54' 06"	14' 44.66"	268° 56' 29"	0.17704
9	94° 52' 20"	3° 34' 17"	95° 27' 19"	26° 55' 01"	0° 54' 06"	14' 44.65"	269° 10' 50"	0.18007
10	95° 21' 53"	3° 36' 17"	96° 00' 28"	26° 55' 51"	0° 54' 06"	14' 44.63"	269° 25' 11"	0.18312
11	95° 51' 26"	3° 38' 16"	96° 33' 37"	26° 56' 33"	0° 54' 06"	14' 44.62"	269° 39' 34"	0.18619
12	96° 20' 60"	3° 40' 15"	97° 06' 46"	26° 57' 07"	0° 54' 06"	14' 44.62"	269° 53' 59"	0.18928
13	96° 50' 33"	3° 42' 12"	97° 39' 55"	26° 57' 34"	0° 54' 06"	14' 44.62"	270° 8' 24"	0.19238
14	97° 20' 06"	3° 44' 08"	98° 13' 04"	26° 57' 52"	0° 54' 06"	14' 44.62"	270° 22' 50"	0.19551
15	97° 49' 39"	3° 46' 04"	98° 46' 14"	26° 58' 03"	0° 54' 06"	14' 44.63"	270° 37' 16"	0.19865
16	98° 19' 12"	3° 47' 58"	99° 19' 23"	26° 58' 07"	0° 54' 06"	14' 44.64"	270° 51' 44"	0.20182
17	98° 48' 45"	3° 49' 52"	99° 52' 32"	26° 58' 02"	0° 54' 06"	14' 44.65"	271° 6' 12"	0.20500
18	99° 18' 18"	3° 51' 44"	100° 25' 41"	26° 57' 50"	0° 54' 07"	14' 44.67"	271° 20' 40"	0.20820
19	99° 47' 52"	3° 53' 35"	100° 58' 50"	26° 57' 30"	0° 54' 07"	14' 44.70"	271° 35' 09"	0.21141
20	100° 17' 25"	3° 55' 25"	101° 31' 58"	26° 57' 02"	0° 54' 07"	14' 44.72"	271° 49' 38"	0.21465
21	100° 46' 58"	3° 57' 15"	102° 05' 06"	26° 56' 27"	0° 54' 07"	14' 44.76"	272° 4' 07"	0.21790
22	101° 16' 32"	3° 59' 03"	102° 38' 14"	26° 55' 44"	0° 54' 07"	14' 44.79"	272° 18' 36"	0.22117
23	101° 46' 06"	4° 00' 50"	103° 11' 21"	26° 54' 53"	0° 54' 07"	14' 44.83"	272° 33' 05"	0.22446
24	102° 15' 40"	4° 02' 36"	103° 44' 28"	26° 53' 54"	0° 54' 07"	14' 44.88"	272° 47' 33"	0.22777



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	45° 28' 33"	0.43"	43° 00' 03"	16° 28' 17"	1.0086679	15' 51.38"	23° 26' 16"	3 m 20 s
1	45° 30' 58"	0.43"	43° 02' 28"	16° 28' 59"	1.0086778	15' 51.37"	23° 26' 16"	3 m 20 s
2	45° 33' 24"	0.43"	43° 04' 53"	16° 29' 41"	1.0086877	15' 51.36"	23° 26' 16"	3 m 20 s
3	45° 35' 49"	0.44"	43° 07' 18"	16° 30' 24"	1.0086977	15' 51.36"	23° 26' 16"	3 m 21 s
4	45° 38' 14"	0.44"	43° 09' 43"	16° 31' 06"	1.0087076	15' 51.35"	23° 26' 16"	3 m 21 s
5	45° 40' 40"	0.44"	43° 12' 08"	16° 31' 48"	1.0087175	15' 51.34"	23° 26' 16"	3 m 21 s
6	45° 43' 05"	0.45"	43° 14' 33"	16° 32' 30"	1.0087274	15' 51.33"	23° 26' 16"	3 m 21 s
7	45° 45' 30"	0.45"	43° 16' 58"	16° 33' 12"	1.0087373	15' 51.32"	23° 26' 16"	3 m 21 s
8	45° 47' 56"	0.45"	43° 19' 23"	16° 33' 54"	1.0087472	15' 51.31"	23° 26' 16"	3 m 22 s
9	45° 50' 21"	0.46"	43° 21' 48"	16° 34' 36"	1.0087571	15' 51.30"	23° 26' 16"	3 m 22 s
10	45° 52' 46"	0.46"	43° 24' 14"	16° 35' 18"	1.0087670	15' 51.29"	23° 26' 16"	3 m 22 s
11	45° 55' 12"	0.46"	43° 26' 39"	16° 36' 00"	1.0087769	15' 51.28"	23° 26' 16"	3 m 22 s
12	45° 57' 37"	0.47"	43° 29' 04"	16° 36' 42"	1.0087867	15' 51.27"	23° 26' 16"	3 m 22 s
13	46° 00' 02"	0.47"	43° 31' 29"	16° 37' 24"	1.0087966	15' 51.26"	23° 26' 16"	3 m 22 s
14	46° 02' 27"	0.47"	43° 33' 54"	16° 38' 06"	1.0088065	15' 51.25"	23° 26' 16"	3 m 23 s
15	46° 04' 53"	0.48"	43° 36' 19"	16° 38' 48"	1.0088163	15' 51.24"	23° 26' 16"	3 m 23 s
16	46° 07' 18"	0.48"	43° 38' 45"	16° 39' 30"	1.0088262	15' 51.23"	23° 26' 16"	3 m 23 s
17	46° 09' 43"	0.48"	43° 41' 10"	16° 40' 11"	1.0088360	15' 51.22"	23° 26' 16"	3 m 23 s
18	46° 12' 09"	0.49"	43° 43' 35"	16° 40' 53"	1.0088459	15' 51.22"	23° 26' 16"	3 m 23 s
19	46° 14' 34"	0.49"	43° 46' 00"	16° 41' 35"	1.0088557	15' 51.21"	23° 26' 16"	3 m 23 s
20	46° 16' 59"	0.49"	43° 48' 26"	16° 42' 17"	1.0088656	15' 51.20"	23° 26' 16"	3 m 24 s
21	46° 19' 24"	0.49"	43° 50' 51"	16° 42' 58"	1.0088754	15' 51.19"	23° 26' 16"	3 m 24 s
22	46° 21' 50"	0.50"	43° 53' 16"	16° 43' 40"	1.0088852	15' 51.18"	23° 26' 16"	3 m 24 s
23	46° 24' 15"	0.50"	43° 55' 42"	16° 44' 22"	1.0088950	15' 51.17"	23° 26' 16"	3 m 24 s
24	46° 26' 40"	0.50"	43° 58' 07"	16° 45' 03"	1.0089048	15' 51.16"	23° 26' 16"	3 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	102° 15' 40"	4° 02' 36"	103° 44' 28"	26° 53' 54"	0° 54' 07"	14' 44.88"	272° 47' 33"	0.22777
1	102° 45' 14"	4° 04' 21"	104° 17' 34"	26° 52' 48"	0° 54' 07"	14' 44.93"	273° 2' 02"	0.23109
2	103° 14' 48"	4° 06' 05"	104° 50' 40"	26° 51' 34"	0° 54' 08"	14' 44.98"	273° 16' 30"	0.23443
3	103° 44' 22"	4° 07' 48"	105° 23' 45"	26° 50' 12"	0° 54' 08"	14' 45.04"	273° 30' 57"	0.23778
4	104° 13' 57"	4° 09' 30"	105° 56' 49"	26° 48' 42"	0° 54' 08"	14' 45.10"	273° 45' 24"	0.24116
5	104° 43' 32"	4° 11' 11"	106° 29' 53"	26° 47' 05"	0° 54' 08"	14' 45.16"	273° 59' 50"	0.24455
6	105° 13' 07"	4° 12' 50"	107° 02' 55"	26° 45' 20"	0° 54' 09"	14' 45.23"	274° 14' 15"	0.24795
7	105° 42' 43"	4° 14' 29"	107° 35' 57"	26° 43' 28"	0° 54' 09"	14' 45.31"	274° 28' 40"	0.25137
8	106° 12' 18"	4° 16' 06"	108° 08' 58"	26° 41' 28"	0° 54' 09"	14' 45.39"	274° 43' 03"	0.25481
9	106° 41' 55"	4° 17' 42"	108° 41' 58"	26° 39' 20"	0° 54' 09"	14' 45.47"	274° 57' 25"	0.25826
10	107° 11' 31"	4° 19' 17"	109° 14' 56"	26° 37' 04"	0° 54' 10"	14' 45.56"	275° 11' 46"	0.26173
11	107° 41' 08"	4° 20' 51"	109° 47' 54"	26° 34' 41"	0° 54' 10"	14' 45.65"	275° 26' 06"	0.26521
12	108° 10' 45"	4° 22' 24"	110° 20' 51"	26° 32' 11"	0° 54' 10"	14' 45.75"	275° 40' 24"	0.26871
13	108° 40' 22"	4° 23' 56"	110° 53' 46"	26° 29' 32"	0° 54' 11"	14' 45.85"	275° 54' 41"	0.27223
14	109° 10' 00"	4° 25' 26"	111° 26' 40"	26° 26' 47"	0° 54' 11"	14' 45.96"	276° 8' 57"	0.27575
15	109° 39' 39"	4° 26' 56"	111° 59' 33"	26° 23' 53"	0° 54' 12"	14' 46.07"	276° 23' 10"	0.27930
16	110° 09' 18"	4° 28' 24"	112° 32' 25"	26° 20' 52"	0° 54' 12"	14' 46.18"	276° 37' 22"	0.28285
17	110° 38' 57"	4° 29' 51"	113° 05' 15"	26° 17' 44"	0° 54' 12"	14' 46.30"	276° 51' 32"	0.28643
18	111° 08' 37"	4° 31' 17"	113° 38' 04"	26° 14' 28"	0° 54' 13"	14' 46.42"	277° 5' 40"	0.29001
19	111° 38' 17"	4° 32' 41"	114° 10' 51"	26° 11' 04"	0° 54' 13"	14' 46.55"	277° 19' 46"	0.29361
20	112° 07' 58"	4° 34' 05"	114° 43' 37"	26° 07' 34"	0° 54' 14"	14' 46.69"	277° 33' 50"	0.29723
21	112° 37' 39"	4° 35' 27"	115° 16' 21"	26° 03' 55"	0° 54' 14"	14' 46.82"	277° 47' 52"	0.30085
22	113° 07' 21"	4° 36' 48"	115° 49' 04"	26° 00' 09"	0° 54' 15"	14' 46.97"	278° 1' 51"	0.30449
23	113° 37' 04"	4° 38' 08"	116° 21' 45"	25° 56' 16"	0° 54' 15"	14' 47.11"	278° 15' 48"	0.30815
24	114° 06' 47"	4° 39' 26"	116° 54' 25"	25° 52' 16"	0° 54' 16"	14' 47.26"	278° 29' 42"	0.31182

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	46° 26' 40"	0.50"	43° 58' 07"	16° 45' 03"	1.0089048	15' 51.16"	23° 26' 16"	3 m 24 s
1	46° 29' 05"	0.50"	44° 00' 32"	16° 45' 45"	1.0089146	15' 51.15"	23° 26' 16"	3 m 25 s
2	46° 31' 31"	0.51"	44° 02' 58"	16° 46' 26"	1.0089244	15' 51.14"	23° 26' 16"	3 m 25 s
3	46° 33' 56"	0.51"	44° 05' 23"	16° 47' 08"	1.0089342	15' 51.13"	23° 26' 16"	3 m 25 s
4	46° 36' 21"	0.51"	44° 07' 48"	16° 47' 49"	1.0089440	15' 51.12"	23° 26' 16"	3 m 25 s
5	46° 38' 46"	0.51"	44° 10' 14"	16° 48' 31"	1.0089538	15' 51.11"	23° 26' 16"	3 m 25 s
6	46° 41' 12"	0.52"	44° 12' 39"	16° 49' 12"	1.0089636	15' 51.10"	23° 26' 16"	3 m 25 s
7	46° 43' 37"	0.52"	44° 15' 05"	16° 49' 54"	1.0089734	15' 51.10"	23° 26' 16"	3 m 25 s
8	46° 46' 02"	0.52"	44° 17' 30"	16° 50' 35"	1.0089831	15' 51.09"	23° 26' 16"	3 m 26 s
9	46° 48' 27"	0.52"	44° 19' 56"	16° 51' 16"	1.0089929	15' 51.08"	23° 26' 16"	3 m 26 s
10	46° 50' 52"	0.53"	44° 22' 21"	16° 51' 58"	1.0090026	15' 51.07"	23° 26' 16"	3 m 26 s
11	46° 53' 18"	0.53"	44° 24' 47"	16° 52' 39"	1.0090124	15' 51.06"	23° 26' 16"	3 m 26 s
12	46° 55' 43"	0.53"	44° 27' 12"	16° 53' 20"	1.0090221	15' 51.05"	23° 26' 16"	3 m 26 s
13	46° 58' 08"	0.53"	44° 29' 38"	16° 54' 01"	1.0090319	15' 51.04"	23° 26' 16"	3 m 26 s
14	47° 00' 33"	0.53"	44° 32' 03"	16° 54' 43"	1.0090416	15' 51.03"	23° 26' 16"	3 m 27 s
15	47° 02' 58"	0.54"	44° 34' 29"	16° 55' 24"	1.0090513	15' 51.02"	23° 26' 16"	3 m 27 s
16	47° 05' 24"	0.54"	44° 36' 54"	16° 56' 05"	1.0090611	15' 51.01"	23° 26' 16"	3 m 27 s
17	47° 07' 49"	0.54"	44° 39' 20"	16° 56' 46"	1.0090708	15' 51.00"	23° 26' 16"	3 m 27 s
18	47° 10' 14"	0.54"	44° 41' 45"	16° 57' 27"	1.0090805	15' 50.99"	23° 26' 16"	3 m 27 s
19	47° 12' 39"	0.54"	44° 44' 11"	16° 58' 08"	1.0090902	15' 50.99"	23° 26' 16"	3 m 27 s
20	47° 15' 04"	0.54"	44° 46' 37"	16° 58' 49"	1.0090999	15' 50.98"	23° 26' 16"	3 m 28 s
21	47° 17' 30"	0.55"	44° 49' 02"	16° 59' 30"	1.0091096	15' 50.97"	23° 26' 16"	3 m 28 s
22	47° 19' 55"	0.55"	44° 51' 28"	17° 00' 11"	1.0091193	15' 50.96"	23° 26' 16"	3 m 28 s
23	47° 22' 20"	0.55"	44° 53' 54"	17° 00' 52"	1.0091290	15' 50.95"	23° 26' 16"	3 m 28 s
24	47° 24' 45"	0.55"	44° 56' 19"	17° 01' 33"	1.0091387	15' 50.94"	23° 26' 16"	3 m 28 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	114° 06' 47"	4° 39' 26"	116° 54' 25"	25° 52' 16"	0° 54' 16"	14' 47.26"	278° 29' 42"	0.31182
1	114° 36' 30"	4° 40' 44"	117° 27' 03"	25° 48' 08"	0° 54' 17"	14' 47.42"	278° 43' 34"	0.31550
2	115° 06' 15"	4° 42' 00"	117° 59' 39"	25° 43' 52"	0° 54' 17"	14' 47.58"	278° 57' 24"	0.31919
3	115° 35' 60"	4° 43' 15"	118° 32' 13"	25° 39' 30"	0° 54' 18"	14' 47.75"	279° 11' 10"	0.32289
4	116° 05' 45"	4° 44' 29"	119° 04' 46"	25° 34' 60"	0° 54' 18"	14' 47.92"	279° 24' 54"	0.32661
5	116° 35' 32"	4° 45' 41"	119° 37' 16"	25° 30' 22"	0° 54' 19"	14' 48.09"	279° 38' 35"	0.33034
6	117° 05' 19"	4° 46' 52"	120° 09' 45"	25° 25' 38"	0° 54' 20"	14' 48.27"	279° 52' 13"	0.33408
7	117° 35' 07"	4° 48' 02"	120° 42' 12"	25° 20' 46"	0° 54' 20"	14' 48.45"	280° 5' 48"	0.33784
8	118° 04' 55"	4° 49' 11"	121° 14' 37"	25° 15' 47"	0° 54' 21"	14' 48.64"	280° 19' 20"	0.34160
9	118° 34' 45"	4° 50' 18"	121° 47' 00"	25° 10' 41"	0° 54' 22"	14' 48.84"	280° 32' 48"	0.34538
10	119° 04' 35"	4° 51' 24"	122° 19' 21"	25° 05' 28"	0° 54' 23"	14' 49.03"	280° 46' 14"	0.34917
11	119° 34' 26"	4° 52' 29"	122° 51' 40"	25° 00' 07"	0° 54' 23"	14' 49.24"	280° 59' 36"	0.35297
12	120° 04' 18"	4° 53' 33"	123° 23' 57"	24° 54' 40"	0° 54' 24"	14' 49.44"	281° 12' 54"	0.35678
13	120° 34' 10"	4° 54' 35"	123° 56' 12"	24° 49' 05"	0° 54' 25"	14' 49.66"	281° 26' 09"	0.36060
14	121° 04' 04"	4° 55' 36"	124° 28' 25"	24° 43' 24"	0° 54' 26"	14' 49.87"	281° 39' 21"	0.36443
15	121° 33' 58"	4° 56' 35"	125° 00' 36"	24° 37' 35"	0° 54' 26"	14' 50.09"	281° 52' 29"	0.36828
16	122° 03' 53"	4° 57' 34"	125° 32' 44"	24° 31' 39"	0° 54' 27"	14' 50.32"	282° 5' 33"	0.37213
17	122° 33' 50"	4° 58' 31"	126° 04' 51"	24° 25' 37"	0° 54' 28"	14' 50.55"	282° 18' 34"	0.37599
18	123° 03' 47"	4° 59' 26"	126° 36' 55"	24° 19' 27"	0° 54' 29"	14' 50.79"	282° 31' 30"	0.37986
19	123° 33' 45"	5° 00' 21"	127° 08' 57"	24° 13' 11"	0° 54' 30"	14' 51.03"	282° 44' 23"	0.38375
20	124° 03' 44"	5° 01' 14"	127° 40' 57"	24° 06' 47"	0° 54' 31"	14' 51.27"	282° 57' 12"	0.38764
21	124° 33' 44"	5° 02' 05"	128° 12' 55"	24° 00' 17"	0° 54' 32"	14' 51.52"	283° 9' 57"	0.39154
22	125° 03' 46"	5° 02' 56"	128° 44' 50"	23° 53' 40"	0° 54' 33"	14' 51.78"	283° 22' 38"	0.39545
23	125° 33' 48"	5° 03' 45"	129° 16' 43"	23° 46' 56"	0° 54' 34"	14' 52.04"	283° 35' 14"	0.39937
24	126° 03' 51"	5° 04' 32"	129° 48' 34"	23° 40' 05"	0° 54' 34"	14' 52.30"	283° 47' 47"	0.40330



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	47° 24' 45"	0.55"	44° 56' 19"	17° 01' 33"	1.0091387	15' 50.94"	23° 26' 16"	3 m 28 s
1	47° 27' 10"	0.55"	44° 58' 45"	17° 02' 14"	1.0091484	15' 50.93"	23° 26' 16"	3 m 28 s
2	47° 29' 36"	0.55"	45° 01' 11"	17° 02' 55"	1.0091580	15' 50.92"	23° 26' 16"	3 m 28 s
3	47° 32' 01"	0.55"	45° 03' 36"	17° 03' 35"	1.0091677	15' 50.91"	23° 26' 16"	3 m 29 s
4	47° 34' 26"	0.55"	45° 06' 02"	17° 04' 16"	1.0091774	15' 50.90"	23° 26' 16"	3 m 29 s
5	47° 36' 51"	0.56"	45° 08' 28"	17° 04' 57"	1.0091870	15' 50.89"	23° 26' 16"	3 m 29 s
6	47° 39' 16"	0.56"	45° 10' 54"	17° 05' 38"	1.0091967	15' 50.89"	23° 26' 16"	3 m 29 s
7	47° 41' 41"	0.56"	45° 13' 19"	17° 06' 18"	1.0092063	15' 50.88"	23° 26' 16"	3 m 29 s
8	47° 44' 06"	0.56"	45° 15' 45"	17° 06' 59"	1.0092160	15' 50.87"	23° 26' 16"	3 m 29 s
9	47° 46' 32"	0.56"	45° 18' 11"	17° 07' 40"	1.0092256	15' 50.86"	23° 26' 16"	3 m 29 s
10	47° 48' 57"	0.56"	45° 20' 37"	17° 08' 20"	1.0092352	15' 50.85"	23° 26' 17"	3 m 29 s
11	47° 51' 22"	0.56"	45° 23' 03"	17° 09' 01"	1.0092449	15' 50.84"	23° 26' 17"	3 m 30 s
12	47° 53' 47"	0.56"	45° 25' 29"	17° 09' 41"	1.0092545	15' 50.83"	23° 26' 17"	3 m 30 s
13	47° 56' 12"	0.56"	45° 27' 54"	17° 10' 22"	1.0092641	15' 50.82"	23° 26' 17"	3 m 30 s
14	47° 58' 37"	0.56"	45° 30' 20"	17° 11' 02"	1.0092737	15' 50.81"	23° 26' 17"	3 m 30 s
15	48° 01' 02"	0.56"	45° 32' 46"	17° 11' 43"	1.0092833	15' 50.80"	23° 26' 17"	3 m 30 s
16	48° 03' 27"	0.56"	45° 35' 12"	17° 12' 23"	1.0092929	15' 50.79"	23° 26' 17"	3 m 30 s
17	48° 05' 53"	0.57"	45° 37' 38"	17° 13' 03"	1.0093025	15' 50.79"	23° 26' 17"	3 m 30 s
18	48° 08' 18"	0.57"	45° 40' 04"	17° 13' 44"	1.0093121	15' 50.78"	23° 26' 17"	3 m 31 s
19	48° 10' 43"	0.57"	45° 42' 30"	17° 14' 24"	1.0093217	15' 50.77"	23° 26' 17"	3 m 31 s
20	48° 13' 08"	0.57"	45° 44' 56"	17° 15' 04"	1.0093313	15' 50.76"	23° 26' 17"	3 m 31 s
21	48° 15' 33"	0.57"	45° 47' 22"	17° 15' 45"	1.0093409	15' 50.75"	23° 26' 17"	3 m 31 s
22	48° 17' 58"	0.57"	45° 49' 48"	17° 16' 25"	1.0093504	15' 50.74"	23° 26' 17"	3 m 31 s
23	48° 20' 23"	0.57"	45° 52' 14"	17° 17' 05"	1.0093600	15' 50.73"	23° 26' 17"	3 m 31 s
24	48° 22' 48"	0.57"	45° 54' 40"	17° 17' 45"	1.0093696	15' 50.72"	23° 26' 17"	3 m 31 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	126° 03' 51"	5° 04' 32"	129° 48' 34"	23° 40' 05"	0° 54' 34"	14' 52.30"	283° 47' 47"	0.40330
1	126° 33' 56"	5° 05' 19"	130° 20' 23"	23° 33' 08"	0° 54' 35"	14' 52.57"	284° 0' 15"	0.40723
2	127° 04' 01"	5° 06' 03"	130° 52' 09"	23° 26' 04"	0° 54' 36"	14' 52.84"	284° 12' 39"	0.41118
3	127° 34' 08"	5° 06' 47"	131° 23' 53"	23° 18' 53"	0° 54' 38"	14' 53.12"	284° 24' 58"	0.41513
4	128° 04' 16"	5° 07' 29"	131° 55' 35"	23° 11' 36"	0° 54' 39"	14' 53.40"	284° 37' 13"	0.41909
5	128° 34' 25"	5° 08' 10"	132° 27' 14"	23° 04' 12"	0° 54' 40"	14' 53.69"	284° 49' 24"	0.42306
6	129° 04' 35"	5° 08' 49"	132° 58' 51"	22° 56' 41"	0° 54' 41"	14' 53.98"	285° 1' 29"	0.42704
7	129° 34' 46"	5° 09' 27"	133° 30' 26"	22° 49' 04"	0° 54' 42"	14' 54.28"	285° 13' 31"	0.43102
8	130° 04' 59"	5° 10' 04"	134° 01' 58"	22° 41' 20"	0° 54' 43"	14' 54.58"	285° 25' 27"	0.43501
9	130° 35' 13"	5° 10' 39"	134° 33' 28"	22° 33' 30"	0° 54' 44"	14' 54.89"	285° 37' 19"	0.43901
10	131° 05' 28"	5° 11' 12"	135° 04' 56"	22° 25' 34"	0° 54' 45"	14' 55.20"	285° 49' 07"	0.44301
11	131° 35' 44"	5° 11' 45"	135° 36' 21"	22° 17' 31"	0° 54' 46"	14' 55.52"	286° 0' 49"	0.44702
12	132° 06' 02"	5° 12' 16"	136° 07' 44"	22° 09' 21"	0° 54' 47"	14' 55.84"	286° 12' 26"	0.45104
13	132° 36' 21"	5° 12' 45"	136° 39' 05"	22° 01' 06"	0° 54' 49"	14' 56.16"	286° 23' 59"	0.45507
14	133° 06' 42"	5° 13' 13"	137° 10' 23"	21° 52' 44"	0° 54' 50"	14' 56.49"	286° 35' 27"	0.45910
15	133° 37' 03"	5° 13' 40"	137° 41' 39"	21° 44' 16"	0° 54' 51"	14' 56.83"	286° 46' 49"	0.46313
16	134° 07' 26"	5° 14' 05"	138° 12' 53"	21° 35' 41"	0° 54' 52"	14' 57.17"	286° 58' 07"	0.46717
17	134° 37' 51"	5° 14' 29"	138° 44' 04"	21° 27' 00"	0° 54' 54"	14' 57.51"	287° 9' 19"	0.47122
18	135° 08' 17"	5° 14' 51"	139° 15' 13"	21° 18' 13"	0° 54' 55"	14' 57.86"	287° 20' 26"	0.47527
19	135° 38' 44"	5° 15' 12"	139° 46' 20"	21° 09' 20"	0° 54' 56"	14' 58.21"	287° 31' 28"	0.47933
20	136° 09' 13"	5° 15' 31"	140° 17' 25"	21° 00' 21"	0° 54' 58"	14' 58.57"	287° 42' 25"	0.48339
21	136° 39' 44"	5° 15' 49"	140° 48' 27"	20° 51' 16"	0° 54' 59"	14' 58.93"	287° 53' 17"	0.48746
22	137° 10' 16"	5° 16' 05"	141° 19' 27"	20° 42' 05"	0° 55' 00"	14' 59.30"	288° 4' 03"	0.49153
23	137° 40' 49"	5° 16' 20"	141° 50' 24"	20° 32' 48"	0° 55' 02"	14' 59.67"	288° 14' 44"	0.49560
24	138° 11' 24"	5° 16' 34"	142° 21' 20"	20° 23' 25"	0° 55' 03"	15' 00.05"	288° 25' 19"	0.49968

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	48° 22' 48"	0.57"	45° 54' 40"	17° 17' 45"	1.0093696	15' 50.72"	23° 26' 17"	3 m 31 s
1	48° 25' 13"	0.57"	45° 57' 06"	17° 18' 25"	1.0093791	15' 50.71"	23° 26' 17"	3 m 31 s
2	48° 27' 39"	0.57"	45° 59' 32"	17° 19' 06"	1.0093887	15' 50.70"	23° 26' 17"	3 m 32 s
3	48° 30' 04"	0.57"	46° 01' 58"	17° 19' 46"	1.0093982	15' 50.70"	23° 26' 17"	3 m 32 s
4	48° 32' 29"	0.57"	46° 04' 24"	17° 20' 26"	1.0094078	15' 50.69"	23° 26' 17"	3 m 32 s
5	48° 34' 54"	0.57"	46° 06' 50"	17° 21' 06"	1.0094173	15' 50.68"	23° 26' 17"	3 m 32 s
6	48° 37' 19"	0.57"	46° 09' 16"	17° 21' 46"	1.0094268	15' 50.67"	23° 26' 17"	3 m 32 s
7	48° 39' 44"	0.57"	46° 11' 42"	17° 22' 26"	1.0094364	15' 50.66"	23° 26' 17"	3 m 32 s
8	48° 42' 09"	0.57"	46° 14' 09"	17° 23' 06"	1.0094459	15' 50.65"	23° 26' 17"	3 m 32 s
9	48° 44' 34"	0.57"	46° 16' 35"	17° 23' 45"	1.0094554	15' 50.64"	23° 26' 17"	3 m 32 s
10	48° 46' 59"	0.57"	46° 19' 01"	17° 24' 25"	1.0094649	15' 50.63"	23° 26' 17"	3 m 32 s
11	48° 49' 24"	0.57"	46° 21' 27"	17° 25' 05"	1.0094744	15' 50.62"	23° 26' 17"	3 m 33 s
12	48° 51' 49"	0.57"	46° 23' 53"	17° 25' 45"	1.0094839	15' 50.61"	23° 26' 17"	3 m 33 s
13	48° 54' 14"	0.56"	46° 26' 19"	17° 26' 25"	1.0094935	15' 50.61"	23° 26' 17"	3 m 33 s
14	48° 56' 39"	0.56"	46° 28' 46"	17° 27' 04"	1.0095029	15' 50.60"	23° 26' 17"	3 m 33 s
15	48° 59' 04"	0.56"	46° 31' 12"	17° 27' 44"	1.0095124	15' 50.59"	23° 26' 17"	3 m 33 s
16	49° 01' 29"	0.56"	46° 33' 38"	17° 28' 24"	1.0095219	15' 50.58"	23° 26' 17"	3 m 33 s
17	49° 03' 54"	0.56"	46° 36' 04"	17° 29' 03"	1.0095314	15' 50.57"	23° 26' 17"	3 m 33 s
18	49° 06' 19"	0.56"	46° 38' 31"	17° 29' 43"	1.0095409	15' 50.56"	23° 26' 17"	3 m 33 s
19	49° 08' 44"	0.56"	46° 40' 57"	17° 30' 23"	1.0095504	15' 50.55"	23° 26' 17"	3 m 33 s
20	49° 11' 10"	0.56"	46° 43' 23"	17° 31' 02"	1.0095598	15' 50.54"	23° 26' 17"	3 m 34 s
21	49° 13' 35"	0.56"	46° 45' 50"	17° 31' 42"	1.0095693	15' 50.53"	23° 26' 17"	3 m 34 s
22	49° 15' 60"	0.56"	46° 48' 16"	17° 32' 21"	1.0095788	15' 50.53"	23° 26' 17"	3 m 34 s
23	49° 18' 25"	0.56"	46° 50' 42"	17° 33' 01"	1.0095882	15' 50.52"	23° 26' 17"	3 m 34 s
24	49° 20' 50"	0.55"	46° 53' 09"	17° 33' 40"	1.0095977	15' 50.51"	23° 26' 17"	3 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	138° 11' 24"	5° 16' 34"	142° 21' 20"	20° 23' 25"	0° 55' 03"	15' 00.05"	288° 25' 19"	0.49968
1	138° 42' 01"	5° 16' 45"	142° 52' 13"	20° 13' 56"	0° 55' 04"	15' 00.43"	288° 35' 49"	0.50376
2	139° 12' 39"	5° 16' 56"	143° 23' 04"	20° 04' 21"	0° 55' 06"	15' 00.81"	288° 46' 14"	0.50785
3	139° 43' 18"	5° 17' 05"	143° 53' 53"	19° 54' 40"	0° 55' 07"	15' 01.20"	288° 56' 33"	0.51194
4	140° 13' 60"	5° 17' 12"	144° 24' 40"	19° 44' 53"	0° 55' 09"	15' 01.60"	289° 6' 46"	0.51603
5	140° 44' 43"	5° 17' 18"	144° 55' 24"	19° 35' 01"	0° 55' 10"	15' 02.00"	289° 16' 54"	0.52012
6	141° 15' 27"	5° 17' 23"	145° 26' 06"	19° 25' 03"	0° 55' 12"	15' 02.40"	289° 26' 56"	0.52422
7	141° 46' 14"	5° 17' 26"	145° 56' 47"	19° 14' 59"	0° 55' 13"	15' 02.81"	289° 36' 52"	0.52832
8	142° 17' 02"	5° 17' 27"	146° 27' 25"	19° 04' 49"	0° 55' 15"	15' 03.22"	289° 46' 43"	0.53242
9	142° 47' 52"	5° 17' 27"	146° 58' 01"	18° 54' 34"	0° 55' 16"	15' 03.64"	289° 56' 28"	0.53653
10	143° 18' 43"	5° 17' 25"	147° 28' 35"	18° 44' 14"	0° 55' 18"	15' 04.06"	290° 6' 07"	0.54063
11	143° 49' 36"	5° 17' 22"	147° 59' 07"	18° 33' 47"	0° 55' 19"	15' 04.48"	290° 15' 40"	0.54474
12	144° 20' 31"	5° 17' 18"	148° 29' 37"	18° 23' 16"	0° 55' 21"	15' 04.91"	290° 25' 08"	0.54885
13	144° 51' 28"	5° 17' 11"	149° 00' 05"	18° 12' 38"	0° 55' 22"	15' 05.35"	290° 34' 29"	0.55295
14	145° 22' 27"	5° 17' 04"	149° 30' 31"	18° 01' 56"	0° 55' 24"	15' 05.78"	290° 43' 45"	0.55706
15	145° 53' 27"	5° 16' 54"	150° 00' 55"	17° 51' 08"	0° 55' 26"	15' 06.23"	290° 52' 55"	0.56117
16	146° 24' 29"	5° 16' 43"	150° 31' 18"	17° 40' 14"	0° 55' 27"	15' 06.67"	291° 1' 58"	0.56528
17	146° 55' 33"	5° 16' 31"	151° 01' 38"	17° 29' 15"	0° 55' 29"	15' 07.12"	291° 10' 56"	0.56939
18	147° 26' 39"	5° 16' 17"	151° 31' 57"	17° 18' 11"	0° 55' 31"	15' 07.58"	291° 19' 48"	0.57350
19	147° 57' 47"	5° 16' 02"	152° 02' 14"	17° 07' 02"	0° 55' 32"	15' 08.04"	291° 28' 33"	0.57761
20	148° 28' 57"	5° 15' 44"	152° 32' 29"	16° 55' 48"	0° 55' 34"	15' 08.50"	291° 37' 12"	0.58172
21	149° 00' 09"	5° 15' 26"	153° 02' 42"	16° 44' 28"	0° 55' 36"	15' 08.97"	291° 45' 46"	0.58583
22	149° 31' 23"	5° 15' 06"	153° 32' 54"	16° 33' 04"	0° 55' 37"	15' 09.44"	291° 54' 13"	0.58993
23	150° 02' 38"	5° 14' 44"	154° 03' 04"	16° 21' 34"	0° 55' 39"	15' 09.91"	292° 2' 34"	0.59404
24	150° 33' 56"	5° 14' 20"	154° 33' 13"	16° 09' 59"	0° 55' 41"	15' 10.39"	292° 10' 48"	0.59814



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	49° 20' 50"	0.55"	46° 53' 09"	17° 33' 40"	1.0095977	15' 50.51"	23° 26' 17"	3 m 34 s
1	49° 23' 15"	0.55"	46° 55' 35"	17° 34' 20"	1.0096071	15' 50.50"	23° 26' 17"	3 m 34 s
2	49° 25' 40"	0.55"	46° 58' 01"	17° 34' 59"	1.0096165	15' 50.49"	23° 26' 17"	3 m 34 s
3	49° 28' 05"	0.55"	47° 00' 28"	17° 35' 38"	1.0096260	15' 50.48"	23° 26' 17"	3 m 34 s
4	49° 30' 30"	0.55"	47° 02' 54"	17° 36' 18"	1.0096354	15' 50.47"	23° 26' 17"	3 m 34 s
5	49° 32' 55"	0.55"	47° 05' 21"	17° 36' 57"	1.0096448	15' 50.46"	23° 26' 17"	3 m 34 s
6	49° 35' 20"	0.55"	47° 07' 47"	17° 37' 36"	1.0096543	15' 50.45"	23° 26' 17"	3 m 34 s
7	49° 37' 45"	0.55"	47° 10' 14"	17° 38' 15"	1.0096637	15' 50.45"	23° 26' 17"	3 m 35 s
8	49° 40' 10"	0.54"	47° 12' 40"	17° 38' 55"	1.0096731	15' 50.44"	23° 26' 17"	3 m 35 s
9	49° 42' 35"	0.54"	47° 15' 07"	17° 39' 34"	1.0096825	15' 50.43"	23° 26' 17"	3 m 35 s
10	49° 44' 60"	0.54"	47° 17' 33"	17° 40' 13"	1.0096919	15' 50.42"	23° 26' 17"	3 m 35 s
11	49° 47' 25"	0.54"	47° 19' 60"	17° 40' 52"	1.0097013	15' 50.41"	23° 26' 17"	3 m 35 s
12	49° 49' 50"	0.54"	47° 22' 26"	17° 41' 31"	1.0097107	15' 50.40"	23° 26' 17"	3 m 35 s
13	49° 52' 14"	0.54"	47° 24' 53"	17° 42' 10"	1.0097201	15' 50.39"	23° 26' 17"	3 m 35 s
14	49° 54' 39"	0.53"	47° 27' 19"	17° 42' 49"	1.0097295	15' 50.38"	23° 26' 17"	3 m 35 s
15	49° 57' 04"	0.53"	47° 29' 46"	17° 43' 28"	1.0097389	15' 50.37"	23° 26' 17"	3 m 35 s
16	49° 59' 29"	0.53"	47° 32' 12"	17° 44' 07"	1.0097483	15' 50.37"	23° 26' 17"	3 m 35 s
17	50° 01' 54"	0.53"	47° 34' 39"	17° 44' 46"	1.0097576	15' 50.36"	23° 26' 17"	3 m 35 s
18	50° 04' 19"	0.53"	47° 37' 06"	17° 45' 25"	1.0097670	15' 50.35"	23° 26' 17"	3 m 35 s
19	50° 06' 44"	0.52"	47° 39' 32"	17° 46' 04"	1.0097764	15' 50.34"	23° 26' 17"	3 m 36 s
20	50° 09' 09"	0.52"	47° 41' 59"	17° 46' 42"	1.0097858	15' 50.33"	23° 26' 17"	3 m 36 s
21	50° 11' 34"	0.52"	47° 44' 26"	17° 47' 21"	1.0097951	15' 50.32"	23° 26' 17"	3 m 36 s
22	50° 13' 59"	0.52"	47° 46' 52"	17° 47' 60"	1.0098045	15' 50.31"	23° 26' 17"	3 m 36 s
23	50° 16' 24"	0.52"	47° 49' 19"	17° 48' 39"	1.0098138	15' 50.30"	23° 26' 17"	3 m 36 s
24	50° 18' 49"	0.51"	47° 51' 46"	17° 49' 17"	1.0098232	15' 50.30"	23° 26' 17"	3 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	150° 33' 56"	5° 14' 20"	154° 33' 13"	16° 09' 59"	0° 55' 41"	15' 10.39"	292° 10' 48"	0.59814
1	151° 05' 16"	5° 13' 55"	155° 03' 20"	15° 58' 19"	0° 55' 43"	15' 10.88"	292° 18' 57"	0.60224
2	151° 36' 37"	5° 13' 29"	155° 33' 25"	15° 46' 34"	0° 55' 44"	15' 11.36"	292° 26' 59"	0.60634
3	152° 08' 01"	5° 13' 01"	156° 03' 29"	15° 34' 45"	0° 55' 46"	15' 11.85"	292° 34' 54"	0.61043
4	152° 39' 27"	5° 12' 31"	156° 33' 31"	15° 22' 50"	0° 55' 48"	15' 12.35"	292° 42' 44"	0.61453
5	153° 10' 55"	5° 11' 60"	157° 03' 32"	15° 10' 51"	0° 55' 50"	15' 12.85"	292° 50' 27"	0.61862
6	153° 42' 25"	5° 11' 27"	157° 33' 32"	14° 58' 47"	0° 55' 52"	15' 13.35"	292° 58' 03"	0.62270
7	154° 13' 57"	5° 10' 52"	158° 03' 30"	14° 46' 38"	0° 55' 54"	15' 13.86"	293° 5' 33"	0.62678
8	154° 45' 31"	5° 10' 16"	158° 33' 27"	14° 34' 24"	0° 55' 55"	15' 14.37"	293° 12' 57"	0.63086
9	155° 17' 07"	5° 09' 38"	159° 03' 23"	14° 22' 06"	0° 55' 57"	15' 14.88"	293° 20' 14"	0.63494
10	155° 48' 46"	5° 08' 59"	159° 33' 17"	14° 09' 43"	0° 55' 59"	15' 15.40"	293° 27' 25"	0.63900
11	156° 20' 27"	5° 08' 18"	160° 03' 11"	13° 57' 15"	0° 56' 01"	15' 15.92"	293° 34' 29"	0.64307
12	156° 52' 09"	5° 07' 35"	160° 33' 03"	13° 44' 43"	0° 56' 03"	15' 16.44"	293° 41' 26"	0.64713
13	157° 23' 55"	5° 06' 51"	161° 02' 54"	13° 32' 07"	0° 56' 05"	15' 16.97"	293° 48' 17"	0.65118
14	157° 55' 42"	5° 06' 05"	161° 32' 44"	13° 19' 26"	0° 56' 07"	15' 17.50"	293° 55' 01"	0.65523
15	158° 27' 31"	5° 05' 18"	162° 02' 33"	13° 06' 40"	0° 56' 09"	15' 18.04"	294° 1' 39"	0.65927
16	158° 59' 23"	5° 04' 29"	162° 32' 22"	12° 53' 51"	0° 56' 11"	15' 18.57"	294° 8' 10"	0.66331
17	159° 31' 17"	5° 03' 38"	163° 02' 09"	12° 40' 57"	0° 56' 13"	15' 19.11"	294° 14' 34"	0.66734
18	160° 03' 13"	5° 02' 46"	163° 31' 56"	12° 27' 58"	0° 56' 15"	15' 19.66"	294° 20' 51"	0.67136
19	160° 35' 12"	5° 01' 52"	164° 01' 41"	12° 14' 56"	0° 56' 17"	15' 20.21"	294° 27' 02"	0.67538
20	161° 07' 13"	5° 00' 56"	164° 31' 26"	12° 01' 49"	0° 56' 19"	15' 20.76"	294° 33' 06"	0.67938
21	161° 39' 16"	4° 59' 59"	165° 01' 11"	11° 48' 38"	0° 56' 21"	15' 21.31"	294° 39' 03"	0.68338
22	162° 11' 21"	4° 59' 00"	165° 30' 55"	11° 35' 23"	0° 56' 23"	15' 21.87"	294° 44' 53"	0.68737
23	162° 43' 29"	4° 57' 60"	166° 00' 38"	11° 22' 04"	0° 56' 25"	15' 22.43"	294° 50' 36"	0.69136
24	163° 15' 40"	4° 56' 58"	166° 30' 21"	11° 08' 41"	0° 56' 27"	15' 22.99"	294° 56' 13"	0.69533

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	50° 18' 49"	0.51"	47° 51' 46"	17° 49' 17"	1.0098232	15' 50.30"	23° 26' 17"	3 m 36 s
1	50° 21' 14"	0.51"	47° 54' 12"	17° 49' 56"	1.0098325	15' 50.29"	23° 26' 17"	3 m 36 s
2	50° 23' 39"	0.51"	47° 56' 39"	17° 50' 35"	1.0098419	15' 50.28"	23° 26' 17"	3 m 36 s
3	50° 26' 04"	0.51"	47° 59' 06"	17° 51' 13"	1.0098512	15' 50.27"	23° 26' 17"	3 m 36 s
4	50° 28' 29"	0.50"	48° 01' 33"	17° 51' 52"	1.0098605	15' 50.26"	23° 26' 17"	3 m 36 s
5	50° 30' 54"	0.50"	48° 03' 60"	17° 52' 30"	1.0098698	15' 50.25"	23° 26' 17"	3 m 36 s
6	50° 33' 19"	0.50"	48° 06' 26"	17° 53' 09"	1.0098792	15' 50.24"	23° 26' 17"	3 m 36 s
7	50° 35' 43"	0.50"	48° 08' 53"	17° 53' 47"	1.0098885	15' 50.23"	23° 26' 17"	3 m 36 s
8	50° 38' 08"	0.49"	48° 11' 20"	17° 54' 26"	1.0098978	15' 50.22"	23° 26' 17"	3 m 37 s
9	50° 40' 33"	0.49"	48° 13' 47"	17° 55' 04"	1.0099071	15' 50.22"	23° 26' 17"	3 m 37 s
10	50° 42' 58"	0.49"	48° 16' 14"	17° 55' 43"	1.0099164	15' 50.21"	23° 26' 17"	3 m 37 s
11	50° 45' 23"	0.48"	48° 18' 41"	17° 56' 21"	1.0099257	15' 50.20"	23° 26' 17"	3 m 37 s
12	50° 47' 48"	0.48"	48° 21' 07"	17° 56' 59"	1.0099350	15' 50.19"	23° 26' 17"	3 m 37 s
13	50° 50' 13"	0.48"	48° 23' 34"	17° 57' 37"	1.0099443	15' 50.18"	23° 26' 17"	3 m 37 s
14	50° 52' 38"	0.48"	48° 26' 01"	17° 58' 16"	1.0099536	15' 50.17"	23° 26' 17"	3 m 37 s
15	50° 55' 03"	0.47"	48° 28' 28"	17° 58' 54"	1.0099629	15' 50.16"	23° 26' 17"	3 m 37 s
16	50° 57' 28"	0.47"	48° 30' 55"	17° 59' 32"	1.0099722	15' 50.15"	23° 26' 17"	3 m 37 s
17	50° 59' 52"	0.47"	48° 33' 22"	18° 00' 10"	1.0099815	15' 50.15"	23° 26' 17"	3 m 37 s
18	51° 02' 17"	0.46"	48° 35' 49"	18° 00' 48"	1.0099907	15' 50.14"	23° 26' 17"	3 m 37 s
19	51° 04' 42"	0.46"	48° 38' 16"	18° 01' 26"	1.0100000	15' 50.13"	23° 26' 17"	3 m 37 s
20	51° 07' 07"	0.46"	48° 40' 43"	18° 02' 05"	1.0100093	15' 50.12"	23° 26' 17"	3 m 37 s
21	51° 09' 32"	0.45"	48° 43' 10"	18° 02' 43"	1.0100185	15' 50.11"	23° 26' 17"	3 m 37 s
22	51° 11' 57"	0.45"	48° 45' 37"	18° 03' 21"	1.0100278	15' 50.10"	23° 26' 17"	3 m 37 s
23	51° 14' 22"	0.45"	48° 48' 04"	18° 03' 59"	1.0100371	15' 50.09"	23° 26' 17"	3 m 37 s
24	51° 16' 47"	0.44"	48° 50' 31"	18° 04' 36"	1.0100463	15' 50.09"	23° 26' 17"	3 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	163° 15' 40"	4° 56' 58"	166° 30' 21"	11° 08' 41"	0° 56' 27"	15' 22.99"	294° 56' 13"	0.69533
1	163° 47' 52"	4° 55' 54"	167° 00' 03"	10° 55' 14"	0° 56' 29"	15' 23.56"	295° 1' 42"	0.69930
2	164° 20' 07"	4° 54' 48"	167° 29' 45"	10° 41' 43"	0° 56' 31"	15' 24.12"	295° 7' 04"	0.70325
3	164° 52' 24"	4° 53' 41"	167° 59' 26"	10° 28' 08"	0° 56' 33"	15' 24.70"	295° 12' 20"	0.70720
4	165° 24' 44"	4° 52' 33"	168° 29' 07"	10° 14' 30"	0° 56' 35"	15' 25.27"	295° 17' 28"	0.71113
5	165° 57' 06"	4° 51' 23"	168° 58' 48"	10° 00' 48"	0° 56' 38"	15' 25.85"	295° 22' 30"	0.71506
6	166° 29' 31"	4° 50' 11"	169° 28' 29"	9° 47' 02"	0° 56' 40"	15' 26.43"	295° 27' 24"	0.71898
7	167° 01' 58"	4° 48' 57"	169° 58' 10"	9° 33' 12"	0° 56' 42"	15' 27.01"	295° 32' 11"	0.72288
8	167° 34' 28"	4° 47' 42"	170° 27' 50"	9° 19' 19"	0° 56' 44"	15' 27.59"	295° 36' 52"	0.72677
9	168° 06' 60"	4° 46' 25"	170° 57' 31"	9° 05' 22"	0° 56' 46"	15' 28.18"	295° 41' 25"	0.73065
10	168° 39' 34"	4° 45' 06"	171° 27' 12"	8° 51' 21"	0° 56' 48"	15' 28.77"	295° 45' 50"	0.73452
11	169° 12' 11"	4° 43' 46"	171° 56' 52"	8° 37' 17"	0° 56' 51"	15' 29.36"	295° 50' 09"	0.73838
12	169° 44' 51"	4° 42' 25"	172° 26' 33"	8° 23' 10"	0° 56' 53"	15' 29.95"	295° 54' 20"	0.74222
13	170° 17' 33"	4° 41' 01"	172° 56' 14"	8° 08' 60"	0° 56' 55"	15' 30.55"	295° 58' 24"	0.74605
14	170° 50' 17"	4° 39' 36"	173° 25' 56"	7° 54' 46"	0° 56' 57"	15' 31.15"	296° 2' 21"	0.74987
15	171° 23' 04"	4° 38' 10"	173° 55' 38"	7° 40' 28"	0° 56' 59"	15' 31.75"	296° 6' 10"	0.75367
16	171° 55' 54"	4° 36' 41"	174° 25' 20"	7° 26' 08"	0° 57' 01"	15' 32.35"	296° 9' 52"	0.75746
17	172° 28' 46"	4° 35' 11"	174° 55' 03"	7° 11' 45"	0° 57' 04"	15' 32.95"	296° 13' 27"	0.76123
18	173° 01' 40"	4° 33' 40"	175° 24' 46"	6° 57' 18"	0° 57' 06"	15' 33.56"	296° 16' 54"	0.76499
19	173° 34' 38"	4° 32' 07"	175° 54' 30"	6° 42' 48"	0° 57' 08"	15' 34.16"	296° 20' 13"	0.76874
20	174° 07' 37"	4° 30' 32"	176° 24' 14"	6° 28' 16"	0° 57' 10"	15' 34.77"	296° 23' 26"	0.77246
21	174° 40' 40"	4° 28' 55"	176° 53' 60"	6° 13' 40"	0° 57' 13"	15' 35.38"	296° 26' 30"	0.77618
22	175° 13' 45"	4° 27' 17"	177° 23' 46"	5° 59' 01"	0° 57' 15"	15' 35.99"	296° 29' 27"	0.77987
23	175° 46' 52"	4° 25' 38"	177° 53' 33"	5° 44' 20"	0° 57' 17"	15' 36.61"	296° 32' 17"	0.78355
24	176° 20' 03"	4° 23' 56"	178° 23' 21"	5° 29' 36"	0° 57' 19"	15' 37.22"	296° 34' 59"	0.78721



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	51° 16' 47"	0.44"	48° 50' 31"	18° 04' 36"	1.0100463	15' 50.09"	23° 26' 17"	3 m 37 s
1	51° 19' 11"	0.44"	48° 52' 58"	18° 05' 14"	1.0100556	15' 50.08"	23° 26' 17"	3 m 37 s
2	51° 21' 36"	0.44"	48° 55' 25"	18° 05' 52"	1.0100648	15' 50.07"	23° 26' 17"	3 m 38 s
3	51° 24' 01"	0.43"	48° 57' 52"	18° 06' 30"	1.0100740	15' 50.06"	23° 26' 17"	3 m 38 s
4	51° 26' 26"	0.43"	49° 00' 20"	18° 07' 08"	1.0100833	15' 50.05"	23° 26' 17"	3 m 38 s
5	51° 28' 51"	0.43"	49° 02' 47"	18° 07' 46"	1.0100925	15' 50.04"	23° 26' 17"	3 m 38 s
6	51° 31' 16"	0.42"	49° 05' 14"	18° 08' 23"	1.0101017	15' 50.03"	23° 26' 17"	3 m 38 s
7	51° 33' 40"	0.42"	49° 07' 41"	18° 09' 01"	1.0101110	15' 50.02"	23° 26' 17"	3 m 38 s
8	51° 36' 05"	0.41"	49° 10' 08"	18° 09' 39"	1.0101202	15' 50.02"	23° 26' 17"	3 m 38 s
9	51° 38' 30"	0.41"	49° 12' 35"	18° 10' 16"	1.0101294	15' 50.01"	23° 26' 17"	3 m 38 s
10	51° 40' 55"	0.41"	49° 15' 02"	18° 10' 54"	1.0101386	15' 50.00"	23° 26' 17"	3 m 38 s
11	51° 43' 20"	0.40"	49° 17' 30"	18° 11' 32"	1.0101478	15' 49.99"	23° 26' 17"	3 m 38 s
12	51° 45' 45"	0.40"	49° 19' 57"	18° 12' 09"	1.0101570	15' 49.98"	23° 26' 17"	3 m 38 s
13	51° 48' 09"	0.40"	49° 22' 24"	18° 12' 47"	1.0101663	15' 49.97"	23° 26' 17"	3 m 38 s
14	51° 50' 34"	0.39"	49° 24' 51"	18° 13' 24"	1.0101755	15' 49.96"	23° 26' 17"	3 m 38 s
15	51° 52' 59"	0.39"	49° 27' 19"	18° 14' 02"	1.0101847	15' 49.96"	23° 26' 17"	3 m 38 s
16	51° 55' 24"	0.38"	49° 29' 46"	18° 14' 39"	1.0101938	15' 49.95"	23° 26' 17"	3 m 38 s
17	51° 57' 49"	0.38"	49° 32' 13"	18° 15' 16"	1.0102030	15' 49.94"	23° 26' 17"	3 m 38 s
18	52° 00' 13"	0.38"	49° 34' 41"	18° 15' 54"	1.0102122	15' 49.93"	23° 26' 17"	3 m 38 s
19	52° 02' 38"	0.37"	49° 37' 08"	18° 16' 31"	1.0102214	15' 49.92"	23° 26' 17"	3 m 38 s
20	52° 05' 03"	0.37"	49° 39' 35"	18° 17' 08"	1.0102306	15' 49.91"	23° 26' 17"	3 m 38 s
21	52° 07' 28"	0.36"	49° 42' 03"	18° 17' 46"	1.0102398	15' 49.90"	23° 26' 17"	3 m 38 s
22	52° 09' 53"	0.36"	49° 44' 30"	18° 18' 23"	1.0102489	15' 49.89"	23° 26' 17"	3 m 38 s
23	52° 12' 17"	0.36"	49° 46' 57"	18° 19' 00"	1.0102581	15' 49.89"	23° 26' 17"	3 m 38 s
24	52° 14' 42"	0.35"	49° 49' 25"	18° 19' 37"	1.0102673	15' 49.88"	23° 26' 17"	3 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	176° 20' 03"	4° 23' 56"	178° 23' 21"	5° 29' 36"	0° 57' 19"	15' 37.22"	296° 34' 59"	0.78721
1	176° 53' 15"	4° 22' 13"	178° 53' 10"	5° 14' 49"	0° 57' 22"	15' 37.84"	296° 37' 33"	0.79086
2	177° 26' 31"	4° 20' 29"	179° 22' 60"	4° 59' 60"	0° 57' 24"	15' 38.46"	296° 39' 59"	0.79449
3	177° 59' 49"	4° 18' 43"	179° 52' 51"	4° 45' 08"	0° 57' 26"	15' 39.07"	296° 42' 18"	0.79810
4	178° 33' 09"	4° 16' 55"	180° 22' 43"	4° 30' 13"	0° 57' 28"	15' 39.69"	296° 44' 29"	0.80169
5	179° 06' 33"	4° 15' 06"	180° 52' 37"	4° 15' 16"	0° 57' 31"	15' 40.31"	296° 46' 32"	0.80526
6	179° 39' 59"	4° 13' 15"	181° 22' 32"	4° 00' 17"	0° 57' 33"	15' 40.93"	296° 48' 28"	0.80881
7	180° 13' 27"	4° 11' 22"	181° 52' 28"	3° 45' 15"	0° 57' 35"	15' 41.56"	296° 50' 15"	0.81234
8	180° 46' 58"	4° 09' 28"	182° 22' 26"	3° 30' 11"	0° 57' 38"	15' 42.18"	296° 51' 55"	0.81585
9	181° 20' 32"	4° 07' 33"	182° 52' 25"	3° 15' 05"	0° 57' 40"	15' 42.80"	296° 53' 26"	0.81934
10	181° 54' 09"	4° 05' 36"	183° 22' 26"	2° 59' 57"	0° 57' 42"	15' 43.43"	296° 54' 50"	0.82281
11	182° 27' 48"	4° 03' 37"	183° 52' 29"	2° 44' 46"	0° 57' 44"	15' 44.05"	296° 56' 05"	0.82626
12	183° 01' 30"	4° 01' 36"	184° 22' 33"	2° 29' 33"	0° 57' 47"	15' 44.68"	296° 57' 13"	0.82969
13	183° 35' 14"	3° 59' 34"	184° 52' 40"	2° 14' 19"	0° 57' 49"	15' 45.30"	296° 58' 12"	0.83309
14	184° 09' 01"	3° 57' 31"	185° 22' 48"	1° 59' 03"	0° 57' 51"	15' 45.93"	296° 59' 03"	0.83648
15	184° 42' 51"	3° 55' 26"	185° 52' 58"	1° 43' 44"	0° 57' 54"	15' 46.55"	296° 59' 46"	0.83984
16	185° 16' 43"	3° 53' 19"	186° 23' 10"	1° 28' 24"	0° 57' 56"	15' 47.18"	297° 0' 21"	0.84317
17	185° 50' 39"	3° 51' 11"	186° 53' 24"	1° 13' 03"	0° 57' 58"	15' 47.80"	297° 0' 47"	0.84648
18	186° 24' 36"	3° 49' 02"	187° 23' 41"	0° 57' 39"	0° 58' 00"	15' 48.43"	297° 1' 05"	0.84977
19	186° 58' 37"	3° 46' 50"	187° 53' 59"	0° 42' 14"	0° 58' 03"	15' 49.05"	297° 1' 15"	0.85304
20	187° 32' 40"	3° 44' 38"	188° 24' 21"	0° 26' 48"	0° 58' 05"	15' 49.68"	297° 1' 16"	0.85628
21	188° 06' 46"	3° 42' 24"	188° 54' 44"	0° 11' 20"	0° 58' 07"	15' 50.30"	297° 1' 09"	0.85949
22	188° 40' 54"	3° 40' 08"	189° 25' 10"	0° -4' 09"	0° 58' 10"	15' 50.93"	297° 0' 53"	0.86268
23	189° 15' 06"	3° 37' 51"	189° 55' 38"	0° -19' 39"	0° 58' 12"	15' 51.55"	297° 0' 29"	0.86584
24	189° 49' 19"	3° 35' 32"	190° 26' 10"	0° -35' 11"	0° 58' 14"	15' 52.17"	296° 59' 56"	0.86897

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	52° 14' 42"	0.35"	49° 49' 25"	18° 19' 37"	1.0102673	15' 49.88"	23° 26' 17"	3 m 38 s
1	52° 17' 07"	0.35"	49° 51' 52"	18° 20' 14"	1.0102764	15' 49.87"	23° 26' 17"	3 m 38 s
2	52° 19' 32"	0.34"	49° 54' 20"	18° 20' 52"	1.0102856	15' 49.86"	23° 26' 17"	3 m 38 s
3	52° 21' 57"	0.34"	49° 56' 47"	18° 21' 29"	1.0102948	15' 49.85"	23° 26' 17"	3 m 38 s
4	52° 24' 21"	0.33"	49° 59' 15"	18° 22' 06"	1.0103039	15' 49.84"	23° 26' 17"	3 m 38 s
5	52° 26' 46"	0.33"	50° 01' 42"	18° 22' 43"	1.0103131	15' 49.83"	23° 26' 17"	3 m 38 s
6	52° 29' 11"	0.32"	50° 04' 10"	18° 23' 20"	1.0103222	15' 49.83"	23° 26' 17"	3 m 38 s
7	52° 31' 36"	0.32"	50° 06' 37"	18° 23' 57"	1.0103314	15' 49.82"	23° 26' 17"	3 m 39 s
8	52° 34' 00"	0.32"	50° 09' 05"	18° 24' 33"	1.0103405	15' 49.81"	23° 26' 17"	3 m 39 s
9	52° 36' 25"	0.31"	50° 11' 32"	18° 25' 10"	1.0103496	15' 49.80"	23° 26' 17"	3 m 39 s
10	52° 38' 50"	0.31"	50° 13' 60"	18° 25' 47"	1.0103588	15' 49.79"	23° 26' 17"	3 m 39 s
11	52° 41' 15"	0.30"	50° 16' 27"	18° 26' 24"	1.0103679	15' 49.78"	23° 26' 17"	3 m 39 s
12	52° 43' 39"	0.30"	50° 18' 55"	18° 27' 01"	1.0103770	15' 49.77"	23° 26' 17"	3 m 39 s
13	52° 46' 04"	0.29"	50° 21' 22"	18° 27' 37"	1.0103861	15' 49.77"	23° 26' 17"	3 m 39 s
14	52° 48' 29"	0.29"	50° 23' 50"	18° 28' 14"	1.0103953	15' 49.76"	23° 26' 17"	3 m 39 s
15	52° 50' 54"	0.28"	50° 26' 18"	18° 28' 51"	1.0104044	15' 49.75"	23° 26' 17"	3 m 39 s
16	52° 53' 18"	0.28"	50° 28' 45"	18° 29' 27"	1.0104135	15' 49.74"	23° 26' 17"	3 m 39 s
17	52° 55' 43"	0.27"	50° 31' 13"	18° 30' 04"	1.0104226	15' 49.73"	23° 26' 17"	3 m 39 s
18	52° 58' 08"	0.27"	50° 33' 41"	18° 30' 41"	1.0104317	15' 49.72"	23° 26' 17"	3 m 39 s
19	53° 00' 33"	0.26"	50° 36' 08"	18° 31' 17"	1.0104408	15' 49.71"	23° 26' 17"	3 m 39 s
20	53° 02' 57"	0.26"	50° 38' 36"	18° 31' 54"	1.0104499	15' 49.71"	23° 26' 17"	3 m 39 s
21	53° 05' 22"	0.26"	50° 41' 04"	18° 32' 30"	1.0104590	15' 49.70"	23° 26' 17"	3 m 39 s
22	53° 07' 47"	0.25"	50° 43' 31"	18° 33' 07"	1.0104681	15' 49.69"	23° 26' 17"	3 m 39 s
23	53° 10' 12"	0.25"	50° 45' 59"	18° 33' 43"	1.0104772	15' 49.68"	23° 26' 17"	3 m 39 s
24	53° 12' 36"	0.24"	50° 48' 27"	18° 34' 19"	1.0104863	15' 49.67"	23° 26' 17"	3 m 39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	189° 49' 19"	3° 35' 32"	190° 26' 10"	0°-35' 11"	0° 58' 14"	15' 52.17"	296° 59' 56"	0.86897
1	190° 23' 36"	3° 33' 12"	190° 56' 43"	0°-50' 44"	0° 58' 17"	15' 52.79"	296° 59' 15"	0.87208
2	190° 57' 55"	3° 30' 50"	191° 27' 20"	-1° 06' 17"	0° 58' 19"	15' 53.41"	296° 58' 24"	0.87516
3	191° 32' 17"	3° 28' 27"	191° 57' 60"	-1° 21' 52"	0° 58' 21"	15' 54.03"	296° 57' 25"	0.87821
4	192° 06' 41"	3° 26' 03"	192° 28' 42"	-1° 37' 28"	0° 58' 23"	15' 54.65"	296° 56' 18"	0.88124
5	192° 41' 08"	3° 23' 37"	192° 59' 27"	-1° 53' 04"	0° 58' 26"	15' 55.27"	296° 55' 01"	0.88424
6	193° 15' 38"	3° 21' 10"	193° 30' 16"	-2° 08' 41"	0° 58' 28"	15' 55.89"	296° 53' 35"	0.88720
7	193° 50' 11"	3° 18' 41"	194° 01' 07"	-2° 24' 19"	0° 58' 30"	15' 56.50"	296° 52' 00"	0.89014
8	194° 24' 46"	3° 16' 11"	194° 32' 02"	-2° 39' 57"	0° 58' 32"	15' 57.11"	296° 50' 17"	0.89305
9	194° 59' 23"	3° 13' 39"	195° 03' 00"	-2° 55' 36"	0° 58' 35"	15' 57.73"	296° 48' 24"	0.89593
10	195° 34' 04"	3° 11' 06"	195° 34' 02"	-3° 11' 16"	0° 58' 37"	15' 58.34"	296° 46' 22"	0.89877
11	196° 08' 47"	3° 08' 32"	196° 05' 07"	-3° 26' 55"	0° 58' 39"	15' 58.95"	296° 44' 11"	0.90159
12	196° 43' 32"	3° 05' 56"	196° 36' 15"	-3° 42' 35"	0° 58' 41"	15' 59.55"	296° 41' 50"	0.90437
13	197° 18' 20"	3° 03' 19"	197° 07' 27"	-3° 58' 15"	0° 58' 44"	16' 00.16"	296° 39' 20"	0.90712
14	197° 53' 11"	3° 00' 41"	197° 38' 43"	-4° 13' 55"	0° 58' 46"	16' 00.76"	296° 36' 41"	0.90984
15	198° 28' 04"	2° 58' 01"	198° 10' 02"	-4° 29' 35"	0° 58' 48"	16' 01.36"	296° 33' 52"	0.91253
16	199° 03' 00"	2° 55' 20"	198° 41' 26"	-4° 45' 15"	0° 58' 50"	16' 01.96"	296° 30' 53"	0.91519
17	199° 37' 59"	2° 52' 38"	199° 12' 53"	-5° 00' 55"	0° 58' 52"	16' 02.55"	296° 27' 45"	0.91781
18	200° 12' 60"	2° 49' 54"	199° 44' 24"	-5° 16' 34"	0° 58' 55"	16' 03.15"	296° 24' 27"	0.92039
19	200° 48' 04"	2° 47' 09"	200° 15' 59"	-5° 32' 14"	0° 58' 57"	16' 03.74"	296° 20' 59"	0.92294
20	201° 23' 10"	2° 44' 23"	200° 47' 39"	-5° 47' 52"	0° 58' 59"	16' 04.32"	296° 17' 21"	0.92546
21	201° 58' 18"	2° 41' 36"	201° 19' 22"	-6° 03' 30"	0° 59' 01"	16' 04.91"	296° 13' 34"	0.92794
22	202° 33' 30"	2° 38' 47"	201° 51' 10"	-6° 19' 08"	0° 59' 03"	16' 05.49"	296° 9' 36"	0.93039
23	203° 08' 43"	2° 35' 58"	202° 23' 02"	-6° 34' 44"	0° 59' 05"	16' 06.07"	296° 5' 28"	0.93280
24	203° 43' 60"	2° 33' 07"	202° 54' 58"	-6° 50' 20"	0° 59' 07"	16' 06.65"	296° 1' 09"	0.93518

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	53° 12' 36"	0.24"	50° 48' 27"	18° 34' 19"	1.0104863	15' 49.67"	23° 26' 17"	3 m 39 s
1	53° 15' 01"	0.24"	50° 50' 55"	18° 34' 56"	1.0104954	15' 49.66"	23° 26' 17"	3 m 39 s
2	53° 17' 26"	0.23"	50° 53' 23"	18° 35' 32"	1.0105045	15' 49.65"	23° 26' 17"	3 m 39 s
3	53° 19' 50"	0.23"	50° 55' 50"	18° 36' 08"	1.0105135	15' 49.65"	23° 26' 17"	3 m 39 s
4	53° 22' 15"	0.22"	50° 58' 18"	18° 36' 45"	1.0105226	15' 49.64"	23° 26' 17"	3 m 39 s
5	53° 24' 40"	0.22"	51° 00' 46"	18° 37' 21"	1.0105317	15' 49.63"	23° 26' 17"	3 m 39 s
6	53° 27' 04"	0.21"	51° 03' 14"	18° 37' 57"	1.0105408	15' 49.62"	23° 26' 17"	3 m 39 s
7	53° 29' 29"	0.21"	51° 05' 42"	18° 38' 33"	1.0105498	15' 49.61"	23° 26' 17"	3 m 39 s
8	53° 31' 54"	0.20"	51° 08' 10"	18° 39' 09"	1.0105589	15' 49.60"	23° 26' 17"	3 m 39 s
9	53° 34' 19"	0.20"	51° 10' 37"	18° 39' 45"	1.0105680	15' 49.59"	23° 26' 17"	3 m 39 s
10	53° 36' 43"	0.19"	51° 13' 05"	18° 40' 22"	1.0105770	15' 49.59"	23° 26' 16"	3 m 39 s
11	53° 39' 08"	0.19"	51° 15' 33"	18° 40' 58"	1.0105861	15' 49.58"	23° 26' 16"	3 m 39 s
12	53° 41' 33"	0.18"	51° 18' 01"	18° 41' 34"	1.0105951	15' 49.57"	23° 26' 16"	3 m 39 s
13	53° 43' 57"	0.18"	51° 20' 29"	18° 42' 09"	1.0106042	15' 49.56"	23° 26' 16"	3 m 39 s
14	53° 46' 22"	0.17"	51° 22' 57"	18° 42' 45"	1.0106132	15' 49.55"	23° 26' 16"	3 m 39 s
15	53° 48' 47"	0.17"	51° 25' 25"	18° 43' 21"	1.0106223	15' 49.54"	23° 26' 16"	3 m 39 s
16	53° 51' 11"	0.16"	51° 27' 53"	18° 43' 57"	1.0106313	15' 49.54"	23° 26' 16"	3 m 39 s
17	53° 53' 36"	0.15"	51° 30' 21"	18° 44' 33"	1.0106403	15' 49.53"	23° 26' 16"	3 m 39 s
18	53° 56' 01"	0.15"	51° 32' 49"	18° 45' 09"	1.0106494	15' 49.52"	23° 26' 16"	3 m 39 s
19	53° 58' 25"	0.14"	51° 35' 17"	18° 45' 45"	1.0106584	15' 49.51"	23° 26' 16"	3 m 39 s
20	54° 00' 50"	0.14"	51° 37' 45"	18° 46' 20"	1.0106674	15' 49.50"	23° 26' 16"	3 m 39 s
21	54° 03' 15"	0.13"	51° 40' 13"	18° 46' 56"	1.0106764	15' 49.49"	23° 26' 16"	3 m 39 s
22	54° 05' 39"	0.13"	51° 42' 41"	18° 47' 32"	1.0106855	15' 49.48"	23° 26' 16"	3 m 38 s
23	54° 08' 04"	0.12"	51° 45' 09"	18° 48' 07"	1.0106945	15' 49.48"	23° 26' 16"	3 m 38 s
24	54° 10' 29"	0.12"	51° 47' 37"	18° 48' 43"	1.0107035	15' 49.47"	23° 26' 16"	3 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	203° 43' 60"	2° 33' 07"	202° 54' 58"	-6° 50' 20"	0° 59' 07"	16' 06.65"	296° 1' 09"	0.93518
1	204° 19' 18"	2° 30' 15"	203° 26' 59"	-7° 05' 55"	0° 59' 09"	16' 07.22"	295° 56' 41"	0.93751
2	204° 54' 40"	2° 27' 21"	203° 59' 05"	-7° 21' 29"	0° 59' 12"	16' 07.79"	295° 52' 01"	0.93982
3	205° 30' 03"	2° 24' 27"	204° 31' 15"	-7° 37' 02"	0° 59' 14"	16' 08.36"	295° 47' 11"	0.94208
4	206° 05' 30"	2° 21' 31"	205° 03' 30"	-7° 52' 33"	0° 59' 16"	16' 08.92"	295° 42' 11"	0.94430
5	206° 40' 58"	2° 18' 34"	205° 35' 50"	-8° 08' 03"	0° 59' 18"	16' 09.48"	295° 36' 59"	0.94649
6	207° 16' 29"	2° 15' 37"	206° 08' 14"	-8° 23' 32"	0° 59' 20"	16' 10.03"	295° 31' 37"	0.94864
7	207° 52' 03"	2° 12' 38"	206° 40' 44"	-8° 38' 59"	0° 59' 22"	16' 10.59"	295° 26' 03"	0.95075
8	208° 27' 38"	2° 09' 38"	207° 13' 18"	-8° 54' 25"	0° 59' 24"	16' 11.13"	295° 20' 18"	0.95282
9	209° 03' 17"	2° 06' 37"	207° 45' 58"	-9° 09' 49"	0° 59' 26"	16' 11.68"	295° 14' 21"	0.95485
10	209° 38' 57"	2° 03' 35"	208° 18' 42"	-9° 25' 11"	0° 59' 28"	16' 12.22"	295° 8' 12"	0.95684
11	210° 14' 40"	2° 00' 32"	208° 51' 32"	-9° 40' 31"	0° 59' 30"	16' 12.75"	295° 1' 52"	0.95879
12	210° 50' 25"	1° 57' 28"	209° 24' 27"	-9° 55' 48"	0° 59' 32"	16' 13.28"	294° 55' 20"	0.96070
13	211° 26' 13"	1° 54' 23"	209° 57' 28"	-10° 11' 04"	0° 59' 34"	16' 13.81"	294° 48' 35"	0.96257
14	212° 02' 03"	1° 51' 17"	210° 30' 34"	-10° 26' 18"	0° 59' 36"	16' 14.33"	294° 41' 38"	0.96439
15	212° 37' 55"	1° 48' 10"	211° 03' 45"	-10° 41' 29"	0° 59' 37"	16' 14.85"	294° 34' 27"	0.96618
16	213° 13' 49"	1° 45' 02"	211° 37' 02"	-10° 56' 37"	0° 59' 39"	16' 15.36"	294° 27' 04"	0.96792
17	213° 49' 46"	1° 41' 53"	212° 10' 24"	-11° 11' 43"	0° 59' 41"	16' 15.87"	294° 19' 27"	0.96962
18	214° 25' 45"	1° 38' 44"	212° 43' 52"	-11° 26' 46"	0° 59' 43"	16' 16.38"	294° 11' 36"	0.97127
19	215° 01' 46"	1° 35' 33"	213° 17' 26"	-11° 41' 46"	0° 59' 45"	16' 16.87"	294° 3' 31"	0.97289
20	215° 37' 49"	1° 32' 22"	213° 51' 05"	-11° 56' 44"	0° 59' 47"	16' 17.37"	293° 55' 11"	0.97445
21	216° 13' 54"	1° 29' 10"	214° 24' 51"	-12° 11' 38"	0° 59' 48"	16' 17.86"	293° 46' 36"	0.97598
22	216° 50' 02"	1° 25' 57"	214° 58' 42"	-12° 26' 29"	0° 59' 50"	16' 18.34"	293° 37' 45"	0.97746
23	217° 26' 11"	1° 22' 43"	215° 32' 39"	-12° 41' 17"	0° 59' 52"	16' 18.82"	293° 28' 38"	0.97890
24	218° 02' 23"	1° 19' 29"	216° 06' 42"	-12° 56' 01"	0° 59' 54"	16' 19.29"	293° 19' 13"	0.98029

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	54° 10' 29"	0.12"	51° 47' 37"	18° 48' 43"	1.0107035	15' 49.47"	23° 26' 16"	3 m 38 s
1	54° 12' 53"	0.11"	51° 50' 06"	18° 49' 18"	1.0107125	15' 49.46"	23° 26' 16"	3 m 38 s
2	54° 15' 18"	0.11"	51° 52' 34"	18° 49' 54"	1.0107215	15' 49.45"	23° 26' 16"	3 m 38 s
3	54° 17' 42"	0.10"	51° 55' 02"	18° 50' 29"	1.0107305	15' 49.44"	23° 26' 16"	3 m 38 s
4	54° 20' 07"	0.10"	51° 57' 30"	18° 51' 05"	1.0107395	15' 49.43"	23° 26' 16"	3 m 38 s
5	54° 22' 32"	0.09"	51° 59' 58"	18° 51' 40"	1.0107485	15' 49.43"	23° 26' 16"	3 m 38 s
6	54° 24' 56"	0.09"	52° 02' 26"	18° 52' 16"	1.0107575	15' 49.42"	23° 26' 16"	3 m 38 s
7	54° 27' 21"	0.08"	52° 04' 55"	18° 52' 51"	1.0107665	15' 49.41"	23° 26' 16"	3 m 38 s
8	54° 29' 46"	0.08"	52° 07' 23"	18° 53' 26"	1.0107755	15' 49.40"	23° 26' 16"	3 m 38 s
9	54° 32' 10"	0.07"	52° 09' 51"	18° 54' 02"	1.0107845	15' 49.39"	23° 26' 16"	3 m 38 s
10	54° 34' 35"	0.07"	52° 12' 19"	18° 54' 37"	1.0107935	15' 49.38"	23° 26' 16"	3 m 38 s
11	54° 36' 60"	0.06"	52° 14' 48"	18° 55' 12"	1.0108025	15' 49.37"	23° 26' 16"	3 m 38 s
12	54° 39' 24"	0.06"	52° 17' 16"	18° 55' 47"	1.0108115	15' 49.37"	23° 26' 16"	3 m 38 s
13	54° 41' 49"	0.05"	52° 19' 44"	18° 56' 23"	1.0108204	15' 49.36"	23° 26' 16"	3 m 38 s
14	54° 44' 13"	0.04"	52° 22' 13"	18° 56' 58"	1.0108294	15' 49.35"	23° 26' 16"	3 m 38 s
15	54° 46' 38"	0.04"	52° 24' 41"	18° 57' 33"	1.0108384	15' 49.34"	23° 26' 16"	3 m 38 s
16	54° 49' 03"	0.03"	52° 27' 09"	18° 58' 08"	1.0108473	15' 49.33"	23° 26' 16"	3 m 38 s
17	54° 51' 27"	0.03"	52° 29' 38"	18° 58' 43"	1.0108563	15' 49.32"	23° 26' 16"	3 m 38 s
18	54° 53' 52"	0.02"	52° 32' 06"	18° 59' 18"	1.0108653	15' 49.32"	23° 26' 16"	3 m 38 s
19	54° 56' 16"	0.02"	52° 34' 34"	18° 59' 53"	1.0108742	15' 49.31"	23° 26' 16"	3 m 38 s
20	54° 58' 41"	0.01"	52° 37' 03"	19° 00' 28"	1.0108832	15' 49.30"	23° 26' 16"	3 m 38 s
21	55° 01' 06"	0.01"	52° 39' 31"	19° 01' 03"	1.0108921	15' 49.29"	23° 26' 16"	3 m 38 s
22	55° 03' 30"	0.00"	52° 41' 60"	19° 01' 37"	1.0109011	15' 49.28"	23° 26' 16"	3 m 38 s
23	55° 05' 55"	-0.00"	52° 44' 28"	19° 02' 12"	1.0109100	15' 49.27"	23° 26' 16"	3 m 38 s
24	55° 08' 19"	-0.01"	52° 46' 56"	19° 02' 47"	1.0109190	15' 49.26"	23° 26' 16"	3 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	218° 02' 23"	1° 19' 29"	216° 06' 42"	-12° 56' 01"	0° 59' 54"	16' 19.29"	293° 19' 13"	0.98029
1	218° 38' 37"	1° 16' 14"	216° 40' 52"	-13° 10' 42"	0° 59' 55"	16' 19.76"	293° 9' 31"	0.98164
2	219° 14' 53"	1° 12' 58"	217° 15' 07"	-13° 25' 19"	0° 59' 57"	16' 20.22"	292° 59' 29"	0.98294
3	219° 51' 11"	1° 09' 42"	217° 49' 29"	-13° 39' 52"	0° 59' 59"	16' 20.67"	292° 49' 08"	0.98419
4	220° 27' 30"	1° 06' 25"	218° 23' 56"	-13° 54' 22"	1° 00' 00"	16' 21.12"	292° 38' 25"	0.98540
5	221° 03' 52"	1° 03' 07"	218° 58' 30"	-14° 08' 47"	1° 00' 02"	16' 21.57"	292° 27' 19"	0.98657
6	221° 40' 16"	0° 59' 48"	219° 33' 11"	-14° 23' 08"	1° 00' 04"	16' 22.00"	292° 15' 48"	0.98768
7	222° 16' 42"	0° 56' 30"	220° 07' 58"	-14° 37' 25"	1° 00' 05"	16' 22.43"	292° 3' 51"	0.98875
8	222° 53' 09"	0° 53' 10"	220° 42' 51"	-14° 51' 38"	1° 00' 07"	16' 22.86"	291° 51' 25"	0.98977
9	223° 29' 39"	0° 49' 50"	221° 17' 50"	-15° 05' 46"	1° 00' 08"	16' 23.28"	291° 38' 26"	0.99075
10	224° 06' 10"	0° 46' 29"	221° 52' 56"	-15° 19' 49"	1° 00' 10"	16' 23.69"	291° 24' 52"	0.99168
11	224° 42' 43"	0° 43' 08"	222° 28' 09"	-15° 33' 48"	1° 00' 11"	16' 24.10"	291° 10' 37"	0.99256
12	225° 19' 18"	0° 39' 47"	223° 03' 28"	-15° 47' 42"	1° 00' 13"	16' 24.50"	290° 55' 37"	0.99339
13	225° 55' 55"	0° 36' 25"	223° 38' 54"	-16° 01' 30"	1° 00' 14"	16' 24.89"	290° 39' 43"	0.99417
14	226° 32' 34"	0° 33' 03"	224° 14' 26"	-16° 15' 14"	1° 00' 16"	16' 25.28"	290° 22' 47"	0.99491
15	227° 09' 14"	0° 29' 40"	224° 50' 05"	-16° 28' 52"	1° 00' 17"	16' 25.66"	290° 4' 37"	0.99559
16	227° 45' 56"	0° 26' 17"	225° 25' 51"	-16° 42' 25"	1° 00' 19"	16' 26.04"	289° 44' 57"	0.99623
17	228° 22' 39"	0° 22' 53"	226° 01' 43"	-16° 55' 52"	1° 00' 20"	16' 26.40"	289° 23' 26"	0.99682
18	228° 59' 24"	0° 19' 30"	226° 37' 43"	-17° 09' 14"	1° 00' 21"	16' 26.76"	288° 59' 35"	0.99736
19	229° 36' 11"	0° 16' 06"	227° 13' 48"	-17° 22' 29"	1° 00' 22"	16' 27.12"	288° 32' 41"	0.99785
20	230° 12' 60"	0° 12' 41"	227° 50' 01"	-17° 35' 39"	1° 00' 24"	16' 27.46"	288° 1' 41"	0.99828
21	230° 49' 50"	0° 09' 17"	228° 26' 21"	-17° 48' 43"	1° 00' 25"	16' 27.80"	287° 24' 57"	0.99867
22	231° 26' 41"	0° 05' 52"	229° 02' 47"	-18° 01' 40"	1° 00' 26"	16' 28.13"	286° 39' 50"	0.99901
23	232° 03' 34"	0° 02' 27"	229° 39' 20"	-18° 14' 32"	1° 00' 27"	16' 28.46"	285° 41' 39"	0.99930
24	232° 40' 28"	0° 00' 58"	230° 16' 00"	-18° 27' 17"	1° 00' 29"	16' 28.78"	284° 21' 18"	0.99954



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	55° 08' 19"	-0.01"	52° 46' 56"	19° 02' 47"	1.0109190	15' 49.26"	23° 26' 16"	3 m 38 s
1	55° 10' 44"	-0.01"	52° 49' 25"	19° 03' 22"	1.0109279	15' 49.26"	23° 26' 16"	3 m 38 s
2	55° 13' 08"	-0.02"	52° 51' 53"	19° 03' 57"	1.0109369	15' 49.25"	23° 26' 16"	3 m 38 s
3	55° 15' 33"	-0.02"	52° 54' 22"	19° 04' 31"	1.0109458	15' 49.24"	23° 26' 16"	3 m 38 s
4	55° 17' 58"	-0.03"	52° 56' 50"	19° 05' 06"	1.0109547	15' 49.23"	23° 26' 16"	3 m 37 s
5	55° 20' 22"	-0.04"	52° 59' 19"	19° 05' 41"	1.0109637	15' 49.22"	23° 26' 16"	3 m 37 s
6	55° 22' 47"	-0.04"	53° 01' 48"	19° 06' 15"	1.0109726	15' 49.21"	23° 26' 16"	3 m 37 s
7	55° 25' 11"	-0.05"	53° 04' 16"	19° 06' 50"	1.0109815	15' 49.21"	23° 26' 16"	3 m 37 s
8	55° 27' 36"	-0.05"	53° 06' 45"	19° 07' 24"	1.0109904	15' 49.20"	23° 26' 16"	3 m 37 s
9	55° 30' 00"	-0.06"	53° 09' 13"	19° 07' 59"	1.0109994	15' 49.19"	23° 26' 16"	3 m 37 s
10	55° 32' 25"	-0.06"	53° 11' 42"	19° 08' 33"	1.0110083	15' 49.18"	23° 26' 16"	3 m 37 s
11	55° 34' 50"	-0.07"	53° 14' 11"	19° 09' 08"	1.0110172	15' 49.17"	23° 26' 16"	3 m 37 s
12	55° 37' 14"	-0.07"	53° 16' 39"	19° 09' 42"	1.0110261	15' 49.16"	23° 26' 16"	3 m 37 s
13	55° 39' 39"	-0.08"	53° 19' 08"	19° 10' 16"	1.0110350	15' 49.16"	23° 26' 16"	3 m 37 s
14	55° 42' 03"	-0.08"	53° 21' 36"	19° 10' 51"	1.0110439	15' 49.15"	23° 26' 16"	3 m 37 s
15	55° 44' 28"	-0.09"	53° 24' 05"	19° 11' 25"	1.0110528	15' 49.14"	23° 26' 16"	3 m 37 s
16	55° 46' 52"	-0.09"	53° 26' 34"	19° 11' 59"	1.0110617	15' 49.13"	23° 26' 16"	3 m 37 s
17	55° 49' 17"	-0.10"	53° 29' 03"	19° 12' 33"	1.0110706	15' 49.12"	23° 26' 16"	3 m 37 s
18	55° 51' 41"	-0.10"	53° 31' 31"	19° 13' 08"	1.0110795	15' 49.11"	23° 26' 16"	3 m 37 s
19	55° 54' 06"	-0.11"	53° 34' 00"	19° 13' 42"	1.0110884	15' 49.11"	23° 26' 16"	3 m 37 s
20	55° 56' 30"	-0.11"	53° 36' 29"	19° 14' 16"	1.0110973	15' 49.10"	23° 26' 16"	3 m 37 s
21	55° 58' 55"	-0.12"	53° 38' 58"	19° 14' 50"	1.0111062	15' 49.09"	23° 26' 16"	3 m 36 s
22	56° 01' 20"	-0.12"	53° 41' 26"	19° 15' 24"	1.0111150	15' 49.08"	23° 26' 16"	3 m 36 s
23	56° 03' 44"	-0.13"	53° 43' 55"	19° 15' 58"	1.0111239	15' 49.07"	23° 26' 16"	3 m 36 s
24	56° 06' 09"	-0.13"	53° 46' 24"	19° 16' 32"	1.0111328	15' 49.06"	23° 26' 16"	3 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	232° 40' 28"	0° 00' -58"	230° 16' 00"	-18° 27' 17"	1° 00' 29"	16' 28.78"	284° 21' 18"	0.99954
1	233° 17' 24"	0° -4' 23"	230° 52' 47"	-18° 39' 55"	1° 00' 30"	16' 29.09"	282° 18' 42"	0.99973
2	233° 54' 21"	0° -7' 48"	231° 29' 41"	-18° 52' 26"	1° 00' 31"	16' 29.39"	278° 38' 56"	0.99987
3	234° 31' 20"	0° -11' 14"	232° 06' 41"	-19° 04' 51"	1° 00' 32"	16' 29.68"	269° 44' 59"	0.99996
4	235° 08' 19"	0° -14' 39"	232° 43' 49"	-19° 17' 09"	1° 00' 33"	16' 29.97"	225° 58' 07"	0.99999
5	235° 45' 21"	0° -18' 04"	233° 21' 03"	-19° 29' 19"	1° 00' 34"	16' 30.25"	139° 6' 59"	0.99998
6	236° 22' 23"	0° -21' 30"	233° 58' 24"	-19° 41' 23"	1° 00' 35"	16' 30.52"	123° 12' 50"	0.99991
7	236° 59' 27"	0° -24' 55"	234° 35' 52"	-19° 53' 19"	1° 00' 36"	16' 30.79"	118° 3' 20"	0.99980
8	237° 36' 31"	0° -28' 20"	235° 13' 27"	-20° 05' 07"	1° 00' 37"	16' 31.05"	115° 27' 35"	0.99963
9	238° 13' 37"	0° -31' 45"	235° 51' 08"	-20° 16' 48"	1° 00' 38"	16' 31.30"	113° 50' 49"	0.99941
10	238° 50' 44"	0° -35' 10"	236° 28' 56"	-20° 28' 21"	1° 00' 39"	16' 31.54"	112° 42' 40"	0.99914
11	239° 27' 53"	0° -38' 35"	237° 06' 51"	-20° 39' 46"	1° 00' 40"	16' 31.77"	111° 50' 30"	0.99882
12	240° 05' 02"	0° -41' 60"	237° 44' 53"	-20° 51' 04"	1° 00' 40"	16' 32.00"	111° 8' 09"	0.99845
13	240° 42' 12"	0° -45' 24"	238° 23' 01"	-21° 02' 13"	1° 00' 41"	16' 32.22"	110° 32' 12"	0.99803
14	241° 19' 24"	0° -48' 49"	239° 01' 16"	-21° 13' 14"	1° 00' 42"	16' 32.43"	110° 0' 40"	0.99755
15	241° 56' 36"	0° -52' 13"	239° 39' 38"	-21° 24' 06"	1° 00' 43"	16' 32.63"	109° 32' 16"	0.99702
16	242° 33' 49"	0° -55' 36"	240° 18' 06"	-21° 34' 50"	1° 00' 43"	16' 32.83"	109° 6' 10"	0.99645
17	243° 11' 03"	0° -58' 60"	240° 56' 41"	-21° 45' 26"	1° 00' 44"	16' 33.01"	108° 41' 48"	0.99582
18	243° 48' 18"	-1° 02' 23"	241° 35' 22"	-21° 55' 52"	1° 00' 45"	16' 33.19"	108° 18' 45"	0.99514
19	244° 25' 34"	-1° 05' 46"	242° 14' 10"	-22° 06' 10"	1° 00' 45"	16' 33.36"	107° 56' 44"	0.99441
20	245° 02' 50"	-1° 09' 08"	242° 53' 04"	-22° 16' 19"	1° 00' 46"	16' 33.52"	107° 35' 32"	0.99362
21	245° 40' 08"	-1° 12' 30"	243° 32' 04"	-22° 26' 19"	1° 00' 47"	16' 33.68"	107° 14' 57"	0.99279
22	246° 17' 26"	-1° 15' 51"	244° 11' 11"	-22° 36' 09"	1° 00' 47"	16' 33.82"	106° 54' 53"	0.99190
23	246° 54' 44"	-1° 19' 12"	244° 50' 23"	-22° 45' 50"	1° 00' 48"	16' 33.96"	106° 35' 14"	0.99097
24	247° 32' 04"	-1° 22' 32"	245° 29' 42"	-22° 55' 22"	1° 00' 48"	16' 34.09"	106° 15' 53"	0.98998

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	56° 06' 09"	-0.13"	53° 46' 24"	19° 16' 32"	1.0111328	15' 49.06"	23° 26' 16"	3 m 36 s
1	56° 08' 33"	-0.14"	53° 48' 53"	19° 17' 06"	1.0111417	15' 49.06"	23° 26' 16"	3 m 36 s
2	56° 10' 58"	-0.14"	53° 51' 22"	19° 17' 40"	1.0111505	15' 49.05"	23° 26' 16"	3 m 36 s
3	56° 13' 22"	-0.15"	53° 53' 50"	19° 18' 14"	1.0111594	15' 49.04"	23° 26' 16"	3 m 36 s
4	56° 15' 47"	-0.15"	53° 56' 19"	19° 18' 48"	1.0111683	15' 49.03"	23° 26' 16"	3 m 36 s
5	56° 18' 11"	-0.16"	53° 58' 48"	19° 19' 21"	1.0111771	15' 49.02"	23° 26' 16"	3 m 36 s
6	56° 20' 36"	-0.16"	54° 01' 17"	19° 19' 55"	1.0111860	15' 49.01"	23° 26' 16"	3 m 36 s
7	56° 23' 00"	-0.17"	54° 03' 46"	19° 20' 29"	1.0111948	15' 49.01"	23° 26' 16"	3 m 36 s
8	56° 25' 25"	-0.17"	54° 06' 15"	19° 21' 03"	1.0112037	15' 49.00"	23° 26' 16"	3 m 36 s
9	56° 27' 49"	-0.18"	54° 08' 44"	19° 21' 36"	1.0112125	15' 48.99"	23° 26' 16"	3 m 36 s
10	56° 30' 14"	-0.18"	54° 11' 13"	19° 22' 10"	1.0112214	15' 48.98"	23° 26' 16"	3 m 36 s
11	56° 32' 38"	-0.19"	54° 13' 42"	19° 22' 44"	1.0112302	15' 48.97"	23° 26' 16"	3 m 35 s
12	56° 35' 03"	-0.19"	54° 16' 11"	19° 23' 17"	1.0112390	15' 48.96"	23° 26' 16"	3 m 35 s
13	56° 37' 27"	-0.20"	54° 18' 40"	19° 23' 51"	1.0112479	15' 48.96"	23° 26' 16"	3 m 35 s
14	56° 39' 52"	-0.20"	54° 21' 09"	19° 24' 24"	1.0112567	15' 48.95"	23° 26' 16"	3 m 35 s
15	56° 42' 16"	-0.21"	54° 23' 38"	19° 24' 58"	1.0112655	15' 48.94"	23° 26' 16"	3 m 35 s
16	56° 44' 41"	-0.21"	54° 26' 07"	19° 25' 31"	1.0112744	15' 48.93"	23° 26' 16"	3 m 35 s
17	56° 47' 05"	-0.22"	54° 28' 36"	19° 26' 05"	1.0112832	15' 48.92"	23° 26' 16"	3 m 35 s
18	56° 49' 30"	-0.22"	54° 31' 05"	19° 26' 38"	1.0112920	15' 48.91"	23° 26' 16"	3 m 35 s
19	56° 51' 54"	-0.23"	54° 33' 34"	19° 27' 11"	1.0113008	15' 48.91"	23° 26' 16"	3 m 35 s
20	56° 54' 19"	-0.23"	54° 36' 03"	19° 27' 45"	1.0113096	15' 48.90"	23° 26' 16"	3 m 35 s
21	56° 56' 43"	-0.24"	54° 38' 32"	19° 28' 18"	1.0113184	15' 48.89"	23° 26' 16"	3 m 35 s
22	56° 59' 07"	-0.24"	54° 41' 02"	19° 28' 51"	1.0113272	15' 48.88"	23° 26' 16"	3 m 35 s
23	57° 01' 32"	-0.25"	54° 43' 31"	19° 29' 24"	1.0113360	15' 48.87"	23° 26' 16"	3 m 34 s
24	57° 03' 56"	-0.25"	54° 45' 60"	19° 29' 57"	1.0113448	15' 48.87"	23° 26' 16"	3 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	247° 32' 04"	-1° 22' 32"	245° 29' 42"	-22° 55' 22"	1° 00' 48"	16' 34.09"	106° 15' 53"	0.98998
1	248° 09' 24"	-1° 25' 52"	246° 09' 07"	-23° 04' 44"	1° 00' 49"	16' 34.21"	105° 56' 48"	0.98894
2	248° 46' 44"	-1° 29' 12"	246° 48' 38"	-23° 13' 56"	1° 00' 49"	16' 34.33"	105° 37' 56"	0.98785
3	249° 24' 05"	-1° 32' 30"	247° 28' 14"	-23° 22' 59"	1° 00' 49"	16' 34.43"	105° 19' 13"	0.98671
4	250° 01' 27"	-1° 35' 48"	248° 07' 57"	-23° 31' 52"	1° 00' 50"	16' 34.53"	105° 0' 38"	0.98552
5	250° 38' 49"	-1° 39' 06"	248° 47' 45"	-23° 40' 34"	1° 00' 50"	16' 34.62"	104° 42' 08"	0.98428
6	251° 16' 12"	-1° 42' 23"	249° 27' 38"	-23° 49' 07"	1° 00' 50"	16' 34.70"	104° 23' 43"	0.98298
7	251° 53' 35"	-1° 45' 39"	250° 07' 38"	-23° 57' 29"	1° 00' 51"	16' 34.78"	104° 5' 22"	0.98164
8	252° 30' 58"	-1° 48' 54"	250° 47' 42"	-24° 05' 41"	1° 00' 51"	16' 34.84"	103° 47' 02"	0.98025
9	253° 08' 21"	-1° 52' 08"	251° 27' 52"	-24° 13' 43"	1° 00' 51"	16' 34.90"	103° 28' 44"	0.97881
10	253° 45' 45"	-1° 55' 22"	252° 08' 07"	-24° 21' 34"	1° 00' 51"	16' 34.94"	103° 10' 26"	0.97731
11	254° 23' 09"	-1° 58' 35"	252° 48' 27"	-24° 29' 14"	1° 00' 51"	16' 34.99"	102° 52' 08"	0.97577
12	255° 00' 34"	-2° 01' 47"	253° 28' 52"	-24° 36' 44"	1° 00' 51"	16' 35.02"	102° 33' 50"	0.97418
13	255° 37' 58"	-2° 04' 59"	254° 09' 22"	-24° 44' 03"	1° 00' 52"	16' 35.04"	102° 15' 31"	0.97254
14	256° 15' 23"	-2° 08' 09"	254° 49' 57"	-24° 51' 11"	1° 00' 52"	16' 35.06"	101° 57' 10"	0.97085
15	256° 52' 48"	-2° 11' 18"	255° 30' 36"	-24° 58' 08"	1° 00' 52"	16' 35.07"	101° 38' 48"	0.96911
16	257° 30' 13"	-2° 14' 27"	256° 11' 19"	-25° 04' 53"	1° 00' 52"	16' 35.06"	101° 20' 24"	0.96732
17	258° 07' 38"	-2° 17' 34"	256° 52' 07"	-25° 11' 28"	1° 00' 52"	16' 35.06"	101° 1' 57"	0.96549
18	258° 45' 03"	-2° 20' 41"	257° 32' 60"	-25° 17' 52"	1° 00' 52"	16' 35.04"	100° 43' 29"	0.96360
19	259° 22' 27"	-2° 23' 46"	258° 13' 56"	-25° 24' 04"	1° 00' 51"	16' 35.02"	100° 24' 58"	0.96167
20	259° 59' 52"	-2° 26' 51"	258° 54' 56"	-25° 30' 03"	1° 00' 51"	16' 34.98"	100° 6' 25"	0.95969
21	260° 37' 17"	-2° 29' 54"	259° 35' 59"	-25° 35' 54"	1° 00' 51"	16' 34.94"	99° 47' 50"	0.95766
22	261° 14' 42"	-2° 32' 57"	260° 17' 07"	-25° 41' 32"	1° 00' 51"	16' 34.89"	99° 29' 12"	0.95559
23	261° 52' 06"	-2° 35' 58"	260° 58' 18"	-25° 46' 58"	1° 00' 51"	16' 34.84"	99° 10' 31"	0.95347
24	262° 29' 30"	-2° 38' 58"	261° 39' 32"	-25° 52' 13"	1° 00' 51"	16' 34.77"	98° 51' 48"	0.95130



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	57° 03' 56"	-0.25"	54° 45' 60"	19° 29' 57"	1.0113448	15' 48.87"	23° 26' 16"	3 m 34 s
1	57° 06' 21"	-0.25"	54° 48' 29"	19° 30' 31"	1.0113536	15' 48.86"	23° 26' 16"	3 m 34 s
2	57° 08' 45"	-0.26"	54° 50' 58"	19° 31' 04"	1.0113624	15' 48.85"	23° 26' 16"	3 m 34 s
3	57° 11' 10"	-0.26"	54° 53' 28"	19° 31' 37"	1.0113712	15' 48.84"	23° 26' 16"	3 m 34 s
4	57° 13' 34"	-0.27"	54° 55' 57"	19° 32' 10"	1.0113800	15' 48.83"	23° 26' 16"	3 m 34 s
5	57° 15' 59"	-0.27"	54° 58' 26"	19° 32' 43"	1.0113888	15' 48.82"	23° 26' 16"	3 m 34 s
6	57° 18' 23"	-0.28"	55° 00' 55"	19° 33' 16"	1.0113976	15' 48.82"	23° 26' 16"	3 m 34 s
7	57° 20' 48"	-0.28"	55° 03' 24"	19° 33' 49"	1.0114063	15' 48.81"	23° 26' 16"	3 m 34 s
8	57° 23' 12"	-0.29"	55° 05' 54"	19° 34' 21"	1.0114151	15' 48.80"	23° 26' 16"	3 m 34 s
9	57° 25' 37"	-0.29"	55° 08' 23"	19° 34' 54"	1.0114239	15' 48.79"	23° 26' 16"	3 m 34 s
10	57° 28' 01"	-0.29"	55° 10' 52"	19° 35' 27"	1.0114326	15' 48.78"	23° 26' 16"	3 m 33 s
11	57° 30' 25"	-0.30"	55° 13' 22"	19° 35' 60"	1.0114414	15' 48.77"	23° 26' 16"	3 m 33 s
12	57° 32' 50"	-0.30"	55° 15' 51"	19° 36' 33"	1.0114501	15' 48.77"	23° 26' 16"	3 m 33 s
13	57° 35' 14"	-0.31"	55° 18' 20"	19° 37' 05"	1.0114589	15' 48.76"	23° 26' 16"	3 m 33 s
14	57° 37' 39"	-0.31"	55° 20' 50"	19° 37' 38"	1.0114677	15' 48.75"	23° 26' 16"	3 m 33 s
15	57° 40' 03"	-0.32"	55° 23' 19"	19° 38' 11"	1.0114764	15' 48.74"	23° 26' 16"	3 m 33 s
16	57° 42' 28"	-0.32"	55° 25' 49"	19° 38' 43"	1.0114851	15' 48.73"	23° 26' 16"	3 m 33 s
17	57° 44' 52"	-0.32"	55° 28' 18"	19° 39' 16"	1.0114939	15' 48.73"	23° 26' 16"	3 m 33 s
18	57° 47' 16"	-0.33"	55° 30' 47"	19° 39' 48"	1.0115026	15' 48.72"	23° 26' 16"	3 m 33 s
19	57° 49' 41"	-0.33"	55° 33' 17"	19° 40' 21"	1.0115113	15' 48.71"	23° 26' 16"	3 m 32 s
20	57° 52' 05"	-0.34"	55° 35' 46"	19° 40' 53"	1.0115201	15' 48.70"	23° 26' 16"	3 m 32 s
21	57° 54' 30"	-0.34"	55° 38' 16"	19° 41' 26"	1.0115288	15' 48.69"	23° 26' 16"	3 m 32 s
22	57° 56' 54"	-0.34"	55° 40' 45"	19° 41' 58"	1.0115375	15' 48.68"	23° 26' 16"	3 m 32 s
23	57° 59' 19"	-0.35"	55° 43' 15"	19° 42' 31"	1.0115462	15' 48.68"	23° 26' 16"	3 m 32 s
24	58° 01' 43"	-0.35"	55° 45' 44"	19° 43' 03"	1.0115550	15' 48.67"	23° 26' 16"	3 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	262° 29' 30"	-2° 38' 58"	261° 39' 32"	-25° 52' 13"	1° 00' 51"	16' 34.77"	98° 51' 48"	0.95130
1	263° 06' 54"	-2° 41' 57"	262° 20' 49"	-25° 57' 15"	1° 00' 50"	16' 34.70"	98° 33' 03"	0.94908
2	263° 44' 18"	-2° 44' 55"	263° 02' 09"	-26° 02' 06"	1° 00' 50"	16' 34.62"	98° 14' 15"	0.94682
3	264° 21' 41"	-2° 47' 51"	263° 43' 32"	-26° 06' 46"	1° 00' 50"	16' 34.54"	97° 55' 25"	0.94452
4	264° 59' 04"	-2° 50' 46"	264° 24' 58"	-26° 11' 13"	1° 00' 49"	16' 34.44"	97° 36' 32"	0.94217
5	265° 36' 27"	-2° 53' 40"	265° 06' 26"	-26° 15' 28"	1° 00' 49"	16' 34.34"	97° 17' 38"	0.93977
6	266° 13' 49"	-2° 56' 33"	265° 47' 56"	-26° 19' 32"	1° 00' 49"	16' 34.23"	96° 58' 41"	0.93733
7	266° 51' 11"	-2° 59' 25"	266° 29' 28"	-26° 23' 23"	1° 00' 48"	16' 34.11"	96° 39' 42"	0.93484
8	267° 28' 32"	-3° 02' 15"	267° 11' 03"	-26° 27' 02"	1° 00' 48"	16' 33.98"	96° 20' 42"	0.93231
9	268° 05' 53"	-3° 05' 04"	267° 52' 39"	-26° 30' 29"	1° 00' 47"	16' 33.85"	96° 1' 40"	0.92974
10	268° 43' 13"	-3° 07' 51"	268° 34' 17"	-26° 33' 44"	1° 00' 47"	16' 33.71"	95° 42' 36"	0.92712
11	269° 20' 33"	-3° 10' 37"	269° 15' 56"	-26° 36' 47"	1° 00' 46"	16' 33.56"	95° 23' 31"	0.92446
12	269° 57' 51"	-3° 13' 22"	269° 57' 36"	-26° 39' 38"	1° 00' 46"	16' 33.41"	95° 4' 24"	0.92176
13	270° 35' 10"	-3° 16' 05"	270° 39' 18"	-26° 42' 16"	1° 00' 45"	16' 33.25"	94° 45' 17"	0.91901
14	271° 12' 27"	-3° 18' 47"	271° 21' 00"	-26° 44' 43"	1° 00' 44"	16' 33.08"	94° 26' 08"	0.91622
15	271° 49' 44"	-3° 21' 27"	272° 02' 43"	-26° 46' 56"	1° 00' 44"	16' 32.90"	94° 6' 59"	0.91339
16	272° 27' 01"	-3° 24' 06"	272° 44' 27"	-26° 48' 58"	1° 00' 43"	16' 32.72"	93° 47' 49"	0.91052
17	273° 04' 16"	-3° 26' 43"	273° 26' 11"	-26° 50' 47"	1° 00' 42"	16' 32.53"	93° 28' 39"	0.90761
18	273° 41' 31"	-3° 29' 19"	274° 07' 55"	-26° 52' 24"	1° 00' 42"	16' 32.33"	93° 9' 28"	0.90466
19	274° 18' 44"	-3° 31' 53"	274° 49' 38"	-26° 53' 49"	1° 00' 41"	16' 32.12"	92° 50' 17"	0.90167
20	274° 55' 57"	-3° 34' 26"	275° 31' 22"	-26° 55' 02"	1° 00' 40"	16' 31.91"	92° 31' 06"	0.89864
21	275° 33' 06"	-3° 36' 56"	276° 13' 02"	-26° 56' 02"	1° 00' 39"	16' 31.69"	92° 11' 57"	0.89557
22	276° 10' 17"	-3° 39' 26"	276° 54' 44"	-26° 56' 50"	1° 00' 38"	16' 31.47"	91° 52' 47"	0.89246
23	276° 47' 27"	-3° 41' 54"	277° 36' 26"	-26° 57' 25"	1° 00' 38"	16' 31.24"	91° 33' 38"	0.88932
24	277° 24' 36"	-3° 44' 20"	278° 18' 07"	-26° 57' 48"	1° 00' 37"	16' 31.00"	91° 14' 29"	0.88613

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	58° 01' 43"	-0.35"	55° 45' 44"	19° 43' 03"	1.0115550	15' 48.67"	23° 26' 16"	3 m 32 s
1	58° 04' 07"	-0.36"	55° 48' 14"	19° 43' 35"	1.0115637	15' 48.66"	23° 26' 16"	3 m 32 s
2	58° 06' 32"	-0.36"	55° 50' 43"	19° 44' 08"	1.0115724	15' 48.65"	23° 26' 16"	3 m 32 s
3	58° 08' 56"	-0.36"	55° 53' 13"	19° 44' 40"	1.0115811	15' 48.64"	23° 26' 16"	3 m 32 s
4	58° 11' 21"	-0.37"	55° 55' 43"	19° 45' 12"	1.0115898	15' 48.64"	23° 26' 16"	3 m 31 s
5	58° 13' 45"	-0.37"	55° 58' 12"	19° 45' 44"	1.0115985	15' 48.63"	23° 26' 16"	3 m 31 s
6	58° 16' 09"	-0.37"	56° 00' 42"	19° 46' 16"	1.0116072	15' 48.62"	23° 26' 16"	3 m 31 s
7	58° 18' 34"	-0.38"	56° 03' 11"	19° 46' 48"	1.0116158	15' 48.61"	23° 26' 16"	3 m 31 s
8	58° 20' 58"	-0.38"	56° 05' 41"	19° 47' 20"	1.0116245	15' 48.60"	23° 26' 16"	3 m 31 s
9	58° 23' 23"	-0.38"	56° 08' 11"	19° 47' 52"	1.0116332	15' 48.59"	23° 26' 16"	3 m 31 s
10	58° 25' 47"	-0.39"	56° 10' 40"	19° 48' 24"	1.0116419	15' 48.59"	23° 26' 16"	3 m 31 s
11	58° 28' 11"	-0.39"	56° 13' 10"	19° 48' 56"	1.0116506	15' 48.58"	23° 26' 16"	3 m 31 s
12	58° 30' 36"	-0.39"	56° 15' 40"	19° 49' 28"	1.0116592	15' 48.57"	23° 26' 16"	3 m 30 s
13	58° 33' 00"	-0.40"	56° 18' 09"	19° 50' 00"	1.0116679	15' 48.56"	23° 26' 16"	3 m 30 s
14	58° 35' 25"	-0.40"	56° 20' 39"	19° 50' 32"	1.0116765	15' 48.55"	23° 26' 16"	3 m 30 s
15	58° 37' 49"	-0.40"	56° 23' 09"	19° 51' 04"	1.0116852	15' 48.55"	23° 26' 16"	3 m 30 s
16	58° 40' 13"	-0.41"	56° 25' 39"	19° 51' 36"	1.0116939	15' 48.54"	23° 26' 16"	3 m 30 s
17	58° 42' 38"	-0.41"	56° 28' 08"	19° 52' 07"	1.0117025	15' 48.53"	23° 26' 16"	3 m 30 s
18	58° 45' 02"	-0.41"	56° 30' 38"	19° 52' 39"	1.0117111	15' 48.52"	23° 26' 16"	3 m 30 s
19	58° 47' 26"	-0.42"	56° 33' 08"	19° 53' 11"	1.0117198	15' 48.51"	23° 26' 16"	3 m 30 s
20	58° 49' 51"	-0.42"	56° 35' 38"	19° 53' 42"	1.0117284	15' 48.51"	23° 26' 16"	3 m 29 s
21	58° 52' 15"	-0.42"	56° 38' 08"	19° 54' 14"	1.0117371	15' 48.50"	23° 26' 16"	3 m 29 s
22	58° 54' 40"	-0.43"	56° 40' 37"	19° 54' 45"	1.0117457	15' 48.49"	23° 26' 16"	3 m 29 s
23	58° 57' 04"	-0.43"	56° 43' 07"	19° 55' 17"	1.0117543	15' 48.48"	23° 26' 16"	3 m 29 s
24	58° 59' 28"	-0.43"	56° 45' 37"	19° 55' 48"	1.0117629	15' 48.47"	23° 26' 16"	3 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	277° 24' 36"	-3° 44' 20"	278° 18' 07"	-26° 57' 48"	1° 00' 37"	16' 31.00"	91° 14' 29"	0.88613
1	278° 01' 44"	-3° 46' 45"	278° 59' 47"	-26° 57' 59"	1° 00' 36"	16' 30.75"	90° 55' 22"	0.88291
2	278° 38' 51"	-3° 49' 07"	279° 41' 25"	-26° 57' 58"	1° 00' 35"	16' 30.50"	90° 36' 15"	0.87965
3	279° 15' 57"	-3° 51' 29"	280° 23' 02"	-26° 57' 45"	1° 00' 34"	16' 30.25"	90° 17' 10"	0.87635
4	279° 53' 02"	-3° 53' 48"	281° 04' 37"	-26° 57' 19"	1° 00' 33"	16' 29.98"	89° 58' 07"	0.87302
5	280° 30' 05"	-3° 56' 06"	281° 46' 10"	-26° 56' 41"	1° 00' 32"	16' 29.71"	89° 39' 05"	0.86965
6	281° 07' 08"	-3° 58' 22"	282° 27' 41"	-26° 55' 52"	1° 00' 31"	16' 29.44"	89° 20' 06"	0.86625
7	281° 44' 09"	-4° 00' 36"	283° 09' 10"	-26° 54' 50"	1° 00' 30"	16' 29.15"	89° 1' 08"	0.86281
8	282° 21' 09"	-4° 02' 49"	283° 50' 36"	-26° 53' 35"	1° 00' 29"	16' 28.87"	88° 42' 13"	0.85934
9	282° 58' 07"	-4° 04' 60"	284° 31' 60"	-26° 52' 09"	1° 00' 28"	16' 28.57"	88° 23' 21"	0.85584
10	283° 35' 05"	-4° 07' 09"	285° 13' 20"	-26° 50' 31"	1° 00' 27"	16' 28.27"	88° 4' 31"	0.85230
11	284° 12' 01"	-4° 09' 16"	285° 54' 38"	-26° 48' 41"	1° 00' 26"	16' 27.97"	87° 45' 44"	0.84873
12	284° 48' 56"	-4° 11' 22"	286° 35' 53"	-26° 46' 39"	1° 00' 24"	16' 27.66"	87° 26' 60"	0.84512
13	285° 25' 49"	-4° 13' 25"	287° 17' 05"	-26° 44' 26"	1° 00' 23"	16' 27.34"	87° 8' 19"	0.84149
14	286° 02' 41"	-4° 15' 27"	287° 58' 13"	-26° 41' 60"	1° 00' 22"	16' 27.02"	86° 49' 42"	0.83782
15	286° 39' 32"	-4° 17' 27"	288° 39' 17"	-26° 39' 23"	1° 00' 21"	16' 26.69"	86° 31' 09"	0.83412
16	287° 16' 21"	-4° 19' 25"	289° 20' 18"	-26° 36' 34"	1° 00' 20"	16' 26.36"	86° 12' 39"	0.83039
17	287° 53' 09"	-4° 21' 21"	290° 01' 15"	-26° 33' 33"	1° 00' 18"	16' 26.02"	85° 54' 14"	0.82663
18	288° 29' 55"	-4° 23' 16"	290° 42' 07"	-26° 30' 21"	1° 00' 17"	16' 25.67"	85° 35' 53"	0.82284
19	289° 06' 40"	-4° 25' 08"	291° 22' 56"	-26° 26' 58"	1° 00' 16"	16' 25.33"	85° 17' 36"	0.81903
20	289° 43' 23"	-4° 26' 59"	292° 03' 40"	-26° 23' 23"	1° 00' 15"	16' 24.97"	84° 59' 23"	0.81518
21	290° 20' 04"	-4° 28' 47"	292° 44' 20"	-26° 19' 36"	1° 00' 13"	16' 24.61"	84° 41' 16"	0.81131
22	290° 56' 44"	-4° 30' 34"	293° 24' 54"	-26° 15' 39"	1° 00' 12"	16' 24.25"	84° 23' 13"	0.80741
23	291° 33' 23"	-4° 32' 19"	294° 05' 24"	-26° 11' 30"	1° 00' 11"	16' 23.88"	84° 5' 15"	0.80348
24	292° 09' 59"	-4° 34' 02"	294° 45' 50"	-26° 07' 10"	1° 00' 09"	16' 23.51"	83° 47' 22"	0.79952

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	58° 59' 28"	-0.43"	56° 45' 37"	19° 55' 48"	1.0117629	15' 48.47"	23° 26' 16"	3 m 29 s
1	59° 01' 53"	-0.43"	56° 48' 07"	19° 56' 20"	1.0117715	15' 48.47"	23° 26' 16"	3 m 29 s
2	59° 04' 17"	-0.44"	56° 50' 37"	19° 56' 51"	1.0117801	15' 48.46"	23° 26' 16"	3 m 29 s
3	59° 06' 41"	-0.44"	56° 53' 07"	19° 57' 23"	1.0117887	15' 48.45"	23° 26' 16"	3 m 28 s
4	59° 09' 06"	-0.44"	56° 55' 37"	19° 57' 54"	1.0117973	15' 48.44"	23° 26' 16"	3 m 28 s
5	59° 11' 30"	-0.45"	56° 58' 07"	19° 58' 25"	1.0118059	15' 48.43"	23° 26' 16"	3 m 28 s
6	59° 13' 54"	-0.45"	57° 00' 37"	19° 58' 57"	1.0118145	15' 48.42"	23° 26' 16"	3 m 28 s
7	59° 16' 19"	-0.45"	57° 03' 07"	19° 59' 28"	1.0118231	15' 48.42"	23° 26' 16"	3 m 28 s
8	59° 18' 43"	-0.45"	57° 05' 37"	19° 59' 59"	1.0118317	15' 48.41"	23° 26' 16"	3 m 28 s
9	59° 21' 08"	-0.46"	57° 08' 07"	20° 00' 30"	1.0118403	15' 48.40"	23° 26' 16"	3 m 28 s
10	59° 23' 32"	-0.46"	57° 10' 37"	20° 01' 01"	1.0118489	15' 48.39"	23° 26' 16"	3 m 27 s
11	59° 25' 56"	-0.46"	57° 13' 07"	20° 01' 33"	1.0118574	15' 48.38"	23° 26' 16"	3 m 27 s
12	59° 28' 21"	-0.46"	57° 15' 37"	20° 02' 04"	1.0118660	15' 48.38"	23° 26' 16"	3 m 27 s
13	59° 30' 45"	-0.46"	57° 18' 07"	20° 02' 35"	1.0118746	15' 48.37"	23° 26' 16"	3 m 27 s
14	59° 33' 09"	-0.47"	57° 20' 37"	20° 03' 06"	1.0118831	15' 48.36"	23° 26' 16"	3 m 27 s
15	59° 35' 34"	-0.47"	57° 23' 07"	20° 03' 37"	1.0118917	15' 48.35"	23° 26' 16"	3 m 27 s
16	59° 37' 58"	-0.47"	57° 25' 37"	20° 04' 08"	1.0119002	15' 48.34"	23° 26' 16"	3 m 27 s
17	59° 40' 22"	-0.47"	57° 28' 07"	20° 04' 38"	1.0119087	15' 48.34"	23° 26' 16"	3 m 26 s
18	59° 42' 47"	-0.47"	57° 30' 37"	20° 05' 09"	1.0119173	15' 48.33"	23° 26' 16"	3 m 26 s
19	59° 45' 11"	-0.48"	57° 33' 07"	20° 05' 40"	1.0119258	15' 48.32"	23° 26' 16"	3 m 26 s
20	59° 47' 35"	-0.48"	57° 35' 38"	20° 06' 11"	1.0119343	15' 48.31"	23° 26' 16"	3 m 26 s
21	59° 49' 60"	-0.48"	57° 38' 08"	20° 06' 42"	1.0119429	15' 48.30"	23° 26' 16"	3 m 26 s
22	59° 52' 24"	-0.48"	57° 40' 38"	20° 07' 12"	1.0119514	15' 48.30"	23° 26' 16"	3 m 26 s
23	59° 54' 48"	-0.48"	57° 43' 08"	20° 07' 43"	1.0119599	15' 48.29"	23° 26' 16"	3 m 25 s
24	59° 57' 13"	-0.49"	57° 45' 38"	20° 08' 14"	1.0119684	15' 48.28"	23° 26' 16"	3 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	292° 09' 59"	-4° 34' 02"	294° 45' 50"	-26° 07' 10"	1° 00' 09"	16' 23.51"	83° 47' 22"	0.79952
1	292° 46' 35"	-4° 35' 43"	295° 26' 10"	-26° 02' 39"	1° 00' 08"	16' 23.13"	83° 29' 35"	0.79554
2	293° 23' 08"	-4° 37' 21"	296° 06' 25"	-25° 57' 57"	1° 00' 06"	16' 22.75"	83° 11' 53"	0.79154
3	293° 59' 40"	-4° 38' 58"	296° 46' 34"	-25° 53' 04"	1° 00' 05"	16' 22.36"	82° 54' 17"	0.78751
4	294° 36' 10"	-4° 40' 34"	297° 26' 38"	-25° 48' 01"	1° 00' 04"	16' 21.97"	82° 36' 47"	0.78345
5	295° 12' 38"	-4° 42' 07"	298° 06' 37"	-25° 42' 47"	1° 00' 02"	16' 21.58"	82° 19' 23"	0.77937
6	295° 49' 05"	-4° 43' 38"	298° 46' 30"	-25° 37' 22"	1° 00' 01"	16' 21.18"	82° 2' 05"	0.77527
7	296° 25' 30"	-4° 45' 07"	299° 26' 17"	-25° 31' 47"	0° 59' 59"	16' 20.78"	81° 44' 53"	0.77114
8	297° 01' 53"	-4° 46' 34"	300° 05' 58"	-25° 26' 01"	0° 59' 58"	16' 20.37"	81° 27' 47"	0.76700
9	297° 38' 14"	-4° 47' 59"	300° 45' 33"	-25° 20' 05"	0° 59' 56"	16' 19.96"	81° 10' 48"	0.76283
10	298° 14' 33"	-4° 49' 22"	301° 25' 03"	-25° 13' 59"	0° 59' 55"	16' 19.54"	80° 53' 56"	0.75863
11	298° 50' 51"	-4° 50' 43"	302° 04' 26"	-25° 07' 42"	0° 59' 53"	16' 19.13"	80° 37' 10"	0.75442
12	299° 27' 07"	-4° 52' 02"	302° 43' 42"	-25° 01' 16"	0° 59' 52"	16' 18.70"	80° 20' 31"	0.75019
13	300° 03' 20"	-4° 53' 20"	303° 22' 53"	-24° 54' 40"	0° 59' 50"	16' 18.28"	80° 3' 60"	0.74594
14	300° 39' 32"	-4° 54' 35"	304° 01' 57"	-24° 47' 53"	0° 59' 48"	16' 17.85"	79° 47' 35"	0.74166
15	301° 15' 42"	-4° 55' 48"	304° 40' 54"	-24° 40' 57"	0° 59' 47"	16' 17.42"	79° 31' 18"	0.73737
16	301° 51' 50"	-4° 56' 59"	305° 19' 45"	-24° 33' 52"	0° 59' 45"	16' 16.98"	79° 15' 07"	0.73306
17	302° 27' 57"	-4° 58' 08"	305° 58' 29"	-24° 26' 37"	0° 59' 44"	16' 16.54"	78° 59' 05"	0.72874
18	303° 04' 01"	-4° 59' 15"	306° 37' 07"	-24° 19' 12"	0° 59' 42"	16' 16.10"	78° 43' 10"	0.72439
19	303° 40' 03"	-5° 00' 20"	307° 15' 37"	-24° 11' 39"	0° 59' 40"	16' 15.65"	78° 27' 22"	0.72003
20	304° 16' 03"	-5° 01' 23"	307° 54' 01"	-24° 03' 56"	0° 59' 39"	16' 15.21"	78° 11' 42"	0.71565
21	304° 52' 01"	-5° 02' 24"	308° 32' 18"	-23° 56' 03"	0° 59' 37"	16' 14.76"	77° 56' 11"	0.71126
22	305° 27' 58"	-5° 03' 22"	309° 10' 28"	-23° 48' 02"	0° 59' 35"	16' 14.30"	77° 40' 47"	0.70685
23	306° 03' 52"	-5° 04' 19"	309° 48' 31"	-23° 39' 52"	0° 59' 34"	16' 13.85"	77° 25' 31"	0.70242
24	306° 39' 44"	-5° 05' 14"	310° 26' 27"	-23° 31' 34"	0° 59' 32"	16' 13.39"	77° 10' 23"	0.69799

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	59° 57' 13"	-0.49"	57° 45' 38"	20° 08' 14"	1.0119684	15' 48.28"	23° 26' 16"	3 m 25 s
1	59° 59' 37"	-0.49"	57° 48' 09"	20° 08' 44"	1.0119769	15' 48.27"	23° 26' 16"	3 m 25 s
2	60° 02' 01"	-0.49"	57° 50' 39"	20° 09' 15"	1.0119854	15' 48.26"	23° 26' 16"	3 m 25 s
3	60° 04' 25"	-0.49"	57° 53' 09"	20° 09' 45"	1.0119939	15' 48.26"	23° 26' 16"	3 m 25 s
4	60° 06' 50"	-0.49"	57° 55' 39"	20° 10' 16"	1.0120024	15' 48.25"	23° 26' 16"	3 m 25 s
5	60° 09' 14"	-0.49"	57° 58' 10"	20° 10' 46"	1.0120109	15' 48.24"	23° 26' 16"	3 m 25 s
6	60° 11' 38"	-0.50"	58° 00' 40"	20° 11' 17"	1.0120193	15' 48.23"	23° 26' 16"	3 m 24 s
7	60° 14' 03"	-0.50"	58° 03' 10"	20° 11' 47"	1.0120278	15' 48.22"	23° 26' 16"	3 m 24 s
8	60° 16' 27"	-0.50"	58° 05' 41"	20° 12' 18"	1.0120363	15' 48.22"	23° 26' 16"	3 m 24 s
9	60° 18' 51"	-0.50"	58° 08' 11"	20° 12' 48"	1.0120447	15' 48.21"	23° 26' 16"	3 m 24 s
10	60° 21' 16"	-0.50"	58° 10' 41"	20° 13' 18"	1.0120532	15' 48.20"	23° 26' 16"	3 m 24 s
11	60° 23' 40"	-0.50"	58° 13' 12"	20° 13' 48"	1.0120617	15' 48.19"	23° 26' 16"	3 m 24 s
12	60° 26' 04"	-0.50"	58° 15' 42"	20° 14' 19"	1.0120701	15' 48.19"	23° 26' 16"	3 m 23 s
13	60° 28' 29"	-0.50"	58° 18' 12"	20° 14' 49"	1.0120785	15' 48.18"	23° 26' 16"	3 m 23 s
14	60° 30' 53"	-0.50"	58° 20' 43"	20° 15' 19"	1.0120870	15' 48.17"	23° 26' 16"	3 m 23 s
15	60° 33' 17"	-0.51"	58° 23' 13"	20° 15' 49"	1.0120954	15' 48.16"	23° 26' 16"	3 m 23 s
16	60° 35' 41"	-0.51"	58° 25' 44"	20° 16' 19"	1.0121038	15' 48.15"	23° 26' 16"	3 m 23 s
17	60° 38' 06"	-0.51"	58° 28' 14"	20° 16' 49"	1.0121123	15' 48.15"	23° 26' 16"	3 m 22 s
18	60° 40' 30"	-0.51"	58° 30' 45"	20° 17' 19"	1.0121207	15' 48.14"	23° 26' 16"	3 m 22 s
19	60° 42' 54"	-0.51"	58° 33' 15"	20° 17' 49"	1.0121291	15' 48.13"	23° 26' 16"	3 m 22 s
20	60° 45' 19"	-0.51"	58° 35' 46"	20° 18' 19"	1.0121375	15' 48.12"	23° 26' 16"	3 m 22 s
21	60° 47' 43"	-0.51"	58° 38' 16"	20° 18' 49"	1.0121459	15' 48.11"	23° 26' 16"	3 m 22 s
22	60° 50' 07"	-0.51"	58° 40' 47"	20° 19' 19"	1.0121543	15' 48.11"	23° 26' 16"	3 m 22 s
23	60° 52' 31"	-0.51"	58° 43' 17"	20° 19' 49"	1.0121627	15' 48.10"	23° 26' 16"	3 m 21 s
24	60° 54' 56"	-0.51"	58° 45' 48"	20° 20' 18"	1.0121710	15' 48.09"	23° 26' 16"	3 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	306° 39' 44"	-5° 05' 14"	310° 26' 27"	-23° 31' 34"	0° 59' 32"	16' 13.39"	77° 10' 23"	0.69799
1	307° 15' 34"	-5° 06' 07"	311° 04' 16"	-23° 23' 06"	0° 59' 30"	16' 12.93"	76° 55' 23"	0.69353
2	307° 51' 22"	-5° 06' 58"	311° 41' 57"	-23° 14' 30"	0° 59' 29"	16' 12.46"	76° 40' 31"	0.68907
3	308° 27' 08"	-5° 07' 46"	312° 19' 32"	-23° 05' 46"	0° 59' 27"	16' 11.99"	76° 25' 48"	0.68459
4	309° 02' 52"	-5° 08' 33"	312° 56' 59"	-22° 56' 53"	0° 59' 25"	16' 11.53"	76° 11' 13"	0.68010
5	309° 38' 34"	-5° 09' 17"	313° 34' 19"	-22° 47' 52"	0° 59' 24"	16' 11.05"	75° 56' 46"	0.67559
6	310° 14' 14"	-5° 10' 00"	314° 11' 32"	-22° 38' 43"	0° 59' 22"	16' 10.58"	75° 42' 28"	0.67108
7	310° 49' 51"	-5° 10' 41"	314° 48' 38"	-22° 29' 26"	0° 59' 20"	16' 10.11"	75° 28' 19"	0.66655
8	311° 25' 27"	-5° 11' 19"	315° 25' 36"	-22° 20' 01"	0° 59' 18"	16' 09.63"	75° 14' 18"	0.66202
9	312° 01' 00"	-5° 11' 56"	316° 02' 27"	-22° 10' 29"	0° 59' 17"	16' 09.15"	75° 0' 26"	0.65747
10	312° 36' 32"	-5° 12' 30"	316° 39' 11"	-22° 00' 48"	0° 59' 15"	16' 08.67"	74° 46' 42"	0.65291
11	313° 12' 01"	-5° 13' 03"	317° 15' 47"	-21° 51' 00"	0° 59' 13"	16' 08.19"	74° 33' 08"	0.64835
12	313° 47' 28"	-5° 13' 33"	317° 52' 16"	-21° 41' 05"	0° 59' 11"	16' 07.70"	74° 19' 42"	0.64378
13	314° 22' 52"	-5° 14' 01"	318° 28' 38"	-21° 31' 02"	0° 59' 09"	16' 07.22"	74° 6' 24"	0.63919
14	314° 58' 15"	-5° 14' 28"	319° 04' 52"	-21° 20' 52"	0° 59' 08"	16' 06.73"	73° 53' 16"	0.63461
15	315° 33' 36"	-5° 14' 52"	319° 40' 59"	-21° 10' 35"	0° 59' 06"	16' 06.24"	73° 40' 17"	0.63001
16	316° 08' 54"	-5° 15' 14"	320° 16' 59"	-21° 00' 12"	0° 59' 04"	16' 05.75"	73° 27' 26"	0.62541
17	316° 44' 10"	-5° 15' 35"	320° 52' 52"	-20° 49' 41"	0° 59' 02"	16' 05.26"	73° 14' 45"	0.62080
18	317° 19' 24"	-5° 15' 53"	321° 28' 37"	-20° 39' 03"	0° 59' 00"	16' 04.77"	73° 2' 12"	0.61618
19	317° 54' 35"	-5° 16' 09"	322° 04' 15"	-20° 28' 19"	0° 58' 59"	16' 04.27"	72° 49' 49"	0.61156
20	318° 29' 45"	-5° 16' 24"	322° 39' 45"	-20° 17' 28"	0° 58' 57"	16' 03.78"	72° 37' 34"	0.60694
21	319° 04' 52"	-5° 16' 36"	323° 15' 09"	-20° 06' 31"	0° 58' 55"	16' 03.28"	72° 25' 29"	0.60231
22	319° 39' 57"	-5° 16' 47"	323° 50' 25"	-19° 55' 27"	0° 58' 53"	16' 02.78"	72° 13' 33"	0.59767
23	320° 15' 00"	-5° 16' 55"	324° 25' 34"	-19° 44' 17"	0° 58' 51"	16' 02.29"	72° 1' 46"	0.59303
24	320° 50' 01"	-5° 17' 01"	325° 00' 36"	-19° 33' 01"	0° 58' 50"	16' 01.79"	71° 50' 07"	0.58839



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	60° 54' 56"	-0.51"	58° 45' 48"	20° 20' 18"	1.0121710	15' 48.09"	23° 26' 16"	3 m 21 s
1	60° 57' 20"	-0.51"	58° 48' 18"	20° 20' 48"	1.0121794	15' 48.08"	23° 26' 16"	3 m 21 s
2	60° 59' 44"	-0.51"	58° 50' 49"	20° 21' 18"	1.0121878	15' 48.08"	23° 26' 16"	3 m 21 s
3	61° 02' 09"	-0.51"	58° 53' 19"	20° 21' 47"	1.0121961	15' 48.07"	23° 26' 16"	3 m 21 s
4	61° 04' 33"	-0.51"	58° 55' 50"	20° 22' 17"	1.0122045	15' 48.06"	23° 26' 16"	3 m 21 s
5	61° 06' 57"	-0.51"	58° 58' 21"	20° 22' 47"	1.0122129	15' 48.05"	23° 26' 16"	3 m 20 s
6	61° 09' 21"	-0.51"	59° 00' 51"	20° 23' 16"	1.0122212	15' 48.04"	23° 26' 16"	3 m 20 s
7	61° 11' 46"	-0.51"	59° 03' 22"	20° 23' 46"	1.0122295	15' 48.04"	23° 26' 16"	3 m 20 s
8	61° 14' 10"	-0.51"	59° 05' 53"	20° 24' 15"	1.0122379	15' 48.03"	23° 26' 16"	3 m 20 s
9	61° 16' 34"	-0.51"	59° 08' 23"	20° 24' 45"	1.0122462	15' 48.02"	23° 26' 16"	3 m 20 s
10	61° 18' 58"	-0.51"	59° 10' 54"	20° 25' 14"	1.0122545	15' 48.01"	23° 26' 16"	3 m 19 s
11	61° 21' 23"	-0.51"	59° 13' 25"	20° 25' 43"	1.0122629	15' 48.00"	23° 26' 16"	3 m 19 s
12	61° 23' 47"	-0.51"	59° 15' 55"	20° 26' 13"	1.0122712	15' 48.00"	23° 26' 16"	3 m 19 s
13	61° 26' 11"	-0.51"	59° 18' 26"	20° 26' 42"	1.0122795	15' 47.99"	23° 26' 16"	3 m 19 s
14	61° 28' 35"	-0.51"	59° 20' 57"	20° 27' 11"	1.0122878	15' 47.98"	23° 26' 16"	3 m 19 s
15	61° 30' 60"	-0.51"	59° 23' 28"	20° 27' 41"	1.0122961	15' 47.97"	23° 26' 16"	3 m 18 s
16	61° 33' 24"	-0.51"	59° 25' 59"	20° 28' 10"	1.0123043	15' 47.97"	23° 26' 16"	3 m 18 s
17	61° 35' 48"	-0.51"	59° 28' 29"	20° 28' 39"	1.0123126	15' 47.96"	23° 26' 16"	3 m 18 s
18	61° 38' 12"	-0.51"	59° 31' 00"	20° 29' 08"	1.0123209	15' 47.95"	23° 26' 16"	3 m 18 s
19	61° 40' 37"	-0.51"	59° 33' 31"	20° 29' 37"	1.0123292	15' 47.94"	23° 26' 16"	3 m 18 s
20	61° 43' 01"	-0.51"	59° 36' 02"	20° 30' 06"	1.0123374	15' 47.93"	23° 26' 16"	3 m 17 s
21	61° 45' 25"	-0.51"	59° 38' 33"	20° 30' 35"	1.0123457	15' 47.93"	23° 26' 16"	3 m 17 s
22	61° 47' 49"	-0.51"	59° 41' 03"	20° 31' 04"	1.0123539	15' 47.92"	23° 26' 16"	3 m 17 s
23	61° 50' 14"	-0.51"	59° 43' 34"	20° 31' 33"	1.0123622	15' 47.91"	23° 26' 16"	3 m 17 s
24	61° 52' 38"	-0.51"	59° 46' 05"	20° 32' 02"	1.0123704	15' 47.90"	23° 26' 16"	3 m 17 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	320° 50' 01"	-5° 17' 01"	325° 00' 36"	-19° 33' 01"	0° 58' 50"	16' 01.79"	71° 50' 07"	0.58839
1	321° 24' 59"	-5° 17' 06"	325° 35' 30"	-19° 21' 39"	0° 58' 48"	16' 01.29"	71° 38' 38"	0.58375
2	321° 59' 55"	-5° 17' 08"	326° 10' 18"	-19° 10' 11"	0° 58' 46"	16' 00.79"	71° 27' 19"	0.57910
3	322° 34' 49"	-5° 17' 09"	326° 44' 58"	-18° 58' 38"	0° 58' 44"	16' 00.29"	71° 16' 08"	0.57446
4	323° 09' 41"	-5° 17' 08"	327° 19' 32"	-18° 46' 58"	0° 58' 42"	15' 59.78"	71° 5' 06"	0.56981
5	323° 44' 30"	-5° 17' 04"	327° 53' 58"	-18° 35' 13"	0° 58' 40"	15' 59.28"	70° 54' 14"	0.56516
6	324° 19' 18"	-5° 16' 59"	328° 28' 18"	-18° 23' 23"	0° 58' 38"	15' 58.78"	70° 43' 31"	0.56051
7	324° 54' 03"	-5° 16' 52"	329° 02' 30"	-18° 11' 27"	0° 58' 37"	15' 58.28"	70° 32' 57"	0.55586
8	325° 28' 46"	-5° 16' 43"	329° 36' 36"	-17° 59' 26"	0° 58' 35"	15' 57.77"	70° 22' 32"	0.55121
9	326° 03' 26"	-5° 16' 32"	330° 10' 35"	-17° 47' 20"	0° 58' 33"	15' 57.27"	70° 12' 16"	0.54656
10	326° 38' 04"	-5° 16' 19"	330° 44' 27"	-17° 35' 08"	0° 58' 31"	15' 56.77"	70° 2' 10"	0.54191
11	327° 12' 40"	-5° 16' 04"	331° 18' 12"	-17° 22' 52"	0° 58' 29"	15' 56.26"	69° 52' 12"	0.53727
12	327° 47' 14"	-5° 15' 47"	331° 51' 51"	-17° 10' 31"	0° 58' 27"	15' 55.76"	69° 42' 24"	0.53262
13	328° 21' 46"	-5° 15' 29"	332° 25' 23"	-16° 58' 05"	0° 58' 26"	15' 55.26"	69° 32' 45"	0.52798
14	328° 56' 15"	-5° 15' 08"	332° 58' 49"	-16° 45' 34"	0° 58' 24"	15' 54.75"	69° 23' 15"	0.52334
15	329° 30' 42"	-5° 14' 46"	333° 32' 08"	-16° 32' 59"	0° 58' 22"	15' 54.25"	69° 13' 54"	0.51870
16	330° 05' 07"	-5° 14' 21"	334° 05' 20"	-16° 20' 20"	0° 58' 20"	15' 53.75"	69° 4' 42"	0.51407
17	330° 39' 30"	-5° 13' 55"	334° 38' 26"	-16° 07' 36"	0° 58' 18"	15' 53.24"	68° 55' 40"	0.50944
18	331° 13' 50"	-5° 13' 27"	335° 11' 26"	-15° 54' 47"	0° 58' 16"	15' 52.74"	68° 46' 46"	0.50482
19	331° 48' 09"	-5° 12' 58"	335° 44' 19"	-15° 41' 55"	0° 58' 14"	15' 52.24"	68° 38' 02"	0.50020
20	332° 22' 25"	-5° 12' 26"	336° 17' 06"	-15° 28' 58"	0° 58' 13"	15' 51.74"	68° 29' 26"	0.49558
21	332° 56' 38"	-5° 11' 53"	336° 49' 47"	-15° 15' 58"	0° 58' 11"	15' 51.23"	68° 20' 60"	0.49097
22	333° 30' 50"	-5° 11' 18"	337° 22' 22"	-15° 02' 53"	0° 58' 09"	15' 50.73"	68° 12' 43"	0.48637
23	334° 04' 59"	-5° 10' 41"	337° 54' 51"	-14° 49' 45"	0° 58' 07"	15' 50.23"	68° 4' 34"	0.48177
24	334° 39' 06"	-5° 10' 02"	338° 27' 14"	-14° 36' 33"	0° 58' 05"	15' 49.73"	67° 56' 35"	0.47718

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	61° 52' 38"	-0.51"	59° 46' 05"	20° 32' 02"	1.0123704	15' 47.90"	23° 26' 16"	3 m 17 s
1	61° 55' 02"	-0.51"	59° 48' 36"	20° 32' 31"	1.0123787	15' 47.90"	23° 26' 16"	3 m 16 s
2	61° 57' 26"	-0.51"	59° 51' 07"	20° 32' 60"	1.0123869	15' 47.89"	23° 26' 16"	3 m 16 s
3	61° 59' 51"	-0.50"	59° 53' 38"	20° 33' 29"	1.0123951	15' 47.88"	23° 26' 16"	3 m 16 s
4	62° 02' 15"	-0.50"	59° 56' 09"	20° 33' 57"	1.0124033	15' 47.87"	23° 26' 16"	3 m 16 s
5	62° 04' 39"	-0.50"	59° 58' 40"	20° 34' 26"	1.0124115	15' 47.87"	23° 26' 16"	3 m 16 s
6	62° 07' 03"	-0.50"	60° 01' 11"	20° 34' 55"	1.0124197	15' 47.86"	23° 26' 16"	3 m 15 s
7	62° 09' 27"	-0.50"	60° 03' 42"	20° 35' 23"	1.0124279	15' 47.85"	23° 26' 16"	3 m 15 s
8	62° 11' 52"	-0.50"	60° 06' 13"	20° 35' 52"	1.0124361	15' 47.84"	23° 26' 16"	3 m 15 s
9	62° 14' 16"	-0.50"	60° 08' 44"	20° 36' 21"	1.0124443	15' 47.83"	23° 26' 16"	3 m 15 s
10	62° 16' 40"	-0.50"	60° 11' 15"	20° 36' 49"	1.0124524	15' 47.83"	23° 26' 16"	3 m 15 s
11	62° 19' 04"	-0.49"	60° 13' 46"	20° 37' 18"	1.0124606	15' 47.82"	23° 26' 16"	3 m 14 s
12	62° 21' 29"	-0.49"	60° 16' 17"	20° 37' 46"	1.0124688	15' 47.81"	23° 26' 16"	3 m 14 s
13	62° 23' 53"	-0.49"	60° 18' 48"	20° 38' 15"	1.0124769	15' 47.80"	23° 26' 16"	3 m 14 s
14	62° 26' 17"	-0.49"	60° 21' 19"	20° 38' 43"	1.0124851	15' 47.80"	23° 26' 16"	3 m 14 s
15	62° 28' 41"	-0.49"	60° 23' 50"	20° 39' 11"	1.0124932	15' 47.79"	23° 26' 16"	3 m 13 s
16	62° 31' 05"	-0.49"	60° 26' 21"	20° 39' 40"	1.0125013	15' 47.78"	23° 26' 16"	3 m 13 s
17	62° 33' 30"	-0.49"	60° 28' 53"	20° 40' 08"	1.0125095	15' 47.77"	23° 26' 16"	3 m 13 s
18	62° 35' 54"	-0.48"	60° 31' 24"	20° 40' 36"	1.0125176	15' 47.77"	23° 26' 16"	3 m 13 s
19	62° 38' 18"	-0.48"	60° 33' 55"	20° 41' 04"	1.0125257	15' 47.76"	23° 26' 16"	3 m 13 s
20	62° 40' 42"	-0.48"	60° 36' 26"	20° 41' 33"	1.0125338	15' 47.75"	23° 26' 16"	3 m 12 s
21	62° 43' 06"	-0.48"	60° 38' 57"	20° 42' 01"	1.0125419	15' 47.74"	23° 26' 16"	3 m 12 s
22	62° 45' 31"	-0.48"	60° 41' 28"	20° 42' 29"	1.0125500	15' 47.74"	23° 26' 16"	3 m 12 s
23	62° 47' 55"	-0.47"	60° 43' 60"	20° 42' 57"	1.0125581	15' 47.73"	23° 26' 16"	3 m 12 s
24	62° 50' 19"	-0.47"	60° 46' 31"	20° 43' 25"	1.0125662	15' 47.72"	23° 26' 16"	3 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	334° 39' 06"	-5° 10' 02"	338° 27' 14"	-14° 36' 33"	0° 58' 05"	15' 49.73"	67° 56' 35"	0.47718
1	335° 13' 11"	-5° 09' 21"	338° 59' 31"	-14° 23' 18"	0° 58' 03"	15' 49.23"	67° 48' 45"	0.47260
2	335° 47' 14"	-5° 08' 39"	339° 31' 42"	-14° 09' 59"	0° 58' 02"	15' 48.73"	67° 41' 03"	0.46802
3	336° 21' 14"	-5° 07' 55"	340° 03' 47"	-13° 56' 36"	0° 57' 60"	15' 48.23"	67° 33' 31"	0.46346
4	336° 55' 12"	-5° 07' 09"	340° 35' 46"	-13° 43' 10"	0° 57' 58"	15' 47.74"	67° 26' 08"	0.45890
5	337° 29' 09"	-5° 06' 21"	341° 07' 40"	-13° 29' 41"	0° 57' 56"	15' 47.24"	67° 18' 53"	0.45434
6	338° 03' 02"	-5° 05' 32"	341° 39' 29"	-13° 16' 09"	0° 57' 54"	15' 46.74"	67° 11' 47"	0.44980
7	338° 36' 54"	-5° 04' 41"	342° 11' 11"	-13° 02' 33"	0° 57' 52"	15' 46.25"	67° 4' 51"	0.44527
8	339° 10' 44"	-5° 03' 48"	342° 42' 49"	-12° 48' 55"	0° 57' 51"	15' 45.75"	66° 58' 03"	0.44074
9	339° 44' 31"	-5° 02' 54"	343° 14' 21"	-12° 35' 14"	0° 57' 49"	15' 45.26"	66° 51' 24"	0.43623
10	340° 18' 16"	-5° 01' 58"	343° 45' 47"	-12° 21' 29"	0° 57' 47"	15' 44.77"	66° 44' 54"	0.43172
11	340° 51' 59"	-5° 01' 00"	344° 17' 09"	-12° 07' 42"	0° 57' 45"	15' 44.27"	66° 38' 32"	0.42723
12	341° 25' 40"	-5° 00' 01"	344° 48' 25"	-11° 53' 53"	0° 57' 43"	15' 43.78"	66° 32' 19"	0.42275
13	341° 59' 19"	-4° 58' 59"	345° 19' 36"	-11° 40' 01"	0° 57' 42"	15' 43.30"	66° 26' 16"	0.41827
14	342° 32' 55"	-4° 57' 57"	345° 50' 43"	-11° 26' 06"	0° 57' 40"	15' 42.81"	66° 20' 20"	0.41381
15	343° 06' 30"	-4° 56' 52"	346° 21' 44"	-11° 12' 09"	0° 57' 38"	15' 42.32"	66° 14' 34"	0.40936
16	343° 40' 02"	-4° 55' 46"	346° 52' 40"	-10° 58' 09"	0° 57' 36"	15' 41.83"	66° 8' 56"	0.40493
17	344° 13' 32"	-4° 54' 39"	347° 23' 32"	-10° 44' 07"	0° 57' 35"	15' 41.35"	66° 3' 27"	0.40050
18	344° 47' 00"	-4° 53' 29"	347° 54' 19"	-10° 30' 04"	0° 57' 33"	15' 40.87"	65° 58' 06"	0.39609
19	345° 20' 26"	-4° 52' 19"	348° 25' 01"	-10° 15' 57"	0° 57' 31"	15' 40.38"	65° 52' 55"	0.39169
20	345° 53' 50"	-4° 51' 06"	348° 55' 39"	-10° 01' 49"	0° 57' 29"	15' 39.90"	65° 47' 51"	0.38731
21	346° 27' 11"	-4° 49' 52"	349° 26' 12"	-9° 47' 39"	0° 57' 27"	15' 39.42"	65° 42' 57"	0.38294
22	347° 00' 31"	-4° 48' 37"	349° 56' 41"	-9° 33' 27"	0° 57' 26"	15' 38.95"	65° 38' 11"	0.37858
23	347° 33' 49"	-4° 47' 20"	350° 27' 05"	-9° 19' 14"	0° 57' 24"	15' 38.47"	65° 33' 33"	0.37423
24	348° 07' 04"	-4° 46' 01"	350° 57' 25"	-9° 04' 58"	0° 57' 22"	15' 37.99"	65° 29' 04"	0.36991



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	62° 50' 19"	-0.47"	60° 46' 31"	20° 43' 25"	1.0125662	15' 47.72"	23° 26' 16"	3 m 11 s
1	62° 52' 43"	-0.47"	60° 49' 02"	20° 43' 53"	1.0125742	15' 47.71"	23° 26' 16"	3 m 11 s
2	62° 55' 07"	-0.47"	60° 51' 33"	20° 44' 21"	1.0125823	15' 47.71"	23° 26' 16"	3 m 11 s
3	62° 57' 32"	-0.47"	60° 54' 05"	20° 44' 49"	1.0125904	15' 47.70"	23° 26' 16"	3 m 11 s
4	62° 59' 56"	-0.46"	60° 56' 36"	20° 45' 17"	1.0125984	15' 47.69"	23° 26' 16"	3 m 11 s
5	63° 02' 20"	-0.46"	60° 59' 07"	20° 45' 44"	1.0126064	15' 47.68"	23° 26' 16"	3 m 10 s
6	63° 04' 44"	-0.46"	61° 01' 38"	20° 46' 12"	1.0126145	15' 47.68"	23° 26' 16"	3 m 10 s
7	63° 07' 08"	-0.46"	61° 04' 10"	20° 46' 40"	1.0126225	15' 47.67"	23° 26' 16"	3 m 10 s
8	63° 09' 32"	-0.45"	61° 06' 41"	20° 47' 08"	1.0126305	15' 47.66"	23° 26' 16"	3 m 10 s
9	63° 11' 57"	-0.45"	61° 09' 12"	20° 47' 35"	1.0126385	15' 47.65"	23° 26' 16"	3 m 09 s
10	63° 14' 21"	-0.45"	61° 11' 44"	20° 48' 03"	1.0126466	15' 47.65"	23° 26' 16"	3 m 09 s
11	63° 16' 45"	-0.45"	61° 14' 15"	20° 48' 31"	1.0126546	15' 47.64"	23° 26' 16"	3 m 09 s
12	63° 19' 09"	-0.44"	61° 16' 47"	20° 48' 58"	1.0126625	15' 47.63"	23° 26' 16"	3 m 09 s
13	63° 21' 33"	-0.44"	61° 19' 18"	20° 49' 26"	1.0126705	15' 47.62"	23° 26' 16"	3 m 08 s
14	63° 23' 58"	-0.44"	61° 21' 49"	20° 49' 53"	1.0126785	15' 47.62"	23° 26' 16"	3 m 08 s
15	63° 26' 22"	-0.44"	61° 24' 21"	20° 50' 21"	1.0126865	15' 47.61"	23° 26' 16"	3 m 08 s
16	63° 28' 46"	-0.43"	61° 26' 52"	20° 50' 48"	1.0126944	15' 47.60"	23° 26' 16"	3 m 08 s
17	63° 31' 10"	-0.43"	61° 29' 24"	20° 51' 16"	1.0127024	15' 47.59"	23° 26' 16"	3 m 08 s
18	63° 33' 34"	-0.43"	61° 31' 55"	20° 51' 43"	1.0127103	15' 47.59"	23° 26' 16"	3 m 07 s
19	63° 35' 58"	-0.42"	61° 34' 27"	20° 52' 10"	1.0127183	15' 47.58"	23° 26' 16"	3 m 07 s
20	63° 38' 22"	-0.42"	61° 36' 58"	20° 52' 37"	1.0127262	15' 47.57"	23° 26' 16"	3 m 07 s
21	63° 40' 47"	-0.42"	61° 39' 30"	20° 53' 05"	1.0127341	15' 47.56"	23° 26' 16"	3 m 07 s
22	63° 43' 11"	-0.41"	61° 42' 01"	20° 53' 32"	1.0127421	15' 47.56"	23° 26' 16"	3 m 06 s
23	63° 45' 35"	-0.41"	61° 44' 33"	20° 53' 59"	1.0127500	15' 47.55"	23° 26' 16"	3 m 06 s
24	63° 47' 59"	-0.41"	61° 47' 04"	20° 54' 26"	1.0127579	15' 47.54"	23° 26' 16"	3 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	348° 07' 04"	-4° 46' 01"	350° 57' 25"	-9° 04' 58"	0° 57' 22"	15' 37.99"	65° 29' 04"	0.36991
1	348° 40' 17"	-4° 44' 41"	351° 27' 41"	-8° 50' 41"	0° 57' 20"	15' 37.52"	65° 24' 43"	0.36559
2	349° 13' 29"	-4° 43' 19"	351° 57' 53"	-8° 36' 22"	0° 57' 19"	15' 37.05"	65° 20' 31"	0.36129
3	349° 46' 38"	-4° 41' 56"	352° 28' 01"	-8° 22' 02"	0° 57' 17"	15' 36.58"	65° 16' 27"	0.35701
4	350° 19' 45"	-4° 40' 32"	352° 58' 05"	-8° 07' 40"	0° 57' 15"	15' 36.11"	65° 12' 32"	0.35274
5	350° 52' 50"	-4° 39' 06"	353° 28' 05"	-7° 53' 17"	0° 57' 14"	15' 35.64"	65° 8' 45"	0.34849
6	351° 25' 54"	-4° 37' 38"	353° 58' 02"	-7° 38' 53"	0° 57' 12"	15' 35.17"	65° 5' 07"	0.34426
7	351° 58' 55"	-4° 36' 09"	354° 27' 54"	-7° 24' 27"	0° 57' 10"	15' 34.71"	65° 1' 37"	0.34004
8	352° 31' 54"	-4° 34' 39"	354° 57' 43"	-7° 10' 00"	0° 57' 08"	15' 34.25"	64° 58' 15"	0.33583
9	353° 04' 51"	-4° 33' 07"	355° 27' 28"	-6° 55' 32"	0° 57' 07"	15' 33.78"	64° 55' 02"	0.33165
10	353° 37' 46"	-4° 31' 34"	355° 57' 10"	-6° 41' 03"	0° 57' 05"	15' 33.33"	64° 51' 57"	0.32748
11	354° 10' 39"	-4° 29' 59"	356° 26' 49"	-6° 26' 33"	0° 57' 03"	15' 32.87"	64° 49' 00"	0.32333
12	354° 43' 30"	-4° 28' 23"	356° 56' 24"	-6° 12' 03"	0° 57' 02"	15' 32.41"	64° 46' 12"	0.31920
13	355° 16' 20"	-4° 26' 46"	357° 25' 56"	-5° 57' 31"	0° 57' 00"	15' 31.96"	64° 43' 32"	0.31509
14	355° 49' 07"	-4° 25' 07"	357° 55' 24"	-5° 42' 59"	0° 56' 58"	15' 31.50"	64° 40' 60"	0.31099
15	356° 21' 52"	-4° 23' 27"	358° 24' 50"	-5° 28' 25"	0° 56' 57"	15' 31.05"	64° 38' 36"	0.30691
16	356° 54' 36"	-4° 21' 46"	358° 54' 12"	-5° 13' 52"	0° 56' 55"	15' 30.60"	64° 36' 21"	0.30286
17	357° 27' 17"	-4° 20' 03"	359° 23' 32"	-4° 59' 17"	0° 56' 53"	15' 30.16"	64° 34' 13"	0.29882
18	357° 59' 57"	-4° 18' 19"	359° 52' 48"	-4° 44' 43"	0° 56' 52"	15' 29.71"	64° 32' 14"	0.29480
19	358° 32' 34"	-4° 16' 33"	0° 22' 02"	-4° 30' 07"	0° 56' 50"	15' 29.27"	64° 30' 24"	0.29080
20	359° 05' 10"	-4° 14' 47"	0° 51' 13"	-4° 15' 32"	0° 56' 49"	15' 28.83"	64° 28' 41"	0.28682
21	359° 37' 44"	-4° 12' 59"	1° 20' 22"	-4° 00' 56"	0° 56' 47"	15' 28.39"	64° 27' 06"	0.28286
22	0° 10' 16"	-4° 11' 10"	1° 49' 27"	-3° 46' 20"	0° 56' 45"	15' 27.95"	64° 25' 40"	0.27892
23	0° 42' 46"	-4° 09' 19"	2° 18' 31"	-3° 31' 43"	0° 56' 44"	15' 27.51"	64° 24' 22"	0.27500
24	1° 15' 14"	-4° 07' 28"	2° 47' 32"	-3° 17' 07"	0° 56' 42"	15' 27.08"	64° 23' 12"	0.27111

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	63° 47' 59"	-0.41"	61° 47' 04"	20° 54' 26"	1.0127579	15' 47.54"	23° 26' 16"	3 m 06 s
1	63° 50' 23"	-0.41"	61° 49' 36"	20° 54' 53"	1.0127658	15' 47.53"	23° 26' 16"	3 m 06 s
2	63° 52' 47"	-0.40"	61° 52' 07"	20° 55' 20"	1.0127737	15' 47.53"	23° 26' 16"	3 m 05 s
3	63° 55' 12"	-0.40"	61° 54' 39"	20° 55' 47"	1.0127815	15' 47.52"	23° 26' 16"	3 m 05 s
4	63° 57' 36"	-0.40"	61° 57' 11"	20° 56' 14"	1.0127894	15' 47.51"	23° 26' 16"	3 m 05 s
5	63° 59' 60"	-0.39"	61° 59' 42"	20° 56' 41"	1.0127973	15' 47.50"	23° 26' 16"	3 m 05 s
6	64° 02' 24"	-0.39"	62° 02' 14"	20° 57' 08"	1.0128051	15' 47.50"	23° 26' 16"	3 m 04 s
7	64° 04' 48"	-0.38"	62° 04' 45"	20° 57' 35"	1.0128130	15' 47.49"	23° 26' 16"	3 m 04 s
8	64° 07' 12"	-0.38"	62° 07' 17"	20° 58' 02"	1.0128208	15' 47.48"	23° 26' 16"	3 m 04 s
9	64° 09' 36"	-0.38"	62° 09' 49"	20° 58' 29"	1.0128287	15' 47.48"	23° 26' 16"	3 m 04 s
10	64° 12' 01"	-0.37"	62° 12' 20"	20° 58' 55"	1.0128365	15' 47.47"	23° 26' 16"	3 m 03 s
11	64° 14' 25"	-0.37"	62° 14' 52"	20° 59' 22"	1.0128443	15' 47.46"	23° 26' 16"	3 m 03 s
12	64° 16' 49"	-0.37"	62° 17' 24"	20° 59' 49"	1.0128521	15' 47.45"	23° 26' 16"	3 m 03 s
13	64° 19' 13"	-0.36"	62° 19' 56"	21° 00' 16"	1.0128599	15' 47.45"	23° 26' 16"	3 m 03 s
14	64° 21' 37"	-0.36"	62° 22' 27"	21° 00' 42"	1.0128677	15' 47.44"	23° 26' 16"	3 m 02 s
15	64° 24' 01"	-0.36"	62° 24' 59"	21° 01' 09"	1.0128755	15' 47.43"	23° 26' 16"	3 m 02 s
16	64° 26' 25"	-0.35"	62° 27' 31"	21° 01' 35"	1.0128833	15' 47.42"	23° 26' 16"	3 m 02 s
17	64° 28' 49"	-0.35"	62° 30' 03"	21° 02' 02"	1.0128910	15' 47.42"	23° 26' 16"	3 m 02 s
18	64° 31' 14"	-0.34"	62° 32' 34"	21° 02' 28"	1.0128988	15' 47.41"	23° 26' 16"	3 m 01 s
19	64° 33' 38"	-0.34"	62° 35' 06"	21° 02' 55"	1.0129066	15' 47.40"	23° 26' 16"	3 m 01 s
20	64° 36' 02"	-0.34"	62° 37' 38"	21° 03' 21"	1.0129143	15' 47.40"	23° 26' 16"	3 m 01 s
21	64° 38' 26"	-0.33"	62° 40' 10"	21° 03' 47"	1.0129221	15' 47.39"	23° 26' 16"	3 m 01 s
22	64° 40' 50"	-0.33"	62° 42' 42"	21° 04' 14"	1.0129298	15' 47.38"	23° 26' 16"	3 m 00 s
23	64° 43' 14"	-0.32"	62° 45' 14"	21° 04' 40"	1.0129375	15' 47.37"	23° 26' 16"	2 m 60 s
24	64° 45' 38"	-0.32"	62° 47' 45"	21° 05' 06"	1.0129452	15' 47.37"	23° 26' 16"	2 m 60 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	1° 15' 14"	-4° 07' 28"	2° 47' 32"	-3° 17' 07"	0° 56' 42"	15' 27.08"	64° 23' 12"	0.27111
1	1° 47' 40"	-4° 05' 35"	3° 16' 30"	-3° 02' 30"	0° 56' 41"	15' 26.65"	64° 22' 10"	0.26723
2	2° 20' 05"	-4° 03' 41"	3° 45' 26"	-2° 47' 53"	0° 56' 39"	15' 26.22"	64° 21' 16"	0.26337
3	2° 52' 28"	-4° 01' 45"	4° 14' 20"	-2° 33' 17"	0° 56' 37"	15' 25.79"	64° 20' 30"	0.25954
4	3° 24' 49"	-3° 59' 49"	4° 43' 12"	-2° 18' 40"	0° 56' 36"	15' 25.36"	64° 19' 53"	0.25573
5	3° 57' 08"	-3° 57' 51"	5° 12' 02"	-2° 04' 04"	0° 56' 34"	15' 24.94"	64° 19' 23"	0.25194
6	4° 29' 25"	-3° 55' 53"	5° 40' 50"	-1° 49' 28"	0° 56' 33"	15' 24.51"	64° 19' 02"	0.24817
7	5° 01' 41"	-3° 53' 53"	6° 09' 36"	-1° 34' 52"	0° 56' 31"	15' 24.09"	64° 18' 48"	0.24443
8	5° 33' 54"	-3° 51' 52"	6° 38' 20"	-1° 20' 17"	0° 56' 30"	15' 23.68"	64° 18' 43"	0.24070
9	6° 06' 06"	-3° 49' 50"	7° 07' 02"	-1° 05' 41"	0° 56' 28"	15' 23.26"	64° 18' 46"	0.23700
10	6° 38' 17"	-3° 47' 46"	7° 35' 43"	0° 51' 07"	0° 56' 27"	15' 22.84"	64° 18' 56"	0.23333
11	7° 10' 25"	-3° 45' 42"	8° 04' 22"	0° 36' 33"	0° 56' 25"	15' 22.43"	64° 19' 15"	0.22967
12	7° 42' 32"	-3° 43' 37"	8° 32' 59"	0° 21' 59"	0° 56' 24"	15' 22.02"	64° 19' 42"	0.22604
13	8° 14' 37"	-3° 41' 30"	9° 01' 35"	0° 7' 26"	0° 56' 22"	15' 21.61"	64° 20' 17"	0.22244
14	8° 46' 40"	-3° 39' 23"	9° 30' 10"	0° 07' 06"	0° 56' 21"	15' 21.21"	64° 21' 00"	0.21885
15	9° 18' 42"	-3° 37' 14"	9° 58' 43"	0° 21' 37"	0° 56' 19"	15' 20.80"	64° 21' 52"	0.21530
16	9° 50' 42"	-3° 35' 05"	10° 27' 14"	0° 36' 08"	0° 56' 18"	15' 20.40"	64° 22' 51"	0.21176
17	10° 22' 40"	-3° 32' 54"	10° 55' 45"	0° 50' 38"	0° 56' 16"	15' 20.00"	64° 23' 58"	0.20825
18	10° 54' 37"	-3° 30' 43"	11° 24' 15"	1° 05' 07"	0° 56' 15"	15' 19.60"	64° 25' 14"	0.20477
19	11° 26' 31"	-3° 28' 30"	11° 52' 43"	1° 19' 35"	0° 56' 13"	15' 19.21"	64° 26' 37"	0.20130
20	11° 58' 25"	-3° 26' 17"	12° 21' 10"	1° 34' 02"	0° 56' 12"	15' 18.81"	64° 28' 09"	0.19787
21	12° 30' 16"	-3° 24' 02"	12° 49' 37"	1° 48' 28"	0° 56' 10"	15' 18.42"	64° 29' 49"	0.19446
22	13° 02' 06"	-3° 21' 47"	13° 18' 02"	2° 02' 53"	0° 56' 09"	15' 18.03"	64° 31' 37"	0.19107
23	13° 33' 55"	-3° 19' 30"	13° 46' 27"	2° 17' 17"	0° 56' 08"	15' 17.64"	64° 33' 33"	0.18771
24	14° 05' 41"	-3° 17' 13"	14° 14' 51"	2° 31' 39"	0° 56' 06"	15' 17.26"	64° 35' 37"	0.18438



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	64° 45' 38"	-0.32"	62° 47' 45"	21° 05' 06"	1.0129452	15' 47.37"	23° 26' 16"	2 m 60 s
1	64° 48' 02"	-0.31"	62° 50' 17"	21° 05' 32"	1.0129529	15' 47.36"	23° 26' 16"	2 m 59 s
2	64° 50' 26"	-0.31"	62° 52' 49"	21° 05' 58"	1.0129606	15' 47.35"	23° 26' 16"	2 m 59 s
3	64° 52' 51"	-0.31"	62° 55' 21"	21° 06' 25"	1.0129683	15' 47.34"	23° 26' 16"	2 m 59 s
4	64° 55' 15"	-0.30"	62° 57' 53"	21° 06' 51"	1.0129760	15' 47.34"	23° 26' 16"	2 m 59 s
5	64° 57' 39"	-0.30"	63° 00' 25"	21° 07' 17"	1.0129837	15' 47.33"	23° 26' 16"	2 m 58 s
6	65° 00' 03"	-0.29"	63° 02' 57"	21° 07' 43"	1.0129913	15' 47.32"	23° 26' 16"	2 m 58 s
7	65° 02' 27"	-0.29"	63° 05' 29"	21° 08' 09"	1.0129990	15' 47.32"	23° 26' 16"	2 m 58 s
8	65° 04' 51"	-0.28"	63° 08' 01"	21° 08' 35"	1.0130067	15' 47.31"	23° 26' 16"	2 m 58 s
9	65° 07' 15"	-0.28"	63° 10' 33"	21° 09' 00"	1.0130143	15' 47.30"	23° 26' 16"	2 m 57 s
10	65° 09' 39"	-0.28"	63° 13' 05"	21° 09' 26"	1.0130219	15' 47.29"	23° 26' 16"	2 m 57 s
11	65° 12' 03"	-0.27"	63° 15' 37"	21° 09' 52"	1.0130296	15' 47.29"	23° 26' 16"	2 m 57 s
12	65° 14' 27"	-0.27"	63° 18' 09"	21° 10' 18"	1.0130372	15' 47.28"	23° 26' 16"	2 m 56 s
13	65° 16' 52"	-0.26"	63° 20' 41"	21° 10' 44"	1.0130448	15' 47.27"	23° 26' 16"	2 m 56 s
14	65° 19' 16"	-0.26"	63° 23' 13"	21° 11' 09"	1.0130524	15' 47.27"	23° 26' 16"	2 m 56 s
15	65° 21' 40"	-0.25"	63° 25' 45"	21° 11' 35"	1.0130600	15' 47.26"	23° 26' 16"	2 m 56 s
16	65° 24' 04"	-0.25"	63° 28' 17"	21° 12' 01"	1.0130676	15' 47.25"	23° 26' 16"	2 m 55 s
17	65° 26' 28"	-0.24"	63° 30' 49"	21° 12' 26"	1.0130751	15' 47.24"	23° 26' 16"	2 m 55 s
18	65° 28' 52"	-0.24"	63° 33' 21"	21° 12' 52"	1.0130827	15' 47.24"	23° 26' 16"	2 m 55 s
19	65° 31' 16"	-0.23"	63° 35' 53"	21° 13' 17"	1.0130903	15' 47.23"	23° 26' 16"	2 m 55 s
20	65° 33' 40"	-0.23"	63° 38' 25"	21° 13' 43"	1.0130978	15' 47.22"	23° 26' 16"	2 m 54 s
21	65° 36' 04"	-0.22"	63° 40' 58"	21° 14' 08"	1.0131053	15' 47.22"	23° 26' 16"	2 m 54 s
22	65° 38' 28"	-0.22"	63° 43' 30"	21° 14' 33"	1.0131129	15' 47.21"	23° 26' 16"	2 m 54 s
23	65° 40' 52"	-0.21"	63° 46' 02"	21° 14' 59"	1.0131204	15' 47.20"	23° 26' 16"	2 m 53 s
24	65° 43' 16"	-0.21"	63° 48' 34"	21° 15' 24"	1.0131279	15' 47.20"	23° 26' 16"	2 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	14° 05' 41"	-3° 17' 13"	14° 14' 51"	2° 31' 39"	0° 56' 06"	15' 17.26"	64° 35' 37"	0.18438
1	14° 37' 27"	-3° 14' 55"	14° 43' 15"	2° 46' 00"	0° 56' 05"	15' 16.87"	64° 37' 50"	0.18107
2	15° 09' 10"	-3° 12' 36"	15° 11' 38"	3° 00' 20"	0° 56' 03"	15' 16.49"	64° 40' 10"	0.17779
3	15° 40' 52"	-3° 10' 16"	15° 39' 60"	3° 14' 38"	0° 56' 02"	15' 16.11"	64° 42' 39"	0.17453
4	16° 12' 33"	-3° 07' 55"	16° 08' 22"	3° 28' 55"	0° 56' 00"	15' 15.73"	64° 45' 16"	0.17130
5	16° 44' 12"	-3° 05' 34"	16° 36' 43"	3° 43' 11"	0° 55' 59"	15' 15.36"	64° 48' 01"	0.16810
6	17° 15' 49"	-3° 03' 11"	17° 05' 04"	3° 57' 25"	0° 55' 58"	15' 14.99"	64° 50' 55"	0.16492
7	17° 47' 25"	-3° 00' 48"	17° 33' 25"	4° 11' 37"	0° 55' 56"	15' 14.62"	64° 53' 57"	0.16177
8	18° 18' 59"	-2° 58' 24"	18° 01' 46"	4° 25' 48"	0° 55' 55"	15' 14.25"	64° 57' 07"	0.15865
9	18° 50' 32"	-2° 55' 59"	18° 30' 06"	4° 39' 57"	0° 55' 54"	15' 13.88"	65° 0' 25"	0.15556
10	19° 22' 03"	-2° 53' 33"	18° 58' 26"	4° 54' 04"	0° 55' 52"	15' 13.51"	65° 3' 52"	0.15249
11	19° 53' 33"	-2° 51' 07"	19° 26' 47"	5° 08' 10"	0° 55' 51"	15' 13.15"	65° 7' 27"	0.14945
12	20° 25' 02"	-2° 48' 40"	19° 55' 07"	5° 22' 13"	0° 55' 50"	15' 12.79"	65° 11' 11"	0.14643
13	20° 56' 28"	-2° 46' 12"	20° 23' 28"	5° 36' 15"	0° 55' 48"	15' 12.43"	65° 15' 03"	0.14345
14	21° 27' 54"	-2° 43' 43"	20° 51' 48"	5° 50' 15"	0° 55' 47"	15' 12.08"	65° 19' 04"	0.14049
15	21° 59' 18"	-2° 41' 14"	21° 20' 09"	6° 04' 13"	0° 55' 46"	15' 11.72"	65° 23' 13"	0.13756
16	22° 30' 40"	-2° 38' 44"	21° 48' 31"	6° 18' 08"	0° 55' 44"	15' 11.37"	65° 27' 31"	0.13466
17	23° 02' 02"	-2° 36' 13"	22° 16' 52"	6° 32' 02"	0° 55' 43"	15' 11.02"	65° 31' 58"	0.13178
18	23° 33' 21"	-2° 33' 42"	22° 45' 14"	6° 45' 53"	0° 55' 42"	15' 10.67"	65° 36' 33"	0.12894
19	24° 04' 40"	-2° 31' 10"	23° 13' 36"	6° 59' 43"	0° 55' 41"	15' 10.33"	65° 41' 17"	0.12612
20	24° 35' 57"	-2° 28' 37"	23° 41' 59"	7° 13' 30"	0° 55' 39"	15' 09.98"	65° 46' 10"	0.12334
21	25° 07' 12"	-2° 26' 04"	24° 10' 23"	7° 27' 14"	0° 55' 38"	15' 09.64"	65° 51' 11"	0.12058
22	25° 38' 26"	-2° 23' 30"	24° 38' 47"	7° 40' 56"	0° 55' 37"	15' 09.30"	65° 56' 22"	0.11785
23	26° 09' 39"	-2° 20' 56"	25° 07' 12"	7° 54' 36"	0° 55' 36"	15' 08.96"	66° 1' 41"	0.11515
24	26° 40' 51"	-2° 18' 20"	25° 35' 38"	8° 08' 14"	0° 55' 34"	15' 08.63"	66° 7' 10"	0.11247

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	65° 43' 16"	-0.21"	63° 48' 34"	21° 15' 24"	1.0131279	15' 47.20"	23° 26' 16"	2 m 53 s
1	65° 45' 40"	-0.20"	63° 51' 06"	21° 15' 49"	1.0131354	15' 47.19"	23° 26' 16"	2 m 53 s
2	65° 48' 05"	-0.20"	63° 53' 39"	21° 16' 15"	1.0131429	15' 47.18"	23° 26' 16"	2 m 53 s
3	65° 50' 29"	-0.19"	63° 56' 11"	21° 16' 40"	1.0131504	15' 47.17"	23° 26' 16"	2 m 52 s
4	65° 52' 53"	-0.19"	63° 58' 43"	21° 17' 05"	1.0131579	15' 47.17"	23° 26' 16"	2 m 52 s
5	65° 55' 17"	-0.18"	64° 01' 15"	21° 17' 30"	1.0131654	15' 47.16"	23° 26' 16"	2 m 52 s
6	65° 57' 41"	-0.18"	64° 03' 47"	21° 17' 55"	1.0131728	15' 47.15"	23° 26' 16"	2 m 51 s
7	66° 00' 05"	-0.17"	64° 06' 20"	21° 18' 20"	1.0131803	15' 47.15"	23° 26' 16"	2 m 51 s
8	66° 02' 29"	-0.17"	64° 08' 52"	21° 18' 45"	1.0131877	15' 47.14"	23° 26' 16"	2 m 51 s
9	66° 04' 53"	-0.16"	64° 11' 24"	21° 19' 10"	1.0131952	15' 47.13"	23° 26' 16"	2 m 50 s
10	66° 07' 17"	-0.16"	64° 13' 57"	21° 19' 35"	1.0132026	15' 47.13"	23° 26' 16"	2 m 50 s
11	66° 09' 41"	-0.15"	64° 16' 29"	21° 20' 00"	1.0132100	15' 47.12"	23° 26' 16"	2 m 50 s
12	66° 12' 05"	-0.15"	64° 19' 01"	21° 20' 25"	1.0132175	15' 47.11"	23° 26' 16"	2 m 50 s
13	66° 14' 29"	-0.14"	64° 21' 34"	21° 20' 50"	1.0132249	15' 47.10"	23° 26' 16"	2 m 49 s
14	66° 16' 53"	-0.14"	64° 24' 06"	21° 21' 14"	1.0132323	15' 47.10"	23° 26' 16"	2 m 49 s
15	66° 19' 17"	-0.13"	64° 26' 38"	21° 21' 39"	1.0132396	15' 47.09"	23° 26' 16"	2 m 49 s
16	66° 21' 41"	-0.13"	64° 29' 11"	21° 22' 04"	1.0132470	15' 47.08"	23° 26' 16"	2 m 48 s
17	66° 24' 05"	-0.12"	64° 31' 43"	21° 22' 29"	1.0132544	15' 47.08"	23° 26' 16"	2 m 48 s
18	66° 26' 29"	-0.11"	64° 34' 15"	21° 22' 53"	1.0132618	15' 47.07"	23° 26' 16"	2 m 48 s
19	66° 28' 53"	-0.11"	64° 36' 48"	21° 23' 18"	1.0132691	15' 47.06"	23° 26' 16"	2 m 48 s
20	66° 31' 17"	-0.10"	64° 39' 20"	21° 23' 42"	1.0132764	15' 47.06"	23° 26' 16"	2 m 47 s
21	66° 33' 41"	-0.10"	64° 41' 53"	21° 24' 07"	1.0132838	15' 47.05"	23° 26' 16"	2 m 47 s
22	66° 36' 05"	-0.09"	64° 44' 25"	21° 24' 31"	1.0132911	15' 47.04"	23° 26' 16"	2 m 47 s
23	66° 38' 30"	-0.09"	64° 46' 58"	21° 24' 56"	1.0132984	15' 47.04"	23° 26' 16"	2 m 46 s
24	66° 40' 54"	-0.08"	64° 49' 30"	21° 25' 20"	1.0133057	15' 47.03"	23° 26' 16"	2 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	26° 40' 51"	-2° 18' 20"	25° 35' 38"	8° 08' 14"	0° 55' 34"	15' 08.63"	66° 7' 10"	0.11247
1	27° 12' 01"	-2° 15' 45"	26° 04' 04"	8° 21' 49"	0° 55' 33"	15' 08.30"	66° 12' 47"	0.10983
2	27° 43' 09"	-2° 13' 09"	26° 32' 31"	8° 35' 21"	0° 55' 32"	15' 07.96"	66° 18' 34"	0.10722
3	28° 14' 17"	-2° 10' 32"	27° 00' 60"	8° 48' 50"	0° 55' 31"	15' 07.64"	66° 24' 30"	0.10464
4	28° 45' 23"	-2° 07' 54"	27° 29' 29"	9° 02' 18"	0° 55' 30"	15' 07.31"	66° 30' 36"	0.10208
5	29° 16' 28"	-2° 05' 17"	27° 57' 59"	9° 15' 42"	0° 55' 28"	15' 06.98"	66° 36' 50"	0.09956
6	29° 47' 31"	-2° 02' 38"	28° 26' 31"	9° 29' 03"	0° 55' 27"	15' 06.66"	66° 43' 15"	0.09706
7	30° 18' 34"	-1° 59' 59"	28° 55' 03"	9° 42' 22"	0° 55' 26"	15' 06.34"	66° 49' 49"	0.09460
8	30° 49' 35"	-1° 57' 20"	29° 23' 37"	9° 55' 38"	0° 55' 25"	15' 06.02"	66° 56' 33"	0.09217
9	31° 20' 35"	-1° 54' 40"	29° 52' 12"	10° 08' 51"	0° 55' 24"	15' 05.70"	67° 3' 26"	0.08976
10	31° 51' 33"	-1° 52' 00"	30° 20' 48"	10° 22' 01"	0° 55' 23"	15' 05.39"	67° 10' 30"	0.08739
11	32° 22' 30"	-1° 49' 19"	30° 49' 25"	10° 35' 08"	0° 55' 21"	15' 05.08"	67° 17' 44"	0.08504
12	32° 53' 26"	-1° 46' 38"	31° 18' 04"	10° 48' 12"	0° 55' 20"	15' 04.77"	67° 25' 08"	0.08273
13	33° 24' 21"	-1° 43' 57"	31° 46' 45"	11° 01' 12"	0° 55' 19"	15' 04.46"	67° 32' 42"	0.08045
14	33° 55' 15"	-1° 41' 15"	32° 15' 27"	11° 14' 10"	0° 55' 18"	15' 04.15"	67° 40' 27"	0.07820
15	34° 26' 07"	-1° 38' 32"	32° 44' 10"	11° 27' 04"	0° 55' 17"	15' 03.85"	67° 48' 22"	0.07598
16	34° 56' 59"	-1° 35' 50"	33° 12' 55"	11° 39' 55"	0° 55' 16"	15' 03.55"	67° 56' 29"	0.07379
17	35° 27' 49"	-1° 33' 07"	33° 41' 42"	11° 52' 43"	0° 55' 15"	15' 03.25"	68° 4' 46"	0.07163
18	35° 58' 37"	-1° 30' 23"	34° 10' 30"	12° 05' 27"	0° 55' 14"	15' 02.95"	68° 13' 15"	0.06950
19	36° 29' 25"	-1° 27' 40"	34° 39' 20"	12° 18' 08"	0° 55' 12"	15' 02.65"	68° 21' 55"	0.06740
20	37° 00' 12"	-1° 24' 56"	35° 08' 12"	12° 30' 46"	0° 55' 11"	15' 02.36"	68° 30' 46"	0.06534
21	37° 30' 57"	-1° 22' 11"	35° 37' 06"	12° 43' 20"	0° 55' 10"	15' 02.07"	68° 39' 50"	0.06330
22	38° 01' 42"	-1° 19' 27"	36° 06' 01"	12° 55' 50"	0° 55' 09"	15' 01.78"	68° 49' 05"	0.06130
23	38° 32' 25"	-1° 16' 42"	36° 34' 59"	13° 08' 17"	0° 55' 08"	15' 01.49"	68° 58' 33"	0.05933
24	39° 03' 07"	-1° 13' 56"	37° 03' 58"	13° 20' 40"	0° 55' 07"	15' 01.20"	69° 8' 14"	0.05739



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	66° 40' 54"	-0.08"	64° 49' 30"	21° 25' 20"	1.0133057	15' 47.03"	23° 26' 16"	2 m 46 s
1	66° 43' 18"	-0.08"	64° 52' 03"	21° 25' 44"	1.0133130	15' 47.02"	23° 26' 16"	2 m 46 s
2	66° 45' 42"	-0.07"	64° 54' 35"	21° 26' 09"	1.0133203	15' 47.02"	23° 26' 16"	2 m 45 s
3	66° 48' 06"	-0.07"	64° 57' 08"	21° 26' 33"	1.0133276	15' 47.01"	23° 26' 16"	2 m 45 s
4	66° 50' 30"	-0.06"	64° 59' 40"	21° 26' 57"	1.0133349	15' 47.00"	23° 26' 16"	2 m 45 s
5	66° 52' 54"	-0.05"	65° 02' 13"	21° 27' 22"	1.0133422	15' 47.00"	23° 26' 16"	2 m 44 s
6	66° 55' 18"	-0.05"	65° 04' 45"	21° 27' 46"	1.0133494	15' 46.99"	23° 26' 16"	2 m 44 s
7	66° 57' 42"	-0.04"	65° 07' 18"	21° 28' 10"	1.0133567	15' 46.98"	23° 26' 16"	2 m 44 s
8	67° 00' 06"	-0.04"	65° 09' 50"	21° 28' 34"	1.0133639	15' 46.97"	23° 26' 16"	2 m 44 s
9	67° 02' 30"	-0.03"	65° 12' 23"	21° 28' 58"	1.0133711	15' 46.97"	23° 26' 16"	2 m 43 s
10	67° 04' 54"	-0.03"	65° 14' 56"	21° 29' 22"	1.0133784	15' 46.96"	23° 26' 16"	2 m 43 s
11	67° 07' 18"	-0.02"	65° 17' 28"	21° 29' 46"	1.0133856	15' 46.95"	23° 26' 16"	2 m 43 s
12	67° 09' 42"	-0.02"	65° 20' 01"	21° 30' 10"	1.0133928	15' 46.95"	23° 26' 16"	2 m 42 s
13	67° 12' 06"	-0.01"	65° 22' 33"	21° 30' 34"	1.0134000	15' 46.94"	23° 26' 16"	2 m 42 s
14	67° 14' 30"	-0.00"	65° 25' 06"	21° 30' 58"	1.0134071	15' 46.93"	23° 26' 16"	2 m 42 s
15	67° 16' 54"	0.00"	65° 27' 39"	21° 31' 21"	1.0134143	15' 46.93"	23° 26' 16"	2 m 41 s
16	67° 19' 18"	0.01"	65° 30' 11"	21° 31' 45"	1.0134215	15' 46.92"	23° 26' 16"	2 m 41 s
17	67° 21' 42"	0.01"	65° 32' 44"	21° 32' 09"	1.0134287	15' 46.91"	23° 26' 16"	2 m 41 s
18	67° 24' 06"	0.02"	65° 35' 17"	21° 32' 33"	1.0134358	15' 46.91"	23° 26' 16"	2 m 40 s
19	67° 26' 30"	0.02"	65° 37' 49"	21° 32' 56"	1.0134429	15' 46.90"	23° 26' 16"	2 m 40 s
20	67° 28' 54"	0.03"	65° 40' 22"	21° 33' 20"	1.0134501	15' 46.89"	23° 26' 16"	2 m 40 s
21	67° 31' 18"	0.04"	65° 42' 55"	21° 33' 43"	1.0134572	15' 46.89"	23° 26' 16"	2 m 39 s
22	67° 33' 42"	0.04"	65° 45' 28"	21° 34' 07"	1.0134643	15' 46.88"	23° 26' 16"	2 m 39 s
23	67° 36' 06"	0.05"	65° 48' 00"	21° 34' 30"	1.0134714	15' 46.87"	23° 26' 16"	2 m 39 s
24	67° 38' 30"	0.05"	65° 50' 33"	21° 34' 54"	1.0134785	15' 46.87"	23° 26' 16"	2 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	39° 03' 07"	-1° 13' 56"	37° 03' 58"	13° 20' 40"	0° 55' 07"	15' 01.20"	69° 8' 14"	0.05739
1	39° 33' 48"	-1° 11' 11"	37° 32' 60"	13° 32' 59"	0° 55' 06"	15' 00.92"	69° 18' 08"	0.05548
2	40° 04' 28"	-1° 08' 25"	38° 02' 03"	13° 45' 15"	0° 55' 05"	15' 00.64"	69° 28' 15"	0.05360
3	40° 35' 07"	-1° 05' 39"	38° 31' 08"	13° 57' 27"	0° 55' 04"	15' 00.36"	69° 38' 35"	0.05176
4	41° 05' 44"	-1° 02' 53"	39° 00' 16"	14° 09' 35"	0° 55' 03"	15' 00.08"	69° 49' 10"	0.04994
5	41° 36' 21"	-1° 00' 07"	39° 29' 26"	14° 21' 39"	0° 55' 02"	14' 59.81"	69° 59' 58"	0.04816
6	42° 06' 57"	0°-57' 20"	39° 58' 38"	14° 33' 39"	0° 55' 01"	14' 59.53"	70° 11' 02"	0.04641
7	42° 37' 31"	0°-54' 34"	40° 27' 52"	14° 45' 35"	0° 55' 00"	14' 59.26"	70° 22' 21"	0.04469
8	43° 08' 05"	0°-51' 47"	40° 57' 08"	14° 57' 27"	0° 54' 59"	14' 58.99"	70° 33' 56"	0.04301
9	43° 38' 37"	0°-48' 60"	41° 26' 27"	15° 09' 15"	0° 54' 58"	14' 58.72"	70° 45' 47"	0.04135
10	44° 09' 09"	0°-46' 13"	41° 55' 48"	15° 20' 58"	0° 54' 57"	14' 58.46"	70° 57' 55"	0.03973
11	44° 39' 39"	0°-43' 25"	42° 25' 11"	15° 32' 38"	0° 54' 56"	14' 58.19"	71° 10' 21"	0.03814
12	45° 10' 09"	0°-40' 38"	42° 54' 37"	15° 44' 13"	0° 54' 55"	14' 57.93"	71° 23' 05"	0.03659
13	45° 40' 37"	0°-37' 50"	43° 24' 05"	15° 55' 44"	0° 54' 54"	14' 57.67"	71° 36' 08"	0.03506
14	46° 11' 05"	0°-35' 03"	43° 53' 36"	16° 07' 10"	0° 54' 53"	14' 57.42"	71° 49' 30"	0.03357
15	46° 41' 31"	0°-32' 15"	44° 23' 09"	16° 18' 32"	0° 54' 52"	14' 57.16"	72° 3' 14"	0.03211
16	47° 11' 57"	0°-29' 28"	44° 52' 45"	16° 29' 50"	0° 54' 51"	14' 56.91"	72° 17' 19"	0.03068
17	47° 42' 22"	0°-26' 40"	45° 22' 23"	16° 41' 03"	0° 54' 50"	14' 56.66"	72° 31' 46"	0.02928
18	48° 12' 45"	0°-23' 52"	45° 52' 04"	16° 52' 11"	0° 54' 50"	14' 56.41"	72° 46' 38"	0.02792
19	48° 43' 08"	0°-21' 04"	46° 21' 47"	17° 03' 15"	0° 54' 49"	14' 56.16"	73° 1' 55"	0.02659
20	49° 13' 30"	0°-18' 16"	46° 51' 33"	17° 14' 14"	0° 54' 48"	14' 55.92"	73° 17' 38"	0.02529
21	49° 43' 51"	0°-15' 29"	47° 21' 22"	17° 25' 09"	0° 54' 47"	14' 55.67"	73° 33' 50"	0.02402
22	50° 14' 11"	0°-12' 41"	47° 51' 13"	17° 35' 59"	0° 54' 46"	14' 55.43"	73° 50' 31"	0.02279
23	50° 44' 30"	0° -9' 53"	48° 21' 07"	17° 46' 44"	0° 54' 45"	14' 55.19"	74° 7' 45"	0.02159
24	51° 14' 48"	0° -7' 05"	48° 51' 04"	17° 57' 24"	0° 54' 44"	14' 54.96"	74° 25' 32"	0.02042

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	67° 38' 30"	0.05"	65° 50' 33"	21° 34' 54"	1.0134785	15' 46.87"	23° 26' 16"	2 m 38 s
1	67° 40' 54"	0.06"	65° 53' 06"	21° 35' 17"	1.0134856	15' 46.86"	23° 26' 16"	2 m 38 s
2	67° 43' 18"	0.06"	65° 55' 39"	21° 35' 41"	1.0134927	15' 46.85"	23° 26' 16"	2 m 38 s
3	67° 45' 42"	0.07"	65° 58' 12"	21° 36' 04"	1.0134998	15' 46.85"	23° 26' 16"	2 m 37 s
4	67° 48' 06"	0.08"	66° 00' 44"	21° 36' 27"	1.0135068	15' 46.84"	23° 26' 16"	2 m 37 s
5	67° 50' 29"	0.08"	66° 03' 17"	21° 36' 51"	1.0135139	15' 46.83"	23° 26' 16"	2 m 37 s
6	67° 52' 53"	0.09"	66° 05' 50"	21° 37' 14"	1.0135209	15' 46.83"	23° 26' 16"	2 m 36 s
7	67° 55' 17"	0.09"	66° 08' 23"	21° 37' 37"	1.0135279	15' 46.82"	23° 26' 16"	2 m 36 s
8	67° 57' 41"	0.10"	66° 10' 56"	21° 38' 00"	1.0135350	15' 46.81"	23° 26' 16"	2 m 36 s
9	68° 00' 05"	0.11"	66° 13' 29"	21° 38' 23"	1.0135420	15' 46.81"	23° 26' 16"	2 m 36 s
10	68° 02' 29"	0.11"	66° 16' 01"	21° 38' 46"	1.0135490	15' 46.80"	23° 26' 16"	2 m 35 s
11	68° 04' 53"	0.12"	66° 18' 34"	21° 39' 09"	1.0135560	15' 46.80"	23° 26' 16"	2 m 35 s
12	68° 07' 17"	0.12"	66° 21' 07"	21° 39' 32"	1.0135630	15' 46.79"	23° 26' 16"	2 m 35 s
13	68° 09' 41"	0.13"	66° 23' 40"	21° 39' 55"	1.0135700	15' 46.78"	23° 26' 16"	2 m 34 s
14	68° 12' 05"	0.13"	66° 26' 13"	21° 40' 18"	1.0135769	15' 46.78"	23° 26' 16"	2 m 34 s
15	68° 14' 29"	0.14"	66° 28' 46"	21° 40' 41"	1.0135839	15' 46.77"	23° 26' 16"	2 m 34 s
16	68° 16' 53"	0.15"	66° 31' 19"	21° 41' 04"	1.0135908	15' 46.76"	23° 26' 16"	2 m 33 s
17	68° 19' 17"	0.15"	66° 33' 52"	21° 41' 27"	1.0135978	15' 46.76"	23° 26' 16"	2 m 33 s
18	68° 21' 41"	0.16"	66° 36' 25"	21° 41' 50"	1.0136047	15' 46.75"	23° 26' 16"	2 m 32 s
19	68° 24' 05"	0.16"	66° 38' 58"	21° 42' 12"	1.0136117	15' 46.74"	23° 26' 16"	2 m 32 s
20	68° 26' 29"	0.17"	66° 41' 31"	21° 42' 35"	1.0136186	15' 46.74"	23° 26' 16"	2 m 32 s
21	68° 28' 53"	0.17"	66° 44' 04"	21° 42' 58"	1.0136255	15' 46.73"	23° 26' 16"	2 m 31 s
22	68° 31' 17"	0.18"	66° 46' 37"	21° 43' 20"	1.0136324	15' 46.72"	23° 26' 16"	2 m 31 s
23	68° 33' 41"	0.19"	66° 49' 10"	21° 43' 43"	1.0136393	15' 46.72"	23° 26' 16"	2 m 31 s
24	68° 36' 05"	0.19"	66° 51' 43"	21° 44' 05"	1.0136461	15' 46.71"	23° 26' 16"	2 m 30 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	51° 14' 48"	0° -7' 05"	48° 51' 04"	17° 57' 24"	0° 54' 44"	14' 54.96"	74° 25' 32"	0.02042
1	51° 45' 06"	0° -4' 18"	49° 21' 04"	18° 07' 59"	0° 54' 43"	14' 54.72"	74° 43' 55"	0.01929
2	52° 15' 22"	0° -1' 30"	49° 51' 06"	18° 18' 29"	0° 54' 43"	14' 54.49"	75° 2' 58"	0.01819
3	52° 45' 38"	0° 01' 17"	50° 21' 11"	18° 28' 54"	0° 54' 42"	14' 54.26"	75° 22' 42"	0.01712
4	53° 15' 53"	0° 04' 05"	50° 51' 19"	18° 39' 14"	0° 54' 41"	14' 54.03"	75° 43' 12"	0.01608
5	53° 46' 07"	0° 06' 52"	51° 21' 29"	18° 49' 29"	0° 54' 40"	14' 53.80"	76° 4' 32"	0.01507
6	54° 16' 20"	0° 09' 39"	51° 51' 43"	18° 59' 39"	0° 54' 39"	14' 53.58"	76° 26' 44"	0.01410
7	54° 46' 32"	0° 12' 26"	52° 21' 59"	19° 09' 44"	0° 54' 38"	14' 53.36"	76° 49' 55"	0.01316
8	55° 16' 43"	0° 15' 11"	52° 52' 19"	19° 19' 41"	0° 54' 38"	14' 53.14"	77° 14' 00"	0.01226
9	55° 46' 54"	0° 17' 58"	53° 22' 41"	19° 29' 35"	0° 54' 37"	14' 52.92"	77° 39' 26"	0.01138
10	56° 17' 04"	0° 20' 44"	53° 53' 06"	19° 39' 24"	0° 54' 36"	14' 52.70"	78° 6' 10"	0.01054
11	56° 47' 13"	0° 23' 31"	54° 23' 34"	19° 49' 07"	0° 54' 35"	14' 52.49"	78° 34' 20"	0.00974
12	57° 17' 21"	0° 26' 17"	54° 54' 04"	19° 58' 45"	0° 54' 34"	14' 52.27"	79° 4' 08"	0.00896
13	57° 47' 29"	0° 29' 03"	55° 24' 38"	20° 08' 18"	0° 54' 34"	14' 52.06"	79° 35' 44"	0.00822
14	58° 17' 35"	0° 31' 49"	55° 55' 15"	20° 17' 45"	0° 54' 33"	14' 51.86"	80° 9' 24"	0.00751
15	58° 47' 41"	0° 34' 35"	56° 25' 54"	20° 27' 06"	0° 54' 32"	14' 51.65"	80° 45' 24"	0.00683
16	59° 17' 47"	0° 37' 20"	56° 56' 36"	20° 36' 22"	0° 54' 31"	14' 51.45"	81° 24' 04"	0.00619
17	59° 47' 51"	0° 40' 05"	57° 27' 22"	20° 45' 32"	0° 54' 31"	14' 51.24"	82° 5' 48"	0.00558
18	60° 17' 55"	0° 42' 50"	57° 58' 10"	20° 54' 36"	0° 54' 30"	14' 51.04"	82° 51' 07"	0.00500
19	60° 47' 58"	0° 45' 34"	58° 29' 01"	21° 03' 34"	0° 54' 29"	14' 50.85"	83° 40' 37"	0.00445
20	61° 17' 60"	0° 48' 19"	58° 59' 55"	21° 12' 27"	0° 54' 28"	14' 50.65"	84° 35' 04"	0.00394
21	61° 48' 02"	0° 51' 03"	59° 30' 52"	21° 21' 14"	0° 54' 28"	14' 50.46"	85° 35' 25"	0.00346
22	62° 18' 02"	0° 53' 46"	60° 01' 52"	21° 29' 55"	0° 54' 27"	14' 50.27"	86° 42' 55"	0.00301
23	62° 48' 03"	0° 56' 30"	60° 32' 55"	21° 38' 30"	0° 54' 26"	14' 50.08"	87° 59' 09"	0.00260
24	63° 18' 02"	0° 59' 13"	61° 04' 01"	21° 46' 59"	0° 54' 26"	14' 49.89"	89° 26' 13"	0.00222



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	68° 36' 05"	0.19"	66° 51' 43"	21° 44' 05"	1.0136461	15' 46.71"	23° 26' 16"	2 m 30 s
1	68° 38' 29"	0.20"	66° 54' 16"	21° 44' 28"	1.0136530	15' 46.70"	23° 26' 16"	2 m 30 s
2	68° 40' 52"	0.20"	66° 56' 49"	21° 44' 50"	1.0136599	15' 46.70"	23° 26' 16"	2 m 30 s
3	68° 43' 16"	0.21"	66° 59' 22"	21° 45' 13"	1.0136667	15' 46.69"	23° 26' 16"	2 m 29 s
4	68° 45' 40"	0.21"	67° 01' 55"	21° 45' 35"	1.0136736	15' 46.69"	23° 26' 16"	2 m 29 s
5	68° 48' 04"	0.22"	67° 04' 28"	21° 45' 57"	1.0136804	15' 46.68"	23° 26' 16"	2 m 29 s
6	68° 50' 28"	0.23"	67° 07' 02"	21° 46' 20"	1.0136872	15' 46.67"	23° 26' 16"	2 m 28 s
7	68° 52' 52"	0.23"	67° 09' 35"	21° 46' 42"	1.0136941	15' 46.67"	23° 26' 16"	2 m 28 s
8	68° 55' 16"	0.24"	67° 12' 08"	21° 47' 04"	1.0137009	15' 46.66"	23° 26' 16"	2 m 28 s
9	68° 57' 40"	0.24"	67° 14' 41"	21° 47' 26"	1.0137077	15' 46.65"	23° 26' 16"	2 m 27 s
10	69° 00' 04"	0.25"	67° 17' 14"	21° 47' 48"	1.0137145	15' 46.65"	23° 26' 16"	2 m 27 s
11	69° 02' 28"	0.25"	67° 19' 47"	21° 48' 10"	1.0137212	15' 46.64"	23° 26' 16"	2 m 27 s
12	69° 04' 52"	0.26"	67° 22' 20"	21° 48' 32"	1.0137280	15' 46.63"	23° 26' 16"	2 m 26 s
13	69° 07' 16"	0.26"	67° 24' 54"	21° 48' 54"	1.0137348	15' 46.63"	23° 26' 16"	2 m 26 s
14	69° 09' 40"	0.27"	67° 27' 27"	21° 49' 16"	1.0137415	15' 46.62"	23° 26' 16"	2 m 26 s
15	69° 12' 03"	0.28"	67° 30' 00"	21° 49' 38"	1.0137483	15' 46.62"	23° 26' 16"	2 m 25 s
16	69° 14' 27"	0.28"	67° 32' 33"	21° 50' 00"	1.0137550	15' 46.61"	23° 26' 16"	2 m 25 s
17	69° 16' 51"	0.29"	67° 35' 06"	21° 50' 22"	1.0137617	15' 46.60"	23° 26' 16"	2 m 25 s
18	69° 19' 15"	0.29"	67° 37' 40"	21° 50' 44"	1.0137685	15' 46.60"	23° 26' 16"	2 m 24 s
19	69° 21' 39"	0.30"	67° 40' 13"	21° 51' 06"	1.0137752	15' 46.59"	23° 26' 16"	2 m 24 s
20	69° 24' 03"	0.30"	67° 42' 46"	21° 51' 27"	1.0137819	15' 46.58"	23° 26' 16"	2 m 23 s
21	69° 26' 27"	0.31"	67° 45' 20"	21° 51' 49"	1.0137886	15' 46.58"	23° 26' 16"	2 m 23 s
22	69° 28' 51"	0.31"	67° 47' 53"	21° 52' 11"	1.0137952	15' 46.57"	23° 26' 16"	2 m 23 s
23	69° 31' 15"	0.32"	67° 50' 26"	21° 52' 32"	1.0138019	15' 46.57"	23° 26' 16"	2 m 22 s
24	69° 33' 38"	0.32"	67° 52' 59"	21° 52' 54"	1.0138086	15' 46.56"	23° 26' 16"	2 m 22 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	63° 18' 02"	0° 59' 13"	61° 04' 01"	21° 46' 59"	0° 54' 26"	14' 49.89"	89° 26' 13"	0.00222
1	63° 48' 01"	1° 01' 56"	61° 35' 10"	21° 55' 22"	0° 54' 25"	14' 49.71"	91° 6' 55"	0.00187
2	64° 17' 59"	1° 04' 38"	62° 06' 21"	22° 03' 39"	0° 54' 24"	14' 49.52"	93° 5' 05"	0.00155
3	64° 47' 57"	1° 07' 20"	62° 37' 36"	22° 11' 50"	0° 54' 24"	14' 49.34"	95° 26' 05"	0.00127
4	65° 17' 53"	1° 10' 01"	63° 08' 53"	22° 19' 54"	0° 54' 23"	14' 49.16"	98° 17' 31"	0.00102
5	65° 47' 50"	1° 12' 43"	63° 40' 13"	22° 27' 53"	0° 54' 22"	14' 48.99"	101° 50' 31"	0.00080
6	66° 17' 45"	1° 15' 23"	64° 11' 37"	22° 35' 45"	0° 54' 22"	14' 48.81"	106° 21' 33"	0.00061
7	66° 47' 40"	1° 18' 04"	64° 43' 02"	22° 43' 31"	0° 54' 21"	14' 48.64"	112° 15' 09"	0.00046
8	67° 17' 35"	1° 20' 44"	65° 14' 31"	22° 51' 10"	0° 54' 20"	14' 48.47"	120° 6' 54"	0.00034
9	67° 47' 28"	1° 23' 23"	65° 46' 03"	22° 58' 44"	0° 54' 20"	14' 48.30"	130° 42' 38"	0.00025
10	68° 17' 21"	1° 26' 02"	66° 17' 37"	23° 06' 10"	0° 54' 19"	14' 48.14"	144° 40' 01"	0.00020
11	68° 47' 14"	1° 28' 41"	66° 49' 15"	23° 13' 31"	0° 54' 19"	14' 47.98"	161° 33' 56"	0.00017
12	69° 17' 06"	1° 31' 19"	67° 20' 55"	23° 20' 44"	0° 54' 18"	14' 47.81"	179° 8' 05"	0.00018
13	69° 46' 57"	1° 33' 57"	67° 52' 37"	23° 27' 52"	0° 54' 17"	14' 47.66"	194° 33' 22"	0.00022
14	70° 16' 49"	1° 36' 34"	68° 24' 23"	23° 34' 52"	0° 54' 17"	14' 47.50"	206° 36' 23"	0.00030
15	70° 46' 39"	1° 39' 11"	68° 56' 11"	23° 41' 46"	0° 54' 16"	14' 47.34"	215° 35' 19"	0.00040
16	71° 16' 29"	1° 41' 47"	69° 28' 02"	23° 48' 34"	0° 54' 16"	14' 47.19"	222° 16' 47"	0.00054
17	71° 46' 18"	1° 44' 23"	69° 59' 56"	23° 55' 14"	0° 54' 15"	14' 47.04"	227° 21' 34"	0.00071
18	72° 16' 06"	1° 46' 58"	70° 31' 52"	24° 01' 48"	0° 54' 15"	14' 46.89"	231° 18' 49"	0.00091
19	72° 45' 55"	1° 49' 32"	71° 03' 50"	24° 08' 16"	0° 54' 14"	14' 46.75"	234° 28' 10"	0.00115
20	73° 15' 42"	1° 52' 06"	71° 35' 52"	24° 14' 36"	0° 54' 14"	14' 46.61"	237° 2' 50"	0.00141
21	73° 45' 29"	1° 54' 40"	72° 07' 55"	24° 20' 50"	0° 54' 13"	14' 46.47"	239° 11' 48"	0.00171
22	74° 15' 16"	1° 57' 13"	72° 40' 01"	24° 26' 56"	0° 54' 13"	14' 46.33"	241° 1' 18"	0.00204
23	74° 45' 02"	1° 59' 45"	73° 12' 10"	24° 32' 56"	0° 54' 12"	14' 46.19"	242° 35' 47"	0.00240
24	75° 14' 48"	2° 02' 17"	73° 44' 21"	24° 38' 49"	0° 54' 12"	14' 46.06"	243° 58' 26"	0.00280

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	69° 33' 38"	0.32"	67° 52' 59"	21° 52' 54"	1.0138086	15' 46.56"	23° 26' 16"	2 m 22 s
1	69° 36' 02"	0.33"	67° 55' 33"	21° 53' 15"	1.0138152	15' 46.55"	23° 26' 16"	2 m 22 s
2	69° 38' 26"	0.33"	67° 58' 06"	21° 53' 37"	1.0138219	15' 46.55"	23° 26' 16"	2 m 21 s
3	69° 40' 50"	0.34"	68° 00' 39"	21° 53' 58"	1.0138285	15' 46.54"	23° 26' 16"	2 m 21 s
4	69° 43' 14"	0.35"	68° 03' 13"	21° 54' 20"	1.0138351	15' 46.53"	23° 26' 16"	2 m 21 s
5	69° 45' 38"	0.35"	68° 05' 46"	21° 54' 41"	1.0138417	15' 46.53"	23° 26' 16"	2 m 20 s
6	69° 48' 02"	0.36"	68° 08' 20"	21° 55' 02"	1.0138484	15' 46.52"	23° 26' 16"	2 m 20 s
7	69° 50' 26"	0.36"	68° 10' 53"	21° 55' 24"	1.0138550	15' 46.52"	23° 26' 16"	2 m 19 s
8	69° 52' 50"	0.37"	68° 13' 26"	21° 55' 45"	1.0138615	15' 46.51"	23° 26' 16"	2 m 19 s
9	69° 55' 13"	0.37"	68° 15' 60"	21° 56' 06"	1.0138681	15' 46.50"	23° 26' 16"	2 m 19 s
10	69° 57' 37"	0.38"	68° 18' 33"	21° 56' 27"	1.0138747	15' 46.50"	23° 26' 16"	2 m 18 s
11	70° 00' 01"	0.38"	68° 21' 07"	21° 56' 49"	1.0138813	15' 46.49"	23° 26' 16"	2 m 18 s
12	70° 02' 25"	0.39"	68° 23' 40"	21° 57' 10"	1.0138878	15' 46.49"	23° 26' 16"	2 m 18 s
13	70° 04' 49"	0.39"	68° 26' 13"	21° 57' 31"	1.0138944	15' 46.48"	23° 26' 16"	2 m 17 s
14	70° 07' 13"	0.40"	68° 28' 47"	21° 57' 52"	1.0139009	15' 46.47"	23° 26' 16"	2 m 17 s
15	70° 09' 37"	0.40"	68° 31' 20"	21° 58' 13"	1.0139074	15' 46.47"	23° 26' 16"	2 m 17 s
16	70° 12' 00"	0.41"	68° 33' 54"	21° 58' 34"	1.0139139	15' 46.46"	23° 26' 16"	2 m 16 s
17	70° 14' 24"	0.41"	68° 36' 27"	21° 58' 55"	1.0139204	15' 46.45"	23° 26' 16"	2 m 16 s
18	70° 16' 48"	0.42"	68° 39' 01"	21° 59' 15"	1.0139269	15' 46.45"	23° 26' 16"	2 m 15 s
19	70° 19' 12"	0.42"	68° 41' 34"	21° 59' 36"	1.0139334	15' 46.44"	23° 26' 16"	2 m 15 s
20	70° 21' 36"	0.43"	68° 44' 08"	21° 59' 57"	1.0139399	15' 46.44"	23° 26' 16"	2 m 15 s
21	70° 23' 60"	0.43"	68° 46' 41"	22° 00' 18"	1.0139464	15' 46.43"	23° 26' 16"	2 m 14 s
22	70° 26' 24"	0.44"	68° 49' 15"	22° 00' 38"	1.0139529	15' 46.42"	23° 26' 16"	2 m 14 s
23	70° 28' 47"	0.44"	68° 51' 48"	22° 00' 59"	1.0139593	15' 46.42"	23° 26' 16"	2 m 14 s
24	70° 31' 11"	0.45"	68° 54' 22"	22° 01' 20"	1.0139658	15' 46.41"	23° 26' 16"	2 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	75° 14' 48"	2° 02' 17"	73° 44' 21"	24° 38' 49"	0° 54' 12"	14' 46.06"	243° 58' 26"	0.00280
1	75° 44' 33"	2° 04' 48"	74° 16' 35"	24° 44' 35"	0° 54' 11"	14' 45.93"	245° 11' 40"	0.00322
2	76° 14' 17"	2° 07' 18"	74° 48' 51"	24° 50' 13"	0° 54' 11"	14' 45.80"	246° 17' 15"	0.00368
3	76° 44' 02"	2° 09' 48"	75° 21' 09"	24° 55' 45"	0° 54' 10"	14' 45.67"	247° 16' 35"	0.00417
4	77° 13' 46"	2° 12' 17"	75° 53' 29"	25° 01' 10"	0° 54' 10"	14' 45.55"	248° 10' 43"	0.00469
5	77° 43' 29"	2° 14' 46"	76° 25' 52"	25° 06' 27"	0° 54' 09"	14' 45.43"	249° 0' 31"	0.00524
6	78° 13' 12"	2° 17' 14"	76° 58' 17"	25° 11' 38"	0° 54' 09"	14' 45.31"	249° 46' 37"	0.00582
7	78° 42' 54"	2° 19' 41"	77° 30' 44"	25° 16' 41"	0° 54' 08"	14' 45.19"	250° 29' 36"	0.00644
8	79° 12' 36"	2° 22' 08"	78° 03' 13"	25° 21' 37"	0° 54' 08"	14' 45.07"	251° 9' 53"	0.00708
9	79° 42' 18"	2° 24' 34"	78° 35' 44"	25° 26' 26"	0° 54' 08"	14' 44.96"	251° 47' 51"	0.00776
10	80° 11' 59"	2° 26' 59"	79° 08' 18"	25° 31' 08"	0° 54' 07"	14' 44.85"	252° 23' 48"	0.00847
11	80° 41' 40"	2° 29' 23"	79° 40' 53"	25° 35' 42"	0° 54' 07"	14' 44.75"	252° 57' 59"	0.00921
12	81° 11' 21"	2° 31' 47"	80° 13' 30"	25° 40' 09"	0° 54' 06"	14' 44.64"	253° 30' 37"	0.00998
13	81° 41' 01"	2° 34' 10"	80° 46' 09"	25° 44' 29"	0° 54' 06"	14' 44.54"	254° 1' 52"	0.01078
14	82° 10' 41"	2° 36' 33"	81° 18' 50"	25° 48' 41"	0° 54' 06"	14' 44.44"	254° 31' 54"	0.01161
15	82° 40' 20"	2° 38' 54"	81° 51' 33"	25° 52' 46"	0° 54' 05"	14' 44.34"	255° 0' 51"	0.01248
16	83° 09' 60"	2° 41' 15"	82° 24' 17"	25° 56' 43"	0° 54' 05"	14' 44.25"	255° 28' 51"	0.01337
17	83° 39' 38"	2° 43' 35"	82° 57' 03"	26° 00' 33"	0° 54' 05"	14' 44.15"	255° 55' 57"	0.01429
18	84° 09' 17"	2° 45' 54"	83° 29' 51"	26° 04' 16"	0° 54' 04"	14' 44.06"	256° 22' 17"	0.01525
19	84° 38' 55"	2° 48' 13"	84° 02' 40"	26° 07' 51"	0° 54' 04"	14' 43.98"	256° 47' 55"	0.01624
20	85° 08' 33"	2° 50' 31"	84° 35' 31"	26° 11' 19"	0° 54' 04"	14' 43.89"	257° 12' 53"	0.01725
21	85° 38' 11"	2° 52' 48"	85° 08' 23"	26° 14' 39"	0° 54' 03"	14' 43.81"	257° 37' 17"	0.01830
22	86° 07' 48"	2° 55' 04"	85° 41' 17"	26° 17' 51"	0° 54' 03"	14' 43.73"	258° 1' 09"	0.01937
23	86° 37' 25"	2° 57' 19"	86° 14' 12"	26° 20' 56"	0° 54' 03"	14' 43.66"	258° 24' 31"	0.02048
24	87° 07' 02"	2° 59' 34"	86° 47' 08"	26° 23' 54"	0° 54' 02"	14' 43.58"	258° 47' 27"	0.02162

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	70° 31' 11"	0.45"	68° 54' 22"	22° 01' 20"	1.0139658	15' 46.41"	23° 26' 16"	2 m 13 s
1	70° 33' 35"	0.45"	68° 56' 56"	22° 01' 40"	1.0139722	15' 46.41"	23° 26' 16"	2 m 13 s
2	70° 35' 59"	0.45"	68° 59' 29"	22° 02' 01"	1.0139786	15' 46.40"	23° 26' 16"	2 m 12 s
3	70° 38' 23"	0.46"	69° 02' 03"	22° 02' 21"	1.0139850	15' 46.39"	23° 26' 16"	2 m 12 s
4	70° 40' 47"	0.46"	69° 04' 36"	22° 02' 42"	1.0139914	15' 46.39"	23° 26' 16"	2 m 12 s
5	70° 43' 10"	0.47"	69° 07' 10"	22° 03' 02"	1.0139978	15' 46.38"	23° 26' 16"	2 m 11 s
6	70° 45' 34"	0.47"	69° 09' 44"	22° 03' 23"	1.0140042	15' 46.38"	23° 26' 16"	2 m 11 s
7	70° 47' 58"	0.48"	69° 12' 17"	22° 03' 43"	1.0140106	15' 46.37"	23° 26' 16"	2 m 11 s
8	70° 50' 22"	0.48"	69° 14' 51"	22° 04' 03"	1.0140170	15' 46.36"	23° 26' 16"	2 m 10 s
9	70° 52' 46"	0.49"	69° 17' 25"	22° 04' 23"	1.0140234	15' 46.36"	23° 26' 16"	2 m 10 s
10	70° 55' 10"	0.49"	69° 19' 58"	22° 04' 44"	1.0140297	15' 46.35"	23° 26' 16"	2 m 09 s
11	70° 57' 33"	0.50"	69° 22' 32"	22° 05' 04"	1.0140361	15' 46.35"	23° 26' 16"	2 m 09 s
12	70° 59' 57"	0.50"	69° 25' 06"	22° 05' 24"	1.0140424	15' 46.34"	23° 26' 16"	2 m 09 s
13	71° 02' 21"	0.50"	69° 27' 39"	22° 05' 44"	1.0140487	15' 46.34"	23° 26' 16"	2 m 08 s
14	71° 04' 45"	0.51"	69° 30' 13"	22° 06' 04"	1.0140550	15' 46.33"	23° 26' 16"	2 m 08 s
15	71° 07' 09"	0.51"	69° 32' 47"	22° 06' 24"	1.0140613	15' 46.32"	23° 26' 16"	2 m 07 s
16	71° 09' 32"	0.52"	69° 35' 20"	22° 06' 44"	1.0140676	15' 46.32"	23° 26' 16"	2 m 07 s
17	71° 11' 56"	0.52"	69° 37' 54"	22° 07' 04"	1.0140739	15' 46.31"	23° 26' 16"	2 m 07 s
18	71° 14' 20"	0.53"	69° 40' 28"	22° 07' 24"	1.0140802	15' 46.31"	23° 26' 16"	2 m 06 s
19	71° 16' 44"	0.53"	69° 43' 02"	22° 07' 44"	1.0140865	15' 46.30"	23° 26' 16"	2 m 06 s
20	71° 19' 08"	0.53"	69° 45' 35"	22° 08' 04"	1.0140928	15' 46.29"	23° 26' 16"	2 m 06 s
21	71° 21' 31"	0.54"	69° 48' 09"	22° 08' 23"	1.0140990	15' 46.29"	23° 26' 16"	2 m 05 s
22	71° 23' 55"	0.54"	69° 50' 43"	22° 08' 43"	1.0141053	15' 46.28"	23° 26' 16"	2 m 05 s
23	71° 26' 19"	0.55"	69° 53' 17"	22° 09' 03"	1.0141115	15' 46.28"	23° 26' 16"	2 m 04 s
24	71° 28' 43"	0.55"	69° 55' 51"	22° 09' 22"	1.0141177	15' 46.27"	23° 26' 16"	2 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	87° 07' 02"	2° 59' 34"	86° 47' 08"	26° 23' 54"	0° 54' 02"	14' 43.58"	258° 47' 27"	0.02162
1	87° 36' 38"	3° 01' 47"	87° 20' 06"	26° 26' 44"	0° 54' 02"	14' 43.51"	259° 9' 59"	0.02278
2	88° 06' 14"	3° 04' 00"	87° 53' 04"	26° 29' 26"	0° 54' 02"	14' 43.44"	259° 32' 07"	0.02398
3	88° 35' 51"	3° 06' 12"	88° 26' 04"	26° 32' 01"	0° 54' 02"	14' 43.38"	259° 53' 55"	0.02521
4	89° 05' 26"	3° 08' 23"	88° 59' 05"	26° 34' 28"	0° 54' 02"	14' 43.31"	260° 15' 24"	0.02646
5	89° 35' 02"	3° 10' 33"	89° 32' 07"	26° 36' 47"	0° 54' 01"	14' 43.25"	260° 36' 34"	0.02775
6	90° 04' 37"	3° 12' 43"	90° 05' 10"	26° 38' 59"	0° 54' 01"	14' 43.20"	260° 57' 28"	0.02906
7	90° 34' 12"	3° 14' 51"	90° 38' 13"	26° 41' 03"	0° 54' 01"	14' 43.14"	261° 18' 07"	0.03041
8	91° 03' 47"	3° 16' 59"	91° 11' 18"	26° 42' 59"	0° 54' 01"	14' 43.09"	261° 38' 31"	0.03178
9	91° 33' 22"	3° 19' 05"	91° 44' 23"	26° 44' 48"	0° 54' 01"	14' 43.04"	261° 58' 41"	0.03318
10	92° 02' 57"	3° 21' 11"	92° 17' 29"	26° 46' 29"	0° 54' 00"	14' 42.99"	262° 18' 39"	0.03462
11	92° 32' 31"	3° 23' 16"	92° 50' 36"	26° 48' 02"	0° 54' 00"	14' 42.95"	262° 38' 25"	0.03608
12	93° 02' 06"	3° 25' 20"	93° 23' 43"	26° 49' 27"	0° 54' 00"	14' 42.91"	262° 57' 60"	0.03757
13	93° 31' 40"	3° 27' 23"	93° 56' 50"	26° 50' 45"	0° 53' 60"	14' 42.87"	263° 17' 24"	0.03909
14	94° 01' 14"	3° 29' 25"	94° 29' 58"	26° 51' 55"	0° 53' 60"	14' 42.84"	263° 36' 38"	0.04063
15	94° 30' 48"	3° 31' 26"	95° 03' 07"	26° 52' 57"	0° 53' 60"	14' 42.80"	263° 55' 42"	0.04221
16	95° 00' 22"	3° 33' 26"	95° 36' 16"	26° 53' 52"	0° 53' 60"	14' 42.77"	264° 14' 38"	0.04382
17	95° 29' 56"	3° 35' 25"	96° 09' 25"	26° 54' 39"	0° 53' 59"	14' 42.75"	264° 33' 25"	0.04545
18	95° 59' 29"	3° 37' 23"	96° 42' 34"	26° 55' 18"	0° 53' 59"	14' 42.72"	264° 52' 04"	0.04711
19	96° 29' 03"	3° 39' 21"	97° 15' 43"	26° 55' 49"	0° 53' 59"	14' 42.70"	265° 10' 35"	0.04880
20	96° 58' 36"	3° 41' 17"	97° 48' 52"	26° 56' 12"	0° 53' 59"	14' 42.69"	265° 28' 59"	0.05052
21	97° 28' 10"	3° 43' 12"	98° 22' 02"	26° 56' 28"	0° 53' 59"	14' 42.67"	265° 47' 15"	0.05226
22	97° 57' 43"	3° 45' 06"	98° 55' 11"	26° 56' 36"	0° 53' 59"	14' 42.66"	266° 5' 25"	0.05404
23	98° 27' 17"	3° 46' 59"	99° 28' 20"	26° 56' 36"	0° 53' 59"	14' 42.65"	266° 23' 28"	0.05584
24	98° 56' 50"	3° 48' 51"	100° 01' 29"	26° 56' 29"	0° 53' 59"	14' 42.65"	266° 41' 24"	0.05767

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	71° 28' 43"	0.55"	69° 55' 51"	22° 09' 22"	1.0141177	15' 46.27"	23° 26' 16"	2 m 04 s
1	71° 31' 07"	0.55"	69° 58' 24"	22° 09' 42"	1.0141239	15' 46.27"	23° 26' 16"	2 m 04 s
2	71° 33' 30"	0.56"	70° 00' 58"	22° 10' 02"	1.0141302	15' 46.26"	23° 26' 16"	2 m 03 s
3	71° 35' 54"	0.56"	70° 03' 32"	22° 10' 21"	1.0141364	15' 46.25"	23° 26' 16"	2 m 03 s
4	71° 38' 18"	0.56"	70° 06' 06"	22° 10' 41"	1.0141425	15' 46.25"	23° 26' 16"	2 m 02 s
5	71° 40' 42"	0.57"	70° 08' 40"	22° 11' 00"	1.0141487	15' 46.24"	23° 26' 16"	2 m 02 s
6	71° 43' 06"	0.57"	70° 11' 14"	22° 11' 19"	1.0141549	15' 46.24"	23° 26' 16"	2 m 02 s
7	71° 45' 29"	0.58"	70° 13' 48"	22° 11' 39"	1.0141611	15' 46.23"	23° 26' 16"	2 m 01 s
8	71° 47' 53"	0.58"	70° 16' 21"	22° 11' 58"	1.0141672	15' 46.22"	23° 26' 16"	2 m 01 s
9	71° 50' 17"	0.58"	70° 18' 55"	22° 12' 17"	1.0141734	15' 46.22"	23° 26' 16"	2 m 00 s
10	71° 52' 41"	0.59"	70° 21' 29"	22° 12' 37"	1.0141795	15' 46.21"	23° 26' 16"	1 m 60 s
11	71° 55' 04"	0.59"	70° 24' 03"	22° 12' 56"	1.0141856	15' 46.21"	23° 26' 16"	1 m 60 s
12	71° 57' 28"	0.59"	70° 26' 37"	22° 13' 15"	1.0141918	15' 46.20"	23° 26' 16"	1 m 59 s
13	71° 59' 52"	0.60"	70° 29' 11"	22° 13' 34"	1.0141979	15' 46.20"	23° 26' 16"	1 m 59 s
14	72° 02' 16"	0.60"	70° 31' 45"	22° 13' 53"	1.0142040	15' 46.19"	23° 26' 16"	1 m 58 s
15	72° 04' 40"	0.60"	70° 34' 19"	22° 14' 12"	1.0142101	15' 46.18"	23° 26' 16"	1 m 58 s
16	72° 07' 03"	0.61"	70° 36' 53"	22° 14' 31"	1.0142162	15' 46.18"	23° 26' 16"	1 m 58 s
17	72° 09' 27"	0.61"	70° 39' 27"	22° 14' 50"	1.0142222	15' 46.17"	23° 26' 16"	1 m 57 s
18	72° 11' 51"	0.61"	70° 42' 01"	22° 15' 09"	1.0142283	15' 46.17"	23° 26' 16"	1 m 57 s
19	72° 14' 15"	0.62"	70° 44' 35"	22° 15' 28"	1.0142344	15' 46.16"	23° 26' 16"	1 m 56 s
20	72° 16' 38"	0.62"	70° 47' 09"	22° 15' 47"	1.0142404	15' 46.16"	23° 26' 16"	1 m 56 s
21	72° 19' 02"	0.62"	70° 49' 43"	22° 16' 06"	1.0142464	15' 46.15"	23° 26' 16"	1 m 56 s
22	72° 21' 26"	0.62"	70° 52' 17"	22° 16' 25"	1.0142525	15' 46.15"	23° 26' 16"	1 m 55 s
23	72° 23' 50"	0.63"	70° 54' 51"	22° 16' 43"	1.0142585	15' 46.14"	23° 26' 16"	1 m 55 s
24	72° 26' 13"	0.63"	70° 57' 25"	22° 17' 02"	1.0142645	15' 46.13"	23° 26' 16"	1 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	98° 56' 50"	3° 48' 51"	100° 01' 29"	26° 56' 29"	0° 53' 59"	14' 42.65"	266° 41' 24"	0.05767
1	99° 26' 23"	3° 50' 43"	100° 34' 37"	26° 56' 13"	0° 53' 59"	14' 42.64"	266° 59' 14"	0.05952
2	99° 55' 57"	3° 52' 33"	101° 07' 46"	26° 55' 50"	0° 53' 59"	14' 42.64"	267° 16' 59"	0.06141
3	100° 25' 30"	3° 54' 22"	101° 40' 53"	26° 55' 20"	0° 53' 59"	14' 42.65"	267° 34' 37"	0.06332
4	100° 55' 03"	3° 56' 10"	102° 14' 01"	26° 54' 41"	0° 53' 59"	14' 42.66"	267° 52' 10"	0.06526
5	101° 24' 37"	3° 57' 57"	102° 47' 08"	26° 53' 55"	0° 53' 59"	14' 42.67"	268° 9' 37"	0.06722
6	101° 54' 10"	3° 59' 42"	103° 20' 14"	26° 53' 01"	0° 53' 59"	14' 42.68"	268° 26' 58"	0.06922
7	102° 23' 44"	4° 01' 27"	103° 53' 20"	26° 51' 59"	0° 53' 59"	14' 42.70"	268° 44' 15"	0.07124
8	102° 53' 17"	4° 03' 11"	104° 26' 25"	26° 50' 50"	0° 53' 59"	14' 42.72"	269° 1' 26"	0.07328
9	103° 22' 51"	4° 04' 54"	104° 59' 29"	26° 49' 33"	0° 53' 59"	14' 42.74"	269° 18' 32"	0.07536
10	103° 52' 25"	4° 06' 35"	105° 32' 32"	26° 48' 08"	0° 53' 59"	14' 42.76"	269° 35' 33"	0.07746
11	104° 21' 59"	4° 08' 16"	106° 05' 35"	26° 46' 35"	0° 53' 60"	14' 42.79"	269° 52' 29"	0.07958
12	104° 51' 33"	4° 09' 55"	106° 38' 36"	26° 44' 55"	0° 53' 60"	14' 42.83"	270° 9' 20"	0.08173
13	105° 21' 07"	4° 11' 33"	107° 11' 37"	26° 43' 07"	0° 53' 60"	14' 42.86"	270° 26' 06"	0.08391
14	105° 50' 41"	4° 13' 10"	107° 44' 36"	26° 41' 12"	0° 54' 00"	14' 42.90"	270° 42' 47"	0.08612
15	106° 20' 15"	4° 14' 46"	108° 17' 34"	26° 39' 09"	0° 54' 00"	14' 42.94"	270° 59' 24"	0.08835
16	106° 49' 50"	4° 16' 21"	108° 50' 31"	26° 36' 58"	0° 54' 00"	14' 42.99"	271° 15' 55"	0.09060
17	107° 19' 24"	4° 17' 55"	109° 23' 27"	26° 34' 40"	0° 54' 01"	14' 43.04"	271° 32' 22"	0.09288
18	107° 48' 59"	4° 19' 27"	109° 56' 22"	26° 32' 14"	0° 54' 01"	14' 43.09"	271° 48' 45"	0.09519
19	108° 18' 34"	4° 20' 59"	110° 29' 15"	26° 29' 41"	0° 54' 01"	14' 43.15"	272° 5' 02"	0.09752
20	108° 48' 09"	4° 22' 29"	111° 02' 07"	26° 26' 60"	0° 54' 01"	14' 43.21"	272° 21' 15"	0.09988
21	109° 17' 45"	4° 23' 58"	111° 34' 57"	26° 24' 11"	0° 54' 01"	14' 43.27"	272° 37' 24"	0.10227
22	109° 47' 21"	4° 25' 26"	112° 07' 46"	26° 21' 15"	0° 54' 02"	14' 43.34"	272° 53' 27"	0.10467
23	110° 16' 57"	4° 26' 53"	112° 40' 34"	26° 18' 12"	0° 54' 02"	14' 43.41"	273° 9' 26"	0.10711
24	110° 46' 33"	4° 28' 18"	113° 13' 19"	26° 15' 01"	0° 54' 02"	14' 43.48"	273° 25' 21"	0.10956



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	72° 26' 13"	0.63"	70° 57' 25"	22° 17' 02"	1.0142645	15' 46.13"	23° 26' 16"	1 m 54 s
1	72° 28' 37"	0.63"	70° 59' 59"	22° 17' 21"	1.0142705	15' 46.13"	23° 26' 16"	1 m 54 s
2	72° 31' 01"	0.64"	71° 02' 33"	22° 17' 39"	1.0142765	15' 46.12"	23° 26' 16"	1 m 54 s
3	72° 33' 25"	0.64"	71° 05' 07"	22° 17' 58"	1.0142825	15' 46.12"	23° 26' 16"	1 m 53 s
4	72° 35' 48"	0.64"	71° 07' 41"	22° 18' 16"	1.0142885	15' 46.11"	23° 26' 16"	1 m 53 s
5	72° 38' 12"	0.64"	71° 10' 15"	22° 18' 35"	1.0142945	15' 46.11"	23° 26' 16"	1 m 52 s
6	72° 40' 36"	0.65"	71° 12' 49"	22° 18' 53"	1.0143004	15' 46.10"	23° 26' 16"	1 m 52 s
7	72° 42' 60"	0.65"	71° 15' 23"	22° 19' 12"	1.0143064	15' 46.09"	23° 26' 16"	1 m 51 s
8	72° 45' 23"	0.65"	71° 17' 57"	22° 19' 30"	1.0143123	15' 46.09"	23° 26' 16"	1 m 51 s
9	72° 47' 47"	0.65"	71° 20' 32"	22° 19' 48"	1.0143182	15' 46.08"	23° 26' 16"	1 m 51 s
10	72° 50' 11"	0.66"	71° 23' 06"	22° 20' 06"	1.0143242	15' 46.08"	23° 26' 16"	1 m 50 s
11	72° 52' 34"	0.66"	71° 25' 40"	22° 20' 25"	1.0143301	15' 46.07"	23° 26' 16"	1 m 50 s
12	72° 54' 58"	0.66"	71° 28' 14"	22° 20' 43"	1.0143360	15' 46.07"	23° 26' 16"	1 m 49 s
13	72° 57' 22"	0.66"	71° 30' 48"	22° 21' 01"	1.0143419	15' 46.06"	23° 26' 16"	1 m 49 s
14	72° 59' 46"	0.67"	71° 33' 22"	22° 21' 19"	1.0143478	15' 46.06"	23° 26' 16"	1 m 49 s
15	73° 02' 09"	0.67"	71° 35' 56"	22° 21' 37"	1.0143537	15' 46.05"	23° 26' 16"	1 m 48 s
16	73° 04' 33"	0.67"	71° 38' 31"	22° 21' 55"	1.0143595	15' 46.05"	23° 26' 16"	1 m 48 s
17	73° 06' 57"	0.67"	71° 41' 05"	22° 22' 13"	1.0143654	15' 46.04"	23° 26' 16"	1 m 47 s
18	73° 09' 20"	0.67"	71° 43' 39"	22° 22' 31"	1.0143713	15' 46.03"	23° 26' 16"	1 m 47 s
19	73° 11' 44"	0.68"	71° 46' 13"	22° 22' 49"	1.0143771	15' 46.03"	23° 26' 16"	1 m 46 s
20	73° 14' 08"	0.68"	71° 48' 47"	22° 23' 07"	1.0143829	15' 46.02"	23° 26' 16"	1 m 46 s
21	73° 16' 32"	0.68"	71° 51' 22"	22° 23' 25"	1.0143888	15' 46.02"	23° 26' 16"	1 m 46 s
22	73° 18' 55"	0.68"	71° 53' 56"	22° 23' 43"	1.0143946	15' 46.01"	23° 26' 16"	1 m 45 s
23	73° 21' 19"	0.68"	71° 56' 30"	22° 24' 00"	1.0144004	15' 46.01"	23° 26' 16"	1 m 45 s
24	73° 23' 43"	0.68"	71° 59' 04"	22° 24' 18"	1.0144062	15' 46.00"	23° 26' 16"	1 m 44 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	110° 46' 33"	4° 28' 18"	113° 13' 19"	26° 15' 01"	0° 54' 02"	14' 43.48"	273° 25' 21"	0.10956
1	111° 16' 09"	4° 29' 43"	113° 46' 03"	26° 11' 42"	0° 54' 02"	14' 43.56"	273° 41' 10"	0.11205
2	111° 45' 46"	4° 31' 06"	114° 18' 46"	26° 08' 17"	0° 54' 03"	14' 43.64"	273° 56' 55"	0.11455
3	112° 15' 23"	4° 32' 28"	114° 51' 26"	26° 04' 43"	0° 54' 03"	14' 43.72"	274° 12' 36"	0.11709
4	112° 45' 00"	4° 33' 48"	115° 24' 05"	26° 01' 03"	0° 54' 03"	14' 43.81"	274° 28' 11"	0.11964
5	113° 14' 38"	4° 35' 08"	115° 56' 42"	25° 57' 15"	0° 54' 04"	14' 43.90"	274° 43' 42"	0.12222
6	113° 44' 16"	4° 36' 26"	116° 29' 17"	25° 53' 19"	0° 54' 04"	14' 44.00"	274° 59' 09"	0.12482
7	114° 13' 54"	4° 37' 43"	117° 01' 50"	25° 49' 17"	0° 54' 04"	14' 44.09"	275° 14' 30"	0.12745
8	114° 43' 33"	4° 38' 59"	117° 34' 21"	25° 45' 07"	0° 54' 05"	14' 44.20"	275° 29' 47"	0.13010
9	115° 13' 12"	4° 40' 14"	118° 06' 50"	25° 40' 50"	0° 54' 05"	14' 44.30"	275° 44' 59"	0.13278
10	115° 42' 52"	4° 41' 27"	118° 39' 17"	25° 36' 25"	0° 54' 06"	14' 44.41"	276° 0' 06"	0.13548
11	116° 12' 32"	4° 42' 39"	119° 11' 42"	25° 31' 54"	0° 54' 06"	14' 44.52"	276° 15' 08"	0.13820
12	116° 42' 12"	4° 43' 50"	119° 44' 05"	25° 27' 15"	0° 54' 06"	14' 44.64"	276° 30' 05"	0.14094
13	117° 11' 53"	4° 45' 00"	120° 16' 26"	25° 22' 29"	0° 54' 07"	14' 44.76"	276° 44' 58"	0.14371
14	117° 41' 34"	4° 46' 08"	120° 48' 44"	25° 17' 36"	0° 54' 07"	14' 44.88"	276° 59' 45"	0.14650
15	118° 11' 15"	4° 47' 15"	121° 21' 00"	25° 12' 36"	0° 54' 08"	14' 45.01"	277° 14' 28"	0.14932
16	118° 40' 57"	4° 48' 21"	121° 53' 14"	25° 07' 28"	0° 54' 08"	14' 45.14"	277° 29' 06"	0.15215
17	119° 10' 40"	4° 49' 26"	122° 25' 26"	25° 02' 14"	0° 54' 09"	14' 45.28"	277° 43' 38"	0.15501
18	119° 40' 23"	4° 50' 29"	122° 57' 35"	24° 56' 53"	0° 54' 09"	14' 45.42"	277° 58' 06"	0.15789
19	120° 10' 07"	4° 51' 31"	123° 29' 42"	24° 51' 25"	0° 54' 10"	14' 45.56"	278° 12' 28"	0.16080
20	120° 39' 51"	4° 52' 32"	124° 01' 46"	24° 45' 49"	0° 54' 10"	14' 45.71"	278° 26' 46"	0.16372
21	121° 09' 35"	4° 53' 31"	124° 33' 48"	24° 40' 07"	0° 54' 11"	14' 45.86"	278° 40' 58"	0.16667
22	121° 39' 20"	4° 54' 29"	125° 05' 48"	24° 34' 18"	0° 54' 11"	14' 46.01"	278° 55' 05"	0.16964
23	122° 09' 06"	4° 55' 26"	125° 37' 45"	24° 28' 23"	0° 54' 12"	14' 46.17"	279° 9' 07"	0.17263
24	122° 38' 52"	4° 56' 22"	126° 09' 39"	24° 22' 20"	0° 54' 13"	14' 46.33"	279° 23' 03"	0.17565

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	73° 23' 43"	0.68"	71° 59' 04"	22° 24' 18"	1.0144062	15' 46.00"	23° 26' 16"	1 m 44 s
1	73° 26' 06"	0.69"	72° 01' 39"	22° 24' 36"	1.0144120	15' 46.00"	23° 26' 16"	1 m 44 s
2	73° 28' 30"	0.69"	72° 04' 13"	22° 24' 53"	1.0144178	15' 45.99"	23° 26' 16"	1 m 44 s
3	73° 30' 54"	0.69"	72° 06' 47"	22° 25' 11"	1.0144236	15' 45.99"	23° 26' 16"	1 m 43 s
4	73° 33' 17"	0.69"	72° 09' 21"	22° 25' 28"	1.0144293	15' 45.98"	23° 26' 16"	1 m 43 s
5	73° 35' 41"	0.69"	72° 11' 56"	22° 25' 46"	1.0144351	15' 45.97"	23° 26' 16"	1 m 42 s
6	73° 38' 05"	0.69"	72° 14' 30"	22° 26' 03"	1.0144408	15' 45.97"	23° 26' 16"	1 m 42 s
7	73° 40' 28"	0.69"	72° 17' 04"	22° 26' 21"	1.0144466	15' 45.96"	23° 26' 16"	1 m 41 s
8	73° 42' 52"	0.70"	72° 19' 39"	22° 26' 38"	1.0144523	15' 45.96"	23° 26' 16"	1 m 41 s
9	73° 45' 16"	0.70"	72° 22' 13"	22° 26' 55"	1.0144581	15' 45.95"	23° 26' 16"	1 m 41 s
10	73° 47' 39"	0.70"	72° 24' 47"	22° 27' 13"	1.0144638	15' 45.95"	23° 26' 16"	1 m 40 s
11	73° 50' 03"	0.70"	72° 27' 22"	22° 27' 30"	1.0144695	15' 45.94"	23° 26' 16"	1 m 40 s
12	73° 52' 27"	0.70"	72° 29' 56"	22° 27' 47"	1.0144752	15' 45.94"	23° 26' 16"	1 m 39 s
13	73° 54' 51"	0.70"	72° 32' 30"	22° 28' 04"	1.0144809	15' 45.93"	23° 26' 16"	1 m 39 s
14	73° 57' 14"	0.70"	72° 35' 05"	22° 28' 22"	1.0144866	15' 45.93"	23° 26' 16"	1 m 38 s
15	73° 59' 38"	0.70"	72° 37' 39"	22° 28' 39"	1.0144922	15' 45.92"	23° 26' 16"	1 m 38 s
16	74° 02' 02"	0.70"	72° 40' 13"	22° 28' 56"	1.0144979	15' 45.92"	23° 26' 16"	1 m 38 s
17	74° 04' 25"	0.70"	72° 42' 48"	22° 29' 13"	1.0145035	15' 45.91"	23° 26' 16"	1 m 37 s
18	74° 06' 49"	0.70"	72° 45' 22"	22° 29' 30"	1.0145092	15' 45.91"	23° 26' 16"	1 m 37 s
19	74° 09' 13"	0.71"	72° 47' 57"	22° 29' 47"	1.0145148	15' 45.90"	23° 26' 16"	1 m 36 s
20	74° 11' 36"	0.71"	72° 50' 31"	22° 30' 03"	1.0145205	15' 45.90"	23° 26' 16"	1 m 36 s
21	74° 13' 60"	0.71"	72° 53' 05"	22° 30' 20"	1.0145261	15' 45.89"	23° 26' 16"	1 m 35 s
22	74° 16' 23"	0.71"	72° 55' 40"	22° 30' 37"	1.0145317	15' 45.88"	23° 26' 16"	1 m 35 s
23	74° 18' 47"	0.71"	72° 58' 14"	22° 30' 54"	1.0145373	15' 45.88"	23° 26' 16"	1 m 34 s
24	74° 21' 11"	0.71"	73° 00' 49"	22° 31' 11"	1.0145429	15' 45.87"	23° 26' 16"	1 m 34 s

*) for mean equinox of date

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	122° 38' 52"	4° 56' 22"	126° 09' 39"	24° 22' 20"	0° 54' 13"	14' 46.33"	279° 23' 03"	0.17565
1	123° 08' 39"	4° 57' 16"	126° 41' 31"	24° 16' 10"	0° 54' 13"	14' 46.50"	279° 36' 55"	0.17868
2	123° 38' 27"	4° 58' 08"	127° 13' 21"	24° 09' 54"	0° 54' 14"	14' 46.67"	279° 50' 41"	0.18173
3	124° 08' 15"	4° 58' 60"	127° 45' 08"	24° 03' 31"	0° 54' 14"	14' 46.85"	280° 4' 21"	0.18481
4	124° 38' 04"	4° 59' 50"	128° 16' 52"	23° 57' 02"	0° 54' 15"	14' 47.02"	280° 17' 57"	0.18791
5	125° 07' 53"	5° 00' 39"	128° 48' 33"	23° 50' 26"	0° 54' 16"	14' 47.21"	280° 31' 27"	0.19103
6	125° 37' 43"	5° 01' 26"	129° 20' 13"	23° 43' 43"	0° 54' 16"	14' 47.39"	280° 44' 51"	0.19417
7	126° 07' 34"	5° 02' 13"	129° 51' 49"	23° 36' 53"	0° 54' 17"	14' 47.58"	280° 58' 10"	0.19733
8	126° 37' 25"	5° 02' 57"	130° 23' 23"	23° 29' 57"	0° 54' 18"	14' 47.78"	281° 11' 24"	0.20050
9	127° 07' 18"	5° 03' 41"	130° 54' 54"	23° 22' 55"	0° 54' 19"	14' 47.97"	281° 24' 32"	0.20370
10	127° 37' 10"	5° 04' 23"	131° 26' 22"	23° 15' 46"	0° 54' 19"	14' 48.18"	281° 37' 34"	0.20693
11	128° 07' 04"	5° 05' 04"	131° 57' 48"	23° 08' 31"	0° 54' 20"	14' 48.38"	281° 50' 31"	0.21017
12	128° 36' 58"	5° 05' 43"	132° 29' 11"	23° 01' 09"	0° 54' 21"	14' 48.59"	282° 3' 22"	0.21342
13	129° 06' 54"	5° 06' 21"	133° 00' 31"	22° 53' 41"	0° 54' 22"	14' 48.81"	282° 16' 07"	0.21670
14	129° 36' 50"	5° 06' 58"	133° 31' 49"	22° 46' 06"	0° 54' 22"	14' 49.03"	282° 28' 47"	0.22000
15	130° 06' 46"	5° 07' 33"	134° 03' 04"	22° 38' 26"	0° 54' 23"	14' 49.25"	282° 41' 21"	0.22332
16	130° 36' 44"	5° 08' 07"	134° 34' 16"	22° 30' 39"	0° 54' 24"	14' 49.48"	282° 53' 50"	0.22666
17	131° 06' 42"	5° 08' 39"	135° 05' 26"	22° 22' 45"	0° 54' 25"	14' 49.71"	283° 6' 12"	0.23001
18	131° 36' 42"	5° 09' 10"	135° 36' 32"	22° 14' 46"	0° 54' 26"	14' 49.94"	283° 18' 29"	0.23339
19	132° 06' 42"	5° 09' 40"	136° 07' 37"	22° 06' 41"	0° 54' 27"	14' 50.18"	283° 30' 40"	0.23678
20	132° 36' 43"	5° 10' 08"	136° 38' 38"	21° 58' 29"	0° 54' 28"	14' 50.42"	283° 42' 45"	0.24020
21	133° 06' 45"	5° 10' 35"	137° 09' 36"	21° 50' 11"	0° 54' 29"	14' 50.67"	283° 54' 44"	0.24363
22	133° 36' 48"	5° 11' 00"	137° 40' 32"	21° 41' 48"	0° 54' 29"	14' 50.92"	284° 6' 37"	0.24708
23	134° 06' 51"	5° 11' 24"	138° 11' 26"	21° 33' 18"	0° 54' 30"	14' 51.18"	284° 18' 24"	0.25054
24	134° 36' 56"	5° 11' 47"	138° 42' 16"	21° 24' 42"	0° 54' 31"	14' 51.44"	284° 30' 05"	0.25403

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	74° 21' 11"	0.71"	73° 00' 49"	22° 31' 11"	1.0145429	15'45.87"	23° 26' 16"	1 m 34 s
1	74° 23' 34"	0.71"	73° 03' 23"	22° 31' 27"	1.0145485	15'45.87"	23° 26' 16"	1 m 34 s
2	74° 25' 58"	0.71"	73° 05' 58"	22° 31' 44"	1.0145541	15'45.86"	23° 26' 16"	1 m 33 s
3	74° 28' 22"	0.71"	73° 08' 32"	22° 32' 00"	1.0145597	15'45.86"	23° 26' 16"	1 m 33 s
4	74° 30' 45"	0.71"	73° 11' 07"	22° 32' 17"	1.0145652	15'45.85"	23° 26' 16"	1 m 32 s
5	74° 33' 09"	0.71"	73° 13' 41"	22° 32' 33"	1.0145708	15'45.85"	23° 26' 16"	1 m 32 s
6	74° 35' 33"	0.71"	73° 16' 16"	22° 32' 50"	1.0145763	15'45.84"	23° 26' 16"	1 m 31 s
7	74° 37' 56"	0.71"	73° 18' 50"	22° 33' 06"	1.0145819	15'45.84"	23° 26' 16"	1 m 31 s
8	74° 40' 20"	0.71"	73° 21' 25"	22° 33' 23"	1.0145874	15'45.83"	23° 26' 16"	1 m 31 s
9	74° 42' 44"	0.71"	73° 23' 59"	22° 33' 39"	1.0145929	15'45.83"	23° 26' 16"	1 m 30 s
10	74° 45' 07"	0.71"	73° 26' 34"	22° 33' 55"	1.0145984	15'45.82"	23° 26' 16"	1 m 30 s
11	74° 47' 31"	0.71"	73° 29' 08"	22° 34' 12"	1.0146039	15'45.82"	23° 26' 16"	1 m 29 s
12	74° 49' 54"	0.71"	73° 31' 43"	22° 34' 28"	1.0146094	15'45.81"	23° 26' 16"	1 m 29 s
13	74° 52' 18"	0.71"	73° 34' 17"	22° 34' 44"	1.0146149	15'45.81"	23° 26' 16"	1 m 28 s
14	74° 54' 42"	0.71"	73° 36' 52"	22° 35' 00"	1.0146204	15'45.80"	23° 26' 16"	1 m 28 s
15	74° 57' 05"	0.71"	73° 39' 26"	22° 35' 16"	1.0146259	15'45.80"	23° 26' 16"	1 m 27 s
16	74° 59' 29"	0.71"	73° 42' 01"	22° 35' 32"	1.0146314	15'45.79"	23° 26' 16"	1 m 27 s
17	75° 01' 52"	0.71"	73° 44' 36"	22° 35' 48"	1.0146368	15'45.79"	23° 26' 16"	1 m 27 s
18	75° 04' 16"	0.71"	73° 47' 10"	22° 36' 04"	1.0146423	15'45.78"	23° 26' 16"	1 m 26 s
19	75° 06' 40"	0.71"	73° 49' 45"	22° 36' 20"	1.0146477	15'45.78"	23° 26' 16"	1 m 26 s
20	75° 09' 03"	0.71"	73° 52' 19"	22° 36' 36"	1.0146531	15'45.77"	23° 26' 16"	1 m 25 s
21	75° 11' 27"	0.70"	73° 54' 54"	22° 36' 52"	1.0146586	15'45.77"	23° 26' 16"	1 m 25 s
22	75° 13' 51"	0.70"	73° 57' 29"	22° 37' 08"	1.0146640	15'45.76"	23° 26' 16"	1 m 24 s
23	75° 16' 14"	0.70"	74° 00' 03"	22° 37' 24"	1.0146694	15'45.76"	23° 26' 16"	1 m 24 s
24	75° 18' 38"	0.70"	74° 02' 38"	22° 37' 39"	1.0146748	15'45.75"	23° 26' 16"	1 m 23 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	134° 36' 56"	5° 11' 47"	138° 42' 16"	21° 24' 42"	0° 54' 31"	14' 51.44"	284° 30' 05"	0.25403
1	135° 07' 02"	5° 12' 08"	139° 13' 04"	21° 16' 01"	0° 54' 32"	14' 51.70"	284° 41' 40"	0.25753
2	135° 37' 08"	5° 12' 28"	139° 43' 49"	21° 07' 13"	0° 54' 33"	14' 51.97"	284° 53' 09"	0.26105
3	136° 07' 16"	5° 12' 46"	140° 14' 31"	20° 58' 20"	0° 54' 34"	14' 52.24"	285° 4' 32"	0.26459
4	136° 37' 25"	5° 13' 03"	140° 45' 11"	20° 49' 21"	0° 54' 35"	14' 52.52"	285° 15' 49"	0.26814
5	137° 07' 35"	5° 13' 19"	141° 15' 48"	20° 40' 16"	0° 54' 36"	14' 52.80"	285° 27' 00"	0.27172
6	137° 37' 45"	5° 13' 33"	141° 46' 23"	20° 31' 06"	0° 54' 37"	14' 53.09"	285° 38' 05"	0.27531
7	138° 07' 57"	5° 13' 45"	142° 16' 55"	20° 21' 50"	0° 54' 38"	14' 53.38"	285° 49' 03"	0.27891
8	138° 38' 10"	5° 13' 56"	142° 47' 24"	20° 12' 28"	0° 54' 40"	14' 53.67"	285° 59' 56"	0.28253
9	139° 08' 24"	5° 14' 06"	143° 17' 50"	20° 03' 01"	0° 54' 41"	14' 53.97"	286° 10' 42"	0.28617
10	139° 38' 39"	5° 14' 14"	143° 48' 14"	19° 53' 28"	0° 54' 42"	14' 54.27"	286° 21' 22"	0.28983
11	140° 08' 55"	5° 14' 21"	144° 18' 36"	19° 43' 49"	0° 54' 43"	14' 54.58"	286° 31' 55"	0.29350
12	140° 39' 13"	5° 14' 27"	144° 48' 55"	19° 34' 06"	0° 54' 44"	14' 54.89"	286° 42' 22"	0.29719
13	141° 09' 31"	5° 14' 30"	145° 19' 11"	19° 24' 16"	0° 54' 45"	14' 55.20"	286° 52' 43"	0.30089
14	141° 39' 51"	5° 14' 33"	145° 49' 25"	19° 14' 22"	0° 54' 46"	14' 55.52"	287° 2' 58"	0.30461
15	142° 10' 12"	5° 14' 34"	146° 19' 37"	19° 04' 21"	0° 54' 48"	14' 55.85"	287° 13' 06"	0.30834
16	142° 40' 34"	5° 14' 33"	146° 49' 46"	18° 54' 16"	0° 54' 49"	14' 56.18"	287° 23' 08"	0.31209
17	143° 10' 58"	5° 14' 31"	147° 19' 52"	18° 44' 05"	0° 54' 50"	14' 56.51"	287° 33' 03"	0.31585
18	143° 41' 22"	5° 14' 28"	147° 49' 56"	18° 33' 50"	0° 54' 51"	14' 56.84"	287° 42' 52"	0.31963
19	144° 11' 48"	5° 14' 23"	148° 19' 58"	18° 23' 28"	0° 54' 52"	14' 57.19"	287° 52' 35"	0.32343
20	144° 42' 15"	5° 14' 17"	148° 49' 58"	18° 13' 02"	0° 54' 54"	14' 57.53"	288° 2' 11"	0.32723
21	145° 12' 44"	5° 14' 09"	149° 19' 55"	18° 02' 31"	0° 54' 55"	14' 57.88"	288° 11' 41"	0.33106
22	145° 43' 14"	5° 13' 59"	149° 49' 50"	17° 51' 54"	0° 54' 56"	14' 58.23"	288° 21' 04"	0.33489
23	146° 13' 45"	5° 13' 49"	150° 19' 42"	17° 41' 13"	0° 54' 58"	14' 58.59"	288° 30' 20"	0.33874
24	146° 44' 17"	5° 13' 36"	150° 49' 33"	17° 30' 27"	0° 54' 59"	14' 58.95"	288° 39' 31"	0.34261

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	75° 18' 38"	0.70"	74° 02' 38"	22° 37' 39"	1.0146748	15' 45.75"	23° 26' 16"	1 m 23 s
1	75° 21' 01"	0.70"	74° 05' 13"	22° 37' 55"	1.0146802	15' 45.75"	23° 26' 16"	1 m 23 s
2	75° 23' 25"	0.70"	74° 07' 47"	22° 38' 11"	1.0146856	15' 45.74"	23° 26' 16"	1 m 22 s
3	75° 25' 48"	0.70"	74° 10' 22"	22° 38' 26"	1.0146909	15' 45.74"	23° 26' 16"	1 m 22 s
4	75° 28' 12"	0.70"	74° 12' 57"	22° 38' 42"	1.0146963	15' 45.73"	23° 26' 16"	1 m 22 s
5	75° 30' 36"	0.70"	74° 15' 31"	22° 38' 57"	1.0147017	15' 45.73"	23° 26' 16"	1 m 21 s
6	75° 32' 59"	0.70"	74° 18' 06"	22° 39' 13"	1.0147070	15' 45.72"	23° 26' 16"	1 m 21 s
7	75° 35' 23"	0.69"	74° 20' 41"	22° 39' 28"	1.0147123	15' 45.72"	23° 26' 16"	1 m 20 s
8	75° 37' 46"	0.69"	74° 23' 15"	22° 39' 44"	1.0147177	15' 45.71"	23° 26' 16"	1 m 20 s
9	75° 40' 10"	0.69"	74° 25' 50"	22° 39' 59"	1.0147230	15' 45.71"	23° 26' 16"	1 m 19 s
10	75° 42' 34"	0.69"	74° 28' 25"	22° 40' 14"	1.0147283	15' 45.70"	23° 26' 16"	1 m 19 s
11	75° 44' 57"	0.69"	74° 30' 59"	22° 40' 29"	1.0147336	15' 45.70"	23° 26' 16"	1 m 18 s
12	75° 47' 21"	0.69"	74° 33' 34"	22° 40' 45"	1.0147389	15' 45.69"	23° 26' 16"	1 m 18 s
13	75° 49' 44"	0.69"	74° 36' 09"	22° 40' 60"	1.0147442	15' 45.69"	23° 26' 16"	1 m 17 s
14	75° 52' 08"	0.68"	74° 38' 44"	22° 41' 15"	1.0147495	15' 45.68"	23° 26' 16"	1 m 17 s
15	75° 54' 31"	0.68"	74° 41' 18"	22° 41' 30"	1.0147548	15' 45.68"	23° 26' 16"	1 m 17 s
16	75° 56' 55"	0.68"	74° 43' 53"	22° 41' 45"	1.0147601	15' 45.67"	23° 26' 16"	1 m 16 s
17	75° 59' 19"	0.68"	74° 46' 28"	22° 42' 00"	1.0147653	15' 45.67"	23° 26' 16"	1 m 16 s
18	76° 01' 42"	0.68"	74° 49' 03"	22° 42' 15"	1.0147706	15' 45.66"	23° 26' 16"	1 m 15 s
19	76° 04' 06"	0.68"	74° 51' 37"	22° 42' 30"	1.0147759	15' 45.66"	23° 26' 16"	1 m 15 s
20	76° 06' 29"	0.67"	74° 54' 12"	22° 42' 45"	1.0147811	15' 45.65"	23° 26' 16"	1 m 14 s
21	76° 08' 53"	0.67"	74° 56' 47"	22° 42' 60"	1.0147863	15' 45.65"	23° 26' 16"	1 m 14 s
22	76° 11' 16"	0.67"	74° 59' 22"	22° 43' 15"	1.0147916	15' 45.64"	23° 26' 16"	1 m 13 s
23	76° 13' 40"	0.67"	75° 01' 57"	22° 43' 29"	1.0147968	15' 45.64"	23° 26' 16"	1 m 13 s
24	76° 16' 03"	0.67"	75° 04' 31"	22° 43' 44"	1.0148020	15' 45.63"	23° 26' 16"	1 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	146° 44' 17"	5° 13' 36"	150° 49' 33"	17° 30' 27"	0° 54' 59"	14' 58.95"	288° 39' 31"	0.34261
1	147° 14' 51"	5° 13' 22"	151° 19' 21"	17° 19' 35"	0° 55' 00"	14' 59.32"	288° 48' 34"	0.34649
2	147° 45' 26"	5° 13' 07"	151° 49' 07"	17° 08' 39"	0° 55' 02"	14' 59.69"	288° 57' 31"	0.35038
3	148° 16' 03"	5° 12' 50"	152° 18' 51"	16° 57' 38"	0° 55' 03"	15' 00.07"	289° 6' 21"	0.35428
4	148° 46' 41"	5° 12' 32"	152° 48' 33"	16° 46' 32"	0° 55' 04"	15' 00.43"	289° 15' 05"	0.35820
5	149° 17' 21"	5° 12' 12"	153° 18' 12"	16° 35' 21"	0° 55' 06"	15' 00.83"	289° 23' 42"	0.36213
6	149° 48' 02"	5° 11' 51"	153° 47' 50"	16° 24' 05"	0° 55' 07"	15' 01.22"	289° 32' 12"	0.36607
7	150° 18' 44"	5° 11' 28"	154° 17' 26"	16° 12' 45"	0° 55' 09"	15' 01.61"	289° 40' 36"	0.37003
8	150° 49' 28"	5° 11' 04"	154° 46' 60"	16° 01' 20"	0° 55' 10"	15' 02.01"	289° 48' 53"	0.37400
9	151° 20' 14"	5° 10' 38"	155° 16' 32"	15° 49' 51"	0° 55' 12"	15' 02.41"	289° 57' 03"	0.37798
10	151° 51' 01"	5° 10' 10"	155° 46' 02"	15° 38' 17"	0° 55' 13"	15' 02.81"	290° 5' 06"	0.38197
11	152° 21' 50"	5° 09' 42"	156° 15' 30"	15° 26' 38"	0° 55' 15"	15' 03.22"	290° 13' 03"	0.38597
12	152° 52' 40"	5° 09' 11"	156° 44' 57"	15° 14' 55"	0° 55' 16"	15' 03.64"	290° 20' 53"	0.38999
13	153° 23' 31"	5° 08' 39"	157° 14' 21"	15° 03' 07"	0° 55' 18"	15' 04.06"	290° 28' 36"	0.39401
14	153° 54' 25"	5° 08' 06"	157° 43' 44"	14° 51' 15"	0° 55' 19"	15' 04.48"	290° 36' 13"	0.39805
15	154° 25' 20"	5° 07' 31"	158° 13' 06"	14° 39' 19"	0° 55' 21"	15' 04.90"	290° 43' 42"	0.40210
16	154° 56' 16"	5° 06' 55"	158° 42' 26"	14° 27' 18"	0° 55' 22"	15' 05.33"	290° 51' 05"	0.40616
17	155° 27' 15"	5° 06' 17"	159° 11' 44"	14° 15' 13"	0° 55' 24"	15' 05.77"	290° 58' 21"	0.41023
18	155° 58' 15"	5° 05' 37"	159° 41' 01"	14° 03' 04"	0° 55' 26"	15' 06.21"	291° 5' 29"	0.41430
19	156° 29' 16"	5° 04' 56"	160° 10' 16"	13° 50' 50"	0° 55' 27"	15' 06.65"	291° 12' 31"	0.41839
20	157° 00' 20"	5° 04' 13"	160° 39' 30"	13° 38' 32"	0° 55' 29"	15' 07.10"	291° 19' 26"	0.42249
21	157° 31' 25"	5° 03' 29"	161° 08' 43"	13° 26' 11"	0° 55' 30"	15' 07.55"	291° 26' 15"	0.42660
22	158° 02' 31"	5° 02' 44"	161° 37' 54"	13° 13' 45"	0° 55' 32"	15' 08.00"	291° 32' 56"	0.43072
23	158° 33' 40"	5° 01' 57"	162° 07' 04"	13° 01' 15"	0° 55' 34"	15' 08.46"	291° 39' 30"	0.43485
24	159° 04' 50"	5° 01' 08"	162° 36' 12"	12° 48' 41"	0° 55' 36"	15' 08.93"	291° 45' 57"	0.43898

**7 Juni 2022****DATA MATAHARI**

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	76° 16' 03"	0.67"	75° 04' 31"	22° 43' 44"	1.0148020	15' 45.63"	23° 26' 16"	1 m 12 s
1	76° 18' 27"	0.66"	75° 07' 06"	22° 43' 59"	1.0148072	15' 45.63"	23° 26' 16"	1 m 12 s
2	76° 20' 51"	0.66"	75° 09' 41"	22° 44' 13"	1.0148124	15' 45.62"	23° 26' 16"	1 m 11 s
3	76° 23' 14"	0.66"	75° 12' 16"	22° 44' 28"	1.0148176	15' 45.62"	23° 26' 16"	1 m 11 s
4	76° 25' 38"	0.66"	75° 14' 51"	22° 44' 43"	1.0148227	15' 45.61"	23° 26' 16"	1 m 11 s
5	76° 28' 01"	0.65"	75° 17' 26"	22° 44' 57"	1.0148279	15' 45.61"	23° 26' 16"	1 m 10 s
6	76° 30' 25"	0.65"	75° 20' 00"	22° 45' 12"	1.0148331	15' 45.60"	23° 26' 16"	1 m 10 s
7	76° 32' 48"	0.65"	75° 22' 35"	22° 45' 26"	1.0148382	15' 45.60"	23° 26' 16"	1 m 09 s
8	76° 35' 12"	0.65"	75° 25' 10"	22° 45' 40"	1.0148434	15' 45.59"	23° 26' 16"	1 m 09 s
9	76° 37' 35"	0.64"	75° 27' 45"	22° 45' 55"	1.0148485	15' 45.59"	23° 26' 16"	1 m 08 s
10	76° 39' 59"	0.64"	75° 30' 20"	22° 46' 09"	1.0148537	15' 45.58"	23° 26' 16"	1 m 08 s
11	76° 42' 22"	0.64"	75° 32' 55"	22° 46' 23"	1.0148588	15' 45.58"	23° 26' 16"	1 m 07 s
12	76° 44' 46"	0.64"	75° 35' 30"	22° 46' 38"	1.0148639	15' 45.58"	23° 26' 16"	1 m 07 s
13	76° 47' 09"	0.63"	75° 38' 05"	22° 46' 52"	1.0148690	15' 45.57"	23° 26' 16"	1 m 06 s
14	76° 49' 33"	0.63"	75° 40' 40"	22° 47' 06"	1.0148741	15' 45.57"	23° 26' 16"	1 m 06 s
15	76° 51' 56"	0.63"	75° 43' 14"	22° 47' 20"	1.0148792	15' 45.56"	23° 26' 16"	1 m 05 s
16	76° 54' 20"	0.63"	75° 45' 49"	22° 47' 34"	1.0148843	15' 45.56"	23° 26' 16"	1 m 05 s
17	76° 56' 44"	0.62"	75° 48' 24"	22° 47' 48"	1.0148894	15' 45.55"	23° 26' 16"	1 m 04 s
18	76° 59' 07"	0.62"	75° 50' 59"	22° 48' 02"	1.0148945	15' 45.55"	23° 26' 16"	1 m 04 s
19	77° 01' 31"	0.62"	75° 53' 34"	22° 48' 16"	1.0148995	15' 45.54"	23° 26' 16"	1 m 03 s
20	77° 03' 54"	0.61"	75° 56' 09"	22° 48' 30"	1.0149046	15' 45.54"	23° 26' 16"	1 m 03 s
21	77° 06' 18"	0.61"	75° 58' 44"	22° 48' 44"	1.0149096	15' 45.53"	23° 26' 16"	1 m 03 s
22	77° 08' 41"	0.61"	76° 01' 19"	22° 48' 58"	1.0149147	15' 45.53"	23° 26' 16"	1 m 02 s
23	77° 11' 05"	0.60"	76° 03' 54"	22° 49' 11"	1.0149197	15' 45.52"	23° 26' 16"	1 m 02 s
24	77° 13' 28"	0.60"	76° 06' 29"	22° 49' 25"	1.0149247	15' 45.52"	23° 26' 16"	1 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	159° 04' 50"	5° 01' 08"	162° 36' 12"	12° 48' 41"	0° 55' 36"	15' 08.93"	291° 45' 57"	0.43898
1	159° 36' 03"	5° 00' 18"	163° 05' 20"	12° 36' 03"	0° 55' 37"	15' 09.40"	291° 52' 17"	0.44313
2	160° 07' 17"	4° 59' 26"	163° 34' 27"	12° 23' 21"	0° 55' 39"	15' 09.87"	291° 58' 30"	0.44728
3	160° 38' 32"	4° 58' 33"	164° 03' 32"	12° 10' 35"	0° 55' 41"	15' 10.34"	292° 4' 36"	0.45144
4	161° 09' 50"	4° 57' 38"	164° 32' 36"	11° 57' 46"	0° 55' 42"	15' 10.82"	292° 10' 35"	0.45561
5	161° 41' 10"	4° 56' 42"	165° 01' 40"	11° 44' 52"	0° 55' 44"	15' 11.31"	292° 16' 27"	0.45979
6	162° 12' 31"	4° 55' 44"	165° 30' 43"	11° 31' 55"	0° 55' 46"	15' 11.79"	292° 22' 12"	0.46397
7	162° 43' 55"	4° 54' 44"	165° 59' 44"	11° 18' 54"	0° 55' 48"	15' 12.28"	292° 27' 50"	0.46816
8	163° 15' 20"	4° 53' 44"	166° 28' 45"	11° 05' 50"	0° 55' 50"	15' 12.78"	292° 33' 20"	0.47236
9	163° 46' 47"	4° 52' 41"	166° 57' 46"	10° 52' 42"	0° 55' 51"	15' 13.28"	292° 38' 43"	0.47657
10	164° 18' 16"	4° 51' 37"	167° 26' 45"	10° 39' 30"	0° 55' 53"	15' 13.78"	292° 43' 59"	0.48078
11	164° 49' 47"	4° 50' 32"	167° 55' 44"	10° 26' 15"	0° 55' 55"	15' 14.29"	292° 49' 08"	0.48500
12	165° 21' 21"	4° 49' 25"	168° 24' 43"	10° 12' 56"	0° 55' 57"	15' 14.80"	292° 54' 10"	0.48922
13	165° 52' 56"	4° 48' 16"	168° 53' 41"	9° 59' 34"	0° 55' 59"	15' 15.32"	292° 59' 04"	0.49345
14	166° 24' 33"	4° 47' 06"	169° 22' 38"	9° 46' 08"	0° 56' 01"	15' 15.83"	293° 3' 51"	0.49769
15	166° 56' 12"	4° 45' 54"	169° 51' 35"	9° 32' 39"	0° 56' 03"	15' 16.36"	293° 8' 30"	0.50193
16	167° 27' 53"	4° 44' 41"	170° 20' 32"	9° 19' 07"	0° 56' 05"	15' 16.88"	293° 13' 03"	0.50617
17	167° 59' 37"	4° 43' 26"	170° 49' 29"	9° 05' 31"	0° 56' 07"	15' 17.41"	293° 17' 28"	0.51042
18	168° 31' 22"	4° 42' 10"	171° 18' 25"	8° 51' 52"	0° 56' 09"	15' 17.94"	293° 21' 45"	0.51468
19	169° 03' 10"	4° 40' 52"	171° 47' 22"	8° 38' 11"	0° 56' 11"	15' 18.48"	293° 25' 55"	0.51894
20	169° 34' 60"	4° 39' 33"	172° 16' 18"	8° 24' 25"	0° 56' 13"	15' 19.02"	293° 29' 58"	0.52320
21	170° 06' 52"	4° 38' 12"	172° 45' 14"	8° 10' 37"	0° 56' 15"	15' 19.57"	293° 33' 53"	0.52747
22	170° 38' 46"	4° 36' 50"	173° 14' 10"	7° 56' 46"	0° 56' 17"	15' 20.11"	293° 37' 41"	0.53174
23	171° 10' 42"	4° 35' 26"	173° 43' 07"	7° 42' 52"	0° 56' 19"	15' 20.66"	293° 41' 21"	0.53601
24	171° 42' 40"	4° 34' 00"	174° 12' 04"	7° 28' 54"	0° 56' 21"	15' 21.22"	293° 44' 54"	0.54029

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	77° 13' 28"	0.60"	76° 06' 29"	22° 49' 25"	1.0149247	15' 45.52"	23° 26' 16"	1 m 01 s
1	77° 15' 52"	0.60"	76° 09' 04"	22° 49' 39"	1.0149298	15' 45.51"	23° 26' 16"	1 m 01 s
2	77° 18' 15"	0.59"	76° 11' 39"	22° 49' 52"	1.0149348	15' 45.51"	23° 26' 16"	1 m 00 s
3	77° 20' 39"	0.59"	76° 14' 14"	22° 50' 06"	1.0149398	15' 45.50"	23° 26' 16"	0 m 60 s
4	77° 23' 02"	0.59"	76° 16' 49"	22° 50' 20"	1.0149448	15' 45.50"	23° 26' 16"	0 m 59 s
5	77° 25' 26"	0.58"	76° 19' 24"	22° 50' 33"	1.0149498	15' 45.50"	23° 26' 16"	0 m 59 s
6	77° 27' 49"	0.58"	76° 21' 59"	22° 50' 46"	1.0149548	15' 45.49"	23° 26' 16"	0 m 58 s
7	77° 30' 13"	0.58"	76° 24' 34"	22° 50' 60"	1.0149597	15' 45.49"	23° 26' 16"	0 m 58 s
8	77° 32' 36"	0.57"	76° 27' 09"	22° 51' 13"	1.0149647	15' 45.48"	23° 26' 16"	0 m 57 s
9	77° 34' 59"	0.57"	76° 29' 44"	22° 51' 27"	1.0149697	15' 45.48"	23° 26' 16"	0 m 57 s
10	77° 37' 23"	0.57"	76° 32' 19"	22° 51' 40"	1.0149746	15' 45.47"	23° 26' 16"	0 m 56 s
11	77° 39' 46"	0.56"	76° 34' 54"	22° 51' 53"	1.0149796	15' 45.47"	23° 26' 16"	0 m 56 s
12	77° 42' 10"	0.56"	76° 37' 29"	22° 52' 06"	1.0149845	15' 45.46"	23° 26' 16"	0 m 55 s
13	77° 44' 33"	0.56"	76° 40' 04"	22° 52' 20"	1.0149895	15' 45.46"	23° 26' 16"	0 m 55 s
14	77° 46' 57"	0.55"	76° 42' 39"	22° 52' 33"	1.0149944	15' 45.45"	23° 26' 16"	0 m 54 s
15	77° 49' 20"	0.55"	76° 45' 14"	22° 52' 46"	1.0149993	15' 45.45"	23° 26' 16"	0 m 54 s
16	77° 51' 44"	0.54"	76° 47' 49"	22° 52' 59"	1.0150042	15' 45.44"	23° 26' 16"	0 m 53 s
17	77° 54' 07"	0.54"	76° 50' 25"	22° 53' 12"	1.0150091	15' 45.44"	23° 26' 16"	0 m 53 s
18	77° 56' 31"	0.54"	76° 52' 60"	22° 53' 25"	1.0150141	15' 45.44"	23° 26' 16"	0 m 52 s
19	77° 58' 54"	0.53"	76° 55' 35"	22° 53' 38"	1.0150189	15' 45.43"	23° 26' 16"	0 m 52 s
20	78° 01' 18"	0.53"	76° 58' 10"	22° 53' 51"	1.0150238	15' 45.43"	23° 26' 16"	0 m 52 s
21	78° 03' 41"	0.53"	77° 00' 45"	22° 54' 04"	1.0150287	15' 45.42"	23° 26' 16"	0 m 51 s
22	78° 06' 05"	0.52"	77° 03' 20"	22° 54' 16"	1.0150336	15' 45.42"	23° 26' 16"	0 m 51 s
23	78° 08' 28"	0.52"	77° 05' 55"	22° 54' 29"	1.0150385	15' 45.41"	23° 26' 16"	0 m 50 s
24	78° 10' 52"	0.51"	77° 08' 30"	22° 54' 42"	1.0150433	15' 45.41"	23° 26' 16"	0 m 50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	171° 42' 40"	4° 34' 00"	174° 12' 04"	7° 28' 54"	0° 56' 21"	15' 21.22"	293° 44' 54"	0.54029
1	172° 14' 41"	4° 32' 33"	174° 41' 00"	7° 14' 54"	0° 56' 23"	15' 21.78"	293° 48' 19"	0.54457
2	172° 46' 44"	4° 31' 05"	175° 09' 58"	7° 00' 51"	0° 56' 25"	15' 22.34"	293° 51' 36"	0.54885
3	173° 18' 49"	4° 29' 35"	175° 38' 55"	6° 46' 45"	0° 56' 27"	15' 22.90"	293° 54' 46"	0.55313
4	173° 50' 56"	4° 28' 04"	176° 07' 53"	6° 32' 37"	0° 56' 29"	15' 23.47"	293° 57' 48"	0.55742
5	174° 23' 06"	4° 26' 31"	176° 36' 52"	6° 18' 26"	0° 56' 31"	15' 24.04"	294° 0' 43"	0.56170
6	174° 55' 18"	4° 24' 56"	177° 05' 51"	6° 04' 12"	0° 56' 33"	15' 24.61"	294° 3' 29"	0.56599
7	175° 27' 32"	4° 23' 20"	177° 34' 51"	5° 49' 55"	0° 56' 35"	15' 25.19"	294° 6' 08"	0.57028
8	175° 59' 49"	4° 21' 42"	178° 03' 52"	5° 35' 36"	0° 56' 37"	15' 25.77"	294° 8' 39"	0.57457
9	176° 32' 08"	4° 20' 03"	178° 32' 53"	5° 21' 14"	0° 56' 39"	15' 26.36"	294° 11' 03"	0.57886
10	177° 04' 29"	4° 18' 23"	179° 01' 56"	5° 06' 50"	0° 56' 42"	15' 26.94"	294° 13' 18"	0.58315
11	177° 36' 53"	4° 16' 41"	179° 30' 59"	4° 52' 23"	0° 56' 44"	15' 27.53"	294° 15' 25"	0.58743
12	178° 09' 19"	4° 14' 57"	180° 00' 03"	4° 37' 54"	0° 56' 46"	15' 28.12"	294° 17' 25"	0.59172
13	178° 41' 47"	4° 13' 12"	180° 29' 09"	4° 23' 23"	0° 56' 48"	15' 28.72"	294° 19' 17"	0.59601
14	179° 14' 18"	4° 11' 26"	180° 58' 15"	4° 08' 49"	0° 56' 50"	15' 29.32"	294° 21' 00"	0.60029
15	179° 46' 51"	4° 09' 38"	181° 27' 23"	3° 54' 14"	0° 56' 53"	15' 29.92"	294° 22' 36"	0.60458
16	180° 19' 27"	4° 07' 48"	181° 56' 32"	3° 39' 36"	0° 56' 55"	15' 30.52"	294° 24' 03"	0.60886
17	180° 52' 05"	4° 05' 57"	182° 25' 43"	3° 24' 56"	0° 56' 57"	15' 31.13"	294° 25' 23"	0.61314
18	181° 24' 46"	4° 04' 05"	182° 54' 55"	3° 10' 14"	0° 56' 59"	15' 31.74"	294° 26' 34"	0.61741
19	181° 57' 29"	4° 02' 11"	183° 24' 08"	2° 55' 29"	0° 57' 01"	15' 32.35"	294° 27' 37"	0.62169
20	182° 30' 14"	4° 00' 16"	183° 53' 23"	2° 40' 43"	0° 57' 04"	15' 32.96"	294° 28' 31"	0.62596
21	183° 03' 03"	3° 58' 19"	184° 22' 40"	2° 25' 55"	0° 57' 06"	15' 33.58"	294° 29' 18"	0.63023
22	183° 35' 53"	3° 56' 20"	184° 51' 58"	2° 11' 05"	0° 57' 08"	15' 34.20"	294° 29' 56"	0.63449
23	184° 08' 47"	3° 54' 21"	185° 21' 19"	1° 56' 14"	0° 57' 11"	15' 34.82"	294° 30' 26"	0.63875
24	184° 41' 42"	3° 52' 20"	185° 50' 41"	1° 41' 20"	0° 57' 13"	15' 35.44"	294° 30' 47"	0.64300

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	78° 10' 52"	0.51"	77° 08' 30"	22° 54' 42"	1.0150433	15' 45.41"	23° 26' 16"	0 m 50 s
1	78° 13' 15"	0.51"	77° 11' 05"	22° 54' 54"	1.0150482	15' 45.40"	23° 26' 16"	0 m 49 s
2	78° 15' 38"	0.50"	77° 13' 41"	22° 55' 07"	1.0150530	15' 45.40"	23° 26' 16"	0 m 49 s
3	78° 18' 02"	0.50"	77° 16' 16"	22° 55' 20"	1.0150579	15' 45.39"	23° 26' 16"	0 m 48 s
4	78° 20' 25"	0.50"	77° 18' 51"	22° 55' 32"	1.0150627	15' 45.39"	23° 26' 16"	0 m 48 s
5	78° 22' 49"	0.49"	77° 21' 26"	22° 55' 45"	1.0150675	15' 45.39"	23° 26' 16"	0 m 47 s
6	78° 25' 12"	0.49"	77° 24' 01"	22° 55' 57"	1.0150723	15' 45.38"	23° 26' 16"	0 m 47 s
7	78° 27' 36"	0.48"	77° 26' 36"	22° 56' 10"	1.0150772	15' 45.38"	23° 26' 16"	0 m 46 s
8	78° 29' 59"	0.48"	77° 29' 11"	22° 56' 22"	1.0150820	15' 45.37"	23° 26' 16"	0 m 46 s
9	78° 32' 23"	0.47"	77° 31' 47"	22° 56' 34"	1.0150868	15' 45.37"	23° 26' 16"	0 m 45 s
10	78° 34' 46"	0.47"	77° 34' 22"	22° 56' 47"	1.0150916	15' 45.36"	23° 26' 16"	0 m 45 s
11	78° 37' 09"	0.47"	77° 36' 57"	22° 56' 59"	1.0150963	15' 45.36"	23° 26' 16"	0 m 44 s
12	78° 39' 33"	0.46"	77° 39' 32"	22° 57' 11"	1.0151011	15' 45.35"	23° 26' 16"	0 m 44 s
13	78° 41' 56"	0.46"	77° 42' 07"	22° 57' 23"	1.0151059	15' 45.35"	23° 26' 16"	0 m 43 s
14	78° 44' 20"	0.45"	77° 44' 43"	22° 57' 35"	1.0151107	15' 45.35"	23° 26' 16"	0 m 43 s
15	78° 46' 43"	0.45"	77° 47' 18"	22° 57' 47"	1.0151154	15' 45.34"	23° 26' 16"	0 m 42 s
16	78° 49' 07"	0.44"	77° 49' 53"	22° 57' 59"	1.0151202	15' 45.34"	23° 26' 16"	0 m 42 s
17	78° 51' 30"	0.44"	77° 52' 28"	22° 58' 11"	1.0151249	15' 45.33"	23° 26' 16"	0 m 41 s
18	78° 53' 53"	0.43"	77° 55' 03"	22° 58' 23"	1.0151297	15' 45.33"	23° 26' 16"	0 m 41 s
19	78° 56' 17"	0.43"	77° 57' 39"	22° 58' 35"	1.0151344	15' 45.32"	23° 26' 16"	0 m 40 s
20	78° 58' 40"	0.42"	78° 00' 14"	22° 58' 47"	1.0151391	15' 45.32"	23° 26' 16"	0 m 40 s
21	79° 01' 04"	0.42"	78° 02' 49"	22° 58' 59"	1.0151439	15' 45.31"	23° 26' 16"	0 m 39 s
22	79° 03' 27"	0.41"	78° 05' 24"	22° 59' 11"	1.0151486	15' 45.31"	23° 26' 16"	0 m 39 s
23	79° 05' 50"	0.41"	78° 07' 60"	22° 59' 23"	1.0151533	15' 45.31"	23° 26' 16"	0 m 38 s
24	79° 08' 14"	0.41"	78° 10' 35"	22° 59' 34"	1.0151580	15' 45.30"	23° 26' 16"	0 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	184° 41' 42"	3° 52' 20"	185° 50' 41"	1° 41' 20"	0° 57' 13"	15' 35.44"	294° 30' 47"	0.64300
1	185° 14' 41"	3° 50' 17"	186° 20' 05"	1° 26' 25"	0° 57' 15"	15' 36.07"	294° 30' 60"	0.64725
2	185° 47' 42"	3° 48' 13"	186° 49' 31"	1° 11' 29"	0° 57' 17"	15' 36.69"	294° 31' 04"	0.65149
3	186° 20' 45"	3° 46' 07"	187° 18' 60"	0° 56' 31"	0° 57' 20"	15' 37.32"	294° 30' 60"	0.65573
4	186° 53' 51"	3° 44' 00"	187° 48' 30"	0° 41' 31"	0° 57' 22"	15' 37.95"	294° 30' 47"	0.65996
5	187° 26' 60"	3° 41' 52"	188° 18' 03"	0° 26' 30"	0° 57' 24"	15' 38.59"	294° 30' 25"	0.66418
6	188° 00' 11"	3° 39' 42"	188° 47' 38"	0° 11' 27"	0° 57' 27"	15' 39.22"	294° 29' 55"	0.66840
7	188° 33' 25"	3° 37' 31"	189° 17' 16"	0° -3' 37"	0° 57' 29"	15' 39.86"	294° 29' 16"	0.67261
8	189° 06' 42"	3° 35' 19"	189° 46' 56"	0° -18' 42"	0° 57' 31"	15' 40.50"	294° 28' 28"	0.67682
9	189° 40' 01"	3° 33' 05"	190° 16' 39"	0° -33' 48"	0° 57' 34"	15' 41.14"	294° 27' 31"	0.68101
10	190° 13' 23"	3° 30' 49"	190° 46' 25"	0° -48' 55"	0° 57' 36"	15' 41.78"	294° 26' 26"	0.68520
11	190° 46' 48"	3° 28' 33"	191° 16' 13"	-1° 04' 04"	0° 57' 38"	15' 42.43"	294° 25' 11"	0.68937
12	191° 20' 15"	3° 26' 15"	191° 46' 04"	-1° 19' 13"	0° 57' 41"	15' 43.07"	294° 23' 47"	0.69354
13	191° 53' 45"	3° 23' 55"	192° 15' 58"	-1° 34' 24"	0° 57' 43"	15' 43.72"	294° 22' 14"	0.69770
14	192° 27' 18"	3° 21' 34"	192° 45' 55"	-1° 49' 35"	0° 57' 46"	15' 44.37"	294° 20' 32"	0.70185
15	193° 00' 53"	3° 19' 12"	193° 15' 55"	-2° 04' 47"	0° 57' 48"	15' 45.02"	294° 18' 41"	0.70599
16	193° 34' 31"	3° 16' 49"	193° 45' 58"	-2° 19' 60"	0° 57' 50"	15' 45.67"	294° 16' 40"	0.71012
17	194° 08' 12"	3° 14' 24"	194° 16' 05"	-2° 35' 13"	0° 57' 53"	15' 46.32"	294° 14' 30"	0.71424
18	194° 41' 56"	3° 11' 58"	194° 46' 15"	-2° 50' 27"	0° 57' 55"	15' 46.97"	294° 12' 11"	0.71834
19	195° 15' 42"	3° 09' 30"	195° 16' 28"	-3° 05' 42"	0° 57' 58"	15' 47.62"	294° 9' 42"	0.72243
20	195° 49' 31"	3° 07' 01"	195° 46' 45"	-3° 20' 57"	0° 57' 60"	15' 48.28"	294° 7' 03"	0.72652
21	196° 23' 23"	3° 04' 31"	196° 17' 05"	-3° 36' 12"	0° 58' 02"	15' 48.93"	294° 4' 15"	0.73058
22	196° 57' 18"	3° 02' 00"	196° 47' 29"	-3° 51' 28"	0° 58' 05"	15' 49.59"	294° 1' 17"	0.73464
23	197° 31' 15"	2° 59' 27"	197° 17' 56"	-4° 06' 44"	0° 58' 07"	15' 50.24"	293° 58' 10"	0.73868
24	198° 05' 16"	2° 56' 54"	197° 48' 28"	-4° 21' 60"	0° 58' 10"	15' 50.90"	293° 54' 52"	0.74271

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	79° 08' 14"	0.41"	78° 10' 35"	22° 59' 34"	1.0151580	15' 45.30"	23° 26' 16"	0 m 38 s
1	79° 10' 37"	0.40"	78° 13' 10"	22° 59' 46"	1.0151627	15' 45.30"	23° 26' 16"	0 m 37 s
2	79° 13' 01"	0.40"	78° 15' 46"	22° 59' 58"	1.0151674	15' 45.29"	23° 26' 16"	0 m 37 s
3	79° 15' 24"	0.39"	78° 18' 21"	23° 00' 09"	1.0151721	15' 45.29"	23° 26' 16"	0 m 36 s
4	79° 17' 47"	0.39"	78° 20' 56"	23° 00' 21"	1.0151767	15' 45.28"	23° 26' 16"	0 m 36 s
5	79° 20' 11"	0.38"	78° 23' 31"	23° 00' 32"	1.0151814	15' 45.28"	23° 26' 16"	0 m 35 s
6	79° 22' 34"	0.38"	78° 26' 07"	23° 00' 44"	1.0151861	15' 45.27"	23° 26' 16"	0 m 35 s
7	79° 24' 58"	0.37"	78° 28' 42"	23° 00' 55"	1.0151907	15' 45.27"	23° 26' 16"	0 m 34 s
8	79° 27' 21"	0.37"	78° 31' 17"	23° 01' 06"	1.0151954	15' 45.27"	23° 26' 16"	0 m 34 s
9	79° 29' 44"	0.36"	78° 33' 53"	23° 01' 18"	1.0152000	15' 45.26"	23° 26' 16"	0 m 33 s
10	79° 32' 08"	0.36"	78° 36' 28"	23° 01' 29"	1.0152047	15' 45.26"	23° 26' 16"	0 m 33 s
11	79° 34' 31"	0.35"	78° 39' 03"	23° 01' 40"	1.0152093	15' 45.25"	23° 26' 16"	0 m 32 s
12	79° 36' 55"	0.35"	78° 41' 39"	23° 01' 51"	1.0152139	15' 45.25"	23° 26' 16"	0 m 32 s
13	79° 39' 18"	0.34"	78° 44' 14"	23° 02' 03"	1.0152185	15' 45.24"	23° 26' 16"	0 m 31 s
14	79° 41' 41"	0.34"	78° 46' 49"	23° 02' 14"	1.0152232	15' 45.24"	23° 26' 16"	0 m 31 s
15	79° 44' 05"	0.33"	78° 49' 25"	23° 02' 25"	1.0152278	15' 45.24"	23° 26' 16"	0 m 30 s
16	79° 46' 28"	0.33"	78° 51' 60"	23° 02' 36"	1.0152324	15' 45.23"	23° 26' 16"	0 m 30 s
17	79° 48' 52"	0.32"	78° 54' 35"	23° 02' 47"	1.0152370	15' 45.23"	23° 26' 16"	0 m 29 s
18	79° 51' 15"	0.32"	78° 57' 11"	23° 02' 58"	1.0152416	15' 45.22"	23° 26' 16"	0 m 29 s
19	79° 53' 38"	0.31"	78° 59' 46"	23° 03' 09"	1.0152462	15' 45.22"	23° 26' 16"	0 m 28 s
20	79° 56' 02"	0.31"	79° 02' 21"	23° 03' 19"	1.0152507	15' 45.21"	23° 26' 16"	0 m 28 s
21	79° 58' 25"	0.30"	79° 04' 57"	23° 03' 30"	1.0152553	15' 45.21"	23° 26' 16"	0 m 27 s
22	80° 00' 48"	0.30"	79° 07' 32"	23° 03' 41"	1.0152599	15' 45.21"	23° 26' 16"	0 m 27 s
23	80° 03' 12"	0.29"	79° 10' 07"	23° 03' 52"	1.0152644	15' 45.20"	23° 26' 16"	0 m 26 s
24	80° 05' 35"	0.28"	79° 12' 43"	23° 04' 02"	1.0152690	15' 45.20"	23° 26' 16"	0 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	198° 05' 16"	2° 56' 54"	197° 48' 28"	-4° 21' 60"	0° 58' 10"	15' 50.90"	293° 54' 52"	0.74271
1	198° 39' 19"	2° 54' 18"	198° 19' 03"	-4° 37' 16"	0° 58' 12"	15' 51.55"	293° 51' 25"	0.74672
2	199° 13' 24"	2° 51' 42"	198° 49' 42"	-4° 52' 32"	0° 58' 14"	15' 52.21"	293° 47' 47"	0.75072
3	199° 47' 33"	2° 49' 04"	199° 20' 26"	-5° 07' 48"	0° 58' 17"	15' 52.87"	293° 43' 60"	0.75470
4	200° 21' 44"	2° 46' 26"	199° 51' 13"	-5° 23' 04"	0° 58' 19"	15' 53.53"	293° 40' 02"	0.75867
5	200° 55' 59"	2° 43' 46"	200° 22' 05"	-5° 38' 20"	0° 58' 22"	15' 54.18"	293° 35' 54"	0.76262
6	201° 30' 16"	2° 41' 04"	200° 53' 01"	-5° 53' 35"	0° 58' 24"	15' 54.84"	293° 31' 35"	0.76656
7	202° 04' 36"	2° 38' 22"	201° 24' 02"	-6° 08' 50"	0° 58' 26"	15' 55.50"	293° 27' 06"	0.77047
8	202° 38' 58"	2° 35' 38"	201° 55' 06"	-6° 24' 05"	0° 58' 29"	15' 56.15"	293° 22' 27"	0.77437
9	203° 13' 24"	2° 32' 53"	202° 26' 16"	-6° 39' 19"	0° 58' 31"	15' 56.81"	293° 17' 37"	0.77826
10	203° 47' 52"	2° 30' 08"	202° 57' 30"	-6° 54' 32"	0° 58' 34"	15' 57.47"	293° 12' 36"	0.78212
11	204° 22' 23"	2° 27' 21"	203° 28' 49"	-7° 09' 45"	0° 58' 36"	15' 58.12"	293° 7' 24"	0.78596
12	204° 56' 57"	2° 24' 32"	204° 00' 12"	-7° 24' 56"	0° 58' 38"	15' 58.78"	293° 2' 01"	0.78979
13	205° 31' 34"	2° 21' 43"	204° 31' 41"	-7° 40' 07"	0° 58' 41"	15' 59.43"	292° 56' 28"	0.79360
14	206° 06' 14"	2° 18' 53"	205° 03' 14"	-7° 55' 17"	0° 58' 43"	16' 00.08"	292° 50' 43"	0.79738
15	206° 40' 56"	2° 16' 01"	205° 34' 53"	-8° 10' 26"	0° 58' 46"	16' 00.74"	292° 44' 47"	0.80115
16	207° 15' 42"	2° 13' 09"	206° 06' 36"	-8° 25' 33"	0° 58' 48"	16' 01.39"	292° 38' 39"	0.80489
17	207° 50' 30"	2° 10' 15"	206° 38' 25"	-8° 40' 40"	0° 58' 50"	16' 02.04"	292° 32' 20"	0.80861
18	208° 25' 21"	2° 07' 20"	207° 10' 19"	-8° 55' 45"	0° 58' 53"	16' 02.69"	292° 25' 49"	0.81232
19	209° 00' 15"	2° 04' 25"	207° 42' 18"	-9° 10' 48"	0° 58' 55"	16' 03.33"	292° 19' 07"	0.81599
20	209° 35' 11"	2° 01' 28"	208° 14' 23"	-9° 25' 50"	0° 58' 58"	16' 03.98"	292° 12' 13"	0.81965
21	210° 10' 11"	1° 58' 30"	208° 46' 34"	-9° 40' 50"	0° 58' 60"	16' 04.62"	292° 5' 07"	0.82328
22	210° 45' 13"	1° 55' 32"	209° 18' 49"	-9° 55' 49"	0° 59' 02"	16' 05.27"	291° 57' 48"	0.82689
23	211° 20' 18"	1° 52' 32"	209° 51' 11"	-10° 10' 46"	0° 59' 05"	16' 05.91"	291° 50' 17"	0.83047
24	211° 55' 26"	1° 49' 31"	210° 23' 38"	-10° 25' 40"	0° 59' 07"	16' 06.55"	291° 42' 34"	0.83403

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	80° 05' 35"	0.28"	79° 12' 43"	23° 04' 02"	1.0152690	15' 45.20"	23° 26' 16"	0 m 26 s
1	80° 07' 58"	0.28"	79° 15' 18"	23° 04' 13"	1.0152735	15' 45.19"	23° 26' 16"	0 m 25 s
2	80° 10' 22"	0.27"	79° 17' 54"	23° 04' 24"	1.0152781	15' 45.19"	23° 26' 16"	0 m 25 s
3	80° 12' 45"	0.27"	79° 20' 29"	23° 04' 34"	1.0152826	15' 45.19"	23° 26' 16"	0 m 24 s
4	80° 15' 09"	0.26"	79° 23' 04"	23° 04' 45"	1.0152872	15' 45.18"	23° 26' 16"	0 m 24 s
5	80° 17' 32"	0.26"	79° 25' 40"	23° 04' 55"	1.0152917	15' 45.18"	23° 26' 16"	0 m 23 s
6	80° 19' 55"	0.25"	79° 28' 15"	23° 05' 06"	1.0152962	15' 45.17"	23° 26' 16"	0 m 23 s
7	80° 22' 19"	0.25"	79° 30' 51"	23° 05' 16"	1.0153007	15' 45.17"	23° 26' 16"	0 m 22 s
8	80° 24' 42"	0.24"	79° 33' 26"	23° 05' 26"	1.0153052	15' 45.16"	23° 26' 16"	0 m 22 s
9	80° 27' 05"	0.24"	79° 36' 02"	23° 05' 37"	1.0153097	15' 45.16"	23° 26' 16"	0 m 21 s
10	80° 29' 29"	0.23"	79° 38' 37"	23° 05' 47"	1.0153142	15' 45.16"	23° 26' 16"	0 m 21 s
11	80° 31' 52"	0.23"	79° 41' 12"	23° 05' 57"	1.0153187	15' 45.15"	23° 26' 16"	0 m 20 s
12	80° 34' 15"	0.22"	79° 43' 48"	23° 06' 07"	1.0153232	15' 45.15"	23° 26' 16"	0 m 20 s
13	80° 36' 39"	0.22"	79° 46' 23"	23° 06' 18"	1.0153277	15' 45.14"	23° 26' 16"	0 m 19 s
14	80° 39' 02"	0.21"	79° 48' 59"	23° 06' 28"	1.0153322	15' 45.14"	23° 26' 16"	0 m 19 s
15	80° 41' 25"	0.21"	79° 51' 34"	23° 06' 38"	1.0153367	15' 45.13"	23° 26' 16"	0 m 18 s
16	80° 43' 49"	0.20"	79° 54' 10"	23° 06' 48"	1.0153411	15' 45.13"	23° 26' 16"	0 m 18 s
17	80° 46' 12"	0.19"	79° 56' 45"	23° 06' 58"	1.0153456	15' 45.13"	23° 26' 16"	0 m 17 s
18	80° 48' 35"	0.19"	79° 59' 21"	23° 07' 08"	1.0153500	15' 45.12"	23° 26' 16"	0 m 17 s
19	80° 50' 59"	0.18"	80° 01' 56"	23° 07' 17"	1.0153545	15' 45.12"	23° 26' 16"	0 m 16 s
20	80° 53' 22"	0.18"	80° 04' 32"	23° 07' 27"	1.0153589	15' 45.11"	23° 26' 16"	0 m 16 s
21	80° 55' 45"	0.17"	80° 07' 07"	23° 07' 37"	1.0153634	15' 45.11"	23° 26' 16"	0 m 15 s
22	80° 58' 09"	0.17"	80° 09' 43"	23° 07' 47"	1.0153678	15' 45.11"	23° 26' 16"	0 m 15 s
23	81° 00' 32"	0.16"	80° 12' 18"	23° 07' 57"	1.0153722	15' 45.10"	23° 26' 16"	0 m 14 s
24	81° 02' 55"	0.16"	80° 14' 54"	23° 08' 06"	1.0153766	15' 45.10"	23° 26' 16"	0 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	211° 55' 26"	1° 49' 31"	210° 23' 38"	-10° 25' 40"	0° 59' 07"	16' 06.55"	291° 42' 34"	0.83403
1	212° 30' 37"	1° 46' 30"	210° 56' 12"	-10° 40' 33"	0° 59' 09"	16' 07.18"	291° 34' 39"	0.83757
2	213° 05' 51"	1° 43' 27"	211° 28' 51"	-10° 55' 24"	0° 59' 12"	16' 07.82"	291° 26' 30"	0.84107
3	213° 41' 07"	1° 40' 24"	212° 01' 36"	-11° 10' 12"	0° 59' 14"	16' 08.45"	291° 18' 09"	0.84456
4	214° 16' 26"	1° 37' 20"	212° 34' 27"	-11° 24' 58"	0° 59' 16"	16' 09.08"	291° 9' 35"	0.84801
5	214° 51' 48"	1° 34' 15"	213° 07' 24"	-11° 39' 41"	0° 59' 19"	16' 09.71"	291° 0' 47"	0.85144
6	215° 27' 13"	1° 31' 09"	213° 40' 28"	-11° 54' 22"	0° 59' 21"	16' 10.33"	290° 51' 46"	0.85484
7	216° 02' 41"	1° 28' 02"	214° 13' 37"	-12° 09' 00"	0° 59' 23"	16' 10.96"	290° 42' 32"	0.85821
8	216° 38' 11"	1° 24' 55"	214° 46' 54"	-12° 23' 36"	0° 59' 25"	16' 11.58"	290° 33' 04"	0.86156
9	217° 13' 44"	1° 21' 47"	215° 20' 16"	-12° 38' 08"	0° 59' 28"	16' 12.19"	290° 23' 22"	0.86487
10	217° 49' 20"	1° 18' 37"	215° 53' 45"	-12° 52' 38"	0° 59' 30"	16' 12.81"	290° 13' 25"	0.86816
11	218° 24' 59"	1° 15' 28"	216° 27' 21"	-13° 07' 04"	0° 59' 32"	16' 13.42"	290° 3' 14"	0.87141
12	219° 00' 40"	1° 12' 17"	217° 01' 03"	-13° 21' 28"	0° 59' 34"	16' 14.03"	289° 52' 49"	0.87464
13	219° 36' 24"	1° 09' 06"	217° 34' 51"	-13° 35' 47"	0° 59' 37"	16' 14.63"	289° 42' 09"	0.87783
14	220° 12' 11"	1° 05' 54"	218° 08' 47"	-13° 50' 04"	0° 59' 39"	16' 15.23"	289° 31' 14"	0.88099
15	220° 48' 01"	1° 02' 41"	218° 42' 49"	-14° 04' 17"	0° 59' 41"	16' 15.83"	289° 20' 03"	0.88412
16	221° 23' 53"	0° 59' 28"	219° 16' 59"	-14° 18' 26"	0° 59' 43"	16' 16.42"	289° 8' 37"	0.88722
17	221° 59' 48"	0° 56' 14"	219° 51' 15"	-14° 32' 31"	0° 59' 45"	16' 17.01"	288° 56' 55"	0.89029
18	222° 35' 45"	0° 52' 60"	220° 25' 38"	-14° 46' 32"	0° 59' 48"	16' 17.60"	288° 44' 56"	0.89332
19	223° 11' 46"	0° 49' 44"	221° 00' 08"	-15° 00' 30"	0° 59' 50"	16' 18.18"	288° 32' 41"	0.89632
20	223° 47' 49"	0° 46' 29"	221° 34' 46"	-15° 14' 23"	0° 59' 52"	16' 18.76"	288° 20' 10"	0.89928
21	224° 23' 54"	0° 43' 13"	222° 09' 30"	-15° 28' 12"	0° 59' 54"	16' 19.33"	288° 7' 21"	0.90221
22	225° 00' 02"	0° 39' 56"	222° 44' 22"	-15° 41' 56"	0° 59' 56"	16' 19.90"	287° 54' 14"	0.90511
23	225° 36' 13"	0° 36' 39"	223° 19' 21"	-15° 55' 36"	0° 59' 58"	16' 20.46"	287° 40' 50"	0.90797
24	226° 12' 27"	0° 33' 21"	223° 54' 27"	-16° 09' 11"	1° 00' 00"	16' 21.03"	287° 27' 07"	0.91079

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	81° 02' 55"	0.16"	80° 14' 54"	23° 08' 06"	1.0153766	15' 45.10"	23° 26' 16"	0 m 14 s
1	81° 05' 19"	0.15"	80° 17' 29"	23° 08' 16"	1.0153810	15' 45.09"	23° 26' 16"	0 m 13 s
2	81° 07' 42"	0.15"	80° 20' 05"	23° 08' 25"	1.0153855	15' 45.09"	23° 26' 16"	0 m 13 s
3	81° 10' 05"	0.14"	80° 22' 40"	23° 08' 35"	1.0153899	15' 45.09"	23° 26' 16"	0 m 12 s
4	81° 12' 29"	0.14"	80° 25' 16"	23° 08' 45"	1.0153943	15' 45.08"	23° 26' 16"	0 m 12 s
5	81° 14' 52"	0.13"	80° 27' 51"	23° 08' 54"	1.0153986	15' 45.08"	23° 26' 16"	0 m 11 s
6	81° 17' 15"	0.13"	80° 30' 27"	23° 09' 03"	1.0154030	15' 45.07"	23° 26' 16"	0 m 10 s
7	81° 19' 39"	0.12"	80° 33' 02"	23° 09' 13"	1.0154074	15' 45.07"	23° 26' 16"	0 m 10 s
8	81° 22' 02"	0.11"	80° 35' 38"	23° 09' 22"	1.0154118	15' 45.06"	23° 26' 16"	0 m 09 s
9	81° 24' 25"	0.11"	80° 38' 13"	23° 09' 31"	1.0154162	15' 45.06"	23° 26' 16"	0 m 09 s
10	81° 26' 49"	0.10"	80° 40' 49"	23° 09' 41"	1.0154205	15' 45.06"	23° 26' 16"	0 m 08 s
11	81° 29' 12"	0.10"	80° 43' 25"	23° 09' 50"	1.0154249	15' 45.05"	23° 26' 16"	0 m 08 s
12	81° 31' 35"	0.09"	80° 46' 00"	23° 09' 59"	1.0154292	15' 45.05"	23° 26' 16"	0 m 07 s
13	81° 33' 58"	0.09"	80° 48' 36"	23° 10' 08"	1.0154336	15' 45.04"	23° 26' 16"	0 m 07 s
14	81° 36' 22"	0.08"	80° 51' 11"	23° 10' 17"	1.0154379	15' 45.04"	23° 26' 16"	0 m 06 s
15	81° 38' 45"	0.08"	80° 53' 47"	23° 10' 26"	1.0154423	15' 45.04"	23° 26' 16"	0 m 06 s
16	81° 41' 08"	0.07"	80° 56' 22"	23° 10' 35"	1.0154466	15' 45.03"	23° 26' 16"	0 m 05 s
17	81° 43' 32"	0.07"	80° 58' 58"	23° 10' 44"	1.0154509	15' 45.03"	23° 26' 16"	0 m 05 s
18	81° 45' 55"	0.06"	81° 01' 34"	23° 10' 53"	1.0154553	15' 45.02"	23° 26' 16"	0 m 04 s
19	81° 48' 18"	0.06"	81° 04' 09"	23° 11' 02"	1.0154596	15' 45.02"	23° 26' 16"	0 m 04 s
20	81° 50' 42"	0.05"	81° 06' 45"	23° 11' 11"	1.0154639	15' 45.02"	23° 26' 16"	0 m 03 s
21	81° 53' 05"	0.05"	81° 09' 20"	23° 11' 20"	1.0154682	15' 45.01"	23° 26' 16"	0 m 03 s
22	81° 55' 28"	0.04"	81° 11' 56"	23° 11' 28"	1.0154725	15' 45.01"	23° 26' 16"	0 m 02 s
23	81° 57' 51"	0.04"	81° 14' 32"	23° 11' 37"	1.0154768	15' 45.00"	23° 26' 16"	0 m 02 s
24	82° 00' 15"	0.03"	81° 17' 07"	23° 11' 46"	1.0154811	15' 45.00"	23° 26' 16"	0 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	226° 12' 27"	0° 33' 21"	223° 54' 27"	-16° 09' 11"	1° 00' 00"	16' 21.03"	287° 27' 07"	0.91079
1	226° 48' 43"	0° 30' 03"	224° 29' 41"	-16° 22' 41"	1° 00' 02"	16' 21.58"	287° 13' 06"	0.91358
2	227° 25' 01"	0° 26' 44"	225° 05' 02"	-16° 36' 07"	1° 00' 04"	16' 22.13"	286° 58' 45"	0.91633
3	228° 01' 22"	0° 23' 25"	225° 40' 30"	-16° 49' 27"	1° 00' 06"	16' 22.68"	286° 44' 04"	0.91904
4	228° 37' 46"	0° 20' 06"	226° 16' 06"	-17° 02' 42"	1° 00' 08"	16' 23.22"	286° 29' 04"	0.92171
5	229° 14' 12"	0° 16' 46"	226° 51' 50"	-17° 15' 52"	1° 00' 10"	16' 23.75"	286° 13' 42"	0.92435
6	229° 50' 40"	0° 13' 26"	227° 27' 41"	-17° 28' 57"	1° 00' 12"	16' 24.28"	285° 57' 59"	0.92695
7	230° 27' 11"	0° 10' 06"	228° 03' 39"	-17° 41' 56"	1° 00' 14"	16' 24.81"	285° 41' 54"	0.92951
8	231° 03' 45"	0° 06' 45"	228° 39' 46"	-17° 54' 49"	1° 00' 16"	16' 25.33"	285° 25' 26"	0.93202
9	231° 40' 21"	0° 03' 25"	229° 15' 60"	-18° 07' 36"	1° 00' 18"	16' 25.84"	285° 8' 35"	0.93450
10	232° 16' 59"	0° 00' 03"	229° 52' 21"	-18° 20' 17"	1° 00' 20"	16' 26.35"	284° 51' 19"	0.93694
11	232° 53' 40"	0° -3' 18"	230° 28' 50"	-18° 32' 53"	1° 00' 22"	16' 26.85"	284° 33' 38"	0.93934
12	233° 30' 23"	0° -6' 39"	231° 05' 27"	-18° 45' 22"	1° 00' 23"	16' 27.35"	284° 15' 31"	0.94170
13	234° 07' 08"	0° -10' 01"	231° 42' 12"	-18° 57' 44"	1° 00' 25"	16' 27.84"	283° 56' 57"	0.94401
14	234° 43' 56"	0° -13' 23"	232° 19' 05"	-19° 10' 00"	1° 00' 27"	16' 28.32"	283° 37' 54"	0.94628
15	235° 20' 46"	0° -16' 45"	232° 56' 05"	-19° 22' 10"	1° 00' 29"	16' 28.80"	283° 18' 23"	0.94851
16	235° 57' 38"	0° -20' 07"	233° 33' 13"	-19° 34' 13"	1° 00' 30"	16' 29.27"	282° 58' 20"	0.95070
17	236° 34' 33"	0° -23' 29"	234° 10' 29"	-19° 46' 08"	1° 00' 32"	16' 29.74"	282° 37' 46"	0.95284
18	237° 11' 30"	0° -26' 51"	234° 47' 52"	-19° 57' 57"	1° 00' 34"	16' 30.20"	282° 16' 37"	0.95494
19	237° 48' 28"	0° -30' 13"	235° 25' 23"	-20° 09' 39"	1° 00' 35"	16' 30.65"	281° 54' 54"	0.95700
20	238° 25' 30"	0° -33' 35"	236° 03' 03"	-20° 21' 13"	1° 00' 37"	16' 31.09"	281° 32' 33"	0.95901
21	239° 02' 33"	0° -36' 57"	236° 40' 49"	-20° 32' 40"	1° 00' 39"	16' 31.53"	281° 9' 33"	0.96097
22	239° 39' 38"	0° -40' 18"	237° 18' 44"	-20° 43' 59"	1° 00' 40"	16' 31.96"	280° 45' 51"	0.96290
23	240° 16' 45"	0° -43' 40"	237° 56' 46"	-20° 55' 10"	1° 00' 42"	16' 32.39"	280° 21' 25"	0.96477
24	240° 53' 55"	0° -47' 02"	238° 34' 56"	-21° 06' 14"	1° 00' 43"	16' 32.81"	279° 56' 12"	0.96660

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	82° 00' 15"	0.03"	81° 17' 07"	23° 11' 46"	1.0154811	15' 45.00"	23° 26' 16"	0 m 01 s
1	82° 02' 38"	0.03"	81° 19' 43"	23° 11' 54"	1.0154854	15' 45.00"	23° 26' 16"	0 m 01 s
2	82° 05' 01"	0.02"	81° 22' 18"	23° 12' 03"	1.0154897	15' 44.99"	23° 26' 16"	0 m 00 s
3	82° 07' 25"	0.01"	81° 24' 54"	23° 12' 11"	1.0154939	15' 44.99"	23° 26' 16"	0 m -0 s
4	82° 09' 48"	0.01"	81° 27' 30"	23° 12' 20"	1.0154982	15' 44.98"	23° 26' 16"	0 m -1 s
5	82° 12' 11"	0.00"	81° 30' 05"	23° 12' 28"	1.0155025	15' 44.98"	23° 26' 16"	0 m -1 s
6	82° 14' 34"	-0.00"	81° 32' 41"	23° 12' 37"	1.0155067	15' 44.98"	23° 26' 16"	0 m -2 s
7	82° 16' 58"	-0.01"	81° 35' 17"	23° 12' 45"	1.0155110	15' 44.97"	23° 26' 16"	0 m -2 s
8	82° 19' 21"	-0.01"	81° 37' 52"	23° 12' 53"	1.0155152	15' 44.97"	23° 26' 16"	0 m -3 s
9	82° 21' 44"	-0.02"	81° 40' 28"	23° 13' 02"	1.0155195	15' 44.96"	23° 26' 16"	0 m -4 s
10	82° 24' 08"	-0.02"	81° 43' 04"	23° 13' 10"	1.0155237	15' 44.96"	23° 26' 16"	0 m -4 s
11	82° 26' 31"	-0.03"	81° 45' 39"	23° 13' 18"	1.0155279	15' 44.96"	23° 26' 16"	0 m -5 s
12	82° 28' 54"	-0.03"	81° 48' 15"	23° 13' 26"	1.0155322	15' 44.95"	23° 26' 16"	0 m -5 s
13	82° 31' 17"	-0.04"	81° 50' 50"	23° 13' 34"	1.0155364	15' 44.95"	23° 26' 16"	0 m -6 s
14	82° 33' 41"	-0.04"	81° 53' 26"	23° 13' 42"	1.0155406	15' 44.94"	23° 26' 16"	0 m -6 s
15	82° 36' 04"	-0.05"	81° 56' 02"	23° 13' 50"	1.0155448	15' 44.94"	23° 26' 16"	0 m -7 s
16	82° 38' 27"	-0.05"	81° 58' 38"	23° 13' 58"	1.0155490	15' 44.94"	23° 26' 16"	0 m -7 s
17	82° 40' 50"	-0.06"	82° 01' 13"	23° 14' 06"	1.0155532	15' 44.93"	23° 26' 16"	0 m -8 s
18	82° 43' 14"	-0.06"	82° 03' 49"	23° 14' 14"	1.0155574	15' 44.93"	23° 26' 16"	0 m -8 s
19	82° 45' 37"	-0.07"	82° 06' 25"	23° 14' 22"	1.0155616	15' 44.93"	23° 26' 16"	0 m -9 s
20	82° 48' 00"	-0.07"	82° 09' 00"	23° 14' 30"	1.0155658	15' 44.92"	23° 26' 16"	0 m -9 s
21	82° 50' 24"	-0.08"	82° 11' 36"	23° 14' 37"	1.0155700	15' 44.92"	23° 26' 16"	0 m -10 s
22	82° 52' 47"	-0.08"	82° 14' 12"	23° 14' 45"	1.0155742	15' 44.91"	23° 26' 16"	0 m -10 s
23	82° 55' 10"	-0.08"	82° 16' 47"	23° 14' 53"	1.0155784	15' 44.91"	23° 26' 16"	0 m -11 s
24	82° 57' 33"	-0.09"	82° 19' 23"	23° 15' 00"	1.0155825	15' 44.91"	23° 26' 16"	0 m -11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	240° 53' 55"	0°-47' 02"	238° 34' 56"	-21° 06' 14"	1° 00' 43"	16' 32.81"	279° 56' 12"	0.96660
1	241° 31' 06"	0°-50' 23"	239° 13' 14"	-21° 17' 10"	1° 00' 45"	16' 33.22"	279° 30' 10"	0.96838
2	242° 08' 20"	0°-53' 44"	239° 51' 39"	-21° 27' 57"	1° 00' 46"	16' 33.62"	279° 3' 13"	0.97012
3	242° 45' 35"	0°-57' 05"	240° 30' 12"	-21° 38' 36"	1° 00' 48"	16' 34.02"	278° 35' 20"	0.97181
4	243° 22' 53"	-1° 00' 26"	241° 08' 53"	-21° 49' 07"	1° 00' 49"	16' 34.40"	278° 6' 24"	0.97345
5	244° 00' 12"	-1° 03' 47"	241° 47' 41"	-21° 59' 29"	1° 00' 51"	16' 34.78"	277° 36' 22"	0.97505
6	244° 37' 33"	-1° 07' 07"	242° 26' 36"	-22° 09' 43"	1° 00' 52"	16' 35.16"	277° 5' 08"	0.97659
7	245° 14' 56"	-1° 10' 27"	243° 05' 40"	-22° 19' 47"	1° 00' 53"	16' 35.52"	276° 32' 35"	0.97809
8	245° 52' 21"	-1° 13' 46"	243° 44' 50"	-22° 29' 43"	1° 00' 55"	16' 35.88"	275° 58' 36"	0.97954
9	246° 29' 47"	-1° 17' 05"	244° 24' 08"	-22° 39' 30"	1° 00' 56"	16' 36.23"	275° 23' 03"	0.98094
10	247° 07' 16"	-1° 20' 24"	245° 03' 33"	-22° 49' 07"	1° 00' 57"	16' 36.57"	274° 45' 47"	0.98229
11	247° 44' 46"	-1° 23' 42"	245° 43' 05"	-22° 58' 36"	1° 00' 58"	16' 36.90"	274° 6' 35"	0.98360
12	248° 22' 17"	-1° 27' 00"	246° 22' 45"	-23° 07' 54"	1° 00' 60"	16' 37.23"	273° 25' 16"	0.98485
13	248° 59' 50"	-1° 30' 17"	247° 02' 31"	-23° 17' 04"	1° 01' 01"	16' 37.55"	272° 41' 35"	0.98605
14	249° 37' 25"	-1° 33' 34"	247° 42' 25"	-23° 26' 03"	1° 01' 02"	16' 37.85"	271° 55' 13"	0.98720
15	250° 15' 02"	-1° 36' 50"	248° 22' 25"	-23° 34' 53"	1° 01' 03"	16' 38.15"	271° 5' 51"	0.98831
16	250° 52' 40"	-1° 40' 06"	249° 02' 33"	-23° 43' 32"	1° 01' 04"	16' 38.45"	270° 13' 03"	0.98936
17	251° 30' 19"	-1° 43' 21"	249° 42' 47"	-23° 52' 02"	1° 01' 05"	16' 38.73"	269° 16' 20"	0.99036
18	252° 08' 00"	-1° 46' 35"	250° 23' 07"	-24° 00' 21"	1° 01' 06"	16' 39.00"	268° 15' 07"	0.99131
19	252° 45' 42"	-1° 49' 49"	251° 03' 35"	-24° 08' 30"	1° 01' 07"	16' 39.27"	267° 8' 39"	0.99221
20	253° 23' 26"	-1° 53' 02"	251° 44' 08"	-24° 16' 29"	1° 01' 08"	16' 39.53"	265° 56' 03"	0.99305
21	254° 01' 11"	-1° 56' 14"	252° 24' 48"	-24° 24' 17"	1° 01' 09"	16' 39.78"	264° 36' 13"	0.99385
22	254° 38' 57"	-1° 59' 25"	253° 05' 35"	-24° 31' 54"	1° 01' 10"	16' 40.02"	263° 7' 47"	0.99459
23	255° 16' 45"	-2° 02' 36"	253° 46' 27"	-24° 39' 21"	1° 01' 11"	16' 40.25"	261° 28' 58"	0.99528
24	255° 54' 34"	-2° 05' 46"	254° 27' 25"	-24° 46' 37"	1° 01' 11"	16' 40.47"	259° 37' 34"	0.99592

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	82° 57' 33"	-0.09"	82° 19' 23"	23° 15' 00"	1.0155825	15' 44.91"	23° 26' 16"	0 m-11 s
1	82° 59' 57"	-0.09"	82° 21' 59"	23° 15' 08"	1.0155867	15' 44.90"	23° 26' 16"	0 m-12 s
2	83° 02' 20"	-0.10"	82° 24' 34"	23° 15' 16"	1.0155908	15' 44.90"	23° 26' 16"	0 m-12 s
3	83° 04' 43"	-0.10"	82° 27' 10"	23° 15' 23"	1.0155950	15' 44.89"	23° 26' 16"	0 m-13 s
4	83° 07' 06"	-0.11"	82° 29' 46"	23° 15' 30"	1.0155991	15' 44.89"	23° 26' 16"	0 m-13 s
5	83° 09' 30"	-0.11"	82° 32' 22"	23° 15' 38"	1.0156033	15' 44.89"	23° 26' 16"	0 m-14 s
6	83° 11' 53"	-0.12"	82° 34' 57"	23° 15' 45"	1.0156074	15' 44.88"	23° 26' 16"	0 m-15 s
7	83° 14' 16"	-0.12"	82° 37' 33"	23° 15' 53"	1.0156115	15' 44.88"	23° 26' 16"	0 m-15 s
8	83° 16' 39"	-0.13"	82° 40' 09"	23° 15' 60"	1.0156157	15' 44.88"	23° 26' 16"	0 m-16 s
9	83° 19' 03"	-0.13"	82° 42' 45"	23° 16' 07"	1.0156198	15' 44.87"	23° 26' 16"	0 m-16 s
10	83° 21' 26"	-0.14"	82° 45' 20"	23° 16' 14"	1.0156239	15' 44.87"	23° 26' 16"	0 m-17 s
11	83° 23' 49"	-0.14"	82° 47' 56"	23° 16' 21"	1.0156280	15' 44.86"	23° 26' 16"	0 m-17 s
12	83° 26' 12"	-0.14"	82° 50' 32"	23° 16' 29"	1.0156321	15' 44.86"	23° 26' 16"	0 m-18 s
13	83° 28' 36"	-0.15"	82° 53' 08"	23° 16' 36"	1.0156362	15' 44.86"	23° 26' 16"	0 m-18 s
14	83° 30' 59"	-0.15"	82° 55' 43"	23° 16' 43"	1.0156403	15' 44.85"	23° 26' 16"	0 m-19 s
15	83° 33' 22"	-0.16"	82° 58' 19"	23° 16' 50"	1.0156444	15' 44.85"	23° 26' 16"	0 m-19 s
16	83° 35' 45"	-0.16"	83° 00' 55"	23° 16' 57"	1.0156485	15' 44.84"	23° 26' 16"	0 m-20 s
17	83° 38' 08"	-0.17"	83° 03' 31"	23° 17' 04"	1.0156526	15' 44.84"	23° 26' 16"	0 m-20 s
18	83° 40' 32"	-0.17"	83° 06' 06"	23° 17' 10"	1.0156567	15' 44.84"	23° 26' 16"	0 m-21 s
19	83° 42' 55"	-0.17"	83° 08' 42"	23° 17' 17"	1.0156607	15' 44.83"	23° 26' 16"	0 m-21 s
20	83° 45' 18"	-0.18"	83° 11' 18"	23° 17' 24"	1.0156648	15' 44.83"	23° 26' 16"	0 m-22 s
21	83° 47' 41"	-0.18"	83° 13' 54"	23° 17' 31"	1.0156688	15' 44.83"	23° 26' 16"	0 m-22 s
22	83° 50' 05"	-0.19"	83° 16' 29"	23° 17' 37"	1.0156729	15' 44.82"	23° 26' 16"	0 m-23 s
23	83° 52' 28"	-0.19"	83° 19' 05"	23° 17' 44"	1.0156770	15' 44.82"	23° 26' 16"	0 m-24 s
24	83° 54' 51"	-0.20"	83° 21' 41"	23° 17' 51"	1.0156810	15' 44.81"	23° 26' 16"	0 m-24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	255° 54' 34"	-2° 05' 46"	254° 27' 25"	-24° 46' 37"	1° 01' 11"	16' 40.47"	259° 37' 34"	0.99592
1	256° 32' 24"	-2° 08' 55"	255° 08' 30"	-24° 53' 41"	1° 01' 12"	16' 40.68"	257° 30' 40"	0.99650
2	257° 10' 15"	-2° 12' 03"	255° 49' 39"	-25° 00' 35"	1° 01' 13"	16' 40.89"	255° 4' 30"	0.99703
3	257° 48' 07"	-2° 15' 10"	256° 30' 55"	-25° 07' 18"	1° 01' 14"	16' 41.08"	252° 14' 02"	0.99751
4	258° 26' 00"	-2° 18' 17"	257° 12' 16"	-25° 13' 49"	1° 01' 14"	16' 41.27"	248° 52' 38"	0.99794
5	259° 03' 54"	-2° 21' 22"	257° 53' 42"	-25° 20' 08"	1° 01' 15"	16' 41.45"	244° 51' 23"	0.99832
6	259° 41' 50"	-2° 24' 27"	258° 35' 14"	-25° 26' 17"	1° 01' 16"	16' 41.62"	239° 58' 33"	0.99864
7	260° 19' 46"	-2° 27' 30"	259° 16' 50"	-25° 32' 13"	1° 01' 16"	16' 41.77"	233° 59' 09"	0.99891
8	260° 57' 43"	-2° 30' 32"	259° 58' 31"	-25° 37' 58"	1° 01' 17"	16' 41.92"	226° 35' 36"	0.99912
9	261° 35' 41"	-2° 33' 34"	260° 40' 17"	-25° 43' 31"	1° 01' 17"	16' 42.06"	217° 31' 26"	0.99928
10	262° 13' 39"	-2° 36' 34"	261° 22' 08"	-25° 48' 53"	1° 01' 18"	16' 42.19"	206° 40' 36"	0.99939
11	262° 51' 39"	-2° 39' 33"	262° 04' 02"	-25° 54' 02"	1° 01' 18"	16' 42.32"	194° 22' 08"	0.99944
12	263° 29' 39"	-2° 42' 31"	262° 46' 01"	-25° 58' 60"	1° 01' 19"	16' 42.43"	181° 28' 12"	0.99944
13	264° 07' 40"	-2° 45' 28"	263° 28' 04"	-26° 03' 45"	1° 01' 19"	16' 42.53"	169° 7' 46"	0.99939
14	264° 45' 41"	-2° 48' 23"	264° 10' 11"	-26° 08' 18"	1° 01' 19"	16' 42.62"	158° 13' 47"	0.99928
15	265° 23' 43"	-2° 51' 18"	264° 52' 22"	-26° 12' 39"	1° 01' 20"	16' 42.71"	149° 6' 10"	0.99912
16	266° 01' 46"	-2° 54' 11"	265° 34' 36"	-26° 16' 48"	1° 01' 20"	16' 42.78"	141° 39' 22"	0.99891
17	266° 39' 49"	-2° 57' 03"	266° 16' 53"	-26° 20' 44"	1° 01' 20"	16' 42.85"	135° 37' 04"	0.99864
18	267° 17' 53"	-2° 59' 53"	266° 59' 13"	-26° 24' 28"	1° 01' 20"	16' 42.90"	130° 41' 37"	0.99832
19	267° 55' 57"	-3° 02' 43"	267° 41' 37"	-26° 27' 59"	1° 01' 21"	16' 42.95"	126° 37' 57"	0.99795
20	268° 34' 01"	-3° 05' 31"	268° 24' 02"	-26° 31' 18"	1° 01' 21"	16' 42.99"	123° 14' 15"	0.99752
21	269° 12' 06"	-3° 08' 17"	269° 06' 31"	-26° 34' 24"	1° 01' 21"	16' 43.02"	120° 21' 33"	0.99704
22	269° 50' 11"	-3° 11' 02"	269° 49' 02"	-26° 37' 18"	1° 01' 21"	16' 43.03"	117° 53' 08"	0.99650
23	270° 28' 16"	-3° 13' 46"	270° 31' 35"	-26° 39' 59"	1° 01' 21"	16' 43.04"	115° 43' 58"	0.99591
24	271° 06' 21"	-3° 16' 28"	271° 14' 09"	-26° 42' 27"	1° 01' 21"	16' 43.04"	113° 50' 12"	0.99527



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	83° 54' 51"	-0.20"	83° 21' 41"	23° 17' 51"	1.0156810	15' 44.81"	23° 26' 16"	0 m-24 s
1	83° 57' 14"	-0.20"	83° 24' 17"	23° 17' 57"	1.0156850	15' 44.81"	23° 26' 16"	0 m-25 s
2	83° 59' 38"	-0.20"	83° 26' 53"	23° 18' 04"	1.0156891	15' 44.81"	23° 26' 16"	0 m-25 s
3	84° 02' 01"	-0.21"	83° 29' 28"	23° 18' 10"	1.0156931	15' 44.80"	23° 26' 16"	0 m-26 s
4	84° 04' 24"	-0.21"	83° 32' 04"	23° 18' 17"	1.0156971	15' 44.80"	23° 26' 16"	0 m-26 s
5	84° 06' 47"	-0.21"	83° 34' 40"	23° 18' 23"	1.0157011	15' 44.80"	23° 26' 16"	0 m-27 s
6	84° 09' 10"	-0.22"	83° 37' 16"	23° 18' 29"	1.0157052	15' 44.79"	23° 26' 16"	0 m-27 s
7	84° 11' 34"	-0.22"	83° 39' 52"	23° 18' 36"	1.0157092	15' 44.79"	23° 26' 16"	0 m-28 s
8	84° 13' 57"	-0.23"	83° 42' 27"	23° 18' 42"	1.0157132	15' 44.78"	23° 26' 16"	0 m-28 s
9	84° 16' 20"	-0.23"	83° 45' 03"	23° 18' 48"	1.0157172	15' 44.78"	23° 26' 16"	0 m-29 s
10	84° 18' 43"	-0.23"	83° 47' 39"	23° 18' 54"	1.0157212	15' 44.78"	23° 26' 16"	0 m-29 s
11	84° 21' 07"	-0.24"	83° 50' 15"	23° 19' 00"	1.0157251	15' 44.77"	23° 26' 16"	0 m-30 s
12	84° 23' 30"	-0.24"	83° 52' 51"	23° 19' 07"	1.0157291	15' 44.77"	23° 26' 16"	0 m-30 s
13	84° 25' 53"	-0.24"	83° 55' 26"	23° 19' 13"	1.0157331	15' 44.77"	23° 26' 16"	0 m-31 s
14	84° 28' 16"	-0.25"	83° 58' 02"	23° 19' 19"	1.0157371	15' 44.76"	23° 26' 16"	0 m-32 s
15	84° 30' 39"	-0.25"	84° 00' 38"	23° 19' 25"	1.0157410	15' 44.76"	23° 26' 16"	0 m-32 s
16	84° 33' 03"	-0.25"	84° 03' 14"	23° 19' 31"	1.0157450	15' 44.75"	23° 26' 16"	0 m-33 s
17	84° 35' 26"	-0.26"	84° 05' 50"	23° 19' 36"	1.0157490	15' 44.75"	23° 26' 16"	0 m-33 s
18	84° 37' 49"	-0.26"	84° 08' 26"	23° 19' 42"	1.0157529	15' 44.75"	23° 26' 16"	0 m-34 s
19	84° 40' 12"	-0.26"	84° 11' 01"	23° 19' 48"	1.0157569	15' 44.74"	23° 26' 16"	0 m-34 s
20	84° 42' 35"	-0.27"	84° 13' 37"	23° 19' 54"	1.0157608	15' 44.74"	23° 26' 16"	0 m-35 s
21	84° 44' 59"	-0.27"	84° 16' 13"	23° 19' 59"	1.0157647	15' 44.74"	23° 26' 16"	0 m-35 s
22	84° 47' 22"	-0.27"	84° 18' 49"	23° 20' 05"	1.0157687	15' 44.73"	23° 26' 16"	0 m-36 s
23	84° 49' 45"	-0.28"	84° 21' 25"	23° 20' 11"	1.0157726	15' 44.73"	23° 26' 16"	0 m-36 s
24	84° 52' 08"	-0.28"	84° 24' 01"	23° 20' 16"	1.0157765	15' 44.73"	23° 26' 16"	0 m-37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	271° 06' 21"	-3° 16' 28"	271° 14' 09"	-26° 42' 27"	1° 01' 21"	16' 43.04"	113° 50' 12"	0.99527
1	271° 44' 27"	-3° 19' 09"	271° 56' 46"	-26° 44' 43"	1° 01' 21"	16' 43.03"	112° 8' 58"	0.99458
2	272° 22' 32"	-3° 21' 49"	272° 39' 24"	-26° 46' 46"	1° 01' 21"	16' 43.01"	110° 37' 58"	0.99383
3	273° 00' 38"	-3° 24' 26"	273° 22' 03"	-26° 48' 36"	1° 01' 21"	16' 42.98"	109° 15' 29"	0.99303
4	273° 38' 43"	-3° 27' 03"	274° 04' 43"	-26° 50' 13"	1° 01' 21"	16' 42.94"	108° 0' 07"	0.99217
5	274° 16' 49"	-3° 29' 37"	274° 47' 25"	-26° 51' 37"	1° 01' 20"	16' 42.89"	106° 50' 45"	0.99127
6	274° 54' 55"	-3° 32' 11"	275° 30' 06"	-26° 52' 49"	1° 01' 20"	16' 42.84"	105° 46' 30"	0.99031
7	275° 32' 60"	-3° 34' 42"	276° 12' 49"	-26° 53' 48"	1° 01' 20"	16' 42.77"	104° 46' 37"	0.98930
8	276° 11' 05"	-3° 37' 12"	276° 55' 31"	-26° 54' 34"	1° 01' 20"	16' 42.70"	103° 50' 32"	0.98823
9	276° 49' 10"	-3° 39' 41"	277° 38' 14"	-26° 55' 06"	1° 01' 19"	16' 42.61"	102° 57' 44"	0.98711
10	277° 27' 15"	-3° 42' 07"	278° 20' 56"	-26° 55' 27"	1° 01' 19"	16' 42.52"	102° 7' 50"	0.98595
11	278° 05' 17"	-3° 44' 32"	279° 03' 35"	-26° 55' 34"	1° 01' 19"	16' 42.41"	101° 20' 31"	0.98473
12	278° 43' 21"	-3° 46' 55"	279° 46' 16"	-26° 55' 28"	1° 01' 18"	16' 42.30"	100° 35' 23"	0.98345
13	279° 21' 24"	-3° 49' 17"	280° 28' 57"	-26° 55' 10"	1° 01' 18"	16' 42.18"	99° 52' 14"	0.98213
14	279° 59' 28"	-3° 51' 37"	281° 11' 36"	-26° 54' 38"	1° 01' 17"	16' 42.05"	99° 10' 53"	0.98076
15	280° 37' 30"	-3° 53' 55"	281° 54' 14"	-26° 53' 54"	1° 01' 17"	16' 41.91"	98° 31' 08"	0.97933
16	281° 15' 33"	-3° 56' 11"	282° 36' 51"	-26° 52' 57"	1° 01' 16"	16' 41.76"	97° 52' 50"	0.97785
17	281° 53' 34"	-3° 58' 26"	283° 19' 26"	-26° 51' 48"	1° 01' 16"	16' 41.60"	97° 15' 50"	0.97633
18	282° 31' 35"	-4° 00' 38"	284° 01' 59"	-26° 50' 25"	1° 01' 15"	16' 41.43"	96° 40' 01"	0.97475
19	283° 09' 35"	-4° 02' 49"	284° 44' 30"	-26° 48' 50"	1° 01' 14"	16' 41.25"	96° 5' 18"	0.97312
20	283° 47' 35"	-4° 04' 58"	285° 26' 59"	-26° 47' 02"	1° 01' 14"	16' 41.07"	95° 31' 35"	0.97145
21	284° 25' 34"	-4° 07' 06"	286° 09' 25"	-26° 45' 02"	1° 01' 13"	16' 40.88"	94° 58' 46"	0.96972
22	285° 03' 32"	-4° 09' 11"	286° 51' 49"	-26° 42' 49"	1° 01' 12"	16' 40.67"	94° 26' 48"	0.96794
23	285° 41' 29"	-4° 11' 14"	287° 34' 09"	-26° 40' 24"	1° 01' 11"	16' 40.46"	93° 55' 37"	0.96612
24	286° 19' 26"	-4° 13' 16"	288° 16' 27"	-26° 37' 46"	1° 01' 11"	16' 40.24"	93° 25' 10"	0.96425

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	84° 52' 08"	-0.28"	84° 24' 01"	23° 20' 16"	1.0157765	15' 44.73"	23° 26' 16"	0 m-37 s
1	84° 54' 31"	-0.28"	84° 26' 37"	23° 20' 22"	1.0157804	15' 44.72"	23° 26' 16"	0 m-37 s
2	84° 56' 55"	-0.29"	84° 29' 12"	23° 20' 27"	1.0157843	15' 44.72"	23° 26' 16"	0 m-38 s
3	84° 59' 18"	-0.29"	84° 31' 48"	23° 20' 33"	1.0157882	15' 44.71"	23° 26' 16"	0 m-39 s
4	85° 01' 41"	-0.29"	84° 34' 24"	23° 20' 38"	1.0157921	15' 44.71"	23° 26' 16"	0 m-39 s
5	85° 04' 04"	-0.30"	84° 37' 00"	23° 20' 44"	1.0157960	15' 44.71"	23° 26' 16"	0 m-40 s
6	85° 06' 28"	-0.30"	84° 39' 36"	23° 20' 49"	1.0157999	15' 44.70"	23° 26' 16"	0 m-40 s
7	85° 08' 51"	-0.30"	84° 42' 12"	23° 20' 54"	1.0158038	15' 44.70"	23° 26' 16"	0 m-41 s
8	85° 11' 14"	-0.30"	84° 44' 48"	23° 20' 59"	1.0158077	15' 44.70"	23° 26' 16"	0 m-41 s
9	85° 13' 37"	-0.31"	84° 47' 24"	23° 21' 05"	1.0158115	15' 44.69"	23° 26' 16"	0 m-42 s
10	85° 16' 00"	-0.31"	84° 49' 59"	23° 21' 10"	1.0158154	15' 44.69"	23° 26' 16"	0 m-42 s
11	85° 18' 23"	-0.31"	84° 52' 35"	23° 21' 15"	1.0158192	15' 44.69"	23° 26' 16"	0 m-43 s
12	85° 20' 47"	-0.31"	84° 55' 11"	23° 21' 20"	1.0158231	15' 44.68"	23° 26' 16"	0 m-43 s
13	85° 23' 10"	-0.32"	84° 57' 47"	23° 21' 25"	1.0158270	15' 44.68"	23° 26' 16"	0 m-44 s
14	85° 25' 33"	-0.32"	85° 00' 23"	23° 21' 30"	1.0158308	15' 44.68"	23° 26' 16"	0 m-44 s
15	85° 27' 56"	-0.32"	85° 02' 59"	23° 21' 35"	1.0158346	15' 44.67"	23° 26' 16"	0 m-45 s
16	85° 30' 19"	-0.32"	85° 05' 35"	23° 21' 40"	1.0158385	15' 44.67"	23° 26' 16"	0 m-46 s
17	85° 32' 43"	-0.33"	85° 08' 11"	23° 21' 45"	1.0158423	15' 44.66"	23° 26' 16"	0 m-46 s
18	85° 35' 06"	-0.33"	85° 10' 47"	23° 21' 49"	1.0158461	15' 44.66"	23° 26' 16"	0 m-47 s
19	85° 37' 29"	-0.33"	85° 13' 22"	23° 21' 54"	1.0158499	15' 44.66"	23° 26' 16"	0 m-47 s
20	85° 39' 52"	-0.33"	85° 15' 58"	23° 21' 59"	1.0158537	15' 44.65"	23° 26' 16"	0 m-48 s
21	85° 42' 15"	-0.34"	85° 18' 34"	23° 22' 04"	1.0158575	15' 44.65"	23° 26' 16"	0 m-48 s
22	85° 44' 39"	-0.34"	85° 21' 10"	23° 22' 08"	1.0158613	15' 44.65"	23° 26' 16"	0 m-49 s
23	85° 47' 02"	-0.34"	85° 23' 46"	23° 22' 13"	1.0158651	15' 44.64"	23° 26' 16"	0 m-49 s
24	85° 49' 25"	-0.34"	85° 26' 22"	23° 22' 17"	1.0158689	15' 44.64"	23° 26' 16"	0 m-50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	286° 19' 26"	-4° 13' 16"	288° 16' 27"	-26° 37' 46"	1° 01' 11"	16' 40.24"	93° 25' 10"	0.96425
1	286° 57' 21"	-4° 15' 16"	288° 58' 41"	-26° 34' 55"	1° 01' 10"	16' 40.02"	92° 55' 24"	0.96232
2	287° 35' 15"	-4° 17' 13"	289° 40' 52"	-26° 31' 52"	1° 01' 09"	16' 39.78"	92° 26' 15"	0.96036
3	288° 13' 09"	-4° 19' 09"	290° 22' 59"	-26° 28' 37"	1° 01' 08"	16' 39.53"	91° 57' 42"	0.95834
4	288° 51' 01"	-4° 21' 03"	291° 05' 03"	-26° 25' 10"	1° 01' 07"	16' 39.28"	91° 29' 43"	0.95627
5	289° 28' 53"	-4° 22' 55"	291° 47' 02"	-26° 21' 31"	1° 01' 06"	16' 39.02"	91° 2' 16"	0.95416
6	290° 06' 43"	-4° 24' 45"	292° 28' 57"	-26° 17' 39"	1° 01' 05"	16' 38.75"	90° 35' 18"	0.95201
7	290° 44' 32"	-4° 26' 32"	293° 10' 48"	-26° 13' 35"	1° 01' 04"	16' 38.47"	90° 8' 49"	0.94980
8	291° 22' 20"	-4° 28' 18"	293° 52' 34"	-26° 09' 20"	1° 01' 03"	16' 38.18"	89° 42' 48"	0.94755
9	292° 00' 06"	-4° 30' 02"	294° 34' 16"	-26° 04' 52"	1° 01' 02"	16' 37.89"	89° 17' 11"	0.94526
10	292° 37' 51"	-4° 31' 44"	295° 15' 52"	-26° 00' 13"	1° 01' 01"	16' 37.59"	88° 52' 00"	0.94292
11	293° 15' 35"	-4° 33' 24"	295° 57' 24"	-25° 55' 22"	1° 00' 60"	16' 37.28"	88° 27' 12"	0.94053
12	293° 53' 18"	-4° 35' 01"	296° 38' 50"	-25° 50' 19"	1° 00' 59"	16' 36.96"	88° 2' 47"	0.93810
13	294° 30' 59"	-4° 36' 37"	297° 20' 12"	-25° 45' 05"	1° 00' 57"	16' 36.64"	87° 38' 44"	0.93563
14	295° 08' 38"	-4° 38' 11"	298° 01' 27"	-25° 39' 40"	1° 00' 56"	16' 36.30"	87° 15' 02"	0.93311
15	295° 46' 17"	-4° 39' 42"	298° 42' 37"	-25° 34' 03"	1° 00' 55"	16' 35.96"	86° 51' 41"	0.93055
16	296° 23' 53"	-4° 41' 12"	299° 23' 41"	-25° 28' 15"	1° 00' 54"	16' 35.62"	86° 28' 39"	0.92795
17	297° 01' 28"	-4° 42' 39"	300° 04' 40"	-25° 22' 16"	1° 00' 52"	16' 35.26"	86° 5' 56"	0.92530
18	297° 39' 02"	-4° 44' 04"	300° 45' 32"	-25° 16' 05"	1° 00' 51"	16' 34.90"	85° 43' 32"	0.92261
19	298° 16' 33"	-4° 45' 27"	301° 26' 18"	-25° 09' 44"	1° 00' 50"	16' 34.53"	85° 21' 26"	0.91989
20	298° 54' 04"	-4° 46' 49"	302° 06' 58"	-25° 03' 12"	1° 00' 48"	16' 34.15"	84° 59' 38"	0.91712
21	299° 31' 32"	-4° 48' 07"	302° 47' 31"	-24° 56' 29"	1° 00' 47"	16' 33.77"	84° 38' 07"	0.91430
22	300° 08' 59"	-4° 49' 24"	303° 27' 58"	-24° 49' 36"	1° 00' 45"	16' 33.38"	84° 16' 53"	0.91145
23	300° 46' 24"	-4° 50' 39"	304° 08' 18"	-24° 42' 32"	1° 00' 44"	16' 32.98"	83° 55' 56"	0.90856
24	301° 23' 47"	-4° 51' 52"	304° 48' 32"	-24° 35' 17"	1° 00' 43"	16' 32.58"	83° 35' 15"	0.90563



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	85° 49' 25"	-0.34"	85° 26' 22"	23° 22' 17"	1.0158689	15' 44.64"	23° 26' 16"	0 m -50 s
1	85° 51' 48"	-0.34"	85° 28' 58"	23° 22' 22"	1.0158727	15' 44.64"	23° 26' 16"	0 m -50 s
2	85° 54' 11"	-0.35"	85° 31' 34"	23° 22' 26"	1.0158765	15' 44.63"	23° 26' 16"	0 m -51 s
3	85° 56' 35"	-0.35"	85° 34' 10"	23° 22' 31"	1.0158802	15' 44.63"	23° 26' 16"	0 m -51 s
4	85° 58' 58"	-0.35"	85° 36' 46"	23° 22' 35"	1.0158840	15' 44.63"	23° 26' 16"	0 m -52 s
5	86° 01' 21"	-0.35"	85° 39' 22"	23° 22' 39"	1.0158878	15' 44.62"	23° 26' 16"	0 m -53 s
6	86° 03' 44"	-0.35"	85° 41' 58"	23° 22' 44"	1.0158915	15' 44.62"	23° 26' 16"	0 m -53 s
7	86° 06' 07"	-0.35"	85° 44' 33"	23° 22' 48"	1.0158953	15' 44.62"	23° 26' 16"	0 m -54 s
8	86° 08' 30"	-0.36"	85° 47' 09"	23° 22' 52"	1.0158990	15' 44.61"	23° 26' 16"	0 m -54 s
9	86° 10' 54"	-0.36"	85° 49' 45"	23° 22' 56"	1.0159027	15' 44.61"	23° 26' 16"	0 m -55 s
10	86° 13' 17"	-0.36"	85° 52' 21"	23° 23' 00"	1.0159065	15' 44.60"	23° 26' 16"	0 m -55 s
11	86° 15' 40"	-0.36"	85° 54' 57"	23° 23' 05"	1.0159102	15' 44.60"	23° 26' 16"	0 m -56 s
12	86° 18' 03"	-0.36"	85° 57' 33"	23° 23' 09"	1.0159139	15' 44.60"	23° 26' 16"	0 m -56 s
13	86° 20' 26"	-0.36"	86° 00' 09"	23° 23' 13"	1.0159176	15' 44.59"	23° 26' 16"	0 m -57 s
14	86° 22' 50"	-0.36"	86° 02' 45"	23° 23' 17"	1.0159213	15' 44.59"	23° 26' 16"	0 m -57 s
15	86° 25' 13"	-0.37"	86° 05' 21"	23° 23' 20"	1.0159250	15' 44.59"	23° 26' 16"	0 m -58 s
16	86° 27' 36"	-0.37"	86° 07' 57"	23° 23' 24"	1.0159287	15' 44.58"	23° 26' 16"	0 m -58 s
17	86° 29' 59"	-0.37"	86° 10' 33"	23° 23' 28"	1.0159324	15' 44.58"	23° 26' 16"	0 m -59 s
18	86° 32' 22"	-0.37"	86° 13' 09"	23° 23' 32"	1.0159361	15' 44.58"	23° 26' 16"	0 m -60 s
19	86° 34' 45"	-0.37"	86° 15' 45"	23° 23' 36"	1.0159398	15' 44.57"	23° 26' 16"	-1 m 00 s
20	86° 37' 09"	-0.37"	86° 18' 21"	23° 23' 39"	1.0159434	15' 44.57"	23° 26' 16"	-1 m 01 s
21	86° 39' 32"	-0.37"	86° 20' 57"	23° 23' 43"	1.0159471	15' 44.57"	23° 26' 16"	-1 m 01 s
22	86° 41' 55"	-0.37"	86° 23' 33"	23° 23' 47"	1.0159507	15' 44.56"	23° 26' 16"	-1 m 02 s
23	86° 44' 18"	-0.37"	86° 26' 08"	23° 23' 50"	1.0159544	15' 44.56"	23° 26' 16"	-1 m 02 s
24	86° 46' 41"	-0.38"	86° 28' 44"	23° 23' 54"	1.0159580	15' 44.56"	23° 26' 16"	-1 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	301° 23' 47"	-4° 51' 52"	304° 48' 32"	-24° 35' 17"	1° 00' 43"	16' 32.58"	83° 35' 15"	0.90563
1	302° 01' 08"	-4° 53' 02"	305° 28' 39"	-24° 27' 53"	1° 00' 41"	16' 32.17"	83° 14' 50"	0.90267
2	302° 38' 27"	-4° 54' 10"	306° 08' 39"	-24° 20' 18"	1° 00' 39"	16' 31.75"	82° 54' 41"	0.89966
3	303° 15' 45"	-4° 55' 16"	306° 48' 31"	-24° 12' 33"	1° 00' 38"	16' 31.33"	82° 34' 47"	0.89662
4	303° 53' 00"	-4° 56' 20"	307° 28' 17"	-24° 04' 39"	1° 00' 36"	16' 30.90"	82° 15' 08"	0.89353
5	304° 30' 14"	-4° 57' 22"	308° 07' 55"	-23° 56' 34"	1° 00' 35"	16' 30.47"	81° 55' 45"	0.89041
6	305° 07' 25"	-4° 58' 22"	308° 47' 27"	-23° 48' 20"	1° 00' 33"	16' 30.03"	81° 36' 36"	0.88726
7	305° 44' 35"	-4° 59' 19"	309° 26' 51"	-23° 39' 56"	1° 00' 32"	16' 29.58"	81° 17' 42"	0.88407
8	306° 21' 42"	-5° 00' 15"	310° 06' 07"	-23° 31' 23"	1° 00' 30"	16' 29.12"	80° 59' 02"	0.88084
9	306° 58' 47"	-5° 01' 08"	310° 45' 16"	-23° 22' 40"	1° 00' 28"	16' 28.67"	80° 40' 36"	0.87758
10	307° 35' 51"	-5° 01' 59"	311° 24' 17"	-23° 13' 48"	1° 00' 26"	16' 28.20"	80° 22' 25"	0.87428
11	308° 12' 52"	-5° 02' 48"	312° 03' 11"	-23° 04' 48"	1° 00' 25"	16' 27.73"	80° 4' 28"	0.87095
12	308° 49' 50"	-5° 03' 35"	312° 41' 58"	-22° 55' 38"	1° 00' 23"	16' 27.26"	79° 46' 44"	0.86759
13	309° 26' 47"	-5° 04' 20"	313° 20' 36"	-22° 46' 19"	1° 00' 21"	16' 26.78"	79° 29' 15"	0.86419
14	310° 03' 41"	-5° 05' 02"	313° 59' 07"	-22° 36' 52"	1° 00' 19"	16' 26.29"	79° 11' 58"	0.86076
15	310° 40' 34"	-5° 05' 42"	314° 37' 30"	-22° 27' 16"	1° 00' 18"	16' 25.80"	78° 54' 56"	0.85730
16	311° 17' 23"	-5° 06' 20"	315° 15' 45"	-22° 17' 32"	1° 00' 16"	16' 25.30"	78° 38' 07"	0.85381
17	311° 54' 11"	-5° 06' 57"	315° 53' 53"	-22° 07' 39"	1° 00' 14"	16' 24.80"	78° 21' 31"	0.85028
18	312° 30' 56"	-5° 07' 30"	316° 31' 52"	-21° 57' 38"	1° 00' 12"	16' 24.29"	78° 5' 08"	0.84673
19	313° 07' 39"	-5° 08' 02"	317° 09' 44"	-21° 47' 30"	1° 00' 10"	16' 23.78"	77° 48' 58"	0.84314
20	313° 44' 19"	-5° 08' 32"	317° 47' 28"	-21° 37' 13"	1° 00' 08"	16' 23.27"	77° 33' 02"	0.83953
21	314° 20' 57"	-5° 08' 59"	318° 25' 03"	-21° 26' 48"	1° 00' 06"	16' 22.75"	77° 17' 18"	0.83589
22	314° 57' 33"	-5° 09' 25"	319° 02' 31"	-21° 16' 16"	1° 00' 05"	16' 22.23"	77° 1' 48"	0.83222
23	315° 34' 06"	-5° 09' 48"	319° 39' 51"	-21° 05' 36"	1° 00' 03"	16' 21.70"	76° 46' 30"	0.82852
24	316° 10' 37"	-5° 10' 09"	320° 17' 03"	-20° 54' 49"	1° 00' 01"	16' 21.17"	76° 31' 24"	0.82479

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	86° 46' 41"	-0.38"	86° 28' 44"	23° 23' 54"	1.0159580	15' 44.56"	23° 26' 16"	-1 m 03 s
1	86° 49' 04"	-0.38"	86° 31' 20"	23° 23' 57"	1.0159617	15' 44.55"	23° 26' 16"	-1 m 03 s
2	86° 51' 28"	-0.38"	86° 33' 56"	23° 24' 01"	1.0159653	15' 44.55"	23° 26' 16"	-1 m 04 s
3	86° 53' 51"	-0.38"	86° 36' 32"	23° 24' 04"	1.0159689	15' 44.55"	23° 26' 16"	-1 m 04 s
4	86° 56' 14"	-0.38"	86° 39' 08"	23° 24' 07"	1.0159726	15' 44.54"	23° 26' 16"	-1 m 05 s
5	86° 58' 37"	-0.38"	86° 41' 44"	23° 24' 11"	1.0159762	15' 44.54"	23° 26' 16"	-1 m 06 s
6	87° 01' 00"	-0.38"	86° 44' 20"	23° 24' 14"	1.0159798	15' 44.54"	23° 26' 16"	-1 m 06 s
7	87° 03' 23"	-0.38"	86° 46' 56"	23° 24' 17"	1.0159834	15' 44.53"	23° 26' 16"	-1 m 07 s
8	87° 05' 47"	-0.38"	86° 49' 32"	23° 24' 20"	1.0159870	15' 44.53"	23° 26' 16"	-1 m 07 s
9	87° 08' 10"	-0.38"	86° 52' 08"	23° 24' 23"	1.0159906	15' 44.53"	23° 26' 16"	-1 m 08 s
10	87° 10' 33"	-0.38"	86° 54' 44"	23° 24' 27"	1.0159941	15' 44.52"	23° 26' 16"	-1 m 08 s
11	87° 12' 56"	-0.38"	86° 57' 20"	23° 24' 30"	1.0159977	15' 44.52"	23° 26' 16"	-1 m 09 s
12	87° 15' 19"	-0.38"	86° 59' 56"	23° 24' 33"	1.0160013	15' 44.52"	23° 26' 16"	-1 m 09 s
13	87° 17' 42"	-0.38"	87° 02' 32"	23° 24' 36"	1.0160049	15' 44.51"	23° 26' 16"	-1 m 10 s
14	87° 20' 06"	-0.38"	87° 05' 08"	23° 24' 38"	1.0160084	15' 44.51"	23° 26' 16"	-1 m 10 s
15	87° 22' 29"	-0.38"	87° 07' 44"	23° 24' 41"	1.0160120	15' 44.51"	23° 26' 16"	-1 m 11 s
16	87° 24' 52"	-0.38"	87° 10' 20"	23° 24' 44"	1.0160155	15' 44.50"	23° 26' 16"	-1 m 12 s
17	87° 27' 15"	-0.38"	87° 12' 56"	23° 24' 47"	1.0160190	15' 44.50"	23° 26' 16"	-1 m 12 s
18	87° 29' 38"	-0.38"	87° 15' 32"	23° 24' 50"	1.0160226	15' 44.50"	23° 26' 16"	-1 m 13 s
19	87° 32' 01"	-0.38"	87° 18' 08"	23° 24' 52"	1.0160261	15' 44.49"	23° 26' 16"	-1 m 13 s
20	87° 34' 25"	-0.38"	87° 20' 44"	23° 24' 55"	1.0160296	15' 44.49"	23° 26' 16"	-1 m 14 s
21	87° 36' 48"	-0.38"	87° 23' 20"	23° 24' 58"	1.0160331	15' 44.49"	23° 26' 16"	-1 m 14 s
22	87° 39' 11"	-0.38"	87° 25' 56"	23° 25' 00"	1.0160366	15' 44.48"	23° 26' 16"	-1 m 15 s
23	87° 41' 34"	-0.38"	87° 28' 32"	23° 25' 03"	1.0160401	15' 44.48"	23° 26' 16"	-1 m 15 s
24	87° 43' 57"	-0.38"	87° 31' 08"	23° 25' 05"	1.0160436	15' 44.48"	23° 26' 16"	-1 m 16 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	316° 10' 37"	-5° 10' 09"	320° 17' 03"	-20° 54' 49"	1° 00' 01"	16' 21.17"	76° 31' 24"	0.82479
1	316° 47' 05"	-5° 10' 28"	320° 54' 07"	-20° 43' 55"	0° 59' 59"	16' 20.63"	76° 16' 32"	0.82103
2	317° 23' 31"	-5° 10' 45"	321° 31' 03"	-20° 32' 53"	0° 59' 57"	16' 20.09"	76° 1' 52"	0.81725
3	317° 59' 54"	-5° 10' 59"	322° 07' 51"	-20° 21' 44"	0° 59' 55"	16' 19.54"	75° 47' 24"	0.81345
4	318° 36' 14"	-5° 11' 12"	322° 44' 31"	-20° 10' 29"	0° 59' 53"	16' 19.00"	75° 33' 09"	0.80962
5	319° 12' 32"	-5° 11' 23"	323° 21' 04"	-19° 59' 07"	0° 59' 51"	16' 18.45"	75° 19' 07"	0.80576
6	319° 48' 48"	-5° 11' 31"	323° 57' 28"	-19° 47' 38"	0° 59' 49"	16' 17.89"	75° 5' 16"	0.80188
7	320° 25' 00"	-5° 11' 37"	324° 33' 44"	-19° 36' 02"	0° 59' 47"	16' 17.33"	74° 51' 38"	0.79797
8	321° 01' 10"	-5° 11' 42"	325° 09' 53"	-19° 24' 20"	0° 59' 45"	16' 16.77"	74° 38' 12"	0.79404
9	321° 37' 18"	-5° 11' 44"	325° 45' 54"	-19° 12' 32"	0° 59' 42"	16' 16.21"	74° 24' 58"	0.79009
10	322° 13' 23"	-5° 11' 44"	326° 21' 47"	-19° 00' 38"	0° 59' 40"	16' 15.64"	74° 11' 56"	0.78612
11	322° 49' 25"	-5° 11' 42"	326° 57' 32"	-18° 48' 38"	0° 59' 38"	16' 15.07"	73° 59' 06"	0.78212
12	323° 25' 25"	-5° 11' 38"	327° 33' 09"	-18° 36' 32"	0° 59' 36"	16' 14.49"	73° 46' 28"	0.77810
13	324° 01' 21"	-5° 11' 32"	328° 08' 38"	-18° 24' 20"	0° 59' 34"	16' 13.92"	73° 34' 02"	0.77406
14	324° 37' 15"	-5° 11' 24"	328° 44' 00"	-18° 12' 02"	0° 59' 32"	16' 13.34"	73° 21' 48"	0.77000
15	325° 13' 07"	-5° 11' 14"	329° 19' 14"	-17° 59' 39"	0° 59' 30"	16' 12.76"	73° 9' 45"	0.76593
16	325° 48' 56"	-5° 11' 02"	329° 54' 21"	-17° 47' 10"	0° 59' 28"	16' 12.17"	72° 57' 54"	0.76183
17	326° 24' 41"	-5° 10' 48"	330° 29' 20"	-17° 34' 37"	0° 59' 25"	16' 11.59"	72° 46' 15"	0.75771
18	327° 00' 25"	-5° 10' 32"	331° 04' 11"	-17° 21' 58"	0° 59' 23"	16' 11.00"	72° 34' 47"	0.75357
19	327° 36' 05"	-5° 10' 14"	331° 38' 55"	-17° 09' 14"	0° 59' 21"	16' 10.41"	72° 23' 31"	0.74942
20	328° 11' 43"	-5° 09' 54"	332° 13' 32"	-16° 56' 25"	0° 59' 19"	16' 09.81"	72° 12' 26"	0.74525
21	328° 47' 17"	-5° 09' 32"	332° 48' 01"	-16° 43' 31"	0° 59' 17"	16' 09.22"	72° 1' 33"	0.74106
22	329° 22' 49"	-5° 09' 08"	333° 22' 23"	-16° 30' 32"	0° 59' 15"	16' 08.62"	71° 50' 51"	0.73686
23	329° 58' 19"	-5° 08' 42"	333° 56' 37"	-16° 17' 29"	0° 59' 12"	16' 08.02"	71° 40' 20"	0.73264
24	330° 33' 45"	-5° 08' 15"	334° 30' 45"	-16° 04' 22"	0° 59' 10"	16' 07.42"	71° 30' 01"	0.72840

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	87° 43' 57"	-0.38"	87° 31' 08"	23° 25' 05"	1.0160436	15' 44.48"	23° 26' 16"	-1 m 16 s
1	87° 46' 20"	-0.38"	87° 33' 44"	23° 25' 08"	1.0160471	15' 44.47"	23° 26' 16"	-1 m 16 s
2	87° 48' 44"	-0.38"	87° 36' 20"	23° 25' 10"	1.0160506	15' 44.47"	23° 26' 16"	-1 m 17 s
3	87° 51' 07"	-0.38"	87° 38' 56"	23° 25' 13"	1.0160540	15' 44.47"	23° 26' 16"	-1 m 17 s
4	87° 53' 30"	-0.38"	87° 41' 32"	23° 25' 15"	1.0160575	15' 44.46"	23° 26' 16"	-1 m 18 s
5	87° 55' 53"	-0.38"	87° 44' 08"	23° 25' 17"	1.0160610	15' 44.46"	23° 26' 16"	-1 m 19 s
6	87° 58' 16"	-0.37"	87° 46' 44"	23° 25' 19"	1.0160644	15' 44.46"	23° 26' 16"	-1 m 19 s
7	88° 00' 39"	-0.37"	87° 49' 20"	23° 25' 22"	1.0160678	15' 44.45"	23° 26' 16"	-1 m 20 s
8	88° 03' 02"	-0.37"	87° 51' 56"	23° 25' 24"	1.0160713	15' 44.45"	23° 26' 16"	-1 m 20 s
9	88° 05' 26"	-0.37"	87° 54' 32"	23° 25' 26"	1.0160747	15' 44.45"	23° 26' 16"	-1 m 21 s
10	88° 07' 49"	-0.37"	87° 57' 08"	23° 25' 28"	1.0160781	15' 44.45"	23° 26' 16"	-1 m 21 s
11	88° 10' 12"	-0.37"	87° 59' 44"	23° 25' 30"	1.0160816	15' 44.44"	23° 26' 16"	-1 m 22 s
12	88° 12' 35"	-0.37"	88° 02' 20"	23° 25' 32"	1.0160850	15' 44.44"	23° 26' 16"	-1 m 22 s
13	88° 14' 58"	-0.37"	88° 04' 56"	23° 25' 34"	1.0160884	15' 44.44"	23° 26' 16"	-1 m 23 s
14	88° 17' 21"	-0.37"	88° 07' 32"	23° 25' 36"	1.0160918	15' 44.43"	23° 26' 16"	-1 m 23 s
15	88° 19' 45"	-0.36"	88° 10' 08"	23° 25' 37"	1.0160951	15' 44.43"	23° 26' 16"	-1 m 24 s
16	88° 22' 08"	-0.36"	88° 12' 44"	23° 25' 39"	1.0160985	15' 44.43"	23° 26' 16"	-1 m 25 s
17	88° 24' 31"	-0.36"	88° 15' 20"	23° 25' 41"	1.0161019	15' 44.42"	23° 26' 16"	-1 m 25 s
18	88° 26' 54"	-0.36"	88° 17' 56"	23° 25' 43"	1.0161053	15' 44.42"	23° 26' 16"	-1 m 26 s
19	88° 29' 17"	-0.36"	88° 20' 32"	23° 25' 44"	1.0161086	15' 44.42"	23° 26' 16"	-1 m 26 s
20	88° 31' 40"	-0.36"	88° 23' 08"	23° 25' 46"	1.0161120	15' 44.41"	23° 26' 16"	-1 m 27 s
21	88° 34' 03"	-0.36"	88° 25' 44"	23° 25' 48"	1.0161153	15' 44.41"	23° 26' 16"	-1 m 27 s
22	88° 36' 27"	-0.35"	88° 28' 20"	23° 25' 49"	1.0161186	15' 44.41"	23° 26' 16"	-1 m 28 s
23	88° 38' 50"	-0.35"	88° 30' 56"	23° 25' 51"	1.0161220	15' 44.40"	23° 26' 16"	-1 m 28 s
24	88° 41' 13"	-0.35"	88° 33' 32"	23° 25' 52"	1.0161253	15' 44.40"	23° 26' 16"	-1 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	330° 33' 45"	-5° 08' 15"	334° 30' 45"	-16° 04' 22"	0° 59' 10"	16' 07.42"	71° 30' 01"	0.72840
1	331° 09' 09"	-5° 07' 45"	335° 04' 45"	-15° 51' 10"	0° 59' 08"	16' 06.82"	71° 19' 52"	0.72415
2	331° 44' 29"	-5° 07' 13"	335° 38' 38"	-15° 37' 53"	0° 59' 06"	16' 06.22"	71° 9' 55"	0.71989
3	332° 19' 47"	-5° 06' 40"	336° 12' 24"	-15° 24' 33"	0° 59' 04"	16' 05.61"	71° 0' 09"	0.71561
4	332° 55' 02"	-5° 06' 04"	336° 46' 03"	-15° 11' 09"	0° 59' 01"	16' 05.01"	70° 50' 34"	0.71131
5	333° 30' 15"	-5° 05' 27"	337° 19' 35"	-14° 57' 40"	0° 58' 59"	16' 04.40"	70° 41' 10"	0.70701
6	334° 05' 24"	-5° 04' 48"	337° 52' 60"	-14° 44' 08"	0° 58' 57"	16' 03.79"	70° 31' 56"	0.70269
7	334° 40' 31"	-5° 04' 07"	338° 26' 18"	-14° 30' 32"	0° 58' 55"	16' 03.18"	70° 22' 54"	0.69836
8	335° 15' 34"	-5° 03' 24"	338° 59' 30"	-14° 16' 53"	0° 58' 52"	16' 02.57"	70° 14' 02"	0.69401
9	335° 50' 35"	-5° 02' 39"	339° 32' 35"	-14° 03' 10"	0° 58' 50"	16' 01.96"	70° 5' 21"	0.68966
10	336° 25' 33"	-5° 01' 53"	340° 05' 33"	-13° 49' 24"	0° 58' 48"	16' 01.35"	69° 56' 51"	0.68530
11	337° 00' 28"	-5° 01' 04"	340° 38' 25"	-13° 35' 34"	0° 58' 46"	16' 00.74"	69° 48' 31"	0.68092
12	337° 35' 21"	-5° 00' 14"	341° 11' 11"	-13° 21' 41"	0° 58' 43"	16' 00.13"	69° 40' 22"	0.67654
13	338° 10' 10"	-4° 59' 22"	341° 43' 50"	-13° 07' 45"	0° 58' 41"	15' 59.51"	69° 32' 23"	0.67214
14	338° 44' 57"	-4° 58' 29"	342° 16' 22"	-12° 53' 46"	0° 58' 39"	15' 58.90"	69° 24' 35"	0.66774
15	339° 19' 40"	-4° 57' 33"	342° 48' 49"	-12° 39' 44"	0° 58' 37"	15' 58.29"	69° 16' 57"	0.66333
16	339° 54' 21"	-4° 56' 36"	343° 21' 09"	-12° 25' 40"	0° 58' 34"	15' 57.67"	69° 9' 30"	0.65891
17	340° 28' 59"	-4° 55' 37"	343° 53' 24"	-12° 11' 32"	0° 58' 32"	15' 57.06"	69° 2' 13"	0.65448
18	341° 03' 34"	-4° 54' 37"	344° 25' 32"	-11° 57' 22"	0° 58' 30"	15' 56.45"	68° 55' 06"	0.65004
19	341° 38' 07"	-4° 53' 35"	344° 57' 34"	-11° 43' 10"	0° 58' 28"	15' 55.83"	68° 48' 09"	0.64560
20	342° 12' 36"	-4° 52' 31"	345° 29' 31"	-11° 28' 55"	0° 58' 25"	15' 55.22"	68° 41' 23"	0.64115
21	342° 47' 03"	-4° 51' 25"	346° 01' 22"	-11° 14' 38"	0° 58' 23"	15' 54.60"	68° 34' 46"	0.63670
22	343° 21' 26"	-4° 50' 18"	346° 33' 07"	-11° 00' 18"	0° 58' 21"	15' 53.99"	68° 28' 20"	0.63224
23	343° 55' 47"	-4° 49' 09"	347° 04' 46"	-10° 45' 56"	0° 58' 19"	15' 53.38"	68° 22' 03"	0.62778
24	344° 30' 05"	-4° 47' 58"	347° 36' 20"	-10° 31' 33"	0° 58' 16"	15' 52.76"	68° 15' 56"	0.62331

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	88° 41' 13"	-0.35"	88° 33' 32"	23° 25' 52"	1.0161253	15' 44.40"	23° 26' 16"	-1 m 29 s
1	88° 43' 36"	-0.35"	88° 36' 08"	23° 25' 54"	1.0161286	15' 44.40"	23° 26' 16"	-1 m 29 s
2	88° 45' 59"	-0.35"	88° 38' 44"	23° 25' 55"	1.0161319	15' 44.40"	23° 26' 16"	-1 m 30 s
3	88° 48' 22"	-0.35"	88° 41' 20"	23° 25' 56"	1.0161352	15' 44.39"	23° 26' 16"	-1 m 31 s
4	88° 50' 46"	-0.34"	88° 43' 56"	23° 25' 58"	1.0161385	15' 44.39"	23° 26' 16"	-1 m 31 s
5	88° 53' 09"	-0.34"	88° 46' 32"	23° 25' 59"	1.0161418	15' 44.39"	23° 26' 16"	-1 m 32 s
6	88° 55' 32"	-0.34"	88° 49' 08"	23° 25' 60"	1.0161451	15' 44.38"	23° 26' 16"	-1 m 32 s
7	88° 57' 55"	-0.34"	88° 51' 44"	23° 26' 01"	1.0161483	15' 44.38"	23° 26' 16"	-1 m 33 s
8	89° 00' 18"	-0.34"	88° 54' 20"	23° 26' 02"	1.0161516	15' 44.38"	23° 26' 16"	-1 m 33 s
9	89° 02' 41"	-0.33"	88° 56' 56"	23° 26' 03"	1.0161549	15' 44.37"	23° 26' 16"	-1 m 34 s
10	89° 05' 04"	-0.33"	88° 59' 32"	23° 26' 04"	1.0161581	15' 44.37"	23° 26' 16"	-1 m 34 s
11	89° 07' 28"	-0.33"	89° 02' 08"	23° 26' 05"	1.0161613	15' 44.37"	23° 26' 16"	-1 m 35 s
12	89° 09' 51"	-0.33"	89° 04' 44"	23° 26' 06"	1.0161646	15' 44.36"	23° 26' 16"	-1 m 35 s
13	89° 12' 14"	-0.32"	89° 07' 20"	23° 26' 07"	1.0161678	15' 44.36"	23° 26' 16"	-1 m 36 s
14	89° 14' 37"	-0.32"	89° 09' 56"	23° 26' 08"	1.0161710	15' 44.36"	23° 26' 16"	-1 m 37 s
15	89° 17' 00"	-0.32"	89° 12' 32"	23° 26' 09"	1.0161742	15' 44.36"	23° 26' 16"	-1 m 37 s
16	89° 19' 23"	-0.32"	89° 15' 08"	23° 26' 10"	1.0161774	15' 44.35"	23° 26' 16"	-1 m 38 s
17	89° 21' 46"	-0.31"	89° 17' 44"	23° 26' 10"	1.0161806	15' 44.35"	23° 26' 16"	-1 m 38 s
18	89° 24' 10"	-0.31"	89° 20' 20"	23° 26' 11"	1.0161838	15' 44.35"	23° 26' 16"	-1 m 39 s
19	89° 26' 33"	-0.31"	89° 22' 56"	23° 26' 12"	1.0161870	15' 44.34"	23° 26' 16"	-1 m 39 s
20	89° 28' 56"	-0.31"	89° 25' 32"	23° 26' 12"	1.0161902	15' 44.34"	23° 26' 16"	-1 m 40 s
21	89° 31' 19"	-0.30"	89° 28' 08"	23° 26' 13"	1.0161933	15' 44.34"	23° 26' 16"	-1 m 40 s
22	89° 33' 42"	-0.30"	89° 30' 44"	23° 26' 13"	1.0161965	15' 44.34"	23° 26' 16"	-1 m 41 s
23	89° 36' 05"	-0.30"	89° 33' 20"	23° 26' 14"	1.0161996	15' 44.33"	23° 26' 16"	-1 m 41 s
24	89° 38' 28"	-0.29"	89° 35' 56"	23° 26' 14"	1.0162028	15' 44.33"	23° 26' 16"	-1 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	344° 30' 05"	-4° 47' 58"	347° 36' 20"	-10° 31' 33"	0° 58' 16"	15' 52.76"	68° 15' 56"	0.62331
1	345° 04' 21"	-4° 46' 46"	348° 07' 49"	-10° 17' 07"	0° 58' 14"	15' 52.15"	68° 9' 60"	0.61883
2	345° 38' 33"	-4° 45' 32"	348° 39' 12"	-10° 02' 39"	0° 58' 12"	15' 51.54"	68° 4' 13"	0.61436
3	346° 12' 42"	-4° 44' 17"	349° 10' 30"	-9° 48' 10"	0° 58' 10"	15' 50.93"	67° 58' 36"	0.60988
4	346° 46' 49"	-4° 42' 60"	349° 41' 43"	-9° 33' 39"	0° 58' 07"	15' 50.32"	67° 53' 08"	0.60539
5	347° 20' 53"	-4° 41' 41"	350° 12' 50"	-9° 19' 06"	0° 58' 05"	15' 49.71"	67° 47' 51"	0.60090
6	347° 54' 54"	-4° 40' 21"	350° 43' 53"	-9° 04' 32"	0° 58' 03"	15' 49.10"	67° 42' 43"	0.59642
7	348° 28' 53"	-4° 38' 59"	351° 14' 50"	-8° 49' 56"	0° 58' 01"	15' 48.49"	67° 37' 44"	0.59193
8	349° 02' 48"	-4° 37' 36"	351° 45' 43"	-8° 35' 19"	0° 57' 59"	15' 47.89"	67° 32' 56"	0.58743
9	349° 36' 41"	-4° 36' 12"	352° 16' 31"	-8° 20' 41"	0° 57' 56"	15' 47.28"	67° 28' 16"	0.58294
10	350° 10' 31"	-4° 34' 45"	352° 47' 14"	-8° 06' 01"	0° 57' 54"	15' 46.68"	67° 23' 46"	0.57845
11	350° 44' 18"	-4° 33' 18"	353° 17' 53"	-7° 51' 20"	0° 57' 52"	15' 46.07"	67° 19' 26"	0.57395
12	351° 18' 02"	-4° 31' 49"	353° 48' 27"	-7° 36' 38"	0° 57' 50"	15' 45.47"	67° 15' 15"	0.56946
13	351° 51' 44"	-4° 30' 18"	354° 18' 56"	-7° 21' 55"	0° 57' 47"	15' 44.87"	67° 11' 13"	0.56496
14	352° 25' 23"	-4° 28' 46"	354° 49' 21"	-7° 07' 11"	0° 57' 45"	15' 44.27"	67° 7' 20"	0.56047
15	352° 58' 59"	-4° 27' 13"	355° 19' 42"	-6° 52' 27"	0° 57' 43"	15' 43.68"	67° 3' 37"	0.55598
16	353° 32' 32"	-4° 25' 38"	355° 49' 59"	-6° 37' 41"	0° 57' 41"	15' 43.08"	67° 0' 03"	0.55149
17	354° 06' 03"	-4° 24' 02"	356° 20' 11"	-6° 22' 55"	0° 57' 39"	15' 42.48"	66° 56' 38"	0.54700
18	354° 39' 31"	-4° 22' 24"	356° 50' 20"	-6° 08' 08"	0° 57' 36"	15' 41.89"	66° 53' 22"	0.54252
19	355° 12' 57"	-4° 20' 45"	357° 20' 24"	-5° 53' 21"	0° 57' 34"	15' 41.30"	66° 50' 16"	0.53803
20	355° 46' 19"	-4° 19' 05"	357° 50' 25"	-5° 38' 33"	0° 57' 32"	15' 40.71"	66° 47' 18"	0.53355
21	356° 19' 39"	-4° 17' 23"	358° 20' 22"	-5° 23' 45"	0° 57' 30"	15' 40.12"	66° 44' 29"	0.52907
22	356° 52' 56"	-4° 15' 40"	358° 50' 15"	-5° 08' 56"	0° 57' 28"	15' 39.54"	66° 41' 49"	0.52460
23	357° 26' 11"	-4° 13' 56"	359° 20' 04"	-4° 54' 08"	0° 57' 26"	15' 38.95"	66° 39' 19"	0.52013
24	357° 59' 23"	-4° 12' 11"	359° 49' 50"	-4° 39' 18"	0° 57' 24"	15' 38.37"	66° 36' 57"	0.51567



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	89° 38' 28"	-0.29"	89° 35' 56"	23° 26' 14"	1.0162028	15' 44.33"	23° 26' 16"	-1 m 42 s
1	89° 40' 52"	-0.29"	89° 38' 32"	23° 26' 15"	1.0162059	15' 44.33"	23° 26' 16"	-1 m 43 s
2	89° 43' 15"	-0.29"	89° 41' 08"	23° 26' 15"	1.0162090	15' 44.32"	23° 26' 16"	-1 m 43 s
3	89° 45' 38"	-0.29"	89° 43' 44"	23° 26' 15"	1.0162121	15' 44.32"	23° 26' 16"	-1 m 44 s
4	89° 48' 01"	-0.28"	89° 46' 20"	23° 26' 15"	1.0162152	15' 44.32"	23° 26' 16"	-1 m 44 s
5	89° 50' 24"	-0.28"	89° 48' 56"	23° 26' 16"	1.0162183	15' 44.31"	23° 26' 16"	-1 m 45 s
6	89° 52' 47"	-0.28"	89° 51' 32"	23° 26' 16"	1.0162214	15' 44.31"	23° 26' 16"	-1 m 45 s
7	89° 55' 10"	-0.27"	89° 54' 08"	23° 26' 16"	1.0162245	15' 44.31"	23° 26' 16"	-1 m 46 s
8	89° 57' 34"	-0.27"	89° 56' 44"	23° 26' 16"	1.0162276	15' 44.31"	23° 26' 16"	-1 m 46 s
9	89° 59' 57"	-0.27"	89° 59' 20"	23° 26' 16"	1.0162306	15' 44.30"	23° 26' 16"	-1 m 47 s
10	90° 02' 20"	-0.26"	90° 01' 56"	23° 26' 16"	1.0162337	15' 44.30"	23° 26' 16"	-1 m 47 s
11	90° 04' 43"	-0.26"	90° 04' 32"	23° 26' 16"	1.0162368	15' 44.30"	23° 26' 16"	-1 m 48 s
12	90° 07' 06"	-0.26"	90° 07' 08"	23° 26' 16"	1.0162398	15' 44.29"	23° 26' 16"	-1 m 49 s
13	90° 09' 29"	-0.25"	90° 09' 44"	23° 26' 16"	1.0162428	15' 44.29"	23° 26' 16"	-1 m 49 s
14	90° 11' 52"	-0.25"	90° 12' 20"	23° 26' 16"	1.0162459	15' 44.29"	23° 26' 16"	-1 m 50 s
15	90° 14' 16"	-0.25"	90° 14' 56"	23° 26' 15"	1.0162489	15' 44.29"	23° 26' 16"	-1 m 50 s
16	90° 16' 39"	-0.24"	90° 17' 32"	23° 26' 15"	1.0162519	15' 44.28"	23° 26' 16"	-1 m 51 s
17	90° 19' 02"	-0.24"	90° 20' 08"	23° 26' 15"	1.0162549	15' 44.28"	23° 26' 16"	-1 m 51 s
18	90° 21' 25"	-0.23"	90° 22' 44"	23° 26' 14"	1.0162579	15' 44.28"	23° 26' 16"	-1 m 52 s
19	90° 23' 48"	-0.23"	90° 25' 20"	23° 26' 14"	1.0162609	15' 44.28"	23° 26' 16"	-1 m 52 s
20	90° 26' 11"	-0.23"	90° 27' 56"	23° 26' 14"	1.0162638	15' 44.27"	23° 26' 16"	-1 m 53 s
21	90° 28' 34"	-0.22"	90° 30' 32"	23° 26' 13"	1.0162668	15' 44.27"	23° 26' 16"	-1 m 53 s
22	90° 30' 57"	-0.22"	90° 33' 08"	23° 26' 13"	1.0162698	15' 44.27"	23° 26' 16"	-1 m 54 s
23	90° 33' 21"	-0.22"	90° 35' 44"	23° 26' 12"	1.0162727	15' 44.26"	23° 26' 16"	-1 m 54 s
24	90° 35' 44"	-0.21"	90° 38' 20"	23° 26' 11"	1.0162756	15' 44.26"	23° 26' 16"	-1 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	357° 59' 23"	-4° 12' 11"	359° 49' 50"	-4° 39' 18"	0° 57' 24"	15' 38.37"	66° 36' 57"	0.51567
1	358° 32' 33"	-4° 10' 24"	0° 19' 33"	-4° 24' 29"	0° 57' 21"	15' 37.79"	66° 34' 44"	0.51120
2	359° 05' 39"	-4° 08' 36"	0° 49' 12"	-4° 09' 40"	0° 57' 19"	15' 37.21"	66° 32' 40"	0.50675
3	359° 38' 43"	-4° 06' 47"	1° 18' 48"	-3° 54' 51"	0° 57' 17"	15' 36.63"	66° 30' 44"	0.50230
4	0° 11' 45"	-4° 04' 56"	1° 48' 20"	-3° 40' 01"	0° 57' 15"	15' 36.06"	66° 28' 57"	0.49785
5	0° 44' 44"	-4° 03' 04"	2° 17' 49"	-3° 25' 12"	0° 57' 13"	15' 35.49"	66° 27' 20"	0.49341
6	1° 17' 41"	-4° 01' 11"	2° 47' 16"	-3° 10' 23"	0° 57' 11"	15' 34.92"	66° 25' 50"	0.48898
7	1° 50' 34"	-3° 59' 17"	3° 16' 39"	-2° 55' 35"	0° 57' 09"	15' 34.35"	66° 24' 30"	0.48456
8	2° 23' 26"	-3° 57' 22"	3° 45' 60"	-2° 40' 46"	0° 57' 07"	15' 33.78"	66° 23' 18"	0.48014
9	2° 56' 15"	-3° 55' 26"	4° 15' 17"	-2° 25' 58"	0° 57' 05"	15' 33.22"	66° 22' 14"	0.47572
10	3° 29' 01"	-3° 53' 28"	4° 44' 32"	-2° 11' 11"	0° 57' 03"	15' 32.66"	66° 21' 20"	0.47132
11	4° 01' 45"	-3° 51' 29"	5° 13' 44"	-1° 56' 23"	0° 57' 01"	15' 32.10"	66° 20' 33"	0.46692
12	4° 34' 26"	-3° 49' 29"	5° 42' 54"	-1° 41' 37"	0° 56' 59"	15' 31.55"	66° 19' 56"	0.46254
13	5° 07' 05"	-3° 47' 29"	6° 12' 01"	-1° 26' 51"	0° 56' 57"	15' 30.99"	66° 19' 26"	0.45815
14	5° 39' 42"	-3° 45' 27"	6° 41' 06"	-1° 12' 06"	0° 56' 54"	15' 30.44"	66° 19' 06"	0.45378
15	6° 12' 16"	-3° 43' 23"	7° 10' 08"	0° -57' 21"	0° 56' 52"	15' 29.90"	66° 18' 53"	0.44942
16	6° 44' 47"	-3° 41' 19"	7° 39' 08"	0° -42' 37"	0° 56' 50"	15' 29.35"	66° 18' 49"	0.44507
17	7° 17' 16"	-3° 39' 14"	8° 08' 06"	0° -27' 54"	0° 56' 48"	15' 28.81"	66° 18' 54"	0.44072
18	7° 49' 43"	-3° 37' 08"	8° 37' 02"	0° -13' 12"	0° 56' 46"	15' 28.27"	66° 19' 07"	0.43639
19	8° 22' 08"	-3° 35' 01"	9° 05' 55"	0° 01' 29"	0° 56' 45"	15' 27.73"	66° 19' 28"	0.43207
20	8° 54' 30"	-3° 32' 53"	9° 34' 47"	0° 16' 09"	0° 56' 43"	15' 27.19"	66° 19' 57"	0.42775
21	9° 26' 49"	-3° 30' 43"	10° 03' 37"	0° 30' 48"	0° 56' 41"	15' 26.66"	66° 20' 35"	0.42345
22	9° 59' 07"	-3° 28' 33"	10° 32' 25"	0° 45' 26"	0° 56' 39"	15' 26.13"	66° 21' 21"	0.41916
23	10° 31' 22"	-3° 26' 22"	11° 01' 11"	1° 00' 03"	0° 56' 37"	15' 25.61"	66° 22' 16"	0.41488
24	11° 03' 35"	-3° 24' 10"	11° 29' 56"	1° 14' 38"	0° 56' 35"	15' 25.08"	66° 23' 18"	0.41061

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	90° 35' 44"	-0.21"	90° 38' 20"	23° 26' 11"	1.0162756	15' 44.26"	23° 26' 16"	-1 m 55 s
1	90° 38' 07"	-0.21"	90° 40' 56"	23° 26' 11"	1.0162786	15' 44.26"	23° 26' 16"	-1 m 56 s
2	90° 40' 30"	-0.20"	90° 43' 32"	23° 26' 10"	1.0162815	15' 44.26"	23° 26' 16"	-1 m 56 s
3	90° 42' 53"	-0.20"	90° 46' 08"	23° 26' 09"	1.0162844	15' 44.25"	23° 26' 16"	-1 m 57 s
4	90° 45' 16"	-0.20"	90° 48' 44"	23° 26' 09"	1.0162873	15' 44.25"	23° 26' 16"	-1 m 57 s
5	90° 47' 39"	-0.19"	90° 51' 20"	23° 26' 08"	1.0162902	15' 44.25"	23° 26' 16"	-1 m 58 s
6	90° 50' 03"	-0.19"	90° 53' 56"	23° 26' 07"	1.0162931	15' 44.25"	23° 26' 16"	-1 m 58 s
7	90° 52' 26"	-0.18"	90° 56' 32"	23° 26' 06"	1.0162960	15' 44.24"	23° 26' 16"	-1 m 59 s
8	90° 54' 49"	-0.18"	90° 59' 08"	23° 26' 05"	1.0162989	15' 44.24"	23° 26' 16"	-1 m 59 s
9	90° 57' 12"	-0.17"	91° 01' 44"	23° 26' 04"	1.0163017	15' 44.24"	23° 26' 16"	-1 m 60 s
10	90° 59' 35"	-0.17"	91° 04' 20"	23° 26' 03"	1.0163046	15' 44.23"	23° 26' 16"	-2 m 00 s
11	91° 01' 58"	-0.17"	91° 06' 56"	23° 26' 02"	1.0163074	15' 44.23"	23° 26' 16"	-2 m 01 s
12	91° 04' 21"	-0.16"	91° 09' 32"	23° 26' 01"	1.0163103	15' 44.23"	23° 26' 16"	-2 m 02 s
13	91° 06' 45"	-0.16"	91° 12' 08"	23° 25' 60"	1.0163131	15' 44.23"	23° 26' 16"	-2 m 02 s
14	91° 09' 08"	-0.15"	91° 14' 44"	23° 25' 58"	1.0163159	15' 44.22"	23° 26' 16"	-2 m 03 s
15	91° 11' 31"	-0.15"	91° 17' 20"	23° 25' 57"	1.0163187	15' 44.22"	23° 26' 16"	-2 m 03 s
16	91° 13' 54"	-0.14"	91° 19' 56"	23° 25' 56"	1.0163215	15' 44.22"	23° 26' 16"	-2 m 04 s
17	91° 16' 17"	-0.14"	91° 22' 32"	23° 25' 54"	1.0163243	15' 44.22"	23° 26' 16"	-2 m 04 s
18	91° 18' 40"	-0.13"	91° 25' 08"	23° 25' 53"	1.0163271	15' 44.21"	23° 26' 16"	-2 m 05 s
19	91° 21' 03"	-0.13"	91° 27' 44"	23° 25' 52"	1.0163299	15' 44.21"	23° 26' 16"	-2 m 05 s
20	91° 23' 26"	-0.13"	91° 30' 20"	23° 25' 50"	1.0163327	15' 44.21"	23° 26' 16"	-2 m 06 s
21	91° 25' 50"	-0.12"	91° 32' 56"	23° 25' 49"	1.0163354	15' 44.21"	23° 26' 16"	-2 m 06 s
22	91° 28' 13"	-0.12"	91° 35' 32"	23° 25' 47"	1.0163382	15' 44.20"	23° 26' 16"	-2 m 07 s
23	91° 30' 36"	-0.11"	91° 38' 08"	23° 25' 46"	1.0163409	15' 44.20"	23° 26' 16"	-2 m 07 s
24	91° 32' 59"	-0.11"	91° 40' 44"	23° 25' 44"	1.0163436	15' 44.20"	23° 26' 16"	-2 m 08 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	11° 03' 35"	-3° 24' 10"	11° 29' 56"	1° 14' 38"	0° 56' 35"	15' 25.08"	66° 23' 18"	0.41061
1	11° 35' 45"	-3° 21' 57"	11° 58' 39"	1° 29' 12"	0° 56' 33"	15' 24.56"	66° 24' 29"	0.40635
2	12° 07' 54"	-3° 19' 43"	12° 27' 21"	1° 43' 45"	0° 56' 31"	15' 24.04"	66° 25' 48"	0.40211
3	12° 39' 60"	-3° 17' 29"	12° 56' 01"	1° 58' 17"	0° 56' 29"	15' 23.53"	66° 27' 15"	0.39787
4	13° 12' 04"	-3° 15' 13"	13° 24' 40"	2° 12' 47"	0° 56' 27"	15' 23.02"	66° 28' 51"	0.39365
5	13° 44' 05"	-3° 12' 57"	13° 53' 17"	2° 27' 15"	0° 56' 25"	15' 22.51"	66° 30' 35"	0.38944
6	14° 16' 05"	-3° 10' 39"	14° 21' 54"	2° 41' 42"	0° 56' 24"	15' 22.00"	66° 32' 26"	0.38525
7	14° 48' 02"	-3° 08' 21"	14° 50' 29"	2° 56' 08"	0° 56' 22"	15' 21.50"	66° 34' 26"	0.38107
8	15° 19' 57"	-3° 06' 02"	15° 19' 03"	3° 10' 32"	0° 56' 20"	15' 21.00"	66° 36' 34"	0.37690
9	15° 51' 50"	-3° 03' 42"	15° 47' 36"	3° 24' 54"	0° 56' 18"	15' 20.50"	66° 38' 51"	0.37275
10	16° 23' 41"	-3° 01' 22"	16° 16' 08"	3° 39' 14"	0° 56' 16"	15' 20.01"	66° 41' 15"	0.36861
11	16° 55' 30"	-2° 59' 00"	16° 44' 40"	3° 53' 33"	0° 56' 14"	15' 19.52"	66° 43' 47"	0.36448
12	17° 27' 16"	-2° 56' 38"	17° 13' 10"	4° 07' 50"	0° 56' 13"	15' 19.03"	66° 46' 28"	0.36037
13	17° 59' 01"	-2° 54' 15"	17° 41' 40"	4° 22' 04"	0° 56' 11"	15' 18.55"	66° 49' 17"	0.35627
14	18° 30' 43"	-2° 51' 51"	18° 10' 09"	4° 36' 17"	0° 56' 09"	15' 18.06"	66° 52' 13"	0.35219
15	19° 02' 24"	-2° 49' 27"	18° 38' 38"	4° 50' 28"	0° 56' 07"	15' 17.59"	66° 55' 18"	0.34812
16	19° 34' 02"	-2° 47' 02"	19° 07' 06"	5° 04' 37"	0° 56' 06"	15' 17.11"	66° 58' 31"	0.34407
17	20° 05' 39"	-2° 44' 36"	19° 35' 34"	5° 18' 44"	0° 56' 04"	15' 16.64"	67° 1' 52"	0.34003
18	20° 37' 13"	-2° 42' 10"	20° 04' 01"	5° 32' 49"	0° 56' 02"	15' 16.17"	67° 5' 21"	0.33601
19	21° 08' 46"	-2° 39' 43"	20° 32' 28"	5° 46' 51"	0° 56' 00"	15' 15.71"	67° 8' 58"	0.33201
20	21° 40' 16"	-2° 37' 15"	21° 00' 55"	6° 00' 51"	0° 55' 59"	15' 15.24"	67° 12' 43"	0.32802
21	22° 11' 45"	-2° 34' 46"	21° 29' 22"	6° 14' 49"	0° 55' 57"	15' 14.79"	67° 16' 36"	0.32405
22	22° 43' 12"	-2° 32' 17"	21° 57' 49"	6° 28' 45"	0° 55' 55"	15' 14.33"	67° 20' 38"	0.32009
23	23° 14' 37"	-2° 29' 48"	22° 26' 15"	6° 42' 38"	0° 55' 54"	15' 13.88"	67° 24' 47"	0.31615
24	23° 45' 60"	-2° 27' 17"	22° 54' 42"	6° 56' 29"	0° 55' 52"	15' 13.43"	67° 29' 04"	0.31223



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	91° 32' 59"	-0.11"	91° 40' 44"	23° 25' 44"	1.0163436	15' 44.20"	23° 26' 16"	-2 m 08 s
1	91° 35' 22"	-0.10"	91° 43' 20"	23° 25' 42"	1.0163463	15' 44.20"	23° 26' 16"	-2 m 09 s
2	91° 37' 45"	-0.10"	91° 45' 56"	23° 25' 40"	1.0163491	15' 44.19"	23° 26' 16"	-2 m 09 s
3	91° 40' 08"	-0.09"	91° 48' 32"	23° 25' 39"	1.0163518	15' 44.19"	23° 26' 16"	-2 m 10 s
4	91° 42' 31"	-0.09"	91° 51' 08"	23° 25' 37"	1.0163545	15' 44.19"	23° 26' 16"	-2 m 10 s
5	91° 44' 55"	-0.08"	91° 53' 44"	23° 25' 35"	1.0163571	15' 44.19"	23° 26' 16"	-2 m 11 s
6	91° 47' 18"	-0.08"	91° 56' 20"	23° 25' 33"	1.0163598	15' 44.18"	23° 26' 16"	-2 m 11 s
7	91° 49' 41"	-0.07"	91° 58' 56"	23° 25' 31"	1.0163625	15' 44.18"	23° 26' 16"	-2 m 12 s
8	91° 52' 04"	-0.07"	92° 01' 32"	23° 25' 29"	1.0163651	15' 44.18"	23° 26' 16"	-2 m 12 s
9	91° 54' 27"	-0.06"	92° 04' 08"	23° 25' 27"	1.0163678	15' 44.18"	23° 26' 16"	-2 m 13 s
10	91° 56' 50"	-0.06"	92° 06' 44"	23° 25' 25"	1.0163704	15' 44.17"	23° 26' 16"	-2 m 13 s
11	91° 59' 13"	-0.05"	92° 09' 20"	23° 25' 23"	1.0163731	15' 44.17"	23° 26' 16"	-2 m 14 s
12	92° 01' 37"	-0.05"	92° 11' 56"	23° 25' 21"	1.0163757	15' 44.17"	23° 26' 16"	-2 m 14 s
13	92° 03' 60"	-0.04"	92° 14' 32"	23° 25' 19"	1.0163783	15' 44.17"	23° 26' 16"	-2 m 15 s
14	92° 06' 23"	-0.04"	92° 17' 08"	23° 25' 16"	1.0163809	15' 44.16"	23° 26' 16"	-2 m 16 s
15	92° 08' 46"	-0.03"	92° 19' 44"	23° 25' 14"	1.0163835	15' 44.16"	23° 26' 16"	-2 m 16 s
16	92° 11' 09"	-0.03"	92° 22' 19"	23° 25' 12"	1.0163861	15' 44.16"	23° 26' 16"	-2 m 17 s
17	92° 13' 32"	-0.02"	92° 24' 55"	23° 25' 09"	1.0163886	15' 44.16"	23° 26' 16"	-2 m 17 s
18	92° 15' 55"	-0.02"	92° 27' 31"	23° 25' 07"	1.0163912	15' 44.15"	23° 26' 16"	-2 m 18 s
19	92° 18' 18"	-0.01"	92° 30' 07"	23° 25' 05"	1.0163938	15' 44.15"	23° 26' 16"	-2 m 18 s
20	92° 20' 42"	-0.01"	92° 32' 43"	23° 25' 02"	1.0163963	15' 44.15"	23° 26' 16"	-2 m 19 s
21	92° 23' 05"	-0.00"	92° 35' 19"	23° 24' 59"	1.0163988	15' 44.15"	23° 26' 16"	-2 m 19 s
22	92° 25' 28"	0.01"	92° 37' 55"	23° 24' 57"	1.0164014	15' 44.14"	23° 26' 16"	-2 m 20 s
23	92° 27' 51"	0.01"	92° 40' 31"	23° 24' 54"	1.0164039	15' 44.14"	23° 26' 16"	-2 m 20 s
24	92° 30' 14"	0.02"	92° 43' 07"	23° 24' 52"	1.0164064	15' 44.14"	23° 26' 16"	-2 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	23° 45' 60"	-2° 27' 17"	22° 54' 42"	6° 56' 29"	0° 55' 52"	15' 13.43"	67° 29' 04"	0.31223
1	24° 17' 21"	-2° 24' 46"	23° 23' 08"	7° 10' 18"	0° 55' 50"	15' 12.98"	67° 33' 30"	0.30833
2	24° 48' 40"	-2° 22' 15"	23° 51' 35"	7° 24' 03"	0° 55' 49"	15' 12.54"	67° 38' 03"	0.30444
3	25° 19' 57"	-2° 19' 43"	24° 20' 02"	7° 37' 47"	0° 55' 47"	15' 12.10"	67° 42' 45"	0.30058
4	25° 51' 13"	-2° 17' 10"	24° 48' 30"	7° 51' 28"	0° 55' 46"	15' 11.66"	67° 47' 35"	0.29672
5	26° 22' 27"	-2° 14' 37"	25° 16' 57"	8° 05' 06"	0° 55' 44"	15' 11.23"	67° 52' 32"	0.29289
6	26° 53' 39"	-2° 12' 04"	25° 45' 25"	8° 18' 41"	0° 55' 42"	15' 10.80"	67° 57' 38"	0.28908
7	27° 24' 50"	-2° 09' 30"	26° 13' 54"	8° 32' 14"	0° 55' 41"	15' 10.38"	68° 2' 52"	0.28528
8	27° 55' 58"	-2° 06' 55"	26° 42' 23"	8° 45' 43"	0° 55' 39"	15' 09.95"	68° 8' 14"	0.28150
9	28° 27' 05"	-2° 04' 20"	27° 10' 53"	8° 59' 10"	0° 55' 38"	15' 09.54"	68° 13' 45"	0.27775
10	28° 58' 10"	-2° 01' 44"	27° 39' 23"	9° 12' 34"	0° 55' 36"	15' 09.12"	68° 19' 23"	0.27401
11	29° 29' 14"	-1° 59' 08"	28° 07' 54"	9° 25' 56"	0° 55' 35"	15' 08.71"	68° 25' 09"	0.27029
12	30° 00' 16"	-1° 56' 32"	28° 36' 26"	9° 39' 14"	0° 55' 33"	15' 08.30"	68° 31' 04"	0.26659
13	30° 31' 16"	-1° 53' 55"	29° 04' 59"	9° 52' 29"	0° 55' 32"	15' 07.89"	68° 37' 07"	0.26291
14	31° 02' 15"	-1° 51' 17"	29° 33' 33"	10° 05' 41"	0° 55' 30"	15' 07.49"	68° 43' 18"	0.25924
15	31° 33' 12"	-1° 48' 40"	30° 02' 07"	10° 18' 50"	0° 55' 29"	15' 07.09"	68° 49' 37"	0.25560
16	32° 04' 07"	-1° 46' 02"	30° 30' 43"	10° 31' 56"	0° 55' 27"	15' 06.70"	68° 56' 05"	0.25198
17	32° 35' 01"	-1° 43' 23"	30° 59' 19"	10° 44' 59"	0° 55' 26"	15' 06.30"	69° 2' 41"	0.24838
18	33° 05' 53"	-1° 40' 44"	31° 27' 57"	10° 57' 58"	0° 55' 24"	15' 05.92"	69° 9' 25"	0.24480
19	33° 36' 44"	-1° 38' 05"	31° 56' 36"	11° 10' 54"	0° 55' 23"	15' 05.53"	69° 16' 17"	0.24124
20	34° 07' 34"	-1° 35' 25"	32° 25' 16"	11° 23' 47"	0° 55' 22"	15' 05.15"	69° 23' 17"	0.23770
21	34° 38' 21"	-1° 32' 45"	32° 53' 57"	11° 36' 37"	0° 55' 20"	15' 04.77"	69° 30' 26"	0.23418
22	35° 09' 08"	-1° 30' 05"	33° 22' 40"	11° 49' 23"	0° 55' 19"	15' 04.39"	69° 37' 44"	0.23069
23	35° 39' 52"	-1° 27' 25"	33° 51' 24"	12° 02' 05"	0° 55' 18"	15' 04.02"	69° 45' 09"	0.22721
24	36° 10' 36"	-1° 24' 44"	34° 20' 10"	12° 14' 44"	0° 55' 16"	15' 03.65"	69° 52' 43"	0.22376

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	92° 30' 14"	0.02"	92° 43' 07"	23° 24' 52"	1.0164064	15' 44.14"	23° 26' 16"	-2 m 21 s
1	92° 32' 37"	0.02"	92° 45' 43"	23° 24' 49"	1.0164089	15' 44.14"	23° 26' 16"	-2 m 21 s
2	92° 35' 00"	0.03"	92° 48' 19"	23° 24' 46"	1.0164114	15' 44.14"	23° 26' 16"	-2 m 22 s
3	92° 37' 23"	0.03"	92° 50' 55"	23° 24' 43"	1.0164139	15' 44.13"	23° 26' 16"	-2 m 23 s
4	92° 39' 47"	0.04"	92° 53' 31"	23° 24' 40"	1.0164163	15' 44.13"	23° 26' 16"	-2 m 23 s
5	92° 42' 10"	0.04"	92° 56' 07"	23° 24' 38"	1.0164188	15' 44.13"	23° 26' 16"	-2 m 24 s
6	92° 44' 33"	0.05"	92° 58' 43"	23° 24' 35"	1.0164213	15' 44.13"	23° 26' 16"	-2 m 24 s
7	92° 46' 56"	0.05"	93° 01' 19"	23° 24' 32"	1.0164237	15' 44.12"	23° 26' 16"	-2 m 25 s
8	92° 49' 19"	0.06"	93° 03' 55"	23° 24' 29"	1.0164261	15' 44.12"	23° 26' 16"	-2 m 25 s
9	92° 51' 42"	0.06"	93° 06' 30"	23° 24' 26"	1.0164285	15' 44.12"	23° 26' 16"	-2 m 26 s
10	92° 54' 05"	0.07"	93° 09' 06"	23° 24' 22"	1.0164310	15' 44.12"	23° 26' 16"	-2 m 26 s
11	92° 56' 28"	0.08"	93° 11' 42"	23° 24' 19"	1.0164334	15' 44.12"	23° 26' 16"	-2 m 27 s
12	92° 58' 51"	0.08"	93° 14' 18"	23° 24' 16"	1.0164358	15' 44.11"	23° 26' 16"	-2 m 27 s
13	93° 01' 15"	0.09"	93° 16' 54"	23° 24' 13"	1.0164381	15' 44.11"	23° 26' 16"	-2 m 28 s
14	93° 03' 38"	0.09"	93° 19' 30"	23° 24' 10"	1.0164405	15' 44.11"	23° 26' 16"	-2 m 28 s
15	93° 06' 01"	0.10"	93° 22' 06"	23° 24' 06"	1.0164429	15' 44.11"	23° 26' 16"	-2 m 29 s
16	93° 08' 24"	0.10"	93° 24' 42"	23° 24' 03"	1.0164452	15' 44.10"	23° 26' 16"	-2 m 30 s
17	93° 10' 47"	0.11"	93° 27' 18"	23° 23' 60"	1.0164476	15' 44.10"	23° 26' 16"	-2 m 30 s
18	93° 13' 10"	0.11"	93° 29' 54"	23° 23' 56"	1.0164499	15' 44.10"	23° 26' 16"	-2 m 31 s
19	93° 15' 33"	0.12"	93° 32' 30"	23° 23' 53"	1.0164522	15' 44.10"	23° 26' 16"	-2 m 31 s
20	93° 17' 56"	0.13"	93° 35' 05"	23° 23' 49"	1.0164546	15' 44.10"	23° 26' 16"	-2 m 32 s
21	93° 20' 20"	0.13"	93° 37' 41"	23° 23' 45"	1.0164569	15' 44.09"	23° 26' 16"	-2 m 32 s
22	93° 22' 43"	0.14"	93° 40' 17"	23° 23' 42"	1.0164592	15' 44.09"	23° 26' 16"	-2 m 33 s
23	93° 25' 06"	0.14"	93° 42' 53"	23° 23' 38"	1.0164614	15' 44.09"	23° 26' 16"	-2 m 33 s
24	93° 27' 29"	0.15"	93° 45' 29"	23° 23' 34"	1.0164637	15' 44.09"	23° 26' 16"	-2 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	36° 10' 36"	-1° 24' 44"	34° 20' 10"	12° 14' 44"	0° 55' 16"	15' 03.65"	69° 52' 43"	0.22376
1	36° 41' 18"	-1° 22' 03"	34° 48' 57"	12° 27' 19"	0° 55' 15"	15' 03.29"	70° 0' 26"	0.22033
2	37° 11' 58"	-1° 19' 22"	35° 17' 45"	12° 39' 51"	0° 55' 13"	15' 02.93"	70° 8' 17"	0.21692
3	37° 42' 38"	-1° 16' 40"	35° 46' 35"	12° 52' 19"	0° 55' 12"	15' 02.57"	70° 16' 16"	0.21353
4	38° 13' 15"	-1° 13' 58"	36° 15' 27"	13° 04' 44"	0° 55' 11"	15' 02.21"	70° 24' 24"	0.21016
5	38° 43' 52"	-1° 11' 16"	36° 44' 21"	13° 17' 05"	0° 55' 10"	15' 01.86"	70° 32' 41"	0.20682
6	39° 14' 27"	-1° 08' 34"	37° 13' 16"	13° 29' 22"	0° 55' 08"	15' 01.51"	70° 41' 06"	0.20349
7	39° 45' 01"	-1° 05' 51"	37° 42' 13"	13° 41' 35"	0° 55' 07"	15' 01.17"	70° 49' 40"	0.20020
8	40° 15' 33"	-1° 03' 09"	38° 11' 12"	13° 53' 44"	0° 55' 06"	15' 00.83"	70° 58' 22"	0.19692
9	40° 46' 04"	-1° 00' 26"	38° 40' 12"	14° 05' 49"	0° 55' 05"	15' 00.49"	71° 7' 14"	0.19367
10	41° 16' 34"	0°-57' 43"	39° 09' 15"	14° 17' 51"	0° 55' 03"	15' 00.15"	71° 16' 13"	0.19044
11	41° 47' 03"	0°-54' 60"	39° 38' 19"	14° 29' 48"	0° 55' 02"	14' 59.82"	71° 25' 22"	0.18723
12	42° 17' 30"	0°-52' 16"	40° 07' 26"	14° 41' 41"	0° 55' 01"	14' 59.49"	71° 34' 40"	0.18405
13	42° 47' 57"	0°-49' 33"	40° 36' 34"	14° 53' 31"	0° 54' 60"	14' 59.17"	71° 44' 06"	0.18088
14	43° 18' 22"	0°-46' 49"	41° 05' 45"	15° 05' 16"	0° 54' 59"	14' 58.85"	71° 53' 42"	0.17775
15	43° 48' 45"	0°-44' 06"	41° 34' 58"	15° 16' 56"	0° 54' 57"	14' 58.53"	72° 3' 26"	0.17464
16	44° 19' 08"	0°-41' 22"	42° 04' 13"	15° 28' 33"	0° 54' 56"	14' 58.21"	72° 13' 20"	0.17155
17	44° 49' 29"	0°-38' 38"	42° 33' 30"	15° 40' 03"	0° 54' 55"	14' 57.90"	72° 23' 23"	0.16848
18	45° 19' 50"	0°-35' 54"	43° 02' 49"	15° 51' 33"	0° 54' 54"	14' 57.59"	72° 33' 35"	0.16544
19	45° 50' 09"	0°-33' 10"	43° 32' 11"	16° 02' 57"	0° 54' 53"	14' 57.29"	72° 43' 56"	0.16242
20	46° 20' 27"	0°-30' 26"	44° 01' 34"	16° 14' 16"	0° 54' 52"	14' 56.99"	72° 54' 26"	0.15943
21	46° 50' 44"	0°-27' 42"	44° 31' 01"	16° 25' 31"	0° 54' 51"	14' 56.69"	73° 5' 06"	0.15647
22	47° 21' 00"	0°-24' 58"	45° 00' 29"	16° 36' 41"	0° 54' 50"	14' 56.39"	73° 15' 55"	0.15352
23	47° 51' 15"	0°-22' 14"	45° 30' 00"	16° 47' 47"	0° 54' 48"	14' 56.10"	73° 26' 54"	0.15060
24	48° 21' 29"	0°-19' 30"	45° 59' 34"	16° 58' 48"	0° 54' 47"	14' 55.81"	73° 38' 02"	0.14771



25 Juni 2022

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	93° 27' 29"	0.15"	93° 45' 29"	23° 23' 34"	1.0164637	15' 44.09"	23° 26' 16"	-2 m 34 s
1	93° 29' 52"	0.15"	93° 48' 05"	23° 23' 31"	1.0164660	15' 44.08"	23° 26' 16"	-2 m 34 s
2	93° 32' 15"	0.16"	93° 50' 41"	23° 23' 27"	1.0164682	15' 44.08"	23° 26' 16"	-2 m 35 s
3	93° 34' 38"	0.17"	93° 53' 17"	23° 23' 23"	1.0164705	15' 44.08"	23° 26' 16"	-2 m 35 s
4	93° 37' 01"	0.17"	93° 55' 52"	23° 23' 19"	1.0164727	15' 44.08"	23° 26' 16"	-2 m 36 s
5	93° 39' 25"	0.18"	93° 58' 28"	23° 23' 15"	1.0164750	15' 44.08"	23° 26' 16"	-2 m 36 s
6	93° 41' 48"	0.18"	94° 01' 04"	23° 23' 11"	1.0164772	15' 44.07"	23° 26' 16"	-2 m 37 s
7	93° 44' 11"	0.19"	94° 03' 40"	23° 23' 07"	1.0164794	15' 44.07"	23° 26' 16"	-2 m 37 s
8	93° 46' 34"	0.19"	94° 06' 16"	23° 23' 03"	1.0164816	15' 44.07"	23° 26' 16"	-2 m 38 s
9	93° 48' 57"	0.20"	94° 08' 52"	23° 22' 59"	1.0164838	15' 44.07"	23° 26' 16"	-2 m 39 s
10	93° 51' 20"	0.21"	94° 11' 28"	23° 22' 55"	1.0164860	15' 44.07"	23° 26' 16"	-2 m 39 s
11	93° 53' 43"	0.21"	94° 14' 04"	23° 22' 51"	1.0164881	15' 44.06"	23° 26' 16"	-2 m 40 s
12	93° 56' 06"	0.22"	94° 16' 39"	23° 22' 47"	1.0164903	15' 44.06"	23° 26' 16"	-2 m 40 s
13	93° 58' 29"	0.22"	94° 19' 15"	23° 22' 42"	1.0164924	15' 44.06"	23° 26' 16"	-2 m 41 s
14	94° 00' 53"	0.23"	94° 21' 51"	23° 22' 38"	1.0164946	15' 44.06"	23° 26' 16"	-2 m 41 s
15	94° 03' 16"	0.23"	94° 24' 27"	23° 22' 34"	1.0164967	15' 44.06"	23° 26' 16"	-2 m 42 s
16	94° 05' 39"	0.24"	94° 27' 03"	23° 22' 29"	1.0164988	15' 44.05"	23° 26' 16"	-2 m 42 s
17	94° 08' 02"	0.24"	94° 29' 39"	23° 22' 25"	1.0165009	15' 44.05"	23° 26' 16"	-2 m 43 s
18	94° 10' 25"	0.25"	94° 32' 14"	23° 22' 20"	1.0165030	15' 44.05"	23° 26' 16"	-2 m 43 s
19	94° 12' 48"	0.26"	94° 34' 50"	23° 22' 16"	1.0165051	15' 44.05"	23° 26' 16"	-2 m 44 s
20	94° 15' 11"	0.26"	94° 37' 26"	23° 22' 11"	1.0165072	15' 44.05"	23° 26' 16"	-2 m 44 s
21	94° 17' 34"	0.27"	94° 40' 02"	23° 22' 07"	1.0165093	15' 44.04"	23° 26' 16"	-2 m 45 s
22	94° 19' 57"	0.27"	94° 42' 38"	23° 22' 02"	1.0165113	15' 44.04"	23° 26' 16"	-2 m 45 s
23	94° 22' 21"	0.28"	94° 45' 14"	23° 21' 57"	1.0165134	15' 44.04"	23° 26' 16"	-2 m 46 s
24	94° 24' 44"	0.28"	94° 47' 49"	23° 21' 53"	1.0165154	15' 44.04"	23° 26' 16"	-2 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	48° 21' 29"	0°-19' 30"	45° 59' 34"	16° 58' 48"	0° 54' 47"	14' 55.81"	73° 38' 02"	0.14771
1	48° 51' 42"	0°-16' 46"	46° 29' 10"	17° 09' 44"	0° 54' 46"	14' 55.53"	73° 49' 20"	0.14484
2	49° 21' 53"	0°-14' 02"	46° 58' 48"	17° 20' 36"	0° 54' 45"	14' 55.25"	74° 0' 48"	0.14200
3	49° 52' 04"	0°-11' 18"	47° 28' 29"	17° 31' 23"	0° 54' 44"	14' 54.97"	74° 12' 26"	0.13919
4	50° 22' 14"	0° -8' 34"	47° 58' 13"	17° 42' 05"	0° 54' 43"	14' 54.69"	74° 24' 14"	0.13639
5	50° 52' 23"	0° -5' 50"	48° 27' 59"	17° 52' 43"	0° 54' 42"	14' 54.42"	74° 36' 11"	0.13363
6	51° 22' 31"	0° -3' 06"	48° 57' 48"	18° 03' 15"	0° 54' 41"	14' 54.15"	74° 48' 19"	0.13089
7	51° 52' 38"	0° 00'-22"	49° 27' 39"	18° 13' 43"	0° 54' 40"	14' 53.88"	75° 0' 37"	0.12817
8	52° 22' 44"	0° 02' 21"	49° 57' 33"	18° 24' 06"	0° 54' 39"	14' 53.62"	75° 13' 06"	0.12548
9	52° 52' 49"	0° 05' 05"	50° 27' 30"	18° 34' 23"	0° 54' 38"	14' 53.36"	75° 25' 45"	0.12282
10	53° 22' 53"	0° 07' 48"	50° 57' 30"	18° 44' 36"	0° 54' 37"	14' 53.10"	75° 38' 35"	0.12019
11	53° 52' 57"	0° 10' 31"	51° 27' 32"	18° 54' 43"	0° 54' 37"	14' 52.85"	75° 51' 35"	0.11758
12	54° 22' 59"	0° 13' 15"	51° 57' 37"	19° 04' 46"	0° 54' 36"	14' 52.60"	76° 4' 46"	0.11499
13	54° 53' 01"	0° 15' 55"	52° 27' 45"	19° 14' 41"	0° 54' 35"	14' 52.35"	76° 18' 06"	0.11244
14	55° 23' 02"	0° 18' 38"	52° 57' 56"	19° 24' 33"	0° 54' 34"	14' 52.11"	76° 31' 39"	0.10991
15	55° 53' 02"	0° 21' 21"	53° 28' 09"	19° 34' 19"	0° 54' 33"	14' 51.87"	76° 45' 24"	0.10740
16	56° 23' 01"	0° 24' 03"	53° 58' 26"	19° 44' 01"	0° 54' 32"	14' 51.63"	76° 59' 20"	0.10493
17	56° 52' 60"	0° 26' 45"	54° 28' 45"	19° 53' 37"	0° 54' 31"	14' 51.39"	77° 13' 29"	0.10248
18	57° 22' 58"	0° 29' 27"	54° 59' 07"	20° 03' 07"	0° 54' 30"	14' 51.16"	77° 27' 48"	0.10005
19	57° 52' 55"	0° 32' 09"	55° 29' 32"	20° 12' 32"	0° 54' 29"	14' 50.93"	77° 42' 20"	0.09766
20	58° 22' 51"	0° 34' 51"	55° 59' 59"	20° 21' 52"	0° 54' 29"	14' 50.71"	77° 57' 05"	0.09529
21	58° 52' 46"	0° 37' 32"	56° 30' 30"	20° 31' 06"	0° 54' 28"	14' 50.49"	78° 12' 01"	0.09295
22	59° 22' 41"	0° 40' 13"	57° 01' 03"	20° 40' 15"	0° 54' 27"	14' 50.27"	78° 27' 11"	0.09064
23	59° 52' 35"	0° 42' 54"	57° 31' 40"	20° 49' 18"	0° 54' 26"	14' 50.05"	78° 42' 33"	0.08835
24	60° 22' 28"	0° 45' 35"	58° 02' 19"	20° 58' 15"	0° 54' 25"	14' 49.84"	78° 58' 09"	0.08609

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	94° 24' 44"	0.28"	94° 47' 49"	23° 21' 53"	1.0165154	15' 44.04"	23° 26' 16"	-2 m 46 s
1	94° 27' 07"	0.29"	94° 50' 25"	23° 21' 48"	1.0165174	15' 44.04"	23° 26' 16"	-2 m 47 s
2	94° 29' 30"	0.30"	94° 53' 01"	23° 21' 43"	1.0165194	15' 44.04"	23° 26' 16"	-2 m 48 s
3	94° 31' 53"	0.30"	94° 55' 37"	23° 21' 38"	1.0165215	15' 44.03"	23° 26' 16"	-2 m 48 s
4	94° 34' 16"	0.31"	94° 58' 13"	23° 21' 33"	1.0165234	15' 44.03"	23° 26' 16"	-2 m 49 s
5	94° 36' 39"	0.31"	95° 00' 48"	23° 21' 28"	1.0165254	15' 44.03"	23° 26' 16"	-2 m 49 s
6	94° 39' 02"	0.32"	95° 03' 24"	23° 21' 23"	1.0165274	15' 44.03"	23° 26' 16"	-2 m 50 s
7	94° 41' 25"	0.32"	95° 05' 60"	23° 21' 18"	1.0165294	15' 44.03"	23° 26' 16"	-2 m 50 s
8	94° 43' 49"	0.33"	95° 08' 36"	23° 21' 13"	1.0165313	15' 44.02"	23° 26' 16"	-2 m 51 s
9	94° 46' 12"	0.34"	95° 11' 12"	23° 21' 08"	1.0165333	15' 44.02"	23° 26' 16"	-2 m 51 s
10	94° 48' 35"	0.34"	95° 13' 47"	23° 21' 03"	1.0165352	15' 44.02"	23° 26' 16"	-2 m 52 s
11	94° 50' 58"	0.35"	95° 16' 23"	23° 20' 58"	1.0165371	15' 44.02"	23° 26' 16"	-2 m 52 s
12	94° 53' 21"	0.35"	95° 18' 59"	23° 20' 53"	1.0165391	15' 44.02"	23° 26' 16"	-2 m 53 s
13	94° 55' 44"	0.36"	95° 21' 35"	23° 20' 47"	1.0165410	15' 44.02"	23° 26' 16"	-2 m 53 s
14	94° 58' 07"	0.36"	95° 24' 10"	23° 20' 42"	1.0165429	15' 44.01"	23° 26' 16"	-2 m 54 s
15	95° 00' 30"	0.37"	95° 26' 46"	23° 20' 37"	1.0165448	15' 44.01"	23° 26' 16"	-2 m 54 s
16	95° 02' 53"	0.37"	95° 29' 22"	23° 20' 31"	1.0165466	15' 44.01"	23° 26' 16"	-2 m 55 s
17	95° 05' 17"	0.38"	95° 31' 58"	23° 20' 26"	1.0165485	15' 44.01"	23° 26' 16"	-2 m 55 s
18	95° 07' 40"	0.39"	95° 34' 33"	23° 20' 20"	1.0165504	15' 44.01"	23° 26' 16"	-2 m 56 s
19	95° 10' 03"	0.39"	95° 37' 09"	23° 20' 15"	1.0165522	15' 44.00"	23° 26' 16"	-2 m 56 s
20	95° 12' 26"	0.40"	95° 39' 45"	23° 20' 09"	1.0165540	15' 44.00"	23° 26' 16"	-2 m 57 s
21	95° 14' 49"	0.40"	95° 42' 21"	23° 20' 03"	1.0165559	15' 44.00"	23° 26' 16"	-2 m 58 s
22	95° 17' 12"	0.41"	95° 44' 56"	23° 19' 58"	1.0165577	15' 44.00"	23° 26' 16"	-2 m 58 s
23	95° 19' 35"	0.41"	95° 47' 32"	23° 19' 52"	1.0165595	15' 44.00"	23° 26' 16"	-2 m 59 s
24	95° 21' 58"	0.42"	95° 50' 08"	23° 19' 46"	1.0165613	15' 44.00"	23° 26' 16"	-2 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	60° 22' 28"	0° 45' 35"	58° 02' 19"	20° 58' 15"	0° 54' 25"	14' 49.84"	78° 58' 09"	0.08609
1	60° 52' 21"	0° 48' 15"	58° 33' 01"	21° 07' 06"	0° 54' 25"	14' 49.63"	79° 13' 58"	0.08386
2	61° 22' 13"	0° 50' 55"	59° 03' 47"	21° 15' 52"	0° 54' 24"	14' 49.42"	79° 30' 01"	0.08166
3	61° 52' 04"	0° 53' 35"	59° 34' 35"	21° 24' 32"	0° 54' 23"	14' 49.21"	79° 46' 18"	0.07949
4	62° 21' 55"	0° 56' 14"	60° 05' 26"	21° 33' 06"	0° 54' 22"	14' 49.01"	80° 2' 49"	0.07734
5	62° 51' 45"	0° 58' 53"	60° 36' 20"	21° 41' 34"	0° 54' 22"	14' 48.81"	80° 19' 35"	0.07522
6	63° 21' 35"	1° 01' 32"	61° 07' 17"	21° 49' 56"	0° 54' 21"	14' 48.62"	80° 36' 37"	0.07313
7	63° 51' 24"	1° 04' 10"	61° 38' 17"	21° 58' 13"	0° 54' 20"	14' 48.43"	80° 53' 53"	0.07107
8	64° 21' 12"	1° 06' 48"	62° 09' 20"	22° 06' 23"	0° 54' 20"	14' 48.24"	81° 11' 26"	0.06904
9	64° 50' 60"	1° 09' 26"	62° 40' 25"	22° 14' 27"	0° 54' 19"	14' 48.05"	81° 29' 15"	0.06703
10	65° 20' 47"	1° 12' 03"	63° 11' 34"	22° 22' 25"	0° 54' 18"	14' 47.87"	81° 47' 21"	0.06506
11	65° 50' 34"	1° 14' 40"	63° 42' 46"	22° 30' 17"	0° 54' 18"	14' 47.69"	82° 5' 44"	0.06311
12	66° 20' 20"	1° 17' 16"	64° 14' 00"	22° 38' 03"	0° 54' 17"	14' 47.51"	82° 24' 25"	0.06119
13	66° 50' 06"	1° 19' 52"	64° 45' 18"	22° 45' 43"	0° 54' 16"	14' 47.33"	82° 43' 24"	0.05930
14	67° 19' 51"	1° 22' 28"	65° 16' 38"	22° 53' 16"	0° 54' 16"	14' 47.16"	83° 2' 42"	0.05744
15	67° 49' 35"	1° 25' 03"	65° 48' 01"	23° 00' 43"	0° 54' 15"	14' 46.99"	83° 22' 20"	0.05561
16	68° 19' 19"	1° 27' 38"	66° 19' 27"	23° 08' 03"	0° 54' 14"	14' 46.82"	83° 42' 18"	0.05381
17	68° 49' 03"	1° 30' 12"	66° 50' 56"	23° 15' 18"	0° 54' 14"	14' 46.66"	84° 2' 37"	0.05204
18	69° 18' 46"	1° 32' 46"	67° 22' 28"	23° 22' 25"	0° 54' 13"	14' 46.50"	84° 23' 18"	0.05029
19	69° 48' 29"	1° 35' 19"	67° 54' 03"	23° 29' 27"	0° 54' 13"	14' 46.34"	84° 44' 22"	0.04858
20	70° 18' 11"	1° 37' 52"	68° 25' 40"	23° 36' 22"	0° 54' 12"	14' 46.19"	85° 5' 49"	0.04689
21	70° 47' 53"	1° 40' 24"	68° 57' 20"	23° 43' 10"	0° 54' 12"	14' 46.04"	85° 27' 41"	0.04524
22	71° 17' 35"	1° 42' 56"	69° 29' 03"	23° 49' 51"	0° 54' 11"	14' 45.89"	85° 49' 58"	0.04361
23	71° 47' 16"	1° 45' 27"	70° 00' 49"	23° 56' 27"	0° 54' 10"	14' 45.74"	86° 12' 42"	0.04201
24	72° 16' 56"	1° 47' 58"	70° 32' 37"	24° 02' 55"	0° 54' 10"	14' 45.60"	86° 35' 54"	0.04045



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	95° 21' 58"	0.42"	95° 50' 08"	23° 19' 46"	1.0165613	15' 44.00"	23° 26' 16"	-2 m 59 s
1	95° 24' 21"	0.42"	95° 52' 44"	23° 19' 40"	1.0165631	15' 43.99"	23° 26' 16"	-2 m 60 s
2	95° 26' 45"	0.43"	95° 55' 19"	23° 19' 35"	1.0165648	15' 43.99"	23° 26' 16"	-3 m 00 s
3	95° 29' 08"	0.43"	95° 57' 55"	23° 19' 29"	1.0165666	15' 43.99"	23° 26' 16"	-3 m 01 s
4	95° 31' 31"	0.44"	96° 00' 31"	23° 19' 23"	1.0165683	15' 43.99"	23° 26' 16"	-3 m 01 s
5	95° 33' 54"	0.44"	96° 03' 06"	23° 19' 17"	1.0165701	15' 43.99"	23° 26' 16"	-3 m 02 s
6	95° 36' 17"	0.45"	96° 05' 42"	23° 19' 11"	1.0165718	15' 43.99"	23° 26' 16"	-3 m 02 s
7	95° 38' 40"	0.45"	96° 08' 18"	23° 19' 05"	1.0165735	15' 43.98"	23° 26' 16"	-3 m 03 s
8	95° 41' 03"	0.46"	96° 10' 54"	23° 18' 59"	1.0165753	15' 43.98"	23° 26' 16"	-3 m 03 s
9	95° 43' 26"	0.47"	96° 13' 29"	23° 18' 52"	1.0165770	15' 43.98"	23° 26' 16"	-3 m 04 s
10	95° 45' 49"	0.47"	96° 16' 05"	23° 18' 46"	1.0165786	15' 43.98"	23° 26' 16"	-3 m 04 s
11	95° 48' 12"	0.48"	96° 18' 41"	23° 18' 40"	1.0165803	15' 43.98"	23° 26' 16"	-3 m 05 s
12	95° 50' 36"	0.48"	96° 21' 16"	23° 18' 34"	1.0165820	15' 43.98"	23° 26' 16"	-3 m 05 s
13	95° 52' 59"	0.49"	96° 23' 52"	23° 18' 27"	1.0165837	15' 43.98"	23° 26' 16"	-3 m 06 s
14	95° 55' 22"	0.49"	96° 26' 28"	23° 18' 21"	1.0165853	15' 43.97"	23° 26' 16"	-3 m 06 s
15	95° 57' 45"	0.50"	96° 29' 03"	23° 18' 15"	1.0165869	15' 43.97"	23° 26' 16"	-3 m 07 s
16	96° 00' 08"	0.50"	96° 31' 39"	23° 18' 08"	1.0165886	15' 43.97"	23° 26' 16"	-3 m 07 s
17	96° 02' 31"	0.51"	96° 34' 15"	23° 18' 02"	1.0165902	15' 43.97"	23° 26' 16"	-3 m 08 s
18	96° 04' 54"	0.51"	96° 36' 50"	23° 17' 55"	1.0165918	15' 43.97"	23° 26' 16"	-3 m 08 s
19	96° 07' 17"	0.52"	96° 39' 26"	23° 17' 49"	1.0165934	15' 43.97"	23° 26' 16"	-3 m 09 s
20	96° 09' 40"	0.52"	96° 42' 01"	23° 17' 42"	1.0165950	15' 43.96"	23° 26' 16"	-3 m 09 s
21	96° 12' 03"	0.53"	96° 44' 37"	23° 17' 35"	1.0165966	15' 43.96"	23° 26' 16"	-3 m 10 s
22	96° 14' 27"	0.53"	96° 47' 13"	23° 17' 29"	1.0165981	15' 43.96"	23° 26' 16"	-3 m 10 s
23	96° 16' 50"	0.54"	96° 49' 48"	23° 17' 22"	1.0165997	15' 43.96"	23° 26' 16"	-3 m 11 s
24	96° 19' 13"	0.54"	96° 52' 24"	23° 17' 15"	1.0166012	15' 43.96"	23° 26' 16"	-3 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	72° 16' 56"	1° 47' 58"	70° 32' 37"	24° 02' 55"	0° 54' 10"	14' 45.60"	86° 35' 54"	0.04045
1	72° 46' 37"	1° 50' 28"	71° 04' 28"	24° 09' 17"	0° 54' 09"	14' 45.45"	86° 59' 35"	0.03891
2	73° 16' 17"	1° 52' 58"	71° 36' 22"	24° 15' 32"	0° 54' 09"	14' 45.32"	87° 23' 47"	0.03740
3	73° 45' 56"	1° 55' 27"	72° 08' 18"	24° 21' 40"	0° 54' 08"	14' 45.18"	87° 48' 31"	0.03592
4	74° 15' 35"	1° 57' 56"	72° 40' 17"	24° 27' 41"	0° 54' 08"	14' 45.05"	88° 13' 50"	0.03448
5	74° 45' 14"	2° 00' 24"	73° 12' 19"	24° 33' 36"	0° 54' 07"	14' 44.92"	88° 39' 43"	0.03306
6	75° 14' 53"	2° 02' 51"	73° 44' 23"	24° 39' 23"	0° 54' 07"	14' 44.79"	89° 6' 15"	0.03167
7	75° 44' 31"	2° 05' 18"	74° 16' 29"	24° 45' 04"	0° 54' 06"	14' 44.67"	89° 33' 26"	0.03031
8	76° 14' 09"	2° 07' 44"	74° 48' 38"	24° 50' 38"	0° 54' 06"	14' 44.55"	90° 1' 20"	0.02898
9	76° 43' 47"	2° 10' 10"	75° 20' 50"	24° 56' 05"	0° 54' 06"	14' 44.43"	90° 29' 59"	0.02769
10	77° 13' 24"	2° 12' 34"	75° 53' 04"	25° 01' 25"	0° 54' 05"	14' 44.31"	90° 59' 25"	0.02642
11	77° 43' 01"	2° 14' 59"	76° 25' 20"	25° 06' 38"	0° 54' 05"	14' 44.20"	91° 29' 42"	0.02518
12	78° 12' 38"	2° 17' 22"	76° 57' 39"	25° 11' 43"	0° 54' 04"	14' 44.09"	92° 0' 53"	0.02398
13	78° 42' 14"	2° 19' 45"	77° 29' 60"	25° 16' 42"	0° 54' 04"	14' 43.98"	92° 33' 02"	0.02280
14	79° 11' 51"	2° 22' 08"	78° 02' 23"	25° 21' 33"	0° 54' 04"	14' 43.87"	93° 6' 13"	0.02166
15	79° 41' 27"	2° 24' 29"	78° 34' 48"	25° 26' 18"	0° 54' 03"	14' 43.77"	93° 40' 30"	0.02054
16	80° 11' 03"	2° 26' 50"	79° 07' 16"	25° 30' 55"	0° 54' 03"	14' 43.67"	94° 15' 60"	0.01946
17	80° 40' 38"	2° 29' 11"	79° 39' 45"	25° 35' 25"	0° 54' 02"	14' 43.57"	94° 52' 46"	0.01840
18	81° 10' 14"	2° 31' 30"	80° 12' 17"	25° 39' 47"	0° 54' 02"	14' 43.48"	95° 30' 57"	0.01738
19	81° 39' 49"	2° 33' 49"	80° 44' 51"	25° 44' 03"	0° 54' 02"	14' 43.38"	96° 10' 38"	0.01639
20	82° 09' 24"	2° 36' 07"	81° 17' 26"	25° 48' 11"	0° 54' 01"	14' 43.29"	96° 51' 57"	0.01543
21	82° 38' 59"	2° 38' 24"	81° 50' 04"	25° 52' 12"	0° 54' 01"	14' 43.21"	97° 35' 03"	0.01450
22	83° 08' 34"	2° 40' 41"	82° 22' 44"	25° 56' 05"	0° 54' 01"	14' 43.12"	98° 20' 07"	0.01360
23	83° 38' 08"	2° 42' 57"	82° 55' 25"	25° 59' 51"	0° 54' 01"	14' 43.04"	99° 7' 19"	0.01273
24	84° 07' 43"	2° 45' 12"	83° 28' 08"	26° 03' 29"	0° 54' 00"	14' 42.96"	99° 56' 52"	0.01189

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	96° 19' 13"	0.54"	96° 52' 24"	23° 17' 15"	1.0166012	15' 43.96"	23° 26' 16"	-3 m 11 s
1	96° 21' 36"	0.55"	96° 54' 60"	23° 17' 08"	1.0166028	15' 43.96"	23° 26' 16"	-3 m 12 s
2	96° 23' 59"	0.55"	96° 57' 35"	23° 17' 01"	1.0166043	15' 43.96"	23° 26' 16"	-3 m 13 s
3	96° 26' 22"	0.55"	97° 00' 11"	23° 16' 55"	1.0166058	15' 43.95"	23° 26' 16"	-3 m 13 s
4	96° 28' 45"	0.56"	97° 02' 46"	23° 16' 48"	1.0166073	15' 43.95"	23° 26' 16"	-3 m 14 s
5	96° 31' 08"	0.56"	97° 05' 22"	23° 16' 41"	1.0166088	15' 43.95"	23° 26' 16"	-3 m 14 s
6	96° 33' 31"	0.57"	97° 07' 58"	23° 16' 34"	1.0166103	15' 43.95"	23° 26' 16"	-3 m 15 s
7	96° 35' 54"	0.57"	97° 10' 33"	23° 16' 26"	1.0166118	15' 43.95"	23° 26' 16"	-3 m 15 s
8	96° 38' 18"	0.58"	97° 13' 09"	23° 16' 19"	1.0166132	15' 43.95"	23° 26' 16"	-3 m 16 s
9	96° 40' 41"	0.58"	97° 15' 44"	23° 16' 12"	1.0166147	15' 43.95"	23° 26' 16"	-3 m 16 s
10	96° 43' 04"	0.59"	97° 18' 20"	23° 16' 05"	1.0166161	15' 43.95"	23° 26' 16"	-3 m 17 s
11	96° 45' 27"	0.59"	97° 20' 56"	23° 15' 58"	1.0166176	15' 43.94"	23° 26' 16"	-3 m 17 s
12	96° 47' 50"	0.60"	97° 23' 31"	23° 15' 50"	1.0166190	15' 43.94"	23° 26' 16"	-3 m 18 s
13	96° 50' 13"	0.60"	97° 26' 07"	23° 15' 43"	1.0166204	15' 43.94"	23° 26' 16"	-3 m 18 s
14	96° 52' 36"	0.60"	97° 28' 42"	23° 15' 36"	1.0166218	15' 43.94"	23° 26' 16"	-3 m 19 s
15	96° 54' 59"	0.61"	97° 31' 18"	23° 15' 28"	1.0166232	15' 43.94"	23° 26' 16"	-3 m 19 s
16	96° 57' 22"	0.61"	97° 33' 53"	23° 15' 21"	1.0166246	15' 43.94"	23° 26' 16"	-3 m 20 s
17	96° 59' 45"	0.62"	97° 36' 29"	23° 15' 13"	1.0166259	15' 43.94"	23° 26' 16"	-3 m 20 s
18	97° 02' 08"	0.62"	97° 39' 04"	23° 15' 06"	1.0166273	15' 43.93"	23° 26' 16"	-3 m 21 s
19	97° 04' 32"	0.63"	97° 41' 40"	23° 14' 58"	1.0166286	15' 43.93"	23° 26' 16"	-3 m 21 s
20	97° 06' 55"	0.63"	97° 44' 15"	23° 14' 50"	1.0166300	15' 43.93"	23° 26' 16"	-3 m 22 s
21	97° 09' 18"	0.63"	97° 46' 51"	23° 14' 43"	1.0166313	15' 43.93"	23° 26' 16"	-3 m 22 s
22	97° 11' 41"	0.64"	97° 49' 26"	23° 14' 35"	1.0166326	15' 43.93"	23° 26' 16"	-3 m 23 s
23	97° 14' 04"	0.64"	97° 52' 02"	23° 14' 27"	1.0166339	15' 43.93"	23° 26' 16"	-3 m 23 s
24	97° 16' 27"	0.65"	97° 54' 37"	23° 14' 20"	1.0166352	15' 43.93"	23° 26' 16"	-3 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	84° 07' 43"	2° 45' 12"	83° 28' 08"	26° 03' 29"	0° 54' 00"	14' 42.96"	99° 56' 52"	0.01189
1	84° 37' 17"	2° 47' 26"	84° 00' 53"	26° 07' 01"	0° 53' 60"	14' 42.89"	100° 49' 00"	0.01108
2	85° 06' 51"	2° 49' 40"	84° 33' 40"	26° 10' 24"	0° 53' 60"	14' 42.81"	101° 44' 00"	0.01031
3	85° 36' 25"	2° 51' 53"	85° 06' 28"	26° 13' 41"	0° 53' 59"	14' 42.74"	102° 42' 10"	0.00956
4	86° 05' 59"	2° 54' 05"	85° 39' 17"	26° 16' 49"	0° 53' 59"	14' 42.67"	103° 43' 53"	0.00885
5	86° 35' 33"	2° 56' 16"	86° 12' 09"	26° 19' 51"	0° 53' 59"	14' 42.61"	104° 49' 31"	0.00816
6	87° 05' 06"	2° 58' 26"	86° 45' 01"	26° 22' 44"	0° 53' 59"	14' 42.54"	105° 59' 35"	0.00751
7	87° 34' 40"	3° 00' 36"	87° 17' 55"	26° 25' 30"	0° 53' 58"	14' 42.48"	107° 14' 37"	0.00689
8	88° 04' 14"	3° 02' 45"	87° 50' 51"	26° 28' 09"	0° 53' 58"	14' 42.42"	108° 35' 15"	0.00630
9	88° 33' 47"	3° 04' 53"	88° 23' 47"	26° 30' 40"	0° 53' 58"	14' 42.37"	110° 2' 15"	0.00574
10	89° 03' 21"	3° 06' 60"	88° 56' 45"	26° 33' 03"	0° 53' 58"	14' 42.32"	111° 36' 29"	0.00522
11	89° 32' 54"	3° 09' 06"	89° 29' 44"	26° 35' 19"	0° 53' 58"	14' 42.27"	113° 18' 59"	0.00472
12	90° 02' 27"	3° 11' 11"	90° 02' 44"	26° 37' 27"	0° 53' 57"	14' 42.22"	115° 10' 57"	0.00425
13	90° 32' 01"	3° 13' 15"	90° 35' 46"	26° 39' 28"	0° 53' 57"	14' 42.17"	117° 13' 49"	0.00382
14	91° 01' 34"	3° 15' 19"	91° 08' 48"	26° 41' 20"	0° 53' 57"	14' 42.13"	119° 29' 14"	0.00342
15	91° 31' 07"	3° 17' 22"	91° 41' 51"	26° 43' 06"	0° 53' 57"	14' 42.09"	121° 59' 10"	0.00305
16	92° 00' 40"	3° 19' 23"	92° 14' 55"	26° 44' 43"	0° 53' 57"	14' 42.05"	124° 45' 53"	0.00271
17	92° 30' 14"	3° 21' 24"	92° 47' 59"	26° 46' 13"	0° 53' 57"	14' 42.02"	127° 51' 58"	0.00240
18	92° 59' 47"	3° 23' 24"	93° 21' 04"	26° 47' 35"	0° 53' 57"	14' 41.98"	131° 20' 20"	0.00212
19	93° 29' 20"	3° 25' 23"	93° 54' 10"	26° 48' 49"	0° 53' 57"	14' 41.95"	135° 14' 08"	0.00188
20	93° 58' 53"	3° 27' 21"	94° 27' 17"	26° 49' 56"	0° 53' 56"	14' 41.93"	139° 36' 31"	0.00166
21	94° 28' 27"	3° 29' 18"	95° 00' 24"	26° 50' 55"	0° 53' 56"	14' 41.90"	144° 30' 22"	0.00148
22	94° 58' 00"	3° 31' 14"	95° 33' 32"	26° 51' 46"	0° 53' 56"	14' 41.88"	149° 57' 38"	0.00133
23	95° 27' 34"	3° 33' 10"	96° 06' 39"	26° 52' 29"	0° 53' 56"	14' 41.86"	155° 58' 35"	0.00120
24	95° 57' 07"	3° 35' 04"	96° 39' 48"	26° 53' 05"	0° 53' 56"	14' 41.84"	162° 30' 49"	0.00112

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	97° 16' 27"	0.65"	97° 54' 37"	23° 14' 20"	1.0166352	15' 43.93"	23° 26' 16"	-3 m 24 s
1	97° 18' 50"	0.65"	97° 57' 13"	23° 14' 12"	1.0166365	15' 43.93"	23° 26' 16"	-3 m 24 s
2	97° 21' 13"	0.65"	97° 59' 48"	23° 14' 04"	1.0166378	15' 43.93"	23° 26' 16"	-3 m 25 s
3	97° 23' 36"	0.66"	98° 02' 24"	23° 13' 56"	1.0166391	15' 43.92"	23° 26' 16"	-3 m 25 s
4	97° 25' 59"	0.66"	98° 04' 59"	23° 13' 48"	1.0166403	15' 43.92"	23° 26' 16"	-3 m 26 s
5	97° 28' 22"	0.67"	98° 07' 35"	23° 13' 40"	1.0166416	15' 43.92"	23° 26' 16"	-3 m 26 s
6	97° 30' 46"	0.67"	98° 10' 10"	23° 13' 32"	1.0166428	15' 43.92"	23° 26' 16"	-3 m 27 s
7	97° 33' 09"	0.67"	98° 12' 46"	23° 13' 24"	1.0166440	15' 43.92"	23° 26' 16"	-3 m 27 s
8	97° 35' 32"	0.68"	98° 15' 21"	23° 13' 16"	1.0166452	15' 43.92"	23° 26' 16"	-3 m 28 s
9	97° 37' 55"	0.68"	98° 17' 57"	23° 13' 07"	1.0166464	15' 43.92"	23° 26' 16"	-3 m 28 s
10	97° 40' 18"	0.68"	98° 20' 32"	23° 12' 59"	1.0166476	15' 43.92"	23° 26' 16"	-3 m 29 s
11	97° 42' 41"	0.69"	98° 23' 08"	23° 12' 51"	1.0166488	15' 43.91"	23° 26' 16"	-3 m 29 s
12	97° 45' 04"	0.69"	98° 25' 43"	23° 12' 43"	1.0166500	15' 43.91"	23° 26' 16"	-3 m 30 s
13	97° 47' 27"	0.70"	98° 28' 18"	23° 12' 34"	1.0166512	15' 43.91"	23° 26' 16"	-3 m 30 s
14	97° 49' 50"	0.70"	98° 30' 54"	23° 12' 26"	1.0166523	15' 43.91"	23° 26' 16"	-3 m 31 s
15	97° 52' 13"	0.70"	98° 33' 29"	23° 12' 17"	1.0166534	15' 43.91"	23° 26' 16"	-3 m 31 s
16	97° 54' 36"	0.71"	98° 36' 05"	23° 12' 09"	1.0166546	15' 43.91"	23° 26' 16"	-3 m 32 s
17	97° 56' 59"	0.71"	98° 38' 40"	23° 12' 00"	1.0166557	15' 43.91"	23° 26' 16"	-3 m 32 s
18	97° 59' 23"	0.71"	98° 41' 15"	23° 11' 52"	1.0166568	15' 43.91"	23° 26' 16"	-3 m 33 s
19	98° 01' 46"	0.72"	98° 43' 51"	23° 11' 43"	1.0166579	15' 43.91"	23° 26' 16"	-3 m 33 s
20	98° 04' 09"	0.72"	98° 46' 26"	23° 11' 34"	1.0166590	15' 43.91"	23° 26' 16"	-3 m 34 s
21	98° 06' 32"	0.72"	98° 49' 02"	23° 11' 26"	1.0166601	15' 43.90"	23° 26' 16"	-3 m 34 s
22	98° 08' 55"	0.72"	98° 51' 37"	23° 11' 17"	1.0166611	15' 43.90"	23° 26' 16"	-3 m 35 s
23	98° 11' 18"	0.73"	98° 54' 12"	23° 11' 08"	1.0166622	15' 43.90"	23° 26' 16"	-3 m 35 s
24	98° 13' 41"	0.73"	98° 56' 48"	23° 10' 59"	1.0166632	15' 43.90"	23° 26' 16"	-3 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	95° 57' 07"	3° 35' 04"	96° 39' 48"	26° 53' 05"	0° 53' 56"	14' 41.84"	162° 30' 49"	0.00112
1	96° 26' 41"	3° 36' 57"	97° 12' 56"	26° 53' 33"	0° 53' 56"	14' 41.83"	169° 28' 36"	0.00106
2	96° 56' 14"	3° 38' 49"	97° 46' 05"	26° 53' 53"	0° 53' 56"	14' 41.82"	176° 42' 37"	0.00103
3	97° 25' 49"	3° 40' 41"	98° 19' 14"	26° 54' 05"	0° 53' 56"	14' 41.81"	184° 1' 12"	0.00104
4	97° 55' 22"	3° 42' 31"	98° 52' 23"	26° 54' 10"	0° 53' 56"	14' 41.80"	191° 11' 23"	0.00107
5	98° 24' 56"	3° 44' 20"	99° 25' 31"	26° 54' 07"	0° 53' 56"	14' 41.80"	198° 2' 07"	0.00114
6	98° 54' 30"	3° 46' 08"	99° 58' 40"	26° 53' 56"	0° 53' 56"	14' 41.80"	204° 25' 10"	0.00124
7	99° 24' 04"	3° 47' 56"	100° 31' 49"	26° 53' 37"	0° 53' 56"	14' 41.80"	210° 15' 51"	0.00137
8	99° 53' 39"	3° 49' 42"	101° 04' 57"	26° 53' 11"	0° 53' 56"	14' 41.80"	215° 32' 42"	0.00153
9	100° 23' 13"	3° 51' 27"	101° 38' 05"	26° 52' 37"	0° 53' 56"	14' 41.81"	220° 16' 36"	0.00172
10	100° 52' 47"	3° 53' 11"	102° 11' 12"	26° 51' 55"	0° 53' 56"	14' 41.81"	224° 29' 52"	0.00195
11	101° 22' 22"	3° 54' 54"	102° 44' 20"	26° 51' 05"	0° 53' 56"	14' 41.83"	228° 15' 31"	0.00220
12	101° 51' 57"	3° 56' 36"	103° 17' 26"	26° 50' 08"	0° 53' 56"	14' 41.84"	231° 36' 43"	0.00249
13	102° 21' 32"	3° 58' 17"	103° 50' 33"	26° 49' 03"	0° 53' 56"	14' 41.86"	234° 36' 34"	0.00280
14	102° 51' 07"	3° 59' 57"	104° 23' 38"	26° 47' 50"	0° 53' 56"	14' 41.87"	237° 17' 53"	0.00315
15	103° 20' 42"	4° 01' 36"	104° 56' 43"	26° 46' 29"	0° 53' 56"	14' 41.90"	239° 43' 10"	0.00353
16	103° 50' 18"	4° 03' 14"	105° 29' 47"	26° 45' 01"	0° 53' 56"	14' 41.92"	241° 54' 35"	0.00395
17	104° 19' 53"	4° 04' 50"	106° 02' 50"	26° 43' 25"	0° 53' 56"	14' 41.95"	243° 53' 58"	0.00439
18	104° 49' 29"	4° 06' 26"	106° 35' 53"	26° 41' 42"	0° 53' 57"	14' 41.98"	245° 42' 57"	0.00486
19	105° 19' 05"	4° 08' 00"	107° 08' 54"	26° 39' 50"	0° 53' 57"	14' 42.01"	247° 22' 51"	0.00537
20	105° 48' 41"	4° 09' 34"	107° 41' 55"	26° 37' 52"	0° 53' 57"	14' 42.04"	248° 54' 49"	0.00590
21	106° 18' 18"	4° 11' 06"	108° 14' 54"	26° 35' 45"	0° 53' 57"	14' 42.08"	250° 19' 51"	0.00647
22	106° 47' 55"	4° 12' 37"	108° 47' 52"	26° 33' 31"	0° 53' 57"	14' 42.12"	251° 38' 46"	0.00707
23	107° 17' 32"	4° 14' 07"	109° 20' 49"	26° 31' 09"	0° 53' 57"	14' 42.16"	252° 52' 18"	0.00770
24	107° 47' 09"	4° 15' 36"	109° 53' 45"	26° 28' 40"	0° 53' 57"	14' 42.20"	254° 1' 02"	0.00836

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	98° 13' 41"	0.73"	98° 56' 48"	23° 10' 59"	1.0166632	15' 43.90"	23° 26' 16"	-3 m 36 s
1	98° 16' 04"	0.73"	98° 59' 23"	23° 10' 51"	1.0166643	15' 43.90"	23° 26' 16"	-3 m 36 s
2	98° 18' 27"	0.74"	99° 01' 58"	23° 10' 42"	1.0166653	15' 43.90"	23° 26' 16"	-3 m 37 s
3	98° 20' 50"	0.74"	99° 04' 34"	23° 10' 33"	1.0166663	15' 43.90"	23° 26' 16"	-3 m 37 s
4	98° 23' 13"	0.74"	99° 07' 09"	23° 10' 24"	1.0166673	15' 43.90"	23° 26' 16"	-3 m 38 s
5	98° 25' 36"	0.75"	99° 09' 44"	23° 10' 15"	1.0166683	15' 43.90"	23° 26' 16"	-3 m 38 s
6	98° 27' 59"	0.75"	99° 12' 20"	23° 10' 06"	1.0166693	15' 43.90"	23° 26' 16"	-3 m 39 s
7	98° 30' 23"	0.75"	99° 14' 55"	23° 09' 56"	1.0166703	15' 43.90"	23° 26' 16"	-3 m 39 s
8	98° 32' 46"	0.75"	99° 17' 30"	23° 09' 47"	1.0166712	15' 43.89"	23° 26' 16"	-3 m 40 s
9	98° 35' 09"	0.76"	99° 20' 06"	23° 09' 38"	1.0166722	15' 43.89"	23° 26' 16"	-3 m 40 s
10	98° 37' 32"	0.76"	99° 22' 41"	23° 09' 29"	1.0166731	15' 43.89"	23° 26' 16"	-3 m 41 s
11	98° 39' 55"	0.76"	99° 25' 16"	23° 09' 20"	1.0166741	15' 43.89"	23° 26' 16"	-3 m 41 s
12	98° 42' 18"	0.76"	99° 27' 51"	23° 09' 10"	1.0166750	15' 43.89"	23° 26' 16"	-3 m 42 s
13	98° 44' 41"	0.77"	99° 30' 27"	23° 09' 01"	1.0166759	15' 43.89"	23° 26' 16"	-3 m 42 s
14	98° 47' 04"	0.77"	99° 33' 02"	23° 08' 51"	1.0166768	15' 43.89"	23° 26' 16"	-3 m 43 s
15	98° 49' 27"	0.77"	99° 35' 37"	23° 08' 42"	1.0166777	15' 43.89"	23° 26' 16"	-3 m 43 s
16	98° 51' 50"	0.77"	99° 38' 13"	23° 08' 32"	1.0166786	15' 43.89"	23° 26' 16"	-3 m 44 s
17	98° 54' 13"	0.77"	99° 40' 48"	23° 08' 23"	1.0166795	15' 43.89"	23° 26' 16"	-3 m 44 s
18	98° 56' 36"	0.78"	99° 43' 23"	23° 08' 13"	1.0166803	15' 43.89"	23° 26' 16"	-3 m 45 s
19	98° 58' 59"	0.78"	99° 45' 58"	23° 08' 04"	1.0166812	15' 43.88"	23° 26' 16"	-3 m 45 s
20	99° 01' 23"	0.78"	99° 48' 33"	23° 07' 54"	1.0166820	15' 43.88"	23° 26' 16"	-3 m 46 s
21	99° 03' 46"	0.78"	99° 51' 09"	23° 07' 44"	1.0166828	15' 43.88"	23° 26' 16"	-3 m 46 s
22	99° 06' 09"	0.79"	99° 53' 44"	23° 07' 35"	1.0166837	15' 43.88"	23° 26' 16"	-3 m 47 s
23	99° 08' 32"	0.79"	99° 56' 19"	23° 07' 25"	1.0166845	15' 43.88"	23° 26' 16"	-3 m 47 s
24	99° 10' 55"	0.79"	99° 58' 54"	23° 07' 15"	1.0166853	15' 43.88"	23° 26' 16"	-3 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	107° 47' 09"	4° 15' 36"	109° 53' 45"	26° 28' 40"	0° 53' 57"	14' 42.20"	254° 1' 02"	0.00836
1	108° 16' 46"	4° 17' 03"	110° 26' 39"	26° 26' 03"	0° 53' 58"	14' 42.25"	255° 5' 31"	0.00905
2	108° 46' 24"	4° 18' 30"	110° 59' 33"	26° 23' 18"	0° 53' 58"	14' 42.30"	256° 6' 11"	0.00977
3	109° 16' 02"	4° 19' 55"	111° 32' 24"	26° 20' 26"	0° 53' 58"	14' 42.36"	257° 3' 27"	0.01052
4	109° 45' 40"	4° 21' 19"	112° 05' 14"	26° 17' 26"	0° 53' 58"	14' 42.41"	257° 57' 38"	0.01131
5	110° 15' 19"	4° 22' 42"	112° 38' 03"	26° 14' 19"	0° 53' 58"	14' 42.47"	258° 49' 04"	0.01212
6	110° 44' 57"	4° 24' 04"	113° 10' 50"	26° 11' 05"	0° 53' 59"	14' 42.53"	259° 37' 59"	0.01297
7	111° 14' 36"	4° 25' 25"	113° 43' 35"	26° 07' 43"	0° 53' 59"	14' 42.59"	260° 24' 37"	0.01384
8	111° 44' 16"	4° 26' 44"	114° 16' 19"	26° 04' 13"	0° 53' 59"	14' 42.66"	261° 9' 11"	0.01475
9	112° 13' 56"	4° 28' 02"	114° 49' 01"	26° 00' 36"	0° 53' 59"	14' 42.73"	261° 51' 51"	0.01569
10	112° 43' 36"	4° 29' 19"	115° 21' 41"	25° 56' 52"	0° 53' 60"	14' 42.80"	262° 32' 47"	0.01665
11	113° 13' 16"	4° 30' 35"	115° 54' 19"	25° 53' 00"	0° 53' 60"	14' 42.87"	263° 12' 08"	0.01765
12	113° 42' 57"	4° 31' 50"	116° 26' 56"	25° 49' 01"	0° 54' 00"	14' 42.95"	263° 49' 60"	0.01868
13	114° 12' 38"	4° 33' 03"	116° 59' 30"	25° 44' 55"	0° 54' 00"	14' 43.03"	264° 26' 31"	0.01974
14	114° 42' 19"	4° 34' 15"	117° 32' 02"	25° 40' 42"	0° 54' 01"	14' 43.11"	265° 1' 46"	0.02083
15	115° 12' 01"	4° 35' 26"	118° 04' 33"	25° 36' 21"	0° 54' 01"	14' 43.19"	265° 35' 52"	0.02195
16	115° 41' 43"	4° 36' 36"	118° 37' 01"	25° 31' 53"	0° 54' 01"	14' 43.28"	266° 8' 53"	0.02310
17	116° 11' 25"	4° 37' 44"	119° 09' 27"	25° 27' 17"	0° 54' 02"	14' 43.37"	266° 40' 53"	0.02428
18	116° 41' 08"	4° 38' 52"	119° 41' 51"	25° 22' 35"	0° 54' 02"	14' 43.46"	267° 11' 57"	0.02549
19	117° 10' 51"	4° 39' 58"	120° 14' 12"	25° 17' 45"	0° 54' 02"	14' 43.56"	267° 42' 08"	0.02674
20	117° 40' 35"	4° 41' 02"	120° 46' 31"	25° 12' 48"	0° 54' 03"	14' 43.66"	268° 11' 29"	0.02801
21	118° 10' 19"	4° 42' 06"	121° 18' 48"	25° 07' 44"	0° 54' 03"	14' 43.76"	268° 40' 04"	0.02931
22	118° 40' 03"	4° 43' 08"	121° 51' 03"	25° 02' 34"	0° 54' 04"	14' 43.86"	269° 7' 54"	0.03064
23	119° 09' 48"	4° 44' 09"	122° 23' 15"	24° 57' 16"	0° 54' 04"	14' 43.97"	269° 35' 04"	0.03200
24	119° 39' 33"	4° 45' 08"	122° 55' 25"	24° 51' 51"	0° 54' 04"	14' 44.08"	270° 1' 35"	0.03339



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	99° 10' 55"	0.79"	99° 58' 54"	23° 07' 15"	1.0166853	15' 43.88"	23° 26' 16"	-3 m 48 s
1	99° 13' 18"	0.79"	100° 01' 30"	23° 07' 05"	1.0166860	15' 43.88"	23° 26' 16"	-3 m 48 s
2	99° 15' 41"	0.79"	100° 04' 05"	23° 06' 55"	1.0166868	15' 43.88"	23° 26' 16"	-3 m 48 s
3	99° 18' 04"	0.79"	100° 06' 40"	23° 06' 45"	1.0166876	15' 43.88"	23° 26' 16"	-3 m 49 s
4	99° 20' 27"	0.80"	100° 09' 15"	23° 06' 35"	1.0166883	15' 43.88"	23° 26' 16"	-3 m 49 s
5	99° 22' 50"	0.80"	100° 11' 50"	23° 06' 25"	1.0166891	15' 43.88"	23° 26' 16"	-3 m 50 s
6	99° 25' 13"	0.80"	100° 14' 25"	23° 06' 15"	1.0166898	15' 43.88"	23° 26' 16"	-3 m 50 s
7	99° 27' 36"	0.80"	100° 17' 01"	23° 06' 05"	1.0166906	15' 43.88"	23° 26' 16"	-3 m 51 s
8	99° 29' 59"	0.80"	100° 19' 36"	23° 05' 55"	1.0166913	15' 43.88"	23° 26' 16"	-3 m 51 s
9	99° 32' 22"	0.80"	100° 22' 11"	23° 05' 44"	1.0166920	15' 43.87"	23° 26' 16"	-3 m 52 s
10	99° 34' 46"	0.80"	100° 24' 46"	23° 05' 34"	1.0166927	15' 43.87"	23° 26' 16"	-3 m 52 s
11	99° 37' 09"	0.81"	100° 27' 21"	23° 05' 24"	1.0166934	15' 43.87"	23° 26' 16"	-3 m 53 s
12	99° 39' 32"	0.81"	100° 29' 56"	23° 05' 14"	1.0166940	15' 43.87"	23° 26' 16"	-3 m 53 s
13	99° 41' 55"	0.81"	100° 32' 31"	23° 05' 03"	1.0166947	15' 43.87"	23° 26' 16"	-3 m 54 s
14	99° 44' 18"	0.81"	100° 35' 06"	23° 04' 53"	1.0166953	15' 43.87"	23° 26' 16"	-3 m 54 s
15	99° 46' 41"	0.81"	100° 37' 42"	23° 04' 42"	1.0166960	15' 43.87"	23° 26' 16"	-3 m 55 s
16	99° 49' 04"	0.81"	100° 40' 17"	23° 04' 32"	1.0166966	15' 43.87"	23° 26' 16"	-3 m 55 s
17	99° 51' 27"	0.81"	100° 42' 52"	23° 04' 21"	1.0166972	15' 43.87"	23° 26' 16"	-3 m 56 s
18	99° 53' 50"	0.81"	100° 45' 27"	23° 04' 11"	1.0166979	15' 43.87"	23° 26' 16"	-3 m 56 s
19	99° 56' 13"	0.81"	100° 48' 02"	23° 03' 60"	1.0166985	15' 43.87"	23° 26' 16"	-3 m 57 s
20	99° 58' 36"	0.81"	100° 50' 37"	23° 03' 49"	1.0166991	15' 43.87"	23° 26' 16"	-3 m 57 s
21	100° 00' 59"	0.82"	100° 53' 12"	23° 03' 39"	1.0166996	15' 43.87"	23° 26' 16"	-3 m 58 s
22	100° 03' 22"	0.82"	100° 55' 47"	23° 03' 28"	1.0167002	15' 43.87"	23° 26' 16"	-3 m 58 s
23	100° 05' 45"	0.82"	100° 58' 22"	23° 03' 17"	1.0167008	15' 43.87"	23° 26' 16"	-3 m 59 s
24	100° 08' 08"	0.82"	101° 00' 57"	23° 03' 06"	1.0167013	15' 43.87"	23° 26' 16"	-3 m 59 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	119° 39' 33"	4° 45' 08"	122° 55' 25"	24° 51' 51"	0° 54' 04"	14' 44.08"	270° 1' 35"	0.03339
1	120° 09' 19"	4° 46' 07"	123° 27' 32"	24° 46' 19"	0° 54' 05"	14' 44.19"	270° 27' 28"	0.03481
2	120° 39' 05"	4° 47' 04"	123° 59' 37"	24° 40' 40"	0° 54' 05"	14' 44.31"	270° 52' 47"	0.03627
3	121° 08' 52"	4° 47' 60"	124° 31' 39"	24° 34' 54"	0° 54' 06"	14' 44.42"	271° 17' 33"	0.03775
4	121° 38' 39"	4° 48' 54"	125° 03' 39"	24° 29' 02"	0° 54' 06"	14' 44.55"	271° 41' 47"	0.03926
5	122° 08' 26"	4° 49' 47"	125° 35' 36"	24° 23' 02"	0° 54' 06"	14' 44.67"	272° 5' 30"	0.04080
6	122° 38' 14"	4° 50' 39"	126° 07' 30"	24° 16' 56"	0° 54' 07"	14' 44.79"	272° 28' 46"	0.04236
7	123° 08' 03"	4° 51' 30"	126° 39' 22"	24° 10' 43"	0° 54' 07"	14' 44.92"	272° 51' 33"	0.04396
8	123° 37' 52"	4° 52' 19"	127° 11' 11"	24° 04' 23"	0° 54' 08"	14' 45.06"	273° 13' 55"	0.04559
9	124° 07' 41"	4° 53' 07"	127° 42' 57"	23° 57' 57"	0° 54' 08"	14' 45.19"	273° 35' 52"	0.04725
10	124° 37' 31"	4° 53' 53"	128° 14' 41"	23° 51' 24"	0° 54' 09"	14' 45.33"	273° 57' 24"	0.04893
11	125° 07' 22"	4° 54' 38"	128° 46' 22"	23° 44' 44"	0° 54' 09"	14' 45.47"	274° 18' 33"	0.05065
12	125° 37' 13"	4° 55' 22"	129° 17' 60"	23° 37' 58"	0° 54' 10"	14' 45.61"	274° 39' 20"	0.05239
13	126° 07' 04"	4° 56' 05"	129° 49' 35"	23° 31' 06"	0° 54' 10"	14' 45.76"	274° 59' 46"	0.05417
14	126° 36' 56"	4° 56' 46"	130° 21' 08"	23° 24' 06"	0° 54' 11"	14' 45.91"	275° 19' 51"	0.05597
15	127° 06' 49"	4° 57' 26"	130° 52' 37"	23° 17' 01"	0° 54' 12"	14' 46.06"	275° 39' 36"	0.05780
16	127° 36' 42"	4° 58' 05"	131° 24' 04"	23° 09' 49"	0° 54' 12"	14' 46.22"	275° 59' 01"	0.05966
17	128° 06' 36"	4° 58' 42"	131° 55' 28"	23° 02' 30"	0° 54' 13"	14' 46.37"	276° 18' 09"	0.06155
18	128° 36' 30"	4° 59' 18"	132° 26' 49"	22° 55' 06"	0° 54' 13"	14' 46.53"	276° 36' 58"	0.06347
19	129° 06' 25"	4° 59' 52"	132° 58' 07"	22° 47' 34"	0° 54' 14"	14' 46.70"	276° 55' 29"	0.06541
20	129° 36' 21"	5° 00' 25"	133° 29' 22"	22° 39' 57"	0° 54' 15"	14' 46.87"	277° 13' 43"	0.06739
21	130° 06' 17"	5° 00' 57"	134° 00' 34"	22° 32' 14"	0° 54' 15"	14' 47.04"	277° 31' 41"	0.06939
22	130° 36' 13"	5° 01' 27"	134° 31' 44"	22° 24' 24"	0° 54' 16"	14' 47.21"	277° 49' 23"	0.07142
23	131° 06' 11"	5° 01' 56"	135° 02' 50"	22° 16' 28"	0° 54' 16"	14' 47.38"	278° 6' 49"	0.07348
24	131° 36' 09"	5° 02' 24"	135° 33' 53"	22° 08' 26"	0° 54' 17"	14' 47.56"	278° 24' 00"	0.07556

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	100° 08' 08"	0.82"	101° 00' 57"	23° 03' 06"	1.0167013	15' 43.87"	23° 26' 16"	-3 m 59 s
1	100° 10' 31"	0.82"	101° 03' 32"	23° 02' 55"	1.0167019	15' 43.87"	23° 26' 16"	-3 m 60 s
2	100° 12' 55"	0.82"	101° 06' 07"	23° 02' 44"	1.0167024	15' 43.87"	23° 26' 16"	-3 m 60 s
3	100° 15' 18"	0.82"	101° 08' 42"	23° 02' 33"	1.0167029	15' 43.86"	23° 26' 16"	-4 m 00 s
4	100° 17' 41"	0.82"	101° 11' 17"	23° 02' 22"	1.0167034	15' 43.86"	23° 26' 16"	-4 m 01 s
5	100° 20' 04"	0.82"	101° 13' 52"	23° 02' 11"	1.0167039	15' 43.86"	23° 26' 16"	-4 m 01 s
6	100° 22' 27"	0.82"	101° 16' 27"	23° 02' 00"	1.0167044	15' 43.86"	23° 26' 16"	-4 m 02 s
7	100° 24' 50"	0.82"	101° 19' 02"	23° 01' 49"	1.0167049	15' 43.86"	23° 26' 16"	-4 m 02 s
8	100° 27' 13"	0.82"	101° 21' 37"	23° 01' 38"	1.0167054	15' 43.86"	23° 26' 16"	-4 m 03 s
9	100° 29' 36"	0.82"	101° 24' 12"	23° 01' 27"	1.0167058	15' 43.86"	23° 26' 16"	-4 m 03 s
10	100° 31' 59"	0.82"	101° 26' 47"	23° 01' 15"	1.0167063	15' 43.86"	23° 26' 16"	-4 m 04 s
11	100° 34' 22"	0.82"	101° 29' 22"	23° 01' 04"	1.0167067	15' 43.86"	23° 26' 16"	-4 m 04 s
12	100° 36' 45"	0.82"	101° 31' 57"	23° 00' 53"	1.0167071	15' 43.86"	23° 26' 16"	-4 m 05 s
13	100° 39' 08"	0.82"	101° 34' 32"	23° 00' 41"	1.0167076	15' 43.86"	23° 26' 16"	-4 m 05 s
14	100° 41' 31"	0.82"	101° 37' 07"	23° 00' 30"	1.0167080	15' 43.86"	23° 26' 16"	-4 m 06 s
15	100° 43' 54"	0.82"	101° 39' 42"	23° 00' 18"	1.0167084	15' 43.86"	23° 26' 16"	-4 m 06 s
16	100° 46' 17"	0.82"	101° 42' 17"	23° 00' 07"	1.0167088	15' 43.86"	23° 26' 16"	-4 m 07 s
17	100° 48' 40"	0.82"	101° 44' 52"	22° 59' 55"	1.0167091	15' 43.86"	23° 26' 16"	-4 m 07 s
18	100° 51' 03"	0.82"	101° 47' 26"	22° 59' 44"	1.0167095	15' 43.86"	23° 26' 16"	-4 m 08 s
19	100° 53' 27"	0.82"	101° 50' 01"	22° 59' 32"	1.0167099	15' 43.86"	23° 26' 16"	-4 m 08 s
20	100° 55' 50"	0.82"	101° 52' 36"	22° 59' 20"	1.0167102	15' 43.86"	23° 26' 16"	-4 m 08 s
21	100° 58' 13"	0.82"	101° 55' 11"	22° 59' 09"	1.0167106	15' 43.86"	23° 26' 16"	-4 m 09 s
22	101° 00' 36"	0.82"	101° 57' 46"	22° 58' 57"	1.0167109	15' 43.86"	23° 26' 16"	-4 m 09 s
23	101° 02' 59"	0.82"	102° 00' 21"	22° 58' 45"	1.0167112	15' 43.86"	23° 26' 16"	-4 m 10 s
24	101° 05' 22"	0.82"	102° 02' 56"	22° 58' 33"	1.0167115	15' 43.86"	23° 26' 16"	-4 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	131° 36' 09"	5° 02' 24"	135° 33' 53"	22° 08' 26"	0° 54' 17"	14' 47.56"	278° 24' 00"	0.07556
1	132° 06' 07"	5° 02' 50"	136° 04' 54"	22° 00' 18"	0° 54' 18"	14' 47.75"	278° 40' 56"	0.07768
2	132° 36' 07"	5° 03' 15"	136° 35' 51"	21° 52' 04"	0° 54' 18"	14' 47.93"	278° 57' 38"	0.07982
3	133° 06' 06"	5° 03' 39"	137° 06' 46"	21° 43' 45"	0° 54' 19"	14' 48.12"	279° 14' 05"	0.08199
4	133° 36' 07"	5° 04' 01"	137° 37' 38"	21° 35' 19"	0° 54' 20"	14' 48.31"	279° 30' 19"	0.08419
5	134° 06' 08"	5° 04' 21"	138° 08' 26"	21° 26' 47"	0° 54' 21"	14' 48.50"	279° 46' 18"	0.08642
6	134° 36' 10"	5° 04' 41"	138° 39' 12"	21° 18' 09"	0° 54' 21"	14' 48.70"	280° 2' 05"	0.08867
7	135° 06' 13"	5° 04' 58"	139° 09' 55"	21° 09' 26"	0° 54' 22"	14' 48.90"	280° 17' 38"	0.09095
8	135° 36' 16"	5° 05' 15"	139° 40' 35"	21° 00' 37"	0° 54' 23"	14' 49.11"	280° 32' 59"	0.09326
9	136° 06' 20"	5° 05' 30"	140° 11' 11"	20° 51' 42"	0° 54' 24"	14' 49.31"	280° 48' 07"	0.09559
10	136° 36' 25"	5° 05' 44"	140° 41' 45"	20° 42' 42"	0° 54' 24"	14' 49.52"	281° 3' 03"	0.09795
11	137° 06' 31"	5° 05' 56"	141° 12' 16"	20° 33' 36"	0° 54' 25"	14' 49.74"	281° 17' 46"	0.10034
12	137° 36' 37"	5° 06' 07"	141° 42' 44"	20° 24' 24"	0° 54' 26"	14' 49.95"	281° 32' 18"	0.10276
13	138° 06' 44"	5° 06' 16"	142° 13' 10"	20° 15' 07"	0° 54' 27"	14' 50.17"	281° 46' 38"	0.10520
14	138° 36' 52"	5° 06' 24"	142° 43' 32"	20° 05' 44"	0° 54' 27"	14' 50.39"	282° 0' 46"	0.10767
15	139° 07' 00"	5° 06' 31"	143° 13' 51"	19° 56' 16"	0° 54' 28"	14' 50.62"	282° 14' 43"	0.11016
16	139° 37' 09"	5° 06' 36"	143° 44' 08"	19° 46' 43"	0° 54' 29"	14' 50.85"	282° 28' 29"	0.11268
17	140° 07' 20"	5° 06' 40"	144° 14' 21"	19° 37' 04"	0° 54' 30"	14' 51.08"	282° 42' 03"	0.11523
18	140° 37' 31"	5° 06' 42"	144° 44' 32"	19° 27' 20"	0° 54' 31"	14' 51.32"	282° 55' 27"	0.11781
19	141° 07' 42"	5° 06' 43"	145° 14' 40"	19° 17' 31"	0° 54' 32"	14' 51.55"	283° 8' 40"	0.12041
20	141° 37' 55"	5° 06' 43"	145° 44' 45"	19° 07' 36"	0° 54' 33"	14' 51.80"	283° 21' 42"	0.12303
21	142° 08' 08"	5° 06' 41"	146° 14' 47"	18° 57' 36"	0° 54' 34"	14' 52.04"	283° 34' 34"	0.12568
22	142° 38' 22"	5° 06' 37"	146° 44' 47"	18° 47' 31"	0° 54' 34"	14' 52.29"	283° 47' 15"	0.12836
23	143° 08' 38"	5° 06' 33"	147° 14' 44"	18° 37' 21"	0° 54' 35"	14' 52.54"	283° 59' 46"	0.13107
24	143° 38' 54"	5° 06' 26"	147° 44' 38"	18° 27' 06"	0° 54' 36"	14' 52.80"	284° 12' 07"	0.13380



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	101° 05' 22"	0.82"	102° 02' 56"	22° 58' 33"	1.0167115	15' 43.86"	23° 26' 16"	-4 m 10 s
1	101° 07' 45"	0.81"	102° 05' 30"	22° 58' 21"	1.0167118	15' 43.86"	23° 26' 16"	-4 m 11 s
2	101° 10' 08"	0.81"	102° 08' 05"	22° 58' 09"	1.0167121	15' 43.86"	23° 26' 16"	-4 m 11 s
3	101° 12' 31"	0.81"	102° 10' 40"	22° 57' 57"	1.0167124	15' 43.86"	23° 26' 16"	-4 m 12 s
4	101° 14' 54"	0.81"	102° 13' 15"	22° 57' 45"	1.0167127	15' 43.86"	23° 26' 16"	-4 m 12 s
5	101° 17' 17"	0.81"	102° 15' 50"	22° 57' 33"	1.0167129	15' 43.86"	23° 26' 16"	-4 m 13 s
6	101° 19' 40"	0.81"	102° 18' 25"	22° 57' 21"	1.0167132	15' 43.86"	23° 26' 16"	-4 m 13 s
7	101° 22' 03"	0.81"	102° 20' 59"	22° 57' 09"	1.0167134	15' 43.85"	23° 26' 16"	-4 m 14 s
8	101° 24' 26"	0.81"	102° 23' 34"	22° 56' 57"	1.0167136	15' 43.85"	23° 26' 16"	-4 m 14 s
9	101° 26' 49"	0.81"	102° 26' 09"	22° 56' 45"	1.0167138	15' 43.85"	23° 26' 16"	-4 m 14 s
10	101° 29' 12"	0.81"	102° 28' 44"	22° 56' 32"	1.0167141	15' 43.85"	23° 26' 16"	-4 m 15 s
11	101° 31' 35"	0.80"	102° 31' 18"	22° 56' 20"	1.0167143	15' 43.85"	23° 26' 16"	-4 m 15 s
12	101° 33' 58"	0.80"	102° 33' 53"	22° 56' 08"	1.0167144	15' 43.85"	23° 26' 16"	-4 m 16 s
13	101° 36' 21"	0.80"	102° 36' 28"	22° 55' 55"	1.0167146	15' 43.85"	23° 26' 16"	-4 m 16 s
14	101° 38' 44"	0.80"	102° 39' 03"	22° 55' 43"	1.0167148	15' 43.85"	23° 26' 16"	-4 m 17 s
15	101° 41' 07"	0.80"	102° 41' 37"	22° 55' 30"	1.0167150	15' 43.85"	23° 26' 16"	-4 m 17 s
16	101° 43' 31"	0.80"	102° 44' 12"	22° 55' 18"	1.0167151	15' 43.85"	23° 26' 16"	-4 m 18 s
17	101° 45' 54"	0.80"	102° 46' 47"	22° 55' 05"	1.0167153	15' 43.85"	23° 26' 16"	-4 m 18 s
18	101° 48' 17"	0.79"	102° 49' 21"	22° 54' 53"	1.0167154	15' 43.85"	23° 26' 16"	-4 m 19 s
19	101° 50' 40"	0.79"	102° 51' 56"	22° 54' 40"	1.0167155	15' 43.85"	23° 26' 16"	-4 m 19 s
20	101° 53' 03"	0.79"	102° 54' 31"	22° 54' 27"	1.0167156	15' 43.85"	23° 26' 16"	-4 m 19 s
21	101° 55' 26"	0.79"	102° 57' 05"	22° 54' 15"	1.0167157	15' 43.85"	23° 26' 16"	-4 m 20 s
22	101° 57' 49"	0.79"	102° 59' 40"	22° 54' 02"	1.0167158	15' 43.85"	23° 26' 16"	-4 m 20 s
23	102° 00' 12"	0.79"	103° 02' 15"	22° 53' 49"	1.0167159	15' 43.85"	23° 26' 16"	-4 m 21 s
24	102° 02' 35"	0.78"	103° 04' 49"	22° 53' 36"	1.0167160	15' 43.85"	23° 26' 16"	-4 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	143° 38' 54"	5° 06' 26"	147° 44' 38"	18° 27' 06"	0° 54' 36"	14' 52.80"	284° 12' 07"	0.13380
1	144° 09' 10"	5° 06' 19"	148° 14' 29"	18° 16' 46"	0° 54' 37"	14' 53.05"	284° 24' 17"	0.13655
2	144° 39' 28"	5° 06' 10"	148° 44' 18"	18° 06' 21"	0° 54' 38"	14' 53.31"	284° 36' 18"	0.13933
3	145° 09' 47"	5° 05' 59"	149° 14' 04"	17° 55' 51"	0° 54' 39"	14' 53.58"	284° 48' 09"	0.14213
4	145° 40' 06"	5° 05' 47"	149° 43' 48"	17° 45' 17"	0° 54' 40"	14' 53.85"	284° 59' 50"	0.14496
5	146° 10' 27"	5° 05' 34"	150° 13' 28"	17° 34' 37"	0° 54' 41"	14' 54.12"	285° 11' 21"	0.14782
6	146° 40' 48"	5° 05' 19"	150° 43' 07"	17° 23' 53"	0° 54' 42"	14' 54.39"	285° 22' 43"	0.15070
7	147° 11' 11"	5° 05' 02"	151° 12' 42"	17° 13' 04"	0° 54' 43"	14' 54.67"	285° 33' 55"	0.15360
8	147° 41' 34"	5° 04' 45"	151° 42' 15"	17° 02' 10"	0° 54' 44"	14' 54.95"	285° 44' 57"	0.15653
9	148° 11' 58"	5° 04' 25"	152° 11' 46"	16° 51' 12"	0° 54' 45"	14' 55.24"	285° 55' 51"	0.15948
10	148° 42' 24"	5° 04' 05"	152° 41' 14"	16° 40' 09"	0° 54' 46"	14' 55.53"	286° 6' 34"	0.16246
11	149° 12' 50"	5° 03' 43"	153° 10' 40"	16° 29' 01"	0° 54' 47"	14' 55.82"	286° 17' 09"	0.16546
12	149° 43' 17"	5° 03' 19"	153° 40' 04"	16° 17' 49"	0° 54' 48"	14' 56.11"	286° 27' 34"	0.16849
13	150° 13' 46"	5° 02' 54"	154° 09' 25"	16° 06' 33"	0° 54' 50"	14' 56.41"	286° 37' 50"	0.17154
14	150° 44' 15"	5° 02' 28"	154° 38' 43"	15° 55' 12"	0° 54' 51"	14' 56.71"	286° 47' 57"	0.17461
15	151° 14' 46"	5° 01' 60"	155° 07' 60"	15° 43' 46"	0° 54' 52"	14' 57.02"	286° 57' 56"	0.17771
16	151° 45' 17"	5° 01' 30"	155° 37' 14"	15° 32' 17"	0° 54' 53"	14' 57.33"	287° 7' 45"	0.18083
17	152° 15' 50"	5° 00' 59"	156° 06' 26"	15° 20' 43"	0° 54' 54"	14' 57.64"	287° 17' 25"	0.18397
18	152° 46' 23"	5° 00' 27"	156° 35' 36"	15° 09' 05"	0° 54' 55"	14' 57.95"	287° 26' 56"	0.18714
19	153° 16' 58"	4° 59' 53"	157° 04' 44"	14° 57' 23"	0° 54' 56"	14' 58.27"	287° 36' 18"	0.19032
20	153° 47' 34"	4° 59' 18"	157° 33' 49"	14° 45' 36"	0° 54' 58"	14' 58.59"	287° 45' 32"	0.19354
21	154° 18' 11"	4° 58' 42"	158° 02' 53"	14° 33' 46"	0° 54' 59"	14' 58.92"	287° 54' 37"	0.19677
22	154° 48' 49"	4° 58' 04"	158° 31' 55"	14° 21' 51"	0° 54' 60"	14' 59.25"	288° 3' 33"	0.20003
23	155° 19' 28"	4° 57' 24"	159° 00' 54"	14° 09' 52"	0° 55' 01"	14' 59.58"	288° 12' 21"	0.20331
24	155° 50' 08"	4° 56' 43"	159° 29' 52"	13° 57' 50"	0° 55' 02"	14' 59.92"	288° 20' 59"	0.20661

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	102° 02' 35"	0.78"	103° 04' 49"	22° 53' 36"	1.0167160	15' 43.85"	23° 26' 16"	-4 m 21 s
1	102° 04' 58"	0.78"	103° 07' 24"	22° 53' 23"	1.0167160	15' 43.85"	23° 26' 16"	-4 m 22 s
2	102° 07' 21"	0.78"	103° 09' 59"	22° 53' 10"	1.0167161	15' 43.85"	23° 26' 16"	-4 m 22 s
3	102° 09' 44"	0.78"	103° 12' 33"	22° 52' 57"	1.0167161	15' 43.85"	23° 26' 16"	-4 m 23 s
4	102° 12' 07"	0.78"	103° 15' 08"	22° 52' 44"	1.0167162	15' 43.85"	23° 26' 16"	-4 m 23 s
5	102° 14' 30"	0.77"	103° 17' 42"	22° 52' 31"	1.0167162	15' 43.85"	23° 26' 16"	-4 m 24 s
6	102° 16' 53"	0.77"	103° 20' 17"	22° 52' 18"	1.0167162	15' 43.85"	23° 26' 16"	-4 m 24 s
7	102° 19' 16"	0.77"	103° 22' 52"	22° 52' 05"	1.0167162	15' 43.85"	23° 26' 16"	-4 m 24 s
8	102° 21' 39"	0.77"	103° 25' 26"	22° 51' 52"	1.0167162	15' 43.85"	23° 26' 16"	-4 m 25 s
9	102° 24' 02"	0.76"	103° 28' 01"	22° 51' 39"	1.0167162	15' 43.85"	23° 26' 16"	-4 m 25 s
10	102° 26' 25"	0.76"	103° 30' 35"	22° 51' 25"	1.0167162	15' 43.85"	23° 26' 16"	-4 m 26 s
11	102° 28' 48"	0.76"	103° 33' 10"	22° 51' 12"	1.0167161	15' 43.85"	23° 26' 16"	-4 m 26 s
12	102° 31' 11"	0.76"	103° 35' 44"	22° 50' 59"	1.0167161	15' 43.85"	23° 26' 16"	-4 m 27 s
13	102° 33' 34"	0.75"	103° 38' 19"	22° 50' 45"	1.0167160	15' 43.85"	23° 26' 16"	-4 m 27 s
14	102° 35' 57"	0.75"	103° 40' 53"	22° 50' 32"	1.0167160	15' 43.85"	23° 26' 16"	-4 m 28 s
15	102° 38' 20"	0.75"	103° 43' 28"	22° 50' 18"	1.0167159	15' 43.85"	23° 26' 16"	-4 m 28 s
16	102° 40' 43"	0.75"	103° 46' 02"	22° 50' 05"	1.0167158	15' 43.85"	23° 26' 16"	-4 m 28 s
17	102° 43' 06"	0.74"	103° 48' 37"	22° 49' 51"	1.0167157	15' 43.85"	23° 26' 16"	-4 m 29 s
18	102° 45' 30"	0.74"	103° 51' 11"	22° 49' 38"	1.0167156	15' 43.85"	23° 26' 16"	-4 m 29 s
19	102° 47' 53"	0.74"	103° 53' 46"	22° 49' 24"	1.0167155	15' 43.85"	23° 26' 16"	-4 m 30 s
20	102° 50' 16"	0.73"	103° 56' 20"	22° 49' 10"	1.0167154	15' 43.85"	23° 26' 16"	-4 m 30 s
21	102° 52' 39"	0.73"	103° 58' 55"	22° 48' 57"	1.0167153	15' 43.85"	23° 26' 16"	-4 m 31 s
22	102° 55' 02"	0.73"	104° 01' 29"	22° 48' 43"	1.0167151	15' 43.85"	23° 26' 16"	-4 m 31 s
23	102° 57' 25"	0.73"	104° 04' 04"	22° 48' 29"	1.0167150	15' 43.85"	23° 26' 16"	-4 m 31 s
24	102° 59' 48"	0.72"	104° 06' 38"	22° 48' 15"	1.0167148	15' 43.85"	23° 26' 16"	-4 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	155° 50' 08"	4° 56' 43"	159° 29' 52"	13° 57' 50"	0° 55' 02"	14' 59.92"	288° 20' 59"	0.20661
1	156° 20' 50"	4° 56' 01"	159° 58' 48"	13° 45' 43"	0° 55' 04"	15' 00.26"	288° 29' 30"	0.20994
2	156° 51' 33"	4° 55' 17"	160° 27' 42"	13° 33' 33"	0° 55' 05"	15' 00.60"	288° 37' 51"	0.21328
3	157° 22' 16"	4° 54' 31"	160° 56' 34"	13° 21' 19"	0° 55' 06"	15' 00.95"	288° 46' 05"	0.21665
4	157° 53' 02"	4° 53' 45"	161° 25' 24"	13° 09' 01"	0° 55' 08"	15' 01.30"	288° 54' 09"	0.22004
5	158° 23' 48"	4° 52' 56"	161° 54' 13"	12° 56' 39"	0° 55' 09"	15' 01.65"	289° 2' 05"	0.22345
6	158° 54' 36"	4° 52' 07"	162° 23' 00"	12° 44' 13"	0° 55' 10"	15' 02.01"	289° 9' 53"	0.22688
7	159° 25' 24"	4° 51' 16"	162° 51' 46"	12° 31' 44"	0° 55' 11"	15' 02.37"	289° 17' 33"	0.23034
8	159° 56' 15"	4° 50' 23"	163° 20' 30"	12° 19' 12"	0° 55' 13"	15' 02.73"	289° 25' 03"	0.23381
9	160° 27' 06"	4° 49' 29"	163° 49' 13"	12° 06' 35"	0° 55' 14"	15' 03.10"	289° 32' 26"	0.23731
10	160° 57' 59"	4° 48' 34"	164° 17' 54"	11° 53' 56"	0° 55' 15"	15' 03.47"	289° 39' 40"	0.24082
11	161° 28' 53"	4° 47' 37"	164° 46' 33"	11° 41' 12"	0° 55' 17"	15' 03.85"	289° 46' 46"	0.24436
12	161° 59' 48"	4° 46' 38"	165° 15' 12"	11° 28' 26"	0° 55' 18"	15' 04.22"	289° 53' 44"	0.24792
13	162° 30' 45"	4° 45' 38"	165° 43' 49"	11° 15' 35"	0° 55' 20"	15' 04.61"	290° 0' 33"	0.25149
14	163° 01' 43"	4° 44' 37"	166° 12' 25"	11° 02' 42"	0° 55' 21"	15' 04.99"	290° 7' 14"	0.25509
15	163° 32' 42"	4° 43' 35"	166° 40' 60"	10° 49' 45"	0° 55' 22"	15' 05.38"	290° 13' 47"	0.25871
16	164° 03' 43"	4° 42' 30"	167° 09' 33"	10° 36' 45"	0° 55' 24"	15' 05.77"	290° 20' 12"	0.26235
17	164° 34' 45"	4° 41' 25"	167° 38' 06"	10° 23' 42"	0° 55' 25"	15' 06.17"	290° 26' 28"	0.26600
18	165° 05' 49"	4° 40' 18"	168° 06' 37"	10° 10' 36"	0° 55' 27"	15' 06.57"	290° 32' 36"	0.26968
19	165° 36' 54"	4° 39' 09"	168° 35' 08"	9° 57' 26"	0° 55' 28"	15' 06.97"	290° 38' 36"	0.27337
20	166° 08' 00"	4° 37' 60"	169° 03' 37"	9° 44' 14"	0° 55' 30"	15' 07.37"	290° 44' 28"	0.27709
21	166° 39' 08"	4° 36' 48"	169° 32' 06"	9° 30' 58"	0° 55' 31"	15' 07.78"	290° 50' 12"	0.28082
22	167° 10' 17"	4° 35' 36"	170° 00' 34"	9° 17' 39"	0° 55' 33"	15' 08.20"	290° 55' 47"	0.28457
23	167° 41' 28"	4° 34' 21"	170° 29' 02"	9° 04' 18"	0° 55' 34"	15' 08.61"	291° 1' 15"	0.28834
24	168° 12' 41"	4° 33' 06"	170° 57' 28"	8° 50' 53"	0° 55' 36"	15' 09.03"	291° 6' 34"	0.29213

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	102° 59' 48"	0.72"	104° 06' 38"	22° 48' 15"	1.0167148	15' 43.85"	23° 26' 16"	-4 m 32 s
1	103° 02' 11"	0.72"	104° 09' 13"	22° 48' 01"	1.0167147	15' 43.85"	23° 26' 16"	-4 m 32 s
2	103° 04' 34"	0.72"	104° 11' 47"	22° 47' 47"	1.0167145	15' 43.85"	23° 26' 16"	-4 m 33 s
3	103° 06' 57"	0.71"	104° 14' 21"	22° 47' 33"	1.0167143	15' 43.85"	23° 26' 16"	-4 m 33 s
4	103° 09' 20"	0.71"	104° 16' 56"	22° 47' 19"	1.0167141	15' 43.85"	23° 26' 16"	-4 m 34 s
5	103° 11' 43"	0.71"	104° 19' 30"	22° 47' 05"	1.0167139	15' 43.85"	23° 26' 16"	-4 m 34 s
6	103° 14' 06"	0.70"	104° 22' 05"	22° 46' 51"	1.0167137	15' 43.85"	23° 26' 16"	-4 m 35 s
7	103° 16' 29"	0.70"	104° 24' 39"	22° 46' 37"	1.0167135	15' 43.85"	23° 26' 16"	-4 m 35 s
8	103° 18' 52"	0.70"	104° 27' 13"	22° 46' 23"	1.0167132	15' 43.86"	23° 26' 16"	-4 m 35 s
9	103° 21' 15"	0.69"	104° 29' 48"	22° 46' 09"	1.0167130	15' 43.86"	23° 26' 16"	-4 m 36 s
10	103° 23' 38"	0.69"	104° 32' 22"	22° 45' 54"	1.0167128	15' 43.86"	23° 26' 16"	-4 m 36 s
11	103° 26' 01"	0.69"	104° 34' 56"	22° 45' 40"	1.0167125	15' 43.86"	23° 26' 16"	-4 m 37 s
12	103° 28' 24"	0.68"	104° 37' 31"	22° 45' 26"	1.0167122	15' 43.86"	23° 26' 16"	-4 m 37 s
13	103° 30' 47"	0.68"	104° 40' 05"	22° 45' 11"	1.0167120	15' 43.86"	23° 26' 16"	-4 m 38 s
14	103° 33' 10"	0.68"	104° 42' 39"	22° 44' 57"	1.0167117	15' 43.86"	23° 26' 16"	-4 m 38 s
15	103° 35' 33"	0.67"	104° 45' 13"	22° 44' 42"	1.0167114	15' 43.86"	23° 26' 16"	-4 m 38 s
16	103° 37' 56"	0.67"	104° 47' 48"	22° 44' 28"	1.0167111	15' 43.86"	23° 26' 16"	-4 m 39 s
17	103° 40' 19"	0.66"	104° 50' 22"	22° 44' 13"	1.0167108	15' 43.86"	23° 26' 16"	-4 m 39 s
18	103° 42' 42"	0.66"	104° 52' 56"	22° 43' 59"	1.0167104	15' 43.86"	23° 26' 16"	-4 m 40 s
19	103° 45' 05"	0.66"	104° 55' 30"	22° 43' 44"	1.0167101	15' 43.86"	23° 26' 16"	-4 m 40 s
20	103° 47' 28"	0.65"	104° 58' 05"	22° 43' 29"	1.0167098	15' 43.86"	23° 26' 16"	-4 m 41 s
21	103° 49' 51"	0.65"	105° 00' 39"	22° 43' 15"	1.0167094	15' 43.86"	23° 26' 16"	-4 m 41 s
22	103° 52' 14"	0.65"	105° 03' 13"	22° 42' 60"	1.0167091	15' 43.86"	23° 26' 16"	-4 m 41 s
23	103° 54' 37"	0.64"	105° 05' 47"	22° 42' 45"	1.0167087	15' 43.86"	23° 26' 16"	-4 m 42 s
24	103° 57' 00"	0.64"	105° 08' 22"	22° 42' 30"	1.0167083	15' 43.86"	23° 26' 16"	-4 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	168° 12' 41"	4° 33' 06"	170° 57' 28"	8° 50' 53"	0° 55' 36"	15' 09.03"	291° 6' 34"	0.29213
1	168° 43' 54"	4° 31' 49"	171° 25' 54"	8° 37' 26"	0° 55' 37"	15' 09.46"	291° 11' 45"	0.29594
2	169° 15' 10"	4° 30' 31"	171° 54' 20"	8° 23' 56"	0° 55' 39"	15' 09.88"	291° 16' 48"	0.29976
3	169° 46' 27"	4° 29' 11"	172° 22' 45"	8° 10' 23"	0° 55' 41"	15' 10.31"	291° 21' 43"	0.30360
4	170° 17' 45"	4° 27' 50"	172° 51' 10"	7° 56' 48"	0° 55' 42"	15' 10.75"	291° 26' 30"	0.30746
5	170° 49' 05"	4° 26' 27"	173° 19' 34"	7° 43' 09"	0° 55' 44"	15' 11.19"	291° 31' 08"	0.31134
6	171° 20' 27"	4° 25' 03"	173° 47' 58"	7° 29' 28"	0° 55' 45"	15' 11.63"	291° 35' 39"	0.31523
7	171° 51' 50"	4° 23' 37"	174° 16' 22"	7° 15' 45"	0° 55' 47"	15' 12.07"	291° 40' 01"	0.31914
8	172° 23' 15"	4° 22' 11"	174° 44' 45"	7° 01' 59"	0° 55' 49"	15' 12.52"	291° 44' 16"	0.32307
9	172° 54' 42"	4° 20' 42"	175° 13' 09"	6° 48' 11"	0° 55' 50"	15' 12.97"	291° 48' 22"	0.32701
10	173° 26' 10"	4° 19' 13"	175° 41' 32"	6° 34' 20"	0° 55' 52"	15' 13.42"	291° 52' 20"	0.33097
11	173° 57' 39"	4° 17' 42"	176° 09' 56"	6° 20' 26"	0° 55' 54"	15' 13.88"	291° 56' 10"	0.33495
12	174° 29' 11"	4° 16' 09"	176° 38' 19"	6° 06' 31"	0° 55' 55"	15' 14.34"	291° 59' 52"	0.33894
13	175° 00' 44"	4° 14' 35"	177° 06' 43"	5° 52' 33"	0° 55' 57"	15' 14.81"	292° 3' 26"	0.34294
14	175° 32' 19"	4° 13' 00"	177° 35' 07"	5° 38' 33"	0° 55' 59"	15' 15.28"	292° 6' 52"	0.34697
15	176° 03' 56"	4° 11' 24"	178° 03' 31"	5° 24' 30"	0° 56' 01"	15' 15.75"	292° 10' 09"	0.35100
16	176° 35' 34"	4° 09' 46"	178° 31' 56"	5° 10' 26"	0° 56' 02"	15' 16.22"	292° 13' 19"	0.35506
17	177° 07' 14"	4° 08' 06"	179° 00' 21"	4° 56' 19"	0° 56' 04"	15' 16.70"	292° 16' 20"	0.35913
18	177° 38' 56"	4° 06' 26"	179° 28' 46"	4° 42' 10"	0° 56' 06"	15' 17.18"	292° 19' 13"	0.36321
19	178° 10' 40"	4° 04' 44"	179° 57' 12"	4° 27' 59"	0° 56' 08"	15' 17.66"	292° 21' 58"	0.36730
20	178° 42' 25"	4° 03' 00"	180° 25' 39"	4° 13' 47"	0° 56' 09"	15' 18.15"	292° 24' 35"	0.37141
21	179° 14' 13"	4° 01' 15"	180° 54' 06"	3° 59' 32"	0° 56' 11"	15' 18.64"	292° 27' 03"	0.37554
22	179° 46' 02"	3° 59' 29"	181° 22' 35"	3° 45' 15"	0° 56' 13"	15' 19.14"	292° 29' 24"	0.37968
23	180° 17' 53"	3° 57' 42"	181° 51' 04"	3° 30' 57"	0° 56' 15"	15' 19.64"	292° 31' 36"	0.38383
24	180° 49' 46"	3° 55' 53"	182° 19' 34"	3° 16' 37"	0° 56' 17"	15' 20.14"	292° 33' 40"	0.38799

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	103° 57' 00"	0.64"	105° 08' 22"	22° 42' 30"	1.0167083	15' 43.86"	23° 26' 16"	-4 m 42 s
1	103° 59' 23"	0.63"	105° 10' 56"	22° 42' 15"	1.0167080	15' 43.86"	23° 26' 16"	-4 m 43 s
2	104° 01' 46"	0.63"	105° 13' 30"	22° 42' 01"	1.0167076	15' 43.86"	23° 26' 16"	-4 m 43 s
3	104° 04' 09"	0.62"	105° 16' 04"	22° 41' 46"	1.0167072	15' 43.86"	23° 26' 16"	-4 m 44 s
4	104° 06' 32"	0.62"	105° 18' 38"	22° 41' 31"	1.0167067	15' 43.86"	23° 26' 16"	-4 m 44 s
5	104° 08' 55"	0.62"	105° 21' 12"	22° 41' 16"	1.0167063	15' 43.86"	23° 26' 16"	-4 m 44 s
6	104° 11' 18"	0.61"	105° 23' 47"	22° 41' 00"	1.0167059	15' 43.86"	23° 26' 16"	-4 m 45 s
7	104° 13' 41"	0.61"	105° 26' 21"	22° 40' 45"	1.0167055	15' 43.86"	23° 26' 16"	-4 m 45 s
8	104° 16' 04"	0.60"	105° 28' 55"	22° 40' 30"	1.0167050	15' 43.86"	23° 26' 16"	-4 m 46 s
9	104° 18' 27"	0.60"	105° 31' 29"	22° 40' 15"	1.0167046	15' 43.86"	23° 26' 16"	-4 m 46 s
10	104° 20' 50"	0.60"	105° 34' 03"	22° 39' 60"	1.0167041	15' 43.86"	23° 26' 16"	-4 m 46 s
11	104° 23' 13"	0.59"	105° 36' 37"	22° 39' 44"	1.0167036	15' 43.86"	23° 26' 16"	-4 m 47 s
12	104° 25' 36"	0.59"	105° 39' 11"	22° 39' 29"	1.0167032	15' 43.86"	23° 26' 16"	-4 m 47 s
13	104° 27' 59"	0.58"	105° 41' 45"	22° 39' 14"	1.0167027	15' 43.86"	23° 26' 16"	-4 m 48 s
14	104° 30' 22"	0.58"	105° 44' 19"	22° 38' 58"	1.0167022	15' 43.87"	23° 26' 16"	-4 m 48 s
15	104° 32' 45"	0.57"	105° 46' 53"	22° 38' 43"	1.0167017	15' 43.87"	23° 26' 16"	-4 m 49 s
16	104° 35' 08"	0.57"	105° 49' 27"	22° 38' 27"	1.0167012	15' 43.87"	23° 26' 16"	-4 m 49 s
17	104° 37' 31"	0.56"	105° 52' 01"	22° 38' 12"	1.0167006	15' 43.87"	23° 26' 16"	-4 m 49 s
18	104° 39' 54"	0.56"	105° 54' 35"	22° 37' 56"	1.0167001	15' 43.87"	23° 26' 16"	-4 m 50 s
19	104° 42' 17"	0.55"	105° 57' 09"	22° 37' 41"	1.0166996	15' 43.87"	23° 26' 16"	-4 m 50 s
20	104° 44' 40"	0.55"	105° 59' 43"	22° 37' 25"	1.0166990	15' 43.87"	23° 26' 16"	-4 m 51 s
21	104° 47' 03"	0.55"	106° 02' 17"	22° 37' 09"	1.0166985	15' 43.87"	23° 26' 16"	-4 m 51 s
22	104° 49' 27"	0.54"	106° 04' 51"	22° 36' 54"	1.0166979	15' 43.87"	23° 26' 16"	-4 m 51 s
23	104° 51' 50"	0.54"	106° 07' 25"	22° 36' 38"	1.0166973	15' 43.87"	23° 26' 16"	-4 m 52 s
24	104° 54' 13"	0.53"	106° 09' 59"	22° 36' 22"	1.0166967	15' 43.87"	23° 26' 16"	-4 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	180° 49' 46"	3° 55' 53"	182° 19' 34"	3° 16' 37"	0° 56' 17"	15' 20.14"	292° 33' 40"	0.38799
1	181° 21' 40"	3° 54' 03"	182° 48' 05"	3° 02' 15"	0° 56' 19"	15' 20.64"	292° 35' 36"	0.39217
2	181° 53' 37"	3° 52' 11"	183° 16' 37"	2° 47' 51"	0° 56' 20"	15' 21.15"	292° 37' 24"	0.39636
3	182° 25' 36"	3° 50' 19"	183° 45' 10"	2° 33' 26"	0° 56' 22"	15' 21.66"	292° 39' 03"	0.40056
4	182° 57' 36"	3° 48' 25"	184° 13' 44"	2° 18' 60"	0° 56' 24"	15' 22.17"	292° 40' 34"	0.40478
5	183° 29' 38"	3° 46' 29"	184° 42' 20"	2° 04' 31"	0° 56' 26"	15' 22.69"	292° 41' 57"	0.40900
6	184° 01' 43"	3° 44' 32"	185° 10' 57"	1° 50' 02"	0° 56' 28"	15' 23.21"	292° 43' 11"	0.41324
7	184° 33' 49"	3° 42' 34"	185° 39' 35"	1° 35' 31"	0° 56' 30"	15' 23.73"	292° 44' 18"	0.41749
8	185° 05' 58"	3° 40' 35"	186° 08' 15"	1° 20' 58"	0° 56' 32"	15' 24.25"	292° 45' 15"	0.42175
9	185° 38' 08"	3° 38' 34"	186° 36' 57"	1° 06' 24"	0° 56' 34"	15' 24.78"	292° 46' 05"	0.42602
10	186° 10' 20"	3° 36' 33"	187° 05' 40"	0° 51' 49"	0° 56' 36"	15' 25.31"	292° 46' 46"	0.43031
11	186° 42' 35"	3° 34' 29"	187° 34' 25"	0° 37' 13"	0° 56' 38"	15' 25.85"	292° 47' 18"	0.43460
12	187° 14' 51"	3° 32' 25"	188° 03' 11"	0° 22' 35"	0° 56' 40"	15' 26.38"	292° 47' 43"	0.43890
13	187° 47' 10"	3° 30' 19"	188° 31' 60"	0° 07' 57"	0° 56' 42"	15' 26.92"	292° 47' 58"	0.44322
14	188° 19' 31"	3° 28' 12"	189° 00' 50"	0° -6' 43"	0° 56' 44"	15' 27.47"	292° 48' 06"	0.44754
15	188° 51' 53"	3° 26' 04"	189° 29' 43"	0° -21' 23"	0° 56' 46"	15' 28.01"	292° 48' 04"	0.45187
16	189° 24' 18"	3° 23' 54"	189° 58' 38"	0° -36' 05"	0° 56' 48"	15' 28.56"	292° 47' 55"	0.45621
17	189° 56' 45"	3° 21' 44"	190° 27' 34"	0° -50' 47"	0° 56' 50"	15' 29.11"	292° 47' 36"	0.46056
18	190° 29' 14"	3° 19' 32"	190° 56' 34"	-1° 05' 31"	0° 56' 52"	15' 29.67"	292° 47' 09"	0.46492
19	191° 01' 46"	3° 17' 19"	191° 25' 35"	-1° 20' 15"	0° 56' 54"	15' 30.22"	292° 46' 34"	0.46928
20	191° 34' 19"	3° 15' 04"	191° 54' 39"	-1° 34' 59"	0° 56' 56"	15' 30.78"	292° 45' 49"	0.47366
21	192° 06' 55"	3° 12' 49"	192° 23' 45"	-1° 49' 45"	0° 56' 58"	15' 31.34"	292° 44' 57"	0.47804
22	192° 39' 33"	3° 10' 32"	192° 52' 54"	-2° 04' 31"	0° 56' 60"	15' 31.91"	292° 43' 55"	0.48243
23	193° 12' 13"	3° 08' 14"	193° 22' 06"	-2° 19' 17"	0° 57' 02"	15' 32.47"	292° 42' 44"	0.48682
24	193° 44' 55"	3° 05' 54"	193° 51' 20"	-2° 34' 04"	0° 57' 04"	15' 33.04"	292° 41' 25"	0.49122



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	104° 54' 13"	0.53"	106° 09' 59"	22° 36' 22"	1.0166967	15' 43.87"	23° 26' 16"	-4 m 52 s
1	104° 56' 36"	0.53"	106° 12' 33"	22° 36' 06"	1.0166962	15' 43.87"	23° 26' 16"	-4 m 53 s
2	104° 58' 59"	0.52"	106° 15' 07"	22° 35' 50"	1.0166956	15' 43.87"	23° 26' 16"	-4 m 53 s
3	105° 01' 22"	0.52"	106° 17' 41"	22° 35' 34"	1.0166950	15' 43.87"	23° 26' 16"	-4 m 53 s
4	105° 03' 45"	0.51"	106° 20' 15"	22° 35' 18"	1.0166943	15' 43.87"	23° 26' 16"	-4 m 54 s
5	105° 06' 08"	0.51"	106° 22' 49"	22° 35' 02"	1.0166937	15' 43.87"	23° 26' 16"	-4 m 54 s
6	105° 08' 31"	0.50"	106° 25' 23"	22° 34' 46"	1.0166931	15' 43.87"	23° 26' 16"	-4 m 55 s
7	105° 10' 54"	0.50"	106° 27' 57"	22° 34' 30"	1.0166925	15' 43.87"	23° 26' 16"	-4 m 55 s
8	105° 13' 17"	0.49"	106° 30' 31"	22° 34' 14"	1.0166918	15' 43.88"	23° 26' 16"	-4 m 55 s
9	105° 15' 40"	0.49"	106° 33' 05"	22° 33' 58"	1.0166912	15' 43.88"	23° 26' 16"	-4 m 56 s
10	105° 18' 03"	0.48"	106° 35' 38"	22° 33' 41"	1.0166905	15' 43.88"	23° 26' 16"	-4 m 56 s
11	105° 20' 26"	0.48"	106° 38' 12"	22° 33' 25"	1.0166898	15' 43.88"	23° 26' 16"	-4 m 57 s
12	105° 22' 49"	0.47"	106° 40' 46"	22° 33' 09"	1.0166891	15' 43.88"	23° 26' 16"	-4 m 57 s
13	105° 25' 12"	0.47"	106° 43' 20"	22° 32' 53"	1.0166885	15' 43.88"	23° 26' 16"	-4 m 57 s
14	105° 27' 35"	0.46"	106° 45' 54"	22° 32' 36"	1.0166878	15' 43.88"	23° 26' 16"	-4 m 58 s
15	105° 29' 58"	0.46"	106° 48' 27"	22° 32' 20"	1.0166871	15' 43.88"	23° 26' 16"	-4 m 58 s
16	105° 32' 21"	0.45"	106° 51' 01"	22° 32' 03"	1.0166863	15' 43.88"	23° 26' 16"	-4 m 59 s
17	105° 34' 44"	0.45"	106° 53' 35"	22° 31' 47"	1.0166856	15' 43.88"	23° 26' 16"	-4 m 59 s
18	105° 37' 07"	0.44"	106° 56' 09"	22° 31' 30"	1.0166849	15' 43.88"	23° 26' 16"	-4 m 59 s
19	105° 39' 30"	0.44"	106° 58' 43"	22° 31' 14"	1.0166842	15' 43.88"	23° 26' 16"	-4 m 60 s
20	105° 41' 53"	0.43"	107° 01' 16"	22° 30' 57"	1.0166834	15' 43.88"	23° 26' 16"	-5 m 00 s
21	105° 44' 16"	0.43"	107° 03' 50"	22° 30' 40"	1.0166827	15' 43.88"	23° 26' 16"	-5 m 01 s
22	105° 46' 39"	0.42"	107° 06' 24"	22° 30' 24"	1.0166819	15' 43.88"	23° 26' 16"	-5 m 01 s
23	105° 49' 02"	0.42"	107° 08' 58"	22° 30' 07"	1.0166811	15' 43.88"	23° 26' 16"	-5 m 01 s
24	105° 51' 25"	0.41"	107° 11' 31"	22° 29' 50"	1.0166804	15' 43.89"	23° 26' 16"	-5 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	193° 44' 55"	3° 05' 54"	193° 51' 20"	-2° 34' 04"	0° 57' 04"	15' 33.04"	292° 41' 25"	0.49122
1	194° 17' 40"	3° 03' 34"	194° 20' 37"	-2° 48' 51"	0° 57' 06"	15' 33.61"	292° 39' 57"	0.49563
2	194° 50' 27"	3° 01' 12"	194° 49' 57"	-3° 03' 39"	0° 57' 08"	15' 34.19"	292° 38' 21"	0.50005
3	195° 23' 16"	2° 58' 50"	195° 19' 20"	-3° 18' 27"	0° 57' 10"	15' 34.76"	292° 36' 35"	0.50447
4	195° 56' 07"	2° 56' 26"	195° 48' 46"	-3° 33' 15"	0° 57' 12"	15' 35.34"	292° 34' 40"	0.50889
5	196° 29' 01"	2° 54' 01"	196° 18' 16"	-3° 48' 04"	0° 57' 15"	15' 35.92"	292° 32' 37"	0.51333
6	197° 01' 57"	2° 51' 35"	196° 47' 48"	-4° 02' 52"	0° 57' 17"	15' 36.51"	292° 30' 24"	0.51776
7	197° 34' 56"	2° 49' 07"	197° 17' 24"	-4° 17' 41"	0° 57' 19"	15' 37.09"	292° 28' 02"	0.52220
8	198° 07' 56"	2° 46' 39"	197° 47' 03"	-4° 32' 29"	0° 57' 21"	15' 37.68"	292° 25' 32"	0.52665
9	198° 40' 59"	2° 44' 09"	198° 16' 46"	-4° 47' 18"	0° 57' 23"	15' 38.27"	292° 22' 52"	0.53109
10	199° 14' 05"	2° 41' 39"	198° 46' 32"	-5° 02' 06"	0° 57' 25"	15' 38.86"	292° 20' 03"	0.53555
11	199° 47' 13"	2° 39' 07"	199° 16' 22"	-5° 16' 54"	0° 57' 28"	15' 39.45"	292° 17' 04"	0.54000
12	200° 20' 23"	2° 36' 34"	199° 46' 15"	-5° 31' 42"	0° 57' 30"	15' 40.05"	292° 13' 57"	0.54446
13	200° 53' 36"	2° 34' 01"	200° 16' 13"	-5° 46' 29"	0° 57' 32"	15' 40.65"	292° 10' 40"	0.54892
14	201° 26' 51"	2° 31' 26"	200° 46' 14"	-6° 01' 16"	0° 57' 34"	15' 41.25"	292° 7' 14"	0.55338
15	202° 00' 09"	2° 28' 50"	201° 16' 19"	-6° 16' 03"	0° 57' 36"	15' 41.85"	292° 3' 38"	0.55785
16	202° 33' 29"	2° 26' 13"	201° 46' 28"	-6° 30' 49"	0° 57' 39"	15' 42.45"	291° 59' 53"	0.56231
17	203° 06' 51"	2° 23' 35"	202° 16' 41"	-6° 45' 34"	0° 57' 41"	15' 43.05"	291° 55' 59"	0.56678
18	203° 40' 16"	2° 20' 56"	202° 46' 59"	-7° 00' 18"	0° 57' 43"	15' 43.66"	291° 51' 55"	0.57124
19	204° 13' 44"	2° 18' 16"	203° 17' 21"	-7° 15' 02"	0° 57' 45"	15' 44.26"	291° 47' 41"	0.57571
20	204° 47' 14"	2° 15' 35"	203° 47' 47"	-7° 29' 45"	0° 57' 47"	15' 44.87"	291° 43' 18"	0.58018
21	205° 20' 46"	2° 12' 53"	204° 18' 18"	-7° 44' 27"	0° 57' 50"	15' 45.48"	291° 38' 45"	0.58465
22	205° 54' 21"	2° 10' 10"	204° 48' 53"	-7° 59' 08"	0° 57' 52"	15' 46.09"	291° 34' 02"	0.58911
23	206° 27' 59"	2° 07' 26"	205° 19' 33"	-8° 13' 48"	0° 57' 54"	15' 46.71"	291° 29' 09"	0.59358
24	207° 01' 39"	2° 04' 41"	205° 50' 17"	-8° 28' 26"	0° 57' 56"	15' 47.32"	291° 24' 07"	0.59804

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	105° 51' 25"	0.41"	107° 11' 31"	22° 29' 50"	1.0166804	15' 43.89"	23° 26' 16"	-5 m 02 s
1	105° 53' 48"	0.41"	107° 14' 05"	22° 29' 33"	1.0166796	15' 43.89"	23° 26' 16"	-5 m 02 s
2	105° 56' 11"	0.40"	107° 16' 39"	22° 29' 16"	1.0166788	15' 43.89"	23° 26' 16"	-5 m 03 s
3	105° 58' 34"	0.39"	107° 19' 12"	22° 28' 59"	1.0166780	15' 43.89"	23° 26' 16"	-5 m 03 s
4	106° 00' 57"	0.39"	107° 21' 46"	22° 28' 42"	1.0166772	15' 43.89"	23° 26' 16"	-5 m 03 s
5	106° 03' 20"	0.38"	107° 24' 20"	22° 28' 25"	1.0166764	15' 43.89"	23° 26' 16"	-5 m 04 s
6	106° 05' 43"	0.38"	107° 26' 53"	22° 28' 08"	1.0166756	15' 43.89"	23° 26' 16"	-5 m 04 s
7	106° 08' 06"	0.37"	107° 29' 27"	22° 27' 51"	1.0166747	15' 43.89"	23° 26' 16"	-5 m 05 s
8	106° 10' 29"	0.37"	107° 32' 00"	22° 27' 34"	1.0166739	15' 43.89"	23° 26' 16"	-5 m 05 s
9	106° 12' 52"	0.36"	107° 34' 34"	22° 27' 17"	1.0166731	15' 43.89"	23° 26' 16"	-5 m 05 s
10	106° 15' 15"	0.36"	107° 37' 08"	22° 26' 60"	1.0166722	15' 43.89"	23° 26' 16"	-5 m 06 s
11	106° 17' 38"	0.35"	107° 39' 41"	22° 26' 43"	1.0166714	15' 43.89"	23° 26' 16"	-5 m 06 s
12	106° 20' 00"	0.35"	107° 42' 15"	22° 26' 25"	1.0166705	15' 43.89"	23° 26' 16"	-5 m 06 s
13	106° 22' 23"	0.34"	107° 44' 48"	22° 26' 08"	1.0166696	15' 43.90"	23° 26' 16"	-5 m 07 s
14	106° 24' 46"	0.34"	107° 47' 22"	22° 25' 51"	1.0166687	15' 43.90"	23° 26' 16"	-5 m 07 s
15	106° 27' 09"	0.33"	107° 49' 56"	22° 25' 33"	1.0166679	15' 43.90"	23° 26' 16"	-5 m 08 s
16	106° 29' 32"	0.32"	107° 52' 29"	22° 25' 16"	1.0166670	15' 43.90"	23° 26' 16"	-5 m 08 s
17	106° 31' 55"	0.32"	107° 55' 03"	22° 24' 58"	1.0166661	15' 43.90"	23° 26' 16"	-5 m 08 s
18	106° 34' 18"	0.31"	107° 57' 36"	22° 24' 41"	1.0166652	15' 43.90"	23° 26' 16"	-5 m 09 s
19	106° 36' 41"	0.31"	108° 00' 10"	22° 24' 23"	1.0166642	15' 43.90"	23° 26' 16"	-5 m 09 s
20	106° 39' 04"	0.30"	108° 02' 43"	22° 24' 06"	1.0166633	15' 43.90"	23° 26' 16"	-5 m 10 s
21	106° 41' 27"	0.30"	108° 05' 17"	22° 23' 48"	1.0166624	15' 43.90"	23° 26' 16"	-5 m 10 s
22	106° 43' 50"	0.29"	108° 07' 50"	22° 23' 30"	1.0166614	15' 43.90"	23° 26' 16"	-5 m 10 s
23	106° 46' 13"	0.29"	108° 10' 23"	22° 23' 12"	1.0166605	15' 43.90"	23° 26' 16"	-5 m 11 s
24	106° 48' 36"	0.28"	108° 12' 57"	22° 22' 55"	1.0166595	15' 43.90"	23° 26' 16"	-5 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	207° 01' 39"	2° 04' 41"	205° 50' 17"	-8° 28' 26"	0° 57' 56"	15' 47.32"	291° 24' 07"	0.59804
1	207° 35' 22"	2° 01' 55"	206° 21' 07"	-8° 43' 04"	0° 57' 59"	15' 47.93"	291° 18' 55"	0.60250
2	208° 09' 07"	1° 59' 08"	206° 52' 01"	-8° 57' 40"	0° 58' 01"	15' 48.55"	291° 13' 32"	0.60696
3	208° 42' 55"	1° 56' 20"	207° 23' 00"	-9° 12' 14"	0° 58' 03"	15' 49.17"	291° 8' 00"	0.61142
4	209° 16' 45"	1° 53' 32"	207° 54' 04"	-9° 26' 48"	0° 58' 05"	15' 49.79"	291° 2' 18"	0.61587
5	209° 50' 38"	1° 50' 43"	208° 25' 14"	-9° 41' 19"	0° 58' 08"	15' 50.40"	290° 56' 25"	0.62032
6	210° 24' 34"	1° 47' 52"	208° 56' 28"	-9° 55' 49"	0° 58' 10"	15' 51.02"	290° 50' 22"	0.62477
7	210° 58' 32"	1° 45' 01"	209° 27' 48"	-10° 10' 17"	0° 58' 12"	15' 51.64"	290° 44' 09"	0.62921
8	211° 32' 33"	1° 42' 09"	209° 59' 13"	-10° 24' 44"	0° 58' 15"	15' 52.26"	290° 37' 46"	0.63365
9	212° 06' 36"	1° 39' 16"	210° 30' 44"	-10° 39' 08"	0° 58' 17"	15' 52.89"	290° 31' 12"	0.63808
10	212° 40' 43"	1° 36' 23"	211° 02' 20"	-10° 53' 30"	0° 58' 19"	15' 53.51"	290° 24' 28"	0.64251
11	213° 14' 52"	1° 33' 28"	211° 34' 02"	-11° 07' 51"	0° 58' 21"	15' 54.13"	290° 17' 33"	0.64693
12	213° 49' 03"	1° 30' 33"	212° 05' 49"	-11° 22' 09"	0° 58' 24"	15' 54.75"	290° 10' 28"	0.65134
13	214° 23' 17"	1° 27' 37"	212° 37' 43"	-11° 36' 25"	0° 58' 26"	15' 55.37"	290° 3' 12"	0.65575
14	214° 57' 34"	1° 24' 40"	213° 09' 42"	-11° 50' 38"	0° 58' 28"	15' 56.00"	289° 55' 45"	0.66015
15	215° 31' 54"	1° 21' 43"	213° 41' 47"	-12° 04' 49"	0° 58' 31"	15' 56.62"	289° 48' 07"	0.66454
16	216° 06' 16"	1° 18' 45"	214° 13' 58"	-12° 18' 58"	0° 58' 33"	15' 57.24"	289° 40' 19"	0.66893
17	216° 40' 41"	1° 15' 46"	214° 46' 15"	-12° 33' 04"	0° 58' 35"	15' 57.87"	289° 32' 20"	0.67330
18	217° 15' 08"	1° 12' 46"	215° 18' 38"	-12° 47' 07"	0° 58' 37"	15' 58.49"	289° 24' 09"	0.67767
19	217° 49' 39"	1° 09' 46"	215° 51' 07"	-13° 01' 07"	0° 58' 40"	15' 59.11"	289° 15' 48"	0.68203
20	218° 24' 12"	1° 06' 45"	216° 23' 43"	-13° 15' 05"	0° 58' 42"	15' 59.73"	289° 7' 15"	0.68638
21	218° 58' 48"	1° 03' 44"	216° 56' 25"	-13° 28' 59"	0° 58' 44"	16' 00.35"	288° 58' 32"	0.69071
22	219° 33' 26"	1° 00' 41"	217° 29' 14"	-13° 42' 50"	0° 58' 47"	16' 00.98"	288° 49' 37"	0.69504
23	220° 08' 07"	0° 57' 39"	218° 02' 09"	-13° 56' 38"	0° 58' 49"	16' 01.60"	288° 40' 30"	0.69936
24	220° 42' 51"	0° 54' 35"	218° 35' 11"	-14° 10' 23"	0° 58' 51"	16' 02.22"	288° 31' 12"	0.70366



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	106° 48' 36"	0.28"	108° 12' 57"	22° 22' 55"	1.0166595	15' 43.90"	23° 26' 16"	-5 m 11 s
1	106° 50' 59"	0.28"	108° 15' 30"	22° 22' 37"	1.0166586	15' 43.91"	23° 26' 16"	-5 m 11 s
2	106° 53' 22"	0.27"	108° 18' 04"	22° 22' 19"	1.0166576	15' 43.91"	23° 26' 16"	-5 m 12 s
3	106° 55' 45"	0.27"	108° 20' 37"	22° 22' 01"	1.0166566	15' 43.91"	23° 26' 16"	-5 m 12 s
4	106° 58' 08"	0.26"	108° 23' 11"	22° 21' 43"	1.0166557	15' 43.91"	23° 26' 16"	-5 m 13 s
5	107° 00' 31"	0.25"	108° 25' 44"	22° 21' 25"	1.0166547	15' 43.91"	23° 26' 16"	-5 m 13 s
6	107° 02' 54"	0.25"	108° 28' 17"	22° 21' 07"	1.0166537	15' 43.91"	23° 26' 16"	-5 m 13 s
7	107° 05' 17"	0.24"	108° 30' 51"	22° 20' 49"	1.0166527	15' 43.91"	23° 26' 16"	-5 m 14 s
8	107° 07' 40"	0.24"	108° 33' 24"	22° 20' 31"	1.0166517	15' 43.91"	23° 26' 16"	-5 m 14 s
9	107° 10' 03"	0.23"	108° 35' 57"	22° 20' 13"	1.0166507	15' 43.91"	23° 26' 16"	-5 m 14 s
10	107° 12' 26"	0.23"	108° 38' 31"	22° 19' 55"	1.0166496	15' 43.91"	23° 26' 16"	-5 m 15 s
11	107° 14' 49"	0.22"	108° 41' 04"	22° 19' 37"	1.0166486	15' 43.92"	23° 26' 16"	-5 m 15 s
12	107° 17' 12"	0.22"	108° 43' 37"	22° 19' 18"	1.0166476	15' 43.92"	23° 26' 16"	-5 m 15 s
13	107° 19' 35"	0.21"	108° 46' 11"	22° 19' 00"	1.0166465	15' 43.92"	23° 26' 16"	-5 m 16 s
14	107° 21' 58"	0.21"	108° 48' 44"	22° 18' 42"	1.0166455	15' 43.92"	23° 26' 16"	-5 m 16 s
15	107° 24' 21"	0.20"	108° 51' 17"	22° 18' 23"	1.0166444	15' 43.92"	23° 26' 16"	-5 m 17 s
16	107° 26' 44"	0.19"	108° 53' 50"	22° 18' 05"	1.0166433	15' 43.92"	23° 26' 16"	-5 m 17 s
17	107° 29' 07"	0.19"	108° 56' 24"	22° 17' 47"	1.0166423	15' 43.92"	23° 26' 16"	-5 m 17 s
18	107° 31' 30"	0.18"	108° 58' 57"	22° 17' 28"	1.0166412	15' 43.92"	23° 26' 16"	-5 m 18 s
19	107° 33' 53"	0.18"	109° 01' 30"	22° 17' 10"	1.0166401	15' 43.92"	23° 26' 16"	-5 m 18 s
20	107° 36' 16"	0.17"	109° 04' 03"	22° 16' 51"	1.0166390	15' 43.92"	23° 26' 16"	-5 m 18 s
21	107° 38' 39"	0.17"	109° 06' 37"	22° 16' 32"	1.0166379	15' 43.93"	23° 26' 16"	-5 m 19 s
22	107° 41' 02"	0.16"	109° 09' 10"	22° 16' 14"	1.0166368	15' 43.93"	23° 26' 16"	-5 m 19 s
23	107° 43' 25"	0.16"	109° 11' 43"	22° 15' 55"	1.0166357	15' 43.93"	23° 26' 16"	-5 m 19 s
24	107° 45' 48"	0.15"	109° 14' 16"	22° 15' 36"	1.0166346	15' 43.93"	23° 26' 16"	-5 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	220° 42' 51"	0° 54' 35"	218° 35' 11"	-14° 10' 23"	0° 58' 51"	16' 02.22"	288° 31' 12"	0.70366
1	221° 17' 38"	0° 51' 31"	219° 08' 19"	-14° 24' 04"	0° 58' 53"	16' 02.84"	288° 21' 43"	0.70795
2	221° 52' 27"	0° 48' 27"	219° 41' 34"	-14° 37' 41"	0° 58' 56"	16' 03.45"	288° 12' 02"	0.71223
3	222° 27' 20"	0° 45' 22"	220° 14' 56"	-14° 51' 15"	0° 58' 58"	16' 04.07"	288° 2' 09"	0.71650
4	223° 02' 15"	0° 42' 16"	220° 48' 25"	-15° 04' 46"	0° 59' 00"	16' 04.69"	287° 52' 04"	0.72075
5	223° 37' 12"	0° 39' 10"	221° 22' 01"	-15° 18' 12"	0° 59' 02"	16' 05.30"	287° 41' 48"	0.72499
6	224° 12' 13"	0° 36' 04"	221° 55' 43"	-15° 31' 34"	0° 59' 05"	16' 05.92"	287° 31' 20"	0.72922
7	224° 47' 16"	0° 32' 57"	222° 29' 33"	-15° 44' 53"	0° 59' 07"	16' 06.53"	287° 20' 39"	0.73342
8	225° 22' 22"	0° 29' 49"	223° 03' 30"	-15° 58' 07"	0° 59' 09"	16' 07.14"	287° 9' 47"	0.73762
9	225° 57' 31"	0° 26' 41"	223° 37' 34"	-16° 11' 17"	0° 59' 11"	16' 07.75"	286° 58' 42"	0.74180
10	226° 32' 42"	0° 23' 33"	224° 11' 45"	-16° 24' 22"	0° 59' 14"	16' 08.36"	286° 47' 25"	0.74596
11	227° 07' 56"	0° 20' 24"	224° 46' 04"	-16° 37' 23"	0° 59' 16"	16' 08.96"	286° 35' 56"	0.75011
12	227° 43' 13"	0° 17' 15"	225° 20' 30"	-16° 50' 19"	0° 59' 18"	16' 09.57"	286° 24' 14"	0.75423
13	228° 18' 33"	0° 14' 06"	225° 55' 03"	-17° 03' 11"	0° 59' 20"	16' 10.17"	286° 12' 20"	0.75834
14	228° 53' 55"	0° 10' 56"	226° 29' 44"	-17° 15' 57"	0° 59' 22"	16' 10.77"	286° 0' 13"	0.76244
15	229° 29' 21"	0° 07' 46"	227° 04' 33"	-17° 28' 39"	0° 59' 25"	16' 11.37"	285° 47' 53"	0.76651
16	230° 04' 49"	0° 04' 36"	227° 39' 28"	-17° 41' 15"	0° 59' 27"	16' 11.96"	285° 35' 21"	0.77056
17	230° 40' 19"	0° 01' 26"	228° 14' 32"	-17° 53' 47"	0° 59' 29"	16' 12.56"	285° 22' 35"	0.77460
18	231° 15' 53"	0° -1' 45"	228° 49' 43"	-18° 06' 13"	0° 59' 31"	16' 13.15"	285° 9' 37"	0.77861
19	231° 51' 29"	0° -4' 56"	229° 25' 02"	-18° 18' 33"	0° 59' 33"	16' 13.74"	284° 56' 25"	0.78261
20	232° 27' 08"	0° -8' 07"	230° 00' 29"	-18° 30' 48"	0° 59' 36"	16' 14.32"	284° 42' 60"	0.78658
21	233° 02' 49"	0° -11' 19"	230° 36' 03"	-18° 42' 57"	0° 59' 38"	16' 14.91"	284° 29' 21"	0.79053
22	233° 38' 34"	0° -14' 30"	231° 11' 45"	-18° 55' 00"	0° 59' 40"	16' 15.49"	284° 15' 30"	0.79446
23	234° 14' 21"	0° -17' 42"	231° 47' 35"	-19° 06' 58"	0° 59' 42"	16' 16.06"	284° 1' 24"	0.79836
24	234° 50' 10"	0° -20' 54"	232° 23' 33"	-19° 18' 49"	0° 59' 44"	16' 16.64"	283° 47' 05"	0.80224

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	107° 45' 48"	0.15"	109° 14' 16"	22° 15' 36"	1.0166346	15' 43.93"	23° 26' 16"	-5 m 20 s
1	107° 48' 11"	0.15"	109° 16' 49"	22° 15' 18"	1.0166335	15' 43.93"	23° 26' 16"	-5 m 20 s
2	107° 50' 34"	0.14"	109° 19' 23"	22° 14' 59"	1.0166323	15' 43.93"	23° 26' 16"	-5 m 21 s
3	107° 52' 57"	0.14"	109° 21' 56"	22° 14' 40"	1.0166312	15' 43.93"	23° 26' 16"	-5 m 21 s
4	107° 55' 20"	0.13"	109° 24' 29"	22° 14' 21"	1.0166301	15' 43.93"	23° 26' 16"	-5 m 21 s
5	107° 57' 43"	0.12"	109° 27' 02"	22° 14' 02"	1.0166289	15' 43.93"	23° 26' 16"	-5 m 22 s
6	108° 00' 06"	0.12"	109° 29' 35"	22° 13' 43"	1.0166277	15' 43.93"	23° 26' 16"	-5 m 22 s
7	108° 02' 29"	0.11"	109° 32' 08"	22° 13' 24"	1.0166266	15' 43.94"	23° 26' 16"	-5 m 22 s
8	108° 04' 52"	0.11"	109° 34' 41"	22° 13' 05"	1.0166254	15' 43.94"	23° 26' 16"	-5 m 23 s
9	108° 07' 15"	0.10"	109° 37' 14"	22° 12' 46"	1.0166242	15' 43.94"	23° 26' 16"	-5 m 23 s
10	108° 09' 38"	0.10"	109° 39' 47"	22° 12' 27"	1.0166231	15' 43.94"	23° 26' 16"	-5 m 23 s
11	108° 12' 01"	0.09"	109° 42' 20"	22° 12' 08"	1.0166219	15' 43.94"	23° 26' 16"	-5 m 24 s
12	108° 14' 24"	0.09"	109° 44' 53"	22° 11' 49"	1.0166207	15' 43.94"	23° 26' 16"	-5 m 24 s
13	108° 16' 47"	0.08"	109° 47' 26"	22° 11' 29"	1.0166195	15' 43.94"	23° 26' 16"	-5 m 24 s
14	108° 19' 10"	0.08"	109° 49' 59"	22° 11' 10"	1.0166183	15' 43.94"	23° 26' 16"	-5 m 25 s
15	108° 21' 33"	0.07"	109° 52' 32"	22° 10' 51"	1.0166170	15' 43.94"	23° 26' 16"	-5 m 25 s
16	108° 23' 56"	0.07"	109° 55' 05"	22° 10' 31"	1.0166158	15' 43.95"	23° 26' 16"	-5 m 25 s
17	108° 26' 19"	0.06"	109° 57' 38"	22° 10' 12"	1.0166146	15' 43.95"	23° 26' 16"	-5 m 26 s
18	108° 28' 42"	0.06"	110° 00' 11"	22° 09' 52"	1.0166134	15' 43.95"	23° 26' 16"	-5 m 26 s
19	108° 31' 05"	0.05"	110° 02' 44"	22° 09' 33"	1.0166121	15' 43.95"	23° 26' 16"	-5 m 26 s
20	108° 33' 28"	0.05"	110° 05' 17"	22° 09' 13"	1.0166109	15' 43.95"	23° 26' 16"	-5 m 27 s
21	108° 35' 51"	0.04"	110° 07' 50"	22° 08' 54"	1.0166096	15' 43.95"	23° 26' 16"	-5 m 27 s
22	108° 38' 14"	0.04"	110° 10' 23"	22° 08' 34"	1.0166084	15' 43.95"	23° 26' 16"	-5 m 28 s
23	108° 40' 37"	0.03"	110° 12' 56"	22° 08' 15"	1.0166071	15' 43.95"	23° 26' 16"	-5 m 28 s
24	108° 42' 60"	0.03"	110° 15' 29"	22° 07' 55"	1.0166058	15' 43.95"	23° 26' 16"	-5 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	234° 50' 10"	0°-20' 54"	232° 23' 33"	-19° 18' 49"	0° 59' 44"	16' 16.64"	283° 47' 05"	0.80224
1	235° 26' 03"	0°-24' 06"	232° 59' 39"	-19° 30' 34"	0° 59' 46"	16' 17.21"	283° 32' 32"	0.80610
2	236° 01' 58"	0°-27' 18"	233° 35' 52"	-19° 42' 13"	0° 59' 48"	16' 17.78"	283° 17' 45"	0.80994
3	236° 37' 55"	0°-30' 30"	234° 12' 14"	-19° 53' 45"	0° 59' 50"	16' 18.34"	283° 2' 44"	0.81374
4	237° 13' 56"	0°-33' 42"	234° 48' 43"	-20° 05' 11"	0° 59' 52"	16' 18.90"	282° 47' 29"	0.81753
5	237° 49' 59"	0°-36' 54"	235° 25' 21"	-20° 16' 30"	0° 59' 54"	16' 19.46"	282° 31' 59"	0.82129
6	238° 26' 05"	0°-40' 05"	236° 02' 06"	-20° 27' 42"	0° 59' 56"	16' 20.01"	282° 16' 15"	0.82502
7	239° 02' 13"	0°-43' 17"	236° 38' 60"	-20° 38' 47"	0° 59' 58"	16' 20.56"	282° 0' 16"	0.82872
8	239° 38' 24"	0°-46' 29"	237° 16' 01"	-20° 49' 45"	1° 00' 00"	16' 21.11"	281° 44' 02"	0.83240
9	240° 14' 38"	0°-49' 41"	237° 53' 11"	-21° 00' 36"	1° 00' 02"	16' 21.65"	281° 27' 34"	0.83605
10	240° 50' 54"	0°-52' 53"	238° 30' 28"	-21° 11' 20"	1° 00' 04"	16' 22.19"	281° 10' 50"	0.83967
11	241° 27' 13"	0°-56' 04"	239° 07' 54"	-21° 21' 56"	1° 00' 06"	16' 22.72"	280° 53' 51"	0.84327
12	242° 03' 34"	0°-59' 15"	239° 45' 27"	-21° 32' 24"	1° 00' 08"	16' 23.25"	280° 36' 37"	0.84683
13	242° 39' 58"	-1° 02' 26"	240° 23' 09"	-21° 42' 45"	1° 00' 10"	16' 23.77"	280° 19' 07"	0.85037
14	243° 16' 25"	-1° 05' 37"	241° 00' 58"	-21° 52' 58"	1° 00' 12"	16' 24.29"	280° 1' 21"	0.85387
15	243° 52' 54"	-1° 08' 48"	241° 38' 55"	-22° 03' 03"	1° 00' 14"	16' 24.81"	279° 43' 19"	0.85734
16	244° 29' 25"	-1° 11' 58"	242° 17' 00"	-22° 12' 59"	1° 00' 16"	16' 25.32"	279° 25' 01"	0.86078
17	245° 05' 59"	-1° 15' 08"	242° 55' 14"	-22° 22' 48"	1° 00' 18"	16' 25.82"	279° 6' 26"	0.86419
18	245° 42' 36"	-1° 18' 18"	243° 33' 35"	-22° 32' 28"	1° 00' 20"	16' 26.32"	278° 47' 35"	0.86757
19	246° 19' 15"	-1° 21' 28"	244° 12' 03"	-22° 41' 59"	1° 00' 21"	16' 26.82"	278° 28' 26"	0.87091
20	246° 55' 56"	-1° 24' 37"	244° 50' 40"	-22° 51' 22"	1° 00' 23"	16' 27.31"	278° 9' 01"	0.87423
21	247° 32' 40"	-1° 27' 45"	245° 29' 24"	-23° 00' 36"	1° 00' 25"	16' 27.79"	277° 49' 18"	0.87750
22	248° 09' 26"	-1° 30' 53"	246° 08' 16"	-23° 09' 41"	1° 00' 27"	16' 28.27"	277° 29' 17"	0.88075
23	248° 46' 15"	-1° 34' 01"	246° 47' 16"	-23° 18' 38"	1° 00' 28"	16' 28.74"	277° 8' 58"	0.88396
24	249° 23' 06"	-1° 37' 08"	247° 26' 23"	-23° 27' 25"	1° 00' 30"	16' 29.21"	276° 48' 20"	0.88713

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	108° 42' 60"	0.03"	110° 15' 29"	22° 07' 55"	1.0166058	15' 43.95"	23° 26' 16"	-5 m 28 s
1	108° 45' 23"	0.02"	110° 18' 02"	22° 07' 35"	1.0166045	15' 43.96"	23° 26' 16"	-5 m 29 s
2	108° 47' 46"	0.02"	110° 20' 35"	22° 07' 16"	1.0166033	15' 43.96"	23° 26' 16"	-5 m 29 s
3	108° 50' 09"	0.01"	110° 23' 08"	22° 06' 56"	1.0166020	15' 43.96"	23° 26' 16"	-5 m 29 s
4	108° 52' 32"	0.01"	110° 25' 40"	22° 06' 36"	1.0166007	15' 43.96"	23° 26' 16"	-5 m 30 s
5	108° 54' 55"	0.00"	110° 28' 13"	22° 06' 16"	1.0165994	15' 43.96"	23° 26' 16"	-5 m 30 s
6	108° 57' 17"	-0.00"	110° 30' 46"	22° 05' 56"	1.0165981	15' 43.96"	23° 26' 16"	-5 m 30 s
7	108° 59' 40"	-0.01"	110° 33' 19"	22° 05' 36"	1.0165968	15' 43.96"	23° 26' 16"	-5 m 31 s
8	109° 02' 03"	-0.01"	110° 35' 52"	22° 05' 16"	1.0165954	15' 43.96"	23° 26' 16"	-5 m 31 s
9	109° 04' 26"	-0.02"	110° 38' 24"	22° 04' 56"	1.0165941	15' 43.97"	23° 26' 16"	-5 m 31 s
10	109° 06' 49"	-0.02"	110° 40' 57"	22° 04' 36"	1.0165928	15' 43.97"	23° 26' 16"	-5 m 32 s
11	109° 09' 12"	-0.03"	110° 43' 30"	22° 04' 16"	1.0165914	15' 43.97"	23° 26' 16"	-5 m 32 s
12	109° 11' 35"	-0.03"	110° 46' 03"	22° 03' 56"	1.0165901	15' 43.97"	23° 26' 16"	-5 m 32 s
13	109° 13' 58"	-0.04"	110° 48' 35"	22° 03' 36"	1.0165888	15' 43.97"	23° 26' 16"	-5 m 33 s
14	109° 16' 21"	-0.04"	110° 51' 08"	22° 03' 15"	1.0165874	15' 43.97"	23° 26' 16"	-5 m 33 s
15	109° 18' 44"	-0.04"	110° 53' 41"	22° 02' 55"	1.0165860	15' 43.97"	23° 26' 16"	-5 m 33 s
16	109° 21' 07"	-0.05"	110° 56' 14"	22° 02' 35"	1.0165847	15' 43.97"	23° 26' 16"	-5 m 34 s
17	109° 23' 30"	-0.05"	110° 58' 46"	22° 02' 14"	1.0165833	15' 43.98"	23° 26' 16"	-5 m 34 s
18	109° 25' 53"	-0.06"	111° 01' 19"	22° 01' 54"	1.0165819	15' 43.98"	23° 26' 16"	-5 m 34 s
19	109° 28' 16"	-0.06"	111° 03' 52"	22° 01' 34"	1.0165805	15' 43.98"	23° 26' 16"	-5 m 34 s
20	109° 30' 39"	-0.07"	111° 06' 24"	22° 01' 13"	1.0165791	15' 43.98"	23° 26' 16"	-5 m 35 s
21	109° 33' 02"	-0.07"	111° 08' 57"	22° 00' 53"	1.0165777	15' 43.98"	23° 26' 16"	-5 m 35 s
22	109° 35' 25"	-0.08"	111° 11' 30"	22° 00' 32"	1.0165763	15' 43.98"	23° 26' 16"	-5 m 35 s
23	109° 37' 48"	-0.08"	111° 14' 02"	22° 00' 11"	1.0165749	15' 43.98"	23° 26' 16"	-5 m 36 s
24	109° 40' 11"	-0.08"	111° 16' 35"	21° 59' 51"	1.0165735	15' 43.98"	23° 26' 16"	-5 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	249° 23' 06"	-1° 37' 08"	247° 26' 23"	-23° 27' 25"	1° 00' 30"	16' 29.21"	276° 48' 20"	0.88713
1	249° 59' 59"	-1° 40' 15"	248° 05' 38"	-23° 36' 03"	1° 00' 32"	16' 29.67"	276° 27' 24"	0.89027
2	250° 36' 54"	-1° 43' 22"	248° 45' 01"	-23° 44' 31"	1° 00' 34"	16' 30.13"	276° 6' 09"	0.89337
3	251° 13' 52"	-1° 46' 27"	249° 24' 30"	-23° 52' 50"	1° 00' 35"	16' 30.58"	275° 44' 34"	0.89643
4	251° 50' 53"	-1° 49' 32"	250° 04' 07"	-24° 00' 59"	1° 00' 37"	16' 31.02"	275° 22' 39"	0.89946
5	252° 27' 55"	-1° 52' 37"	250° 43' 52"	-24° 08' 58"	1° 00' 38"	16' 31.46"	275° 0' 24"	0.90245
6	253° 04' 60"	-1° 55' 41"	251° 23' 43"	-24° 16' 48"	1° 00' 40"	16' 31.89"	274° 37' 47"	0.90540
7	253° 42' 07"	-1° 58' 44"	252° 03' 42"	-24° 24' 27"	1° 00' 42"	16' 32.32"	274° 14' 49"	0.90831
8	254° 19' 16"	-2° 01' 47"	252° 43' 47"	-24° 31' 57"	1° 00' 43"	16' 32.74"	273° 51' 30"	0.91119
9	254° 56' 27"	-2° 04' 49"	253° 23' 60"	-24° 39' 16"	1° 00' 45"	16' 33.15"	273° 27' 47"	0.91402
10	255° 33' 40"	-2° 07' 50"	254° 04' 19"	-24° 46' 25"	1° 00' 46"	16' 33.55"	273° 3' 42"	0.91682
11	256° 10' 55"	-2° 10' 50"	254° 44' 45"	-24° 53' 23"	1° 00' 48"	16' 33.95"	272° 39' 12"	0.91957
12	256° 48' 13"	-2° 13' 50"	255° 25' 18"	-25° 00' 11"	1° 00' 49"	16' 34.34"	272° 14' 18"	0.92228
13	257° 25' 32"	-2° 16' 48"	256° 05' 57"	-25° 06' 48"	1° 00' 50"	16' 34.73"	271° 48' 58"	0.92496
14	258° 02' 54"	-2° 19' 46"	256° 46' 42"	-25° 13' 14"	1° 00' 52"	16' 35.10"	271° 23' 11"	0.92759
15	258° 40' 17"	-2° 22' 43"	257° 27' 34"	-25° 19' 29"	1° 00' 53"	16' 35.47"	270° 56' 58"	0.93018
16	259° 17' 43"	-2° 25' 39"	258° 08' 32"	-25° 25' 33"	1° 00' 54"	16' 35.84"	270° 30' 15"	0.93272
17	259° 55' 10"	-2° 28' 35"	258° 49' 35"	-25° 31' 27"	1° 00' 56"	16' 36.19"	270° 3' 04"	0.93522
18	260° 32' 39"	-2° 31' 29"	259° 30' 45"	-25° 37' 09"	1° 00' 57"	16' 36.54"	269° 35' 21"	0.93768
19	261° 10' 10"	-2° 34' 22"	260° 12' 00"	-25° 42' 39"	1° 00' 58"	16' 36.88"	269° 7' 07"	0.94010
20	261° 47' 43"	-2° 37' 15"	260° 53' 21"	-25° 47' 58"	1° 00' 60"	16' 37.21"	268° 38' 19"	0.94247
21	262° 25' 18"	-2° 40' 06"	261° 34' 48"	-25° 53' 06"	1° 01' 01"	16' 37.54"	268° 8' 55"	0.94480
22	263° 02' 54"	-2° 42' 56"	262° 16' 19"	-25° 58' 02"	1° 01' 02"	16' 37.85"	267° 38' 55"	0.94708
23	263° 40' 33"	-2° 45' 45"	262° 57' 56"	-26° 02' 46"	1° 01' 03"	16' 38.16"	267° 8' 16"	0.94932
24	264° 18' 12"	-2° 48' 34"	263° 39' 38"	-26° 07' 19"	1° 01' 04"	16' 38.46"	266° 36' 56"	0.95151

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	109° 40' 11"	-0.08"	111° 16' 35"	21° 59' 51"	1.0165735	15' 43.98"	23° 26' 16"	-5 m 36 s
1	109° 42' 34"	-0.09"	111° 19' 07"	21° 59' 30"	1.0165721	15' 43.99"	23° 26' 16"	-5 m 36 s
2	109° 44' 57"	-0.09"	111° 21' 40"	21° 59' 10"	1.0165707	15' 43.99"	23° 26' 16"	-5 m 37 s
3	109° 47' 20"	-0.10"	111° 24' 13"	21° 58' 49"	1.0165692	15' 43.99"	23° 26' 16"	-5 m 37 s
4	109° 49' 43"	-0.10"	111° 26' 45"	21° 58' 28"	1.0165678	15' 43.99"	23° 26' 16"	-5 m 37 s
5	109° 52' 06"	-0.11"	111° 29' 18"	21° 58' 07"	1.0165664	15' 43.99"	23° 26' 16"	-5 m 38 s
6	109° 54' 29"	-0.11"	111° 31' 50"	21° 57' 46"	1.0165649	15' 43.99"	23° 26' 16"	-5 m 38 s
7	109° 56' 52"	-0.11"	111° 34' 23"	21° 57' 25"	1.0165635	15' 43.99"	23° 26' 16"	-5 m 38 s
8	109° 59' 15"	-0.12"	111° 36' 55"	21° 57' 04"	1.0165620	15' 44.00"	23° 26' 16"	-5 m 39 s
9	110° 01' 38"	-0.12"	111° 39' 28"	21° 56' 44"	1.0165605	15' 44.00"	23° 26' 16"	-5 m 39 s
10	110° 04' 01"	-0.13"	111° 42' 00"	21° 56' 23"	1.0165591	15' 44.00"	23° 26' 16"	-5 m 39 s
11	110° 06' 24"	-0.13"	111° 44' 33"	21° 56' 01"	1.0165576	15' 44.00"	23° 26' 16"	-5 m 40 s
12	110° 08' 47"	-0.13"	111° 47' 05"	21° 55' 40"	1.0165561	15' 44.00"	23° 26' 16"	-5 m 40 s
13	110° 11' 10"	-0.14"	111° 49' 38"	21° 55' 19"	1.0165546	15' 44.00"	23° 26' 16"	-5 m 40 s
14	110° 13' 33"	-0.14"	111° 52' 10"	21° 54' 58"	1.0165531	15' 44.00"	23° 26' 16"	-5 m 41 s
15	110° 15' 56"	-0.14"	111° 54' 42"	21° 54' 37"	1.0165516	15' 44.01"	23° 26' 16"	-5 m 41 s
16	110° 18' 19"	-0.15"	111° 57' 15"	21° 54' 16"	1.0165501	15' 44.01"	23° 26' 16"	-5 m 41 s
17	110° 20' 42"	-0.15"	111° 59' 47"	21° 53' 54"	1.0165486	15' 44.01"	23° 26' 16"	-5 m 41 s
18	110° 23' 05"	-0.16"	112° 02' 20"	21° 53' 33"	1.0165471	15' 44.01"	23° 26' 16"	-5 m 42 s
19	110° 25' 28"	-0.16"	112° 04' 52"	21° 53' 12"	1.0165456	15' 44.01"	23° 26' 16"	-5 m 42 s
20	110° 27' 51"	-0.16"	112° 07' 24"	21° 52' 50"	1.0165440	15' 44.01"	23° 26' 16"	-5 m 42 s
21	110° 30' 14"	-0.17"	112° 09' 57"	21° 52' 29"	1.0165425	15' 44.01"	23° 26' 16"	-5 m 43 s
22	110° 32' 37"	-0.17"	112° 12' 29"	21° 52' 07"	1.0165410	15' 44.02"	23° 26' 16"	-5 m 43 s
23	110° 34' 60"	-0.17"	112° 15' 01"	21° 51' 46"	1.0165394	15' 44.02"	23° 26' 16"	-5 m 43 s
24	110° 37' 23"	-0.18"	112° 17' 34"	21° 51' 24"	1.0165379	15' 44.02"	23° 26' 16"	-5 m 44 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	264° 18' 12"	-2° 48' 34"	263° 39' 38"	-26° 07' 19"	1° 01' 04"	16' 38.46"	266° 36' 56"	0.95151
1	264° 55' 54"	-2° 51' 21"	264° 21' 24"	-26° 11' 40"	1° 01' 05"	16' 38.76"	266° 4' 53"	0.95365
2	265° 33' 37"	-2° 54' 06"	265° 03' 15"	-26° 15' 48"	1° 01' 06"	16' 39.04"	265° 32' 05"	0.95575
3	266° 11' 21"	-2° 56' 51"	265° 45' 11"	-26° 19' 45"	1° 01' 07"	16' 39.32"	264° 58' 28"	0.95780
4	266° 49' 08"	-2° 59' 34"	266° 27' 11"	-26° 23' 30"	1° 01' 08"	16' 39.59"	264° 23' 59"	0.95981
5	267° 26' 55"	-3° 02' 17"	267° 09' 15"	-26° 27' 02"	1° 01' 09"	16' 39.85"	263° 48' 35"	0.96177
6	268° 04' 44"	-3° 04' 58"	267° 51' 23"	-26° 30' 23"	1° 01' 10"	16' 40.10"	263° 12' 13"	0.96368
7	268° 42' 35"	-3° 07' 37"	268° 33' 34"	-26° 33' 30"	1° 01' 11"	16' 40.34"	262° 34' 48"	0.96554
8	269° 20' 27"	-3° 10' 16"	269° 15' 50"	-26° 36' 26"	1° 01' 12"	16' 40.58"	261° 56' 15"	0.96735
9	269° 58' 20"	-3° 12' 53"	269° 58' 08"	-26° 39' 09"	1° 01' 13"	16' 40.80"	261° 16' 30"	0.96911
10	270° 36' 14"	-3° 15' 28"	270° 40' 30"	-26° 41' 40"	1° 01' 14"	16' 41.02"	260° 35' 26"	0.97083
11	271° 14' 10"	-3° 18' 03"	271° 22' 55"	-26° 43' 58"	1° 01' 14"	16' 41.23"	259° 52' 57"	0.97250
12	271° 52' 07"	-3° 20' 36"	272° 05' 22"	-26° 46' 03"	1° 01' 15"	16' 41.43"	259° 8' 56"	0.97411
13	272° 30' 05"	-3° 23' 07"	272° 47' 52"	-26° 47' 56"	1° 01' 16"	16' 41.62"	258° 23' 14"	0.97568
14	273° 08' 05"	-3° 25' 37"	273° 30' 25"	-26° 49' 36"	1° 01' 16"	16' 41.80"	257° 35' 43"	0.97720
15	273° 46' 05"	-3° 28' 06"	274° 12' 59"	-26° 51' 04"	1° 01' 17"	16' 41.98"	256° 46' 10"	0.97866
16	274° 24' 07"	-3° 30' 33"	274° 55' 36"	-26° 52' 19"	1° 01' 18"	16' 42.14"	255° 54' 26"	0.98008
17	275° 02' 09"	-3° 32' 59"	275° 38' 14"	-26° 53' 20"	1° 01' 18"	16' 42.30"	255° 0' 15"	0.98144
18	275° 40' 12"	-3° 35' 23"	276° 20' 54"	-26° 54' 10"	1° 01' 19"	16' 42.44"	254° 3' 23"	0.98275
19	276° 18' 17"	-3° 37' 45"	277° 03' 36"	-26° 54' 46"	1° 01' 19"	16' 42.58"	253° 3' 30"	0.98402
20	276° 56' 22"	-3° 40' 06"	277° 46' 18"	-26° 55' 09"	1° 01' 20"	16' 42.71"	252° 0' 17"	0.98523
21	277° 34' 28"	-3° 42' 26"	278° 29' 01"	-26° 55' 20"	1° 01' 20"	16' 42.83"	250° 53' 19"	0.98639
22	278° 12' 35"	-3° 44' 43"	279° 11' 45"	-26° 55' 18"	1° 01' 21"	16' 42.94"	249° 42' 09"	0.98749
23	278° 50' 42"	-3° 46' 59"	279° 54' 30"	-26° 55' 02"	1° 01' 21"	16' 43.04"	248° 26' 13"	0.98855
24	279° 28' 48"	-3° 49' 14"	280° 37' 12"	-26° 54' 34"	1° 01' 21"	16' 43.13"	247° 4' 59"	0.98955



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	110° 37' 23"	-0.18"	112° 17' 34"	21° 51' 24"	1.0165379	15' 44.02"	23° 26' 16"	-5 m 44 s
1	110° 39' 46"	-0.18"	112° 20' 06"	21° 51' 03"	1.0165363	15' 44.02"	23° 26' 16"	-5 m 44 s
2	110° 42' 09"	-0.18"	112° 22' 38"	21° 50' 41"	1.0165348	15' 44.02"	23° 26' 16"	-5 m 44 s
3	110° 44' 32"	-0.19"	112° 25' 11"	21° 50' 19"	1.0165332	15' 44.02"	23° 26' 16"	-5 m 44 s
4	110° 46' 55"	-0.19"	112° 27' 43"	21° 49' 58"	1.0165316	15' 44.02"	23° 26' 16"	-5 m 45 s
5	110° 49' 18"	-0.19"	112° 30' 15"	21° 49' 36"	1.0165300	15' 44.03"	23° 26' 16"	-5 m 45 s
6	110° 51' 41"	-0.20"	112° 32' 47"	21° 49' 14"	1.0165285	15' 44.03"	23° 26' 16"	-5 m 45 s
7	110° 54' 04"	-0.20"	112° 35' 20"	21° 48' 52"	1.0165269	15' 44.03"	23° 26' 16"	-5 m 46 s
8	110° 56' 27"	-0.20"	112° 37' 52"	21° 48' 30"	1.0165253	15' 44.03"	23° 26' 16"	-5 m 46 s
9	110° 58' 50"	-0.21"	112° 40' 24"	21° 48' 08"	1.0165237	15' 44.03"	23° 26' 16"	-5 m 46 s
10	111° 01' 13"	-0.21"	112° 42' 56"	21° 47' 47"	1.0165221	15' 44.03"	23° 26' 16"	-5 m 47 s
11	111° 03' 36"	-0.21"	112° 45' 28"	21° 47' 25"	1.0165205	15' 44.03"	23° 26' 16"	-5 m 47 s
12	111° 05' 59"	-0.22"	112° 48' 00"	21° 47' 02"	1.0165188	15' 44.04"	23° 26' 16"	-5 m 47 s
13	111° 08' 22"	-0.22"	112° 50' 33"	21° 46' 40"	1.0165172	15' 44.04"	23° 26' 16"	-5 m 47 s
14	111° 10' 45"	-0.22"	112° 53' 05"	21° 46' 18"	1.0165156	15' 44.04"	23° 26' 16"	-5 m 48 s
15	111° 13' 08"	-0.22"	112° 55' 37"	21° 45' 56"	1.0165140	15' 44.04"	23° 26' 16"	-5 m 48 s
16	111° 15' 31"	-0.23"	112° 58' 09"	21° 45' 34"	1.0165123	15' 44.04"	23° 26' 16"	-5 m 48 s
17	111° 17' 54"	-0.23"	113° 00' 41"	21° 45' 12"	1.0165107	15' 44.04"	23° 26' 16"	-5 m 49 s
18	111° 20' 17"	-0.23"	113° 03' 13"	21° 44' 50"	1.0165090	15' 44.04"	23° 26' 16"	-5 m 49 s
19	111° 22' 40"	-0.23"	113° 05' 45"	21° 44' 27"	1.0165074	15' 44.05"	23° 26' 16"	-5 m 49 s
20	111° 25' 03"	-0.24"	113° 08' 17"	21° 44' 05"	1.0165057	15' 44.05"	23° 26' 16"	-5 m 49 s
21	111° 27' 26"	-0.24"	113° 10' 49"	21° 43' 43"	1.0165040	15' 44.05"	23° 26' 16"	-5 m 50 s
22	111° 29' 49"	-0.24"	113° 13' 21"	21° 43' 20"	1.0165024	15' 44.05"	23° 26' 16"	-5 m 50 s
23	111° 32' 12"	-0.24"	113° 15' 53"	21° 42' 58"	1.0165007	15' 44.05"	23° 26' 16"	-5 m 50 s
24	111° 34' 35"	-0.25"	113° 18' 25"	21° 42' 35"	1.0164990	15' 44.05"	23° 26' 16"	-5 m 51 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	279° 28' 48"	-3° 49' 14"	280° 37' 12"	-26° 54' 34"	1° 01' 21"	16' 43.13"	247° 4' 59"	0.98955
1	280° 06' 57"	-3° 51' 26"	281° 19' 56"	-26° 53' 53"	1° 01' 22"	16' 43.21"	245° 37' 31"	0.99050
2	280° 45' 06"	-3° 53' 37"	282° 02' 41"	-26° 52' 59"	1° 01' 22"	16' 43.28"	244° 3' 01"	0.99140
3	281° 23' 16"	-3° 55' 47"	282° 45' 25"	-26° 51' 53"	1° 01' 22"	16' 43.34"	242° 20' 27"	0.99224
4	282° 01' 27"	-3° 57' 54"	283° 28' 09"	-26° 50' 33"	1° 01' 22"	16' 43.40"	240° 28' 32"	0.99303
5	282° 39' 38"	-3° 59' 60"	284° 10' 52"	-26° 49' 00"	1° 01' 22"	16' 43.44"	238° 25' 47"	0.99377
6	283° 17' 49"	-4° 02' 04"	284° 53' 34"	-26° 47' 15"	1° 01' 23"	16' 43.47"	236° 10' 26"	0.99446
7	283° 56' 01"	-4° 04' 06"	285° 36' 15"	-26° 45' 17"	1° 01' 23"	16' 43.50"	233° 40' 22"	0.99509
8	284° 34' 13"	-4° 06' 06"	286° 18' 54"	-26° 43' 06"	1° 01' 23"	16' 43.51"	230° 53' 02"	0.99567
9	285° 12' 26"	-4° 08' 05"	287° 01' 32"	-26° 40' 42"	1° 01' 23"	16' 43.52"	227° 45' 29"	0.99619
10	285° 50' 38"	-4° 10' 02"	287° 44' 08"	-26° 38' 05"	1° 01' 23"	16' 43.52"	224° 14' 17"	0.99667
11	286° 28' 51"	-4° 11' 56"	288° 26' 42"	-26° 35' 16"	1° 01' 23"	16' 43.50"	220° 15' 35"	0.99709
12	287° 07' 04"	-4° 13' 49"	289° 09' 13"	-26° 32' 14"	1° 01' 23"	16' 43.48"	215° 45' 16"	0.99745
13	287° 45' 17"	-4° 15' 40"	289° 51' 42"	-26° 28' 60"	1° 01' 22"	16' 43.45"	210° 39' 20"	0.99776
14	288° 23' 30"	-4° 17' 30"	290° 34' 09"	-26° 25' 33"	1° 01' 22"	16' 43.41"	204° 54' 33"	0.99802
15	289° 01' 43"	-4° 19' 17"	291° 16' 32"	-26° 21' 53"	1° 01' 22"	16' 43.35"	198° 29' 39"	0.99823
16	289° 39' 56"	-4° 21' 02"	291° 58' 53"	-26° 18' 01"	1° 01' 22"	16' 43.29"	191° 26' 33"	0.99838
17	290° 18' 09"	-4° 22' 45"	292° 41' 10"	-26° 13' 56"	1° 01' 22"	16' 43.22"	183° 51' 47"	0.99847
18	290° 56' 21"	-4° 24' 26"	293° 23' 24"	-26° 09' 40"	1° 01' 21"	16' 43.14"	175° 56' 50"	0.99852
19	291° 34' 34"	-4° 26' 06"	294° 05' 35"	-26° 05' 10"	1° 01' 21"	16' 43.05"	167° 56' 57"	0.99851
20	292° 12' 46"	-4° 27' 43"	294° 47' 41"	-26° 00' 29"	1° 01' 21"	16' 42.96"	160° 8' 26"	0.99844
21	292° 50' 58"	-4° 29' 18"	295° 29' 44"	-25° 55' 36"	1° 01' 20"	16' 42.85"	152° 45' 19"	0.99833
22	293° 29' 09"	-4° 30' 52"	296° 11' 42"	-25° 50' 30"	1° 01' 20"	16' 42.73"	145° 57' 10"	0.99816
23	294° 07' 20"	-4° 32' 23"	296° 53' 37"	-25° 45' 13"	1° 01' 19"	16' 42.60"	139° 48' 36"	0.99793
24	294° 45' 31"	-4° 33' 52"	297° 35' 26"	-25° 39' 43"	1° 01' 19"	16' 42.47"	134° 20' 07"	0.99765

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	111° 34' 35"	-0.25"	113° 18' 25"	21° 42' 35"	1.0164990	15' 44.05"	23° 26' 16"	-5 m 51 s
1	111° 36' 58"	-0.25"	113° 20' 57"	21° 42' 13"	1.0164973	15' 44.06"	23° 26' 16"	-5 m 51 s
2	111° 39' 21"	-0.25"	113° 23' 29"	21° 41' 50"	1.0164956	15' 44.06"	23° 26' 16"	-5 m 51 s
3	111° 41' 44"	-0.25"	113° 26' 01"	21° 41' 28"	1.0164939	15' 44.06"	23° 26' 16"	-5 m 51 s
4	111° 44' 07"	-0.26"	113° 28' 33"	21° 41' 05"	1.0164922	15' 44.06"	23° 26' 16"	-5 m 52 s
5	111° 46' 30"	-0.26"	113° 31' 05"	21° 40' 42"	1.0164905	15' 44.06"	23° 26' 16"	-5 m 52 s
6	111° 48' 53"	-0.26"	113° 33' 37"	21° 40' 19"	1.0164888	15' 44.06"	23° 26' 16"	-5 m 52 s
7	111° 51' 16"	-0.26"	113° 36' 09"	21° 39' 57"	1.0164871	15' 44.07"	23° 26' 16"	-5 m 53 s
8	111° 53' 39"	-0.26"	113° 38' 41"	21° 39' 34"	1.0164853	15' 44.07"	23° 26' 16"	-5 m 53 s
9	111° 56' 02"	-0.27"	113° 41' 13"	21° 39' 11"	1.0164836	15' 44.07"	23° 26' 16"	-5 m 53 s
10	111° 58' 25"	-0.27"	113° 43' 45"	21° 38' 48"	1.0164819	15' 44.07"	23° 26' 16"	-5 m 53 s
11	112° 00' 48"	-0.27"	113° 46' 17"	21° 38' 25"	1.0164801	15' 44.07"	23° 26' 16"	-5 m 54 s
12	112° 03' 11"	-0.27"	113° 48' 49"	21° 38' 02"	1.0164784	15' 44.07"	23° 26' 16"	-5 m 54 s
13	112° 05' 34"	-0.27"	113° 51' 20"	21° 37' 39"	1.0164766	15' 44.07"	23° 26' 16"	-5 m 54 s
14	112° 07' 57"	-0.27"	113° 53' 52"	21° 37' 16"	1.0164749	15' 44.08"	23° 26' 16"	-5 m 54 s
15	112° 10' 20"	-0.28"	113° 56' 24"	21° 36' 53"	1.0164731	15' 44.08"	23° 26' 16"	-5 m 55 s
16	112° 12' 43"	-0.28"	113° 58' 56"	21° 36' 30"	1.0164713	15' 44.08"	23° 26' 16"	-5 m 55 s
17	112° 15' 06"	-0.28"	114° 01' 28"	21° 36' 07"	1.0164696	15' 44.08"	23° 26' 16"	-5 m 55 s
18	112° 17' 29"	-0.28"	114° 03' 59"	21° 35' 44"	1.0164678	15' 44.08"	23° 26' 16"	-5 m 55 s
19	112° 19' 52"	-0.28"	114° 06' 31"	21° 35' 21"	1.0164660	15' 44.08"	23° 26' 16"	-5 m 56 s
20	112° 22' 15"	-0.28"	114° 09' 03"	21° 34' 57"	1.0164642	15' 44.09"	23° 26' 16"	-5 m 56 s
21	112° 24' 38"	-0.28"	114° 11' 35"	21° 34' 34"	1.0164624	15' 44.09"	23° 26' 16"	-5 m 56 s
22	112° 27' 01"	-0.29"	114° 14' 06"	21° 34' 11"	1.0164606	15' 44.09"	23° 26' 16"	-5 m 57 s
23	112° 29' 24"	-0.29"	114° 16' 38"	21° 33' 47"	1.0164588	15' 44.09"	23° 26' 16"	-5 m 57 s
24	112° 31' 47"	-0.29"	114° 19' 10"	21° 33' 24"	1.0164570	15' 44.09"	23° 26' 16"	-5 m 57 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	294° 45' 31"	-4° 33' 52"	297° 35' 26"	-25° 39' 43"	1° 01' 19"	16' 42.47"	134° 20' 07"	0.99765
1	295° 23' 41"	-4° 35' 19"	298° 17' 11"	-25° 34' 02"	1° 01' 18"	16' 42.32"	129° 29' 31"	0.99732
2	296° 01' 51"	-4° 36' 44"	298° 58' 52"	-25° 28' 09"	1° 01' 18"	16' 42.17"	125° 13' 11"	0.99694
3	296° 39' 60"	-4° 38' 07"	299° 40' 27"	-25° 22' 04"	1° 01' 17"	16' 42.00"	121° 26' 59"	0.99650
4	297° 18' 08"	-4° 39' 28"	300° 21' 57"	-25° 15' 48"	1° 01' 16"	16' 41.83"	118° 6' 53"	0.99601
5	297° 56' 16"	-4° 40' 46"	301° 03' 22"	-25° 09' 21"	1° 01' 16"	16' 41.65"	115° 9' 10"	0.99547
6	298° 34' 23"	-4° 42' 03"	301° 44' 41"	-25° 02' 41"	1° 01' 15"	16' 41.45"	112° 30' 37"	0.99487
7	299° 12' 29"	-4° 43' 17"	302° 25' 55"	-24° 55' 51"	1° 01' 14"	16' 41.25"	110° 8' 24"	0.99423
8	299° 50' 34"	-4° 44' 30"	303° 07' 04"	-24° 48' 50"	1° 01' 14"	16' 41.04"	108° 0' 12"	0.99353
9	300° 28' 38"	-4° 45' 40"	303° 48' 06"	-24° 41' 37"	1° 01' 13"	16' 40.82"	106° 4' 01"	0.99277
10	301° 06' 42"	-4° 46' 48"	304° 29' 02"	-24° 34' 14"	1° 01' 12"	16' 40.60"	104° 18' 10"	0.99197
11	301° 44' 44"	-4° 47' 54"	305° 09' 53"	-24° 26' 40"	1° 01' 11"	16' 40.36"	102° 41' 17"	0.99111
12	302° 22' 45"	-4° 48' 58"	305° 50' 37"	-24° 18' 55"	1° 01' 10"	16' 40.11"	101° 12' 12"	0.99020
13	303° 00' 46"	-4° 49' 59"	306° 31' 15"	-24° 10' 59"	1° 01' 09"	16' 39.86"	99° 49' 54"	0.98924
14	303° 38' 45"	-4° 50' 58"	307° 11' 46"	-24° 02' 53"	1° 01' 08"	16' 39.60"	98° 33' 35"	0.98823
15	304° 16' 43"	-4° 51' 56"	307° 52' 11"	-23° 54' 36"	1° 01' 07"	16' 39.33"	97° 22' 32"	0.98717
16	304° 54' 40"	-4° 52' 51"	308° 32' 29"	-23° 46' 09"	1° 01' 06"	16' 39.05"	96° 16' 08"	0.98606
17	305° 32' 35"	-4° 53' 44"	309° 12' 41"	-23° 37' 33"	1° 01' 05"	16' 38.76"	95° 13' 54"	0.98490
18	306° 10' 30"	-4° 54' 34"	309° 52' 46"	-23° 28' 46"	1° 01' 04"	16' 38.46"	94° 15' 22"	0.98368
19	306° 48' 23"	-4° 55' 23"	310° 32' 44"	-23° 19' 49"	1° 01' 03"	16' 38.15"	93° 20' 09"	0.98242
20	307° 26' 14"	-4° 56' 09"	311° 12' 34"	-23° 10' 42"	1° 01' 02"	16' 37.84"	92° 27' 57"	0.98110
21	308° 04' 04"	-4° 56' 53"	311° 52' 18"	-23° 01' 26"	1° 01' 01"	16' 37.52"	91° 38' 27"	0.97974
22	308° 41' 53"	-4° 57' 35"	312° 31' 55"	-22° 52' 00"	1° 00' 59"	16' 37.19"	90° 51' 25"	0.97833
23	309° 19' 40"	-4° 58' 15"	313° 11' 24"	-22° 42' 25"	1° 00' 58"	16' 36.85"	90° 6' 37"	0.97687
24	309° 57' 25"	-4° 58' 52"	313° 50' 46"	-22° 32' 40"	1° 00' 57"	16' 36.50"	89° 23' 53"	0.97536



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	112° 31' 47"	-0.29"	114° 19' 10"	21° 33' 24"	1.0164570	15' 44.09"	23° 26' 16"	-5 m 57 s
1	112° 34' 10"	-0.29"	114° 21' 41"	21° 33' 01"	1.0164551	15' 44.09"	23° 26' 16"	-5 m 57 s
2	112° 36' 33"	-0.29"	114° 24' 13"	21° 32' 37"	1.0164533	15' 44.10"	23° 26' 16"	-5 m 58 s
3	112° 38' 56"	-0.29"	114° 26' 45"	21° 32' 14"	1.0164515	15' 44.10"	23° 26' 16"	-5 m 58 s
4	112° 41' 19"	-0.29"	114° 29' 16"	21° 31' 50"	1.0164496	15' 44.10"	23° 26' 16"	-5 m 58 s
5	112° 43' 42"	-0.29"	114° 31' 48"	21° 31' 26"	1.0164478	15' 44.10"	23° 26' 16"	-5 m 58 s
6	112° 46' 05"	-0.29"	114° 34' 20"	21° 31' 03"	1.0164459	15' 44.10"	23° 26' 16"	-5 m 59 s
7	112° 48' 28"	-0.29"	114° 36' 51"	21° 30' 39"	1.0164441	15' 44.11"	23° 26' 16"	-5 m 59 s
8	112° 50' 51"	-0.30"	114° 39' 23"	21° 30' 15"	1.0164422	15' 44.11"	23° 26' 16"	-5 m 59 s
9	112° 53' 14"	-0.30"	114° 41' 55"	21° 29' 52"	1.0164404	15' 44.11"	23° 26' 17"	-5 m 59 s
10	112° 55' 37"	-0.30"	114° 44' 26"	21° 29' 28"	1.0164385	15' 44.11"	23° 26' 17"	-5 m 60 s
11	112° 57' 60"	-0.30"	114° 46' 58"	21° 29' 04"	1.0164366	15' 44.11"	23° 26' 17"	-5 m 60 s
12	113° 00' 23"	-0.30"	114° 49' 29"	21° 28' 40"	1.0164347	15' 44.11"	23° 26' 17"	-6 m 00 s
13	113° 02' 46"	-0.30"	114° 52' 01"	21° 28' 16"	1.0164328	15' 44.12"	23° 26' 17"	-6 m 00 s
14	113° 05' 09"	-0.30"	114° 54' 32"	21° 27' 52"	1.0164309	15' 44.12"	23° 26' 17"	-6 m 01 s
15	113° 07' 32"	-0.30"	114° 57' 04"	21° 27' 28"	1.0164290	15' 44.12"	23° 26' 17"	-6 m 01 s
16	113° 09' 55"	-0.30"	114° 59' 35"	21° 27' 04"	1.0164271	15' 44.12"	23° 26' 17"	-6 m 01 s
17	113° 12' 18"	-0.30"	115° 02' 07"	21° 26' 40"	1.0164252	15' 44.12"	23° 26' 17"	-6 m 01 s
18	113° 14' 41"	-0.30"	115° 04' 38"	21° 26' 16"	1.0164233	15' 44.12"	23° 26' 17"	-6 m 02 s
19	113° 17' 04"	-0.30"	115° 07' 10"	21° 25' 52"	1.0164214	15' 44.13"	23° 26' 17"	-6 m 02 s
20	113° 19' 27"	-0.30"	115° 09' 41"	21° 25' 28"	1.0164194	15' 44.13"	23° 26' 17"	-6 m 02 s
21	113° 21' 50"	-0.30"	115° 12' 13"	21° 25' 04"	1.0164175	15' 44.13"	23° 26' 17"	-6 m 02 s
22	113° 24' 13"	-0.30"	115° 14' 44"	21° 24' 39"	1.0164156	15' 44.13"	23° 26' 17"	-6 m 03 s
23	113° 26' 36"	-0.30"	115° 17' 15"	21° 24' 15"	1.0164136	15' 44.13"	23° 26' 17"	-6 m 03 s
24	113° 28' 59"	-0.30"	115° 19' 47"	21° 23' 51"	1.0164117	15' 44.14"	23° 26' 17"	-6 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	309° 57' 25"	-4° 58' 52"	313° 50' 46"	-22° 32' 40"	1° 00' 57"	16' 36.50"	89° 23' 53"	0.97536
1	310° 35' 09"	-4° 59' 27"	314° 30' 01"	-22° 22' 47"	1° 00' 56"	16' 36.15"	88° 43' 01"	0.97380
2	311° 12' 51"	-5° 00' 00"	315° 09' 08"	-22° 12' 44"	1° 00' 54"	16' 35.78"	88° 3' 53"	0.97219
3	311° 50' 32"	-5° 00' 31"	315° 48' 08"	-22° 02' 33"	1° 00' 53"	16' 35.41"	87° 26' 21"	0.97053
4	312° 28' 11"	-5° 01' 00"	316° 27' 01"	-21° 52' 13"	1° 00' 52"	16' 35.04"	86° 50' 18"	0.96883
5	313° 05' 48"	-5° 01' 27"	317° 05' 45"	-21° 41' 44"	1° 00' 50"	16' 34.65"	86° 15' 37"	0.96708
6	313° 43' 23"	-5° 01' 51"	317° 44' 23"	-21° 31' 07"	1° 00' 49"	16' 34.26"	85° 42' 12"	0.96529
7	314° 20' 56"	-5° 02' 13"	318° 22' 52"	-21° 20' 21"	1° 00' 47"	16' 33.86"	85° 9' 59"	0.96344
8	314° 58' 28"	-5° 02' 33"	319° 01' 14"	-21° 09' 27"	1° 00' 46"	16' 33.45"	84° 38' 53"	0.96156
9	315° 35' 58"	-5° 02' 51"	319° 39' 28"	-20° 58' 25"	1° 00' 44"	16' 33.03"	84° 8' 49"	0.95962
10	316° 13' 25"	-5° 03' 06"	320° 17' 35"	-20° 47' 15"	1° 00' 43"	16' 32.61"	83° 39' 45"	0.95764
11	316° 50' 51"	-5° 03' 19"	320° 55' 34"	-20° 35' 58"	1° 00' 41"	16' 32.18"	83° 11' 36"	0.95562
12	317° 28' 14"	-5° 03' 31"	321° 33' 25"	-20° 24' 33"	1° 00' 39"	16' 31.75"	82° 44' 19"	0.95355
13	318° 05' 36"	-5° 03' 40"	322° 11' 08"	-20° 12' 60"	1° 00' 38"	16' 31.30"	82° 17' 53"	0.95143
14	318° 42' 55"	-5° 03' 46"	322° 48' 44"	-20° 01' 20"	1° 00' 36"	16' 30.85"	81° 52' 13"	0.94927
15	319° 20' 12"	-5° 03' 51"	323° 26' 11"	-19° 49' 32"	1° 00' 35"	16' 30.40"	81° 27' 17"	0.94707
16	319° 57' 27"	-5° 03' 54"	324° 03' 31"	-19° 37' 38"	1° 00' 33"	16' 29.93"	81° 3' 05"	0.94483
17	320° 34' 40"	-5° 03' 54"	324° 40' 43"	-19° 25' 36"	1° 00' 31"	16' 29.47"	80° 39' 32"	0.94254
18	321° 11' 50"	-5° 03' 52"	325° 17' 48"	-19° 13' 28"	1° 00' 29"	16' 28.99"	80° 16' 39"	0.94021
19	321° 48' 59"	-5° 03' 48"	325° 54' 44"	-19° 01' 13"	1° 00' 28"	16' 28.51"	79° 54' 22"	0.93784
20	322° 26' 04"	-5° 03' 42"	326° 31' 33"	-18° 48' 51"	1° 00' 26"	16' 28.02"	79° 32' 41"	0.93543
21	323° 03' 08"	-5° 03' 34"	327° 08' 14"	-18° 36' 23"	1° 00' 24"	16' 27.52"	79° 11' 34"	0.93298
22	323° 40' 09"	-5° 03' 24"	327° 44' 48"	-18° 23' 49"	1° 00' 22"	16' 27.02"	78° 50' 60"	0.93048
23	324° 17' 08"	-5° 03' 11"	328° 21' 13"	-18° 11' 09"	1° 00' 20"	16' 26.52"	78° 30' 57"	0.92795
24	324° 54' 04"	-5° 02' 57"	328° 57' 31"	-17° 58' 22"	1° 00' 18"	16' 26.01"	78° 11' 24"	0.92537

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	113° 28' 59"	-0.30"	115° 19' 47"	21° 23' 51"	1.0164117	15' 44.14"	23° 26' 17"	-6 m 03 s
1	113° 31' 22"	-0.30"	115° 22' 18"	21° 23' 27"	1.0164097	15' 44.14"	23° 26' 17"	-6 m 03 s
2	113° 33' 45"	-0.30"	115° 24' 49"	21° 23' 02"	1.0164077	15' 44.14"	23° 26' 17"	-6 m 04 s
3	113° 36' 08"	-0.30"	115° 27' 21"	21° 22' 38"	1.0164058	15' 44.14"	23° 26' 17"	-6 m 04 s
4	113° 38' 31"	-0.30"	115° 29' 52"	21° 22' 13"	1.0164038	15' 44.14"	23° 26' 17"	-6 m 04 s
5	113° 40' 54"	-0.30"	115° 32' 23"	21° 21' 49"	1.0164018	15' 44.14"	23° 26' 17"	-6 m 04 s
6	113° 43' 17"	-0.30"	115° 34' 55"	21° 21' 24"	1.0163998	15' 44.15"	23° 26' 17"	-6 m 05 s
7	113° 45' 40"	-0.30"	115° 37' 26"	21° 20' 60"	1.0163978	15' 44.15"	23° 26' 17"	-6 m 05 s
8	113° 48' 04"	-0.30"	115° 39' 57"	21° 20' 35"	1.0163958	15' 44.15"	23° 26' 17"	-6 m 05 s
9	113° 50' 27"	-0.30"	115° 42' 29"	21° 20' 10"	1.0163938	15' 44.15"	23° 26' 17"	-6 m 05 s
10	113° 52' 50"	-0.30"	115° 44' 60"	21° 19' 46"	1.0163918	15' 44.15"	23° 26' 17"	-6 m 05 s
11	113° 55' 13"	-0.30"	115° 47' 31"	21° 19' 21"	1.0163898	15' 44.16"	23° 26' 17"	-6 m 06 s
12	113° 57' 36"	-0.29"	115° 50' 02"	21° 18' 56"	1.0163877	15' 44.16"	23° 26' 17"	-6 m 06 s
13	113° 59' 59"	-0.29"	115° 52' 34"	21° 18' 31"	1.0163857	15' 44.16"	23° 26' 17"	-6 m 06 s
14	114° 02' 22"	-0.29"	115° 55' 05"	21° 18' 06"	1.0163837	15' 44.16"	23° 26' 17"	-6 m 06 s
15	114° 04' 45"	-0.29"	115° 57' 36"	21° 17' 42"	1.0163816	15' 44.16"	23° 26' 17"	-6 m 07 s
16	114° 07' 08"	-0.29"	116° 00' 07"	21° 17' 17"	1.0163796	15' 44.16"	23° 26' 17"	-6 m 07 s
17	114° 09' 31"	-0.29"	116° 02' 38"	21° 16' 52"	1.0163775	15' 44.17"	23° 26' 17"	-6 m 07 s
18	114° 11' 54"	-0.29"	116° 05' 09"	21° 16' 27"	1.0163755	15' 44.17"	23° 26' 17"	-6 m 07 s
19	114° 14' 17"	-0.29"	116° 07' 41"	21° 16' 02"	1.0163734	15' 44.17"	23° 26' 17"	-6 m 07 s
20	114° 16' 40"	-0.29"	116° 10' 12"	21° 15' 37"	1.0163713	15' 44.17"	23° 26' 17"	-6 m 08 s
21	114° 19' 03"	-0.29"	116° 12' 43"	21° 15' 11"	1.0163692	15' 44.17"	23° 26' 17"	-6 m 08 s
22	114° 21' 26"	-0.28"	116° 15' 14"	21° 14' 46"	1.0163671	15' 44.18"	23° 26' 17"	-6 m 08 s
23	114° 23' 49"	-0.28"	116° 17' 45"	21° 14' 21"	1.0163650	15' 44.18"	23° 26' 17"	-6 m 08 s
24	114° 26' 12"	-0.28"	116° 20' 16"	21° 13' 56"	1.0163629	15' 44.18"	23° 26' 17"	-6 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	324° 54' 04"	-5° 02' 57"	328° 57' 31"	-17° 58' 22"	1° 00' 18"	16' 26.01"	78° 11' 24"	0.92537
1	325° 30' 58"	-5° 02' 40"	329° 33' 42"	-17° 45' 30"	1° 00' 17"	16' 25.49"	77° 52' 21"	0.92276
2	326° 07' 49"	-5° 02' 22"	330° 09' 44"	-17° 32' 32"	1° 00' 15"	16' 24.97"	77° 33' 46"	0.92011
3	326° 44' 38"	-5° 02' 01"	330° 45' 39"	-17° 19' 28"	1° 00' 13"	16' 24.44"	77° 15' 38"	0.91742
4	327° 21' 24"	-5° 01' 38"	331° 21' 27"	-17° 06' 19"	1° 00' 11"	16' 23.90"	76° 57' 56"	0.91469
5	327° 58' 08"	-5° 01' 13"	331° 57' 07"	-16° 53' 04"	1° 00' 09"	16' 23.37"	76° 40' 41"	0.91192
6	328° 34' 49"	-5° 00' 47"	332° 32' 39"	-16° 39' 44"	1° 00' 07"	16' 22.82"	76° 23' 50"	0.90912
7	329° 11' 27"	-5° 00' 18"	333° 08' 04"	-16° 26' 19"	1° 00' 05"	16' 22.27"	76° 7' 23"	0.90628
8	329° 48' 03"	-4° 59' 47"	333° 43' 21"	-16° 12' 49"	1° 00' 03"	16' 21.72"	75° 51' 20"	0.90340
9	330° 24' 36"	-4° 59' 14"	334° 18' 31"	-15° 59' 14"	1° 00' 01"	16' 21.16"	75° 35' 39"	0.90049
10	331° 01' 06"	-4° 58' 39"	334° 53' 34"	-15° 45' 35"	0° 59' 59"	16' 20.60"	75° 20' 21"	0.89754
11	331° 37' 34"	-4° 58' 02"	335° 28' 30"	-15° 31' 50"	0° 59' 56"	16' 20.03"	75° 5' 24"	0.89456
12	332° 13' 59"	-4° 57' 23"	336° 03' 18"	-15° 18' 02"	0° 59' 54"	16' 19.46"	74° 50' 49"	0.89154
13	332° 50' 21"	-4° 56' 42"	336° 37' 59"	-15° 04' 09"	0° 59' 52"	16' 18.88"	74° 36' 34"	0.88849
14	333° 26' 40"	-4° 55' 60"	337° 12' 33"	-14° 50' 12"	0° 59' 50"	16' 18.30"	74° 22' 39"	0.88541
15	334° 02' 57"	-4° 55' 15"	337° 46' 60"	-14° 36' 10"	0° 59' 48"	16' 17.72"	74° 9' 04"	0.88229
16	334° 39' 10"	-4° 54' 28"	338° 21' 20"	-14° 22' 05"	0° 59' 46"	16' 17.13"	73° 55' 49"	0.87914
17	335° 15' 21"	-4° 53' 40"	338° 55' 33"	-14° 07' 56"	0° 59' 44"	16' 16.54"	73° 42' 52"	0.87596
18	335° 51' 29"	-4° 52' 49"	339° 29' 38"	-13° 53' 43"	0° 59' 41"	16' 15.94"	73° 30' 14"	0.87275
19	336° 27' 34"	-4° 51' 57"	340° 03' 38"	-13° 39' 26"	0° 59' 39"	16' 15.34"	73° 17' 54"	0.86951
20	337° 03' 36"	-4° 51' 03"	340° 37' 30"	-13° 25' 06"	0° 59' 37"	16' 14.74"	73° 5' 51"	0.86623
21	337° 39' 35"	-4° 50' 07"	341° 11' 16"	-13° 10' 43"	0° 59' 35"	16' 14.14"	72° 54' 06"	0.86293
22	338° 15' 31"	-4° 49' 09"	341° 44' 55"	-12° 56' 16"	0° 59' 33"	16' 13.53"	72° 42' 38"	0.85960
23	338° 51' 24"	-4° 48' 09"	342° 18' 27"	-12° 41' 46"	0° 59' 30"	16' 12.91"	72° 31' 27"	0.85623
24	339° 27' 15"	-4° 47' 08"	342° 51' 53"	-12° 27' 13"	0° 59' 28"	16' 12.30"	72° 20' 33"	0.85284



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	114° 26' 12"	-0.28"	116° 20' 16"	21° 13' 56"	1.0163629	15' 44.18"	23° 26' 17"	-6 m 09 s
1	114° 28' 35"	-0.28"	116° 22' 47"	21° 13' 31"	1.0163608	15' 44.18"	23° 26' 17"	-6 m 09 s
2	114° 30' 58"	-0.28"	116° 25' 18"	21° 13' 05"	1.0163587	15' 44.18"	23° 26' 17"	-6 m 09 s
3	114° 33' 21"	-0.28"	116° 27' 49"	21° 12' 40"	1.0163566	15' 44.19"	23° 26' 17"	-6 m 09 s
4	114° 35' 44"	-0.28"	116° 30' 20"	21° 12' 15"	1.0163545	15' 44.19"	23° 26' 17"	-6 m 09 s
5	114° 38' 08"	-0.27"	116° 32' 51"	21° 11' 49"	1.0163524	15' 44.19"	23° 26' 17"	-6 m 10 s
6	114° 40' 31"	-0.27"	116° 35' 22"	21° 11' 24"	1.0163502	15' 44.19"	23° 26' 17"	-6 m 10 s
7	114° 42' 54"	-0.27"	116° 37' 53"	21° 10' 58"	1.0163481	15' 44.19"	23° 26' 17"	-6 m 10 s
8	114° 45' 17"	-0.27"	116° 40' 24"	21° 10' 33"	1.0163459	15' 44.20"	23° 26' 17"	-6 m 10 s
9	114° 47' 40"	-0.27"	116° 42' 55"	21° 10' 07"	1.0163438	15' 44.20"	23° 26' 17"	-6 m 10 s
10	114° 50' 03"	-0.27"	116° 45' 26"	21° 09' 42"	1.0163416	15' 44.20"	23° 26' 17"	-6 m 11 s
11	114° 52' 26"	-0.26"	116° 47' 57"	21° 09' 16"	1.0163394	15' 44.20"	23° 26' 17"	-6 m 11 s
12	114° 54' 49"	-0.26"	116° 50' 28"	21° 08' 50"	1.0163373	15' 44.20"	23° 26' 17"	-6 m 11 s
13	114° 57' 12"	-0.26"	116° 52' 59"	21° 08' 25"	1.0163351	15' 44.21"	23° 26' 17"	-6 m 11 s
14	114° 59' 35"	-0.26"	116° 55' 30"	21° 07' 59"	1.0163329	15' 44.21"	23° 26' 17"	-6 m 12 s
15	115° 01' 58"	-0.26"	116° 58' 00"	21° 07' 33"	1.0163307	15' 44.21"	23° 26' 17"	-6 m 12 s
16	115° 04' 21"	-0.25"	117° 00' 31"	21° 07' 07"	1.0163285	15' 44.21"	23° 26' 17"	-6 m 12 s
17	115° 06' 44"	-0.25"	117° 03' 02"	21° 06' 41"	1.0163263	15' 44.21"	23° 26' 17"	-6 m 12 s
18	115° 09' 07"	-0.25"	117° 05' 33"	21° 06' 16"	1.0163241	15' 44.22"	23° 26' 17"	-6 m 12 s
19	115° 11' 30"	-0.25"	117° 08' 04"	21° 05' 50"	1.0163218	15' 44.22"	23° 26' 17"	-6 m 13 s
20	115° 13' 54"	-0.24"	117° 10' 35"	21° 05' 24"	1.0163196	15' 44.22"	23° 26' 17"	-6 m 13 s
21	115° 16' 17"	-0.24"	117° 13' 05"	21° 04' 58"	1.0163174	15' 44.22"	23° 26' 17"	-6 m 13 s
22	115° 18' 40"	-0.24"	117° 15' 36"	21° 04' 32"	1.0163151	15' 44.22"	23° 26' 17"	-6 m 13 s
23	115° 21' 03"	-0.24"	117° 18' 07"	21° 04' 05"	1.0163129	15' 44.23"	23° 26' 17"	-6 m 13 s
24	115° 23' 26"	-0.23"	117° 20' 38"	21° 03' 39"	1.0163106	15' 44.23"	23° 26' 17"	-6 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	339° 27' 15"	-4° 47' 08"	342° 51' 53"	-12° 27' 13"	0° 59' 28"	16' 12.30"	72° 20' 33"	0.85284
1	340° 03' 02"	-4° 46' 04"	343° 25' 13"	-12° 12' 38"	0° 59' 26"	16' 11.68"	72° 9' 55"	0.84942
2	340° 38' 46"	-4° 44' 59"	343° 58' 26"	-11° 57' 59"	0° 59' 24"	16' 11.06"	71° 59' 32"	0.84598
3	341° 14' 27"	-4° 43' 53"	344° 31' 33"	-11° 43' 17"	0° 59' 21"	16' 10.44"	71° 49' 26"	0.84250
4	341° 50' 06"	-4° 42' 44"	345° 04' 33"	-11° 28' 33"	0° 59' 19"	16' 09.81"	71° 39' 34"	0.83900
5	342° 25' 41"	-4° 41' 34"	345° 37' 28"	-11° 13' 47"	0° 59' 17"	16' 09.18"	71° 29' 58"	0.83547
6	343° 01' 13"	-4° 40' 22"	346° 10' 16"	-10° 58' 58"	0° 59' 14"	16' 08.55"	71° 20' 37"	0.83192
7	343° 36' 42"	-4° 39' 08"	346° 42' 58"	-10° 44' 07"	0° 59' 12"	16' 07.92"	71° 11' 31"	0.82834
8	344° 12' 08"	-4° 37' 52"	347° 15' 35"	-10° 29' 13"	0° 59' 10"	16' 07.28"	71° 2' 40"	0.82474
9	344° 47' 31"	-4° 36' 35"	347° 48' 05"	-10° 14' 18"	0° 59' 07"	16' 06.64"	70° 54' 02"	0.82111
10	345° 22' 51"	-4° 35' 17"	348° 20' 30"	-9° 59' 20"	0° 59' 05"	16' 06.00"	70° 45' 39"	0.81746
11	345° 58' 08"	-4° 33' 56"	348° 52' 49"	-9° 44' 21"	0° 59' 03"	16' 05.36"	70° 37' 30"	0.81379
12	346° 33' 21"	-4° 32' 34"	349° 25' 03"	-9° 29' 20"	0° 59' 00"	16' 04.72"	70° 29' 34"	0.81009
13	347° 08' 32"	-4° 31' 11"	349° 57' 11"	-9° 14' 17"	0° 58' 58"	16' 04.07"	70° 21' 52"	0.80637
14	347° 43' 39"	-4° 29' 45"	350° 29' 13"	-8° 59' 13"	0° 58' 56"	16' 03.43"	70° 14' 24"	0.80263
15	348° 18' 44"	-4° 28' 19"	351° 01' 10"	-8° 44' 07"	0° 58' 53"	16' 02.78"	70° 7' 09"	0.79886
16	348° 53' 45"	-4° 26' 50"	351° 33' 02"	-8° 28' 59"	0° 58' 51"	16' 02.13"	70° 0' 07"	0.79508
17	349° 28' 43"	-4° 25' 20"	352° 04' 49"	-8° 13' 51"	0° 58' 48"	16' 01.48"	69° 53' 17"	0.79127
18	350° 03' 38"	-4° 23' 49"	352° 36' 30"	-7° 58' 41"	0° 58' 46"	16' 00.83"	69° 46' 41"	0.78745
19	350° 38' 30"	-4° 22' 16"	353° 08' 07"	-7° 43' 30"	0° 58' 44"	16' 00.18"	69° 40' 17"	0.78360
20	351° 13' 19"	-4° 20' 42"	353° 39' 38"	-7° 28' 18"	0° 58' 41"	15' 59.53"	69° 34' 06"	0.77974
21	351° 48' 04"	-4° 19' 06"	354° 11' 05"	-7° 13' 05"	0° 58' 39"	15' 58.87"	69° 28' 07"	0.77585
22	352° 22' 47"	-4° 17' 29"	354° 42' 26"	-6° 57' 51"	0° 58' 36"	15' 58.22"	69° 22' 20"	0.77195
23	352° 57' 26"	-4° 15' 50"	355° 13' 43"	-6° 42' 37"	0° 58' 34"	15' 57.56"	69° 16' 46"	0.76803
24	353° 32' 02"	-4° 14' 10"	355° 44' 56"	-6° 27' 22"	0° 58' 32"	15' 56.91"	69° 11' 23"	0.76410

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	115° 23' 26"	-0.23"	117° 20' 38"	21° 03' 39"	1.0163106	15' 44.23"	23° 26' 17"	-6 m 14 s
1	115° 25' 49"	-0.23"	117° 23' 08"	21° 03' 13"	1.0163084	15' 44.23"	23° 26' 17"	-6 m 14 s
2	115° 28' 12"	-0.23"	117° 25' 39"	21° 02' 47"	1.0163061	15' 44.23"	23° 26' 17"	-6 m 14 s
3	115° 30' 35"	-0.23"	117° 28' 10"	21° 02' 21"	1.0163038	15' 44.24"	23° 26' 17"	-6 m 14 s
4	115° 32' 58"	-0.22"	117° 30' 41"	21° 01' 55"	1.0163015	15' 44.24"	23° 26' 17"	-6 m 14 s
5	115° 35' 21"	-0.22"	117° 33' 11"	21° 01' 28"	1.0162993	15' 44.24"	23° 26' 17"	-6 m 15 s
6	115° 37' 44"	-0.22"	117° 35' 42"	21° 01' 02"	1.0162970	15' 44.24"	23° 26' 17"	-6 m 15 s
7	115° 40' 07"	-0.21"	117° 38' 13"	21° 00' 36"	1.0162947	15' 44.24"	23° 26' 17"	-6 m 15 s
8	115° 42' 31"	-0.21"	117° 40' 43"	21° 00' 09"	1.0162923	15' 44.25"	23° 26' 17"	-6 m 15 s
9	115° 44' 54"	-0.21"	117° 43' 14"	20° 59' 43"	1.0162900	15' 44.25"	23° 26' 17"	-6 m 15 s
10	115° 47' 17"	-0.21"	117° 45' 44"	20° 59' 16"	1.0162877	15' 44.25"	23° 26' 17"	-6 m 15 s
11	115° 49' 40"	-0.20"	117° 48' 15"	20° 58' 50"	1.0162854	15' 44.25"	23° 26' 17"	-6 m 16 s
12	115° 52' 03"	-0.20"	117° 50' 46"	20° 58' 23"	1.0162830	15' 44.25"	23° 26' 17"	-6 m 16 s
13	115° 54' 26"	-0.20"	117° 53' 16"	20° 57' 56"	1.0162807	15' 44.26"	23° 26' 17"	-6 m 16 s
14	115° 56' 49"	-0.19"	117° 55' 47"	20° 57' 30"	1.0162783	15' 44.26"	23° 26' 17"	-6 m 16 s
15	115° 59' 12"	-0.19"	117° 58' 17"	20° 57' 03"	1.0162760	15' 44.26"	23° 26' 17"	-6 m 16 s
16	116° 01' 35"	-0.19"	118° 00' 48"	20° 56' 36"	1.0162736	15' 44.26"	23° 26' 17"	-6 m 17 s
17	116° 03' 58"	-0.18"	118° 03' 18"	20° 56' 10"	1.0162712	15' 44.27"	23° 26' 17"	-6 m 17 s
18	116° 06' 21"	-0.18"	118° 05' 49"	20° 55' 43"	1.0162689	15' 44.27"	23° 26' 17"	-6 m 17 s
19	116° 08' 45"	-0.18"	118° 08' 19"	20° 55' 16"	1.0162665	15' 44.27"	23° 26' 17"	-6 m 17 s
20	116° 11' 08"	-0.17"	118° 10' 50"	20° 54' 49"	1.0162641	15' 44.27"	23° 26' 17"	-6 m 17 s
21	116° 13' 31"	-0.17"	118° 13' 20"	20° 54' 22"	1.0162617	15' 44.27"	23° 26' 17"	-6 m 17 s
22	116° 15' 54"	-0.17"	118° 15' 51"	20° 53' 55"	1.0162593	15' 44.28"	23° 26' 17"	-6 m 18 s
23	116° 18' 17"	-0.16"	118° 18' 21"	20° 53' 28"	1.0162569	15' 44.28"	23° 26' 17"	-6 m 18 s
24	116° 20' 40"	-0.16"	118° 20' 52"	20° 53' 01"	1.0162544	15' 44.28"	23° 26' 17"	-6 m 18 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	353° 32' 02"	-4° 14' 10"	355° 44' 56"	-6° 27' 22"	0° 58' 32"	15' 56.91"	69° 11' 23"	0.76410
1	354° 06' 35"	-4° 12' 28"	356° 16' 03"	-6° 12' 06"	0° 58' 29"	15' 56.25"	69° 6' 12"	0.76014
2	354° 41' 05"	-4° 10' 45"	356° 47' 07"	-5° 56' 50"	0° 58' 27"	15' 55.60"	69° 1' 13"	0.75617
3	355° 15' 32"	-4° 09' 01"	357° 18' 05"	-5° 41' 33"	0° 58' 24"	15' 54.94"	68° 56' 26"	0.75219
4	355° 49' 56"	-4° 07' 15"	357° 49' 00"	-5° 26' 16"	0° 58' 22"	15' 54.28"	68° 51' 50"	0.74818
5	356° 24' 17"	-4° 05' 28"	358° 19' 50"	-5° 10' 58"	0° 58' 20"	15' 53.63"	68° 47' 25"	0.74417
6	356° 58' 34"	-4° 03' 40"	358° 50' 36"	-4° 55' 41"	0° 58' 17"	15' 52.97"	68° 43' 12"	0.74013
7	357° 32' 48"	-4° 01' 50"	359° 21' 19"	-4° 40' 23"	0° 58' 15"	15' 52.31"	68° 39' 10"	0.73609
8	358° 06' 60"	-3° 59' 59"	359° 51' 57"	-4° 25' 06"	0° 58' 12"	15' 51.66"	68° 35' 18"	0.73203
9	358° 41' 08"	-3° 58' 07"	0° 22' 31"	-4° 09' 48"	0° 58' 10"	15' 51.00"	68° 31' 38"	0.72795
10	359° 15' 13"	-3° 56' 13"	0° 53' 01"	-3° 54' 31"	0° 58' 08"	15' 50.35"	68° 28' 09"	0.72387
11	359° 49' 15"	-3° 54' 19"	1° 23' 28"	-3° 39' 14"	0° 58' 05"	15' 49.69"	68° 24' 50"	0.71977
12	0° 23' 14"	-3° 52' 23"	1° 53' 51"	-3° 23' 57"	0° 58' 03"	15' 49.04"	68° 21' 43"	0.71566
13	0° 57' 10"	-3° 50' 26"	2° 24' 10"	-3° 08' 40"	0° 58' 00"	15' 48.39"	68° 18' 45"	0.71153
14	1° 31' 02"	-3° 48' 27"	2° 54' 26"	-2° 53' 24"	0° 57' 58"	15' 47.73"	68° 15' 59"	0.70740
15	2° 04' 52"	-3° 46' 28"	3° 24' 38"	-2° 38' 08"	0° 57' 56"	15' 47.08"	68° 13' 22"	0.70325
16	2° 38' 39"	-3° 44' 27"	3° 54' 47"	-2° 22' 53"	0° 57' 53"	15' 46.43"	68° 10' 56"	0.69909
17	3° 12' 22"	-3° 42' 25"	4° 24' 53"	-2° 07' 39"	0° 57' 51"	15' 45.78"	68° 8' 41"	0.69493
18	3° 46' 03"	-3° 40' 23"	4° 54' 56"	-1° 52' 25"	0° 57' 48"	15' 45.13"	68° 6' 35"	0.69075
19	4° 19' 40"	-3° 38' 19"	5° 24' 56"	-1° 37' 12"	0° 57' 46"	15' 44.49"	68° 4' 40"	0.68656
20	4° 53' 15"	-3° 36' 14"	5° 54' 52"	-1° 21' 60"	0° 57' 44"	15' 43.84"	68° 2' 54"	0.68237
21	5° 26' 46"	-3° 34' 07"	6° 24' 46"	-1° 06' 48"	0° 57' 41"	15' 43.19"	68° 1' 19"	0.67817
22	6° 00' 14"	-3° 32' 00"	6° 54' 37"	0° -51' 38"	0° 57' 39"	15' 42.55"	67° 59' 53"	0.67395
23	6° 33' 40"	-3° 29' 52"	7° 24' 25"	0° -36' 29"	0° 57' 37"	15' 41.91"	67° 58' 38"	0.66973
24	7° 07' 02"	-3° 27' 43"	7° 54' 10"	0° -21' 21"	0° 57' 34"	15' 41.27"	67° 57' 32"	0.66551

**19 Juli 2022****DATA MATAHARI**

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	116° 20' 40"	-0.16"	118° 20' 52"	20° 53' 01"	1.0162544	15' 44.28"	23° 26' 17"	-6 m 18 s
1	116° 23' 03"	-0.16"	118° 23' 22"	20° 52' 34"	1.0162520	15' 44.28"	23° 26' 17"	-6 m 18 s
2	116° 25' 26"	-0.15"	118° 25' 52"	20° 52' 07"	1.0162496	15' 44.29"	23° 26' 17"	-6 m 18 s
3	116° 27' 49"	-0.15"	118° 28' 23"	20° 51' 40"	1.0162471	15' 44.29"	23° 26' 17"	-6 m 18 s
4	116° 30' 13"	-0.14"	118° 30' 53"	20° 51' 13"	1.0162447	15' 44.29"	23° 26' 17"	-6 m 19 s
5	116° 32' 36"	-0.14"	118° 33' 23"	20° 50' 46"	1.0162422	15' 44.29"	23° 26' 17"	-6 m 19 s
6	116° 34' 59"	-0.14"	118° 35' 54"	20° 50' 19"	1.0162397	15' 44.29"	23° 26' 17"	-6 m 19 s
7	116° 37' 22"	-0.13"	118° 38' 24"	20° 49' 51"	1.0162373	15' 44.30"	23° 26' 17"	-6 m 19 s
8	116° 39' 45"	-0.13"	118° 40' 54"	20° 49' 24"	1.0162348	15' 44.30"	23° 26' 17"	-6 m 19 s
9	116° 42' 08"	-0.12"	118° 43' 25"	20° 48' 57"	1.0162323	15' 44.30"	23° 26' 17"	-6 m 19 s
10	116° 44' 31"	-0.12"	118° 45' 55"	20° 48' 29"	1.0162298	15' 44.30"	23° 26' 17"	-6 m 20 s
11	116° 46' 54"	-0.12"	118° 48' 25"	20° 48' 02"	1.0162273	15' 44.31"	23° 26' 17"	-6 m 20 s
12	116° 49' 17"	-0.11"	118° 50' 55"	20° 47' 35"	1.0162248	15' 44.31"	23° 26' 17"	-6 m 20 s
13	116° 51' 41"	-0.11"	118° 53' 26"	20° 47' 07"	1.0162223	15' 44.31"	23° 26' 17"	-6 m 20 s
14	116° 54' 04"	-0.10"	118° 55' 56"	20° 46' 40"	1.0162198	15' 44.31"	23° 26' 17"	-6 m 20 s
15	116° 56' 27"	-0.10"	118° 58' 26"	20° 46' 12"	1.0162172	15' 44.32"	23° 26' 17"	-6 m 20 s
16	116° 58' 50"	-0.10"	119° 00' 56"	20° 45' 44"	1.0162147	15' 44.32"	23° 26' 17"	-6 m 21 s
17	117° 01' 13"	-0.09"	119° 03' 27"	20° 45' 17"	1.0162121	15' 44.32"	23° 26' 17"	-6 m 21 s
18	117° 03' 36"	-0.09"	119° 05' 57"	20° 44' 49"	1.0162096	15' 44.32"	23° 26' 17"	-6 m 21 s
19	117° 05' 59"	-0.08"	119° 08' 27"	20° 44' 21"	1.0162070	15' 44.33"	23° 26' 17"	-6 m 21 s
20	117° 08' 23"	-0.08"	119° 10' 57"	20° 43' 54"	1.0162044	15' 44.33"	23° 26' 17"	-6 m 21 s
21	117° 10' 46"	-0.07"	119° 13' 27"	20° 43' 26"	1.0162019	15' 44.33"	23° 26' 17"	-6 m 21 s
22	117° 13' 09"	-0.07"	119° 15' 57"	20° 42' 58"	1.0161993	15' 44.33"	23° 26' 17"	-6 m 22 s
23	117° 15' 32"	-0.07"	119° 18' 27"	20° 42' 30"	1.0161967	15' 44.33"	23° 26' 17"	-6 m 22 s
24	117° 17' 55"	-0.06"	119° 20' 57"	20° 42' 02"	1.0161941	15' 44.34"	23° 26' 17"	-6 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	7° 07' 02"	-3° 27' 43"	7° 54' 10"	0°-21' 21"	0° 57' 34"	15' 41.27"	67° 57' 32"	0.66551
1	7° 40' 22"	-3° 25' 33"	8° 23' 53"	0° -6' 14"	0° 57' 32"	15' 40.63"	67° 56' 35"	0.66127
2	8° 13' 38"	-3° 23' 22"	8° 53' 33"	0° 08' 52"	0° 57' 30"	15' 39.99"	67° 55' 49"	0.65703
3	8° 46' 52"	-3° 21' 09"	9° 23' 11"	0° 23' 56"	0° 57' 27"	15' 39.36"	67° 55' 12"	0.65279
4	9° 20' 03"	-3° 18' 56"	9° 52' 46"	0° 38' 59"	0° 57' 25"	15' 38.72"	67° 54' 44"	0.64853
5	9° 53' 11"	-3° 16' 42"	10° 22' 19"	0° 54' 01"	0° 57' 23"	15' 38.09"	67° 54' 26"	0.64427
6	10° 26' 15"	-3° 14' 27"	10° 51' 50"	1° 09' 01"	0° 57' 20"	15' 37.46"	67° 54' 17"	0.64001
7	10° 59' 17"	-3° 12' 12"	11° 21' 19"	1° 23' 59"	0° 57' 18"	15' 36.84"	67° 54' 17"	0.63574
8	11° 32' 16"	-3° 09' 55"	11° 50' 45"	1° 38' 56"	0° 57' 16"	15' 36.21"	67° 54' 27"	0.63147
9	12° 05' 13"	-3° 07' 37"	12° 20' 10"	1° 53' 52"	0° 57' 13"	15' 35.59"	67° 54' 46"	0.62719
10	12° 38' 06"	-3° 05' 19"	12° 49' 33"	2° 08' 45"	0° 57' 11"	15' 34.97"	67° 55' 14"	0.62291
11	13° 10' 57"	-3° 02' 60"	13° 18' 54"	2° 23' 37"	0° 57' 09"	15' 34.35"	67° 55' 52"	0.61862
12	13° 43' 45"	-3° 00' 40"	13° 48' 13"	2° 38' 27"	0° 57' 07"	15' 33.73"	67° 56' 38"	0.61434
13	14° 16' 29"	-2° 58' 19"	14° 17' 31"	2° 53' 15"	0° 57' 04"	15' 33.12"	67° 57' 33"	0.61004
14	14° 49' 12"	-2° 55' 57"	14° 46' 46"	3° 08' 01"	0° 57' 02"	15' 32.50"	67° 58' 37"	0.60575
15	15° 21' 51"	-2° 53' 35"	15° 16' 01"	3° 22' 46"	0° 56' 60"	15' 31.90"	67° 59' 50"	0.60146
16	15° 54' 28"	-2° 51' 12"	15° 45' 14"	3° 37' 28"	0° 56' 58"	15' 31.29"	68° 1' 12"	0.59716
17	16° 27' 02"	-2° 48' 48"	16° 14' 25"	3° 52' 08"	0° 56' 55"	15' 30.68"	68° 2' 43"	0.59286
18	16° 59' 33"	-2° 46' 23"	16° 43' 35"	4° 06' 46"	0° 56' 53"	15' 30.08"	68° 4' 23"	0.58856
19	17° 32' 01"	-2° 43' 58"	17° 12' 44"	4° 21' 21"	0° 56' 51"	15' 29.48"	68° 6' 11"	0.58426
20	18° 04' 27"	-2° 41' 32"	17° 41' 52"	4° 35' 55"	0° 56' 49"	15' 28.89"	68° 8' 08"	0.57996
21	18° 36' 50"	-2° 39' 05"	18° 10' 59"	4° 50' 26"	0° 56' 47"	15' 28.30"	68° 10' 14"	0.57566
22	19° 09' 11"	-2° 36' 38"	18° 40' 05"	5° 04' 54"	0° 56' 44"	15' 27.71"	68° 12' 28"	0.57136
23	19° 41' 29"	-2° 34' 10"	19° 09' 10"	5° 19' 21"	0° 56' 42"	15' 27.12"	68° 14' 51"	0.56706
24	20° 13' 44"	-2° 31' 41"	19° 38' 13"	5° 33' 44"	0° 56' 40"	15' 26.53"	68° 17' 22"	0.56276

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	117° 17' 55"	-0.06"	119° 20' 57"	20° 42' 02"	1.0161941	15' 44.34"	23° 26' 17"	-6 m 22 s
1	117° 20' 18"	-0.06"	119° 23' 28"	20° 41' 34"	1.0161915	15' 44.34"	23° 26' 17"	-6 m 22 s
2	117° 22' 41"	-0.05"	119° 25' 58"	20° 41' 06"	1.0161888	15' 44.34"	23° 26' 17"	-6 m 22 s
3	117° 25' 04"	-0.05"	119° 28' 28"	20° 40' 38"	1.0161862	15' 44.34"	23° 26' 17"	-6 m 22 s
4	117° 27' 28"	-0.04"	119° 30' 58"	20° 40' 10"	1.0161836	15' 44.35"	23° 26' 17"	-6 m 22 s
5	117° 29' 51"	-0.04"	119° 33' 28"	20° 39' 42"	1.0161810	15' 44.35"	23° 26' 17"	-6 m 23 s
6	117° 32' 14"	-0.03"	119° 35' 58"	20° 39' 14"	1.0161783	15' 44.35"	23° 26' 17"	-6 m 23 s
7	117° 34' 37"	-0.03"	119° 38' 28"	20° 38' 46"	1.0161756	15' 44.35"	23° 26' 17"	-6 m 23 s
8	117° 37' 00"	-0.02"	119° 40' 58"	20° 38' 18"	1.0161730	15' 44.36"	23° 26' 17"	-6 m 23 s
9	117° 39' 23"	-0.02"	119° 43' 28"	20° 37' 50"	1.0161703	15' 44.36"	23° 26' 17"	-6 m 23 s
10	117° 41' 47"	-0.01"	119° 45' 58"	20° 37' 22"	1.0161676	15' 44.36"	23° 26' 17"	-6 m 23 s
11	117° 44' 10"	-0.01"	119° 48' 27"	20° 36' 53"	1.0161649	15' 44.36"	23° 26' 17"	-6 m 23 s
12	117° 46' 33"	-0.00"	119° 50' 57"	20° 36' 25"	1.0161622	15' 44.37"	23° 26' 17"	-6 m 24 s
13	117° 48' 56"	0.00"	119° 53' 27"	20° 35' 57"	1.0161595	15' 44.37"	23° 26' 17"	-6 m 24 s
14	117° 51' 19"	0.01"	119° 55' 57"	20° 35' 28"	1.0161568	15' 44.37"	23° 26' 17"	-6 m 24 s
15	117° 53' 42"	0.01"	119° 58' 27"	20° 34' 60"	1.0161541	15' 44.37"	23° 26' 17"	-6 m 24 s
16	117° 56' 05"	0.02"	120° 00' 57"	20° 34' 31"	1.0161514	15' 44.38"	23° 26' 17"	-6 m 24 s
17	117° 58' 29"	0.02"	120° 03' 27"	20° 34' 03"	1.0161486	15' 44.38"	23° 26' 17"	-6 m 24 s
18	118° 00' 52"	0.03"	120° 05' 57"	20° 33' 34"	1.0161459	15' 44.38"	23° 26' 17"	-6 m 24 s
19	118° 03' 15"	0.03"	120° 08' 26"	20° 33' 06"	1.0161431	15' 44.38"	23° 26' 17"	-6 m 25 s
20	118° 05' 38"	0.04"	120° 10' 56"	20° 32' 37"	1.0161404	15' 44.39"	23° 26' 17"	-6 m 25 s
21	118° 08' 01"	0.04"	120° 13' 26"	20° 32' 08"	1.0161376	15' 44.39"	23° 26' 17"	-6 m 25 s
22	118° 10' 24"	0.05"	120° 15' 56"	20° 31' 40"	1.0161348	15' 44.39"	23° 26' 17"	-6 m 25 s
23	118° 12' 48"	0.05"	120° 18' 26"	20° 31' 11"	1.0161321	15' 44.39"	23° 26' 17"	-6 m 25 s
24	118° 15' 11"	0.06"	120° 20' 55"	20° 30' 42"	1.0161293	15' 44.40"	23° 26' 17"	-6 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	20° 13' 44"	-2° 31' 41"	19° 38' 13"	5° 33' 44"	0° 56' 40"	15' 26.53"	68° 17' 22"	0.56276
1	20° 45' 57"	-2° 29' 12"	20° 07' 17"	5° 48' 06"	0° 56' 38"	15' 25.95"	68° 20' 02"	0.55846
2	21° 18' 07"	-2° 26' 42"	20° 36' 19"	6° 02' 24"	0° 56' 36"	15' 25.37"	68° 22' 51"	0.55416
3	21° 50' 14"	-2° 24' 12"	21° 05' 21"	6° 16' 40"	0° 56' 34"	15' 24.80"	68° 25' 48"	0.54987
4	22° 22' 19"	-2° 21' 41"	21° 34' 22"	6° 30' 54"	0° 56' 32"	15' 24.23"	68° 28' 53"	0.54558
5	22° 54' 22"	-2° 19' 09"	22° 03' 22"	6° 45' 05"	0° 56' 30"	15' 23.66"	68° 32' 06"	0.54128
6	23° 26' 22"	-2° 16' 37"	22° 32' 22"	6° 59' 13"	0° 56' 28"	15' 23.09"	68° 35' 28"	0.53700
7	23° 58' 19"	-2° 14' 05"	23° 01' 22"	7° 13' 18"	0° 56' 25"	15' 22.53"	68° 38' 59"	0.53271
8	24° 30' 14"	-2° 11' 32"	23° 30' 21"	7° 27' 20"	0° 56' 23"	15' 21.97"	68° 42' 37"	0.52843
9	25° 02' 07"	-2° 08' 58"	23° 59' 20"	7° 41' 19"	0° 56' 21"	15' 21.42"	68° 46' 24"	0.52415
10	25° 33' 57"	-2° 06' 24"	24° 28' 19"	7° 55' 16"	0° 56' 19"	15' 20.86"	68° 50' 19"	0.51987
11	26° 05' 45"	-2° 03' 50"	24° 57' 18"	8° 09' 09"	0° 56' 17"	15' 20.32"	68° 54' 22"	0.51560
12	26° 37' 31"	-2° 01' 15"	25° 26' 17"	8° 22' 59"	0° 56' 15"	15' 19.77"	68° 58' 33"	0.51134
13	27° 09' 14"	-1° 58' 39"	25° 55' 16"	8° 36' 47"	0° 56' 13"	15' 19.23"	69° 2' 53"	0.50707
14	27° 40' 54"	-1° 56' 03"	26° 24' 14"	8° 50' 31"	0° 56' 11"	15' 18.69"	69° 7' 20"	0.50282
15	28° 12' 33"	-1° 53' 27"	26° 53' 13"	9° 04' 12"	0° 56' 09"	15' 18.15"	69° 11' 56"	0.49856
16	28° 44' 09"	-1° 50' 50"	27° 22' 12"	9° 17' 49"	0° 56' 07"	15' 17.62"	69° 16' 40"	0.49432
17	29° 15' 43"	-1° 48' 13"	27° 51' 12"	9° 31' 24"	0° 56' 05"	15' 17.10"	69° 21' 32"	0.49008
18	29° 47' 14"	-1° 45' 36"	28° 20' 11"	9° 44' 55"	0° 56' 04"	15' 16.57"	69° 26' 31"	0.48584
19	30° 18' 44"	-1° 42' 58"	28° 49' 11"	9° 58' 23"	0° 56' 02"	15' 16.05"	69° 31' 39"	0.48161
20	30° 50' 11"	-1° 40' 20"	29° 18' 12"	10° 11' 47"	0° 55' 60"	15' 15.53"	69° 36' 55"	0.47739
21	31° 21' 36"	-1° 37' 42"	29° 47' 13"	10° 25' 08"	0° 55' 58"	15' 15.02"	69° 42' 19"	0.47317
22	31° 52' 59"	-1° 35' 03"	30° 16' 14"	10° 38' 25"	0° 55' 56"	15' 14.51"	69° 47' 51"	0.46896
23	32° 24' 19"	-1° 32' 24"	30° 45' 16"	10° 51' 39"	0° 55' 54"	15' 14.01"	69° 53' 30"	0.46476
24	32° 55' 38"	-1° 29' 45"	31° 14' 19"	11° 04' 49"	0° 55' 52"	15' 13.51"	69° 59' 18"	0.46056



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	118° 15' 11"	0.06"	120° 20' 55"	20° 30' 42"	1.0161293	15' 44.40"	23° 26' 17"	-6 m 25 s
1	118° 17' 34"	0.06"	120° 23' 25"	20° 30' 14"	1.0161265	15' 44.40"	23° 26' 17"	-6 m 25 s
2	118° 19' 57"	0.07"	120° 25' 55"	20° 29' 45"	1.0161237	15' 44.40"	23° 26' 17"	-6 m 25 s
3	118° 22' 20"	0.07"	120° 28' 24"	20° 29' 16"	1.0161208	15' 44.41"	23° 26' 17"	-6 m 26 s
4	118° 24' 43"	0.08"	120° 30' 54"	20° 28' 47"	1.0161180	15' 44.41"	23° 26' 17"	-6 m 26 s
5	118° 27' 07"	0.08"	120° 33' 24"	20° 28' 18"	1.0161152	15' 44.41"	23° 26' 17"	-6 m 26 s
6	118° 29' 30"	0.09"	120° 35' 54"	20° 27' 49"	1.0161123	15' 44.41"	23° 26' 17"	-6 m 26 s
7	118° 31' 53"	0.09"	120° 38' 23"	20° 27' 20"	1.0161095	15' 44.42"	23° 26' 17"	-6 m 26 s
8	118° 34' 16"	0.10"	120° 40' 53"	20° 26' 51"	1.0161066	15' 44.42"	23° 26' 17"	-6 m 26 s
9	118° 36' 39"	0.10"	120° 43' 22"	20° 26' 22"	1.0161037	15' 44.42"	23° 26' 17"	-6 m 26 s
10	118° 39' 03"	0.11"	120° 45' 52"	20° 25' 53"	1.0161009	15' 44.42"	23° 26' 17"	-6 m 26 s
11	118° 41' 26"	0.11"	120° 48' 22"	20° 25' 24"	1.0160980	15' 44.43"	23° 26' 17"	-6 m 27 s
12	118° 43' 49"	0.12"	120° 50' 51"	20° 24' 54"	1.0160951	15' 44.43"	23° 26' 17"	-6 m 27 s
13	118° 46' 12"	0.12"	120° 53' 21"	20° 24' 25"	1.0160922	15' 44.43"	23° 26' 17"	-6 m 27 s
14	118° 48' 35"	0.13"	120° 55' 50"	20° 23' 56"	1.0160893	15' 44.43"	23° 26' 17"	-6 m 27 s
15	118° 50' 58"	0.13"	120° 58' 20"	20° 23' 27"	1.0160864	15' 44.44"	23° 26' 17"	-6 m 27 s
16	118° 53' 22"	0.14"	121° 00' 49"	20° 22' 57"	1.0160834	15' 44.44"	23° 26' 17"	-6 m 27 s
17	118° 55' 45"	0.15"	121° 03' 19"	20° 22' 28"	1.0160805	15' 44.44"	23° 26' 17"	-6 m 27 s
18	118° 58' 08"	0.15"	121° 05' 48"	20° 21' 59"	1.0160776	15' 44.45"	23° 26' 17"	-6 m 27 s
19	119° 00' 31"	0.16"	121° 08' 18"	20° 21' 29"	1.0160746	15' 44.45"	23° 26' 17"	-6 m 27 s
20	119° 02' 54"	0.16"	121° 10' 47"	20° 20' 60"	1.0160716	15' 44.45"	23° 26' 17"	-6 m 28 s
21	119° 05' 18"	0.17"	121° 13' 17"	20° 20' 30"	1.0160687	15' 44.45"	23° 26' 17"	-6 m 28 s
22	119° 07' 41"	0.17"	121° 15' 46"	20° 20' 01"	1.0160657	15' 44.46"	23° 26' 17"	-6 m 28 s
23	119° 10' 04"	0.18"	121° 18' 16"	20° 19' 31"	1.0160627	15' 44.46"	23° 26' 17"	-6 m 28 s
24	119° 12' 27"	0.18"	121° 20' 45"	20° 19' 02"	1.0160597	15' 44.46"	23° 26' 17"	-6 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	32° 55' 38"	-1° 29' 45"	31° 14' 19"	11° 04' 49"	0° 55' 52"	15' 13.51"	69° 59' 18"	0.46056
1	33° 26' 54"	-1° 27' 05"	31° 43' 22"	11° 17' 56"	0° 55' 50"	15' 13.01"	70° 5' 13"	0.45638
2	33° 58' 08"	-1° 24' 26"	32° 12' 27"	11° 30' 59"	0° 55' 49"	15' 12.51"	70° 11' 16"	0.45220
3	34° 29' 21"	-1° 21' 46"	32° 41' 32"	11° 43' 58"	0° 55' 47"	15' 12.02"	70° 17' 28"	0.44803
4	35° 00' 31"	-1° 19' 05"	33° 10' 38"	11° 56' 53"	0° 55' 45"	15' 11.54"	70° 23' 47"	0.44386
5	35° 31' 39"	-1° 16' 25"	33° 39' 45"	12° 09' 45"	0° 55' 43"	15' 11.06"	70° 30' 13"	0.43971
6	36° 02' 45"	-1° 13' 44"	34° 08' 53"	12° 22' 33"	0° 55' 42"	15' 10.58"	70° 36' 48"	0.43556
7	36° 33' 50"	-1° 11' 03"	34° 38' 02"	12° 35' 17"	0° 55' 40"	15' 10.10"	70° 43' 30"	0.43143
8	37° 04' 52"	-1° 08' 22"	35° 07' 12"	12° 47' 57"	0° 55' 38"	15' 09.63"	70° 50' 21"	0.42730
9	37° 35' 52"	-1° 05' 41"	35° 36' 23"	13° 00' 33"	0° 55' 36"	15' 09.17"	70° 57' 19"	0.42318
10	38° 06' 51"	-1° 02' 59"	36° 05' 36"	13° 13' 04"	0° 55' 35"	15' 08.70"	71° 4' 24"	0.41907
11	38° 37' 47"	-1° 00' 18"	36° 34' 49"	13° 25' 32"	0° 55' 33"	15' 08.25"	71° 11' 38"	0.41498
12	39° 08' 42"	0°-57' 36"	37° 04' 05"	13° 37' 56"	0° 55' 31"	15' 07.79"	71° 18' 59"	0.41089
13	39° 39' 35"	0°-54' 54"	37° 33' 21"	13° 50' 16"	0° 55' 30"	15' 07.34"	71° 26' 28"	0.40681
14	40° 10' 26"	0°-52' 12"	38° 02' 39"	14° 02' 31"	0° 55' 28"	15' 06.90"	71° 34' 04"	0.40274
15	40° 41' 15"	0°-49' 30"	38° 31' 58"	14° 14' 42"	0° 55' 26"	15' 06.45"	71° 41' 48"	0.39869
16	41° 12' 02"	0°-46' 48"	39° 01' 19"	14° 26' 49"	0° 55' 25"	15' 06.02"	71° 49' 40"	0.39464
17	41° 42' 48"	0°-44' 06"	39° 30' 41"	14° 38' 52"	0° 55' 23"	15' 05.58"	71° 57' 40"	0.39061
18	42° 13' 32"	0°-41' 24"	40° 00' 05"	14° 50' 50"	0° 55' 22"	15' 05.15"	72° 5' 47"	0.38659
19	42° 44' 14"	0°-38' 42"	40° 29' 31"	15° 02' 44"	0° 55' 20"	15' 04.73"	72° 14' 02"	0.38257
20	43° 14' 55"	0°-35' 59"	40° 58' 58"	15° 14' 34"	0° 55' 19"	15' 04.30"	72° 22' 24"	0.37858
21	43° 45' 34"	0°-33' 17"	41° 28' 27"	15° 26' 19"	0° 55' 17"	15' 03.89"	72° 30' 55"	0.37459
22	44° 16' 11"	0°-30' 35"	41° 57' 58"	15° 37' 59"	0° 55' 16"	15' 03.47"	72° 39' 32"	0.37061
23	44° 46' 47"	0°-27' 52"	42° 27' 31"	15° 49' 35"	0° 55' 14"	15' 03.06"	72° 48' 18"	0.36665
24	45° 17' 21"	0°-25' 10"	42° 57' 06"	16° 01' 06"	0° 55' 13"	15' 02.66"	72° 57' 11"	0.36270

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	119° 12' 27"	0.18"	121° 20' 45"	20° 19' 02"	1.0160597	15' 44.46"	23° 26' 17"	-6 m 28 s
1	119° 14' 50"	0.19"	121° 23' 14"	20° 18' 32"	1.0160567	15' 44.46"	23° 26' 17"	-6 m 28 s
2	119° 17' 14"	0.19"	121° 25' 44"	20° 18' 02"	1.0160537	15' 44.47"	23° 26' 17"	-6 m 28 s
3	119° 19' 37"	0.20"	121° 28' 13"	20° 17' 33"	1.0160507	15' 44.47"	23° 26' 17"	-6 m 28 s
4	119° 22' 00"	0.21"	121° 30' 43"	20° 17' 03"	1.0160476	15' 44.47"	23° 26' 17"	-6 m 28 s
5	119° 24' 23"	0.21"	121° 33' 12"	20° 16' 33"	1.0160446	15' 44.48"	23° 26' 17"	-6 m 28 s
6	119° 26' 47"	0.22"	121° 35' 41"	20° 16' 03"	1.0160416	15' 44.48"	23° 26' 17"	-6 m 29 s
7	119° 29' 10"	0.22"	121° 38' 11"	20° 15' 33"	1.0160385	15' 44.48"	23° 26' 17"	-6 m 29 s
8	119° 31' 33"	0.23"	121° 40' 40"	20° 15' 03"	1.0160354	15' 44.48"	23° 26' 17"	-6 m 29 s
9	119° 33' 56"	0.23"	121° 43' 09"	20° 14' 33"	1.0160324	15' 44.49"	23° 26' 17"	-6 m 29 s
10	119° 36' 19"	0.24"	121° 45' 38"	20° 14' 04"	1.0160293	15' 44.49"	23° 26' 17"	-6 m 29 s
11	119° 38' 43"	0.24"	121° 48' 08"	20° 13' 34"	1.0160262	15' 44.49"	23° 26' 17"	-6 m 29 s
12	119° 41' 06"	0.25"	121° 50' 37"	20° 13' 03"	1.0160231	15' 44.50"	23° 26' 17"	-6 m 29 s
13	119° 43' 29"	0.26"	121° 53' 06"	20° 12' 33"	1.0160200	15' 44.50"	23° 26' 17"	-6 m 29 s
14	119° 45' 52"	0.26"	121° 55' 35"	20° 12' 03"	1.0160169	15' 44.50"	23° 26' 17"	-6 m 29 s
15	119° 48' 15"	0.27"	121° 58' 04"	20° 11' 33"	1.0160137	15' 44.50"	23° 26' 17"	-6 m 29 s
16	119° 50' 39"	0.27"	122° 00' 34"	20° 11' 03"	1.0160106	15' 44.51"	23° 26' 17"	-6 m 29 s
17	119° 53' 02"	0.28"	122° 03' 03"	20° 10' 33"	1.0160075	15' 44.51"	23° 26' 17"	-6 m 30 s
18	119° 55' 25"	0.28"	122° 05' 32"	20° 10' 03"	1.0160043	15' 44.51"	23° 26' 17"	-6 m 30 s
19	119° 57' 48"	0.29"	122° 08' 01"	20° 09' 32"	1.0160011	15' 44.52"	23° 26' 17"	-6 m 30 s
20	120° 00' 12"	0.29"	122° 10' 30"	20° 09' 02"	1.0159980	15' 44.52"	23° 26' 17"	-6 m 30 s
21	120° 02' 35"	0.30"	122° 12' 59"	20° 08' 32"	1.0159948	15' 44.52"	23° 26' 17"	-6 m 30 s
22	120° 04' 58"	0.31"	122° 15' 28"	20° 08' 01"	1.0159916	15' 44.53"	23° 26' 17"	-6 m 30 s
23	120° 07' 21"	0.31"	122° 17' 57"	20° 07' 31"	1.0159884	15' 44.53"	23° 26' 17"	-6 m 30 s
24	120° 09' 45"	0.32"	122° 20' 27"	20° 07' 00"	1.0159852	15' 44.53"	23° 26' 17"	-6 m 30 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	45° 17' 21"	0°-25' 10"	42° 57' 06"	16° 01' 06"	0° 55' 13"	15' 02.66"	72° 57' 11"	0.36270
1	45° 47' 53"	0°-22' 28"	43° 26' 42"	16° 12' 33"	0° 55' 11"	15' 02.26"	73° 6' 11"	0.35877
2	46° 18' 24"	0°-19' 46"	43° 56' 20"	16° 23' 55"	0° 55' 10"	15' 01.86"	73° 15' 19"	0.35484
3	46° 48' 53"	0°-17' 03"	44° 26' 01"	16° 35' 12"	0° 55' 08"	15' 01.47"	73° 24' 35"	0.35093
4	47° 19' 21"	0°-14' 21"	44° 55' 43"	16° 46' 25"	0° 55' 07"	15' 01.08"	73° 33' 58"	0.34704
5	47° 49' 47"	0°-11' 39"	45° 25' 27"	16° 57' 32"	0° 55' 05"	15' 00.70"	73° 43' 29"	0.34315
6	48° 20' 12"	0° -8' 57"	45° 55' 14"	17° 08' 35"	0° 55' 04"	15' 00.32"	73° 53' 08"	0.33928
7	48° 50' 36"	0° -6' 15"	46° 25' 02"	17° 19' 33"	0° 55' 03"	14' 59.94"	74° 2' 54"	0.33543
8	49° 20' 58"	0° -3' 34"	46° 54' 53"	17° 30' 26"	0° 55' 01"	14' 59.57"	74° 12' 47"	0.33159
9	49° 51' 18"	0° 00'-52"	47° 24' 46"	17° 41' 14"	0° 54' 60"	14' 59.20"	74° 22' 48"	0.32776
10	50° 21' 38"	0° 01' 50"	47° 54' 41"	17° 51' 57"	0° 54' 59"	14' 58.84"	74° 32' 57"	0.32395
11	50° 51' 56"	0° 04' 31"	48° 24' 39"	18° 02' 35"	0° 54' 57"	14' 58.48"	74° 43' 13"	0.32015
12	51° 22' 12"	0° 07' 12"	48° 54' 39"	18° 13' 08"	0° 54' 56"	14' 58.13"	74° 53' 36"	0.31637
13	51° 52' 27"	0° 09' 53"	49° 24' 41"	18° 23' 35"	0° 54' 55"	14' 57.78"	75° 4' 08"	0.31260
14	52° 22' 41"	0° 12' 34"	49° 54' 45"	18° 33' 58"	0° 54' 53"	14' 57.43"	75° 14' 46"	0.30885
15	52° 52' 54"	0° 15' 15"	50° 24' 52"	18° 44' 15"	0° 54' 52"	14' 57.09"	75° 25' 33"	0.30511
16	53° 23' 05"	0° 17' 56"	50° 55' 01"	18° 54' 27"	0° 54' 51"	14' 56.75"	75° 36' 26"	0.30139
17	53° 53' 16"	0° 20' 36"	51° 25' 13"	19° 04' 34"	0° 54' 50"	14' 56.42"	75° 47' 27"	0.29769
18	54° 23' 25"	0° 23' 16"	51° 55' 27"	19° 14' 35"	0° 54' 48"	14' 56.09"	75° 58' 36"	0.29400
19	54° 53' 32"	0° 25' 53"	52° 25' 44"	19° 24' 29"	0° 54' 47"	14' 55.77"	76° 9' 51"	0.29032
20	55° 23' 39"	0° 28' 33"	52° 56' 03"	19° 34' 20"	0° 54' 46"	14' 55.44"	76° 21' 15"	0.28667
21	55° 53' 45"	0° 31' 13"	53° 26' 24"	19° 44' 05"	0° 54' 45"	14' 55.13"	76° 32' 46"	0.28303
22	56° 23' 49"	0° 33' 52"	53° 56' 48"	19° 53' 44"	0° 54' 44"	14' 54.82"	76° 44' 25"	0.27940
23	56° 53' 52"	0° 36' 31"	54° 27' 15"	20° 03' 19"	0° 54' 43"	14' 54.51"	76° 56' 11"	0.27580
24	57° 23' 54"	0° 39' 09"	54° 57' 44"	20° 12' 47"	0° 54' 41"	14' 54.20"	77° 8' 05"	0.27221



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	120° 09' 45"	0.32"	122° 20' 27"	20° 07' 00"	1.0159852	15' 44.53"	23° 26' 17"	-6 m 30 s
1	120° 12' 08"	0.32"	122° 22' 56"	20° 06' 30"	1.0159820	15' 44.53"	23° 26' 17"	-6 m 30 s
2	120° 14' 31"	0.33"	122° 25' 25"	20° 05' 59"	1.0159787	15' 44.54"	23° 26' 17"	-6 m 30 s
3	120° 16' 54"	0.33"	122° 27' 54"	20° 05' 29"	1.0159755	15' 44.54"	23° 26' 17"	-6 m 30 s
4	120° 19' 18"	0.34"	122° 30' 23"	20° 04' 58"	1.0159723	15' 44.54"	23° 26' 17"	-6 m 30 s
5	120° 21' 41"	0.34"	122° 32' 52"	20° 04' 28"	1.0159690	15' 44.55"	23° 26' 17"	-6 m 31 s
6	120° 24' 04"	0.35"	122° 35' 21"	20° 03' 57"	1.0159658	15' 44.55"	23° 26' 17"	-6 m 31 s
7	120° 26' 27"	0.36"	122° 37' 50"	20° 03' 26"	1.0159625	15' 44.55"	23° 26' 17"	-6 m 31 s
8	120° 28' 51"	0.36"	122° 40' 18"	20° 02' 55"	1.0159592	15' 44.56"	23° 26' 17"	-6 m 31 s
9	120° 31' 14"	0.37"	122° 42' 47"	20° 02' 25"	1.0159559	15' 44.56"	23° 26' 17"	-6 m 31 s
10	120° 33' 37"	0.37"	122° 45' 16"	20° 01' 54"	1.0159526	15' 44.56"	23° 26' 17"	-6 m 31 s
11	120° 36' 00"	0.38"	122° 47' 45"	20° 01' 23"	1.0159493	15' 44.56"	23° 26' 17"	-6 m 31 s
12	120° 38' 24"	0.38"	122° 50' 14"	20° 00' 52"	1.0159460	15' 44.57"	23° 26' 17"	-6 m 31 s
13	120° 40' 47"	0.39"	122° 52' 43"	20° 00' 21"	1.0159427	15' 44.57"	23° 26' 17"	-6 m 31 s
14	120° 43' 10"	0.39"	122° 55' 12"	19° 59' 50"	1.0159393	15' 44.57"	23° 26' 17"	-6 m 31 s
15	120° 45' 33"	0.40"	122° 57' 41"	19° 59' 19"	1.0159360	15' 44.58"	23° 26' 17"	-6 m 31 s
16	120° 47' 57"	0.41"	123° 00' 10"	19° 58' 48"	1.0159326	15' 44.58"	23° 26' 17"	-6 m 31 s
17	120° 50' 20"	0.41"	123° 02' 38"	19° 58' 17"	1.0159293	15' 44.58"	23° 26' 17"	-6 m 31 s
18	120° 52' 43"	0.42"	123° 05' 07"	19° 57' 46"	1.0159259	15' 44.59"	23° 26' 17"	-6 m 31 s
19	120° 55' 06"	0.42"	123° 07' 36"	19° 57' 15"	1.0159225	15' 44.59"	23° 26' 17"	-6 m 31 s
20	120° 57' 30"	0.43"	123° 10' 05"	19° 56' 44"	1.0159191	15' 44.59"	23° 26' 17"	-6 m 32 s
21	120° 59' 53"	0.43"	123° 12' 33"	19° 56' 13"	1.0159157	15' 44.60"	23° 26' 17"	-6 m 32 s
22	121° 02' 16"	0.44"	123° 15' 02"	19° 55' 41"	1.0159123	15' 44.60"	23° 26' 17"	-6 m 32 s
23	121° 04' 39"	0.44"	123° 17' 31"	19° 55' 10"	1.0159089	15' 44.60"	23° 26' 17"	-6 m 32 s
24	121° 07' 03"	0.45"	123° 19' 60"	19° 54' 39"	1.0159055	15' 44.61"	23° 26' 17"	-6 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	57° 23' 54"	0° 39' 09"	54° 57' 44"	20° 12' 47"	0° 54' 41"	14' 54.20"	77° 8' 05"	0.27221
1	57° 53' 55"	0° 41' 48"	55° 28' 16"	20° 22' 10"	0° 54' 40"	14' 53.90"	77° 20' 06"	0.26864
2	58° 23' 56"	0° 44' 26"	55° 58' 50"	20° 31' 27"	0° 54' 39"	14' 53.61"	77° 32' 15"	0.26508
3	58° 53' 55"	0° 47' 03"	56° 29' 27"	20° 40' 39"	0° 54' 38"	14' 53.32"	77° 44' 31"	0.26154
4	59° 23' 53"	0° 49' 41"	57° 00' 07"	20° 49' 45"	0° 54' 37"	14' 53.03"	77° 56' 54"	0.25802
5	59° 53' 50"	0° 52' 18"	57° 30' 49"	20° 58' 45"	0° 54' 36"	14' 52.75"	78° 9' 26"	0.25452
6	60° 23' 46"	0° 54' 55"	58° 01' 34"	21° 07' 39"	0° 54' 35"	14' 52.47"	78° 22' 04"	0.25104
7	60° 53' 41"	0° 57' 31"	58° 32' 21"	21° 16' 27"	0° 54' 34"	14' 52.19"	78° 34' 50"	0.24757
8	61° 23' 35"	1° 00' 07"	59° 03' 12"	21° 25' 10"	0° 54' 33"	14' 51.92"	78° 47' 44"	0.24412
9	61° 53' 29"	1° 02' 43"	59° 34' 05"	21° 33' 46"	0° 54' 32"	14' 51.65"	79° 0' 45"	0.24069
10	62° 23' 21"	1° 05' 18"	60° 05' 00"	21° 42' 17"	0° 54' 31"	14' 51.39"	79° 13' 54"	0.23728
11	62° 53' 13"	1° 07' 53"	60° 35' 59"	21° 50' 41"	0° 54' 30"	14' 51.13"	79° 27' 10"	0.23389
12	63° 23' 03"	1° 10' 28"	61° 06' 60"	21° 58' 60"	0° 54' 29"	14' 50.88"	79° 40' 33"	0.23052
13	63° 52' 53"	1° 13' 02"	61° 38' 03"	22° 07' 12"	0° 54' 28"	14' 50.63"	79° 54' 05"	0.22717
14	64° 22' 43"	1° 15' 35"	62° 09' 10"	22° 15' 18"	0° 54' 27"	14' 50.38"	80° 7' 43"	0.22383
15	64° 52' 31"	1° 18' 09"	62° 40' 19"	22° 23' 18"	0° 54' 27"	14' 50.14"	80° 21' 30"	0.22052
16	65° 22' 19"	1° 20' 41"	63° 11' 31"	22° 31' 12"	0° 54' 26"	14' 49.90"	80° 35' 23"	0.21722
17	65° 52' 05"	1° 23' 14"	63° 42' 45"	22° 38' 60"	0° 54' 25"	14' 49.67"	80° 49' 25"	0.21395
18	66° 21' 52"	1° 25' 46"	64° 14' 03"	22° 46' 41"	0° 54' 24"	14' 49.44"	81° 3' 33"	0.21069
19	66° 51' 37"	1° 28' 17"	64° 45' 22"	22° 54' 16"	0° 54' 23"	14' 49.21"	81° 17' 50"	0.20745
20	67° 21' 22"	1° 30' 48"	65° 16' 45"	23° 01' 45"	0° 54' 22"	14' 48.99"	81° 32' 14"	0.20424
21	67° 51' 06"	1° 33' 19"	65° 48' 10"	23° 09' 07"	0° 54' 22"	14' 48.77"	81° 46' 46"	0.20104
22	68° 20' 49"	1° 35' 49"	66° 19' 38"	23° 16' 23"	0° 54' 21"	14' 48.56"	82° 1' 25"	0.19787
23	68° 50' 32"	1° 38' 18"	66° 51' 09"	23° 23' 32"	0° 54' 20"	14' 48.35"	82° 16' 12"	0.19471
24	69° 20' 14"	1° 40' 47"	67° 22' 42"	23° 30' 35"	0° 54' 19"	14' 48.14"	82° 31' 06"	0.19158

24 Juli 2022

DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	121° 07' 03"	0.45"	123° 19' 60"	19° 54' 39"	1.0159055	15' 44.61"	23° 26' 17"	-6 m 32 s
1	121° 09' 26"	0.45"	123° 22' 28"	19° 54' 08"	1.0159020	15' 44.61"	23° 26' 17"	-6 m 32 s
2	121° 11' 49"	0.46"	123° 24' 57"	19° 53' 36"	1.0158986	15' 44.61"	23° 26' 17"	-6 m 32 s
3	121° 14' 12"	0.46"	123° 27' 26"	19° 53' 05"	1.0158951	15' 44.62"	23° 26' 17"	-6 m 32 s
4	121° 16' 36"	0.47"	123° 29' 54"	19° 52' 33"	1.0158917	15' 44.62"	23° 26' 17"	-6 m 32 s
5	121° 18' 59"	0.47"	123° 32' 23"	19° 52' 02"	1.0158882	15' 44.62"	23° 26' 17"	-6 m 32 s
6	121° 21' 22"	0.48"	123° 34' 51"	19° 51' 30"	1.0158847	15' 44.62"	23° 26' 17"	-6 m 32 s
7	121° 23' 46"	0.49"	123° 37' 20"	19° 50' 59"	1.0158812	15' 44.63"	23° 26' 17"	-6 m 32 s
8	121° 26' 09"	0.49"	123° 39' 49"	19° 50' 27"	1.0158777	15' 44.63"	23° 26' 17"	-6 m 32 s
9	121° 28' 32"	0.50"	123° 42' 17"	19° 49' 56"	1.0158742	15' 44.63"	23° 26' 17"	-6 m 32 s
10	121° 30' 55"	0.50"	123° 44' 46"	19° 49' 24"	1.0158707	15' 44.64"	23° 26' 17"	-6 m 32 s
11	121° 33' 19"	0.51"	123° 47' 14"	19° 48' 52"	1.0158672	15' 44.64"	23° 26' 17"	-6 m 32 s
12	121° 35' 42"	0.51"	123° 49' 43"	19° 48' 21"	1.0158636	15' 44.64"	23° 26' 17"	-6 m 32 s
13	121° 38' 05"	0.52"	123° 52' 11"	19° 47' 49"	1.0158601	15' 44.65"	23° 26' 17"	-6 m 32 s
14	121° 40' 29"	0.52"	123° 54' 40"	19° 47' 17"	1.0158565	15' 44.65"	23° 26' 17"	-6 m 32 s
15	121° 42' 52"	0.53"	123° 57' 08"	19° 46' 45"	1.0158529	15' 44.65"	23° 26' 17"	-6 m 32 s
16	121° 45' 15"	0.53"	123° 59' 37"	19° 46' 14"	1.0158494	15' 44.66"	23° 26' 17"	-6 m 32 s
17	121° 47' 38"	0.54"	124° 02' 05"	19° 45' 42"	1.0158458	15' 44.66"	23° 26' 17"	-6 m 33 s
18	121° 50' 02"	0.54"	124° 04' 34"	19° 45' 10"	1.0158422	15' 44.66"	23° 26' 17"	-6 m 33 s
19	121° 52' 25"	0.55"	124° 07' 02"	19° 44' 38"	1.0158386	15' 44.67"	23° 26' 17"	-6 m 33 s
20	121° 54' 48"	0.55"	124° 09' 31"	19° 44' 06"	1.0158350	15' 44.67"	23° 26' 17"	-6 m 33 s
21	121° 57' 12"	0.56"	124° 11' 59"	19° 43' 34"	1.0158313	15' 44.67"	23° 26' 17"	-6 m 33 s
22	121° 59' 35"	0.56"	124° 14' 27"	19° 43' 02"	1.0158277	15' 44.68"	23° 26' 17"	-6 m 33 s
23	122° 01' 58"	0.57"	124° 16' 56"	19° 42' 30"	1.0158241	15' 44.68"	23° 26' 17"	-6 m 33 s
24	122° 04' 22"	0.57"	124° 19' 24"	19° 41' 58"	1.0158204	15' 44.68"	23° 26' 17"	-6 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	69° 20' 14"	1° 40' 47"	67° 22' 42"	23° 30' 35"	0° 54' 19"	14' 48.14"	82° 31' 06"	0.19158
1	69° 49' 56"	1° 43' 16"	67° 54' 18"	23° 37' 31"	0° 54' 19"	14' 47.94"	82° 46' 09"	0.18847
2	70° 19' 37"	1° 45' 44"	68° 25' 57"	23° 44' 21"	0° 54' 18"	14' 47.74"	83° 1' 18"	0.18538
3	70° 49' 17"	1° 48' 11"	68° 57' 38"	23° 51' 04"	0° 54' 17"	14' 47.55"	83° 16' 36"	0.18231
4	71° 18' 57"	1° 50' 38"	69° 29' 22"	23° 57' 41"	0° 54' 16"	14' 47.36"	83° 32' 01"	0.17926
5	71° 48' 37"	1° 53' 04"	70° 01' 08"	24° 04' 10"	0° 54' 16"	14' 47.17"	83° 47' 35"	0.17623
6	72° 18' 16"	1° 55' 30"	70° 32' 57"	24° 10' 34"	0° 54' 15"	14' 46.99"	84° 3' 16"	0.17322
7	72° 47' 54"	1° 57' 55"	71° 04' 49"	24° 16' 50"	0° 54' 14"	14' 46.81"	84° 19' 04"	0.17024
8	73° 17' 32"	2° 00' 19"	71° 36' 43"	24° 22' 59"	0° 54' 14"	14' 46.64"	84° 35' 01"	0.16728
9	73° 47' 09"	2° 02' 43"	72° 08' 39"	24° 29' 02"	0° 54' 13"	14' 46.47"	84° 51' 05"	0.16434
10	74° 16' 46"	2° 05' 07"	72° 40' 38"	24° 34' 58"	0° 54' 12"	14' 46.30"	85° 7' 18"	0.16142
11	74° 46' 23"	2° 07' 29"	73° 12' 40"	24° 40' 47"	0° 54' 12"	14' 46.14"	85° 23' 38"	0.15852
12	75° 15' 59"	2° 09' 52"	73° 44' 44"	24° 46' 29"	0° 54' 11"	14' 45.98"	85° 40' 07"	0.15565
13	75° 45' 35"	2° 12' 13"	74° 16' 50"	24° 52' 04"	0° 54' 11"	14' 45.82"	85° 56' 43"	0.15280
14	76° 15' 10"	2° 14' 34"	74° 48' 59"	24° 57' 33"	0° 54' 10"	14' 45.67"	86° 13' 28"	0.14997
15	76° 44' 46"	2° 16' 54"	75° 21' 10"	25° 02' 54"	0° 54' 10"	14' 45.52"	86° 30' 21"	0.14716
16	77° 14' 20"	2° 19' 14"	75° 53' 23"	25° 08' 08"	0° 54' 09"	14' 45.38"	86° 47' 22"	0.14438
17	77° 43' 55"	2° 21' 32"	76° 25' 39"	25° 13' 15"	0° 54' 09"	14' 45.24"	87° 4' 31"	0.14162
18	78° 13' 29"	2° 23' 51"	76° 57' 56"	25° 18' 15"	0° 54' 08"	14' 45.10"	87° 21' 49"	0.13889
19	78° 43' 03"	2° 26' 08"	77° 30' 16"	25° 23' 08"	0° 54' 08"	14' 44.97"	87° 39' 16"	0.13617
20	79° 12' 36"	2° 28' 25"	78° 02' 39"	25° 27' 53"	0° 54' 07"	14' 44.84"	87° 56' 50"	0.13348
21	79° 42' 10"	2° 30' 41"	78° 35' 03"	25° 32' 32"	0° 54' 07"	14' 44.71"	88° 14' 34"	0.13082
22	80° 11' 43"	2° 32' 56"	79° 07' 30"	25° 37' 03"	0° 54' 06"	14' 44.59"	88° 32' 26"	0.12818
23	80° 41' 16"	2° 35' 11"	79° 39' 58"	25° 41' 27"	0° 54' 06"	14' 44.47"	88° 50' 27"	0.12556
24	81° 10' 48"	2° 37' 25"	80° 12' 29"	25° 45' 44"	0° 54' 05"	14' 44.35"	89° 8' 37"	0.12297



25 Juli 2022

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	122° 04' 22"	0.57"	124° 19' 24"	19° 41' 58"	1.0158204	15' 44.68"	23° 26' 17"	-6 m 33 s
1	122° 06' 45"	0.58"	124° 21' 52"	19° 41' 25"	1.0158167	15' 44.69"	23° 26' 17"	-6 m 33 s
2	122° 09' 08"	0.58"	124° 24' 21"	19° 40' 53"	1.0158131	15' 44.69"	23° 26' 17"	-6 m 33 s
3	122° 11' 31"	0.59"	124° 26' 49"	19° 40' 21"	1.0158094	15' 44.69"	23° 26' 17"	-6 m 33 s
4	122° 13' 55"	0.59"	124° 29' 17"	19° 39' 49"	1.0158057	15' 44.70"	23° 26' 17"	-6 m 33 s
5	122° 16' 18"	0.60"	124° 31' 46"	19° 39' 16"	1.0158020	15' 44.70"	23° 26' 17"	-6 m 33 s
6	122° 18' 41"	0.60"	124° 34' 14"	19° 38' 44"	1.0157983	15' 44.71"	23° 26' 17"	-6 m 33 s
7	122° 21' 05"	0.60"	124° 36' 42"	19° 38' 12"	1.0157946	15' 44.71"	23° 26' 17"	-6 m 33 s
8	122° 23' 28"	0.61"	124° 39' 10"	19° 37' 39"	1.0157908	15' 44.71"	23° 26' 17"	-6 m 33 s
9	122° 25' 51"	0.61"	124° 41' 38"	19° 37' 07"	1.0157871	15' 44.72"	23° 26' 17"	-6 m 33 s
10	122° 28' 15"	0.62"	124° 44' 07"	19° 36' 34"	1.0157833	15' 44.72"	23° 26' 17"	-6 m 33 s
11	122° 30' 38"	0.62"	124° 46' 35"	19° 36' 02"	1.0157796	15' 44.72"	23° 26' 17"	-6 m 33 s
12	122° 33' 01"	0.63"	124° 49' 03"	19° 35' 29"	1.0157758	15' 44.73"	23° 26' 17"	-6 m 33 s
13	122° 35' 25"	0.63"	124° 51' 31"	19° 34' 57"	1.0157720	15' 44.73"	23° 26' 17"	-6 m 33 s
14	122° 37' 48"	0.64"	124° 53' 59"	19° 34' 24"	1.0157682	15' 44.73"	23° 26' 17"	-6 m 33 s
15	122° 40' 11"	0.64"	124° 56' 27"	19° 33' 52"	1.0157644	15' 44.74"	23° 26' 17"	-6 m 33 s
16	122° 42' 35"	0.64"	124° 58' 56"	19° 33' 19"	1.0157606	15' 44.74"	23° 26' 17"	-6 m 33 s
17	122° 44' 58"	0.65"	125° 01' 24"	19° 32' 46"	1.0157568	15' 44.74"	23° 26' 17"	-6 m 33 s
18	122° 47' 21"	0.65"	125° 03' 52"	19° 32' 14"	1.0157530	15' 44.75"	23° 26' 17"	-6 m 33 s
19	122° 49' 45"	0.66"	125° 06' 20"	19° 31' 41"	1.0157492	15' 44.75"	23° 26' 17"	-6 m 33 s
20	122° 52' 08"	0.66"	125° 08' 48"	19° 31' 08"	1.0157453	15' 44.75"	23° 26' 17"	-6 m 33 s
21	122° 54' 31"	0.67"	125° 11' 16"	19° 30' 35"	1.0157415	15' 44.76"	23° 26' 17"	-6 m 33 s
22	122° 56' 55"	0.67"	125° 13' 44"	19° 30' 02"	1.0157376	15' 44.76"	23° 26' 17"	-6 m 33 s
23	122° 59' 18"	0.67"	125° 16' 12"	19° 29' 29"	1.0157337	15' 44.77"	23° 26' 17"	-6 m 33 s
24	123° 01' 41"	0.68"	125° 18' 40"	19° 28' 56"	1.0157298	15' 44.77"	23° 26' 17"	-6 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	81° 10' 48"	2° 37' 25"	80° 12' 29"	25° 45' 44"	0° 54' 05"	14' 44.35"	89° 8' 37"	0.12297
1	81° 40' 21"	2° 39' 38"	80° 45' 01"	25° 49' 54"	0° 54' 05"	14' 44.24"	89° 26' 56"	0.12040
2	82° 09' 53"	2° 41' 51"	81° 17' 36"	25° 53' 56"	0° 54' 05"	14' 44.13"	89° 45' 24"	0.11785
3	82° 39' 25"	2° 44' 02"	81° 50' 12"	25° 57' 51"	0° 54' 04"	14' 44.03"	90° 4' 01"	0.11533
4	83° 08' 57"	2° 46' 13"	82° 22' 50"	26° 01' 38"	0° 54' 04"	14' 43.93"	90° 22' 47"	0.11283
5	83° 38' 29"	2° 48' 23"	82° 55' 30"	26° 05' 18"	0° 54' 03"	14' 43.83"	90° 41' 44"	0.11036
6	84° 08' 01"	2° 50' 33"	83° 28' 12"	26° 08' 51"	0° 54' 03"	14' 43.74"	91° 0' 50"	0.10791
7	84° 37' 32"	2° 52' 41"	84° 00' 55"	26° 12' 16"	0° 54' 03"	14' 43.65"	91° 20' 05"	0.10549
8	85° 07' 04"	2° 54' 49"	84° 33' 41"	26° 15' 34"	0° 54' 02"	14' 43.56"	91° 39' 31"	0.10309
9	85° 36' 35"	2° 56' 56"	85° 06' 27"	26° 18' 44"	0° 54' 02"	14' 43.48"	91° 59' 07"	0.10072
10	86° 06' 06"	2° 59' 02"	85° 39' 16"	26° 21' 47"	0° 54' 02"	14' 43.40"	92° 18' 54"	0.09838
11	86° 35' 38"	3° 01' 07"	86° 12' 05"	26° 24' 42"	0° 54' 02"	14' 43.32"	92° 38' 51"	0.09605
12	87° 05' 09"	3° 03' 12"	86° 44' 57"	26° 27' 30"	0° 54' 01"	14' 43.25"	92° 58' 59"	0.09376
13	87° 34' 40"	3° 05' 16"	87° 17' 49"	26° 30' 10"	0° 54' 01"	14' 43.18"	93° 19' 18"	0.09149
14	88° 04' 11"	3° 07' 18"	87° 50' 43"	26° 32' 43"	0° 54' 01"	14' 43.11"	93° 39' 49"	0.08924
15	88° 33' 42"	3° 09' 20"	88° 23' 39"	26° 35' 08"	0° 54' 01"	14' 43.05"	94° 0' 31"	0.08703
16	89° 03' 14"	3° 11' 21"	88° 56' 35"	26° 37' 26"	0° 54' 00"	14' 42.99"	94° 21' 25"	0.08483
17	89° 32' 45"	3° 13' 22"	89° 29' 33"	26° 39' 35"	0° 54' 00"	14' 42.93"	94° 42' 31"	0.08267
18	90° 02' 16"	3° 15' 21"	90° 02' 32"	26° 41' 38"	0° 53' 60"	14' 42.88"	95° 3' 50"	0.08053
19	90° 31' 47"	3° 17' 19"	90° 35' 32"	26° 43' 32"	0° 53' 60"	14' 42.83"	95° 25' 22"	0.07841
20	91° 01' 19"	3° 19' 17"	91° 08' 33"	26° 45' 19"	0° 53' 60"	14' 42.78"	95° 47' 07"	0.07633
21	91° 30' 50"	3° 21' 14"	91° 41' 35"	26° 46' 58"	0° 53' 59"	14' 42.74"	96° 9' 06"	0.07427
22	92° 00' 22"	3° 23' 09"	92° 14' 37"	26° 48' 30"	0° 53' 59"	14' 42.70"	96° 31' 19"	0.07223
23	92° 29' 53"	3° 25' 04"	92° 47' 41"	26° 49' 54"	0° 53' 59"	14' 42.66"	96° 53' 47"	0.07022
24	92° 59' 25"	3° 26' 58"	93° 20' 45"	26° 51' 10"	0° 53' 59"	14' 42.63"	97° 16' 30"	0.06824

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	123° 01' 41"	0.68"	125° 18' 40"	19° 28' 56"	1.0157298	15' 44.77"	23° 26' 17"	-6 m 33 s
1	123° 04' 05"	0.68"	125° 21' 08"	19° 28' 23"	1.0157259	15' 44.77"	23° 26' 17"	-6 m 33 s
2	123° 06' 28"	0.69"	125° 23' 36"	19° 27' 50"	1.0157220	15' 44.78"	23° 26' 17"	-6 m 33 s
3	123° 08' 51"	0.69"	125° 26' 04"	19° 27' 17"	1.0157181	15' 44.78"	23° 26' 17"	-6 m 33 s
4	123° 11' 15"	0.69"	125° 28' 32"	19° 26' 44"	1.0157142	15' 44.78"	23° 26' 17"	-6 m 33 s
5	123° 13' 38"	0.70"	125° 30' 59"	19° 26' 11"	1.0157103	15' 44.79"	23° 26' 17"	-6 m 33 s
6	123° 16' 01"	0.70"	125° 33' 27"	19° 25' 38"	1.0157063	15' 44.79"	23° 26' 17"	-6 m 33 s
7	123° 18' 25"	0.71"	125° 35' 55"	19° 25' 05"	1.0157024	15' 44.79"	23° 26' 17"	-6 m 33 s
8	123° 20' 48"	0.71"	125° 38' 23"	19° 24' 32"	1.0156984	15' 44.80"	23° 26' 17"	-6 m 33 s
9	123° 23' 11"	0.71"	125° 40' 51"	19° 23' 59"	1.0156944	15' 44.80"	23° 26' 17"	-6 m 33 s
10	123° 25' 35"	0.72"	125° 43' 19"	19° 23' 25"	1.0156905	15' 44.81"	23° 26' 17"	-6 m 33 s
11	123° 27' 58"	0.72"	125° 45' 47"	19° 22' 52"	1.0156865	15' 44.81"	23° 26' 17"	-6 m 33 s
12	123° 30' 21"	0.72"	125° 48' 14"	19° 22' 19"	1.0156825	15' 44.81"	23° 26' 17"	-6 m 33 s
13	123° 32' 45"	0.73"	125° 50' 42"	19° 21' 45"	1.0156784	15' 44.82"	23° 26' 17"	-6 m 33 s
14	123° 35' 08"	0.73"	125° 53' 10"	19° 21' 12"	1.0156744	15' 44.82"	23° 26' 17"	-6 m 33 s
15	123° 37' 31"	0.74"	125° 55' 38"	19° 20' 38"	1.0156704	15' 44.82"	23° 26' 17"	-6 m 33 s
16	123° 39' 55"	0.74"	125° 58' 05"	19° 20' 05"	1.0156664	15' 44.83"	23° 26' 17"	-6 m 33 s
17	123° 42' 18"	0.74"	126° 00' 33"	19° 19' 31"	1.0156623	15' 44.83"	23° 26' 17"	-6 m 33 s
18	123° 44' 41"	0.75"	126° 03' 01"	19° 18' 58"	1.0156582	15' 44.84"	23° 26' 17"	-6 m 33 s
19	123° 47' 05"	0.75"	126° 05' 29"	19° 18' 24"	1.0156542	15' 44.84"	23° 26' 17"	-6 m 33 s
20	123° 49' 28"	0.75"	126° 07' 56"	19° 17' 51"	1.0156501	15' 44.84"	23° 26' 17"	-6 m 33 s
21	123° 51' 52"	0.76"	126° 10' 24"	19° 17' 17"	1.0156460	15' 44.85"	23° 26' 17"	-6 m 33 s
22	123° 54' 15"	0.76"	126° 12' 51"	19° 16' 43"	1.0156419	15' 44.85"	23° 26' 17"	-6 m 33 s
23	123° 56' 38"	0.76"	126° 15' 19"	19° 16' 10"	1.0156378	15' 44.85"	23° 26' 17"	-6 m 33 s
24	123° 59' 02"	0.77"	126° 17' 47"	19° 15' 36"	1.0156337	15' 44.86"	23° 26' 17"	-6 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	92° 59' 25"	3° 26' 58"	93° 20' 45"	26° 51' 10"	0° 53' 59"	14' 42.63"	97° 16' 30"	0.06824
1	93° 28' 57"	3° 28' 51"	93° 53' 51"	26° 52' 18"	0° 53' 59"	14' 42.60"	97° 39' 29"	0.06629
2	93° 58' 29"	3° 30' 43"	94° 26' 56"	26° 53' 19"	0° 53' 59"	14' 42.57"	98° 2' 44"	0.06436
3	94° 28' 01"	3° 32' 34"	95° 00' 03"	26° 54' 12"	0° 53' 59"	14' 42.55"	98° 26' 15"	0.06247
4	94° 57' 33"	3° 34' 24"	95° 33' 09"	26° 54' 57"	0° 53' 59"	14' 42.52"	98° 50' 05"	0.06059
5	95° 27' 06"	3° 36' 13"	96° 06' 17"	26° 55' 34"	0° 53' 59"	14' 42.51"	99° 14' 12"	0.05875
6	95° 56' 38"	3° 38' 01"	96° 39' 24"	26° 56' 04"	0° 53' 58"	14' 42.49"	99° 38' 38"	0.05693
7	96° 26' 11"	3° 39' 49"	97° 12' 32"	26° 56' 26"	0° 53' 58"	14' 42.48"	100° 3' 25"	0.05514
8	96° 55' 44"	3° 41' 35"	97° 45' 41"	26° 56' 40"	0° 53' 58"	14' 42.47"	100° 28' 32"	0.05338
9	97° 25' 17"	3° 43' 20"	98° 18' 49"	26° 56' 47"	0° 53' 58"	14' 42.46"	100° 53' 60"	0.05165
10	97° 54' 51"	3° 45' 04"	98° 51' 58"	26° 56' 45"	0° 53' 58"	14' 42.46"	101° 19' 51"	0.04995
11	98° 24' 24"	3° 46' 47"	99° 25' 06"	26° 56' 36"	0° 53' 58"	14' 42.46"	101° 46' 06"	0.04827
12	98° 53' 58"	3° 48' 30"	99° 58' 15"	26° 56' 19"	0° 53' 58"	14' 42.47"	102° 12' 45"	0.04662
13	99° 23' 32"	3° 50' 11"	100° 31' 24"	26° 55' 55"	0° 53' 58"	14' 42.47"	102° 39' 51"	0.04500
14	99° 53' 07"	3° 51' 51"	101° 04' 32"	26° 55' 22"	0° 53' 58"	14' 42.48"	103° 7' 23"	0.04341
15	100° 22' 41"	3° 53' 30"	101° 37' 41"	26° 54' 42"	0° 53' 59"	14' 42.49"	103° 35' 25"	0.04184
16	100° 52' 16"	3° 55' 08"	102° 10' 49"	26° 53' 54"	0° 53' 59"	14' 42.51"	104° 3' 57"	0.04031
17	101° 21' 52"	3° 56' 45"	102° 43' 57"	26° 52' 58"	0° 53' 59"	14' 42.53"	104° 33' 02"	0.03880
18	101° 51' 27"	3° 58' 21"	103° 17' 04"	26° 51' 55"	0° 53' 59"	14' 42.55"	105° 2' 40"	0.03732
19	102° 21' 03"	3° 59' 55"	103° 50' 11"	26° 50' 44"	0° 53' 59"	14' 42.57"	105° 32' 54"	0.03587
20	102° 50' 39"	4° 01' 29"	104° 23' 17"	26° 49' 25"	0° 53' 59"	14' 42.60"	106° 3' 46"	0.03445
21	103° 20' 16"	4° 03' 02"	104° 56' 23"	26° 47' 58"	0° 53' 59"	14' 42.63"	106° 35' 18"	0.03306
22	103° 49' 53"	4° 04' 33"	105° 29' 29"	26° 46' 23"	0° 53' 59"	14' 42.66"	107° 7' 34"	0.03170
23	104° 19' 30"	4° 06' 04"	106° 02' 33"	26° 44' 41"	0° 53' 59"	14' 42.69"	107° 40' 35"	0.03037
24	104° 49' 07"	4° 07' 33"	106° 35' 37"	26° 42' 51"	0° 53' 59"	14' 42.73"	108° 14' 25"	0.02906

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	123° 59' 02"	0.77"	126° 17' 47"	19° 15' 36"	1.0156337	15' 44.86"	23° 26' 17"	-6 m 33 s
1	124° 01' 25"	0.77"	126° 20' 14"	19° 15' 02"	1.0156296	15' 44.86"	23° 26' 17"	-6 m 33 s
2	124° 03' 48"	0.77"	126° 22' 42"	19° 14' 28"	1.0156254	15' 44.87"	23° 26' 17"	-6 m 33 s
3	124° 06' 12"	0.77"	126° 25' 09"	19° 13' 55"	1.0156213	15' 44.87"	23° 26' 17"	-6 m 33 s
4	124° 08' 35"	0.78"	126° 27' 37"	19° 13' 21"	1.0156171	15' 44.87"	23° 26' 17"	-6 m 33 s
5	124° 10' 59"	0.78"	126° 30' 05"	19° 12' 47"	1.0156129	15' 44.88"	23° 26' 17"	-6 m 33 s
6	124° 13' 22"	0.78"	126° 32' 32"	19° 12' 13"	1.0156088	15' 44.88"	23° 26' 17"	-6 m 33 s
7	124° 15' 45"	0.79"	126° 34' 60"	19° 11' 39"	1.0156046	15' 44.89"	23° 26' 17"	-6 m 33 s
8	124° 18' 09"	0.79"	126° 37' 27"	19° 11' 05"	1.0156004	15' 44.89"	23° 26' 17"	-6 m 33 s
9	124° 20' 32"	0.79"	126° 39' 55"	19° 10' 31"	1.0155962	15' 44.89"	23° 26' 17"	-6 m 33 s
10	124° 22' 55"	0.79"	126° 42' 22"	19° 09' 57"	1.0155920	15' 44.90"	23° 26' 17"	-6 m 33 s
11	124° 25' 19"	0.80"	126° 44' 49"	19° 09' 23"	1.0155877	15' 44.90"	23° 26' 17"	-6 m 33 s
12	124° 27' 42"	0.80"	126° 47' 17"	19° 08' 49"	1.0155835	15' 44.91"	23° 26' 17"	-6 m 33 s
13	124° 30' 06"	0.80"	126° 49' 44"	19° 08' 14"	1.0155792	15' 44.91"	23° 26' 17"	-6 m 33 s
14	124° 32' 29"	0.80"	126° 52' 12"	19° 07' 40"	1.0155750	15' 44.91"	23° 26' 17"	-6 m 33 s
15	124° 34' 52"	0.81"	126° 54' 39"	19° 07' 06"	1.0155707	15' 44.92"	23° 26' 17"	-6 m 33 s
16	124° 37' 16"	0.81"	126° 57' 06"	19° 06' 32"	1.0155664	15' 44.92"	23° 26' 17"	-6 m 33 s
17	124° 39' 39"	0.81"	126° 59' 34"	19° 05' 57"	1.0155622	15' 44.92"	23° 26' 17"	-6 m 33 s
18	124° 42' 03"	0.81"	127° 02' 01"	19° 05' 23"	1.0155579	15' 44.93"	23° 26' 17"	-6 m 32 s
19	124° 44' 26"	0.82"	127° 04' 28"	19° 04' 49"	1.0155536	15' 44.93"	23° 26' 17"	-6 m 32 s
20	124° 46' 49"	0.82"	127° 06' 56"	19° 04' 14"	1.0155492	15' 44.94"	23° 26' 17"	-6 m 32 s
21	124° 49' 13"	0.82"	127° 09' 23"	19° 03' 40"	1.0155449	15' 44.94"	23° 26' 17"	-6 m 32 s
22	124° 51' 36"	0.82"	127° 11' 50"	19° 03' 05"	1.0155406	15' 44.95"	23° 26' 17"	-6 m 32 s
23	124° 53' 59"	0.82"	127° 14' 17"	19° 02' 31"	1.0155362	15' 44.95"	23° 26' 17"	-6 m 32 s
24	124° 56' 23"	0.83"	127° 16' 45"	19° 01' 56"	1.0155319	15' 44.95"	23° 26' 17"	-6 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	104° 49' 07"	4° 07' 33"	106° 35' 37"	26° 42' 51"	0° 53' 59"	14' 42.73"	108° 14' 25"	0.02906
1	105° 18' 43"	4° 09' 01"	107° 08' 40"	26° 40' 54"	0° 53' 60"	14' 42.77"	108° 49' 07"	0.02779
2	105° 48' 23"	4° 10' 29"	107° 41' 42"	26° 38' 49"	0° 53' 60"	14' 42.82"	109° 24' 44"	0.02655
3	106° 18' 02"	4° 11' 55"	108° 14' 43"	26° 36' 36"	0° 53' 60"	14' 42.86"	110° 1' 21"	0.02533
4	106° 47' 41"	4° 13' 19"	108° 47' 43"	26° 34' 15"	0° 54' 00"	14' 42.91"	110° 39' 01"	0.02415
5	107° 17' 21"	4° 14' 43"	109° 20' 42"	26° 31' 47"	0° 54' 00"	14' 42.96"	111° 17' 50"	0.02299
6	107° 47' 00"	4° 16' 06"	109° 53' 40"	26° 29' 11"	0° 54' 00"	14' 43.02"	111° 57' 53"	0.02187
7	108° 16' 41"	4° 17' 27"	110° 26' 37"	26° 26' 28"	0° 54' 01"	14' 43.07"	112° 39' 15"	0.02077
8	108° 46' 21"	4° 18' 47"	110° 59' 33"	26° 23' 36"	0° 54' 01"	14' 43.13"	113° 22' 03"	0.01970
9	109° 16' 02"	4° 20' 07"	111° 32' 27"	26° 20' 38"	0° 54' 01"	14' 43.20"	114° 6' 23"	0.01867
10	109° 45' 44"	4° 21' 24"	112° 05' 20"	26° 17' 32"	0° 54' 01"	14' 43.26"	114° 52' 24"	0.01766
11	110° 15' 26"	4° 22' 41"	112° 38' 11"	26° 14' 18"	0° 54' 02"	14' 43.33"	115° 40' 14"	0.01669
12	110° 45' 08"	4° 23' 57"	113° 11' 01"	26° 10' 56"	0° 54' 02"	14' 43.40"	116° 30' 02"	0.01574
13	111° 14' 51"	4° 25' 11"	113° 43' 49"	26° 07' 28"	0° 54' 02"	14' 43.47"	117° 21' 59"	0.01483
14	111° 44' 35"	4° 26' 24"	114° 16' 36"	26° 03' 51"	0° 54' 02"	14' 43.55"	118° 16' 16"	0.01394
15	112° 14' 18"	4° 27' 36"	114° 49' 21"	26° 00' 07"	0° 54' 03"	14' 43.63"	119° 13' 08"	0.01309
16	112° 44' 03"	4° 28' 47"	115° 22' 05"	25° 56' 16"	0° 54' 03"	14' 43.71"	120° 12' 49"	0.01227
17	113° 13' 48"	4° 29' 57"	115° 54' 47"	25° 52' 18"	0° 54' 03"	14' 43.79"	121° 15' 35"	0.01148
18	113° 43' 33"	4° 31' 05"	116° 27' 26"	25° 48' 12"	0° 54' 04"	14' 43.88"	122° 21' 45"	0.01071
19	114° 13' 19"	4° 32' 12"	117° 00' 05"	25° 43' 58"	0° 54' 04"	14' 43.97"	123° 31' 40"	0.00998
20	114° 43' 05"	4° 33' 18"	117° 32' 41"	25° 39' 37"	0° 54' 04"	14' 44.06"	124° 45' 44"	0.00928
21	115° 12' 52"	4° 34' 23"	118° 05' 15"	25° 35' 09"	0° 54' 05"	14' 44.15"	126° 4' 23"	0.00861
22	115° 42' 39"	4° 35' 26"	118° 37' 47"	25° 30' 34"	0° 54' 05"	14' 44.25"	127° 28' 08"	0.00798
23	116° 12' 27"	4° 36' 29"	119° 10' 17"	25° 25' 51"	0° 54' 05"	14' 44.35"	128° 57' 34"	0.00737
24	116° 42' 15"	4° 37' 30"	119° 42' 46"	25° 21' 01"	0° 54' 06"	14' 44.45"	130° 33' 19"	0.00679

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	124° 56' 23"	0.83"	127° 16' 45"	19° 01' 56"	1.0155319	15' 44.95"	23° 26' 17"	-6 m 32 s
1	124° 58' 46"	0.83"	127° 19' 12"	19° 01' 22"	1.0155275	15' 44.96"	23° 26' 17"	-6 m 32 s
2	125° 01' 10"	0.83"	127° 21' 39"	19° 00' 47"	1.0155231	15' 44.96"	23° 26' 17"	-6 m 32 s
3	125° 03' 33"	0.83"	127° 24' 06"	19° 00' 13"	1.0155187	15' 44.97"	23° 26' 17"	-6 m 32 s
4	125° 05' 57"	0.83"	127° 26' 34"	18° 59' 38"	1.0155144	15' 44.97"	23° 26' 17"	-6 m 32 s
5	125° 08' 20"	0.84"	127° 29' 01"	18° 59' 03"	1.0155099	15' 44.97"	23° 26' 17"	-6 m 32 s
6	125° 10' 43"	0.84"	127° 31' 28"	18° 58' 29"	1.0155055	15' 44.98"	23° 26' 17"	-6 m 32 s
7	125° 13' 07"	0.84"	127° 33' 55"	18° 57' 54"	1.0155011	15' 44.98"	23° 26' 17"	-6 m 32 s
8	125° 15' 30"	0.84"	127° 36' 22"	18° 57' 19"	1.0154967	15' 44.99"	23° 26' 17"	-6 m 32 s
9	125° 17' 54"	0.84"	127° 38' 49"	18° 56' 44"	1.0154922	15' 44.99"	23° 26' 17"	-6 m 32 s
10	125° 20' 17"	0.84"	127° 41' 16"	18° 56' 09"	1.0154878	15' 44.99"	23° 26' 17"	-6 m 32 s
11	125° 22' 40"	0.84"	127° 43' 43"	18° 55' 34"	1.0154833	15' 45.00"	23° 26' 17"	-6 m 32 s
12	125° 25' 04"	0.85"	127° 46' 10"	18° 54' 59"	1.0154788	15' 45.00"	23° 26' 17"	-6 m 32 s
13	125° 27' 27"	0.85"	127° 48' 37"	18° 54' 25"	1.0154744	15' 45.01"	23° 26' 17"	-6 m 32 s
14	125° 29' 51"	0.85"	127° 51' 04"	18° 53' 50"	1.0154699	15' 45.01"	23° 26' 17"	-6 m 32 s
15	125° 32' 14"	0.85"	127° 53' 31"	18° 53' 15"	1.0154654	15' 45.02"	23° 26' 17"	-6 m 31 s
16	125° 34' 37"	0.85"	127° 55' 58"	18° 52' 39"	1.0154608	15' 45.02"	23° 26' 17"	-6 m 31 s
17	125° 37' 01"	0.85"	127° 58' 25"	18° 52' 04"	1.0154563	15' 45.02"	23° 26' 17"	-6 m 31 s
18	125° 39' 24"	0.85"	128° 00' 52"	18° 51' 29"	1.0154518	15' 45.03"	23° 26' 17"	-6 m 31 s
19	125° 41' 48"	0.85"	128° 03' 19"	18° 50' 54"	1.0154472	15' 45.03"	23° 26' 17"	-6 m 31 s
20	125° 44' 11"	0.86"	128° 05' 46"	18° 50' 19"	1.0154427	15' 45.04"	23° 26' 17"	-6 m 31 s
21	125° 46' 35"	0.86"	128° 08' 13"	18° 49' 44"	1.0154381	15' 45.04"	23° 26' 17"	-6 m 31 s
22	125° 48' 58"	0.86"	128° 10' 40"	18° 49' 08"	1.0154336	15' 45.04"	23° 26' 17"	-6 m 31 s
23	125° 51' 21"	0.86"	128° 13' 07"	18° 48' 33"	1.0154290	15' 45.05"	23° 26' 17"	-6 m 31 s
24	125° 53' 45"	0.86"	128° 15' 34"	18° 47' 58"	1.0154244	15' 45.05"	23° 26' 17"	-6 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	116° 42' 15"	4° 37' 30"	119° 42' 46"	25° 21' 01"	0° 54' 06"	14' 44.45"	130° 33' 19"	0.00679
1	117° 12' 04"	4° 38' 29"	120° 15' 12"	25° 16' 04"	0° 54' 06"	14' 44.55"	132° 16' 07"	0.00625
2	117° 41' 54"	4° 39' 28"	120° 47' 35"	25° 10' 60"	0° 54' 06"	14' 44.66"	134° 6' 47"	0.00574
3	118° 11' 44"	4° 40' 25"	121° 19' 57"	25° 05' 49"	0° 54' 07"	14' 44.76"	136° 6' 15"	0.00525
4	118° 41' 34"	4° 41' 21"	121° 52' 16"	25° 00' 30"	0° 54' 07"	14' 44.87"	138° 15' 33"	0.00480
5	119° 11' 26"	4° 42' 15"	122° 24' 33"	24° 55' 04"	0° 54' 08"	14' 44.99"	140° 35' 51"	0.00438
6	119° 41' 17"	4° 43' 09"	122° 56' 48"	24° 49' 32"	0° 54' 08"	14' 45.10"	143° 8' 23"	0.00400
7	120° 11' 10"	4° 44' 01"	123° 29' 00"	24° 43' 52"	0° 54' 09"	14' 45.22"	145° 54' 31"	0.00364
8	120° 41' 03"	4° 44' 51"	124° 01' 10"	24° 38' 05"	0° 54' 09"	14' 45.34"	148° 55' 38"	0.00332
9	121° 10' 56"	4° 45' 41"	124° 33' 17"	24° 32' 11"	0° 54' 09"	14' 45.47"	152° 13' 10"	0.00302
10	121° 40' 50"	4° 46' 29"	125° 05' 22"	24° 26' 11"	0° 54' 10"	14' 45.59"	155° 48' 25"	0.00276
11	122° 10' 45"	4° 47' 16"	125° 37' 25"	24° 20' 03"	0° 54' 10"	14' 45.72"	159° 42' 29"	0.00253
12	122° 40' 40"	4° 48' 01"	126° 09' 25"	24° 13' 49"	0° 54' 11"	14' 45.85"	163° 56' 02"	0.00233
13	123° 10' 36"	4° 48' 46"	126° 41' 22"	24° 07' 28"	0° 54' 11"	14' 45.98"	168° 29' 05"	0.00217
14	123° 40' 33"	4° 49' 29"	127° 13' 17"	24° 00' 60"	0° 54' 12"	14' 46.12"	173° 20' 48"	0.00203
15	124° 10' 30"	4° 50' 10"	127° 45' 09"	23° 54' 25"	0° 54' 12"	14' 46.25"	178° 29' 13"	0.00193
16	124° 40' 28"	4° 50' 50"	128° 16' 58"	23° 47' 44"	0° 54' 13"	14' 46.39"	183° 51' 17"	0.00186
17	125° 10' 26"	4° 51' 29"	128° 48' 45"	23° 40' 56"	0° 54' 13"	14' 46.54"	189° 22' 27"	0.00182
18	125° 40' 26"	4° 52' 07"	129° 20' 29"	23° 34' 01"	0° 54' 14"	14' 46.68"	194° 57' 37"	0.00181
19	126° 10' 25"	4° 52' 43"	129° 52' 10"	23° 26' 60"	0° 54' 14"	14' 46.83"	200° 31' 08"	0.00184
20	126° 40' 26"	4° 53' 18"	130° 23' 49"	23° 19' 52"	0° 54' 15"	14' 46.97"	205° 57' 35"	0.00190
21	127° 10' 27"	4° 53' 51"	130° 55' 24"	23° 12' 37"	0° 54' 16"	14' 47.13"	211° 12' 09"	0.00199
22	127° 40' 28"	4° 54' 24"	131° 26' 57"	23° 05' 16"	0° 54' 16"	14' 47.28"	216° 11' 08"	0.00211
23	128° 10' 31"	4° 54' 54"	131° 58' 27"	22° 57' 49"	0° 54' 17"	14' 47.43"	220° 52' 03"	0.00226
24	128° 40' 34"	4° 55' 24"	132° 29' 54"	22° 50' 15"	0° 54' 17"	14' 47.59"	225° 13' 34"	0.00245



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	125° 53' 45"	0.86"	128° 15' 34"	18° 47' 58"	1.0154244	15' 45.05"	23° 26' 17"	-6 m 31 s
1	125° 56' 08"	0.86"	128° 18' 01"	18° 47' 23"	1.0154198	15' 45.06"	23° 26' 17"	-6 m 31 s
2	125° 58' 32"	0.86"	128° 20' 27"	18° 46' 47"	1.0154152	15' 45.06"	23° 26' 17"	-6 m 31 s
3	126° 00' 55"	0.86"	128° 22' 54"	18° 46' 12"	1.0154105	15' 45.07"	23° 26' 17"	-6 m 31 s
4	126° 03' 19"	0.86"	128° 25' 21"	18° 45' 36"	1.0154059	15' 45.07"	23° 26' 17"	-6 m 31 s
5	126° 05' 42"	0.86"	128° 27' 48"	18° 45' 01"	1.0154013	15' 45.07"	23° 26' 17"	-6 m 30 s
6	126° 08' 05"	0.86"	128° 30' 14"	18° 44' 25"	1.0153966	15' 45.08"	23° 26' 17"	-6 m 30 s
7	126° 10' 29"	0.86"	128° 32' 41"	18° 43' 50"	1.0153920	15' 45.08"	23° 26' 17"	-6 m 30 s
8	126° 12' 52"	0.86"	128° 35' 08"	18° 43' 14"	1.0153873	15' 45.09"	23° 26' 17"	-6 m 30 s
9	126° 15' 16"	0.86"	128° 37' 35"	18° 42' 39"	1.0153826	15' 45.09"	23° 26' 17"	-6 m 30 s
10	126° 17' 39"	0.86"	128° 40' 01"	18° 42' 03"	1.0153779	15' 45.10"	23° 26' 17"	-6 m 30 s
11	126° 20' 03"	0.86"	128° 42' 28"	18° 41' 27"	1.0153732	15' 45.10"	23° 26' 17"	-6 m 30 s
12	126° 22' 26"	0.86"	128° 44' 55"	18° 40' 52"	1.0153685	15' 45.11"	23° 26' 17"	-6 m 30 s
13	126° 24' 50"	0.86"	128° 47' 21"	18° 40' 16"	1.0153638	15' 45.11"	23° 26' 17"	-6 m 30 s
14	126° 27' 13"	0.86"	128° 49' 48"	18° 39' 40"	1.0153590	15' 45.11"	23° 26' 17"	-6 m 30 s
15	126° 29' 36"	0.86"	128° 52' 15"	18° 39' 04"	1.0153543	15' 45.12"	23° 26' 17"	-6 m 30 s
16	126° 31' 60"	0.86"	128° 54' 41"	18° 38' 29"	1.0153496	15' 45.12"	23° 26' 17"	-6 m 30 s
17	126° 34' 23"	0.86"	128° 57' 08"	18° 37' 53"	1.0153448	15' 45.13"	23° 26' 17"	-6 m 30 s
18	126° 36' 47"	0.86"	128° 59' 34"	18° 37' 17"	1.0153400	15' 45.13"	23° 26' 17"	-6 m 29 s
19	126° 39' 10"	0.86"	129° 02' 01"	18° 36' 41"	1.0153352	15' 45.14"	23° 26' 17"	-6 m 29 s
20	126° 41' 34"	0.86"	129° 04' 27"	18° 36' 05"	1.0153305	15' 45.14"	23° 26' 17"	-6 m 29 s
21	126° 43' 57"	0.86"	129° 06' 54"	18° 35' 29"	1.0153257	15' 45.15"	23° 26' 17"	-6 m 29 s
22	126° 46' 21"	0.86"	129° 09' 20"	18° 34' 53"	1.0153208	15' 45.15"	23° 26' 17"	-6 m 29 s
23	126° 48' 44"	0.86"	129° 11' 47"	18° 34' 17"	1.0153160	15' 45.15"	23° 26' 17"	-6 m 29 s
24	126° 51' 08"	0.86"	129° 14' 13"	18° 33' 41"	1.0153112	15' 45.16"	23° 26' 17"	-6 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	128° 40' 34"	4° 55' 24"	132° 29' 54"	22° 50' 15"	0° 54' 17"	14' 47.59"	225° 13' 34"	0.00245
1	129° 10' 37"	4° 55' 52"	133° 01' 18"	22° 42' 35"	0° 54' 18"	14' 47.75"	229° 15' 19"	0.00266
2	129° 40' 42"	4° 56' 19"	133° 32' 40"	22° 34' 49"	0° 54' 18"	14' 47.91"	232° 57' 45"	0.00291
3	130° 10' 47"	4° 56' 44"	134° 03' 58"	22° 26' 56"	0° 54' 19"	14' 48.08"	236° 21' 47"	0.00320
4	130° 40' 52"	4° 57' 08"	134° 35' 14"	22° 18' 58"	0° 54' 20"	14' 48.25"	239° 28' 38"	0.00351
5	131° 10' 59"	4° 57' 31"	135° 06' 26"	22° 10' 53"	0° 54' 20"	14' 48.42"	242° 19' 42"	0.00386
6	131° 41' 06"	4° 57' 52"	135° 37' 36"	22° 02' 41"	0° 54' 21"	14' 48.59"	244° 56' 24"	0.00424
7	132° 11' 14"	4° 58' 12"	136° 08' 43"	21° 54' 24"	0° 54' 22"	14' 48.76"	247° 20' 05"	0.00465
8	132° 41' 22"	4° 58' 30"	136° 39' 47"	21° 46' 01"	0° 54' 22"	14' 48.94"	249° 32' 06"	0.00509
9	133° 11' 31"	4° 58' 47"	137° 10' 48"	21° 37' 32"	0° 54' 23"	14' 49.11"	251° 33' 37"	0.00557
10	133° 41' 41"	4° 59' 03"	137° 41' 45"	21° 28' 56"	0° 54' 23"	14' 49.29"	253° 25' 43"	0.00608
11	134° 11' 52"	4° 59' 17"	138° 12' 40"	21° 20' 15"	0° 54' 24"	14' 49.48"	255° 9' 24"	0.00662
12	134° 42' 04"	4° 59' 30"	138° 43' 32"	21° 11' 28"	0° 54' 25"	14' 49.66"	256° 45' 31"	0.00719
13	135° 12' 16"	4° 59' 42"	139° 14' 21"	21° 02' 35"	0° 54' 25"	14' 49.85"	258° 14' 51"	0.00780
14	135° 42' 29"	4° 59' 52"	139° 45' 08"	20° 53' 37"	0° 54' 26"	14' 50.04"	259° 38' 05"	0.00843
15	136° 12' 42"	5° 00' 00"	140° 15' 51"	20° 44' 32"	0° 54' 27"	14' 50.23"	260° 55' 49"	0.00911
16	136° 42' 57"	5° 00' 08"	140° 46' 31"	20° 35' 22"	0° 54' 28"	14' 50.42"	262° 8' 35"	0.00981
17	137° 13' 12"	5° 00' 14"	141° 17' 08"	20° 26' 06"	0° 54' 28"	14' 50.62"	263° 16' 52"	0.01054
18	137° 43' 28"	5° 00' 18"	141° 47' 42"	20° 16' 45"	0° 54' 29"	14' 50.82"	264° 21' 06"	0.01131
19	138° 13' 44"	5° 00' 21"	142° 18' 13"	20° 07' 18"	0° 54' 30"	14' 51.02"	265° 21' 37"	0.01211
20	138° 44' 02"	5° 00' 23"	142° 48' 42"	19° 57' 46"	0° 54' 31"	14' 51.22"	266° 18' 46"	0.01294
21	139° 14' 20"	5° 00' 23"	143° 19' 07"	19° 48' 08"	0° 54' 31"	14' 51.42"	267° 12' 50"	0.01381
22	139° 44' 39"	5° 00' 22"	143° 49' 30"	19° 38' 24"	0° 54' 32"	14' 51.63"	268° 4' 06"	0.01470
23	140° 14' 58"	5° 00' 19"	144° 19' 49"	19° 28' 36"	0° 54' 33"	14' 51.84"	268° 52' 46"	0.01563
24	140° 45' 19"	5° 00' 15"	144° 50' 06"	19° 18' 42"	0° 54' 34"	14' 52.05"	269° 39' 04"	0.01659

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	126° 51' 08"	0.86"	129° 14' 13"	18° 33' 41"	1.0153112	15' 45.16"	23° 26' 17"	-6 m 29 s
1	126° 53' 31"	0.86"	129° 16' 40"	18° 33' 05"	1.0153064	15' 45.16"	23° 26' 17"	-6 m 29 s
2	126° 55' 55"	0.86"	129° 19' 06"	18° 32' 29"	1.0153015	15' 45.17"	23° 26' 17"	-6 m 29 s
3	126° 58' 18"	0.86"	129° 21' 33"	18° 31' 52"	1.0152967	15' 45.17"	23° 26' 17"	-6 m 29 s
4	127° 00' 41"	0.86"	129° 23' 59"	18° 31' 16"	1.0152918	15' 45.18"	23° 26' 17"	-6 m 28 s
5	127° 03' 05"	0.86"	129° 26' 26"	18° 30' 40"	1.0152869	15' 45.18"	23° 26' 17"	-6 m 28 s
6	127° 05' 28"	0.86"	129° 28' 52"	18° 30' 04"	1.0152820	15' 45.19"	23° 26' 17"	-6 m 28 s
7	127° 07' 52"	0.86"	129° 31' 18"	18° 29' 27"	1.0152771	15' 45.19"	23° 26' 17"	-6 m 28 s
8	127° 10' 15"	0.85"	129° 33' 45"	18° 28' 51"	1.0152722	15' 45.19"	23° 26' 17"	-6 m 28 s
9	127° 12' 39"	0.85"	129° 36' 11"	18° 28' 15"	1.0152673	15' 45.20"	23° 26' 17"	-6 m 28 s
10	127° 15' 02"	0.85"	129° 38' 37"	18° 27' 38"	1.0152624	15' 45.20"	23° 26' 17"	-6 m 28 s
11	127° 17' 26"	0.85"	129° 41' 04"	18° 27' 02"	1.0152574	15' 45.21"	23° 26' 17"	-6 m 28 s
12	127° 19' 49"	0.85"	129° 43' 30"	18° 26' 25"	1.0152525	15' 45.21"	23° 26' 17"	-6 m 28 s
13	127° 22' 13"	0.85"	129° 45' 56"	18° 25' 49"	1.0152475	15' 45.22"	23° 26' 17"	-6 m 28 s
14	127° 24' 36"	0.85"	129° 48' 22"	18° 25' 12"	1.0152426	15' 45.22"	23° 26' 17"	-6 m 27 s
15	127° 26' 60"	0.85"	129° 50' 49"	18° 24' 36"	1.0152376	15' 45.23"	23° 26' 17"	-6 m 27 s
16	127° 29' 23"	0.84"	129° 53' 15"	18° 23' 59"	1.0152326	15' 45.23"	23° 26' 17"	-6 m 27 s
17	127° 31' 47"	0.84"	129° 55' 41"	18° 23' 23"	1.0152276	15' 45.24"	23° 26' 17"	-6 m 27 s
18	127° 34' 10"	0.84"	129° 58' 07"	18° 22' 46"	1.0152226	15' 45.24"	23° 26' 17"	-6 m 27 s
19	127° 36' 34"	0.84"	130° 00' 33"	18° 22' 09"	1.0152176	15' 45.25"	23° 26' 17"	-6 m 27 s
20	127° 38' 57"	0.84"	130° 02' 60"	18° 21' 33"	1.0152126	15' 45.25"	23° 26' 17"	-6 m 27 s
21	127° 41' 21"	0.84"	130° 05' 26"	18° 20' 56"	1.0152075	15' 45.26"	23° 26' 17"	-6 m 27 s
22	127° 43' 44"	0.84"	130° 07' 52"	18° 20' 19"	1.0152025	15' 45.26"	23° 26' 17"	-6 m 27 s
23	127° 46' 08"	0.83"	130° 10' 18"	18° 19' 42"	1.0151974	15' 45.26"	23° 26' 17"	-6 m 26 s
24	127° 48' 31"	0.83"	130° 12' 44"	18° 19' 06"	1.0151924	15' 45.27"	23° 26' 17"	-6 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	140° 45' 19"	5° 00' 15"	144° 50' 06"	19° 18' 42"	0° 54' 34"	14' 52.05"	269° 39' 04"	0.01659
1	141° 15' 40"	5° 00' 09"	145° 20' 19"	19° 08' 43"	0° 54' 34"	14' 52.26"	270° 23' 11"	0.01759
2	141° 46' 02"	5° 00' 03"	145° 50' 30"	18° 58' 38"	0° 54' 35"	14' 52.48"	271° 5' 16"	0.01861
3	142° 16' 25"	4° 59' 54"	146° 20' 38"	18° 48' 29"	0° 54' 36"	14' 52.69"	271° 45' 29"	0.01967
4	142° 46' 49"	4° 59' 44"	146° 50' 43"	18° 38' 14"	0° 54' 37"	14' 52.91"	272° 23' 57"	0.02076
5	143° 17' 13"	4° 59' 33"	147° 20' 46"	18° 27' 54"	0° 54' 38"	14' 53.14"	273° 0' 49"	0.02188
6	143° 47' 39"	4° 59' 21"	147° 50' 45"	18° 17' 29"	0° 54' 38"	14' 53.36"	273° 36' 11"	0.02304
7	144° 18' 05"	4° 59' 07"	148° 20' 42"	18° 06' 59"	0° 54' 39"	14' 53.59"	274° 10' 09"	0.02423
8	144° 48' 32"	4° 58' 51"	148° 50' 36"	17° 56' 25"	0° 54' 40"	14' 53.81"	274° 42' 48"	0.02544
9	145° 18' 59"	4° 58' 34"	149° 20' 27"	17° 45' 45"	0° 54' 41"	14' 54.05"	275° 14' 13"	0.02670
10	145° 49' 28"	4° 58' 16"	149° 50' 15"	17° 35' 00"	0° 54' 42"	14' 54.28"	275° 44' 29"	0.02798
11	146° 19' 57"	4° 57' 56"	150° 20' 01"	17° 24' 11"	0° 54' 43"	14' 54.51"	276° 13' 40"	0.02929
12	146° 50' 28"	4° 57' 35"	150° 49' 44"	17° 13' 17"	0° 54' 43"	14' 54.75"	276° 41' 50"	0.03064
13	147° 20' 59"	4° 57' 12"	151° 19' 24"	17° 02' 18"	0° 54' 44"	14' 54.99"	277° 9' 03"	0.03202
14	147° 51' 31"	4° 56' 48"	151° 49' 02"	16° 51' 15"	0° 54' 45"	14' 55.23"	277° 35' 20"	0.03343
15	148° 22' 04"	4° 56' 22"	152° 18' 37"	16° 40' 07"	0° 54' 46"	14' 55.47"	278° 0' 47"	0.03487
16	148° 52' 37"	4° 55' 56"	152° 48' 09"	16° 28' 55"	0° 54' 47"	14' 55.72"	278° 25' 24"	0.03635
17	149° 23' 12"	4° 55' 27"	153° 17' 39"	16° 17' 38"	0° 54' 48"	14' 55.97"	278° 49' 15"	0.03786
18	149° 53' 47"	4° 54' 57"	153° 47' 07"	16° 06' 16"	0° 54' 49"	14' 56.22"	279° 12' 23"	0.03939
19	150° 24' 24"	4° 54' 26"	154° 16' 32"	15° 54' 50"	0° 54' 50"	14' 56.47"	279° 34' 48"	0.04096
20	150° 55' 01"	4° 53' 53"	154° 45' 54"	15° 43' 20"	0° 54' 51"	14' 56.72"	279° 56' 33"	0.04257
21	151° 25' 39"	4° 53' 19"	155° 15' 14"	15° 31' 46"	0° 54' 52"	14' 56.98"	280° 17' 40"	0.04420
22	151° 56' 18"	4° 52' 44"	155° 44' 32"	15° 20' 07"	0° 54' 53"	14' 57.24"	280° 38' 11"	0.04587
23	152° 26' 58"	4° 52' 07"	156° 13' 47"	15° 08' 24"	0° 54' 54"	14' 57.50"	280° 58' 07"	0.04756
24	152° 57' 38"	4° 51' 28"	156° 42' 60"	14° 56' 37"	0° 54' 55"	14' 57.76"	281° 17' 30"	0.04929



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	127° 48' 31"	0.83"	130° 12' 44"	18° 19' 06"	1.0151924	15' 45.27"	23° 26' 17"	-6 m 26 s
1	127° 50' 55"	0.83"	130° 15' 10"	18° 18' 29"	1.0151873	15' 45.27"	23° 26' 17"	-6 m 26 s
2	127° 53' 18"	0.83"	130° 17' 36"	18° 17' 52"	1.0151822	15' 45.28"	23° 26' 17"	-6 m 26 s
3	127° 55' 42"	0.83"	130° 20' 02"	18° 17' 15"	1.0151771	15' 45.28"	23° 26' 17"	-6 m 26 s
4	127° 58' 05"	0.82"	130° 22' 28"	18° 16' 38"	1.0151720	15' 45.29"	23° 26' 17"	-6 m 26 s
5	128° 00' 28"	0.82"	130° 24' 54"	18° 16' 01"	1.0151669	15' 45.29"	23° 26' 17"	-6 m 26 s
6	128° 02' 52"	0.82"	130° 27' 20"	18° 15' 24"	1.0151618	15' 45.30"	23° 26' 17"	-6 m 26 s
7	128° 05' 15"	0.82"	130° 29' 46"	18° 14' 47"	1.0151567	15' 45.30"	23° 26' 17"	-6 m 25 s
8	128° 07' 39"	0.82"	130° 32' 12"	18° 14' 10"	1.0151515	15' 45.31"	23° 26' 17"	-6 m 25 s
9	128° 10' 02"	0.81"	130° 34' 38"	18° 13' 33"	1.0151464	15' 45.31"	23° 26' 17"	-6 m 25 s
10	128° 12' 26"	0.81"	130° 37' 04"	18° 12' 56"	1.0151412	15' 45.32"	23° 26' 17"	-6 m 25 s
11	128° 14' 50"	0.81"	130° 39' 30"	18° 12' 18"	1.0151360	15' 45.32"	23° 26' 17"	-6 m 25 s
12	128° 17' 13"	0.81"	130° 41' 56"	18° 11' 41"	1.0151309	15' 45.33"	23° 26' 17"	-6 m 25 s
13	128° 19' 37"	0.80"	130° 44' 22"	18° 11' 04"	1.0151257	15' 45.33"	23° 26' 17"	-6 m 25 s
14	128° 22' 00"	0.80"	130° 46' 48"	18° 10' 27"	1.0151205	15' 45.34"	23° 26' 17"	-6 m 24 s
15	128° 24' 24"	0.80"	130° 49' 13"	18° 09' 49"	1.0151153	15' 45.34"	23° 26' 17"	-6 m 24 s
16	128° 26' 47"	0.80"	130° 51' 39"	18° 09' 12"	1.0151100	15' 45.35"	23° 26' 17"	-6 m 24 s
17	128° 29' 11"	0.79"	130° 54' 05"	18° 08' 35"	1.0151048	15' 45.35"	23° 26' 17"	-6 m 24 s
18	128° 31' 34"	0.79"	130° 56' 31"	18° 07' 57"	1.0150996	15' 45.36"	23° 26' 17"	-6 m 24 s
19	128° 33' 58"	0.79"	130° 58' 57"	18° 07' 20"	1.0150943	15' 45.36"	23° 26' 17"	-6 m 24 s
20	128° 36' 21"	0.79"	131° 01' 22"	18° 06' 42"	1.0150891	15' 45.37"	23° 26' 17"	-6 m 24 s
21	128° 38' 45"	0.78"	131° 03' 48"	18° 06' 05"	1.0150838	15' 45.37"	23° 26' 17"	-6 m 24 s
22	128° 41' 08"	0.78"	131° 06' 14"	18° 05' 27"	1.0150785	15' 45.38"	23° 26' 17"	-6 m 23 s
23	128° 43' 32"	0.78"	131° 08' 40"	18° 04' 50"	1.0150733	15' 45.38"	23° 26' 17"	-6 m 23 s
24	128° 45' 55"	0.77"	131° 11' 05"	18° 04' 12"	1.0150680	15' 45.38"	23° 26' 17"	-6 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	152° 57' 38"	4° 51' 28"	156° 42' 60"	14° 56' 37"	0° 54' 55"	14' 57.76"	281° 17' 30"	0.04929
1	153° 28' 20"	4° 50' 48"	157° 12' 10"	14° 44' 46"	0° 54' 56"	14' 58.03"	281° 36' 21"	0.05105
2	153° 59' 02"	4° 50' 07"	157° 41' 18"	14° 32' 51"	0° 54' 57"	14' 58.30"	281° 54' 41"	0.05284
3	154° 29' 46"	4° 49' 24"	158° 10' 24"	14° 20' 51"	0° 54' 57"	14' 58.57"	282° 12' 31"	0.05466
4	155° 00' 30"	4° 48' 40"	158° 39' 28"	14° 08' 48"	0° 54' 58"	14' 58.84"	282° 29' 54"	0.05651
5	155° 31' 16"	4° 47' 55"	159° 08' 30"	13° 56' 41"	0° 54' 59"	14' 59.11"	282° 46' 48"	0.05840
6	156° 02' 02"	4° 47' 08"	159° 37' 29"	13° 44' 30"	0° 55' 01"	14' 59.39"	283° 3' 17"	0.06031
7	156° 32' 49"	4° 46' 19"	160° 06' 27"	13° 32' 15"	0° 55' 02"	14' 59.67"	283° 19' 20"	0.06226
8	157° 03' 37"	4° 45' 29"	160° 35' 22"	13° 19' 57"	0° 55' 03"	14' 59.95"	283° 34' 58"	0.06424
9	157° 34' 26"	4° 44' 38"	161° 04' 16"	13° 07' 35"	0° 55' 04"	15' 00.23"	283° 50' 13"	0.06625
10	158° 05' 16"	4° 43' 45"	161° 33' 07"	12° 55' 09"	0° 55' 05"	15' 00.52"	284° 5' 05"	0.06829
11	158° 36' 07"	4° 42' 51"	162° 01' 57"	12° 42' 39"	0° 55' 06"	15' 00.80"	284° 19' 34"	0.07035
12	159° 06' 59"	4° 41' 56"	162° 30' 45"	12° 30' 06"	0° 55' 07"	15' 01.09"	284° 33' 42"	0.07245
13	159° 37' 52"	4° 40' 59"	162° 59' 31"	12° 17' 30"	0° 55' 08"	15' 01.38"	284° 47' 28"	0.07459
14	160° 08' 46"	4° 40' 00"	163° 28' 15"	12° 04' 50"	0° 55' 09"	15' 01.68"	285° 0' 55"	0.07675
15	160° 39' 41"	4° 39' 01"	163° 56' 57"	11° 52' 07"	0° 55' 10"	15' 01.97"	285° 14' 01"	0.07894
16	161° 10' 37"	4° 37' 60"	164° 25' 38"	11° 39' 20"	0° 55' 11"	15' 02.27"	285° 26' 48"	0.08116
17	161° 41' 34"	4° 36' 57"	164° 54' 17"	11° 26' 30"	0° 55' 12"	15' 02.57"	285° 39' 16"	0.08341
18	162° 12' 32"	4° 35' 53"	165° 22' 54"	11° 13' 36"	0° 55' 13"	15' 02.87"	285° 51' 26"	0.08569
19	162° 43' 31"	4° 34' 48"	165° 51' 30"	11° 00' 40"	0° 55' 14"	15' 03.18"	286° 3' 19"	0.08801
20	163° 14' 31"	4° 33' 41"	166° 20' 05"	10° 47' 40"	0° 55' 16"	15' 03.49"	286° 14' 53"	0.09035
21	163° 45' 32"	4° 32' 33"	166° 48' 38"	10° 34' 37"	0° 55' 17"	15' 03.80"	286° 26' 11"	0.09272
22	164° 16' 34"	4° 31' 23"	167° 17' 09"	10° 21' 32"	0° 55' 18"	15' 04.11"	286° 37' 12"	0.09512
23	164° 47' 37"	4° 30' 12"	167° 45' 40"	10° 08' 23"	0° 55' 19"	15' 04.42"	286° 47' 56"	0.09755
24	165° 18' 41"	4° 28' 60"	168° 14' 08"	9° 55' 11"	0° 55' 20"	15' 04.74"	286° 58' 25"	0.10002

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	128° 45' 55"	0.77"	131° 11' 05"	18° 04' 12"	1.0150680	15' 45.38"	23° 26' 17"	-6 m 23 s
1	128° 48' 19"	0.77"	131° 13' 31"	18° 03' 35"	1.0150627	15' 45.39"	23° 26' 17"	-6 m 23 s
2	128° 50' 42"	0.77"	131° 15' 57"	18° 02' 57"	1.0150574	15' 45.39"	23° 26' 17"	-6 m 23 s
3	128° 53' 06"	0.76"	131° 18' 22"	18° 02' 19"	1.0150520	15' 45.40"	23° 26' 17"	-6 m 23 s
4	128° 55' 29"	0.76"	131° 20' 48"	18° 01' 42"	1.0150467	15' 45.40"	23° 26' 17"	-6 m 23 s
5	128° 57' 53"	0.76"	131° 23' 14"	18° 01' 04"	1.0150414	15' 45.41"	23° 26' 17"	-6 m 22 s
6	129° 00' 16"	0.76"	131° 25' 39"	18° 00' 26"	1.0150360	15' 45.41"	23° 26' 17"	-6 m 22 s
7	129° 02' 40"	0.75"	131° 28' 05"	17° 59' 48"	1.0150307	15' 45.42"	23° 26' 17"	-6 m 22 s
8	129° 05' 03"	0.75"	131° 30' 30"	17° 59' 11"	1.0150253	15' 45.42"	23° 26' 17"	-6 m 22 s
9	129° 07' 27"	0.75"	131° 32' 56"	17° 58' 33"	1.0150199	15' 45.43"	23° 26' 17"	-6 m 22 s
10	129° 09' 50"	0.74"	131° 35' 21"	17° 57' 55"	1.0150145	15' 45.43"	23° 26' 17"	-6 m 22 s
11	129° 12' 14"	0.74"	131° 37' 47"	17° 57' 17"	1.0150091	15' 45.44"	23° 26' 17"	-6 m 21 s
12	129° 14' 37"	0.74"	131° 40' 12"	17° 56' 39"	1.0150037	15' 45.44"	23° 26' 17"	-6 m 21 s
13	129° 17' 01"	0.73"	131° 42' 38"	17° 56' 01"	1.0149983	15' 45.45"	23° 26' 17"	-6 m 21 s
14	129° 19' 25"	0.73"	131° 45' 03"	17° 55' 23"	1.0149929	15' 45.45"	23° 26' 17"	-6 m 21 s
15	129° 21' 48"	0.72"	131° 47' 29"	17° 54' 45"	1.0149875	15' 45.46"	23° 26' 17"	-6 m 21 s
16	129° 24' 12"	0.72"	131° 49' 54"	17° 54' 07"	1.0149820	15' 45.47"	23° 26' 17"	-6 m 21 s
17	129° 26' 35"	0.72"	131° 52' 20"	17° 53' 29"	1.0149766	15' 45.47"	23° 26' 17"	-6 m 20 s
18	129° 28' 59"	0.71"	131° 54' 45"	17° 52' 51"	1.0149711	15' 45.48"	23° 26' 17"	-6 m 20 s
19	129° 31' 22"	0.71"	131° 57' 10"	17° 52' 13"	1.0149656	15' 45.48"	23° 26' 17"	-6 m 20 s
20	129° 33' 46"	0.71"	131° 59' 36"	17° 51' 34"	1.0149602	15' 45.49"	23° 26' 17"	-6 m 20 s
21	129° 36' 09"	0.70"	132° 02' 01"	17° 50' 56"	1.0149547	15' 45.49"	23° 26' 17"	-6 m 20 s
22	129° 38' 33"	0.70"	132° 04' 27"	17° 50' 18"	1.0149492	15' 45.50"	23° 26' 17"	-6 m 20 s
23	129° 40' 56"	0.69"	132° 06' 52"	17° 49' 40"	1.0149437	15' 45.50"	23° 26' 17"	-6 m 19 s
24	129° 43' 20"	0.69"	132° 09' 17"	17° 49' 01"	1.0149381	15' 45.51"	23° 26' 17"	-6 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	165° 18' 41"	4° 28' 60"	168° 14' 08"	9° 55' 11"	0° 55' 20"	15' 04.74"	286° 58' 25"	0.10002
1	165° 49' 47"	4° 27' 46"	168° 42' 36"	9° 41' 56"	0° 55' 21"	15' 05.06"	287° 8' 38"	0.10251
2	166° 20' 53"	4° 26' 31"	169° 11' 03"	9° 28' 38"	0° 55' 22"	15' 05.38"	287° 18' 35"	0.10503
3	166° 52' 00"	4° 25' 15"	169° 39' 28"	9° 15' 18"	0° 55' 24"	15' 05.70"	287° 28' 18"	0.10757
4	167° 23' 09"	4° 23' 57"	170° 07' 52"	9° 01' 55"	0° 55' 25"	15' 06.03"	287° 37' 46"	0.11015
5	167° 54' 18"	4° 22' 38"	170° 36' 16"	8° 48' 29"	0° 55' 26"	15' 06.35"	287° 46' 59"	0.11276
6	168° 25' 29"	4° 21' 17"	171° 04' 38"	8° 35' 00"	0° 55' 27"	15' 06.68"	287° 55' 58"	0.11540
7	168° 56' 40"	4° 19' 55"	171° 32' 59"	8° 21' 29"	0° 55' 28"	15' 07.01"	288° 4' 43"	0.11806
8	169° 27' 53"	4° 18' 32"	172° 01' 20"	8° 07' 55"	0° 55' 30"	15' 07.35"	288° 13' 14"	0.12075
9	169° 59' 07"	4° 17' 08"	172° 29' 40"	7° 54' 19"	0° 55' 31"	15' 07.68"	288° 21' 32"	0.12348
10	170° 30' 22"	4° 15' 42"	172° 57' 58"	7° 40' 40"	0° 55' 32"	15' 08.02"	288° 29' 36"	0.12623
11	171° 01' 38"	4° 14' 14"	173° 26' 17"	7° 26' 59"	0° 55' 33"	15' 08.36"	288° 37' 28"	0.12900
12	171° 32' 56"	4° 12' 46"	173° 54' 34"	7° 13' 16"	0° 55' 35"	15' 08.71"	288° 45' 06"	0.13181
13	172° 04' 14"	4° 11' 16"	174° 22' 51"	6° 59' 30"	0° 55' 36"	15' 09.05"	288° 52' 31"	0.13465
14	172° 35' 34"	4° 09' 44"	174° 51' 08"	6° 45' 42"	0° 55' 37"	15' 09.40"	288° 59' 44"	0.13751
15	173° 06' 55"	4° 08' 12"	175° 19' 24"	6° 31' 51"	0° 55' 39"	15' 09.75"	289° 6' 45"	0.14040
16	173° 38' 17"	4° 06' 38"	175° 47' 40"	6° 17' 59"	0° 55' 40"	15' 10.10"	289° 13' 33"	0.14332
17	174° 09' 40"	4° 05' 03"	176° 15' 55"	6° 04' 04"	0° 55' 41"	15' 10.46"	289° 20' 09"	0.14626
18	174° 41' 04"	4° 03' 26"	176° 44' 10"	5° 50' 07"	0° 55' 42"	15' 10.81"	289° 26' 33"	0.14924
19	175° 12' 30"	4° 01' 48"	177° 12' 25"	5° 36' 09"	0° 55' 44"	15' 11.17"	289° 32' 46"	0.15224
20	175° 43' 57"	4° 00' 09"	177° 40' 39"	5° 22' 08"	0° 55' 45"	15' 11.53"	289° 38' 46"	0.15526
21	176° 15' 25"	3° 58' 29"	178° 08' 54"	5° 08' 06"	0° 55' 46"	15' 11.90"	289° 44' 35"	0.15832
22	176° 46' 54"	3° 56' 47"	178° 37' 08"	4° 54' 01"	0° 55' 48"	15' 12.26"	289° 50' 12"	0.16140
23	177° 18' 24"	3° 55' 04"	179° 05' 23"	4° 39' 55"	0° 55' 49"	15' 12.63"	289° 55' 39"	0.16451
24	177° 49' 56"	3° 53' 20"	179° 33' 38"	4° 25' 47"	0° 55' 50"	15' 13.00"	290° 0' 53"	0.16764

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	129° 43' 20"	0.69"	132° 09' 17"	17° 49' 01"	1.0149381	15' 45.51"	23° 26' 17"	-6 m 19 s
1	129° 45' 44"	0.69"	132° 11' 43"	17° 48' 23"	1.0149326	15' 45.51"	23° 26' 17"	-6 m 19 s
2	129° 48' 07"	0.68"	132° 14' 08"	17° 47' 45"	1.0149271	15' 45.52"	23° 26' 17"	-6 m 19 s
3	129° 50' 31"	0.68"	132° 16' 33"	17° 47' 06"	1.0149215	15' 45.52"	23° 26' 17"	-6 m 19 s
4	129° 52' 54"	0.67"	132° 18' 58"	17° 46' 28"	1.0149160	15' 45.53"	23° 26' 17"	-6 m 19 s
5	129° 55' 18"	0.67"	132° 21' 24"	17° 45' 49"	1.0149104	15' 45.53"	23° 26' 17"	-6 m 18 s
6	129° 57' 41"	0.67"	132° 23' 49"	17° 45' 11"	1.0149049	15' 45.54"	23° 26' 17"	-6 m 18 s
7	130° 00' 05"	0.66"	132° 26' 14"	17° 44' 32"	1.0148993	15' 45.54"	23° 26' 17"	-6 m 18 s
8	130° 02' 28"	0.66"	132° 28' 39"	17° 43' 54"	1.0148937	15' 45.55"	23° 26' 17"	-6 m 18 s
9	130° 04' 52"	0.65"	132° 31' 04"	17° 43' 15"	1.0148881	15' 45.55"	23° 26' 17"	-6 m 18 s
10	130° 07' 16"	0.65"	132° 33' 29"	17° 42' 37"	1.0148825	15' 45.56"	23° 26' 17"	-6 m 18 s
11	130° 09' 39"	0.64"	132° 35' 55"	17° 41' 58"	1.0148769	15' 45.56"	23° 26' 17"	-6 m 17 s
12	130° 12' 03"	0.64"	132° 38' 20"	17° 41' 19"	1.0148713	15' 45.57"	23° 26' 17"	-6 m 17 s
13	130° 14' 26"	0.64"	132° 40' 45"	17° 40' 41"	1.0148656	15' 45.57"	23° 26' 17"	-6 m 17 s
14	130° 16' 50"	0.63"	132° 43' 10"	17° 40' 02"	1.0148600	15' 45.58"	23° 26' 17"	-6 m 17 s
15	130° 19' 13"	0.63"	132° 45' 35"	17° 39' 23"	1.0148543	15' 45.58"	23° 26' 17"	-6 m 17 s
16	130° 21' 37"	0.62"	132° 47' 60"	17° 38' 44"	1.0148487	15' 45.59"	23° 26' 17"	-6 m 16 s
17	130° 24' 00"	0.62"	132° 50' 25"	17° 38' 05"	1.0148430	15' 45.59"	23° 26' 17"	-6 m 16 s
18	130° 26' 24"	0.61"	132° 52' 50"	17° 37' 27"	1.0148373	15' 45.60"	23° 26' 17"	-6 m 16 s
19	130° 28' 48"	0.61"	132° 55' 15"	17° 36' 48"	1.0148316	15' 45.61"	23° 26' 17"	-6 m 16 s
20	130° 31' 11"	0.60"	132° 57' 40"	17° 36' 09"	1.0148260	15' 45.61"	23° 26' 17"	-6 m 16 s
21	130° 33' 35"	0.60"	133° 00' 05"	17° 35' 30"	1.0148202	15' 45.62"	23° 26' 17"	-6 m 15 s
22	130° 35' 58"	0.59"	133° 02' 30"	17° 34' 51"	1.0148145	15' 45.62"	23° 26' 17"	-6 m 15 s
23	130° 38' 22"	0.59"	133° 04' 55"	17° 34' 12"	1.0148088	15' 45.63"	23° 26' 17"	-6 m 15 s
24	130° 40' 45"	0.59"	133° 07' 20"	17° 33' 33"	1.0148031	15' 45.63"	23° 26' 17"	-6 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	177° 49' 56"	3° 53' 20"	179° 33' 38"	4° 25' 47"	0° 55' 50"	15' 13.00"	290° 0' 53"	0.16764
1	178° 21' 29"	3° 51' 34"	180° 01' 52"	4° 11' 37"	0° 55' 52"	15' 13.38"	290° 5' 57"	0.17080
2	178° 53' 03"	3° 49' 47"	180° 30' 07"	3° 57' 26"	0° 55' 53"	15' 13.75"	290° 10' 50"	0.17399
3	179° 24' 39"	3° 47' 59"	180° 58' 23"	3° 43' 13"	0° 55' 55"	15' 14.13"	290° 15' 31"	0.17720
4	179° 56' 16"	3° 46' 10"	181° 26' 38"	3° 28' 58"	0° 55' 56"	15' 14.51"	290° 20' 02"	0.18044
5	180° 27' 54"	3° 44' 19"	181° 54' 54"	3° 14' 42"	0° 55' 57"	15' 14.89"	290° 24' 22"	0.18370
6	180° 59' 33"	3° 42' 28"	182° 23' 11"	3° 00' 25"	0° 55' 59"	15' 15.27"	290° 28' 31"	0.18699
7	181° 31' 14"	3° 40' 35"	182° 51' 28"	2° 46' 06"	0° 56' 00"	15' 15.66"	290° 32' 30"	0.19031
8	182° 02' 56"	3° 38' 40"	183° 19' 46"	2° 31' 45"	0° 56' 02"	15' 16.05"	290° 36' 18"	0.19365
9	182° 34' 39"	3° 36' 45"	183° 48' 04"	2° 17' 24"	0° 56' 03"	15' 16.44"	290° 39' 56"	0.19701
10	183° 06' 24"	3° 34' 48"	184° 16' 23"	2° 03' 01"	0° 56' 05"	15' 16.83"	290° 43' 23"	0.20040
11	183° 38' 10"	3° 32' 50"	184° 44' 43"	1° 48' 37"	0° 56' 06"	15' 17.23"	290° 46' 40"	0.20382
12	184° 09' 58"	3° 30' 51"	185° 13' 04"	1° 34' 12"	0° 56' 07"	15' 17.63"	290° 49' 46"	0.20726
13	184° 41' 46"	3° 28' 51"	185° 41' 26"	1° 19' 46"	0° 56' 09"	15' 18.03"	290° 52' 42"	0.21072
14	185° 13' 37"	3° 26' 49"	186° 09' 49"	1° 05' 18"	0° 56' 10"	15' 18.43"	290° 55' 29"	0.21421
15	185° 45' 28"	3° 24' 47"	186° 38' 13"	0° 50' 50"	0° 56' 12"	15' 18.83"	290° 58' 04"	0.21772
16	186° 17' 21"	3° 22' 43"	187° 06' 38"	0° 36' 21"	0° 56' 13"	15' 19.24"	291° 0' 30"	0.22126
17	186° 49' 16"	3° 20' 38"	187° 35' 04"	0° 21' 51"	0° 56' 15"	15' 19.65"	291° 2' 46"	0.22482
18	187° 21' 12"	3° 18' 32"	188° 03' 31"	0° 07' 20"	0° 56' 16"	15' 20.06"	291° 4' 52"	0.22840
19	187° 53' 09"	3° 16' 25"	188° 32' 00"	0° -7' 12"	0° 56' 18"	15' 20.47"	291° 6' 48"	0.23201
20	188° 25' 08"	3° 14' 16"	189° 00' 31"	0° -21' 44"	0° 56' 19"	15' 20.89"	291° 8' 34"	0.23564
21	188° 57' 08"	3° 12' 07"	189° 29' 03"	0° -36' 17"	0° 56' 21"	15' 21.31"	291° 10' 10"	0.23929
22	189° 29' 10"	3° 09' 56"	189° 57' 36"	0° -50' 50"	0° 56' 22"	15' 21.73"	291° 11' 36"	0.24297
23	190° 01' 13"	3° 07' 44"	190° 26' 11"	-1° 05' 24"	0° 56' 24"	15' 22.15"	291° 12' 52"	0.24667
24	190° 33' 18"	3° 05' 31"	190° 54' 48"	-1° 19' 59"	0° 56' 26"	15' 22.57"	291° 13' 59"	0.25039

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	130° 40' 45"	0.59"	133° 07' 20"	17° 33' 33"	1.0148031	15' 45.63"	23° 26' 17"	-6 m 15 s
1	130° 43' 09"	0.58"	133° 09' 45"	17° 32' 54"	1.0147974	15' 45.64"	23° 26' 17"	-6 m 15 s
2	130° 45' 33"	0.58"	133° 12' 10"	17° 32' 15"	1.0147916	15' 45.64"	23° 26' 17"	-6 m 14 s
3	130° 47' 56"	0.57"	133° 14' 34"	17° 31' 36"	1.0147858	15' 45.65"	23° 26' 17"	-6 m 14 s
4	130° 50' 20"	0.57"	133° 16' 59"	17° 30' 57"	1.0147801	15' 45.65"	23° 26' 17"	-6 m 14 s
5	130° 52' 43"	0.56"	133° 19' 24"	17° 30' 17"	1.0147743	15' 45.66"	23° 26' 17"	-6 m 14 s
6	130° 55' 07"	0.56"	133° 21' 49"	17° 29' 38"	1.0147685	15' 45.66"	23° 26' 17"	-6 m 14 s
7	130° 57' 30"	0.55"	133° 24' 14"	17° 28' 59"	1.0147627	15' 45.67"	23° 26' 17"	-6 m 13 s
8	130° 59' 54"	0.55"	133° 26' 39"	17° 28' 20"	1.0147569	15' 45.67"	23° 26' 17"	-6 m 13 s
9	131° 02' 18"	0.54"	133° 29' 03"	17° 27' 40"	1.0147511	15' 45.68"	23° 26' 17"	-6 m 13 s
10	131° 04' 41"	0.54"	133° 31' 28"	17° 27' 01"	1.0147453	15' 45.69"	23° 26' 17"	-6 m 13 s
11	131° 07' 05"	0.53"	133° 33' 53"	17° 26' 22"	1.0147395	15' 45.69"	23° 26' 17"	-6 m 13 s
12	131° 09' 28"	0.53"	133° 36' 18"	17° 25' 42"	1.0147337	15' 45.70"	23° 26' 17"	-6 m 12 s
13	131° 11' 52"	0.52"	133° 38' 42"	17° 25' 03"	1.0147278	15' 45.70"	23° 26' 17"	-6 m 12 s
14	131° 14' 16"	0.52"	133° 41' 07"	17° 24' 23"	1.0147220	15' 45.71"	23° 26' 17"	-6 m 12 s
15	131° 16' 39"	0.51"	133° 43' 32"	17° 23' 44"	1.0147161	15' 45.71"	23° 26' 17"	-6 m 12 s
16	131° 19' 03"	0.51"	133° 45' 56"	17° 23' 05"	1.0147103	15' 45.72"	23° 26' 17"	-6 m 12 s
17	131° 21' 26"	0.50"	133° 48' 21"	17° 22' 25"	1.0147044	15' 45.72"	23° 26' 17"	-6 m 11 s
18	131° 23' 50"	0.50"	133° 50' 46"	17° 21' 45"	1.0146985	15' 45.73"	23° 26' 17"	-6 m 11 s
19	131° 26' 14"	0.49"	133° 53' 10"	17° 21' 06"	1.0146926	15' 45.73"	23° 26' 17"	-6 m 11 s
20	131° 28' 37"	0.49"	133° 55' 35"	17° 20' 26"	1.0146867	15' 45.74"	23° 26' 17"	-6 m 11 s
21	131° 31' 01"	0.48"	133° 57' 59"	17° 19' 47"	1.0146808	15' 45.75"	23° 26' 17"	-6 m 11 s
22	131° 33' 24"	0.47"	134° 00' 24"	17° 19' 07"	1.0146749	15' 45.75"	23° 26' 17"	-6 m 10 s
23	131° 35' 48"	0.47"	134° 02' 49"	17° 18' 27"	1.0146690	15' 45.76"	23° 26' 17"	-6 m 10 s
24	131° 38' 12"	0.46"	134° 05' 13"	17° 17' 47"	1.0146631	15' 45.76"	23° 26' 17"	-6 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	190° 33' 18"	3° 05' 31"	190° 54' 48"	-1° 19' 59"	0° 56' 26"	15' 22.57"	291° 13' 59"	0.25039
1	191° 05' 24"	3° 03' 17"	191° 23' 27"	-1° 34' 34"	0° 56' 27"	15' 23.00"	291° 14' 56"	0.25413
2	191° 37' 31"	3° 01' 02"	191° 52' 07"	-1° 49' 09"	0° 56' 29"	15' 23.43"	291° 15' 43"	0.25789
3	192° 09' 41"	2° 58' 46"	192° 20' 50"	-2° 03' 45"	0° 56' 30"	15' 23.86"	291° 16' 20"	0.26168
4	192° 41' 52"	2° 56' 29"	192° 49' 34"	-2° 18' 21"	0° 56' 32"	15' 24.29"	291° 16' 48"	0.26548
5	193° 14' 04"	2° 54' 11"	193° 18' 21"	-2° 32' 57"	0° 56' 33"	15' 24.73"	291° 17' 06"	0.26931
6	193° 46' 18"	2° 51' 51"	193° 47' 10"	-2° 47' 33"	0° 56' 35"	15' 25.16"	291° 17' 14"	0.27316
7	194° 18' 33"	2° 49' 31"	194° 16' 01"	-3° 02' 10"	0° 56' 37"	15' 25.60"	291° 17' 13"	0.27703
8	194° 50' 50"	2° 47' 10"	194° 44' 54"	-3° 16' 46"	0° 56' 38"	15' 26.04"	291° 17' 02"	0.28092
9	195° 23' 09"	2° 44' 47"	195° 13' 50"	-3° 31' 23"	0° 56' 40"	15' 26.49"	291° 16' 41"	0.28483
10	195° 55' 29"	2° 42' 24"	195° 42' 48"	-3° 45' 59"	0° 56' 42"	15' 26.93"	291° 16' 11"	0.28876
11	196° 27' 51"	2° 39' 59"	196° 11' 49"	-4° 00' 35"	0° 56' 43"	15' 27.38"	291° 15' 32"	0.29271
12	197° 00' 15"	2° 37' 34"	196° 40' 52"	-4° 15' 11"	0° 56' 45"	15' 27.83"	291° 14' 42"	0.29668
13	197° 32' 40"	2° 35' 08"	197° 09' 58"	-4° 29' 46"	0° 56' 47"	15' 28.28"	291° 13' 43"	0.30067
14	198° 05' 07"	2° 32' 40"	197° 39' 07"	-4° 44' 22"	0° 56' 48"	15' 28.74"	291° 12' 35"	0.30468
15	198° 37' 36"	2° 30' 12"	198° 08' 18"	-4° 58' 56"	0° 56' 50"	15' 29.19"	291° 11' 17"	0.30871
16	199° 10' 06"	2° 27' 43"	198° 37' 33"	-5° 13' 31"	0° 56' 52"	15' 29.65"	291° 9' 49"	0.31276
17	199° 42' 38"	2° 25' 12"	199° 06' 51"	-5° 28' 05"	0° 56' 53"	15' 30.11"	291° 8' 12"	0.31682
18	200° 15' 11"	2° 22' 41"	199° 36' 11"	-5° 42' 38"	0° 56' 55"	15' 30.57"	291° 6' 25"	0.32091
19	200° 47' 47"	2° 20' 09"	200° 05' 35"	-5° 57' 10"	0° 56' 57"	15' 31.03"	291° 4' 29"	0.32501
20	201° 20' 24"	2° 17' 36"	200° 35' 02"	-6° 11' 42"	0° 56' 58"	15' 31.50"	291° 2' 23"	0.32913
21	201° 53' 03"	2° 15' 02"	201° 04' 32"	-6° 26' 13"	0° 57' 00"	15' 31.97"	291° 0' 07"	0.33326
22	202° 25' 43"	2° 12' 28"	201° 34' 06"	-6° 40' 43"	0° 57' 02"	15' 32.43"	290° 57' 42"	0.33742
23	202° 58' 26"	2° 09' 52"	202° 03' 43"	-6° 55' 13"	0° 57' 04"	15' 32.91"	290° 55' 08"	0.34159
24	203° 31' 10"	2° 07' 15"	202° 33' 24"	-7° 09' 41"	0° 57' 05"	15' 33.38"	290° 52' 24"	0.34578



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	131° 38' 12"	0.46"	134° 05' 13"	17° 17' 47"	1.0146631	15' 45.76"	23° 26' 17"	-6 m 10 s
1	131° 40' 35"	0.46"	134° 07' 38"	17° 17' 08"	1.0146571	15' 45.77"	23° 26' 17"	-6 m 10 s
2	131° 42' 59"	0.45"	134° 10' 02"	17° 16' 28"	1.0146512	15' 45.77"	23° 26' 17"	-6 m 09 s
3	131° 45' 22"	0.45"	134° 12' 27"	17° 15' 48"	1.0146452	15' 45.78"	23° 26' 17"	-6 m 09 s
4	131° 47' 46"	0.44"	134° 14' 51"	17° 15' 08"	1.0146392	15' 45.78"	23° 26' 17"	-6 m 09 s
5	131° 50' 10"	0.44"	134° 17' 15"	17° 14' 28"	1.0146333	15' 45.79"	23° 26' 17"	-6 m 09 s
6	131° 52' 33"	0.43"	134° 19' 40"	17° 13' 48"	1.0146273	15' 45.80"	23° 26' 17"	-6 m 09 s
7	131° 54' 57"	0.43"	134° 22' 04"	17° 13' 09"	1.0146213	15' 45.80"	23° 26' 17"	-6 m 08 s
8	131° 57' 20"	0.42"	134° 24' 29"	17° 12' 29"	1.0146153	15' 45.81"	23° 26' 17"	-6 m 08 s
9	131° 59' 44"	0.42"	134° 26' 53"	17° 11' 49"	1.0146093	15' 45.81"	23° 26' 17"	-6 m 08 s
10	132° 02' 08"	0.41"	134° 29' 17"	17° 11' 09"	1.0146033	15' 45.82"	23° 26' 17"	-6 m 08 s
11	132° 04' 31"	0.41"	134° 31' 42"	17° 10' 29"	1.0145973	15' 45.82"	23° 26' 17"	-6 m 07 s
12	132° 06' 55"	0.40"	134° 34' 06"	17° 09' 48"	1.0145913	15' 45.83"	23° 26' 17"	-6 m 07 s
13	132° 09' 18"	0.39"	134° 36' 30"	17° 09' 08"	1.0145852	15' 45.83"	23° 26' 17"	-6 m 07 s
14	132° 11' 42"	0.39"	134° 38' 55"	17° 08' 28"	1.0145792	15' 45.84"	23° 26' 17"	-6 m 07 s
15	132° 14' 06"	0.38"	134° 41' 19"	17° 07' 48"	1.0145731	15' 45.85"	23° 26' 17"	-6 m 06 s
16	132° 16' 29"	0.38"	134° 43' 43"	17° 07' 08"	1.0145671	15' 45.85"	23° 26' 17"	-6 m 06 s
17	132° 18' 53"	0.37"	134° 46' 08"	17° 06' 28"	1.0145610	15' 45.86"	23° 26' 17"	-6 m 06 s
18	132° 21' 17"	0.37"	134° 48' 32"	17° 05' 47"	1.0145549	15' 45.86"	23° 26' 17"	-6 m 06 s
19	132° 23' 40"	0.36"	134° 50' 56"	17° 05' 07"	1.0145489	15' 45.87"	23° 26' 17"	-6 m 05 s
20	132° 26' 04"	0.36"	134° 53' 20"	17° 04' 27"	1.0145428	15' 45.87"	23° 26' 17"	-6 m 05 s
21	132° 28' 27"	0.35"	134° 55' 44"	17° 03' 46"	1.0145367	15' 45.88"	23° 26' 17"	-6 m 05 s
22	132° 30' 51"	0.34"	134° 58' 09"	17° 03' 06"	1.0145306	15' 45.89"	23° 26' 17"	-6 m 05 s
23	132° 33' 15"	0.34"	135° 00' 33"	17° 02' 26"	1.0145245	15' 45.89"	23° 26' 17"	-6 m 04 s
24	132° 35' 38"	0.33"	135° 02' 57"	17° 01' 45"	1.0145183	15' 45.90"	23° 26' 17"	-6 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	203° 31' 10"	2° 07' 15"	202° 33' 24"	-7° 09' 41"	0° 57' 05"	15' 33.38"	290° 52' 24"	0.34578
1	204° 03' 56"	2° 04' 38"	203° 03' 08"	-7° 24' 08"	0° 57' 07"	15' 33.85"	290° 49' 30"	0.34998
2	204° 36' 43"	2° 01' 60"	203° 32' 56"	-7° 38' 34"	0° 57' 09"	15' 34.33"	290° 46' 26"	0.35420
3	205° 09' 33"	1° 59' 21"	204° 02' 47"	-7° 52' 59"	0° 57' 10"	15' 34.81"	290° 43' 13"	0.35844
4	205° 42' 24"	1° 56' 41"	204° 32' 43"	-8° 07' 23"	0° 57' 12"	15' 35.29"	290° 39' 50"	0.36269
5	206° 15' 18"	1° 54' 00"	205° 02' 42"	-8° 21' 45"	0° 57' 14"	15' 35.77"	290° 36' 18"	0.36695
6	206° 48' 13"	1° 51' 19"	205° 32' 46"	-8° 36' 06"	0° 57' 16"	15' 36.25"	290° 32' 36"	0.37124
7	207° 21' 10"	1° 48' 37"	206° 02' 53"	-8° 50' 26"	0° 57' 18"	15' 36.74"	290° 28' 44"	0.37553
8	207° 54' 08"	1° 45' 54"	206° 33' 05"	-9° 04' 43"	0° 57' 19"	15' 37.22"	290° 24' 43"	0.37984
9	208° 27' 09"	1° 43' 10"	207° 03' 21"	-9° 18' 60"	0° 57' 21"	15' 37.71"	290° 20' 32"	0.38417
10	209° 00' 12"	1° 40' 25"	207° 33' 41"	-9° 33' 14"	0° 57' 23"	15' 38.20"	290° 16' 11"	0.38851
11	209° 33' 16"	1° 37' 40"	208° 04' 06"	-9° 47' 27"	0° 57' 25"	15' 38.69"	290° 11' 40"	0.39286
12	210° 06' 23"	1° 34' 54"	208° 34' 35"	-10° 01' 38"	0° 57' 27"	15' 39.18"	290° 7' 00"	0.39722
13	210° 39' 31"	1° 32' 08"	209° 05' 08"	-10° 15' 47"	0° 57' 28"	15' 39.68"	290° 2' 10"	0.40160
14	211° 12' 42"	1° 29' 20"	209° 35' 47"	-10° 29' 54"	0° 57' 30"	15' 40.17"	289° 57' 10"	0.40599
15	211° 45' 54"	1° 26' 32"	210° 06' 30"	-10° 43' 59"	0° 57' 32"	15' 40.67"	289° 52' 00"	0.41040
16	212° 19' 08"	1° 23' 44"	210° 37' 17"	-10° 58' 02"	0° 57' 34"	15' 41.17"	289° 46' 41"	0.41481
17	212° 52' 24"	1° 20' 54"	211° 08' 10"	-11° 12' 03"	0° 57' 36"	15' 41.67"	289° 41' 12"	0.41924
18	213° 25' 43"	1° 18' 04"	211° 39' 07"	-11° 26' 01"	0° 57' 38"	15' 42.17"	289° 35' 32"	0.42368
19	213° 59' 03"	1° 15' 14"	212° 10' 09"	-11° 39' 57"	0° 57' 39"	15' 42.67"	289° 29' 43"	0.42813
20	214° 32' 25"	1° 12' 22"	212° 41' 17"	-11° 53' 50"	0° 57' 41"	15' 43.17"	289° 23' 44"	0.43259
21	215° 05' 50"	1° 09' 31"	213° 12' 29"	-12° 07' 41"	0° 57' 43"	15' 43.68"	289° 17' 35"	0.43706
22	215° 39' 16"	1° 06' 38"	213° 43' 47"	-12° 21' 30"	0° 57' 45"	15' 44.19"	289° 11' 16"	0.44154
23	216° 12' 44"	1° 03' 45"	214° 15' 10"	-12° 35' 15"	0° 57' 47"	15' 44.69"	289° 4' 47"	0.44604
24	216° 46' 15"	1° 00' 52"	214° 46' 39"	-12° 48' 58"	0° 57' 49"	15' 45.20"	288° 58' 08"	0.45054

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	132° 35' 38"	0.33"	135° 02' 57"	17° 01' 45"	1.0145183	15' 45.90"	23° 26' 17"	-6 m 04 s
1	132° 38' 02"	0.33"	135° 05' 21"	17° 01' 05"	1.0145122	15' 45.90"	23° 26' 17"	-6 m 04 s
2	132° 40' 26"	0.32"	135° 07' 45"	17° 00' 24"	1.0145061	15' 45.91"	23° 26' 17"	-6 m 04 s
3	132° 42' 49"	0.32"	135° 10' 09"	16° 59' 44"	1.0144999	15' 45.91"	23° 26' 17"	-6 m 03 s
4	132° 45' 13"	0.31"	135° 12' 33"	16° 59' 03"	1.0144938	15' 45.92"	23° 26' 17"	-6 m 03 s
5	132° 47' 36"	0.31"	135° 14' 57"	16° 58' 23"	1.0144876	15' 45.93"	23° 26' 17"	-6 m 03 s
6	132° 50' 00"	0.30"	135° 17' 22"	16° 57' 42"	1.0144815	15' 45.93"	23° 26' 17"	-6 m 03 s
7	132° 52' 24"	0.29"	135° 19' 46"	16° 57' 02"	1.0144753	15' 45.94"	23° 26' 17"	-6 m 02 s
8	132° 54' 47"	0.29"	135° 22' 10"	16° 56' 21"	1.0144691	15' 45.94"	23° 26' 17"	-6 m 02 s
9	132° 57' 11"	0.28"	135° 24' 34"	16° 55' 40"	1.0144630	15' 45.95"	23° 26' 17"	-6 m 02 s
10	132° 59' 35"	0.28"	135° 26' 58"	16° 54' 59"	1.0144568	15' 45.95"	23° 26' 17"	-6 m 02 s
11	133° 01' 58"	0.27"	135° 29' 22"	16° 54' 19"	1.0144506	15' 45.96"	23° 26' 17"	-6 m 01 s
12	133° 04' 22"	0.27"	135° 31' 45"	16° 53' 38"	1.0144444	15' 45.97"	23° 26' 17"	-6 m 01 s
13	133° 06' 46"	0.26"	135° 34' 09"	16° 52' 57"	1.0144381	15' 45.97"	23° 26' 17"	-6 m 01 s
14	133° 09' 09"	0.26"	135° 36' 33"	16° 52' 16"	1.0144319	15' 45.98"	23° 26' 17"	-6 m 01 s
15	133° 11' 33"	0.25"	135° 38' 57"	16° 51' 36"	1.0144257	15' 45.98"	23° 26' 17"	-6 m 00 s
16	133° 13' 56"	0.24"	135° 41' 21"	16° 50' 55"	1.0144195	15' 45.99"	23° 26' 17"	-6 m 00 s
17	133° 16' 20"	0.24"	135° 43' 45"	16° 50' 14"	1.0144132	15' 46.00"	23° 26' 17"	-5 m 60 s
18	133° 18' 44"	0.23"	135° 46' 09"	16° 49' 33"	1.0144070	15' 46.00"	23° 26' 17"	-5 m 60 s
19	133° 21' 07"	0.23"	135° 48' 33"	16° 48' 52"	1.0144007	15' 46.01"	23° 26' 17"	-5 m 59 s
20	133° 23' 31"	0.22"	135° 50' 57"	16° 48' 11"	1.0143944	15' 46.01"	23° 26' 17"	-5 m 59 s
21	133° 25' 55"	0.22"	135° 53' 20"	16° 47' 30"	1.0143882	15' 46.02"	23° 26' 17"	-5 m 59 s
22	133° 28' 18"	0.21"	135° 55' 44"	16° 46' 49"	1.0143819	15' 46.02"	23° 26' 17"	-5 m 59 s
23	133° 30' 42"	0.21"	135° 58' 08"	16° 46' 08"	1.0143756	15' 46.03"	23° 26' 17"	-5 m 58 s
24	133° 33' 06"	0.20"	136° 00' 32"	16° 45' 27"	1.0143693	15' 46.04"	23° 26' 17"	-5 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	216° 46' 15"	1° 00' 52"	214° 46' 39"	-12° 48' 58"	0° 57' 49"	15' 45.20"	288° 58' 08"	0.45054
1	217° 19' 47"	0° 57' 58"	215° 18' 13"	-13° 02' 38"	0° 57' 51"	15' 45.71"	288° 51' 19"	0.45505
2	217° 53' 22"	0° 55' 03"	215° 49' 52"	-13° 16' 15"	0° 57' 52"	15' 46.22"	288° 44' 20"	0.45957
3	218° 26' 59"	0° 52' 08"	216° 21' 37"	-13° 29' 49"	0° 57' 54"	15' 46.73"	288° 37' 11"	0.46409
4	219° 00' 38"	0° 49' 13"	216° 53' 28"	-13° 43' 20"	0° 57' 56"	15' 47.24"	288° 29' 51"	0.46863
5	219° 34' 19"	0° 46' 17"	217° 25' 24"	-13° 56' 47"	0° 57' 58"	15' 47.75"	288° 22' 22"	0.47317
6	220° 08' 02"	0° 43' 20"	217° 57' 26"	-14° 10' 12"	0° 57' 60"	15' 48.27"	288° 14' 42"	0.47772
7	220° 41' 47"	0° 40' 23"	218° 29' 34"	-14° 23' 32"	0° 58' 02"	15' 48.78"	288° 7' 53"	0.48228
8	221° 15' 34"	0° 37' 26"	219° 01' 48"	-14° 36' 50"	0° 58' 04"	15' 49.30"	287° 58' 53"	0.48684
9	221° 49' 24"	0° 34' 28"	219° 34' 08"	-14° 50' 04"	0° 58' 06"	15' 49.81"	287° 50' 42"	0.49141
10	222° 23' 16"	0° 31' 30"	220° 06' 34"	-15° 03' 14"	0° 58' 07"	15' 50.33"	287° 42' 22"	0.49599
11	222° 57' 09"	0° 28' 32"	220° 39' 06"	-15° 16' 20"	0° 58' 09"	15' 50.85"	287° 33' 51"	0.50057
12	223° 31' 05"	0° 25' 33"	221° 11' 44"	-15° 29' 23"	0° 58' 11"	15' 51.36"	287° 25' 10"	0.50516
13	224° 05' 04"	0° 22' 34"	221° 44' 28"	-15° 42' 21"	0° 58' 13"	15' 51.88"	287° 16' 18"	0.50975
14	224° 39' 04"	0° 19' 34"	222° 17' 19"	-15° 55' 16"	0° 58' 15"	15' 52.40"	287° 7' 16"	0.51435
15	225° 13' 07"	0° 16' 34"	222° 50' 16"	-16° 08' 06"	0° 58' 17"	15' 52.92"	286° 58' 04"	0.51895
16	225° 47' 12"	0° 13' 34"	223° 23' 20"	-16° 20' 52"	0° 58' 19"	15' 53.44"	286° 48' 42"	0.52355
17	226° 21' 19"	0° 10' 34"	223° 56' 30"	-16° 33' 34"	0° 58' 21"	15' 53.96"	286° 39' 09"	0.52816
18	226° 55' 28"	0° 07' 33"	224° 29' 47"	-16° 46' 11"	0° 58' 23"	15' 54.48"	286° 29' 25"	0.53277
19	227° 29' 40"	0° 04' 32"	225° 03' 10"	-16° 58' 44"	0° 58' 25"	15' 55.00"	286° 19' 31"	0.53738
20	228° 03' 53"	0° 01' 31"	225° 36' 40"	-17° 11' 12"	0° 58' 27"	15' 55.52"	286° 9' 26"	0.54200
21	228° 38' 10"	0° -1' 30"	226° 10' 17"	-17° 23' 36"	0° 58' 28"	15' 56.04"	285° 59' 11"	0.54662
22	229° 12' 28"	0° -4' 32"	226° 43' 60"	-17° 35' 54"	0° 58' 30"	15' 56.56"	285° 48' 46"	0.55123
23	229° 46' 49"	0° -7' 34"	227° 17' 50"	-17° 48' 08"	0° 58' 32"	15' 57.08"	285° 38' 10"	0.55585
24	230° 21' 11"	0° -10' 35"	227° 51' 47"	-18° 00' 17"	0° 58' 34"	15' 57.60"	285° 27' 23"	0.56047

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	133° 33' 06"	0.20"	136° 00' 32"	16° 45' 27"	1.0143693	15' 46.04"	23° 26' 17"	-5 m 58 s
1	133° 35' 29"	0.20"	136° 02' 55"	16° 44' 45"	1.0143630	15' 46.04"	23° 26' 17"	-5 m 58 s
2	133° 37' 53"	0.19"	136° 05' 19"	16° 44' 04"	1.0143567	15' 46.05"	23° 26' 17"	-5 m 57 s
3	133° 40' 17"	0.18"	136° 07' 43"	16° 43' 23"	1.0143504	15' 46.05"	23° 26' 17"	-5 m 57 s
4	133° 42' 40"	0.18"	136° 10' 07"	16° 42' 42"	1.0143441	15' 46.06"	23° 26' 17"	-5 m 57 s
5	133° 45' 04"	0.17"	136° 12' 30"	16° 42' 01"	1.0143378	15' 46.07"	23° 26' 17"	-5 m 57 s
6	133° 47' 28"	0.17"	136° 14' 54"	16° 41' 19"	1.0143314	15' 46.07"	23° 26' 17"	-5 m 56 s
7	133° 49' 51"	0.16"	136° 17' 18"	16° 40' 38"	1.0143251	15' 46.08"	23° 26' 17"	-5 m 56 s
8	133° 52' 15"	0.16"	136° 19' 41"	16° 39' 57"	1.0143188	15' 46.08"	23° 26' 17"	-5 m 56 s
9	133° 54' 39"	0.15"	136° 22' 05"	16° 39' 15"	1.0143124	15' 46.09"	23° 26' 17"	-5 m 56 s
10	133° 57' 02"	0.15"	136° 24' 28"	16° 38' 34"	1.0143061	15' 46.10"	23° 26' 17"	-5 m 55 s
11	133° 59' 26"	0.14"	136° 26' 52"	16° 37' 53"	1.0142997	15' 46.10"	23° 26' 17"	-5 m 55 s
12	134° 01' 50"	0.14"	136° 29' 16"	16° 37' 11"	1.0142933	15' 46.11"	23° 26' 17"	-5 m 55 s
13	134° 04' 13"	0.13"	136° 31' 39"	16° 36' 30"	1.0142869	15' 46.11"	23° 26' 17"	-5 m 54 s
14	134° 06' 37"	0.12"	136° 34' 03"	16° 35' 48"	1.0142806	15' 46.12"	23° 26' 17"	-5 m 54 s
15	134° 09' 01"	0.12"	136° 36' 26"	16° 35' 07"	1.0142742	15' 46.12"	23° 26' 17"	-5 m 54 s
16	134° 11' 24"	0.11"	136° 38' 50"	16° 34' 25"	1.0142678	15' 46.13"	23° 26' 17"	-5 m 54 s
17	134° 13' 48"	0.11"	136° 41' 13"	16° 33' 44"	1.0142614	15' 46.14"	23° 26' 17"	-5 m 53 s
18	134° 16' 12"	0.10"	136° 43' 37"	16° 33' 02"	1.0142550	15' 46.14"	23° 26' 17"	-5 m 53 s
19	134° 18' 35"	0.10"	136° 46' 00"	16° 32' 20"	1.0142486	15' 46.15"	23° 26' 17"	-5 m 53 s
20	134° 20' 59"	0.09"	136° 48' 23"	16° 31' 39"	1.0142421	15' 46.15"	23° 26' 17"	-5 m 52 s
21	134° 23' 23"	0.09"	136° 50' 47"	16° 30' 57"	1.0142357	15' 46.16"	23° 26' 17"	-5 m 52 s
22	134° 25' 46"	0.08"	136° 53' 10"	16° 30' 15"	1.0142293	15' 46.17"	23° 26' 17"	-5 m 52 s
23	134° 28' 10"	0.08"	136° 55' 34"	16° 29' 34"	1.0142228	15' 46.17"	23° 26' 17"	-5 m 51 s
24	134° 30' 34"	0.07"	136° 57' 57"	16° 28' 52"	1.0142164	15' 46.18"	23° 26' 17"	-5 m 51 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	230° 21' 11"	0°-10' 35"	227° 51' 47"	-18° 00' 17"	0° 58' 34"	15' 57.60"	285° 27' 23"	0.56047
1	230° 55' 37"	0°-13' 37"	228° 25' 51"	-18° 12' 20"	0° 58' 36"	15' 58.11"	285° 16' 25"	0.56509
2	231° 30' 04"	0°-16' 39"	229° 00' 02"	-18° 24' 19"	0° 58' 38"	15' 58.63"	285° 5' 17"	0.56971
3	232° 04' 34"	0°-19' 42"	229° 34' 20"	-18° 36' 12"	0° 58' 40"	15' 59.15"	284° 53' 59"	0.57433
4	232° 39' 06"	0°-22' 44"	230° 08' 45"	-18° 47' 59"	0° 58' 42"	15' 59.67"	284° 42' 29"	0.57895
5	233° 13' 40"	0°-25' 46"	230° 43' 18"	-18° 59' 41"	0° 58' 44"	16' 00.19"	284° 30' 49"	0.58356
6	233° 48' 17"	0°-28' 49"	231° 17' 57"	-19° 11' 17"	0° 58' 46"	16' 00.71"	284° 18' 58"	0.58818
7	234° 22' 56"	0°-31' 51"	231° 52' 43"	-19° 22' 48"	0° 58' 47"	16' 01.22"	284° 6' 57"	0.59279
8	234° 57' 38"	0°-34' 53"	232° 27' 37"	-19° 34' 13"	0° 58' 49"	16' 01.74"	283° 54' 45"	0.59740
9	235° 32' 21"	0°-37' 56"	233° 02' 38"	-19° 45' 31"	0° 58' 51"	16' 02.25"	283° 42' 22"	0.60200
10	236° 07' 07"	0°-40' 58"	233° 37' 46"	-19° 56' 44"	0° 58' 53"	16' 02.77"	283° 29' 48"	0.60660
11	236° 41' 56"	0°-44' 00"	234° 13' 02"	-20° 07' 50"	0° 58' 55"	16' 03.28"	283° 17' 03"	0.61120
12	237° 16' 46"	0°-47' 03"	234° 48' 24"	-20° 18' 50"	0° 58' 57"	16' 03.80"	283° 4' 08"	0.61579
13	237° 51' 39"	0°-50' 05"	235° 23' 54"	-20° 29' 44"	0° 58' 59"	16' 04.31"	282° 51' 02"	0.62038
14	238° 26' 35"	0°-53' 07"	235° 59' 32"	-20° 40' 31"	0° 59' 01"	16' 04.82"	282° 37' 45"	0.62496
15	239° 01' 32"	0°-56' 09"	236° 35' 17"	-20° 51' 11"	0° 59' 03"	16' 05.33"	282° 24' 18"	0.62954
16	239° 36' 33"	0°-59' 10"	237° 11' 09"	-21° 01' 45"	0° 59' 04"	16' 05.84"	282° 10' 39"	0.63411
17	240° 11' 35"	-1° 02' 12"	237° 47' 09"	-21° 12' 12"	0° 59' 06"	16' 06.34"	281° 56' 50"	0.63867
18	240° 46' 40"	-1° 05' 13"	238° 23' 16"	-21° 22' 32"	0° 59' 08"	16' 06.85"	281° 42' 50"	0.64323
19	241° 21' 47"	-1° 08' 14"	238° 59' 30"	-21° 32' 44"	0° 59' 10"	16' 07.35"	281° 28' 39"	0.64777
20	241° 56' 56"	-1° 11' 15"	239° 35' 52"	-21° 42' 50"	0° 59' 12"	16' 07.86"	281° 14' 17"	0.65231
21	242° 32' 08"	-1° 14' 16"	240° 12' 22"	-21° 52' 48"	0° 59' 14"	16' 08.36"	280° 59' 45"	0.65684
22	243° 07' 22"	-1° 17' 16"	240° 48' 59"	-22° 02' 39"	0° 59' 15"	16' 08.86"	280° 45' 01"	0.66136
23	243° 42' 39"	-1° 20' 16"	241° 25' 43"	-22° 12' 22"	0° 59' 17"	16' 09.35"	280° 30' 07"	0.66587
24	244° 17' 58"	-1° 23' 16"	242° 02' 35"	-22° 21' 58"	0° 59' 19"	16' 09.85"	280° 15' 02"	0.67038

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	134° 30' 34"	0.07"	136° 57' 57"	16° 28' 52"	1.0142164	15' 46.18"	23° 26' 17"	-5 m 51 s
1	134° 32' 57"	0.07"	137° 00' 20"	16° 28' 10"	1.0142099	15' 46.18"	23° 26' 17"	-5 m 51 s
2	134° 35' 21"	0.06"	137° 02' 44"	16° 27' 28"	1.0142035	15' 46.19"	23° 26' 17"	-5 m 51 s
3	134° 37' 45"	0.06"	137° 05' 07"	16° 26' 46"	1.0141970	15' 46.20"	23° 26' 17"	-5 m 50 s
4	134° 40' 09"	0.05"	137° 07' 30"	16° 26' 04"	1.0141905	15' 46.20"	23° 26' 17"	-5 m 50 s
5	134° 42' 32"	0.05"	137° 09' 54"	16° 25' 23"	1.0141841	15' 46.21"	23° 26' 17"	-5 m 50 s
6	134° 44' 56"	0.04"	137° 12' 17"	16° 24' 41"	1.0141776	15' 46.21"	23° 26' 17"	-5 m 49 s
7	134° 47' 20"	0.04"	137° 14' 40"	16° 23' 59"	1.0141711	15' 46.22"	23° 26' 17"	-5 m 49 s
8	134° 49' 43"	0.03"	137° 17' 04"	16° 23' 17"	1.0141646	15' 46.23"	23° 26' 17"	-5 m 49 s
9	134° 52' 07"	0.03"	137° 19' 27"	16° 22' 35"	1.0141581	15' 46.23"	23° 26' 17"	-5 m 48 s
10	134° 54' 31"	0.02"	137° 21' 50"	16° 21' 53"	1.0141516	15' 46.24"	23° 26' 17"	-5 m 48 s
11	134° 56' 54"	0.02"	137° 24' 13"	16° 21' 11"	1.0141451	15' 46.25"	23° 26' 17"	-5 m 48 s
12	134° 59' 18"	0.01"	137° 26' 36"	16° 20' 28"	1.0141386	15' 46.25"	23° 26' 17"	-5 m 48 s
13	135° 01' 42"	0.01"	137° 28' 60"	16° 19' 46"	1.0141320	15' 46.26"	23° 26' 17"	-5 m 47 s
14	135° 04' 05"	0.00"	137° 31' 23"	16° 19' 04"	1.0141255	15' 46.26"	23° 26' 17"	-5 m 47 s
15	135° 06' 29"	-0.00"	137° 33' 46"	16° 18' 22"	1.0141190	15' 46.27"	23° 26' 17"	-5 m 47 s
16	135° 08' 53"	-0.01"	137° 36' 09"	16° 17' 40"	1.0141124	15' 46.28"	23° 26' 17"	-5 m 46 s
17	135° 11' 17"	-0.01"	137° 38' 32"	16° 16' 58"	1.0141059	15' 46.28"	23° 26' 17"	-5 m 46 s
18	135° 13' 40"	-0.02"	137° 40' 55"	16° 16' 15"	1.0140993	15' 46.29"	23° 26' 17"	-5 m 46 s
19	135° 16' 04"	-0.02"	137° 43' 18"	16° 15' 33"	1.0140928	15' 46.29"	23° 26' 17"	-5 m 45 s
20	135° 18' 28"	-0.03"	137° 45' 41"	16° 14' 51"	1.0140862	15' 46.30"	23° 26' 17"	-5 m 45 s
21	135° 20' 51"	-0.03"	137° 48' 04"	16° 14' 08"	1.0140796	15' 46.31"	23° 26' 17"	-5 m 45 s
22	135° 23' 15"	-0.04"	137° 50' 27"	16° 13' 26"	1.0140731	15' 46.31"	23° 26' 17"	-5 m 44 s
23	135° 25' 39"	-0.04"	137° 52' 50"	16° 12' 44"	1.0140665	15' 46.32"	23° 26' 17"	-5 m 44 s
24	135° 28' 03"	-0.05"	137° 55' 13"	16° 12' 01"	1.0140599	15' 46.32"	23° 26' 17"	-5 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	244° 17' 58"	-1° 23' 16"	242° 02' 35"	-22° 21' 58"	0° 59' 19"	16' 09.85"	280° 15' 02"	0.67038
1	244° 53' 19"	-1° 26' 15"	242° 39' 34"	-22° 31' 26"	0° 59' 21"	16' 10.34"	279° 59' 46"	0.67487
2	245° 28' 43"	-1° 29' 14"	243° 16' 41"	-22° 40' 46"	0° 59' 23"	16' 10.83"	279° 44' 20"	0.67934
3	246° 04' 09"	-1° 32' 13"	243° 53' 54"	-22° 49' 58"	0° 59' 25"	16' 11.32"	279° 28' 43"	0.68381
4	246° 39' 37"	-1° 35' 11"	244° 31' 16"	-22° 59' 01"	0° 59' 26"	16' 11.81"	279° 12' 54"	0.68827
5	247° 15' 08"	-1° 38' 09"	245° 08' 44"	-23° 07' 57"	0° 59' 28"	16' 12.30"	278° 56' 56"	0.69271
6	247° 50' 41"	-1° 41' 06"	245° 46' 20"	-23° 16' 44"	0° 59' 30"	16' 12.78"	278° 40' 46"	0.69714
7	248° 26' 16"	-1° 44' 03"	246° 24' 04"	-23° 25' 23"	0° 59' 32"	16' 13.26"	278° 24' 26"	0.70156
8	249° 01' 54"	-1° 46' 59"	247° 01' 54"	-23° 33' 53"	0° 59' 33"	16' 13.74"	278° 7' 55"	0.70596
9	249° 37' 34"	-1° 49' 55"	247° 39' 52"	-23° 42' 15"	0° 59' 35"	16' 14.21"	277° 51' 13"	0.71035
10	250° 13' 16"	-1° 52' 50"	248° 17' 57"	-23° 50' 28"	0° 59' 37"	16' 14.69"	277° 34' 21"	0.71472
11	250° 49' 00"	-1° 55' 45"	248° 56' 09"	-23° 58' 31"	0° 59' 39"	16' 15.16"	277° 17' 18"	0.71907
12	251° 24' 47"	-1° 58' 39"	249° 34' 28"	-24° 06' 26"	0° 59' 40"	16' 15.62"	277° 0' 04"	0.72342
13	252° 00' 37"	-2° 01' 33"	250° 12' 54"	-24° 14' 12"	0° 59' 42"	16' 16.09"	276° 42' 40"	0.72774
14	252° 36' 28"	-2° 04' 26"	250° 51' 27"	-24° 21' 48"	0° 59' 44"	16' 16.55"	276° 25' 05"	0.73205
15	253° 12' 22"	-2° 07' 18"	251° 30' 07"	-24° 29' 16"	0° 59' 45"	16' 17.01"	276° 7' 20"	0.73634
16	253° 48' 18"	-2° 10' 09"	252° 08' 54"	-24° 36' 33"	0° 59' 47"	16' 17.46"	275° 49' 24"	0.74061
17	254° 24' 16"	-2° 13' 00"	252° 47' 48"	-24° 43' 42"	0° 59' 49"	16' 17.91"	275° 31' 17"	0.74486
18	255° 00' 17"	-2° 15' 50"	253° 26' 48"	-24° 50' 40"	0° 59' 50"	16' 18.36"	275° 13' 00"	0.74909
19	255° 36' 20"	-2° 18' 40"	254° 05' 55"	-24° 57' 29"	0° 59' 52"	16' 18.81"	274° 54' 33"	0.75331
20	256° 12' 25"	-2° 21' 28"	254° 45' 09"	-25° 04' 08"	0° 59' 54"	16' 19.25"	274° 35' 55"	0.75750
21	256° 48' 32"	-2° 24' 16"	255° 24' 29"	-25° 10' 37"	0° 59' 55"	16' 19.69"	274° 17' 07"	0.76168
22	257° 24' 41"	-2° 27' 03"	256° 03' 55"	-25° 16' 55"	0° 59' 57"	16' 20.12"	273° 58' 08"	0.76583
23	258° 00' 53"	-2° 29' 49"	256° 43' 28"	-25° 23' 04"	0° 59' 58"	16' 20.55"	273° 38' 59"	0.76996
24	258° 37' 07"	-2° 32' 35"	257° 23' 07"	-25° 29' 03"	0° 59' 60"	16' 20.98"	273° 19' 40"	0.77407



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	135° 28' 03"	-0.05"	137° 55' 13"	16° 12' 01"	1.0140599	15' 46.32"	23° 26' 17"	-5 m 44 s
1	135° 30' 26"	-0.05"	137° 57' 36"	16° 11' 19"	1.0140533	15' 46.33"	23° 26' 17"	-5 m 43 s
2	135° 32' 50"	-0.05"	137° 59' 59"	16° 10' 36"	1.0140467	15' 46.34"	23° 26' 17"	-5 m 43 s
3	135° 35' 14"	-0.06"	138° 02' 22"	16° 09' 54"	1.0140401	15' 46.34"	23° 26' 17"	-5 m 43 s
4	135° 37' 37"	-0.06"	138° 04' 45"	16° 09' 11"	1.0140335	15' 46.35"	23° 26' 17"	-5 m 42 s
5	135° 40' 01"	-0.07"	138° 07' 08"	16° 08' 29"	1.0140269	15' 46.36"	23° 26' 17"	-5 m 42 s
6	135° 42' 25"	-0.07"	138° 09' 31"	16° 07' 46"	1.0140203	15' 46.36"	23° 26' 17"	-5 m 42 s
7	135° 44' 49"	-0.08"	138° 11' 54"	16° 07' 04"	1.0140136	15' 46.37"	23° 26' 17"	-5 m 42 s
8	135° 47' 12"	-0.08"	138° 14' 17"	16° 06' 21"	1.0140070	15' 46.37"	23° 26' 17"	-5 m 41 s
9	135° 49' 36"	-0.09"	138° 16' 40"	16° 05' 38"	1.0140004	15' 46.38"	23° 26' 17"	-5 m 41 s
10	135° 51' 60"	-0.09"	138° 19' 03"	16° 04' 56"	1.0139937	15' 46.39"	23° 26' 17"	-5 m 41 s
11	135° 54' 23"	-0.09"	138° 21' 25"	16° 04' 13"	1.0139871	15' 46.39"	23° 26' 17"	-5 m 40 s
12	135° 56' 47"	-0.10"	138° 23' 48"	16° 03' 30"	1.0139804	15' 46.40"	23° 26' 17"	-5 m 40 s
13	135° 59' 11"	-0.10"	138° 26' 11"	16° 02' 47"	1.0139738	15' 46.41"	23° 26' 17"	-5 m 40 s
14	136° 01' 35"	-0.11"	138° 28' 34"	16° 02' 05"	1.0139671	15' 46.41"	23° 26' 17"	-5 m 39 s
15	136° 03' 58"	-0.11"	138° 30' 57"	16° 01' 22"	1.0139605	15' 46.42"	23° 26' 17"	-5 m 39 s
16	136° 06' 22"	-0.11"	138° 33' 19"	16° 00' 39"	1.0139538	15' 46.42"	23° 26' 17"	-5 m 39 s
17	136° 08' 46"	-0.12"	138° 35' 42"	15° 59' 56"	1.0139471	15' 46.43"	23° 26' 17"	-5 m 38 s
18	136° 11' 10"	-0.12"	138° 38' 05"	15° 59' 13"	1.0139404	15' 46.44"	23° 26' 17"	-5 m 38 s
19	136° 13' 33"	-0.13"	138° 40' 27"	15° 58' 30"	1.0139337	15' 46.44"	23° 26' 17"	-5 m 37 s
20	136° 15' 57"	-0.13"	138° 42' 50"	15° 57' 47"	1.0139270	15' 46.45"	23° 26' 17"	-5 m 37 s
21	136° 18' 21"	-0.13"	138° 45' 13"	15° 57' 04"	1.0139204	15' 46.46"	23° 26' 17"	-5 m 37 s
22	136° 20' 45"	-0.14"	138° 47' 35"	15° 56' 21"	1.0139136	15' 46.46"	23° 26' 17"	-5 m 36 s
23	136° 23' 08"	-0.14"	138° 49' 58"	15° 55' 38"	1.0139069	15' 46.47"	23° 26' 17"	-5 m 36 s
24	136° 25' 32"	-0.15"	138° 52' 21"	15° 54' 55"	1.0139002	15' 46.47"	23° 26' 17"	-5 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	258° 37' 07"	-2° 32' 35"	257° 23' 07"	-25° 29' 03"	0° 59' 60"	16' 20.98"	273° 19' 40"	0.77407
1	259° 13' 23"	-2° 35' 19"	258° 02' 52"	-25° 34' 51"	1° 00' 01"	16' 21.40"	273° 0' 10"	0.77815
2	259° 49' 41"	-2° 38' 03"	258° 42' 43"	-25° 40' 28"	1° 00' 03"	16' 21.82"	272° 40' 30"	0.78222
3	260° 26' 02"	-2° 40' 45"	259° 22' 40"	-25° 45' 55"	1° 00' 05"	16' 22.23"	272° 20' 40"	0.78626
4	261° 02' 24"	-2° 43' 27"	260° 02' 43"	-25° 51' 11"	1° 00' 06"	16' 22.64"	272° 0' 40"	0.79027
5	261° 38' 49"	-2° 46' 08"	260° 42' 51"	-25° 56' 17"	1° 00' 08"	16' 23.05"	271° 40' 29"	0.79426
6	262° 15' 15"	-2° 48' 48"	261° 23' 05"	-26° 01' 12"	1° 00' 09"	16' 23.45"	271° 20' 09"	0.79823
7	262° 51' 44"	-2° 51' 26"	262° 03' 25"	-26° 05' 56"	1° 00' 10"	16' 23.84"	270° 59' 38"	0.80217
8	263° 28' 15"	-2° 54' 04"	262° 43' 49"	-26° 10' 28"	1° 00' 12"	16' 24.24"	270° 38' 57"	0.80608
9	264° 04' 48"	-2° 56' 41"	263° 24' 19"	-26° 14' 50"	1° 00' 13"	16' 24.62"	270° 18' 05"	0.80997
10	264° 41' 23"	-2° 59' 16"	264° 04' 54"	-26° 19' 01"	1° 00' 15"	16' 25.01"	269° 57' 04"	0.81383
11	265° 17' 60"	-3° 01' 51"	264° 45' 34"	-26° 23' 00"	1° 00' 16"	16' 25.38"	269° 35' 52"	0.81766
12	265° 54' 39"	-3° 04' 24"	265° 26' 19"	-26° 26' 48"	1° 00' 17"	16' 25.76"	269° 14' 31"	0.82147
13	266° 31' 20"	-3° 06' 56"	266° 07' 08"	-26° 30' 25"	1° 00' 19"	16' 26.12"	268° 52' 59"	0.82524
14	267° 08' 03"	-3° 09' 27"	266° 48' 01"	-26° 33' 50"	1° 00' 20"	16' 26.49"	268° 31' 17"	0.82899
15	267° 44' 48"	-3° 11' 57"	267° 28' 60"	-26° 37' 03"	1° 00' 21"	16' 26.84"	268° 9' 25"	0.83270
16	268° 21' 34"	-3° 14' 26"	268° 10' 02"	-26° 40' 05"	1° 00' 23"	16' 27.20"	267° 47' 22"	0.83639
17	268° 58' 23"	-3° 16' 53"	268° 51' 08"	-26° 42' 55"	1° 00' 24"	16' 27.54"	267° 25' 09"	0.84005
18	269° 35' 14"	-3° 19' 19"	269° 32' 18"	-26° 45' 34"	1° 00' 25"	16' 27.88"	267° 2' 46"	0.84367
19	270° 12' 06"	-3° 21' 44"	270° 13' 32"	-26° 48' 00"	1° 00' 27"	16' 28.22"	266° 40' 13"	0.84727
20	270° 49' 00"	-3° 24' 07"	270° 54' 49"	-26° 50' 15"	1° 00' 28"	16' 28.55"	266° 17' 29"	0.85083
21	271° 25' 56"	-3° 26' 30"	271° 36' 10"	-26° 52' 18"	1° 00' 29"	16' 28.87"	265° 54' 35"	0.85435
22	272° 02' 54"	-3° 28' 51"	272° 17' 34"	-26° 54' 09"	1° 00' 30"	16' 29.19"	265° 31' 30"	0.85785
23	272° 39' 54"	-3° 31' 10"	272° 59' 01"	-26° 55' 48"	1° 00' 31"	16' 29.50"	265° 8' 15"	0.86131
24	273° 16' 55"	-3° 33' 28"	273° 40' 31"	-26° 57' 14"	1° 00' 32"	16' 29.81"	264° 44' 48"	0.86474

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	136° 25' 32"	-0.15"	138° 52' 21"	15° 54' 55"	1.0139002	15' 46.47"	23° 26' 17"	-5 m 36 s
1	136° 27' 56"	-0.15"	138° 54' 43"	15° 54' 12"	1.0138935	15' 46.48"	23° 26' 17"	-5 m 35 s
2	136° 30' 20"	-0.15"	138° 57' 06"	15° 53' 29"	1.0138868	15' 46.49"	23° 26' 17"	-5 m 35 s
3	136° 32' 43"	-0.16"	138° 59' 28"	15° 52' 46"	1.0138801	15' 46.49"	23° 26' 17"	-5 m 35 s
4	136° 35' 07"	-0.16"	139° 01' 51"	15° 52' 03"	1.0138733	15' 46.50"	23° 26' 17"	-5 m 34 s
5	136° 37' 31"	-0.16"	139° 04' 14"	15° 51' 19"	1.0138666	15' 46.51"	23° 26' 17"	-5 m 34 s
6	136° 39' 55"	-0.17"	139° 06' 36"	15° 50' 36"	1.0138599	15' 46.51"	23° 26' 17"	-5 m 34 s
7	136° 42' 18"	-0.17"	139° 08' 59"	15° 49' 53"	1.0138531	15' 46.52"	23° 26' 17"	-5 m 33 s
8	136° 44' 42"	-0.17"	139° 11' 21"	15° 49' 10"	1.0138464	15' 46.52"	23° 26' 17"	-5 m 33 s
9	136° 47' 06"	-0.18"	139° 13' 44"	15° 48' 26"	1.0138396	15' 46.53"	23° 26' 17"	-5 m 33 s
10	136° 49' 30"	-0.18"	139° 16' 06"	15° 47' 43"	1.0138328	15' 46.54"	23° 26' 17"	-5 m 32 s
11	136° 51' 53"	-0.18"	139° 18' 29"	15° 46' 60"	1.0138261	15' 46.54"	23° 26' 17"	-5 m 32 s
12	136° 54' 17"	-0.19"	139° 20' 51"	15° 46' 16"	1.0138193	15' 46.55"	23° 26' 17"	-5 m 32 s
13	136° 56' 41"	-0.19"	139° 23' 13"	15° 45' 33"	1.0138125	15' 46.56"	23° 26' 17"	-5 m 31 s
14	136° 59' 05"	-0.19"	139° 25' 36"	15° 44' 50"	1.0138058	15' 46.56"	23° 26' 17"	-5 m 31 s
15	137° 01' 29"	-0.20"	139° 27' 58"	15° 44' 06"	1.0137990	15' 46.57"	23° 26' 17"	-5 m 30 s
16	137° 03' 52"	-0.20"	139° 30' 21"	15° 43' 23"	1.0137922	15' 46.57"	23° 26' 17"	-5 m 30 s
17	137° 06' 16"	-0.20"	139° 32' 43"	15° 42' 39"	1.0137854	15' 46.58"	23° 26' 17"	-5 m 30 s
18	137° 08' 40"	-0.21"	139° 35' 05"	15° 41' 56"	1.0137786	15' 46.59"	23° 26' 17"	-5 m 29 s
19	137° 11' 04"	-0.21"	139° 37' 28"	15° 41' 12"	1.0137718	15' 46.59"	23° 26' 17"	-5 m 29 s
20	137° 13' 27"	-0.21"	139° 39' 50"	15° 40' 28"	1.0137650	15' 46.60"	23° 26' 17"	-5 m 29 s
21	137° 15' 51"	-0.21"	139° 42' 12"	15° 39' 45"	1.0137582	15' 46.61"	23° 26' 17"	-5 m 28 s
22	137° 18' 15"	-0.22"	139° 44' 35"	15° 39' 01"	1.0137514	15' 46.61"	23° 26' 17"	-5 m 28 s
23	137° 20' 39"	-0.22"	139° 46' 57"	15° 38' 18"	1.0137445	15' 46.62"	23° 26' 17"	-5 m 28 s
24	137° 23' 03"	-0.22"	139° 49' 19"	15° 37' 34"	1.0137377	15' 46.63"	23° 26' 17"	-5 m 27 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	273° 16' 55"	-3° 33' 28"	273° 40' 31"	-26° 57' 14"	1° 00' 32"	16' 29.81"	264° 44' 48"	0.86474
1	273° 53' 58"	-3° 35' 45"	274° 22' 03"	-26° 58' 29"	1° 00' 33"	16' 30.11"	264° 21' 11"	0.86813
2	274° 31' 02"	-3° 38' 00"	275° 03' 39"	-26° 59' 31"	1° 00' 35"	16' 30.40"	263° 57' 23"	0.87149
3	275° 08' 09"	-3° 40' 14"	275° 45' 16"	-27° 00' 22"	1° 00' 36"	16' 30.69"	263° 33' 23"	0.87482
4	275° 45' 17"	-3° 42' 26"	276° 26' 55"	-27° 00' 60"	1° 00' 37"	16' 30.97"	263° 9' 12"	0.87810
5	276° 22' 26"	-3° 44' 37"	277° 08' 37"	-27° 01' 26"	1° 00' 38"	16' 31.25"	262° 44' 50"	0.88135
6	276° 59' 37"	-3° 46' 46"	277° 50' 20"	-27° 01' 39"	1° 00' 39"	16' 31.52"	262° 20' 16"	0.88457
7	277° 36' 50"	-3° 48' 54"	278° 32' 05"	-27° 01' 40"	1° 00' 40"	16' 31.78"	261° 55' 29"	0.88775
8	278° 14' 04"	-3° 51' 00"	279° 13' 51"	-27° 01' 29"	1° 00' 41"	16' 32.04"	261° 30' 30"	0.89089
9	278° 51' 19"	-3° 53' 05"	279° 55' 39"	-27° 01' 05"	1° 00' 41"	16' 32.29"	261° 5' 19"	0.89399
10	279° 28' 36"	-3° 55' 08"	280° 37' 28"	-27° 00' 29"	1° 00' 42"	16' 32.53"	260° 39' 55"	0.89705
11	280° 05' 54"	-3° 57' 10"	281° 19' 17"	-26° 59' 41"	1° 00' 43"	16' 32.76"	260° 14' 17"	0.90007
12	280° 43' 14"	-3° 59' 10"	282° 01' 07"	-26° 58' 40"	1° 00' 44"	16' 32.99"	259° 48' 25"	0.90306
13	281° 20' 32"	-4° 01' 08"	282° 42' 54"	-26° 57' 27"	1° 00' 45"	16' 33.21"	259° 22' 22"	0.90600
14	281° 57' 55"	-4° 03' 04"	283° 24' 45"	-26° 56' 02"	1° 00' 46"	16' 33.43"	258° 56' 01"	0.90890
15	282° 35' 18"	-4° 04' 59"	284° 06' 36"	-26° 54' 24"	1° 00' 46"	16' 33.64"	258° 29' 25"	0.91177
16	283° 12' 43"	-4° 06' 52"	284° 48' 27"	-26° 52' 34"	1° 00' 47"	16' 33.84"	258° 2' 34"	0.91459
17	283° 50' 09"	-4° 08' 44"	285° 30' 17"	-26° 50' 31"	1° 00' 48"	16' 34.03"	257° 35' 26"	0.91737
18	284° 27' 37"	-4° 10' 33"	286° 12' 07"	-26° 48' 16"	1° 00' 49"	16' 34.22"	257° 8' 01"	0.92011
19	285° 05' 05"	-4° 12' 21"	286° 53' 57"	-26° 45' 48"	1° 00' 49"	16' 34.40"	256° 40' 17"	0.92281
20	285° 42' 35"	-4° 14' 08"	287° 35' 45"	-26° 43' 08"	1° 00' 50"	16' 34.57"	256° 12' 15"	0.92547
21	286° 20' 05"	-4° 15' 52"	288° 17' 33"	-26° 40' 16"	1° 00' 50"	16' 34.73"	255° 43' 53"	0.92808
22	286° 57' 37"	-4° 17' 34"	288° 59' 19"	-26° 37' 12"	1° 00' 51"	16' 34.89"	255° 15' 11"	0.93065
23	287° 35' 09"	-4° 19' 15"	289° 41' 04"	-26° 33' 55"	1° 00' 52"	16' 35.04"	254° 46' 06"	0.93317
24	288° 12' 43"	-4° 20' 54"	290° 22' 47"	-26° 30' 26"	1° 00' 52"	16' 35.18"	254° 16' 39"	0.93565

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	137° 23' 03"	-0.22"	139° 49' 19"	15° 37' 34"	1.0137377	15' 46.63"	23° 26' 17"	-5 m 27 s
1	137° 25' 26"	-0.23"	139° 51' 41"	15° 36' 50"	1.0137309	15' 46.63"	23° 26' 17"	-5 m 27 s
2	137° 27' 50"	-0.23"	139° 54' 04"	15° 36' 06"	1.0137240	15' 46.64"	23° 26' 17"	-5 m 26 s
3	137° 30' 14"	-0.23"	139° 56' 26"	15° 35' 23"	1.0137172	15' 46.64"	23° 26' 17"	-5 m 26 s
4	137° 32' 38"	-0.23"	139° 58' 48"	15° 34' 39"	1.0137104	15' 46.65"	23° 26' 17"	-5 m 26 s
5	137° 35' 01"	-0.24"	140° 01' 10"	15° 33' 55"	1.0137035	15' 46.66"	23° 26' 17"	-5 m 25 s
6	137° 37' 25"	-0.24"	140° 03' 32"	15° 33' 11"	1.0136967	15' 46.66"	23° 26' 17"	-5 m 25 s
7	137° 39' 49"	-0.24"	140° 05' 54"	15° 32' 27"	1.0136898	15' 46.67"	23° 26' 17"	-5 m 25 s
8	137° 42' 13"	-0.24"	140° 08' 17"	15° 31' 43"	1.0136829	15' 46.68"	23° 26' 17"	-5 m 24 s
9	137° 44' 37"	-0.25"	140° 10' 39"	15° 30' 59"	1.0136761	15' 46.68"	23° 26' 17"	-5 m 24 s
10	137° 47' 00"	-0.25"	140° 13' 01"	15° 30' 16"	1.0136692	15' 46.69"	23° 26' 17"	-5 m 23 s
11	137° 49' 24"	-0.25"	140° 15' 23"	15° 29' 32"	1.0136623	15' 46.70"	23° 26' 17"	-5 m 23 s
12	137° 51' 48"	-0.25"	140° 17' 45"	15° 28' 48"	1.0136555	15' 46.70"	23° 26' 17"	-5 m 23 s
13	137° 54' 12"	-0.25"	140° 20' 07"	15° 28' 04"	1.0136486	15' 46.71"	23° 26' 17"	-5 m 22 s
14	137° 56' 36"	-0.26"	140° 22' 29"	15° 27' 20"	1.0136417	15' 46.72"	23° 26' 17"	-5 m 22 s
15	137° 58' 60"	-0.26"	140° 24' 51"	15° 26' 35"	1.0136348	15' 46.72"	23° 26' 17"	-5 m 22 s
16	138° 01' 23"	-0.26"	140° 27' 13"	15° 25' 51"	1.0136279	15' 46.73"	23° 26' 17"	-5 m 21 s
17	138° 03' 47"	-0.26"	140° 29' 35"	15° 25' 07"	1.0136210	15' 46.73"	23° 26' 17"	-5 m 21 s
18	138° 06' 11"	-0.26"	140° 31' 57"	15° 24' 23"	1.0136141	15' 46.74"	23° 26' 17"	-5 m 20 s
19	138° 08' 35"	-0.27"	140° 34' 19"	15° 23' 39"	1.0136072	15' 46.75"	23° 26' 17"	-5 m 20 s
20	138° 10' 59"	-0.27"	140° 36' 41"	15° 22' 55"	1.0136003	15' 46.75"	23° 26' 17"	-5 m 20 s
21	138° 13' 22"	-0.27"	140° 39' 03"	15° 22' 10"	1.0135934	15' 46.76"	23° 26' 17"	-5 m 19 s
22	138° 15' 46"	-0.27"	140° 41' 25"	15° 21' 26"	1.0135864	15' 46.77"	23° 26' 17"	-5 m 19 s
23	138° 18' 10"	-0.27"	140° 43' 47"	15° 20' 42"	1.0135795	15' 46.77"	23° 26' 17"	-5 m 18 s
24	138° 20' 34"	-0.27"	140° 46' 09"	15° 19' 58"	1.0135726	15' 46.78"	23° 26' 17"	-5 m 18 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	288° 12' 43"	-4° 20' 54"	290° 22' 47"	-26° 30' 26"	1° 00' 52"	16' 35.18"	254° 16' 39"	0.93565
1	288° 50' 17"	-4° 22' 31"	291° 04' 29"	-26° 26' 45"	1° 00' 53"	16' 35.31"	253° 46' 47"	0.93809
2	289° 27' 53"	-4° 24' 06"	291° 46' 08"	-26° 22' 51"	1° 00' 53"	16' 35.44"	253° 16' 29"	0.94048
3	290° 05' 29"	-4° 25' 40"	292° 27' 46"	-26° 18' 45"	1° 00' 53"	16' 35.56"	252° 45' 44"	0.94283
4	290° 43' 06"	-4° 27' 11"	293° 09' 21"	-26° 14' 28"	1° 00' 54"	16' 35.67"	252° 14' 30"	0.94513
5	291° 20' 44"	-4° 28' 41"	293° 50' 53"	-26° 09' 58"	1° 00' 54"	16' 35.77"	251° 42' 45"	0.94739
6	291° 58' 22"	-4° 30' 08"	294° 32' 23"	-26° 05' 16"	1° 00' 55"	16' 35.86"	251° 10' 26"	0.94960
7	292° 36' 01"	-4° 31' 34"	295° 13' 50"	-26° 00' 23"	1° 00' 55"	16' 35.95"	250° 37' 32"	0.95176
8	293° 13' 41"	-4° 32' 58"	295° 55' 15"	-25° 55' 17"	1° 00' 55"	16' 36.03"	250° 4' 01"	0.95388
9	293° 51' 21"	-4° 34' 19"	296° 36' 36"	-25° 49' 60"	1° 00' 55"	16' 36.10"	249° 29' 48"	0.95595
10	294° 29' 02"	-4° 35' 39"	297° 17' 53"	-25° 44' 30"	1° 00' 56"	16' 36.16"	248° 54' 52"	0.95798
11	295° 06' 44"	-4° 36' 57"	297° 59' 08"	-25° 38' 50"	1° 00' 56"	16' 36.22"	248° 19' 09"	0.95995
12	295° 44' 26"	-4° 38' 13"	298° 40' 18"	-25° 32' 57"	1° 00' 56"	16' 36.26"	247° 42' 35"	0.96188
13	296° 22' 08"	-4° 39' 26"	299° 21' 25"	-25° 26' 53"	1° 00' 56"	16' 36.30"	247° 5' 07"	0.96376
14	296° 59' 51"	-4° 40' 38"	300° 02' 28"	-25° 20' 37"	1° 00' 56"	16' 36.33"	246° 26' 39"	0.96559
15	297° 37' 34"	-4° 41' 48"	300° 43' 27"	-25° 14' 10"	1° 00' 56"	16' 36.35"	245° 47' 06"	0.96738
16	298° 15' 17"	-4° 42' 55"	301° 24' 21"	-25° 07' 32"	1° 00' 56"	16' 36.37"	245° 6' 24"	0.96911
17	298° 53' 01"	-4° 44' 01"	302° 05' 11"	-25° 00' 42"	1° 00' 56"	16' 36.37"	244° 24' 25"	0.97080
18	299° 30' 45"	-4° 45' 05"	302° 45' 57"	-24° 53' 42"	1° 00' 56"	16' 36.37"	243° 41' 03"	0.97244
19	300° 08' 29"	-4° 46' 06"	303° 26' 38"	-24° 46' 30"	1° 00' 56"	16' 36.36"	242° 56' 10"	0.97402
20	300° 46' 13"	-4° 47' 05"	304° 07' 15"	-24° 39' 07"	1° 00' 56"	16' 36.34"	242° 9' 37"	0.97556
21	301° 23' 57"	-4° 48' 03"	304° 47' 46"	-24° 31' 33"	1° 00' 56"	16' 36.31"	241° 21' 15"	0.97705
22	302° 01' 41"	-4° 48' 58"	305° 28' 13"	-24° 23' 48"	1° 00' 56"	16' 36.28"	240° 30' 53"	0.97849
23	302° 39' 26"	-4° 49' 51"	306° 08' 34"	-24° 15' 53"	1° 00' 56"	16' 36.23"	239° 38' 17"	0.97988
24	303° 17' 10"	-4° 50' 42"	306° 48' 50"	-24° 07' 47"	1° 00' 56"	16' 36.18"	238° 43' 14"	0.98122

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	138° 20' 34"	-0.27"	140° 46' 09"	15° 19' 58"	1.0135726	15' 46.78"	23° 26' 17"	-5 m 18 s
1	138° 22' 58"	-0.28"	140° 48' 31"	15° 19' 13"	1.0135656	15' 46.79"	23° 26' 17"	-5 m 18 s
2	138° 25' 22"	-0.28"	140° 50' 52"	15° 18' 29"	1.0135587	15' 46.79"	23° 26' 17"	-5 m 17 s
3	138° 27' 45"	-0.28"	140° 53' 14"	15° 17' 45"	1.0135518	15' 46.80"	23° 26' 17"	-5 m 17 s
4	138° 30' 09"	-0.28"	140° 55' 36"	15° 17' 00"	1.0135448	15' 46.81"	23° 26' 17"	-5 m 16 s
5	138° 32' 33"	-0.28"	140° 57' 58"	15° 16' 16"	1.0135379	15' 46.81"	23° 26' 17"	-5 m 16 s
6	138° 34' 57"	-0.28"	141° 00' 20"	15° 15' 31"	1.0135309	15' 46.82"	23° 26' 17"	-5 m 16 s
7	138° 37' 21"	-0.28"	141° 02' 41"	15° 14' 47"	1.0135239	15' 46.83"	23° 26' 17"	-5 m 15 s
8	138° 39' 45"	-0.28"	141° 05' 03"	15° 14' 02"	1.0135170	15' 46.83"	23° 26' 17"	-5 m 15 s
9	138° 42' 08"	-0.29"	141° 07' 25"	15° 13' 18"	1.0135100	15' 46.84"	23° 26' 17"	-5 m 14 s
10	138° 44' 32"	-0.29"	141° 09' 47"	15° 12' 33"	1.0135030	15' 46.84"	23° 26' 17"	-5 m 14 s
11	138° 46' 56"	-0.29"	141° 12' 08"	15° 11' 49"	1.0134961	15' 46.85"	23° 26' 17"	-5 m 14 s
12	138° 49' 20"	-0.29"	141° 14' 30"	15° 11' 04"	1.0134891	15' 46.86"	23° 26' 17"	-5 m 13 s
13	138° 51' 44"	-0.29"	141° 16' 52"	15° 10' 19"	1.0134821	15' 46.86"	23° 26' 17"	-5 m 13 s
14	138° 54' 08"	-0.29"	141° 19' 14"	15° 09' 35"	1.0134751	15' 46.87"	23° 26' 17"	-5 m 12 s
15	138° 56' 32"	-0.29"	141° 21' 35"	15° 08' 50"	1.0134681	15' 46.88"	23° 26' 17"	-5 m 12 s
16	138° 58' 55"	-0.29"	141° 23' 57"	15° 08' 05"	1.0134611	15' 46.88"	23° 26' 17"	-5 m 12 s
17	139° 01' 19"	-0.29"	141° 26' 19"	15° 07' 21"	1.0134541	15' 46.89"	23° 26' 17"	-5 m 11 s
18	139° 03' 43"	-0.29"	141° 28' 40"	15° 06' 36"	1.0134471	15' 46.90"	23° 26' 17"	-5 m 11 s
19	139° 06' 07"	-0.29"	141° 31' 02"	15° 05' 51"	1.0134401	15' 46.90"	23° 26' 17"	-5 m 10 s
20	139° 08' 31"	-0.29"	141° 33' 23"	15° 05' 06"	1.0134331	15' 46.91"	23° 26' 17"	-5 m 10 s
21	139° 10' 55"	-0.29"	141° 35' 45"	15° 04' 21"	1.0134261	15' 46.92"	23° 26' 17"	-5 m 10 s
22	139° 13' 19"	-0.29"	141° 38' 06"	15° 03' 37"	1.0134191	15' 46.92"	23° 26' 17"	-5 m 09 s
23	139° 15' 42"	-0.29"	141° 40' 28"	15° 02' 52"	1.0134120	15' 46.93"	23° 26' 17"	-5 m 09 s
24	139° 18' 06"	-0.29"	141° 42' 50"	15° 02' 07"	1.0134050	15' 46.94"	23° 26' 17"	-5 m 08 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	303° 17' 10"	-4° 50' 42"	306° 48' 50"	-24° 07' 47"	1° 00' 56"	16' 36.18"	238° 43' 14"	0.98122
1	303° 54' 54"	-4° 51' 31"	307° 29' 01"	-23° 59' 31"	1° 00' 56"	16' 36.12"	237° 45' 28"	0.98251
2	304° 32' 38"	-4° 52' 17"	308° 09' 06"	-23° 51' 04"	1° 00' 55"	16' 36.05"	236° 44' 40"	0.98374
3	305° 10' 22"	-4° 53' 02"	308° 49' 06"	-23° 42' 27"	1° 00' 55"	16' 35.97"	235° 40' 29"	0.98493
4	305° 48' 06"	-4° 53' 44"	309° 28' 60"	-23° 33' 39"	1° 00' 55"	16' 35.88"	234° 32' 33"	0.98607
5	306° 25' 49"	-4° 54' 25"	310° 08' 48"	-23° 24' 42"	1° 00' 54"	16' 35.79"	233° 20' 21"	0.98715
6	307° 03' 32"	-4° 55' 03"	310° 48' 30"	-23° 15' 34"	1° 00' 54"	16' 35.69"	232° 3' 24"	0.98819
7	307° 41' 15"	-4° 55' 39"	311° 28' 07"	-23° 06' 17"	1° 00' 54"	16' 35.58"	230° 41' 04"	0.98917
8	308° 18' 57"	-4° 56' 13"	312° 07' 37"	-22° 56' 50"	1° 00' 53"	16' 35.46"	229° 12' 39"	0.99010
9	308° 56' 39"	-4° 56' 44"	312° 47' 02"	-22° 47' 13"	1° 00' 53"	16' 35.33"	227° 37' 18"	0.99099
10	309° 34' 20"	-4° 57' 14"	313° 26' 20"	-22° 37' 27"	1° 00' 52"	16' 35.19"	225° 54' 04"	0.99182
11	310° 12' 01"	-4° 57' 41"	314° 05' 32"	-22° 27' 31"	1° 00' 52"	16' 35.05"	224° 1' 50"	0.99259
12	310° 49' 41"	-4° 58' 06"	314° 44' 38"	-22° 17' 26"	1° 00' 51"	16' 34.90"	221° 59' 17"	0.99332
13	311° 27' 21"	-4° 58' 29"	315° 23' 37"	-22° 07' 12"	1° 00' 50"	16' 34.73"	219° 44' 54"	0.99400
14	312° 04' 59"	-4° 58' 50"	316° 02' 30"	-21° 56' 48"	1° 00' 50"	16' 34.57"	217° 16' 57"	0.99462
15	312° 42' 38"	-4° 59' 09"	316° 41' 16"	-21° 46' 16"	1° 00' 49"	16' 34.39"	214° 33' 25"	0.99520
16	313° 20' 15"	-4° 59' 25"	317° 19' 56"	-21° 35' 35"	1° 00' 48"	16' 34.20"	211° 32' 01"	0.99572
17	313° 57' 52"	-4° 59' 39"	317° 58' 29"	-21° 24' 45"	1° 00' 48"	16' 34.01"	208° 10' 16"	0.99619
18	314° 35' 28"	-4° 59' 52"	318° 36' 56"	-21° 13' 47"	1° 00' 47"	16' 33.81"	204° 25' 32"	0.99660
19	315° 13' 02"	-5° 00' 01"	319° 15' 16"	-21° 02' 40"	1° 00' 46"	16' 33.60"	200° 15' 10"	0.99697
20	315° 50' 36"	-5° 00' 09"	319° 53' 29"	-20° 51' 25"	1° 00' 45"	16' 33.38"	195° 36' 52"	0.99729
21	316° 28' 09"	-5° 00' 15"	320° 31' 35"	-20° 40' 02"	1° 00' 45"	16' 33.15"	190° 29' 04"	0.99755
22	317° 05' 41"	-5° 00' 18"	321° 09' 35"	-20° 28' 31"	1° 00' 44"	16' 32.92"	184° 51' 37"	0.99776
23	317° 43' 12"	-5° 00' 20"	321° 47' 27"	-20° 16' 51"	1° 00' 43"	16' 32.68"	178° 46' 22"	0.99792
24	318° 20' 42"	-5° 00' 19"	322° 25' 13"	-20° 05' 04"	1° 00' 42"	16' 32.43"	172° 17' 52"	0.99803

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	139° 18' 06"	-0.29"	141° 42' 50"	15° 02' 07"	1.0134050	15' 46.94"	23° 26' 17"	-5 m 08 s
1	139° 20' 30"	-0.30"	141° 45' 11"	15° 01' 22"	1.0133980	15' 46.94"	23° 26' 17"	-5 m 08 s
2	139° 22' 54"	-0.30"	141° 47' 33"	15° 00' 37"	1.0133909	15' 46.95"	23° 26' 17"	-5 m 07 s
3	139° 25' 18"	-0.30"	141° 49' 54"	14° 59' 52"	1.0133839	15' 46.96"	23° 26' 17"	-5 m 07 s
4	139° 27' 42"	-0.30"	141° 52' 16"	14° 59' 07"	1.0133768	15' 46.96"	23° 26' 17"	-5 m 07 s
5	139° 30' 06"	-0.30"	141° 54' 37"	14° 58' 22"	1.0133698	15' 46.97"	23° 26' 17"	-5 m 06 s
6	139° 32' 30"	-0.30"	141° 56' 58"	14° 57' 37"	1.0133627	15' 46.98"	23° 26' 17"	-5 m 06 s
7	139° 34' 53"	-0.30"	141° 59' 20"	14° 56' 52"	1.0133557	15' 46.98"	23° 26' 17"	-5 m 05 s
8	139° 37' 17"	-0.30"	142° 01' 41"	14° 56' 07"	1.0133486	15' 46.99"	23° 26' 17"	-5 m 05 s
9	139° 39' 41"	-0.30"	142° 04' 03"	14° 55' 22"	1.0133416	15' 47.00"	23° 26' 17"	-5 m 05 s
10	139° 42' 05"	-0.29"	142° 06' 24"	14° 54' 36"	1.0133345	15' 47.00"	23° 26' 17"	-5 m 04 s
11	139° 44' 29"	-0.29"	142° 08' 45"	14° 53' 51"	1.0133274	15' 47.01"	23° 26' 17"	-5 m 04 s
12	139° 46' 53"	-0.29"	142° 11' 07"	14° 53' 06"	1.0133203	15' 47.02"	23° 26' 17"	-5 m 03 s
13	139° 49' 17"	-0.29"	142° 13' 28"	14° 52' 21"	1.0133132	15' 47.02"	23° 26' 17"	-5 m 03 s
14	139° 51' 41"	-0.29"	142° 15' 50"	14° 51' 36"	1.0133062	15' 47.03"	23° 26' 17"	-5 m 02 s
15	139° 54' 05"	-0.29"	142° 18' 11"	14° 50' 50"	1.0132991	15' 47.04"	23° 26' 17"	-5 m 02 s
16	139° 56' 29"	-0.29"	142° 20' 32"	14° 50' 05"	1.0132920	15' 47.04"	23° 26' 17"	-5 m 02 s
17	139° 58' 52"	-0.29"	142° 22' 53"	14° 49' 20"	1.0132849	15' 47.05"	23° 26' 17"	-5 m 01 s
18	140° 01' 16"	-0.29"	142° 25' 15"	14° 48' 34"	1.0132778	15' 47.06"	23° 26' 17"	-5 m 01 s
19	140° 03' 40"	-0.29"	142° 27' 36"	14° 47' 49"	1.0132707	15' 47.06"	23° 26' 17"	-5 m 00 s
20	140° 06' 04"	-0.29"	142° 29' 57"	14° 47' 04"	1.0132636	15' 47.07"	23° 26' 17"	-4 m 60 s
21	140° 08' 28"	-0.29"	142° 32' 18"	14° 46' 18"	1.0132564	15' 47.08"	23° 26' 17"	-4 m 59 s
22	140° 10' 52"	-0.29"	142° 34' 40"	14° 45' 33"	1.0132493	15' 47.08"	23° 26' 17"	-4 m 59 s
23	140° 13' 16"	-0.29"	142° 37' 01"	14° 44' 47"	1.0132422	15' 47.09"	23° 26' 17"	-4 m 58 s
24	140° 15' 40"	-0.29"	142° 39' 22"	14° 44' 02"	1.0132351	15' 47.10"	23° 26' 17"	-4 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	318° 20' 42"	-5° 00' 19"	322° 25' 13"	-20° 05' 04"	1° 00' 42"	16' 32.43"	172° 17' 52"	0.99803
1	318° 58' 11"	-5° 00' 16"	323° 02' 52"	-19° 53' 10"	1° 00' 41"	16' 32.17"	165° 33' 25"	0.99809
2	319° 35' 38"	-5° 00' 11"	323° 40' 25"	-19° 41' 08"	1° 00' 40"	16' 31.90"	158° 42' 34"	0.99810
3	320° 13' 04"	-5° 00' 03"	324° 17' 50"	-19° 28' 58"	1° 00' 39"	16' 31.63"	151° 55' 52"	0.99806
4	320° 50' 29"	-4° 59' 54"	324° 55' 08"	-19° 16' 41"	1° 00' 38"	16' 31.35"	145° 23' 14"	0.99796
5	321° 27' 53"	-4° 59' 42"	325° 32' 20"	-19° 04' 17"	1° 00' 37"	16' 31.06"	139° 12' 39"	0.99782
6	322° 05' 15"	-4° 59' 28"	326° 09' 24"	-18° 51' 46"	1° 00' 36"	16' 30.76"	133° 29' 18"	0.99762
7	322° 42' 36"	-4° 59' 13"	326° 46' 22"	-18° 39' 08"	1° 00' 35"	16' 30.46"	128° 15' 41"	0.99738
8	323° 19' 56"	-4° 58' 55"	327° 23' 13"	-18° 26' 23"	1° 00' 34"	16' 30.15"	123° 32' 05"	0.99708
9	323° 57' 14"	-4° 58' 34"	327° 59' 56"	-18° 13' 32"	1° 00' 32"	16' 29.83"	119° 17' 14"	0.99673
10	324° 34' 30"	-4° 58' 12"	328° 36' 33"	-18° 00' 34"	1° 00' 31"	16' 29.50"	115° 28' 56"	0.99633
11	325° 11' 45"	-4° 57' 48"	329° 13' 03"	-17° 47' 30"	1° 00' 30"	16' 29.17"	112° 4' 37"	0.99589
12	325° 48' 58"	-4° 57' 21"	329° 49' 26"	-17° 34' 20"	1° 00' 29"	16' 28.83"	109° 1' 36"	0.99539
13	326° 26' 10"	-4° 56' 53"	330° 25' 43"	-17° 21' 03"	1° 00' 27"	16' 28.48"	106° 17' 22"	0.99484
14	327° 03' 20"	-4° 56' 22"	331° 01' 52"	-17° 07' 41"	1° 00' 26"	16' 28.12"	103° 49' 34"	0.99425
15	327° 40' 28"	-4° 55' 50"	331° 37' 55"	-16° 54' 13"	1° 00' 25"	16' 27.76"	101° 36' 08"	0.99360
16	328° 17' 35"	-4° 55' 15"	332° 13' 50"	-16° 40' 39"	1° 00' 23"	16' 27.39"	99° 35' 16"	0.99290
17	328° 54' 39"	-4° 54' 38"	332° 49' 39"	-16° 26' 59"	1° 00' 22"	16' 27.02"	97° 45' 22"	0.99216
18	329° 31' 42"	-4° 53' 59"	333° 25' 22"	-16° 13' 14"	1° 00' 21"	16' 26.63"	96° 5' 06"	0.99137
19	330° 08' 43"	-4° 53' 19"	334° 00' 57"	-15° 59' 24"	1° 00' 19"	16' 26.24"	94° 33' 17"	0.99053
20	330° 45' 42"	-4° 52' 36"	334° 36' 26"	-15° 45' 29"	1° 00' 18"	16' 25.85"	93° 8' 56"	0.98964
21	331° 22' 39"	-4° 51' 51"	335° 11' 48"	-15° 31' 28"	1° 00' 16"	16' 25.44"	91° 51' 09"	0.98870
22	331° 59' 35"	-4° 51' 04"	335° 47' 03"	-15° 17' 23"	1° 00' 15"	16' 25.03"	90° 39' 14"	0.98771
23	332° 36' 28"	-4° 50' 15"	336° 22' 12"	-15° 03' 13"	1° 00' 13"	16' 24.62"	89° 32' 32"	0.98668
24	333° 13' 19"	-4° 49' 24"	336° 57' 15"	-14° 48' 58"	1° 00' 12"	16' 24.19"	88° 30' 30"	0.98560

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	140° 15' 40"	-0.29"	142° 39' 22"	14° 44' 02"	1.0132351	15' 47.10"	23° 26' 17"	-4 m 58 s
1	140° 18' 04"	-0.28"	142° 41' 43"	14° 43' 16"	1.0132279	15' 47.10"	23° 26' 17"	-4 m 58 s
2	140° 20' 28"	-0.28"	142° 44' 04"	14° 42' 31"	1.0132208	15' 47.11"	23° 26' 17"	-4 m 57 s
3	140° 22' 52"	-0.28"	142° 46' 26"	14° 41' 45"	1.0132137	15' 47.12"	23° 26' 17"	-4 m 57 s
4	140° 25' 16"	-0.28"	142° 48' 47"	14° 40' 59"	1.0132065	15' 47.12"	23° 26' 17"	-4 m 56 s
5	140° 27' 39"	-0.28"	142° 51' 08"	14° 40' 14"	1.0131994	15' 47.13"	23° 26' 17"	-4 m 56 s
6	140° 30' 03"	-0.28"	142° 53' 29"	14° 39' 28"	1.0131922	15' 47.14"	23° 26' 17"	-4 m 55 s
7	140° 32' 27"	-0.28"	142° 55' 50"	14° 38' 43"	1.0131851	15' 47.14"	23° 26' 17"	-4 m 55 s
8	140° 34' 51"	-0.28"	142° 58' 11"	14° 37' 57"	1.0131779	15' 47.15"	23° 26' 17"	-4 m 54 s
9	140° 37' 15"	-0.27"	143° 00' 32"	14° 37' 11"	1.0131707	15' 47.16"	23° 26' 17"	-4 m 54 s
10	140° 39' 39"	-0.27"	143° 02' 53"	14° 36' 25"	1.0131636	15' 47.16"	23° 26' 17"	-4 m 54 s
11	140° 42' 03"	-0.27"	143° 05' 14"	14° 35' 40"	1.0131564	15' 47.17"	23° 26' 17"	-4 m 53 s
12	140° 44' 27"	-0.27"	143° 07' 35"	14° 34' 54"	1.0131492	15' 47.18"	23° 26' 17"	-4 m 53 s
13	140° 46' 51"	-0.27"	143° 09' 56"	14° 34' 08"	1.0131420	15' 47.18"	23° 26' 17"	-4 m 52 s
14	140° 49' 15"	-0.27"	143° 12' 17"	14° 33' 22"	1.0131349	15' 47.19"	23° 26' 17"	-4 m 52 s
15	140° 51' 39"	-0.26"	143° 14' 38"	14° 32' 36"	1.0131277	15' 47.20"	23° 26' 17"	-4 m 51 s
16	140° 54' 03"	-0.26"	143° 16' 59"	14° 31' 50"	1.0131205	15' 47.20"	23° 26' 17"	-4 m 51 s
17	140° 56' 27"	-0.26"	143° 19' 20"	14° 31' 05"	1.0131133	15' 47.21"	23° 26' 17"	-4 m 50 s
18	140° 58' 51"	-0.26"	143° 21' 41"	14° 30' 19"	1.0131061	15' 47.22"	23° 26' 17"	-4 m 50 s
19	141° 01' 15"	-0.26"	143° 24' 02"	14° 29' 33"	1.0130989	15' 47.22"	23° 26' 17"	-4 m 50 s
20	141° 03' 39"	-0.26"	143° 26' 23"	14° 28' 47"	1.0130917	15' 47.23"	23° 26' 17"	-4 m 49 s
21	141° 06' 03"	-0.25"	143° 28' 44"	14° 28' 01"	1.0130844	15' 47.24"	23° 26' 17"	-4 m 49 s
22	141° 08' 27"	-0.25"	143° 31' 05"	14° 27' 15"	1.0130772	15' 47.24"	23° 26' 17"	-4 m 48 s
23	141° 10' 51"	-0.25"	143° 33' 25"	14° 26' 29"	1.0130700	15' 47.25"	23° 26' 17"	-4 m 48 s
24	141° 13' 15"	-0.25"	143° 35' 46"	14° 25' 43"	1.0130628	15' 47.26"	23° 26' 17"	-4 m 47 s

(*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	333° 13' 19"	-4° 49' 24"	336° 57' 15"	-14° 48' 58"	1° 00' 12"	16' 24.19"	88° 30' 30"	0.98560
1	333° 50' 08"	-4° 48' 31"	337° 32' 11"	-14° 34' 38"	1° 00' 10"	16' 23.76"	87° 32' 38"	0.98447
2	334° 26' 55"	-4° 47' 37"	338° 07' 00"	-14° 20' 15"	1° 00' 09"	16' 23.33"	86° 38' 33"	0.98330
3	335° 03' 40"	-4° 46' 40"	338° 41' 43"	-14° 05' 47"	1° 00' 07"	16' 22.89"	85° 47' 51"	0.98208
4	335° 40' 23"	-4° 45' 41"	339° 16' 20"	-13° 51' 14"	1° 00' 05"	16' 22.44"	85° 0' 15"	0.98081
5	336° 17' 03"	-4° 44' 41"	339° 50' 50"	-13° 36' 38"	1° 00' 04"	16' 21.99"	84° 15' 27"	0.97950
6	336° 53' 41"	-4° 43' 38"	340° 25' 14"	-13° 21' 58"	1° 00' 02"	16' 21.53"	83° 33' 12"	0.97814
7	337° 30' 17"	-4° 42' 34"	340° 59' 32"	-13° 07' 14"	1° 00' 00"	16' 21.06"	82° 53' 18"	0.97674
8	338° 06' 51"	-4° 41' 28"	341° 33' 44"	-12° 52' 26"	0° 59' 59"	16' 20.59"	82° 15' 33"	0.97529
9	338° 43' 22"	-4° 40' 20"	342° 07' 49"	-12° 37' 35"	0° 59' 57"	16' 20.12"	81° 39' 47"	0.97379
10	339° 19' 51"	-4° 39' 10"	342° 41' 49"	-12° 22' 40"	0° 59' 55"	16' 19.63"	81° 5' 50"	0.97225
11	339° 56' 18"	-4° 37' 58"	343° 15' 42"	-12° 07' 42"	0° 59' 53"	16' 19.15"	80° 33' 34"	0.97067
12	340° 32' 42"	-4° 36' 45"	343° 49' 30"	-11° 52' 41"	0° 59' 51"	16' 18.65"	80° 2' 52"	0.96905
13	341° 09' 04"	-4° 35' 30"	344° 23' 11"	-11° 37' 37"	0° 59' 50"	16' 18.16"	79° 33' 38"	0.96738
14	341° 45' 23"	-4° 34' 12"	344° 56' 47"	-11° 22' 30"	0° 59' 48"	16' 17.65"	79° 5' 45"	0.96566
15	342° 21' 40"	-4° 32' 54"	345° 30' 17"	-11° 07' 20"	0° 59' 46"	16' 17.14"	78° 39' 08"	0.96391
16	342° 57' 55"	-4° 31' 33"	346° 03' 42"	-10° 52' 07"	0° 59' 44"	16' 16.63"	78° 13' 43"	0.96211
17	343° 34' 06"	-4° 30' 11"	346° 37' 01"	-10° 36' 52"	0° 59' 42"	16' 16.11"	77° 49' 24"	0.96027
18	344° 10' 16"	-4° 28' 46"	347° 10' 14"	-10° 21' 34"	0° 59' 40"	16' 15.59"	77° 26' 08"	0.95839
19	344° 46' 22"	-4° 27' 21"	347° 43' 22"	-10° 06' 14"	0° 59' 38"	16' 15.06"	77° 3' 51"	0.95647
20	345° 22' 26"	-4° 25' 53"	348° 16' 24"	-9° 50' 51"	0° 59' 36"	16' 14.53"	76° 42' 30"	0.95450
21	345° 58' 28"	-4° 24' 24"	348° 49' 21"	-9° 35' 27"	0° 59' 34"	16' 14.00"	76° 22' 01"	0.95250
22	346° 34' 27"	-4° 22' 53"	349° 22' 13"	-9° 20' 00"	0° 59' 32"	16' 13.46"	76° 2' 23"	0.95045
23	347° 10' 23"	-4° 21' 21"	349° 54' 59"	-9° 04' 31"	0° 59' 30"	16' 12.91"	75° 43' 32"	0.94837
24	347° 46' 16"	-4° 19' 47"	350° 27' 40"	-8° 49' 01"	0° 59' 28"	16' 12.36"	75° 25' 26"	0.94624



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	141° 13' 15"	-0.25"	143° 35' 46"	14° 25' 43"	1.0130628	15' 47.26"	23° 26' 17"	-4 m 47 s
1	141° 15' 39"	-0.24"	143° 38' 07"	14° 24' 56"	1.0130555	15' 47.26"	23° 26' 17"	-4 m 47 s
2	141° 18' 03"	-0.24"	143° 40' 28"	14° 24' 10"	1.0130483	15' 47.27"	23° 26' 17"	-4 m 46 s
3	141° 20' 27"	-0.24"	143° 42' 49"	14° 23' 24"	1.0130411	15' 47.28"	23° 26' 17"	-4 m 46 s
4	141° 22' 51"	-0.24"	143° 45' 10"	14° 22' 38"	1.0130338	15' 47.28"	23° 26' 17"	-4 m 45 s
5	141° 25' 15"	-0.23"	143° 47' 30"	14° 21' 52"	1.0130266	15' 47.29"	23° 26' 17"	-4 m 45 s
6	141° 27' 39"	-0.23"	143° 49' 51"	14° 21' 06"	1.0130193	15' 47.30"	23° 26' 17"	-4 m 44 s
7	141° 30' 03"	-0.23"	143° 52' 12"	14° 20' 19"	1.0130121	15' 47.30"	23° 26' 17"	-4 m 44 s
8	141° 32' 27"	-0.23"	143° 54' 33"	14° 19' 33"	1.0130048	15' 47.31"	23° 26' 17"	-4 m 43 s
9	141° 34' 51"	-0.22"	143° 56' 53"	14° 18' 47"	1.0129975	15' 47.32"	23° 26' 17"	-4 m 43 s
10	141° 37' 15"	-0.22"	143° 59' 14"	14° 18' 00"	1.0129903	15' 47.32"	23° 26' 17"	-4 m 43 s
11	141° 39' 39"	-0.22"	144° 01' 35"	14° 17' 14"	1.0129830	15' 47.33"	23° 26' 17"	-4 m 42 s
12	141° 42' 03"	-0.22"	144° 03' 55"	14° 16' 28"	1.0129757	15' 47.34"	23° 26' 17"	-4 m 42 s
13	141° 44' 27"	-0.21"	144° 06' 16"	14° 15' 41"	1.0129684	15' 47.34"	23° 26' 17"	-4 m 41 s
14	141° 46' 51"	-0.21"	144° 08' 37"	14° 14' 55"	1.0129611	15' 47.35"	23° 26' 17"	-4 m 41 s
15	141° 49' 15"	-0.21"	144° 10' 57"	14° 14' 09"	1.0129538	15' 47.36"	23° 26' 17"	-4 m 40 s
16	141° 51' 39"	-0.20"	144° 13' 18"	14° 13' 22"	1.0129465	15' 47.36"	23° 26' 17"	-4 m 40 s
17	141° 54' 03"	-0.20"	144° 15' 39"	14° 12' 36"	1.0129392	15' 47.37"	23° 26' 17"	-4 m 39 s
18	141° 56' 27"	-0.20"	144° 17' 59"	14° 11' 49"	1.0129319	15' 47.38"	23° 26' 17"	-4 m 39 s
19	141° 58' 51"	-0.20"	144° 20' 20"	14° 11' 03"	1.0129246	15' 47.39"	23° 26' 17"	-4 m 38 s
20	142° 01' 15"	-0.19"	144° 22' 40"	14° 10' 16"	1.0129173	15' 47.39"	23° 26' 17"	-4 m 38 s
21	142° 03' 39"	-0.19"	144° 25' 01"	14° 09' 29"	1.0129100	15' 47.40"	23° 26' 17"	-4 m 37 s
22	142° 06' 03"	-0.19"	144° 27' 21"	14° 08' 43"	1.0129027	15' 47.41"	23° 26' 17"	-4 m 37 s
23	142° 08' 27"	-0.18"	144° 29' 42"	14° 07' 56"	1.0128953	15' 47.41"	23° 26' 17"	-4 m 36 s
24	142° 10' 51"	-0.18"	144° 32' 02"	14° 07' 10"	1.0128880	15' 47.42"	23° 26' 17"	-4 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	347° 46' 16"	-4° 19' 47"	350° 27' 40"	-8° 49' 01"	0° 59' 28"	16' 12.36"	75° 25' 26"	0.94624
1	348° 22' 07"	-4° 18' 11"	351° 00' 17"	-8° 33' 29"	0° 59' 26"	16' 11.81"	75° 8' 03"	0.94408
2	348° 57' 55"	-4° 16' 34"	351° 32' 48"	-8° 17' 55"	0° 59' 24"	16' 11.25"	74° 51' 21"	0.94188
3	349° 33' 40"	-4° 14' 55"	352° 05' 14"	-8° 02' 20"	0° 59' 22"	16' 10.69"	74° 35' 17"	0.93964
4	350° 09' 22"	-4° 13' 15"	352° 37' 35"	-7° 46' 43"	0° 59' 20"	16' 10.13"	74° 19' 51"	0.93736
5	350° 45' 02"	-4° 11' 33"	353° 09' 52"	-7° 31' 05"	0° 59' 18"	16' 09.56"	74° 5' 01"	0.93504
6	351° 20' 39"	-4° 09' 50"	353° 42' 04"	-7° 15' 25"	0° 59' 16"	16' 08.99"	73° 50' 45"	0.93269
7	351° 56' 13"	-4° 08' 05"	354° 14' 11"	-6° 59' 45"	0° 59' 14"	16' 08.41"	73° 37' 01"	0.93030
8	352° 31' 44"	-4° 06' 18"	354° 46' 14"	-6° 44' 04"	0° 59' 12"	16' 07.83"	73° 23' 49"	0.92787
9	353° 07' 13"	-4° 04' 31"	355° 18' 12"	-6° 28' 21"	0° 59' 10"	16' 07.25"	73° 11' 08"	0.92541
10	353° 42' 38"	-4° 02' 41"	355° 50' 06"	-6° 12' 38"	0° 59' 07"	16' 06.66"	72° 58' 55"	0.92291
11	354° 18' 01"	-4° 00' 51"	356° 21' 55"	-5° 56' 54"	0° 59' 05"	16' 06.08"	72° 47' 11"	0.92037
12	354° 53' 21"	-3° 58' 59"	356° 53' 40"	-5° 41' 10"	0° 59' 03"	16' 05.49"	72° 35' 54"	0.91780
13	355° 28' 37"	-3° 57' 05"	357° 25' 21"	-5° 25' 25"	0° 59' 01"	16' 04.89"	72° 25' 03"	0.91520
14	356° 03' 51"	-3° 55' 10"	357° 56' 58"	-5° 09' 39"	0° 58' 59"	16' 04.30"	72° 14' 38"	0.91256
15	356° 39' 02"	-3° 53' 14"	358° 28' 30"	-4° 53' 53"	0° 58' 57"	16' 03.70"	72° 4' 37"	0.90989
16	357° 14' 10"	-3° 51' 17"	358° 59' 59"	-4° 38' 07"	0° 58' 54"	16' 03.10"	71° 54' 60"	0.90719
17	357° 49' 16"	-3° 49' 18"	359° 31' 24"	-4° 22' 21"	0° 58' 52"	16' 02.49"	71° 45' 46"	0.90445
18	358° 24' 18"	-3° 47' 18"	0° 02' 45"	-4° 06' 35"	0° 58' 50"	16' 01.89"	71° 36' 54"	0.90168
19	358° 59' 17"	-3° 45' 16"	0° 34' 02"	-3° 50' 48"	0° 58' 48"	16' 01.28"	71° 28' 24"	0.89888
20	359° 34' 13"	-3° 43' 14"	1° 05' 16"	-3° 35' 02"	0° 58' 45"	16' 00.67"	71° 20' 16"	0.89605
21	0° 09' 07"	-3° 41' 10"	1° 36' 25"	-3° 19' 16"	0° 58' 43"	16' 00.05"	71° 12' 28"	0.89318
22	0° 43' 57"	-3° 39' 05"	2° 07' 32"	-3° 03' 31"	0° 58' 41"	15' 59.44"	71° 5' 00"	0.89029
23	1° 18' 44"	-3° 36' 59"	2° 38' 35"	-2° 47' 45"	0° 58' 39"	15' 58.82"	70° 57' 52"	0.88736
24	1° 53' 28"	-3° 34' 51"	3° 09' 34"	-2° 32' 00"	0° 58' 36"	15' 58.21"	70° 51' 02"	0.88441

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	142° 10' 51"	-0.18"	144° 32' 02"	14° 07' 10"	1.0128880	15' 47.42"	23° 26' 17"	-4 m 36 s
1	142° 13' 15"	-0.18"	144° 34' 23"	14° 06' 23"	1.0128807	15' 47.43"	23° 26' 17"	-4 m 35 s
2	142° 15' 39"	-0.17"	144° 36' 43"	14° 05' 36"	1.0128733	15' 47.43"	23° 26' 17"	-4 m 35 s
3	142° 18' 03"	-0.17"	144° 39' 04"	14° 04' 49"	1.0128660	15' 47.44"	23° 26' 17"	-4 m 34 s
4	142° 20' 27"	-0.17"	144° 41' 24"	14° 04' 03"	1.0128586	15' 47.45"	23° 26' 17"	-4 m 34 s
5	142° 22' 51"	-0.16"	144° 43' 45"	14° 03' 16"	1.0128513	15' 47.45"	23° 26' 17"	-4 m 33 s
6	142° 25' 15"	-0.16"	144° 46' 05"	14° 02' 29"	1.0128439	15' 47.46"	23° 26' 17"	-4 m 33 s
7	142° 27' 39"	-0.16"	144° 48' 26"	14° 01' 42"	1.0128365	15' 47.47"	23° 26' 17"	-4 m 32 s
8	142° 30' 03"	-0.15"	144° 50' 46"	14° 00' 56"	1.0128292	15' 47.47"	23° 26' 17"	-4 m 32 s
9	142° 32' 27"	-0.15"	144° 53' 06"	14° 00' 09"	1.0128218	15' 47.48"	23° 26' 17"	-4 m 31 s
10	142° 34' 51"	-0.14"	144° 55' 27"	13° 59' 22"	1.0128144	15' 47.49"	23° 26' 17"	-4 m 31 s
11	142° 37' 15"	-0.14"	144° 57' 47"	13° 58' 35"	1.0128070	15' 47.50"	23° 26' 17"	-4 m 30 s
12	142° 39' 39"	-0.14"	145° 00' 08"	13° 57' 48"	1.0127996	15' 47.50"	23° 26' 17"	-4 m 30 s
13	142° 42' 03"	-0.13"	145° 02' 28"	13° 57' 01"	1.0127922	15' 47.51"	23° 26' 17"	-4 m 29 s
14	142° 44' 28"	-0.13"	145° 04' 48"	13° 56' 14"	1.0127848	15' 47.52"	23° 26' 17"	-4 m 29 s
15	142° 46' 52"	-0.13"	145° 07' 09"	13° 55' 27"	1.0127774	15' 47.52"	23° 26' 17"	-4 m 28 s
16	142° 49' 16"	-0.12"	145° 09' 29"	13° 54' 40"	1.0127700	15' 47.53"	23° 26' 17"	-4 m 28 s
17	142° 51' 40"	-0.12"	145° 11' 49"	13° 53' 53"	1.0127626	15' 47.54"	23° 26' 17"	-4 m 27 s
18	142° 54' 04"	-0.11"	145° 14' 09"	13° 53' 06"	1.0127552	15' 47.54"	23° 26' 17"	-4 m 27 s
19	142° 56' 28"	-0.11"	145° 16' 30"	13° 52' 19"	1.0127478	15' 47.55"	23° 26' 17"	-4 m 26 s
20	142° 58' 52"	-0.11"	145° 18' 50"	13° 51' 32"	1.0127404	15' 47.56"	23° 26' 17"	-4 m 26 s
21	143° 01' 16"	-0.10"	145° 21' 10"	13° 50' 45"	1.0127329	15' 47.56"	23° 26' 17"	-4 m 25 s
22	143° 03' 40"	-0.10"	145° 23' 30"	13° 49' 57"	1.0127255	15' 47.57"	23° 26' 17"	-4 m 25 s
23	143° 06' 04"	-0.09"	145° 25' 51"	13° 49' 10"	1.0127180	15' 47.58"	23° 26' 17"	-4 m 24 s
24	143° 08' 28"	-0.09"	145° 28' 11"	13° 48' 23"	1.0127106	15' 47.59"	23° 26' 17"	-4 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	1° 53' 28"	-3° 34' 51"	3° 09' 34"	-2° 32' 00"	0° 58' 36"	15' 58.21"	70° 51' 02"	0.88441
1	2° 28' 10"	-3° 32' 42"	3° 40' 31"	-2° 16' 16"	0° 58' 34"	15' 57.59"	70° 44' 32"	0.88142
2	3° 02' 48"	-3° 30' 33"	4° 11' 24"	-2° 00' 32"	0° 58' 32"	15' 56.97"	70° 38' 19"	0.87841
3	3° 37' 23"	-3° 28' 22"	4° 42' 14"	-1° 44' 49"	0° 58' 30"	15' 56.34"	70° 32' 25"	0.87537
4	4° 11' 56"	-3° 26' 10"	5° 13' 01"	-1° 29' 07"	0° 58' 27"	15' 55.72"	70° 26' 47"	0.87230
5	4° 46' 25"	-3° 23' 57"	5° 43' 45"	-1° 13' 25"	0° 58' 25"	15' 55.09"	70° 21' 27"	0.86920
6	5° 20' 51"	-3° 21' 43"	6° 14' 26"	0°-57' 43"	0° 58' 23"	15' 54.47"	70° 16' 23"	0.86607
7	5° 55' 14"	-3° 19' 28"	6° 45' 04"	0°-42' 05"	0° 58' 20"	15' 53.84"	70° 11' 36"	0.86292
8	6° 29' 35"	-3° 17' 12"	7° 15' 39"	0°-26' 27"	0° 58' 18"	15' 53.21"	70° 7' 05"	0.85974
9	7° 03' 52"	-3° 14' 54"	7° 46' 12"	0°-10' 50"	0° 58' 16"	15' 52.58"	70° 2' 49"	0.85654
10	7° 38' 06"	-3° 12' 36"	8° 16' 42"	0° 04' 46"	0° 58' 13"	15' 51.96"	69° 58' 48"	0.85330
11	8° 12' 17"	-3° 10' 17"	8° 47' 09"	0° 20' 21"	0° 58' 11"	15' 51.33"	69° 55' 03"	0.85005
12	8° 46' 25"	-3° 07' 57"	9° 17' 34"	0° 35' 54"	0° 58' 09"	15' 50.70"	69° 51' 32"	0.84677
13	9° 20' 30"	-3° 05' 36"	9° 47' 57"	0° 51' 26"	0° 58' 06"	15' 50.06"	69° 48' 16"	0.84346
14	9° 54' 32"	-3° 03' 14"	10° 18' 17"	1° 06' 56"	0° 58' 04"	15' 49.43"	69° 45' 15"	0.84013
15	10° 28' 31"	-3° 00' 51"	10° 48' 35"	1° 22' 25"	0° 58' 02"	15' 48.80"	69° 42' 27"	0.83678
16	11° 02' 27"	-2° 58' 28"	11° 18' 51"	1° 37' 52"	0° 57' 60"	15' 48.17"	69° 39' 53"	0.83340
17	11° 36' 20"	-2° 56' 03"	11° 49' 05"	1° 53' 17"	0° 57' 57"	15' 47.54"	69° 37' 33"	0.83000
18	12° 10' 10"	-2° 53' 38"	12° 19' 17"	2° 08' 41"	0° 57' 55"	15' 46.91"	69° 35' 26"	0.82658
19	12° 43' 57"	-2° 51' 12"	12° 49' 27"	2° 24' 03"	0° 57' 53"	15' 46.27"	69° 33' 32"	0.82313
20	13° 17' 41"	-2° 48' 45"	13° 19' 35"	2° 39' 22"	0° 57' 50"	15' 45.64"	69° 31' 52"	0.81967
21	13° 51' 22"	-2° 46' 17"	13° 49' 41"	2° 54' 40"	0° 57' 48"	15' 45.01"	69° 30' 24"	0.81618
22	14° 25' 00"	-2° 43' 48"	14° 19' 46"	3° 09' 55"	0° 57' 46"	15' 44.38"	69° 29' 08"	0.81267
23	14° 58' 36"	-2° 41' 19"	14° 49' 48"	3° 25' 09"	0° 57' 43"	15' 43.75"	69° 28' 06"	0.80914
24	15° 32' 08"	-2° 38' 49"	15° 19' 50"	3° 40' 20"	0° 57' 41"	15' 43.12"	69° 27' 15"	0.80559

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	143° 08' 28"	-0.09"	145° 28' 11"	13° 48' 23"	1.0127106	15' 47.59"	23° 26' 17"	-4 m 24 s
1	143° 10' 52"	-0.08"	145° 30' 31"	13° 47' 36"	1.0127031	15' 47.59"	23° 26' 17"	-4 m 23 s
2	143° 13' 17"	-0.08"	145° 32' 51"	13° 46' 49"	1.0126957	15' 47.60"	23° 26' 17"	-4 m 23 s
3	143° 15' 41"	-0.08"	145° 35' 11"	13° 46' 01"	1.0126882	15' 47.61"	23° 26' 17"	-4 m 22 s
4	143° 18' 05"	-0.07"	145° 37' 31"	13° 45' 14"	1.0126808	15' 47.61"	23° 26' 17"	-4 m 22 s
5	143° 20' 29"	-0.07"	145° 39' 52"	13° 44' 27"	1.0126733	15' 47.62"	23° 26' 17"	-4 m 21 s
6	143° 22' 53"	-0.06"	145° 42' 12"	13° 43' 39"	1.0126658	15' 47.63"	23° 26' 17"	-4 m 21 s
7	143° 25' 17"	-0.06"	145° 44' 32"	13° 42' 52"	1.0126583	15' 47.63"	23° 26' 17"	-4 m 20 s
8	143° 27' 41"	-0.05"	145° 46' 52"	13° 42' 05"	1.0126509	15' 47.64"	23° 26' 17"	-4 m 20 s
9	143° 30' 05"	-0.05"	145° 49' 12"	13° 41' 17"	1.0126434	15' 47.65"	23° 26' 17"	-4 m 19 s
10	143° 32' 29"	-0.04"	145° 51' 32"	13° 40' 30"	1.0126359	15' 47.66"	23° 26' 17"	-4 m 19 s
11	143° 34' 54"	-0.04"	145° 53' 52"	13° 39' 42"	1.0126284	15' 47.66"	23° 26' 17"	-4 m 18 s
12	143° 37' 18"	-0.04"	145° 56' 12"	13° 38' 55"	1.0126209	15' 47.67"	23° 26' 17"	-4 m 18 s
13	143° 39' 42"	-0.03"	145° 58' 32"	13° 38' 07"	1.0126133	15' 47.68"	23° 26' 17"	-4 m 17 s
14	143° 42' 06"	-0.03"	146° 00' 52"	13° 37' 20"	1.0126058	15' 47.68"	23° 26' 17"	-4 m 17 s
15	143° 44' 30"	-0.02"	146° 03' 12"	13° 36' 32"	1.0125983	15' 47.69"	23° 26' 17"	-4 m 16 s
16	143° 46' 54"	-0.02"	146° 05' 32"	13° 35' 45"	1.0125908	15' 47.70"	23° 26' 17"	-4 m 16 s
17	143° 49' 18"	-0.01"	146° 07' 52"	13° 34' 57"	1.0125832	15' 47.70"	23° 26' 17"	-4 m 15 s
18	143° 51' 42"	-0.01"	146° 10' 12"	13° 34' 10"	1.0125757	15' 47.71"	23° 26' 17"	-4 m 15 s
19	143° 54' 07"	-0.00"	146° 12' 32"	13° 33' 22"	1.0125682	15' 47.72"	23° 26' 17"	-4 m 14 s
20	143° 56' 31"	0.00"	146° 14' 52"	13° 32' 34"	1.0125606	15' 47.73"	23° 26' 17"	-4 m 14 s
21	143° 58' 55"	0.01"	146° 17' 12"	13° 31' 47"	1.0125531	15' 47.73"	23° 26' 17"	-4 m 13 s
22	144° 01' 19"	0.01"	146° 19' 32"	13° 30' 59"	1.0125455	15' 47.74"	23° 26' 17"	-4 m 13 s
23	144° 03' 43"	0.02"	146° 21' 52"	13° 30' 11"	1.0125379	15' 47.75"	23° 26' 17"	-4 m 12 s
24	144° 06' 07"	0.02"	146° 24' 12"	13° 29' 23"	1.0125304	15' 47.75"	23° 26' 17"	-4 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	15° 32' 08"	-2° 38' 49"	15° 19' 50"	3° 40' 20"	0° 57' 41"	15' 43.12"	69° 27' 15"	0.80559
1	16° 05' 37"	-2° 36' 18"	15° 49' 49"	3° 55' 29"	0° 57' 39"	15' 42.49"	69° 26' 37"	0.80202
2	16° 39' 03"	-2° 33' 47"	16° 19' 47"	4° 10' 36"	0° 57' 36"	15' 41.86"	69° 26' 10"	0.79844
3	17° 12' 26"	-2° 31' 15"	16° 49' 44"	4° 25' 40"	0° 57' 34"	15' 41.24"	69° 25' 55"	0.79483
4	17° 45' 46"	-2° 28' 42"	17° 19' 40"	4° 40' 42"	0° 57' 32"	15' 40.61"	69° 25' 52"	0.79120
5	18° 19' 04"	-2° 26' 09"	17° 49' 34"	4° 55' 41"	0° 57' 30"	15' 39.99"	69° 26' 01"	0.78756
6	18° 52' 18"	-2° 23' 35"	18° 19' 27"	5° 10' 38"	0° 57' 27"	15' 39.36"	69° 26' 21"	0.78390
7	19° 25' 30"	-2° 21' 00"	18° 49' 19"	5° 25' 32"	0° 57' 25"	15' 38.74"	69° 26' 52"	0.78022
8	19° 58' 38"	-2° 18' 25"	19° 19' 10"	5° 40' 23"	0° 57' 23"	15' 38.12"	69° 27' 34"	0.77653
9	20° 31' 44"	-2° 15' 49"	19° 49' 00"	5° 55' 12"	0° 57' 20"	15' 37.49"	69° 28' 27"	0.77281
10	21° 04' 47"	-2° 13' 13"	20° 18' 49"	6° 09' 57"	0° 57' 18"	15' 36.87"	69° 29' 31"	0.76909
11	21° 37' 47"	-2° 10' 36"	20° 48' 38"	6° 24' 40"	0° 57' 16"	15' 36.26"	69° 30' 46"	0.76534
12	22° 10' 44"	-2° 07' 59"	21° 18' 25"	6° 39' 20"	0° 57' 14"	15' 35.64"	69° 32' 12"	0.76158
13	22° 43' 38"	-2° 05' 21"	21° 48' 12"	6° 53' 57"	0° 57' 11"	15' 35.03"	69° 33' 48"	0.75781
14	23° 16' 29"	-2° 02' 43"	22° 17' 58"	7° 08' 31"	0° 57' 09"	15' 34.41"	69° 35' 35"	0.75402
15	23° 49' 18"	-2° 00' 04"	22° 47' 44"	7° 23' 02"	0° 57' 07"	15' 33.80"	69° 37' 31"	0.75021
16	24° 22' 04"	-1° 57' 25"	23° 17' 29"	7° 37' 30"	0° 57' 05"	15' 33.19"	69° 39' 39"	0.74640
17	24° 54' 47"	-1° 54' 45"	23° 47' 13"	7° 51' 54"	0° 57' 02"	15' 32.58"	69° 41' 56"	0.74256
18	25° 27' 27"	-1° 52' 05"	24° 16' 57"	8° 06' 15"	0° 57' 00"	15' 31.98"	69° 44' 23"	0.73872
19	26° 00' 04"	-1° 49' 24"	24° 46' 41"	8° 20' 33"	0° 56' 58"	15' 31.37"	69° 47' 01"	0.73486
20	26° 32' 39"	-1° 46' 43"	25° 16' 25"	8° 34' 48"	0° 56' 56"	15' 30.77"	69° 49' 48"	0.73099
21	27° 05' 11"	-1° 44' 02"	25° 46' 08"	8° 48' 59"	0° 56' 53"	15' 30.17"	69° 52' 45"	0.72711
22	27° 37' 40"	-1° 41' 21"	26° 15' 52"	9° 03' 06"	0° 56' 51"	15' 29.57"	69° 55' 51"	0.72321
23	28° 10' 07"	-1° 38' 39"	26° 45' 35"	9° 17' 11"	0° 56' 49"	15' 28.98"	69° 59' 08"	0.71931
24	28° 42' 30"	-1° 35' 56"	27° 15' 18"	9° 31' 11"	0° 56' 47"	15' 28.39"	70° 2' 34"	0.71539

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	144° 06' 07"	0.02"	146° 24' 12"	13° 29' 23"	1.0125304	15' 47.75"	23° 26' 17"	-4 m 12 s
1	144° 08' 32"	0.03"	146° 26' 31"	13° 28' 36"	1.0125228	15' 47.76"	23° 26' 17"	-4 m 11 s
2	144° 10' 56"	0.03"	146° 28' 51"	13° 27' 48"	1.0125152	15' 47.77"	23° 26' 17"	-4 m 10 s
3	144° 13' 20"	0.04"	146° 31' 11"	13° 27' 00"	1.0125076	15' 47.78"	23° 26' 17"	-4 m 10 s
4	144° 15' 44"	0.04"	146° 33' 31"	13° 26' 12"	1.0125001	15' 47.78"	23° 26' 17"	-4 m 09 s
5	144° 18' 08"	0.05"	146° 35' 51"	13° 25' 24"	1.0124925	15' 47.79"	23° 26' 17"	-4 m 09 s
6	144° 20' 32"	0.05"	146° 38' 11"	13° 24' 37"	1.0124849	15' 47.80"	23° 26' 17"	-4 m 08 s
7	144° 22' 57"	0.06"	146° 40' 30"	13° 23' 49"	1.0124772	15' 47.80"	23° 26' 17"	-4 m 08 s
8	144° 25' 21"	0.06"	146° 42' 50"	13° 23' 01"	1.0124696	15' 47.81"	23° 26' 17"	-4 m 07 s
9	144° 27' 45"	0.07"	146° 45' 10"	13° 22' 13"	1.0124620	15' 47.82"	23° 26' 17"	-4 m 07 s
10	144° 30' 09"	0.07"	146° 47' 30"	13° 21' 25"	1.0124544	15' 47.83"	23° 26' 17"	-4 m 06 s
11	144° 32' 33"	0.08"	146° 49' 49"	13° 20' 37"	1.0124468	15' 47.83"	23° 26' 17"	-4 m 06 s
12	144° 34' 57"	0.08"	146° 52' 09"	13° 19' 49"	1.0124391	15' 47.84"	23° 26' 17"	-4 m 05 s
13	144° 37' 22"	0.09"	146° 54' 29"	13° 19' 01"	1.0124315	15' 47.85"	23° 26' 17"	-4 m 05 s
14	144° 39' 46"	0.09"	146° 56' 48"	13° 18' 13"	1.0124239	15' 47.85"	23° 26' 17"	-4 m 04 s
15	144° 42' 10"	0.10"	146° 59' 08"	13° 17' 25"	1.0124162	15' 47.86"	23° 26' 17"	-4 m 04 s
16	144° 44' 34"	0.10"	147° 01' 28"	13° 16' 37"	1.0124086	15' 47.87"	23° 26' 17"	-4 m 03 s
17	144° 46' 58"	0.11"	147° 03' 48"	13° 15' 48"	1.0124009	15' 47.88"	23° 26' 17"	-4 m 02 s
18	144° 49' 23"	0.11"	147° 06' 07"	13° 15' 00"	1.0123932	15' 47.88"	23° 26' 17"	-4 m 02 s
19	144° 51' 47"	0.12"	147° 08' 27"	13° 14' 12"	1.0123856	15' 47.89"	23° 26' 17"	-4 m 01 s
20	144° 54' 11"	0.12"	147° 10' 46"	13° 13' 24"	1.0123779	15' 47.90"	23° 26' 17"	-4 m 01 s
21	144° 56' 35"	0.13"	147° 13' 06"	13° 12' 36"	1.0123702	15' 47.90"	23° 26' 17"	-4 m 00 s
22	144° 58' 60"	0.13"	147° 15' 26"	13° 11' 47"	1.0123625	15' 47.91"	23° 26' 17"	-3 m 60 s
23	145° 01' 24"	0.14"	147° 17' 45"	13° 10' 59"	1.0123548	15' 47.92"	23° 26' 17"	-3 m 59 s
24	145° 03' 48"	0.15"	147° 20' 05"	13° 10' 11"	1.0123471	15' 47.93"	23° 26' 17"	-3 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	28° 42' 30"	-1° 35' 56"	27° 15' 18"	9° 31' 11"	0° 56' 47"	15' 28.39"	70° 2' 34"	0.71539
1	29° 14' 51"	-1° 33' 14"	27° 45' 02"	9° 45' 08"	0° 56' 45"	15' 27.80"	70° 6' 09"	0.71146
2	29° 47' 10"	-1° 30' 31"	28° 14' 45"	9° 59' 01"	0° 56' 43"	15' 27.21"	70° 9' 54"	0.70752
3	30° 19' 26"	-1° 27' 48"	28° 44' 29"	10° 12' 51"	0° 56' 40"	15' 26.62"	70° 13' 48"	0.70358
4	30° 51' 39"	-1° 25' 05"	29° 14' 12"	10° 26' 37"	0° 56' 38"	15' 26.04"	70° 17' 51"	0.69962
5	31° 23' 49"	-1° 22' 21"	29° 43' 56"	10° 40' 19"	0° 56' 36"	15' 25.46"	70° 22' 04"	0.69565
6	31° 55' 57"	-1° 19' 37"	30° 13' 41"	10° 53' 57"	0° 56' 34"	15' 24.88"	70° 26' 25"	0.69167
7	32° 28' 03"	-1° 16' 53"	30° 43' 26"	11° 07' 31"	0° 56' 32"	15' 24.31"	70° 30' 56"	0.68769
8	33° 00' 06"	-1° 14' 09"	31° 13' 11"	11° 21' 01"	0° 56' 30"	15' 23.74"	70° 35' 36"	0.68369
9	33° 32' 06"	-1° 11' 24"	31° 42' 57"	11° 34' 27"	0° 56' 28"	15' 23.17"	70° 40' 25"	0.67969
10	34° 04' 04"	-1° 08' 40"	32° 12' 43"	11° 47' 49"	0° 56' 26"	15' 22.60"	70° 45' 22"	0.67568
11	34° 35' 59"	-1° 05' 55"	32° 42' 30"	12° 01' 07"	0° 56' 24"	15' 22.04"	70° 50' 28"	0.67166
12	35° 07' 52"	-1° 03' 10"	33° 12' 17"	12° 14' 21"	0° 56' 22"	15' 21.48"	70° 55' 43"	0.66763
13	35° 39' 42"	-1° 00' 25"	33° 42' 06"	12° 27' 31"	0° 56' 20"	15' 20.92"	71° 1' 07"	0.66360
14	36° 11' 30"	0°-57' 40"	34° 11' 55"	12° 40' 36"	0° 56' 18"	15' 20.37"	71° 6' 39"	0.65956
15	36° 43' 15"	0°-54' 55"	34° 41' 45"	12° 53' 37"	0° 56' 15"	15' 19.82"	71° 12' 20"	0.65551
16	37° 14' 58"	0°-52' 09"	35° 11' 35"	13° 06' 34"	0° 56' 13"	15' 19.27"	71° 18' 10"	0.65146
17	37° 46' 39"	0°-49' 24"	35° 41' 27"	13° 19' 26"	0° 56' 11"	15' 18.72"	71° 24' 08"	0.64741
18	38° 18' 17"	0°-46' 38"	36° 11' 20"	13° 32' 14"	0° 56' 09"	15' 18.18"	71° 30' 14"	0.64334
19	38° 49' 53"	0°-43' 53"	36° 41' 13"	13° 44' 58"	0° 56' 08"	15' 17.65"	71° 36' 29"	0.63927
20	39° 21' 26"	0°-41' 07"	37° 11' 08"	13° 57' 37"	0° 56' 06"	15' 17.11"	71° 42' 52"	0.63520
21	39° 52' 58"	0°-38' 22"	37° 41' 04"	14° 10' 11"	0° 56' 04"	15' 16.58"	71° 49' 23"	0.63112
22	40° 24' 27"	0°-35' 36"	38° 11' 01"	14° 22' 41"	0° 56' 02"	15' 16.06"	71° 56' 03"	0.62704
23	40° 55' 53"	0°-32' 51"	38° 40' 59"	14° 35' 06"	0° 55' 60"	15' 15.53"	72° 2' 51"	0.62296
24	41° 27' 18"	0°-30' 05"	39° 10' 59"	14° 47' 26"	0° 55' 58"	15' 15.01"	72° 9' 46"	0.61887

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Oblliquity	Equation Of Time
0	145° 03' 48"	0.15"	147° 20' 05"	13° 10' 11"	1.0123471	15' 47.93"	23° 26' 17"	-3 m 59 s
1	145° 06' 12"	0.15"	147° 22' 24"	13° 09' 23"	1.0123394	15' 47.93"	23° 26' 17"	-3 m 58 s
2	145° 08' 36"	0.16"	147° 24' 44"	13° 08' 34"	1.0123317	15' 47.94"	23° 26' 17"	-3 m 57 s
3	145° 11' 01"	0.16"	147° 27' 03"	13° 07' 46"	1.0123240	15' 47.95"	23° 26' 17"	-3 m 57 s
4	145° 13' 25"	0.17"	147° 29' 23"	13° 06' 58"	1.0123162	15' 47.95"	23° 26' 17"	-3 m 56 s
5	145° 15' 49"	0.17"	147° 31' 42"	13° 06' 09"	1.0123085	15' 47.96"	23° 26' 17"	-3 m 56 s
6	145° 18' 13"	0.18"	147° 34' 02"	13° 05' 21"	1.0123008	15' 47.97"	23° 26' 17"	-3 m 55 s
7	145° 20' 38"	0.18"	147° 36' 21"	13° 04' 32"	1.0122930	15' 47.98"	23° 26' 17"	-3 m 55 s
8	145° 23' 02"	0.19"	147° 38' 41"	13° 03' 44"	1.0122853	15' 47.98"	23° 26' 17"	-3 m 54 s
9	145° 25' 26"	0.19"	147° 41' 00"	13° 02' 55"	1.0122775	15' 47.99"	23° 26' 17"	-3 m 54 s
10	145° 27' 50"	0.20"	147° 43' 20"	13° 02' 07"	1.0122698	15' 48.00"	23° 26' 17"	-3 m 53 s
11	145° 30' 15"	0.20"	147° 45' 39"	13° 01' 18"	1.0122620	15' 48.01"	23° 26' 17"	-3 m 52 s
12	145° 32' 39"	0.21"	147° 47' 59"	13° 00' 30"	1.0122543	15' 48.01"	23° 26' 17"	-3 m 52 s
13	145° 35' 03"	0.22"	147° 50' 18"	12° 59' 41"	1.0122465	15' 48.02"	23° 26' 17"	-3 m 51 s
14	145° 37' 27"	0.22"	147° 52' 38"	12° 58' 53"	1.0122387	15' 48.03"	23° 26' 17"	-3 m 51 s
15	145° 39' 52"	0.23"	147° 54' 57"	12° 58' 04"	1.0122309	15' 48.03"	23° 26' 17"	-3 m 50 s
16	145° 42' 16"	0.23"	147° 57' 16"	12° 57' 16"	1.0122231	15' 48.04"	23° 26' 17"	-3 m 50 s
17	145° 44' 40"	0.24"	147° 59' 36"	12° 56' 27"	1.0122153	15' 48.05"	23° 26' 17"	-3 m 49 s
18	145° 47' 04"	0.24"	148° 01' 55"	12° 55' 38"	1.0122075	15' 48.06"	23° 26' 17"	-3 m 49 s
19	145° 49' 29"	0.25"	148° 04' 14"	12° 54' 50"	1.0121997	15' 48.06"	23° 26' 17"	-3 m 48 s
20	145° 51' 53"	0.25"	148° 06' 34"	12° 54' 01"	1.0121919	15' 48.07"	23° 26' 17"	-3 m 47 s
21	145° 54' 17"	0.26"	148° 08' 53"	12° 53' 12"	1.0121841	15' 48.08"	23° 26' 17"	-3 m 47 s
22	145° 56' 42"	0.26"	148° 11' 12"	12° 52' 23"	1.0121762	15' 48.09"	23° 26' 17"	-3 m 46 s
23	145° 59' 06"	0.27"	148° 13' 32"	12° 51' 35"	1.0121684	15' 48.09"	23° 26' 17"	-3 m 46 s
24	146° 01' 30"	0.28"	148° 15' 51"	12° 50' 46"	1.0121606	15' 48.10"	23° 26' 17"	-3 m 45 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	41° 27' 18"	0°-30' 05"	39° 10' 59"	14° 47' 26"	0° 55' 58"	15' 15.01"	72° 9' 46"	0.61887
1	41° 58' 40"	0°-27' 20"	39° 40' 60"	14° 59' 42"	0° 55' 56"	15' 14.50"	72° 16' 50"	0.61477
2	42° 29' 60"	0°-24' 34"	40° 11' 02"	15° 11' 53"	0° 55' 54"	15' 13.98"	72° 24' 02"	0.61068
3	43° 01' 18"	0°-21' 49"	40° 41' 05"	15° 23' 59"	0° 55' 52"	15' 13.48"	72° 31' 22"	0.60658
4	43° 32' 33"	0°-19' 04"	41° 11' 10"	15° 36' 00"	0° 55' 50"	15' 12.97"	72° 38' 50"	0.60248
5	44° 03' 47"	0°-16' 19"	41° 41' 16"	15° 47' 57"	0° 55' 49"	15' 12.47"	72° 46' 26"	0.59837
6	44° 34' 58"	0°-13' 34"	42° 11' 24"	15° 59' 48"	0° 55' 47"	15' 11.97"	72° 54' 09"	0.59427
7	45° 06' 08"	0°-10' 49"	42° 41' 34"	16° 11' 35"	0° 55' 45"	15' 11.48"	73° 2' 01"	0.59016
8	45° 37' 15"	0° -8' 04"	43° 11' 45"	16° 23' 16"	0° 55' 43"	15' 10.99"	73° 9' 60"	0.58605
9	46° 08' 20"	0° -5' 19"	43° 41' 57"	16° 34' 52"	0° 55' 41"	15' 10.50"	73° 18' 07"	0.58194
10	46° 39' 23"	0° -2' 34"	44° 12' 12"	16° 46' 23"	0° 55' 40"	15' 10.02"	73° 26' 22"	0.57783
11	47° 10' 24"	0° 00' 10"	44° 42' 28"	16° 57' 49"	0° 55' 38"	15' 09.54"	73° 34' 44"	0.57372
12	47° 41' 23"	0° 02' 54"	45° 12' 45"	17° 09' 10"	0° 55' 36"	15' 09.07"	73° 43' 14"	0.56960
13	48° 12' 20"	0° 05' 38"	45° 43' 05"	17° 20' 26"	0° 55' 34"	15' 08.60"	73° 51' 51"	0.56549
14	48° 43' 16"	0° 08' 22"	46° 13' 26"	17° 31' 36"	0° 55' 33"	15' 08.14"	74° 0' 36"	0.56138
15	49° 14' 09"	0° 11' 06"	46° 43' 49"	17° 42' 41"	0° 55' 31"	15' 07.67"	74° 9' 28"	0.55727
16	49° 45' 00"	0° 13' 49"	47° 14' 14"	17° 53' 41"	0° 55' 29"	15' 07.22"	74° 18' 28"	0.55316
17	50° 15' 50"	0° 16' 32"	47° 44' 41"	18° 04' 35"	0° 55' 28"	15' 06.76"	74° 27' 35"	0.54904
18	50° 46' 37"	0° 19' 15"	48° 15' 10"	18° 15' 24"	0° 55' 26"	15' 06.32"	74° 36' 50"	0.54493
19	51° 17' 23"	0° 21' 58"	48° 45' 40"	18° 26' 07"	0° 55' 24"	15' 05.87"	74° 46' 12"	0.54083
20	51° 48' 07"	0° 24' 41"	49° 16' 13"	18° 36' 45"	0° 55' 23"	15' 05.43"	74° 55' 41"	0.53672
21	52° 18' 49"	0° 27' 23"	49° 46' 48"	18° 47' 18"	0° 55' 21"	15' 04.99"	75° 5' 17"	0.53261
22	52° 49' 30"	0° 30' 05"	50° 17' 24"	18° 57' 44"	0° 55' 19"	15' 04.56"	75° 15' 01"	0.52851
23	53° 20' 08"	0° 32' 46"	50° 48' 03"	19° 08' 05"	0° 55' 18"	15' 04.14"	75° 24' 51"	0.52441
24	53° 50' 46"	0° 35' 25"	51° 18' 45"	19° 18' 18"	0° 55' 16"	15' 03.71"	75° 34' 50"	0.52031

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	146° 01' 30"	0.28"	148° 15' 51"	12° 50' 46"	1.0121606	15' 48.10"	23° 26' 17"	-3 m 45 s
1	146° 03' 54"	0.28"	148° 18' 10"	12° 49' 57"	1.0121527	15' 48.11"	23° 26' 17"	-3 m 45 s
2	146° 06' 19"	0.29"	148° 20' 29"	12° 49' 08"	1.0121449	15' 48.12"	23° 26' 17"	-3 m 44 s
3	146° 08' 43"	0.29"	148° 22' 49"	12° 48' 19"	1.0121370	15' 48.12"	23° 26' 17"	-3 m 43 s
4	146° 11' 07"	0.30"	148° 25' 08"	12° 47' 30"	1.0121291	15' 48.13"	23° 26' 17"	-3 m 43 s
5	146° 13' 32"	0.30"	148° 27' 27"	12° 46' 41"	1.0121213	15' 48.14"	23° 26' 17"	-3 m 42 s
6	146° 15' 56"	0.31"	148° 29' 46"	12° 45' 53"	1.0121134	15' 48.14"	23° 26' 17"	-3 m 42 s
7	146° 18' 20"	0.31"	148° 32' 05"	12° 45' 04"	1.0121055	15' 48.15"	23° 26' 17"	-3 m 41 s
8	146° 20' 45"	0.32"	148° 34' 25"	12° 44' 15"	1.0120976	15' 48.16"	23° 26' 17"	-3 m 41 s
9	146° 23' 09"	0.32"	148° 36' 44"	12° 43' 26"	1.0120897	15' 48.17"	23° 26' 17"	-3 m 40 s
10	146° 25' 33"	0.33"	148° 39' 03"	12° 42' 37"	1.0120818	15' 48.17"	23° 26' 17"	-3 m 39 s
11	146° 27' 58"	0.34"	148° 41' 22"	12° 41' 48"	1.0120739	15' 48.18"	23° 26' 17"	-3 m 39 s
12	146° 30' 22"	0.34"	148° 43' 41"	12° 40' 59"	1.0120660	15' 48.19"	23° 26' 17"	-3 m 38 s
13	146° 32' 46"	0.35"	148° 46' 00"	12° 40' 09"	1.0120581	15' 48.20"	23° 26' 17"	-3 m 38 s
14	146° 35' 10"	0.35"	148° 48' 19"	12° 39' 20"	1.0120501	15' 48.20"	23° 26' 17"	-3 m 37 s
15	146° 37' 35"	0.36"	148° 50' 39"	12° 38' 31"	1.0120422	15' 48.21"	23° 26' 17"	-3 m 37 s
16	146° 39' 59"	0.36"	148° 52' 58"	12° 37' 42"	1.0120343	15' 48.22"	23° 26' 17"	-3 m 36 s
17	146° 42' 23"	0.37"	148° 55' 17"	12° 36' 53"	1.0120263	15' 48.23"	23° 26' 17"	-3 m 35 s
18	146° 44' 48"	0.37"	148° 57' 36"	12° 36' 04"	1.0120184	15' 48.23"	23° 26' 17"	-3 m 35 s
19	146° 47' 12"	0.38"	148° 59' 55"	12° 35' 15"	1.0120104	15' 48.24"	23° 26' 17"	-3 m 34 s
20	146° 49' 37"	0.38"	149° 02' 14"	12° 34' 25"	1.0120024	15' 48.25"	23° 26' 17"	-3 m 34 s
21	146° 52' 01"	0.39"	149° 04' 33"	12° 33' 36"	1.0119945	15' 48.26"	23° 26' 17"	-3 m 33 s
22	146° 54' 25"	0.40"	149° 06' 52"	12° 32' 47"	1.0119865	15' 48.26"	23° 26' 17"	-3 m 32 s
23	146° 56' 50"	0.40"	149° 09' 11"	12° 31' 58"	1.0119785	15' 48.27"	23° 26' 17"	-3 m 32 s
24	146° 59' 14"	0.41"	149° 11' 30"	12° 31' 08"	1.0119705	15' 48.28"	23° 26' 17"	-3 m 31 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	53° 50' 46"	0° 35' 25"	51° 18' 45"	19° 18' 18"	0° 55' 16"	15' 03.71"	75° 34' 50"	0.52031
1	54° 21' 21"	0° 38' 06"	51° 49' 28"	19° 28' 28"	0° 55' 15"	15' 03.29"	75° 44' 55"	0.51621
2	54° 51' 54"	0° 40' 47"	52° 20' 13"	19° 38' 32"	0° 55' 13"	15' 02.88"	75° 55' 06"	0.51212
3	55° 22' 26"	0° 43' 27"	52° 50' 60"	19° 48' 30"	0° 55' 12"	15' 02.47"	76° 5' 25"	0.50803
4	55° 52' 57"	0° 46' 07"	53° 21' 49"	19° 58' 23"	0° 55' 10"	15' 02.06"	76° 15' 51"	0.50394
5	56° 23' 26"	0° 48' 46"	53° 52' 41"	20° 08' 09"	0° 55' 09"	15' 01.66"	76° 26' 24"	0.49986
6	56° 53' 53"	0° 51' 26"	54° 23' 35"	20° 17' 50"	0° 55' 07"	15' 01.27"	76° 37' 04"	0.49578
7	57° 24' 18"	0° 54' 04"	54° 54' 31"	20° 27' 25"	0° 55' 06"	15' 00.87"	76° 47' 50"	0.49171
8	57° 54' 42"	0° 56' 43"	55° 25' 29"	20° 36' 53"	0° 55' 05"	15' 00.49"	76° 58' 43"	0.48763
9	58° 25' 05"	0° 59' 21"	55° 56' 29"	20° 46' 16"	0° 55' 03"	15' 00.10"	77° 9' 43"	0.48357
10	58° 55' 26"	1° 01' 58"	56° 27' 32"	20° 55' 33"	0° 55' 02"	14' 59.73"	77° 20' 50"	0.47951
11	59° 25' 46"	1° 04' 36"	56° 58' 37"	21° 04' 43"	0° 55' 00"	14' 59.35"	77° 32' 03"	0.47545
12	59° 56' 04"	1° 07' 12"	57° 29' 45"	21° 13' 48"	0° 54' 59"	14' 58.98"	77° 43' 23"	0.47140
13	60° 26' 21"	1° 09' 49"	58° 00' 54"	21° 22' 46"	0° 54' 58"	14' 58.62"	77° 54' 50"	0.46735
14	60° 56' 36"	1° 12' 25"	58° 32' 06"	21° 31' 38"	0° 54' 56"	14' 58.26"	78° 6' 23"	0.46331
15	61° 26' 50"	1° 15' 00"	59° 03' 20"	21° 40' 24"	0° 54' 55"	14' 57.90"	78° 18' 03"	0.45928
16	61° 57' 03"	1° 17' 35"	59° 34' 37"	21° 49' 04"	0° 54' 54"	14' 57.55"	78° 29' 49"	0.45525
17	62° 27' 14"	1° 20' 10"	60° 05' 56"	21° 57' 37"	0° 54' 52"	14' 57.20"	78° 41' 41"	0.45123
18	62° 57' 24"	1° 22' 43"	60° 37' 17"	22° 06' 04"	0° 54' 51"	14' 56.86"	78° 53' 40"	0.44721
19	63° 27' 33"	1° 25' 17"	61° 08' 41"	22° 14' 25"	0° 54' 50"	14' 56.52"	79° 5' 45"	0.44320
20	63° 57' 41"	1° 27' 50"	61° 40' 07"	22° 22' 39"	0° 54' 49"	14' 56.19"	79° 17' 57"	0.43920
21	64° 27' 47"	1° 30' 22"	62° 11' 35"	22° 30' 47"	0° 54' 48"	14' 55.86"	79° 30' 14"	0.43520
22	64° 57' 52"	1° 32' 54"	62° 43' 06"	22° 38' 48"	0° 54' 46"	14' 55.54"	79° 42' 38"	0.43121
23	65° 27' 56"	1° 35' 26"	63° 14' 39"	22° 46' 43"	0° 54' 45"	14' 55.22"	79° 55' 08"	0.42723
24	65° 57' 59"	1° 37' 57"	63° 46' 14"	22° 54' 31"	0° 54' 44"	14' 54.91"	80° 7' 44"	0.42326

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	146° 59' 14"	0.41"	149° 11' 30"	12° 31' 08"	1.0119705	15' 48.28"	23° 26' 17"	-3 m 31 s
1	147° 01' 38"	0.41"	149° 13' 49"	12° 30' 19"	1.0119625	15' 48.29"	23° 26' 17"	-3 m 31 s
2	147° 04' 03"	0.42"	149° 16' 08"	12° 29' 30"	1.0119545	15' 48.29"	23° 26' 17"	-3 m 30 s
3	147° 06' 27"	0.42"	149° 18' 27"	12° 28' 40"	1.0119465	15' 48.30"	23° 26' 17"	-3 m 29 s
4	147° 08' 51"	0.43"	149° 20' 46"	12° 27' 51"	1.0119385	15' 48.31"	23° 26' 17"	-3 m 29 s
5	147° 11' 16"	0.43"	149° 23' 05"	12° 27' 01"	1.0119304	15' 48.32"	23° 26' 17"	-3 m 28 s
6	147° 13' 40"	0.44"	149° 25' 24"	12° 26' 12"	1.0119224	15' 48.32"	23° 26' 17"	-3 m 28 s
7	147° 16' 04"	0.44"	149° 27' 42"	12° 25' 23"	1.0119144	15' 48.33"	23° 26' 17"	-3 m 27 s
8	147° 18' 29"	0.45"	149° 30' 01"	12° 24' 33"	1.0119063	15' 48.34"	23° 26' 17"	-3 m 26 s
9	147° 20' 53"	0.45"	149° 32' 20"	12° 23' 44"	1.0118983	15' 48.35"	23° 26' 17"	-3 m 26 s
10	147° 23' 18"	0.46"	149° 34' 39"	12° 22' 54"	1.0118902	15' 48.35"	23° 26' 17"	-3 m 25 s
11	147° 25' 42"	0.46"	149° 36' 58"	12° 22' 05"	1.0118822	15' 48.36"	23° 26' 17"	-3 m 25 s
12	147° 28' 06"	0.47"	149° 39' 17"	12° 21' 15"	1.0118741	15' 48.37"	23° 26' 17"	-3 m 24 s
13	147° 30' 31"	0.47"	149° 41' 36"	12° 20' 25"	1.0118660	15' 48.38"	23° 26' 17"	-3 m 23 s
14	147° 32' 55"	0.48"	149° 43' 54"	12° 19' 36"	1.0118579	15' 48.38"	23° 26' 17"	-3 m 23 s
15	147° 35' 20"	0.48"	149° 46' 13"	12° 18' 46"	1.0118498	15' 48.39"	23° 26' 17"	-3 m 22 s
16	147° 37' 44"	0.49"	149° 48' 32"	12° 17' 57"	1.0118418	15' 48.40"	23° 26' 17"	-3 m 22 s
17	147° 40' 08"	0.49"	149° 50' 51"	12° 17' 07"	1.0118337	15' 48.41"	23° 26' 17"	-3 m 21 s
18	147° 42' 33"	0.50"	149° 53' 10"	12° 16' 17"	1.0118255	15' 48.41"	23° 26' 17"	-3 m 20 s
19	147° 44' 57"	0.50"	149° 55' 28"	12° 15' 28"	1.0118174	15' 48.42"	23° 26' 17"	-3 m 20 s
20	147° 47' 22"	0.51"	149° 57' 47"	12° 14' 38"	1.0118093	15' 48.43"	23° 26' 17"	-3 m 19 s
21	147° 49' 46"	0.51"	150° 00' 06"	12° 13' 48"	1.0118012	15' 48.44"	23° 26' 17"	-3 m 19 s
22	147° 52' 10"	0.52"	150° 02' 25"	12° 12' 58"	1.0117930	15' 48.44"	23° 26' 17"	-3 m 18 s
23	147° 54' 35"	0.52"	150° 04' 43"	12° 12' 09"	1.0117849	15' 48.45"	23° 26' 17"	-3 m 17 s
24	147° 56' 59"	0.53"	150° 07' 02"	12° 11' 19"	1.0117767	15' 48.46"	23° 26' 17"	-3 m 17 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	65° 57' 59"	1° 37' 57"	63° 46' 14"	22° 54' 31"	0° 54' 44"	14' 54.91"	80° 7' 44"	0.42326
1	66° 28' 01"	1° 40' 27"	64° 17' 52"	23° 02' 13"	0° 54' 43"	14' 54.60"	80° 20' 26"	0.41929
2	66° 58' 01"	1° 42' 57"	64° 49' 32"	23° 09' 48"	0° 54' 42"	14' 54.29"	80° 33' 14"	0.41533
3	67° 28' 01"	1° 45' 26"	65° 21' 14"	23° 17' 17"	0° 54' 41"	14' 53.99"	80° 46' 08"	0.41138
4	67° 57' 59"	1° 47' 54"	65° 52' 59"	23° 24' 39"	0° 54' 40"	14' 53.70"	80° 59' 08"	0.40744
5	68° 27' 56"	1° 50' 22"	66° 24' 46"	23° 31' 54"	0° 54' 39"	14' 53.41"	81° 12' 14"	0.40351
6	68° 57' 53"	1° 52' 50"	66° 56' 35"	23° 39' 02"	0° 54' 38"	14' 53.12"	81° 25' 26"	0.39959
7	69° 27' 48"	1° 55' 17"	67° 28' 27"	23° 46' 04"	0° 54' 36"	14' 52.84"	81° 38' 43"	0.39567
8	69° 57' 42"	1° 57' 43"	68° 00' 20"	23° 52' 59"	0° 54' 35"	14' 52.57"	81° 52' 07"	0.39176
9	70° 27' 36"	2° 00' 08"	68° 32' 17"	23° 59' 47"	0° 54' 34"	14' 52.29"	82° 5' 35"	0.38787
10	70° 57' 28"	2° 02' 33"	69° 04' 15"	24° 06' 28"	0° 54' 33"	14' 52.03"	82° 19' 10"	0.38398
11	71° 27' 20"	2° 04' 57"	69° 36' 16"	24° 13' 02"	0° 54' 33"	14' 51.76"	82° 32' 50"	0.38010
12	71° 57' 11"	2° 07' 21"	70° 08' 19"	24° 19' 30"	0° 54' 32"	14' 51.51"	82° 46' 35"	0.37624
13	72° 27' 00"	2° 09' 44"	70° 40' 24"	24° 25' 50"	0° 54' 31"	14' 51.25"	83° 0' 26"	0.37238
14	72° 56' 49"	2° 12' 06"	71° 12' 31"	24° 32' 04"	0° 54' 30"	14' 51.00"	83° 14' 23"	0.36853
15	73° 26' 38"	2° 14' 28"	71° 44' 41"	24° 38' 10"	0° 54' 29"	14' 50.76"	83° 28' 24"	0.36470
16	73° 56' 25"	2° 16' 49"	72° 16' 52"	24° 44' 10"	0° 54' 28"	14' 50.52"	83° 42' 32"	0.36087
17	74° 26' 12"	2° 19' 09"	72° 49' 06"	24° 50' 02"	0° 54' 27"	14' 50.29"	83° 56' 44"	0.35705
18	74° 55' 57"	2° 21' 29"	73° 21' 22"	24° 55' 47"	0° 54' 26"	14' 50.06"	84° 11' 01"	0.35325
19	75° 25' 43"	2° 23' 48"	73° 53' 40"	25° 01' 25"	0° 54' 25"	14' 49.83"	84° 25' 24"	0.34946
20	75° 55' 27"	2° 26' 06"	74° 26' 00"	25° 06' 56"	0° 54' 25"	14' 49.61"	84° 39' 52"	0.34568
21	76° 25' 11"	2° 28' 23"	74° 58' 22"	25° 12' 20"	0° 54' 24"	14' 49.40"	84° 54' 25"	0.34191
22	76° 54' 54"	2° 30' 40"	75° 30' 46"	25° 17' 37"	0° 54' 23"	14' 49.19"	85° 9' 02"	0.33815
23	77° 24' 36"	2° 32' 56"	76° 03' 12"	25° 22' 46"	0° 54' 22"	14' 48.98"	85° 23' 45"	0.33440
24	77° 54' 18"	2° 35' 11"	76° 35' 40"	25° 27' 48"	0° 54' 22"	14' 48.78"	85° 38' 33"	0.33067

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	147° 56' 59"	0.53"	150° 07' 02"	12° 11' 19"	1.0117767	15' 48.46"	23° 26' 17"	-3 m 17 s
1	147° 59' 24"	0.53"	150° 09' 21"	12° 10' 29"	1.0117686	15' 48.47"	23° 26' 17"	-3 m 16 s
2	148° 01' 48"	0.54"	150° 11' 39"	12° 09' 39"	1.0117604	15' 48.48"	23° 26' 17"	-3 m 16 s
3	148° 04' 13"	0.54"	150° 13' 58"	12° 08' 49"	1.0117523	15' 48.48"	23° 26' 17"	-3 m 15 s
4	148° 06' 37"	0.55"	150° 16' 17"	12° 07' 59"	1.0117441	15' 48.49"	23° 26' 17"	-3 m 14 s
5	148° 09' 01"	0.55"	150° 18' 35"	12° 07' 10"	1.0117359	15' 48.50"	23° 26' 17"	-3 m 14 s
6	148° 11' 26"	0.56"	150° 20' 54"	12° 06' 20"	1.0117277	15' 48.51"	23° 26' 17"	-3 m 13 s
7	148° 13' 50"	0.56"	150° 23' 13"	12° 05' 30"	1.0117195	15' 48.51"	23° 26' 17"	-3 m 13 s
8	148° 16' 15"	0.57"	150° 25' 31"	12° 04' 40"	1.0117113	15' 48.52"	23° 26' 17"	-3 m 12 s
9	148° 18' 39"	0.57"	150° 27' 50"	12° 03' 50"	1.0117031	15' 48.53"	23° 26' 17"	-3 m 11 s
10	148° 21' 04"	0.58"	150° 30' 08"	12° 02' 60"	1.0116949	15' 48.54"	23° 26' 17"	-3 m 11 s
11	148° 23' 28"	0.58"	150° 32' 27"	12° 02' 10"	1.0116867	15' 48.54"	23° 26' 17"	-3 m 10 s
12	148° 25' 53"	0.58"	150° 34' 45"	12° 01' 20"	1.0116784	15' 48.55"	23° 26' 17"	-3 m 09 s
13	148° 28' 17"	0.59"	150° 37' 04"	12° 00' 30"	1.0116702	15' 48.56"	23° 26' 17"	-3 m 09 s
14	148° 30' 42"	0.59"	150° 39' 23"	11° 59' 40"	1.0116619	15' 48.57"	23° 26' 17"	-3 m 08 s
15	148° 33' 06"	0.60"	150° 41' 41"	11° 58' 50"	1.0116537	15' 48.58"	23° 26' 17"	-3 m 08 s
16	148° 35' 30"	0.60"	150° 43' 60"	11° 57' 59"	1.0116454	15' 48.58"	23° 26' 17"	-3 m 07 s
17	148° 37' 55"	0.61"	150° 46' 18"	11° 57' 09"	1.0116372	15' 48.59"	23° 26' 17"	-3 m 06 s
18	148° 40' 19"	0.61"	150° 48' 37"	11° 56' 19"	1.0116289	15' 48.60"	23° 26' 17"	-3 m 06 s
19	148° 42' 44"	0.62"	150° 50' 55"	11° 55' 29"	1.0116206	15' 48.61"	23° 26' 17"	-3 m 05 s
20	148° 45' 08"	0.62"	150° 53' 14"	11° 54' 39"	1.0116123	15' 48.61"	23° 26' 17"	-3 m 04 s
21	148° 47' 33"	0.62"	150° 55' 32"	11° 53' 49"	1.0116040	15' 48.62"	23° 26' 17"	-3 m 04 s
22	148° 49' 57"	0.63"	150° 57' 50"	11° 52' 58"	1.0115957	15' 48.63"	23° 26' 17"	-3 m 03 s
23	148° 52' 22"	0.63"	151° 00' 09"	11° 52' 08"	1.0115874	15' 48.64"	23° 26' 17"	-3 m 03 s
24	148° 54' 46"	0.64"	151° 02' 27"	11° 51' 18"	1.0115791	15' 48.65"	23° 26' 17"	-3 m 02 s

(*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	77° 54' 18"	2° 35' 11"	76° 35' 40"	25° 27' 48"	0° 54' 22"	14' 48.78"	85° 38' 33"	0.33067
1	78° 23' 59"	2° 37' 25"	77° 08' 10"	25° 32' 43"	0° 54' 21"	14' 48.58"	85° 53' 25"	0.32694
2	78° 53' 40"	2° 39' 39"	77° 40' 42"	25° 37' 31"	0° 54' 20"	14' 48.39"	86° 8' 23"	0.32323
3	79° 23' 20"	2° 41' 52"	78° 13' 16"	25° 42' 11"	0° 54' 19"	14' 48.20"	86° 23' 24"	0.31954
4	79° 52' 60"	2° 44' 04"	78° 45' 51"	25° 46' 44"	0° 54' 19"	14' 48.02"	86° 38' 31"	0.31585
5	80° 22' 39"	2° 46' 15"	79° 18' 29"	25° 51' 10"	0° 54' 18"	14' 47.84"	86° 53' 42"	0.31218
6	80° 52' 17"	2° 48' 26"	79° 51' 08"	25° 55' 28"	0° 54' 17"	14' 47.67"	87° 8' 58"	0.30852
7	81° 21' 55"	2° 50' 36"	80° 23' 49"	25° 59' 38"	0° 54' 17"	14' 47.50"	87° 24' 18"	0.30488
8	81° 51' 33"	2° 52' 45"	80° 56' 31"	26° 03' 42"	0° 54' 16"	14' 47.33"	87° 39' 43"	0.30125
9	82° 21' 10"	2° 54' 53"	81° 29' 15"	26° 07' 38"	0° 54' 16"	14' 47.17"	87° 55' 12"	0.29763
10	82° 50' 47"	2° 57' 00"	82° 02' 01"	26° 11' 26"	0° 54' 15"	14' 47.01"	88° 10' 46"	0.29402
11	83° 20' 24"	2° 59' 06"	82° 34' 48"	26° 15' 07"	0° 54' 15"	14' 46.86"	88° 26' 23"	0.29043
12	83° 49' 60"	3° 01' 12"	83° 07' 37"	26° 18' 40"	0° 54' 14"	14' 46.72"	88° 42' 05"	0.28686
13	84° 19' 36"	3° 03' 17"	83° 40' 27"	26° 22' 06"	0° 54' 13"	14' 46.58"	88° 57' 51"	0.28330
14	84° 49' 11"	3° 05' 21"	84° 13' 19"	26° 25' 24"	0° 54' 13"	14' 46.44"	89° 13' 42"	0.27975
15	85° 18' 46"	3° 07' 24"	84° 46' 12"	26° 28' 35"	0° 54' 12"	14' 46.30"	89° 29' 36"	0.27622
16	85° 48' 21"	3° 09' 26"	85° 19' 06"	26° 31' 38"	0° 54' 12"	14' 46.18"	89° 45' 34"	0.27270
17	86° 17' 55"	3° 11' 27"	85° 52' 02"	26° 34' 33"	0° 54' 12"	14' 46.05"	90° 1' 36"	0.26919
18	86° 47' 30"	3° 13' 28"	86° 24' 59"	26° 37' 21"	0° 54' 11"	14' 45.93"	90° 17' 43"	0.26571
19	87° 17' 04"	3° 15' 27"	86° 57' 57"	26° 40' 02"	0° 54' 11"	14' 45.82"	90° 33' 53"	0.26224
20	87° 46' 38"	3° 17' 26"	87° 30' 56"	26° 42' 34"	0° 54' 10"	14' 45.71"	90° 50' 06"	0.25878
21	88° 16' 11"	3° 19' 24"	88° 03' 56"	26° 44' 59"	0° 54' 10"	14' 45.60"	91° 6' 24"	0.25534
22	88° 45' 45"	3° 21' 20"	88° 36' 58"	26° 47' 16"	0° 54' 10"	14' 45.50"	91° 22' 45"	0.25191
23	89° 15' 18"	3° 23' 16"	89° 10' 00"	26° 49' 26"	0° 54' 09"	14' 45.40"	91° 39' 10"	0.24850
24	89° 44' 52"	3° 25' 11"	89° 43' 04"	26° 51' 27"	0° 54' 09"	14' 45.31"	91° 55' 38"	0.24511

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	148° 54' 46"	0.64"	151° 02' 27"	11° 51' 18"	1.0115791	15' 48.65"	23° 26' 17"	-3 m 02 s
1	148° 57' 11"	0.64"	151° 04' 46"	11° 50' 27"	1.0115708	15' 48.65"	23° 26' 17"	-3 m 01 s
2	148° 59' 35"	0.65"	151° 07' 04"	11° 49' 37"	1.0115625	15' 48.66"	23° 26' 17"	-3 m 01 s
3	149° 01' 60"	0.65"	151° 09' 22"	11° 48' 47"	1.0115541	15' 48.67"	23° 26' 17"	-3 m 00 s
4	149° 04' 24"	0.65"	151° 11' 41"	11° 47' 56"	1.0115458	15' 48.68"	23° 26' 17"	-2 m 59 s
5	149° 06' 49"	0.66"	151° 13' 59"	11° 47' 06"	1.0115374	15' 48.68"	23° 26' 17"	-2 m 59 s
6	149° 09' 13"	0.66"	151° 16' 18"	11° 46' 16"	1.0115291	15' 48.69"	23° 26' 17"	-2 m 58 s
7	149° 11' 38"	0.67"	151° 18' 36"	11° 45' 25"	1.0115207	15' 48.70"	23° 26' 17"	-2 m 58 s
8	149° 14' 02"	0.67"	151° 20' 54"	11° 44' 35"	1.0115124	15' 48.71"	23° 26' 17"	-2 m 57 s
9	149° 16' 27"	0.67"	151° 23' 13"	11° 43' 44"	1.0115040	15' 48.72"	23° 26' 17"	-2 m 56 s
10	149° 18' 51"	0.68"	151° 25' 31"	11° 42' 54"	1.0114956	15' 48.72"	23° 26' 17"	-2 m 56 s
11	149° 21' 16"	0.68"	151° 27' 49"	11° 42' 03"	1.0114872	15' 48.73"	23° 26' 17"	-2 m 55 s
12	149° 23' 40"	0.68"	151° 30' 07"	11° 41' 13"	1.0114788	15' 48.74"	23° 26' 17"	-2 m 54 s
13	149° 26' 05"	0.69"	151° 32' 26"	11° 40' 22"	1.0114704	15' 48.75"	23° 26' 17"	-2 m 54 s
14	149° 28' 30"	0.69"	151° 34' 44"	11° 39' 32"	1.0114620	15' 48.76"	23° 26' 17"	-2 m 53 s
15	149° 30' 54"	0.70"	151° 37' 02"	11° 38' 41"	1.0114536	15' 48.76"	23° 26' 17"	-2 m 52 s
16	149° 33' 19"	0.70"	151° 39' 20"	11° 37' 51"	1.0114451	15' 48.77"	23° 26' 17"	-2 m 52 s
17	149° 35' 43"	0.70"	151° 41' 39"	11° 37' 00"	1.0114367	15' 48.78"	23° 26' 17"	-2 m 51 s
18	149° 38' 08"	0.71"	151° 43' 57"	11° 36' 09"	1.0114283	15' 48.79"	23° 26' 17"	-2 m 51 s
19	149° 40' 32"	0.71"	151° 46' 15"	11° 35' 19"	1.0114198	15' 48.79"	23° 26' 17"	-2 m 50 s
20	149° 42' 57"	0.71"	151° 48' 33"	11° 34' 28"	1.0114114	15' 48.80"	23° 26' 17"	-2 m 49 s
21	149° 45' 21"	0.72"	151° 50' 51"	11° 33' 38"	1.0114029	15' 48.81"	23° 26' 17"	-2 m 49 s
22	149° 47' 46"	0.72"	151° 53' 10"	11° 32' 47"	1.0113944	15' 48.82"	23° 26' 17"	-2 m 48 s
23	149° 50' 10"	0.72"	151° 55' 28"	11° 31' 56"	1.0113859	15' 48.83"	23° 26' 17"	-2 m 47 s
24	149° 52' 35"	0.73"	151° 57' 46"	11° 31' 05"	1.0113775	15' 48.83"	23° 26' 17"	-2 m 47 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	89° 44' 52"	3° 25' 11"	89° 43' 04"	26° 51' 27"	0° 54' 09"	14' 45.31"	91° 55' 38"	0.24511
1	90° 14' 25"	3° 27' 05"	90° 16' 08"	26° 53' 22"	0° 54' 09"	14' 45.22"	92° 12' 10"	0.24173
2	90° 43' 58"	3° 28' 58"	90° 49' 13"	26° 55' 08"	0° 54' 08"	14' 45.13"	92° 28' 46"	0.23837
3	91° 13' 31"	3° 30' 50"	91° 22' 19"	26° 56' 47"	0° 54' 08"	14' 45.05"	92° 45' 25"	0.23503
4	91° 43' 04"	3° 32' 41"	91° 55' 25"	26° 58' 17"	0° 54' 08"	14' 44.98"	93° 2' 07"	0.23170
5	92° 12' 37"	3° 34' 32"	92° 28' 33"	26° 59' 41"	0° 54' 07"	14' 44.91"	93° 18' 53"	0.22839
6	92° 42' 09"	3° 36' 21"	93° 01' 40"	27° 00' 56"	0° 54' 07"	14' 44.84"	93° 35' 42"	0.22510
7	93° 11' 42"	3° 38' 09"	93° 34' 49"	27° 02' 03"	0° 54' 07"	14' 44.78"	93° 52' 34"	0.22183
8	93° 41' 15"	3° 39' 56"	94° 07' 58"	27° 03' 03"	0° 54' 07"	14' 44.72"	94° 9' 30"	0.21857
9	94° 10' 48"	3° 41' 43"	94° 41' 07"	27° 03' 55"	0° 54' 06"	14' 44.66"	94° 26' 28"	0.21533
10	94° 40' 21"	3° 43' 28"	95° 14' 17"	27° 04' 39"	0° 54' 06"	14' 44.61"	94° 43' 30"	0.21211
11	95° 09' 54"	3° 45' 12"	95° 47' 27"	27° 05' 16"	0° 54' 06"	14' 44.56"	95° 0' 35"	0.20890
12	95° 39' 27"	3° 46' 55"	96° 20' 38"	27° 05' 45"	0° 54' 06"	14' 44.52"	95° 17' 43"	0.20572
13	96° 09' 00"	3° 48' 38"	96° 53' 49"	27° 06' 05"	0° 54' 06"	14' 44.48"	95° 34' 55"	0.20255
14	96° 38' 34"	3° 50' 19"	97° 26' 59"	27° 06' 18"	0° 54' 06"	14' 44.45"	95° 52' 09"	0.19940
15	97° 08' 07"	3° 51' 59"	98° 00' 10"	27° 06' 23"	0° 54' 06"	14' 44.42"	96° 9' 26"	0.19627
16	97° 37' 41"	3° 53' 38"	98° 33' 21"	27° 06' 21"	0° 54' 05"	14' 44.40"	96° 26' 46"	0.19316
17	98° 07' 15"	3° 55' 16"	99° 06' 32"	27° 06' 10"	0° 54' 05"	14' 44.37"	96° 44' 09"	0.19007
18	98° 36' 49"	3° 56' 53"	99° 39' 43"	27° 05' 52"	0° 54' 05"	14' 44.36"	97° 1' 35"	0.18699
19	99° 06' 23"	3° 58' 29"	100° 12' 54"	27° 05' 26"	0° 54' 05"	14' 44.34"	97° 19' 04"	0.18394
20	99° 35' 57"	4° 00' 04"	100° 46' 05"	27° 04' 52"	0° 54' 05"	14' 44.33"	97° 36' 36"	0.18091
21	100° 05' 32"	4° 01' 38"	101° 19' 15"	27° 04' 11"	0° 54' 05"	14' 44.33"	97° 54' 11"	0.17789
22	100° 35' 07"	4° 03' 11"	101° 52' 26"	27° 03' 21"	0° 54' 05"	14' 44.33"	98° 11' 49"	0.17490
23	101° 04' 42"	4° 04' 42"	102° 25' 35"	27° 02' 24"	0° 54' 05"	14' 44.33"	98° 29' 29"	0.17192
24	101° 34' 18"	4° 06' 13"	102° 58' 45"	27° 01' 19"	0° 54' 05"	14' 44.34"	98° 47' 13"	0.16897

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	149° 52' 35"	0.73"	151° 57' 46"	11° 31' 05"	1.0113775	15' 48.83"	23° 26' 17"	-2 m 47 s
1	149° 54' 60"	0.73"	152° 00' 04"	11° 30' 15"	1.0113690	15' 48.84"	23° 26' 17"	-2 m 46 s
2	149° 57' 24"	0.73"	152° 02' 22"	11° 29' 24"	1.0113605	15' 48.85"	23° 26' 17"	-2 m 45 s
3	149° 59' 49"	0.74"	152° 04' 40"	11° 28' 33"	1.0113520	15' 48.86"	23° 26' 17"	-2 m 45 s
4	150° 02' 13"	0.74"	152° 06' 58"	11° 27' 42"	1.0113435	15' 48.87"	23° 26' 17"	-2 m 44 s
5	150° 04' 38"	0.74"	152° 09' 17"	11° 26' 51"	1.0113349	15' 48.87"	23° 26' 17"	-2 m 43 s
6	150° 07' 02"	0.74"	152° 11' 35"	11° 26' 00"	1.0113264	15' 48.88"	23° 26' 17"	-2 m 43 s
7	150° 09' 27"	0.75"	152° 13' 53"	11° 25' 10"	1.0113179	15' 48.89"	23° 26' 17"	-2 m 42 s
8	150° 11' 52"	0.75"	152° 16' 11"	11° 24' 19"	1.0113093	15' 48.90"	23° 26' 17"	-2 m 41 s
9	150° 14' 16"	0.75"	152° 18' 29"	11° 23' 28"	1.0113008	15' 48.91"	23° 26' 17"	-2 m 41 s
10	150° 16' 41"	0.76"	152° 20' 47"	11° 22' 37"	1.0112922	15' 48.91"	23° 26' 17"	-2 m 40 s
11	150° 19' 05"	0.76"	152° 23' 05"	11° 21' 46"	1.0112837	15' 48.92"	23° 26' 17"	-2 m 39 s
12	150° 21' 30"	0.76"	152° 25' 23"	11° 20' 55"	1.0112751	15' 48.93"	23° 26' 17"	-2 m 39 s
13	150° 23' 54"	0.76"	152° 27' 41"	11° 20' 04"	1.0112665	15' 48.94"	23° 26' 17"	-2 m 38 s
14	150° 26' 19"	0.77"	152° 29' 59"	11° 19' 13"	1.0112579	15' 48.95"	23° 26' 17"	-2 m 38 s
15	150° 28' 44"	0.77"	152° 32' 17"	11° 18' 22"	1.0112493	15' 48.95"	23° 26' 17"	-2 m 37 s
16	150° 31' 08"	0.77"	152° 34' 35"	11° 17' 31"	1.0112407	15' 48.96"	23° 26' 17"	-2 m 36 s
17	150° 33' 33"	0.77"	152° 36' 53"	11° 16' 40"	1.0112321	15' 48.97"	23° 26' 17"	-2 m 36 s
18	150° 35' 58"	0.78"	152° 39' 11"	11° 15' 49"	1.0112235	15' 48.98"	23° 26' 17"	-2 m 35 s
19	150° 38' 22"	0.78"	152° 41' 29"	11° 14' 58"	1.0112149	15' 48.99"	23° 26' 17"	-2 m 34 s
20	150° 40' 47"	0.78"	152° 43' 47"	11° 14' 07"	1.0112063	15' 49.00"	23° 26' 17"	-2 m 34 s
21	150° 43' 11"	0.78"	152° 46' 05"	11° 13' 15"	1.0111976	15' 49.00"	23° 26' 17"	-2 m 33 s
22	150° 45' 36"	0.79"	152° 48' 22"	11° 12' 24"	1.0111890	15' 49.01"	23° 26' 17"	-2 m 32 s
23	150° 48' 01"	0.79"	152° 50' 40"	11° 11' 33"	1.0111803	15' 49.02"	23° 26' 17"	-2 m 32 s
24	150° 50' 25"	0.79"	152° 52' 58"	11° 10' 42"	1.0111717	15' 49.03"	23° 26' 17"	-2 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	101° 34' 18"	4° 06' 13"	102° 58' 45"	27° 01' 19"	0° 54' 05"	14' 44.34"	98° 47' 13"	0.16897
1	102° 03' 53"	4° 07' 42"	103° 31' 54"	27° 00' 06"	0° 54' 05"	14' 44.35"	99° 4' 59"	0.16603
2	102° 33' 29"	4° 09' 11"	104° 05' 02"	26° 58' 45"	0° 54' 05"	14' 44.36"	99° 22' 48"	0.16312
3	103° 03' 06"	4° 10' 38"	104° 38' 10"	26° 57' 17"	0° 54' 05"	14' 44.38"	99° 40' 40"	0.16023
4	103° 32' 43"	4° 12' 04"	105° 11' 17"	26° 55' 41"	0° 54' 05"	14' 44.40"	99° 58' 35"	0.15735
5	104° 02' 20"	4° 13' 29"	105° 44' 23"	26° 53' 57"	0° 54' 06"	14' 44.42"	100° 16' 33"	0.15450
6	104° 31' 57"	4° 14' 53"	106° 17' 29"	26° 52' 05"	0° 54' 06"	14' 44.45"	100° 34' 34"	0.15167
7	105° 01' 35"	4° 16' 16"	106° 50' 34"	26° 50' 06"	0° 54' 06"	14' 44.49"	100° 52' 38"	0.14886
8	105° 31' 13"	4° 17' 37"	107° 23' 38"	26° 47' 58"	0° 54' 06"	14' 44.52"	101° 10' 45"	0.14607
9	106° 00' 52"	4° 18' 58"	107° 56' 41"	26° 45' 44"	0° 54' 06"	14' 44.56"	101° 28' 55"	0.14331
10	106° 30' 31"	4° 20' 17"	108° 29' 43"	26° 43' 21"	0° 54' 06"	14' 44.61"	101° 47' 09"	0.14056
11	107° 00' 11"	4° 21' 35"	109° 02' 44"	26° 40' 51"	0° 54' 06"	14' 44.66"	102° 5' 25"	0.13784
12	107° 29' 51"	4° 22' 52"	109° 35' 44"	26° 38' 13"	0° 54' 07"	14' 44.71"	102° 23' 45"	0.13514
13	107° 59' 31"	4° 24' 08"	110° 08' 43"	26° 35' 27"	0° 54' 07"	14' 44.76"	102° 42' 08"	0.13246
14	108° 29' 12"	4° 25' 23"	110° 41' 40"	26° 32' 34"	0° 54' 07"	14' 44.82"	103° 0' 34"	0.12981
15	108° 58' 54"	4° 26' 36"	111° 14' 37"	26° 29' 33"	0° 54' 07"	14' 44.88"	103° 19' 04"	0.12718
16	109° 28' 35"	4° 27' 48"	111° 47' 32"	26° 26' 24"	0° 54' 08"	14' 44.95"	103° 37' 37"	0.12457
17	109° 58' 18"	4° 28' 59"	112° 20' 26"	26° 23' 08"	0° 54' 08"	14' 45.02"	103° 56' 14"	0.12198
18	110° 28' 01"	4° 30' 09"	112° 53' 18"	26° 19' 45"	0° 54' 08"	14' 45.09"	104° 14' 55"	0.11941
19	110° 57' 45"	4° 31' 18"	113° 26' 09"	26° 16' 13"	0° 54' 08"	14' 45.17"	104° 33' 39"	0.11687
20	111° 27' 29"	4° 32' 25"	113° 58' 58"	26° 12' 35"	0° 54' 09"	14' 45.25"	104° 52' 28"	0.11436
21	111° 57' 13"	4° 33' 31"	114° 31' 46"	26° 08' 48"	0° 54' 09"	14' 45.33"	105° 11' 21"	0.11186
22	112° 26' 59"	4° 34' 36"	115° 04' 32"	26° 04' 54"	0° 54' 09"	14' 45.42"	105° 30' 18"	0.10939
23	112° 56' 45"	4° 35' 40"	115° 37' 16"	26° 00' 53"	0° 54' 10"	14' 45.51"	105° 49' 20"	0.10695
24	113° 26' 31"	4° 36' 43"	116° 09' 59"	25° 56' 44"	0° 54' 10"	14' 45.60"	106° 8' 26"	0.10452

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	150° 50' 25"	0.79"	152° 52' 58"	11° 10' 42"	1.0111717	15' 49.03"	23° 26' 17"	-2 m 31 s
1	150° 52' 50"	0.79"	152° 55' 16"	11° 09' 51"	1.0111630	15' 49.04"	23° 26' 17"	-2 m 30 s
2	150° 55' 14"	0.79"	152° 57' 34"	11° 08' 59"	1.0111543	15' 49.04"	23° 26' 17"	-2 m 30 s
3	150° 57' 39"	0.80"	152° 59' 52"	11° 08' 08"	1.0111456	15' 49.05"	23° 26' 17"	-2 m 29 s
4	151° 00' 04"	0.80"	153° 02' 10"	11° 07' 17"	1.0111370	15' 49.06"	23° 26' 17"	-2 m 28 s
5	151° 02' 28"	0.80"	153° 04' 27"	11° 06' 26"	1.0111283	15' 49.07"	23° 26' 17"	-2 m 28 s
6	151° 04' 53"	0.80"	153° 06' 45"	11° 05' 34"	1.0111196	15' 49.08"	23° 26' 17"	-2 m 27 s
7	151° 07' 18"	0.80"	153° 09' 03"	11° 04' 43"	1.0111109	15' 49.08"	23° 26' 17"	-2 m 26 s
8	151° 09' 42"	0.81"	153° 11' 21"	11° 03' 52"	1.0111021	15' 49.09"	23° 26' 17"	-2 m 26 s
9	151° 12' 07"	0.81"	153° 13' 39"	11° 03' 00"	1.0110934	15' 49.10"	23° 26' 17"	-2 m 25 s
10	151° 14' 32"	0.81"	153° 15' 56"	11° 02' 09"	1.0110847	15' 49.11"	23° 26' 17"	-2 m 24 s
11	151° 16' 56"	0.81"	153° 18' 14"	11° 01' 18"	1.0110759	15' 49.12"	23° 26' 17"	-2 m 24 s
12	151° 19' 21"	0.81"	153° 20' 32"	11° 00' 26"	1.0110672	15' 49.13"	23° 26' 17"	-2 m 23 s
13	151° 21' 46"	0.81"	153° 22' 50"	10° 59' 35"	1.0110584	15' 49.13"	23° 26' 17"	-2 m 22 s
14	151° 24' 10"	0.82"	153° 25' 07"	10° 58' 43"	1.0110497	15' 49.14"	23° 26' 17"	-2 m 22 s
15	151° 26' 35"	0.82"	153° 27' 25"	10° 57' 52"	1.0110409	15' 49.15"	23° 26' 17"	-2 m 21 s
16	151° 28' 60"	0.82"	153° 29' 43"	10° 57' 00"	1.0110321	15' 49.16"	23° 26' 17"	-2 m 20 s
17	151° 31' 24"	0.82"	153° 32' 01"	10° 56' 09"	1.0110233	15' 49.17"	23° 26' 17"	-2 m 19 s
18	151° 33' 49"	0.82"	153° 34' 18"	10° 55' 17"	1.0110145	15' 49.18"	23° 26' 17"	-2 m 19 s
19	151° 36' 14"	0.82"	153° 36' 36"	10° 54' 26"	1.0110057	15' 49.18"	23° 26' 17"	-2 m 18 s
20	151° 38' 38"	0.82"	153° 38' 54"	10° 53' 34"	1.0109969	15' 49.19"	23° 26' 17"	-2 m 17 s
21	151° 41' 03"	0.82"	153° 41' 11"	10° 52' 43"	1.0109881	15' 49.20"	23° 26' 17"	-2 m 17 s
22	151° 43' 28"	0.82"	153° 43' 29"	10° 51' 51"	1.0109793	15' 49.21"	23° 26' 17"	-2 m 16 s
23	151° 45' 52"	0.83"	153° 45' 47"	10° 50' 59"	1.0109705	15' 49.22"	23° 26' 17"	-2 m 15 s
24	151° 48' 17"	0.83"	153° 48' 04"	10° 50' 08"	1.0109616	15' 49.22"	23° 26' 17"	-2 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	113° 26' 31"	4° 36' 43"	116° 09' 59"	25° 56' 44"	0° 54' 10"	14' 45.60"	106° 8' 26"	0.10452
1	113° 56' 18"	4° 37' 44"	116° 42' 40"	25° 52' 28"	0° 54' 10"	14' 45.70"	106° 27' 37"	0.10213
2	114° 26' 06"	4° 38' 44"	117° 15' 19"	25° 48' 04"	0° 54' 11"	14' 45.80"	106° 46' 53"	0.09975
3	114° 55' 54"	4° 39' 43"	117° 47' 56"	25° 43' 33"	0° 54' 11"	14' 45.90"	107° 6' 14"	0.09740
4	115° 25' 43"	4° 40' 40"	118° 20' 32"	25° 38' 55"	0° 54' 11"	14' 46.01"	107° 25' 41"	0.09508
5	115° 55' 33"	4° 41' 36"	118° 53' 05"	25° 34' 09"	0° 54' 12"	14' 46.12"	107° 45' 14"	0.09278
6	116° 25' 24"	4° 42' 31"	119° 25' 37"	25° 29' 16"	0° 54' 12"	14' 46.23"	108° 4' 52"	0.09051
7	116° 55' 15"	4° 43' 25"	119° 58' 06"	25° 24' 16"	0° 54' 13"	14' 46.35"	108° 24' 37"	0.08826
8	117° 25' 06"	4° 44' 17"	120° 30' 34"	25° 19' 08"	0° 54' 13"	14' 46.47"	108° 44' 29"	0.08603
9	117° 54' 59"	4° 45' 08"	121° 02' 59"	25° 13' 53"	0° 54' 14"	14' 46.59"	109° 4' 28"	0.08383
10	118° 24' 52"	4° 45' 58"	121° 35' 22"	25° 08' 31"	0° 54' 14"	14' 46.72"	109° 24' 33"	0.08166
11	118° 54' 46"	4° 46' 47"	122° 07' 43"	25° 03' 02"	0° 54' 14"	14' 46.84"	109° 44' 47"	0.07951
12	119° 24' 41"	4° 47' 34"	122° 40' 02"	24° 57' 26"	0° 54' 15"	14' 46.98"	110° 5' 09"	0.07739
13	119° 54' 36"	4° 48' 20"	123° 12' 19"	24° 51' 43"	0° 54' 15"	14' 47.11"	110° 25' 39"	0.07530
14	120° 24' 32"	4° 49' 04"	123° 44' 33"	24° 45' 52"	0° 54' 16"	14' 47.25"	110° 46' 18"	0.07323
15	120° 54' 29"	4° 49' 48"	124° 16' 45"	24° 39' 54"	0° 54' 16"	14' 47.39"	111° 7' 06"	0.07118
16	121° 24' 27"	4° 50' 30"	124° 48' 55"	24° 33' 50"	0° 54' 17"	14' 47.53"	111° 28' 05"	0.06917
17	121° 54' 25"	4° 51' 10"	125° 21' 02"	24° 27' 38"	0° 54' 18"	14' 47.68"	111° 49' 14"	0.06718
18	122° 24' 24"	4° 51' 50"	125° 53' 07"	24° 21' 20"	0° 54' 18"	14' 47.83"	112° 10' 35"	0.06522
19	122° 54' 25"	4° 52' 28"	126° 25' 09"	24° 14' 54"	0° 54' 19"	14' 47.98"	112° 32' 07"	0.06328
20	123° 24' 25"	4° 53' 04"	126° 57' 09"	24° 08' 22"	0° 54' 19"	14' 48.14"	112° 53' 52"	0.06137
21	123° 54' 27"	4° 53' 40"	127° 29' 06"	24° 01' 43"	0° 54' 20"	14' 48.29"	113° 15' 50"	0.05949
22	124° 24' 30"	4° 54' 14"	128° 01' 01"	23° 54' 57"	0° 54' 20"	14' 48.45"	113° 38' 03"	0.05764
23	124° 54' 33"	4° 54' 46"	128° 32' 54"	23° 48' 04"	0° 54' 21"	14' 48.62"	114° 0' 30"	0.05581
24	125° 24' 37"	4° 55' 18"	129° 04' 44"	23° 41' 04"	0° 54' 22"	14' 48.78"	114° 23' 13"	0.05401

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	151° 48' 17"	0.83"	153° 48' 04"	10° 50' 08"	1.0109616	15' 49.22"	23° 26' 17"	-2 m 15 s
1	151° 50' 42"	0.83"	153° 50' 22"	10° 49' 16"	1.0109528	15' 49.23"	23° 26' 17"	-2 m 14 s
2	151° 53' 06"	0.83"	153° 52' 39"	10° 48' 24"	1.0109439	15' 49.24"	23° 26' 17"	-2 m 13 s
3	151° 55' 31"	0.83"	153° 54' 57"	10° 47' 33"	1.0109351	15' 49.25"	23° 26' 17"	-2 m 13 s
4	151° 57' 56"	0.83"	153° 57' 15"	10° 46' 41"	1.0109262	15' 49.26"	23° 26' 17"	-2 m 12 s
5	152° 00' 21"	0.83"	153° 59' 32"	10° 45' 49"	1.0109173	15' 49.27"	23° 26' 17"	-2 m 11 s
6	152° 02' 45"	0.83"	154° 01' 50"	10° 44' 58"	1.0109085	15' 49.27"	23° 26' 17"	-2 m 11 s
7	152° 05' 10"	0.83"	154° 04' 07"	10° 44' 06"	1.0108996	15' 49.28"	23° 26' 17"	-2 m 10 s
8	152° 07' 35"	0.83"	154° 06' 25"	10° 43' 14"	1.0108907	15' 49.29"	23° 26' 17"	-2 m 09 s
9	152° 09' 59"	0.83"	154° 08' 42"	10° 42' 22"	1.0108818	15' 49.30"	23° 26' 17"	-2 m 09 s
10	152° 12' 24"	0.83"	154° 10' 60"	10° 41' 31"	1.0108729	15' 49.31"	23° 26' 17"	-2 m 08 s
11	152° 14' 49"	0.83"	154° 13' 17"	10° 40' 39"	1.0108639	15' 49.32"	23° 26' 17"	-2 m 07 s
12	152° 17' 14"	0.83"	154° 15' 35"	10° 39' 47"	1.0108550	15' 49.33"	23° 26' 17"	-2 m 06 s
13	152° 19' 38"	0.83"	154° 17' 52"	10° 38' 55"	1.0108461	15' 49.33"	23° 26' 17"	-2 m 06 s
14	152° 22' 03"	0.83"	154° 20' 10"	10° 38' 03"	1.0108371	15' 49.34"	23° 26' 17"	-2 m 05 s
15	152° 24' 28"	0.83"	154° 22' 27"	10° 37' 11"	1.0108282	15' 49.35"	23° 26' 17"	-2 m 04 s
16	152° 26' 53"	0.83"	154° 24' 45"	10° 36' 19"	1.0108192	15' 49.36"	23° 26' 17"	-2 m 04 s
17	152° 29' 17"	0.83"	154° 27' 02"	10° 35' 27"	1.0108103	15' 49.37"	23° 26' 17"	-2 m 03 s
18	152° 31' 42"	0.83"	154° 29' 20"	10° 34' 35"	1.0108013	15' 49.38"	23° 26' 17"	-2 m 02 s
19	152° 34' 07"	0.83"	154° 31' 37"	10° 33' 43"	1.0107923	15' 49.38"	23° 26' 17"	-2 m 02 s
20	152° 36' 32"	0.83"	154° 33' 55"	10° 32' 51"	1.0107833	15' 49.39"	23° 26' 17"	-2 m 01 s
21	152° 38' 56"	0.83"	154° 36' 12"	10° 31' 59"	1.0107743	15' 49.40"	23° 26' 17"	-2 m 00 s
22	152° 41' 21"	0.83"	154° 38' 29"	10° 31' 07"	1.0107653	15' 49.41"	23° 26' 17"	-1 m 60 s
23	152° 43' 46"	0.83"	154° 40' 47"	10° 30' 15"	1.0107563	15' 49.42"	23° 26' 17"	-1 m 59 s
24	152° 46' 11"	0.83"	154° 43' 04"	10° 29' 23"	1.0107473	15' 49.43"	23° 26' 17"	-1 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	125° 24' 37"	4° 55' 18"	129° 04' 44"	23° 41' 04"	0° 54' 22"	14' 48.78"	114° 23' 13"	0.05401
1	125° 54' 42"	4° 55' 47"	129° 36' 31"	23° 33' 58"	0° 54' 22"	14' 48.95"	114° 46' 13"	0.05224
2	126° 24' 48"	4° 56' 16"	130° 08' 16"	23° 26' 45"	0° 54' 23"	14' 49.12"	115° 9' 31"	0.05050
3	126° 54' 55"	4° 56' 43"	130° 39' 58"	23° 19' 26"	0° 54' 23"	14' 49.30"	115° 33' 09"	0.04879
4	127° 25' 02"	4° 57' 09"	131° 11' 37"	23° 11' 59"	0° 54' 24"	14' 49.48"	115° 57' 06"	0.04710
5	127° 55' 11"	4° 57' 33"	131° 43' 14"	23° 04' 27"	0° 54' 25"	14' 49.65"	116° 21' 25"	0.04544
6	128° 25' 20"	4° 57' 56"	132° 14' 48"	22° 56' 48"	0° 54' 25"	14' 49.84"	116° 46' 08"	0.04381
7	128° 55' 31"	4° 58' 18"	132° 46' 19"	22° 49' 02"	0° 54' 26"	14' 50.02"	117° 11' 15"	0.04221
8	129° 25' 42"	4° 58' 38"	133° 17' 47"	22° 41' 10"	0° 54' 27"	14' 50.21"	117° 36' 48"	0.04064
9	129° 55' 54"	4° 58' 57"	133° 49' 13"	22° 33' 11"	0° 54' 28"	14' 50.40"	118° 2' 50"	0.03910
10	130° 26' 07"	4° 59' 15"	134° 20' 36"	22° 25' 06"	0° 54' 28"	14' 50.59"	118° 29' 22"	0.03759
11	130° 56' 21"	4° 59' 31"	134° 51' 57"	22° 16' 55"	0° 54' 29"	14' 50.78"	118° 56' 26"	0.03611
12	131° 26' 36"	4° 59' 46"	135° 23' 14"	22° 08' 38"	0° 54' 30"	14' 50.98"	119° 24' 04"	0.03465
13	131° 56' 52"	4° 59' 59"	135° 54' 29"	22° 00' 14"	0° 54' 30"	14' 51.18"	119° 52' 20"	0.03323
14	132° 27' 08"	5° 00' 11"	136° 25' 41"	21° 51' 44"	0° 54' 31"	14' 51.38"	120° 21' 15"	0.03183
15	132° 57' 26"	5° 00' 21"	136° 56' 50"	21° 43' 08"	0° 54' 32"	14' 51.59"	120° 50' 53"	0.03047
16	133° 27' 45"	5° 00' 30"	137° 27' 57"	21° 34' 26"	0° 54' 33"	14' 51.79"	121° 21' 17"	0.02913
17	133° 58' 04"	5° 00' 38"	137° 59' 00"	21° 25' 38"	0° 54' 33"	14' 52.00"	121° 52' 31"	0.02783
18	134° 28' 25"	5° 00' 44"	138° 30' 01"	21° 16' 43"	0° 54' 34"	14' 52.21"	122° 24' 37"	0.02655
19	134° 58' 46"	5° 00' 49"	139° 00' 59"	21° 07' 43"	0° 54' 35"	14' 52.43"	122° 57' 42"	0.02531
20	135° 29' 09"	5° 00' 52"	139° 31' 55"	20° 58' 37"	0° 54' 36"	14' 52.64"	123° 31' 49"	0.02410
21	135° 59' 32"	5° 00' 54"	140° 02' 47"	20° 49' 25"	0° 54' 37"	14' 52.86"	124° 7' 03"	0.02291
22	136° 29' 56"	5° 00' 55"	140° 33' 37"	20° 40' 07"	0° 54' 37"	14' 53.08"	124° 43' 31"	0.02176
23	137° 00' 22"	5° 00' 54"	141° 04' 24"	20° 30' 44"	0° 54' 38"	14' 53.30"	125° 21' 17"	0.02064
24	137° 30' 48"	5° 00' 52"	141° 35' 08"	20° 21' 14"	0° 54' 39"	14' 53.53"	126° 0' 30"	0.01955



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	152° 46' 11"	0.83"	154° 43' 04"	10° 29' 23"	1.0107473	15' 49.43"	23° 26' 17"	-1 m 58 s
1	152° 48' 35"	0.83"	154° 45' 21"	10° 28' 31"	1.0107383	15' 49.43"	23° 26' 17"	-1 m 57 s
2	152° 51' 00"	0.83"	154° 47' 39"	10° 27' 39"	1.0107292	15' 49.44"	23° 26' 17"	-1 m 57 s
3	152° 53' 25"	0.83"	154° 49' 56"	10° 26' 47"	1.0107202	15' 49.45"	23° 26' 17"	-1 m 56 s
4	152° 55' 50"	0.83"	154° 52' 13"	10° 25' 55"	1.0107111	15' 49.46"	23° 26' 17"	-1 m 55 s
5	152° 58' 14"	0.83"	154° 54' 31"	10° 25' 03"	1.0107021	15' 49.47"	23° 26' 17"	-1 m 55 s
6	153° 00' 39"	0.83"	154° 56' 48"	10° 24' 11"	1.0106930	15' 49.48"	23° 26' 17"	-1 m 54 s
7	153° 03' 04"	0.83"	154° 59' 05"	10° 23' 18"	1.0106840	15' 49.49"	23° 26' 17"	-1 m 53 s
8	153° 05' 29"	0.83"	155° 01' 23"	10° 22' 26"	1.0106749	15' 49.49"	23° 26' 17"	-1 m 53 s
9	153° 07' 54"	0.83"	155° 03' 40"	10° 21' 34"	1.0106658	15' 49.50"	23° 26' 17"	-1 m 52 s
10	153° 10' 18"	0.83"	155° 05' 57"	10° 20' 42"	1.0106567	15' 49.51"	23° 26' 17"	-1 m 51 s
11	153° 12' 43"	0.83"	155° 08' 15"	10° 19' 50"	1.0106476	15' 49.52"	23° 26' 17"	-1 m 50 s
12	153° 15' 08"	0.82"	155° 10' 32"	10° 18' 57"	1.0106385	15' 49.53"	23° 26' 17"	-1 m 50 s
13	153° 17' 33"	0.82"	155° 12' 49"	10° 18' 05"	1.0106294	15' 49.54"	23° 26' 17"	-1 m 49 s
14	153° 19' 57"	0.82"	155° 15' 06"	10° 17' 13"	1.0106202	15' 49.55"	23° 26' 17"	-1 m 48 s
15	153° 22' 22"	0.82"	155° 17' 23"	10° 16' 20"	1.0106111	15' 49.55"	23° 26' 17"	-1 m 48 s
16	153° 24' 47"	0.82"	155° 19' 41"	10° 15' 28"	1.0106020	15' 49.56"	23° 26' 17"	-1 m 47 s
17	153° 27' 12"	0.82"	155° 21' 58"	10° 14' 36"	1.0105928	15' 49.57"	23° 26' 17"	-1 m 46 s
18	153° 29' 37"	0.82"	155° 24' 15"	10° 13' 43"	1.0105837	15' 49.58"	23° 26' 17"	-1 m 45 s
19	153° 32' 02"	0.82"	155° 26' 32"	10° 12' 51"	1.0105745	15' 49.59"	23° 26' 17"	-1 m 45 s
20	153° 34' 26"	0.81"	155° 28' 49"	10° 11' 59"	1.0105653	15' 49.60"	23° 26' 17"	-1 m 44 s
21	153° 36' 51"	0.81"	155° 31' 07"	10° 11' 06"	1.0105562	15' 49.61"	23° 26' 17"	-1 m 43 s
22	153° 39' 16"	0.81"	155° 33' 24"	10° 10' 14"	1.0105470	15' 49.61"	23° 26' 17"	-1 m 43 s
23	153° 41' 41"	0.81"	155° 35' 41"	10° 09' 21"	1.0105378	15' 49.62"	23° 26' 17"	-1 m 42 s
24	153° 44' 06"	0.81"	155° 37' 58"	10° 08' 29"	1.0105286	15' 49.63"	23° 26' 17"	-1 m 41 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	137° 30' 48"	5° 00' 52"	141° 35' 08"	20° 21' 14"	0° 54' 39"	14' 53.53"	126° 0' 30"	0.01955
1	138° 01' 16"	5° 00' 48"	142° 05' 49"	20° 11' 39"	0° 54' 40"	14' 53.75"	126° 41' 17"	0.01849
2	138° 31' 44"	5° 00' 43"	142° 36' 27"	20° 01' 58"	0° 54' 41"	14' 53.98"	127° 23' 46"	0.01746
3	139° 02' 13"	5° 00' 36"	143° 07' 03"	19° 52' 12"	0° 54' 42"	14' 54.21"	128° 8' 07"	0.01647
4	139° 32' 44"	5° 00' 28"	143° 37' 36"	19° 42' 20"	0° 54' 42"	14' 54.44"	128° 54' 30"	0.01550
5	140° 03' 15"	5° 00' 18"	144° 08' 06"	19° 32' 23"	0° 54' 43"	14' 54.68"	129° 43' 08"	0.01457
6	140° 33' 48"	5° 00' 07"	144° 38' 33"	19° 22' 20"	0° 54' 44"	14' 54.91"	130° 34' 13"	0.01367
7	141° 04' 21"	4° 59' 55"	145° 08' 58"	19° 12' 11"	0° 54' 45"	14' 55.15"	131° 27' 60"	0.01280
8	141° 34' 56"	4° 59' 41"	145° 39' 20"	19° 01' 58"	0° 54' 46"	14' 55.39"	132° 24' 46"	0.01196
9	142° 05' 31"	4° 59' 26"	146° 09' 39"	18° 51' 38"	0° 54' 47"	14' 55.63"	133° 24' 51"	0.01116
10	142° 36' 08"	4° 59' 09"	146° 39' 56"	18° 41' 14"	0° 54' 48"	14' 55.88"	134° 28' 34"	0.01039
11	143° 06' 45"	4° 58' 51"	147° 10' 09"	18° 30' 45"	0° 54' 49"	14' 56.12"	135° 36' 21"	0.00965
12	143° 37' 24"	4° 58' 31"	147° 40' 20"	18° 20' 10"	0° 54' 49"	14' 56.37"	136° 48' 40"	0.00894
13	144° 08' 03"	4° 58' 10"	148° 10' 29"	18° 09' 30"	0° 54' 50"	14' 56.62"	138° 6' 00"	0.00826
14	144° 38' 44"	4° 57' 47"	148° 40' 35"	17° 58' 45"	0° 54' 51"	14' 56.87"	139° 28' 59"	0.00762
15	145° 09' 26"	4° 57' 23"	149° 10' 38"	17° 47' 55"	0° 54' 52"	14' 57.13"	140° 58' 16"	0.00701
16	145° 40' 09"	4° 56' 58"	149° 40' 38"	17° 36' 60"	0° 54' 53"	14' 57.38"	142° 34' 37"	0.00643
17	146° 10' 52"	4° 56' 31"	150° 10' 36"	17° 25' 60"	0° 54' 54"	14' 57.64"	144° 18' 56"	0.00589
18	146° 41' 37"	4° 56' 02"	150° 40' 32"	17° 14' 55"	0° 54' 55"	14' 57.89"	146° 12' 12"	0.00538
19	147° 12' 23"	4° 55' 33"	151° 10' 25"	17° 03' 45"	0° 54' 56"	14' 58.15"	148° 15' 32"	0.00490
20	147° 43' 10"	4° 55' 01"	151° 40' 15"	16° 52' 31"	0° 54' 57"	14' 58.42"	150° 30' 12"	0.00446
21	148° 13' 58"	4° 54' 29"	152° 10' 03"	16° 41' 12"	0° 54' 58"	14' 58.68"	152° 57' 36"	0.00404
22	148° 44' 47"	4° 53' 54"	152° 39' 48"	16° 29' 48"	0° 54' 59"	14' 58.94"	155° 39' 15"	0.00367
23	149° 15' 37"	4° 53' 19"	153° 09' 31"	16° 18' 19"	0° 54' 60"	14' 59.21"	158° 36' 49"	0.00332
24	149° 46' 29"	4° 52' 41"	153° 39' 12"	16° 06' 46"	0° 55' 01"	14' 59.48"	161° 51' 56"	0.00301

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	153° 44' 06"	0.81"	155° 37' 58"	10° 08' 29"	1.0105286	15' 49.63"	23° 26' 17"	-1 m 41 s
1	153° 46' 30"	0.81"	155° 40' 15"	10° 07' 36"	1.0105194	15' 49.64"	23° 26' 17"	-1 m 40 s
2	153° 48' 55"	0.80"	155° 42' 32"	10° 06' 44"	1.0105102	15' 49.65"	23° 26' 18"	-1 m 40 s
3	153° 51' 20"	0.80"	155° 44' 49"	10° 05' 51"	1.0105009	15' 49.66"	23° 26' 18"	-1 m 39 s
4	153° 53' 45"	0.80"	155° 47' 06"	10° 04' 59"	1.0104917	15' 49.67"	23° 26' 18"	-1 m 38 s
5	153° 56' 10"	0.80"	155° 49' 23"	10° 04' 06"	1.0104825	15' 49.68"	23° 26' 18"	-1 m 38 s
6	153° 58' 35"	0.80"	155° 51' 41"	10° 03' 14"	1.0104732	15' 49.68"	23° 26' 18"	-1 m 37 s
7	154° 00' 59"	0.80"	155° 53' 58"	10° 02' 21"	1.0104640	15' 49.69"	23° 26' 18"	-1 m 36 s
8	154° 03' 24"	0.79"	155° 56' 15"	10° 01' 29"	1.0104547	15' 49.70"	23° 26' 18"	-1 m 35 s
9	154° 05' 49"	0.79"	155° 58' 32"	10° 00' 36"	1.0104455	15' 49.71"	23° 26' 18"	-1 m 35 s
10	154° 08' 14"	0.79"	156° 00' 49"	9° 59' 43"	1.0104362	15' 49.72"	23° 26' 18"	-1 m 34 s
11	154° 10' 39"	0.79"	156° 03' 06"	9° 58' 51"	1.0104269	15' 49.73"	23° 26' 18"	-1 m 33 s
12	154° 13' 04"	0.78"	156° 05' 23"	9° 57' 58"	1.0104176	15' 49.74"	23° 26' 18"	-1 m 33 s
13	154° 15' 29"	0.78"	156° 07' 40"	9° 57' 05"	1.0104083	15' 49.74"	23° 26' 18"	-1 m 32 s
14	154° 17' 53"	0.78"	156° 09' 57"	9° 56' 13"	1.0103990	15' 49.75"	23° 26' 18"	-1 m 31 s
15	154° 20' 18"	0.78"	156° 12' 14"	9° 55' 20"	1.0103897	15' 49.76"	23° 26' 18"	-1 m 30 s
16	154° 22' 43"	0.78"	156° 14' 31"	9° 54' 27"	1.0103804	15' 49.77"	23° 26' 18"	-1 m 30 s
17	154° 25' 08"	0.77"	156° 16' 48"	9° 53' 34"	1.0103710	15' 49.78"	23° 26' 18"	-1 m 29 s
18	154° 27' 33"	0.77"	156° 19' 05"	9° 52' 42"	1.0103617	15' 49.79"	23° 26' 18"	-1 m 28 s
19	154° 29' 58"	0.77"	156° 21' 22"	9° 51' 49"	1.0103524	15' 49.80"	23° 26' 18"	-1 m 27 s
20	154° 32' 23"	0.77"	156° 23' 38"	9° 50' 56"	1.0103430	15' 49.81"	23° 26' 18"	-1 m 27 s
21	154° 34' 48"	0.76"	156° 25' 55"	9° 50' 03"	1.0103337	15' 49.81"	23° 26' 18"	-1 m 26 s
22	154° 37' 12"	0.76"	156° 28' 12"	9° 49' 10"	1.0103243	15' 49.82"	23° 26' 18"	-1 m 25 s
23	154° 39' 37"	0.76"	156° 30' 29"	9° 48' 18"	1.0103149	15' 49.83"	23° 26' 18"	-1 m 25 s
24	154° 42' 02"	0.75"	156° 32' 46"	9° 47' 25"	1.0103055	15' 49.84"	23° 26' 18"	-1 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	149° 46' 29"	4° 52' 41"	153° 39' 12"	16° 06' 46"	0° 55' 01"	14' 59.48"	161° 51' 56"	0.00301
1	150° 17' 21"	4° 52' 03"	154° 08' 50"	15° 55' 08"	0° 55' 02"	14' 59.75"	165° 26' 15"	0.00274
2	150° 48' 14"	4° 51' 23"	154° 38' 25"	15° 43' 26"	0° 55' 03"	15' 00.02"	169° 21' 09"	0.00249
3	151° 19' 09"	4° 50' 41"	155° 07' 59"	15° 31' 39"	0° 55' 04"	15' 00.29"	173° 37' 37"	0.00228
4	151° 50' 05"	4° 49' 58"	155° 37' 30"	15° 19' 48"	0° 55' 05"	15' 00.57"	178° 15' 59"	0.00211
5	152° 21' 01"	4° 49' 14"	156° 06' 59"	15° 07' 53"	0° 55' 06"	15' 00.84"	183° 15' 22"	0.00197
6	152° 51' 59"	4° 48' 28"	156° 36' 26"	14° 55' 53"	0° 55' 07"	15' 01.12"	188° 33' 43"	0.00186
7	153° 22' 58"	4° 47' 41"	157° 05' 50"	14° 43' 50"	0° 55' 08"	15' 01.40"	194° 7' 26"	0.00179
8	153° 53' 58"	4° 46' 52"	157° 35' 12"	14° 31' 42"	0° 55' 09"	15' 01.68"	199° 51' 27"	0.00175
9	154° 24' 59"	4° 46' 02"	158° 04' 32"	14° 19' 29"	0° 55' 10"	15' 01.96"	205° 39' 38"	0.00175
10	154° 56' 01"	4° 45' 10"	158° 33' 50"	14° 07' 13"	0° 55' 11"	15' 02.24"	211° 25' 20"	0.00178
11	155° 27' 04"	4° 44' 17"	159° 03' 06"	13° 54' 53"	0° 55' 12"	15' 02.53"	217° 2' 10"	0.00184
12	155° 58' 08"	4° 43' 22"	159° 32' 20"	13° 42' 29"	0° 55' 13"	15' 02.81"	222° 24' 44"	0.00194
13	156° 29' 13"	4° 42' 26"	160° 01' 32"	13° 30' 00"	0° 55' 14"	15' 03.10"	227° 28' 58"	0.00208
14	157° 00' 20"	4° 41' 29"	160° 30' 42"	13° 17' 28"	0° 55' 15"	15' 03.39"	232° 12' 23"	0.00224
15	157° 31' 27"	4° 40' 30"	160° 59' 50"	13° 04' 52"	0° 55' 16"	15' 03.68"	236° 33' 51"	0.00245
16	158° 02' 36"	4° 39' 29"	161° 28' 56"	12° 52' 13"	0° 55' 17"	15' 03.97"	240° 33' 21"	0.00269
17	158° 33' 45"	4° 38' 28"	161° 58' 00"	12° 39' 29"	0° 55' 18"	15' 04.26"	244° 11' 42"	0.00296
18	159° 04' 56"	4° 37' 24"	162° 27' 02"	12° 26' 42"	0° 55' 19"	15' 04.55"	247° 30' 13"	0.00327
19	159° 36' 08"	4° 36' 20"	162° 56' 03"	12° 13' 52"	0° 55' 21"	15' 04.85"	250° 30' 29"	0.00361
20	160° 07' 21"	4° 35' 14"	163° 25' 02"	12° 00' 58"	0° 55' 22"	15' 05.14"	253° 14' 09"	0.00399
21	160° 38' 35"	4° 34' 06"	163° 53' 59"	11° 48' 00"	0° 55' 23"	15' 05.44"	255° 42' 52"	0.00440
22	161° 09' 50"	4° 32' 57"	164° 22' 55"	11° 34' 59"	0° 55' 24"	15' 05.74"	257° 58' 13"	0.00485
23	161° 41' 06"	4° 31' 47"	164° 51' 49"	11° 21' 54"	0° 55' 25"	15' 06.04"	260° 1' 37"	0.00533
24	162° 12' 24"	4° 30' 35"	165° 20' 41"	11° 08' 47"	0° 55' 26"	15' 06.34"	261° 54' 23"	0.00585

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	154° 42' 02"	0.75"	156° 32' 46"	9° 47' 25"	1.0103055	15' 49.84"	23° 26' 18"	-1 m 24 s
1	154° 44' 27"	0.75"	156° 35' 03"	9° 46' 32"	1.0102961	15' 49.85"	23° 26' 18"	-1 m 23 s
2	154° 46' 52"	0.75"	156° 37' 20"	9° 45' 39"	1.0102867	15' 49.86"	23° 26' 18"	-1 m 22 s
3	154° 49' 17"	0.75"	156° 39' 37"	9° 44' 46"	1.0102773	15' 49.87"	23° 26' 18"	-1 m 22 s
4	154° 51' 42"	0.74"	156° 41' 54"	9° 43' 53"	1.0102679	15' 49.88"	23° 26' 18"	-1 m 21 s
5	154° 54' 07"	0.74"	156° 44' 10"	9° 43' 00"	1.0102585	15' 49.89"	23° 26' 18"	-1 m 20 s
6	154° 56' 32"	0.74"	156° 46' 27"	9° 42' 07"	1.0102491	15' 49.89"	23° 26' 18"	-1 m 19 s
7	154° 58' 56"	0.73"	156° 48' 44"	9° 41' 14"	1.0102397	15' 49.90"	23° 26' 18"	-1 m 19 s
8	155° 01' 21"	0.73"	156° 51' 01"	9° 40' 21"	1.0102302	15' 49.91"	23° 26' 18"	-1 m 18 s
9	155° 03' 46"	0.73"	156° 53' 18"	9° 39' 28"	1.0102208	15' 49.92"	23° 26' 18"	-1 m 17 s
10	155° 06' 11"	0.72"	156° 55' 35"	9° 38' 35"	1.0102113	15' 49.93"	23° 26' 18"	-1 m 16 s
11	155° 08' 36"	0.72"	156° 57' 51"	9° 37' 42"	1.0102018	15' 49.94"	23° 26' 18"	-1 m 16 s
12	155° 11' 01"	0.72"	157° 00' 08"	9° 36' 49"	1.0101924	15' 49.95"	23° 26' 18"	-1 m 15 s
13	155° 13' 26"	0.71"	157° 02' 25"	9° 35' 56"	1.0101829	15' 49.96"	23° 26' 18"	-1 m 14 s
14	155° 15' 51"	0.71"	157° 04' 42"	9° 35' 03"	1.0101734	15' 49.97"	23° 26' 18"	-1 m 14 s
15	155° 18' 16"	0.71"	157° 06' 58"	9° 34' 10"	1.0101639	15' 49.97"	23° 26' 18"	-1 m 13 s
16	155° 20' 41"	0.70"	157° 09' 15"	9° 33' 17"	1.0101544	15' 49.98"	23° 26' 18"	-1 m 12 s
17	155° 23' 06"	0.70"	157° 11' 32"	9° 32' 24"	1.0101449	15' 49.99"	23° 26' 18"	-1 m 11 s
18	155° 25' 31"	0.70"	157° 13' 49"	9° 31' 30"	1.0101354	15' 50.00"	23° 26' 18"	-1 m 11 s
19	155° 27' 56"	0.69"	157° 16' 05"	9° 30' 37"	1.0101259	15' 50.01"	23° 26' 18"	-1 m 10 s
20	155° 30' 21"	0.69"	157° 18' 22"	9° 29' 44"	1.0101163	15' 50.02"	23° 26' 18"	-1 m 09 s
21	155° 32' 45"	0.69"	157° 20' 39"	9° 28' 51"	1.0101068	15' 50.03"	23° 26' 18"	-1 m 08 s
22	155° 35' 10"	0.68"	157° 22' 55"	9° 27' 58"	1.0100972	15' 50.04"	23° 26' 18"	-1 m 08 s
23	155° 37' 35"	0.68"	157° 25' 12"	9° 27' 04"	1.0100877	15' 50.05"	23° 26' 18"	-1 m 07 s
24	155° 40' 00"	0.67"	157° 27' 29"	9° 26' 11"	1.0100781	15' 50.06"	23° 26' 18"	-1 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	162° 12' 24"	4° 30' 35"	165° 20' 41"	11° 08' 47"	0° 55' 26"	15' 06.34"	261° 54' 23"	0.00585
1	162° 43' 42"	4° 29' 22"	165° 49' 32"	10° 55' 35"	0° 55' 27"	15' 06.64"	263° 37' 41"	0.00641
2	163° 15' 02"	4° 28' 07"	166° 18' 22"	10° 42' 21"	0° 55' 28"	15' 06.94"	265° 12' 31"	0.00700
3	163° 46' 22"	4° 26' 51"	166° 47' 10"	10° 29' 03"	0° 55' 29"	15' 07.25"	266° 39' 50"	0.00762
4	164° 17' 44"	4° 25' 34"	167° 15' 56"	10° 15' 43"	0° 55' 30"	15' 07.55"	268° 0' 25"	0.00828
5	164° 49' 07"	4° 24' 15"	167° 44' 42"	10° 02' 19"	0° 55' 32"	15' 07.86"	269° 14' 57"	0.00898
6	165° 20' 31"	4° 22' 55"	168° 13' 26"	9° 48' 52"	0° 55' 33"	15' 08.16"	270° 24' 05"	0.00971
7	165° 51' 56"	4° 21' 33"	168° 42' 09"	9° 35' 23"	0° 55' 34"	15' 08.47"	271° 28' 20"	0.01047
8	166° 23' 22"	4° 20' 10"	169° 10' 50"	9° 21' 50"	0° 55' 35"	15' 08.78"	272° 28' 10"	0.01127
9	166° 54' 50"	4° 18' 46"	169° 39' 31"	9° 08' 14"	0° 55' 36"	15' 09.09"	273° 24' 02"	0.01211
10	167° 26' 18"	4° 17' 20"	170° 08' 10"	8° 54' 36"	0° 55' 37"	15' 09.40"	274° 16' 17"	0.01298
11	167° 57' 47"	4° 15' 53"	170° 36' 49"	8° 40' 55"	0° 55' 38"	15' 09.71"	275° 5' 15"	0.01389
12	168° 29' 18"	4° 14' 25"	171° 05' 26"	8° 27' 11"	0° 55' 40"	15' 10.02"	275° 51' 13"	0.01483
13	169° 00' 50"	4° 12' 55"	171° 34' 03"	8° 13' 25"	0° 55' 41"	15' 10.34"	276° 34' 27"	0.01581
14	169° 32' 23"	4° 11' 24"	172° 02' 38"	7° 59' 36"	0° 55' 42"	15' 10.65"	277° 15' 09"	0.01683
15	170° 03' 57"	4° 09' 51"	172° 31' 13"	7° 45' 44"	0° 55' 43"	15' 10.97"	277° 53' 34"	0.01788
16	170° 35' 32"	4° 08' 17"	172° 59' 47"	7° 31' 50"	0° 55' 44"	15' 11.29"	278° 29' 51"	0.01896
17	171° 07' 08"	4° 06' 42"	173° 28' 20"	7° 17' 54"	0° 55' 45"	15' 11.60"	279° 4' 09"	0.02008
18	171° 38' 45"	4° 05' 06"	173° 56' 53"	7° 03' 55"	0° 55' 47"	15' 11.92"	279° 36' 39"	0.02124
19	172° 10' 24"	4° 03' 28"	174° 25' 25"	6° 49' 54"	0° 55' 48"	15' 12.24"	280° 7' 28"	0.02243
20	172° 42' 03"	4° 01' 49"	174° 53' 56"	6° 35' 51"	0° 55' 49"	15' 12.56"	280° 36' 43"	0.02366
21	173° 13' 44"	4° 00' 08"	175° 22' 27"	6° 21' 45"	0° 55' 50"	15' 12.88"	281° 4' 30"	0.02492
22	173° 45' 26"	3° 58' 26"	175° 50' 58"	6° 07' 38"	0° 55' 51"	15' 13.20"	281° 30' 56"	0.02622
23	174° 17' 09"	3° 56' 43"	176° 19' 28"	5° 53' 28"	0° 55' 52"	15' 13.53"	281° 56' 05"	0.02755
24	174° 48' 53"	3° 54' 59"	176° 47' 58"	5° 39' 16"	0° 55' 54"	15' 13.85"	282° 20' 03"	0.02892

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	155° 40' 00"	0.67"	157° 27' 29"	9° 26' 11"	1.0100781	15' 50.06"	23° 26' 18"	-1 m 06 s
1	155° 42' 25"	0.67"	157° 29' 45"	9° 25' 18"	1.0100686	15' 50.06"	23° 26' 18"	-1 m 05 s
2	155° 44' 50"	0.67"	157° 32' 02"	9° 24' 25"	1.0100590	15' 50.07"	23° 26' 18"	-1 m 05 s
3	155° 47' 15"	0.66"	157° 34' 19"	9° 23' 31"	1.0100494	15' 50.08"	23° 26' 18"	-1 m 04 s
4	155° 49' 40"	0.66"	157° 36' 35"	9° 22' 38"	1.0100398	15' 50.09"	23° 26' 18"	-1 m 03 s
5	155° 52' 05"	0.65"	157° 38' 52"	9° 21' 45"	1.0100302	15' 50.10"	23° 26' 18"	-1 m 02 s
6	155° 54' 30"	0.65"	157° 41' 08"	9° 20' 51"	1.0100206	15' 50.11"	23° 26' 18"	-1 m 02 s
7	155° 56' 55"	0.65"	157° 43' 25"	9° 19' 58"	1.0100110	15' 50.12"	23° 26' 18"	-1 m 01 s
8	155° 59' 20"	0.64"	157° 45' 42"	9° 19' 05"	1.0100014	15' 50.13"	23° 26' 18"	-1 m 00 s
9	156° 01' 45"	0.64"	157° 47' 58"	9° 18' 11"	1.0099918	15' 50.14"	23° 26' 18"	0 m -59 s
10	156° 04' 10"	0.63"	157° 50' 15"	9° 17' 18"	1.0099821	15' 50.15"	23° 26' 18"	0 m -59 s
11	156° 06' 35"	0.63"	157° 52' 31"	9° 16' 24"	1.0099725	15' 50.15"	23° 26' 18"	0 m -58 s
12	156° 08' 60"	0.62"	157° 54' 48"	9° 15' 31"	1.0099628	15' 50.16"	23° 26' 18"	0 m -57 s
13	156° 11' 25"	0.62"	157° 57' 04"	9° 14' 38"	1.0099532	15' 50.17"	23° 26' 18"	0 m -56 s
14	156° 13' 50"	0.62"	157° 59' 21"	9° 13' 44"	1.0099435	15' 50.18"	23° 26' 18"	0 m -56 s
15	156° 16' 15"	0.61"	158° 01' 38"	9° 12' 51"	1.0099338	15' 50.19"	23° 26' 18"	0 m -55 s
16	156° 18' 40"	0.61"	158° 03' 54"	9° 11' 57"	1.0099242	15' 50.20"	23° 26' 18"	0 m -54 s
17	156° 21' 05"	0.60"	158° 06' 11"	9° 11' 04"	1.0099145	15' 50.21"	23° 26' 18"	0 m -53 s
18	156° 23' 30"	0.60"	158° 08' 27"	9° 10' 10"	1.0099048	15' 50.22"	23° 26' 18"	0 m -53 s
19	156° 25' 55"	0.59"	158° 10' 44"	9° 09' 17"	1.0098951	15' 50.23"	23° 26' 18"	0 m -52 s
20	156° 28' 20"	0.59"	158° 13' 00"	9° 08' 23"	1.0098854	15' 50.24"	23° 26' 18"	0 m -51 s
21	156° 30' 45"	0.58"	158° 15' 16"	9° 07' 29"	1.0098757	15' 50.25"	23° 26' 18"	0 m -50 s
22	156° 33' 10"	0.58"	158° 17' 33"	9° 06' 36"	1.0098659	15' 50.25"	23° 26' 18"	0 m -50 s
23	156° 35' 35"	0.58"	158° 19' 49"	9° 05' 42"	1.0098562	15' 50.26"	23° 26' 18"	0 m -49 s
24	156° 37' 60"	0.57"	158° 22' 06"	9° 04' 49"	1.0098465	15' 50.27"	23° 26' 18"	0 m -48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	174° 48' 53"	3° 54' 59"	176° 47' 58"	5° 39' 16"	0° 55' 54"	15' 13.85"	282° 20' 03"	0.02892
1	175° 20' 38"	3° 53' 13"	177° 16' 27"	5° 25' 02"	0° 55' 55"	15' 14.17"	282° 42' 54"	0.03032
2	175° 52' 24"	3° 51' 26"	177° 44' 56"	5° 10' 47"	0° 55' 56"	15' 14.50"	283° 4' 41"	0.03176
3	176° 24' 11"	3° 49' 38"	178° 13' 25"	4° 56' 29"	0° 55' 57"	15' 14.83"	283° 25' 29"	0.03323
4	176° 55' 60"	3° 47' 48"	178° 41' 54"	4° 42' 10"	0° 55' 58"	15' 15.15"	283° 45' 21"	0.03474
5	177° 27' 49"	3° 45' 57"	179° 10' 23"	4° 27' 49"	0° 55' 60"	15' 15.48"	284° 4' 20"	0.03629
6	177° 59' 40"	3° 44' 05"	179° 38' 52"	4° 13' 26"	0° 56' 01"	15' 15.81"	284° 22' 28"	0.03787
7	178° 31' 32"	3° 42' 12"	180° 07' 21"	3° 59' 02"	0° 56' 02"	15' 16.14"	284° 39' 49"	0.03948
8	179° 03' 25"	3° 40' 17"	180° 35' 50"	3° 44' 36"	0° 56' 03"	15' 16.47"	284° 56' 25"	0.04113
9	179° 35' 19"	3° 38' 22"	181° 04' 19"	3° 30' 08"	0° 56' 04"	15' 16.80"	285° 12' 18"	0.04282
10	180° 07' 15"	3° 36' 25"	181° 32' 49"	3° 15' 39"	0° 56' 06"	15' 17.13"	285° 27' 29"	0.04454
11	180° 39' 11"	3° 34' 26"	182° 01' 19"	3° 01' 09"	0° 56' 07"	15' 17.46"	285° 42' 02"	0.04629
12	181° 11' 09"	3° 32' 27"	182° 29' 49"	2° 46' 37"	0° 56' 08"	15' 17.79"	285° 55' 57"	0.04808
13	181° 43' 07"	3° 30' 26"	182° 58' 20"	2° 32' 04"	0° 56' 09"	15' 18.13"	286° 9' 17"	0.04991
14	182° 15' 07"	3° 28' 24"	183° 26' 51"	2° 17' 30"	0° 56' 11"	15' 18.46"	286° 22' 02"	0.05177
15	182° 47' 08"	3° 26' 21"	183° 55' 22"	2° 02' 55"	0° 56' 12"	15' 18.80"	286° 34' 14"	0.05366
16	183° 19' 10"	3° 24' 17"	184° 23' 55"	1° 48' 18"	0° 56' 13"	15' 19.13"	286° 45' 55"	0.05559
17	183° 51' 13"	3° 22' 12"	184° 52' 27"	1° 33' 41"	0° 56' 14"	15' 19.47"	286° 57' 06"	0.05756
18	184° 23' 18"	3° 20' 05"	185° 21' 01"	1° 19' 02"	0° 56' 15"	15' 19.81"	287° 7' 47"	0.05955
19	184° 55' 23"	3° 17' 58"	185° 49' 36"	1° 04' 22"	0° 56' 17"	15' 20.14"	287° 18' 01"	0.06159
20	185° 27' 30"	3° 15' 49"	186° 18' 11"	0° 49' 42"	0° 56' 18"	15' 20.48"	287° 27' 47"	0.06365
21	185° 59' 38"	3° 13' 39"	186° 46' 47"	0° 35' 01"	0° 56' 19"	15' 20.82"	287° 37' 07"	0.06575
22	186° 31' 47"	3° 11' 28"	187° 15' 24"	0° 20' 19"	0° 56' 20"	15' 21.16"	287° 46' 02"	0.06789
23	187° 03' 57"	3° 09' 15"	187° 44' 03"	0° 05' 36"	0° 56' 22"	15' 21.50"	287° 54' 33"	0.07006
24	187° 36' 08"	3° 07' 02"	188° 12' 42"	0° -9' 07"	0° 56' 23"	15' 21.84"	288° 2' 39"	0.07226

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	156° 37' 60"	0.57"	158° 22' 06"	9° 04' 49"	1.0098465	15' 50.27"	23° 26' 18"	0 m-48 s
1	156° 40' 25"	0.57"	158° 24' 22"	9° 03' 55"	1.0098367	15' 50.28"	23° 26' 18"	0 m-47 s
2	156° 42' 50"	0.56"	158° 26' 39"	9° 03' 01"	1.0098270	15' 50.29"	23° 26' 18"	0 m-47 s
3	156° 45' 15"	0.56"	158° 28' 55"	9° 02' 08"	1.0098172	15' 50.30"	23° 26' 18"	0 m-46 s
4	156° 47' 40"	0.55"	158° 31' 12"	9° 01' 14"	1.0098075	15' 50.31"	23° 26' 18"	0 m-45 s
5	156° 50' 05"	0.55"	158° 33' 28"	9° 00' 20"	1.0097977	15' 50.32"	23° 26' 18"	0 m-44 s
6	156° 52' 30"	0.54"	158° 35' 44"	8° 59' 27"	1.0097879	15' 50.33"	23° 26' 18"	0 m-43 s
7	156° 54' 55"	0.54"	158° 38' 01"	8° 58' 33"	1.0097781	15' 50.34"	23° 26' 18"	0 m-43 s
8	156° 57' 20"	0.53"	158° 40' 17"	8° 57' 39"	1.0097683	15' 50.35"	23° 26' 18"	0 m-42 s
9	156° 59' 45"	0.53"	158° 42' 33"	8° 56' 46"	1.0097585	15' 50.36"	23° 26' 18"	0 m-41 s
10	157° 02' 10"	0.52"	158° 44' 50"	8° 55' 52"	1.0097487	15' 50.37"	23° 26' 18"	0 m-40 s
11	157° 04' 35"	0.52"	158° 47' 06"	8° 54' 58"	1.0097389	15' 50.37"	23° 26' 18"	0 m-40 s
12	157° 07' 00"	0.51"	158° 49' 22"	8° 54' 04"	1.0097291	15' 50.38"	23° 26' 18"	0 m-39 s
13	157° 09' 25"	0.51"	158° 51' 39"	8° 53' 10"	1.0097193	15' 50.39"	23° 26' 18"	0 m-38 s
14	157° 11' 50"	0.50"	158° 53' 55"	8° 52' 17"	1.0097095	15' 50.40"	23° 26' 18"	0 m-37 s
15	157° 14' 15"	0.50"	158° 56' 11"	8° 51' 23"	1.0096996	15' 50.41"	23° 26' 18"	0 m-37 s
16	157° 16' 40"	0.49"	158° 58' 28"	8° 50' 29"	1.0096898	15' 50.42"	23° 26' 18"	0 m-36 s
17	157° 19' 05"	0.49"	159° 00' 44"	8° 49' 35"	1.0096799	15' 50.43"	23° 26' 18"	0 m-35 s
18	157° 21' 31"	0.48"	159° 03' 00"	8° 48' 41"	1.0096700	15' 50.44"	23° 26' 18"	0 m-34 s
19	157° 23' 56"	0.48"	159° 05' 17"	8° 47' 47"	1.0096602	15' 50.45"	23° 26' 18"	0 m-33 s
20	157° 26' 21"	0.47"	159° 07' 33"	8° 46' 53"	1.0096503	15' 50.46"	23° 26' 18"	0 m-33 s
21	157° 28' 46"	0.47"	159° 09' 49"	8° 45' 59"	1.0096404	15' 50.47"	23° 26' 18"	0 m-32 s
22	157° 31' 11"	0.46"	159° 12' 05"	8° 45' 05"	1.0096305	15' 50.48"	23° 26' 18"	0 m-31 s
23	157° 33' 36"	0.46"	159° 14' 22"	8° 44' 11"	1.0096206	15' 50.49"	23° 26' 18"	0 m-30 s
24	157° 36' 01"	0.45"	159° 16' 38"	8° 43' 18"	1.0096107	15' 50.50"	23° 26' 18"	0 m-30 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	187° 36' 08"	3° 07' 02"	188° 12' 42"	0° -9' 07"	0° 56' 23"	15' 21.84"	288° 2' 39"	0.07226
1	188° 08' 20"	3° 04' 48"	188° 41' 23"	0° -23' 51"	0° 56' 24"	15' 22.18"	288° 10' 23"	0.07450
2	188° 40' 34"	3° 02' 32"	189° 10' 04"	0° -38' 35"	0° 56' 25"	15' 22.53"	288° 17' 44"	0.07677
3	189° 12' 49"	3° 00' 16"	189° 38' 47"	0° -53' 20"	0° 56' 27"	15' 22.87"	288° 24' 44"	0.07907
4	189° 45' 05"	2° 57' 58"	190° 07' 32"	-1° 08' 05"	0° 56' 28"	15' 23.21"	288° 31' 22"	0.08141
5	190° 17' 22"	2° 55' 39"	190° 36' 18"	-1° 22' 50"	0° 56' 29"	15' 23.56"	288° 37' 40"	0.08378
6	190° 49' 40"	2° 53' 20"	191° 05' 05"	-1° 37' 36"	0° 56' 30"	15' 23.90"	288° 43' 38"	0.08618
7	191° 21' 59"	2° 50' 59"	191° 33' 54"	-1° 52' 22"	0° 56' 32"	15' 24.25"	288° 49' 17"	0.08862
8	191° 54' 20"	2° 48' 37"	192° 02' 45"	-2° 07' 08"	0° 56' 33"	15' 24.59"	288° 54' 36"	0.09109
9	192° 26' 42"	2° 46' 14"	192° 31' 37"	-2° 21' 54"	0° 56' 34"	15' 24.94"	288° 59' 37"	0.09360
10	192° 59' 05"	2° 43' 51"	193° 00' 32"	-2° 36' 41"	0° 56' 36"	15' 25.28"	289° 4' 19"	0.09613
11	193° 31' 29"	2° 41' 26"	193° 29' 28"	-2° 51' 27"	0° 56' 37"	15' 25.63"	289° 8' 44"	0.09870
12	194° 03' 54"	2° 39' 00"	193° 58' 26"	-3° 06' 13"	0° 56' 38"	15' 25.98"	289° 12' 51"	0.10131
13	194° 36' 21"	2° 36' 33"	194° 27' 25"	-3° 20' 59"	0° 56' 39"	15' 26.33"	289° 16' 42"	0.10394
14	195° 08' 48"	2° 34' 06"	194° 56' 27"	-3° 35' 44"	0° 56' 41"	15' 26.68"	289° 20' 15"	0.10661
15	195° 41' 17"	2° 31' 37"	195° 25' 31"	-3° 50' 30"	0° 56' 42"	15' 27.03"	289° 23' 33"	0.10931
16	196° 13' 47"	2° 29' 08"	195° 54' 38"	-4° 05' 15"	0° 56' 43"	15' 27.38"	289° 26' 34"	0.11204
17	196° 46' 19"	2° 26' 37"	196° 23' 46"	-4° 19' 59"	0° 56' 45"	15' 27.73"	289° 29' 19"	0.11480
18	197° 18' 51"	2° 24' 06"	196° 52' 57"	-4° 34' 43"	0° 56' 46"	15' 28.08"	289° 31' 49"	0.11760
19	197° 51' 25"	2° 21' 33"	197° 22' 10"	-4° 49' 27"	0° 56' 47"	15' 28.43"	289° 34' 03"	0.12042
20	198° 23' 60"	2° 19' 00"	197° 51' 26"	-5° 04' 10"	0° 56' 48"	15' 28.79"	289° 36' 03"	0.12328
21	198° 56' 36"	2° 16' 26"	198° 20' 44"	-5° 18' 52"	0° 56' 50"	15' 29.14"	289° 37' 47"	0.12617
22	199° 29' 13"	2° 13' 51"	198° 50' 05"	-5° 33' 33"	0° 56' 51"	15' 29.49"	289° 39' 17"	0.12909
23	200° 01' 52"	2° 11' 16"	199° 19' 28"	-5° 48' 14"	0° 56' 52"	15' 29.85"	289° 40' 33"	0.13204
24	200° 34' 32"	2° 08' 39"	199° 48' 54"	-6° 02' 53"	0° 56' 54"	15' 30.20"	289° 41' 34"	0.13503

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	157° 36' 01"	0.45"	159° 16' 38"	8° 43' 18"	1.0096107	15' 50.50"	23° 26' 18"	0 m-30 s
1	157° 38' 26"	0.45"	159° 18' 54"	8° 42' 24"	1.0096008	15' 50.50"	23° 26' 18"	0 m-29 s
2	157° 40' 51"	0.44"	159° 21' 10"	8° 41' 30"	1.0095909	15' 50.51"	23° 26' 18"	0 m-28 s
3	157° 43' 16"	0.43"	159° 23' 26"	8° 40' 36"	1.0095810	15' 50.52"	23° 26' 18"	0 m-27 s
4	157° 45' 41"	0.43"	159° 25' 43"	8° 39' 42"	1.0095711	15' 50.53"	23° 26' 18"	0 m-27 s
5	157° 48' 06"	0.42"	159° 27' 59"	8° 38' 47"	1.0095611	15' 50.54"	23° 26' 18"	0 m-26 s
6	157° 50' 31"	0.42"	159° 30' 15"	8° 37' 53"	1.0095512	15' 50.55"	23° 26' 18"	0 m-25 s
7	157° 52' 56"	0.41"	159° 32' 31"	8° 36' 59"	1.0095412	15' 50.56"	23° 26' 18"	0 m-24 s
8	157° 55' 22"	0.41"	159° 34' 47"	8° 36' 05"	1.0095313	15' 50.57"	23° 26' 18"	0 m-23 s
9	157° 57' 47"	0.40"	159° 37' 04"	8° 35' 11"	1.0095213	15' 50.58"	23° 26' 18"	0 m-23 s
10	158° 00' 12"	0.40"	159° 39' 20"	8° 34' 17"	1.0095113	15' 50.59"	23° 26' 18"	0 m-22 s
11	158° 02' 37"	0.39"	159° 41' 36"	8° 33' 23"	1.0095014	15' 50.60"	23° 26' 18"	0 m-21 s
12	158° 05' 02"	0.39"	159° 43' 52"	8° 32' 29"	1.0094914	15' 50.61"	23° 26' 18"	0 m-20 s
13	158° 07' 27"	0.38"	159° 46' 08"	8° 31' 35"	1.0094814	15' 50.62"	23° 26' 18"	0 m-20 s
14	158° 09' 52"	0.38"	159° 48' 24"	8° 30' 40"	1.0094714	15' 50.63"	23° 26' 18"	0 m-19 s
15	158° 12' 17"	0.37"	159° 50' 40"	8° 29' 46"	1.0094614	15' 50.64"	23° 26' 18"	0 m-18 s
16	158° 14' 42"	0.36"	159° 52' 56"	8° 28' 52"	1.0094514	15' 50.65"	23° 26' 18"	0 m-17 s
17	158° 17' 08"	0.36"	159° 55' 13"	8° 27' 58"	1.0094414	15' 50.65"	23° 26' 18"	0 m-16 s
18	158° 19' 33"	0.35"	159° 57' 29"	8° 27' 04"	1.0094314	15' 50.66"	23° 26' 18"	0 m-16 s
19	158° 21' 58"	0.35"	159° 59' 45"	8° 26' 09"	1.0094213	15' 50.67"	23° 26' 18"	0 m-15 s
20	158° 24' 23"	0.34"	160° 02' 01"	8° 25' 15"	1.0094113	15' 50.68"	23° 26' 18"	0 m-14 s
21	158° 26' 48"	0.34"	160° 04' 17"	8° 24' 21"	1.0094013	15' 50.69"	23° 26' 18"	0 m-13 s
22	158° 29' 13"	0.33"	160° 06' 33"	8° 23' 27"	1.0093912	15' 50.70"	23° 26' 18"	0 m-12 s
23	158° 31' 38"	0.33"	160° 08' 49"	8° 22' 32"	1.0093812	15' 50.71"	23° 26' 18"	0 m-12 s
24	158° 34' 03"	0.32"	160° 11' 05"	8° 21' 38"	1.0093711	15' 50.72"	23° 26' 18"	0 m-11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	200° 34' 32"	2° 08' 39"	199° 48' 54"	-6° 02' 53"	0° 56' 54"	15' 30.20"	289° 41' 34"	0.13503
1	201° 07' 13"	2° 06' 02"	200° 18' 23"	-6° 17' 32"	0° 56' 55"	15' 30.56"	289° 42' 21"	0.13804
2	201° 39' 55"	2° 03' 23"	200° 47' 55"	-6° 32' 10"	0° 56' 56"	15' 30.91"	289° 42' 55"	0.14108
3	202° 12' 38"	2° 00' 44"	201° 17' 30"	-6° 46' 46"	0° 56' 58"	15' 31.27"	289° 43' 15"	0.14416
4	202° 45' 23"	1° 58' 05"	201° 47' 08"	-7° 01' 21"	0° 56' 59"	15' 31.62"	289° 43' 21"	0.14726
5	203° 18' 09"	1° 55' 24"	202° 16' 48"	-7° 15' 56"	0° 57' 00"	15' 31.98"	289° 43' 14"	0.15040
6	203° 50' 56"	1° 52' 43"	202° 46' 32"	-7° 30' 28"	0° 57' 01"	15' 32.34"	289° 42' 54"	0.15356
7	204° 23' 45"	1° 50' 01"	203° 16' 20"	-7° 44' 60"	0° 57' 03"	15' 32.70"	289° 42' 21"	0.15675
8	204° 56' 34"	1° 47' 18"	203° 46' 10"	-7° 59' 30"	0° 57' 04"	15' 33.06"	289° 41' 35"	0.15998
9	205° 29' 25"	1° 44' 34"	204° 16' 04"	-8° 13' 58"	0° 57' 05"	15' 33.41"	289° 40' 36"	0.16323
10	206° 02' 18"	1° 41' 50"	204° 46' 01"	-8° 28' 25"	0° 57' 07"	15' 33.77"	289° 39' 24"	0.16651
11	206° 35' 11"	1° 39' 05"	205° 16' 02"	-8° 42' 50"	0° 57' 08"	15' 34.13"	289° 38' 00"	0.16982
12	207° 08' 06"	1° 36' 20"	205° 46' 06"	-8° 57' 14"	0° 57' 09"	15' 34.49"	289° 36' 23"	0.17316
13	207° 41' 02"	1° 33' 33"	206° 16' 14"	-9° 11' 35"	0° 57' 11"	15' 34.85"	289° 34' 34"	0.17653
14	208° 13' 59"	1° 30' 47"	206° 46' 26"	-9° 25' 55"	0° 57' 12"	15' 35.22"	289° 32' 33"	0.17992
15	208° 46' 58"	1° 27' 59"	207° 16' 41"	-9° 40' 13"	0° 57' 13"	15' 35.58"	289° 30' 20"	0.18335
16	209° 19' 58"	1° 25' 11"	207° 47' 00"	-9° 54' 28"	0° 57' 15"	15' 35.94"	289° 27' 54"	0.18680
17	209° 52' 59"	1° 22' 22"	208° 17' 23"	-10° 08' 42"	0° 57' 16"	15' 36.30"	289° 25' 17"	0.19028
18	210° 26' 02"	1° 19' 33"	208° 47' 50"	-10° 22' 53"	0° 57' 17"	15' 36.66"	289° 22' 27"	0.19379
19	210° 59' 06"	1° 16' 43"	209° 18' 21"	-10° 37' 02"	0° 57' 19"	15' 37.03"	289° 19' 26"	0.19732
20	211° 32' 11"	1° 13' 52"	209° 48' 57"	-10° 51' 09"	0° 57' 20"	15' 37.39"	289° 16' 13"	0.20088
21	212° 05' 18"	1° 11' 01"	210° 19' 36"	-11° 05' 14"	0° 57' 21"	15' 37.75"	289° 12' 48"	0.20447
22	212° 38' 25"	1° 08' 10"	210° 50' 20"	-11° 19' 15"	0° 57' 23"	15' 38.12"	289° 9' 12"	0.20808
23	213° 11' 35"	1° 05' 18"	211° 21' 08"	-11° 33' 15"	0° 57' 24"	15' 38.48"	289° 5' 24"	0.21172
24	213° 44' 45"	1° 02' 25"	211° 51' 60"	-11° 47' 11"	0° 57' 25"	15' 38.85"	289° 1' 25"	0.21539



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	158° 34' 03"	0.32"	160° 11' 05"	8° 21' 38"	1.0093711	15' 50.72"	23° 26' 18"	0 m -11 s
1	158° 36' 29"	0.31"	160° 13' 21"	8° 20' 44"	1.0093610	15' 50.73"	23° 26' 18"	0 m -10 s
2	158° 38' 54"	0.31"	160° 15' 37"	8° 19' 49"	1.0093510	15' 50.74"	23° 26' 18"	0 m -9 s
3	158° 41' 19"	0.30"	160° 17' 53"	8° 18' 55"	1.0093409	15' 50.75"	23° 26' 18"	0 m -9 s
4	158° 43' 44"	0.30"	160° 20' 09"	8° 18' 01"	1.0093308	15' 50.76"	23° 26' 18"	0 m -8 s
5	158° 46' 09"	0.29"	160° 22' 25"	8° 17' 06"	1.0093207	15' 50.77"	23° 26' 18"	0 m -7 s
6	158° 48' 34"	0.29"	160° 24' 41"	8° 16' 12"	1.0093106	15' 50.78"	23° 26' 18"	0 m -6 s
7	158° 50' 59"	0.28"	160° 26' 57"	8° 15' 18"	1.0093005	15' 50.79"	23° 26' 18"	0 m -5 s
8	158° 53' 24"	0.27"	160° 29' 13"	8° 14' 23"	1.0092904	15' 50.80"	23° 26' 18"	0 m -5 s
9	158° 55' 50"	0.27"	160° 31' 29"	8° 13' 29"	1.0092803	15' 50.81"	23° 26' 18"	0 m -4 s
10	158° 58' 15"	0.26"	160° 33' 45"	8° 12' 34"	1.0092702	15' 50.82"	23° 26' 18"	0 m -3 s
11	159° 00' 40"	0.26"	160° 36' 01"	8° 11' 40"	1.0092600	15' 50.83"	23° 26' 18"	0 m -2 s
12	159° 03' 05"	0.25"	160° 38' 17"	8° 10' 45"	1.0092499	15' 50.83"	23° 26' 18"	0 m -1 s
13	159° 05' 30"	0.25"	160° 40' 33"	8° 09' 51"	1.0092398	15' 50.84"	23° 26' 18"	0 m -1 s
14	159° 07' 55"	0.24"	160° 42' 48"	8° 08' 56"	1.0092296	15' 50.85"	23° 26' 18"	0 m 00 s
15	159° 10' 21"	0.24"	160° 45' 04"	8° 08' 02"	1.0092195	15' 50.86"	23° 26' 18"	0 m 01 s
16	159° 12' 46"	0.23"	160° 47' 20"	8° 07' 07"	1.0092093	15' 50.87"	23° 26' 18"	0 m 02 s
17	159° 15' 11"	0.22"	160° 49' 36"	8° 06' 13"	1.0091991	15' 50.88"	23° 26' 18"	0 m 03 s
18	159° 17' 36"	0.22"	160° 51' 52"	8° 05' 18"	1.0091890	15' 50.89"	23° 26' 18"	0 m 03 s
19	159° 20' 01"	0.21"	160° 54' 08"	8° 04' 24"	1.0091788	15' 50.90"	23° 26' 18"	0 m 04 s
20	159° 22' 26"	0.21"	160° 56' 24"	8° 03' 29"	1.0091686	15' 50.91"	23° 26' 18"	0 m 05 s
21	159° 24' 52"	0.20"	160° 58' 40"	8° 02' 34"	1.0091584	15' 50.92"	23° 26' 18"	0 m 06 s
22	159° 27' 17"	0.20"	161° 00' 56"	8° 01' 40"	1.0091482	15' 50.93"	23° 26' 18"	0 m 07 s
23	159° 29' 42"	0.19"	161° 03' 11"	8° 00' 45"	1.0091381	15' 50.94"	23° 26' 18"	0 m 07 s
24	159° 32' 07"	0.18"	161° 05' 27"	7° 59' 51"	1.0091278	15' 50.95"	23° 26' 18"	0 m 08 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	213° 44' 45"	1° 02' 25"	211° 51' 60"	-11° 47' 11"	0° 57' 25"	15' 38.85"	289° 1' 25"	0.21539
1	214° 17' 57"	0° 59' 32"	212° 22' 57"	-12° 01' 05"	0° 57' 27"	15' 39.21"	288° 57' 14"	0.21908
2	214° 51' 10"	0° 56' 39"	212° 53' 58"	-12° 14' 56"	0° 57' 28"	15' 39.58"	288° 52' 52"	0.22280
3	215° 24' 25"	0° 53' 45"	213° 25' 04"	-12° 28' 45"	0° 57' 29"	15' 39.94"	288° 48' 18"	0.22654
4	215° 57' 41"	0° 50' 50"	213° 56' 14"	-12° 42' 30"	0° 57' 31"	15' 40.31"	288° 43' 33"	0.23031
5	216° 30' 58"	0° 47' 55"	214° 27' 29"	-12° 56' 12"	0° 57' 32"	15' 40.68"	288° 38' 37"	0.23410
6	217° 04' 17"	0° 45' 00"	214° 58' 49"	-13° 09' 51"	0° 57' 33"	15' 41.04"	288° 33' 30"	0.23792
7	217° 37' 37"	0° 42' 05"	215° 30' 14"	-13° 23' 27"	0° 57' 35"	15' 41.41"	288° 28' 12"	0.24176
8	218° 10' 58"	0° 39' 09"	216° 01' 43"	-13° 36' 59"	0° 57' 36"	15' 41.78"	288° 22' 42"	0.24562
9	218° 44' 21"	0° 36' 12"	216° 33' 18"	-13° 50' 28"	0° 57' 37"	15' 42.15"	288° 17' 01"	0.24951
10	219° 17' 45"	0° 33' 15"	217° 04' 58"	-14° 03' 54"	0° 57' 39"	15' 42.51"	288° 11' 10"	0.25343
11	219° 51' 11"	0° 30' 18"	217° 36' 42"	-14° 17' 16"	0° 57' 40"	15' 42.88"	288° 5' 07"	0.25736
12	220° 24' 38"	0° 27' 21"	218° 08' 32"	-14° 30' 35"	0° 57' 41"	15' 43.25"	287° 58' 54"	0.26132
13	220° 58' 06"	0° 24' 23"	218° 40' 27"	-14° 43' 50"	0° 57' 43"	15' 43.62"	287° 52' 29"	0.26530
14	221° 31' 36"	0° 21' 26"	219° 12' 27"	-14° 57' 01"	0° 57' 44"	15' 43.99"	287° 45' 54"	0.26931
15	222° 05' 07"	0° 18' 27"	219° 44' 32"	-15° 10' 08"	0° 57' 46"	15' 44.36"	287° 39' 08"	0.27333
16	222° 38' 40"	0° 15' 29"	220° 16' 43"	-15° 23' 11"	0° 57' 47"	15' 44.73"	287° 32' 11"	0.27738
17	223° 12' 14"	0° 12' 30"	220° 48' 60"	-15° 36' 10"	0° 57' 48"	15' 45.09"	287° 25' 03"	0.28145
18	223° 45' 49"	0° 09' 31"	221° 21' 21"	-15° 49' 05"	0° 57' 50"	15' 45.46"	287° 17' 45"	0.28554
19	224° 19' 26"	0° 06' 32"	221° 53' 49"	-16° 01' 55"	0° 57' 51"	15' 45.83"	287° 10' 16"	0.28965
20	224° 53' 05"	0° 03' 33"	222° 26' 21"	-16° 14' 42"	0° 57' 52"	15' 46.20"	287° 2' 36"	0.29378
21	225° 26' 45"	0° 00' 34"	222° 58' 60"	-16° 27' 24"	0° 57' 54"	15' 46.57"	286° 54' 45"	0.29794
22	226° 00' 26"	0° -2' 26"	223° 31' 44"	-16° 40' 01"	0° 57' 55"	15' 46.94"	286° 46' 44"	0.30211
23	226° 34' 09"	0° -5' 26"	224° 04' 34"	-16° 52' 34"	0° 57' 56"	15' 47.31"	286° 38' 32"	0.30630
24	227° 07' 53"	0° -8' 25"	224° 37' 30"	-17° 05' 02"	0° 57' 58"	15' 47.68"	286° 30' 10"	0.31051

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	159° 32' 07"	0.18"	161° 05' 27"	7° 59' 51"	1.0091278	15' 50.95"	23° 26' 18"	0 m 08 s
1	159° 34' 32"	0.18"	161° 07' 43"	7° 58' 56"	1.0091176	15' 50.96"	23° 26' 18"	0 m 09 s
2	159° 36' 58"	0.17"	161° 09' 59"	7° 58' 01"	1.0091074	15' 50.97"	23° 26' 18"	0 m 10 s
3	159° 39' 23"	0.17"	161° 12' 15"	7° 57' 07"	1.0090972	15' 50.98"	23° 26' 18"	0 m 11 s
4	159° 41' 48"	0.16"	161° 14' 30"	7° 56' 12"	1.0090870	15' 50.99"	23° 26' 18"	0 m 11 s
5	159° 44' 13"	0.16"	161° 16' 46"	7° 55' 17"	1.0090767	15' 51.00"	23° 26' 18"	0 m 12 s
6	159° 46' 38"	0.15"	161° 19' 02"	7° 54' 23"	1.0090665	15' 51.01"	23° 26' 18"	0 m 13 s
7	159° 49' 04"	0.15"	161° 21' 18"	7° 53' 28"	1.0090563	15' 51.02"	23° 26' 18"	0 m 14 s
8	159° 51' 29"	0.14"	161° 23' 34"	7° 52' 33"	1.0090460	15' 51.03"	23° 26' 18"	0 m 15 s
9	159° 53' 54"	0.13"	161° 25' 49"	7° 51' 38"	1.0090358	15' 51.04"	23° 26' 18"	0 m 15 s
10	159° 56' 19"	0.13"	161° 28' 05"	7° 50' 44"	1.0090255	15' 51.05"	23° 26' 18"	0 m 16 s
11	159° 58' 44"	0.12"	161° 30' 21"	7° 49' 49"	1.0090152	15' 51.06"	23° 26' 18"	0 m 17 s
12	160° 01' 10"	0.12"	161° 32' 37"	7° 48' 54"	1.0090050	15' 51.07"	23° 26' 18"	0 m 18 s
13	160° 03' 35"	0.11"	161° 34' 52"	7° 47' 59"	1.0089947	15' 51.08"	23° 26' 18"	0 m 19 s
14	160° 06' 00"	0.11"	161° 37' 08"	7° 47' 04"	1.0089844	15' 51.09"	23° 26' 18"	0 m 19 s
15	160° 08' 25"	0.10"	161° 39' 24"	7° 46' 10"	1.0089741	15' 51.09"	23° 26' 18"	0 m 20 s
16	160° 10' 51"	0.10"	161° 41' 40"	7° 45' 15"	1.0089638	15' 51.10"	23° 26' 18"	0 m 21 s
17	160° 13' 16"	0.09"	161° 43' 55"	7° 44' 20"	1.0089536	15' 51.11"	23° 26' 18"	0 m 22 s
18	160° 15' 41"	0.08"	161° 46' 11"	7° 43' 25"	1.0089433	15' 51.12"	23° 26' 18"	0 m 23 s
19	160° 18' 06"	0.08"	161° 48' 27"	7° 42' 30"	1.0089329	15' 51.13"	23° 26' 18"	0 m 23 s
20	160° 20' 31"	0.07"	161° 50' 42"	7° 41' 35"	1.0089226	15' 51.14"	23° 26' 18"	0 m 24 s
21	160° 22' 57"	0.07"	161° 52' 58"	7° 40' 40"	1.0089123	15' 51.15"	23° 26' 18"	0 m 25 s
22	160° 25' 22"	0.06"	161° 55' 14"	7° 39' 45"	1.0089020	15' 51.16"	23° 26' 18"	0 m 26 s
23	160° 27' 47"	0.06"	161° 57' 29"	7° 38' 50"	1.0088917	15' 51.17"	23° 26' 18"	0 m 27 s
24	160° 30' 12"	0.05"	161° 59' 45"	7° 37' 56"	1.0088813	15' 51.18"	23° 26' 18"	0 m 27 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	227° 07' 53"	0° -8' 25"	224° 37' 30"	-17° 05' 02"	0° 57' 58"	15' 47.68"	286° 30' 10"	0.31051
1	227° 41' 39"	0° -11' 25"	225° 10' 31"	-17° 17' 25"	0° 57' 59"	15' 48.05"	286° 21' 37"	0.31474
2	228° 15' 26"	0° -14' 25"	225° 43' 39"	-17° 29' 44"	0° 58' 00"	15' 48.42"	286° 12' 54"	0.31899
3	228° 49' 15"	0° -17' 25"	226° 16' 52"	-17° 41' 57"	0° 58' 02"	15' 48.79"	286° 4' 00"	0.32326
4	229° 23' 05"	0° -20' 25"	226° 50' 11"	-17° 54' 06"	0° 58' 03"	15' 49.16"	285° 54' 56"	0.32755
5	229° 56' 57"	0° -23' 25"	227° 23' 37"	-18° 06' 09"	0° 58' 05"	15' 49.53"	285° 45' 41"	0.33185
6	230° 30' 50"	0° -26' 25"	227° 57' 08"	-18° 18' 07"	0° 58' 06"	15' 49.90"	285° 36' 16"	0.33617
7	231° 04' 45"	0° -29' 25"	228° 30' 45"	-18° 29' 60"	0° 58' 07"	15' 50.27"	285° 26' 40"	0.34051
8	231° 38' 42"	0° -32' 25"	229° 04' 29"	-18° 41' 47"	0° 58' 09"	15' 50.64"	285° 16' 55"	0.34487
9	232° 12' 39"	0° -35' 25"	229° 38' 19"	-18° 53' 29"	0° 58' 10"	15' 51.01"	285° 6' 58"	0.34924
10	232° 46' 39"	0° -38' 25"	230° 12' 15"	-19° 05' 05"	0° 58' 11"	15' 51.38"	284° 56' 52"	0.35363
11	233° 20' 40"	0° -41' 25"	230° 46' 17"	-19° 16' 36"	0° 58' 13"	15' 51.75"	284° 46' 35"	0.35804
12	233° 54' 42"	0° -44' 25"	231° 20' 25"	-19° 28' 00"	0° 58' 14"	15' 52.11"	284° 36' 08"	0.36246
13	234° 28' 46"	0° -47' 24"	231° 54' 40"	-19° 39' 19"	0° 58' 15"	15' 52.48"	284° 25' 31"	0.36689
14	235° 02' 52"	0° -50' 24"	232° 29' 01"	-19° 50' 32"	0° 58' 17"	15' 52.85"	284° 14' 44"	0.37134
15	235° 36' 59"	0° -53' 23"	233° 03' 29"	-20° 01' 38"	0° 58' 18"	15' 53.22"	284° 3' 46"	0.37581
16	236° 11' 07"	0° -56' 22"	233° 38' 02"	-20° 12' 39"	0° 58' 19"	15' 53.59"	283° 52' 39"	0.38028
17	236° 45' 18"	0° -59' 21"	234° 12' 43"	-20° 23' 33"	0° 58' 21"	15' 53.95"	283° 41' 21"	0.38478
18	237° 19' 29"	-1° 02' 20"	234° 47' 29"	-20° 34' 21"	0° 58' 22"	15' 54.32"	283° 29' 54"	0.38928
19	237° 53' 43"	-1° 05' 18"	235° 22' 22"	-20° 45' 02"	0° 58' 23"	15' 54.69"	283° 18' 16"	0.39380
20	238° 27' 58"	-1° 08' 17"	235° 57' 22"	-20° 55' 37"	0° 58' 25"	15' 55.05"	283° 6' 29"	0.39833
21	239° 02' 14"	-1° 11' 14"	236° 32' 28"	-21° 06' 05"	0° 58' 26"	15' 55.42"	282° 54' 31"	0.40288
22	239° 36' 32"	-1° 14' 12"	237° 07' 40"	-21° 16' 26"	0° 58' 27"	15' 55.79"	282° 42' 24"	0.40743
23	240° 10' 52"	-1° 17' 09"	237° 42' 59"	-21° 26' 40"	0° 58' 29"	15' 56.15"	282° 30' 07"	0.41200
24	240° 45' 13"	-1° 20' 06"	238° 18' 25"	-21° 36' 48"	0° 58' 30"	15' 56.51"	282° 17' 40"	0.41658



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	160° 30' 12"	0.05"	161° 59' 45"	7° 37' 56"	1.0088813	15' 51.18"	23° 26' 18"	0 m 27 s
1	160° 32' 38"	0.05"	162° 02' 01"	7° 37' 01"	1.0088710	15' 51.19"	23° 26' 18"	0 m 28 s
2	160° 35' 03"	0.04"	162° 04' 16"	7° 36' 06"	1.0088607	15' 51.20"	23° 26' 18"	0 m 29 s
3	160° 37' 28"	0.04"	162° 06' 32"	7° 35' 11"	1.0088503	15' 51.21"	23° 26' 18"	0 m 30 s
4	160° 39' 53"	0.03"	162° 08' 48"	7° 34' 16"	1.0088400	15' 51.22"	23° 26' 18"	0 m 31 s
5	160° 42' 19"	0.03"	162° 11' 03"	7° 33' 21"	1.0088296	15' 51.23"	23° 26' 18"	0 m 31 s
6	160° 44' 44"	0.02"	162° 13' 19"	7° 32' 26"	1.0088192	15' 51.24"	23° 26' 18"	0 m 32 s
7	160° 47' 09"	0.02"	162° 15' 34"	7° 31' 31"	1.0088089	15' 51.25"	23° 26' 18"	0 m 33 s
8	160° 49' 34"	0.01"	162° 17' 50"	7° 30' 36"	1.0087985	15' 51.26"	23° 26' 18"	0 m 34 s
9	160° 51' 60"	0.00"	162° 20' 06"	7° 29' 40"	1.0087881	15' 51.27"	23° 26' 18"	0 m 35 s
10	160° 54' 25"	-0.00"	162° 22' 21"	7° 28' 45"	1.0087778	15' 51.28"	23° 26' 18"	0 m 36 s
11	160° 56' 50"	-0.01"	162° 24' 37"	7° 27' 50"	1.0087674	15' 51.29"	23° 26' 18"	0 m 36 s
12	160° 59' 15"	-0.01"	162° 26' 52"	7° 26' 55"	1.0087570	15' 51.30"	23° 26' 18"	0 m 37 s
13	161° 01' 41"	-0.02"	162° 29' 08"	7° 26' 00"	1.0087466	15' 51.31"	23° 26' 18"	0 m 38 s
14	161° 04' 06"	-0.02"	162° 31' 23"	7° 25' 05"	1.0087362	15' 51.32"	23° 26' 18"	0 m 39 s
15	161° 06' 31"	-0.03"	162° 33' 39"	7° 24' 10"	1.0087258	15' 51.33"	23° 26' 18"	0 m 40 s
16	161° 08' 57"	-0.03"	162° 35' 55"	7° 23' 15"	1.0087154	15' 51.34"	23° 26' 18"	0 m 40 s
17	161° 11' 22"	-0.04"	162° 38' 10"	7° 22' 20"	1.0087050	15' 51.35"	23° 26' 18"	0 m 41 s
18	161° 13' 47"	-0.04"	162° 40' 26"	7° 21' 24"	1.0086946	15' 51.36"	23° 26' 18"	0 m 42 s
19	161° 16' 12"	-0.05"	162° 42' 41"	7° 20' 29"	1.0086841	15' 51.37"	23° 26' 18"	0 m 43 s
20	161° 18' 38"	-0.05"	162° 44' 57"	7° 19' 34"	1.0086737	15' 51.38"	23° 26' 18"	0 m 44 s
21	161° 21' 03"	-0.06"	162° 47' 12"	7° 18' 39"	1.0086633	15' 51.39"	23° 26' 18"	0 m 45 s
22	161° 23' 28"	-0.06"	162° 49' 28"	7° 17' 44"	1.0086528	15' 51.40"	23° 26' 18"	0 m 45 s
23	161° 25' 54"	-0.07"	162° 51' 43"	7° 16' 48"	1.0086424	15' 51.41"	23° 26' 17"	0 m 46 s
24	161° 28' 19"	-0.07"	162° 53' 59"	7° 15' 53"	1.0086320	15' 51.42"	23° 26' 17"	0 m 47 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	240° 45' 13"	-1° 20' 06"	238° 18' 25"	-21° 36' 48"	0° 58' 30"	15' 56.51"	282° 17' 40"	0.41658
1	241° 19' 36"	-1° 23' 03"	238° 53' 57"	-21° 46' 48"	0° 58' 31"	15' 56.88"	282° 5' 04"	0.42117
2	241° 54' 01"	-1° 25' 59"	239° 29' 35"	-21° 56' 41"	0° 58' 33"	15' 57.24"	281° 52' 18"	0.42577
3	242° 28' 27"	-1° 28' 55"	240° 05' 20"	-22° 06' 27"	0° 58' 34"	15' 57.60"	281° 39' 22"	0.43038
4	243° 02' 55"	-1° 31' 51"	240° 41' 11"	-22° 16' 06"	0° 58' 35"	15' 57.97"	281° 26' 16"	0.43500
5	243° 37' 24"	-1° 34' 46"	241° 17' 09"	-22° 25' 37"	0° 58' 37"	15' 58.33"	281° 13' 02"	0.43963
6	244° 11' 55"	-1° 37' 41"	241° 53' 14"	-22° 35' 00"	0° 58' 38"	15' 58.69"	280° 59' 37"	0.44426
7	244° 46' 28"	-1° 40' 35"	242° 29' 25"	-22° 44' 16"	0° 58' 39"	15' 59.05"	280° 46' 03"	0.44891
8	245° 21' 02"	-1° 43' 29"	243° 05' 42"	-22° 53' 24"	0° 58' 41"	15' 59.41"	280° 32' 20"	0.45356
9	245° 55' 38"	-1° 46' 22"	243° 42' 06"	-23° 02' 24"	0° 58' 42"	15' 59.76"	280° 18' 28"	0.45823
10	246° 30' 15"	-1° 49' 15"	244° 18' 37"	-23° 11' 16"	0° 58' 43"	16' 00.12"	280° 4' 26"	0.46290
11	247° 04' 54"	-1° 52' 07"	244° 55' 13"	-23° 20' 00"	0° 58' 45"	16' 00.48"	279° 50' 16"	0.46757
12	247° 39' 35"	-1° 54' 58"	245° 31' 56"	-23° 28' 37"	0° 58' 46"	16' 00.83"	279° 35' 56"	0.47225
13	248° 14' 17"	-1° 57' 49"	246° 08' 46"	-23° 37' 04"	0° 58' 47"	16' 01.19"	279° 21' 27"	0.47694
14	248° 49' 01"	-2° 00' 40"	246° 45' 42"	-23° 45' 24"	0° 58' 49"	16' 01.54"	279° 6' 49"	0.48164
15	249° 23' 47"	-2° 03' 30"	247° 22' 44"	-23° 53' 35"	0° 58' 50"	16' 01.89"	278° 52' 02"	0.48634
16	249° 58' 34"	-2° 06' 19"	247° 59' 52"	-24° 01' 37"	0° 58' 51"	16' 02.24"	278° 37' 07"	0.49104
17	250° 33' 23"	-2° 09' 07"	248° 37' 07"	-24° 09' 31"	0° 58' 52"	16' 02.60"	278° 22' 03"	0.49575
18	251° 08' 14"	-2° 11' 55"	249° 14' 28"	-24° 17' 16"	0° 58' 54"	16' 02.94"	278° 6' 50"	0.50046
19	251° 43' 06"	-2° 14' 42"	249° 51' 55"	-24° 24' 52"	0° 58' 55"	16' 03.29"	277° 51' 28"	0.50518
20	252° 17' 60"	-2° 17' 29"	250° 29' 28"	-24° 32' 20"	0° 58' 56"	16' 03.64"	277° 35' 58"	0.50990
21	252° 52' 55"	-2° 20' 15"	251° 07' 07"	-24° 39' 38"	0° 58' 58"	16' 03.98"	277° 20' 20"	0.51462
22	253° 27' 52"	-2° 22' 60"	251° 44' 52"	-24° 46' 47"	0° 58' 59"	16' 04.33"	277° 4' 34"	0.51934
23	254° 02' 51"	-2° 25' 44"	252° 22' 43"	-24° 53' 47"	0° 59' 00"	16' 04.67"	276° 48' 39"	0.52407
24	254° 37' 52"	-2° 28' 27"	253° 00' 40"	-25° 00' 38"	0° 59' 01"	16' 05.01"	276° 32' 36"	0.52880

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	161° 28' 19"	-0.07"	162° 53' 59"	7° 15' 53"	1.0086320	15' 51.42"	23° 26' 17"	0 m 47 s
1	161° 30' 44"	-0.07"	162° 56' 14"	7° 14' 58"	1.0086215	15' 51.43"	23° 26' 17"	0 m 48 s
2	161° 33' 10"	-0.08"	162° 58' 30"	7° 14' 03"	1.0086111	15' 51.44"	23° 26' 17"	0 m 49 s
3	161° 35' 35"	-0.08"	163° 00' 45"	7° 13' 07"	1.0086006	15' 51.45"	23° 26' 17"	0 m 49 s
4	161° 38' 00"	-0.09"	163° 03' 00"	7° 12' 12"	1.0085902	15' 51.46"	23° 26' 17"	0 m 50 s
5	161° 40' 25"	-0.09"	163° 05' 16"	7° 11' 17"	1.0085797	15' 51.47"	23° 26' 17"	0 m 51 s
6	161° 42' 51"	-0.10"	163° 07' 31"	7° 10' 21"	1.0085692	15' 51.48"	23° 26' 17"	0 m 52 s
7	161° 45' 16"	-0.10"	163° 09' 47"	7° 09' 26"	1.0085588	15' 51.49"	23° 26' 17"	0 m 53 s
8	161° 47' 41"	-0.11"	163° 12' 02"	7° 08' 31"	1.0085483	15' 51.50"	23° 26' 17"	0 m 54 s
9	161° 50' 07"	-0.11"	163° 14' 18"	7° 07' 35"	1.0085378	15' 51.51"	23° 26' 17"	0 m 54 s
10	161° 52' 32"	-0.12"	163° 16' 33"	7° 06' 40"	1.0085273	15' 51.52"	23° 26' 17"	0 m 55 s
11	161° 54' 57"	-0.12"	163° 18' 48"	7° 05' 45"	1.0085168	15' 51.53"	23° 26' 17"	0 m 56 s
12	161° 57' 23"	-0.13"	163° 21' 04"	7° 04' 49"	1.0085063	15' 51.54"	23° 26' 17"	0 m 57 s
13	161° 59' 48"	-0.13"	163° 23' 19"	7° 03' 54"	1.0084958	15' 51.55"	23° 26' 17"	0 m 58 s
14	162° 02' 13"	-0.13"	163° 25' 35"	7° 02' 59"	1.0084853	15' 51.56"	23° 26' 17"	0 m 59 s
15	162° 04' 39"	-0.14"	163° 27' 50"	7° 02' 03"	1.0084748	15' 51.57"	23° 26' 17"	0 m 59 s
16	162° 07' 04"	-0.14"	163° 30' 05"	7° 01' 08"	1.0084643	15' 51.58"	23° 26' 17"	1 m 00 s
17	162° 09' 29"	-0.15"	163° 32' 21"	7° 00' 12"	1.0084538	15' 51.59"	23° 26' 17"	1 m 01 s
18	162° 11' 55"	-0.15"	163° 34' 36"	6° 59' 17"	1.0084433	15' 51.60"	23° 26' 17"	1 m 02 s
19	162° 14' 20"	-0.16"	163° 36' 51"	6° 58' 21"	1.0084328	15' 51.61"	23° 26' 17"	1 m 03 s
20	162° 16' 45"	-0.16"	163° 39' 07"	6° 57' 26"	1.0084223	15' 51.62"	23° 26' 17"	1 m 04 s
21	162° 19' 11"	-0.16"	163° 41' 22"	6° 56' 30"	1.0084117	15' 51.63"	23° 26' 17"	1 m 04 s
22	162° 21' 36"	-0.17"	163° 43' 38"	6° 55' 35"	1.0084012	15' 51.64"	23° 26' 17"	1 m 05 s
23	162° 24' 01"	-0.17"	163° 45' 53"	6° 54' 39"	1.0083907	15' 51.65"	23° 26' 17"	1 m 06 s
24	162° 26' 27"	-0.18"	163° 48' 08"	6° 53' 44"	1.0083801	15' 51.65"	23° 26' 17"	1 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	254° 37' 52"	-2° 28' 27"	253° 00' 40"	-25° 00' 38"	0° 59' 01"	16' 05.01"	276° 32' 36"	0.52880
1	255° 12' 54"	-2° 31' 10"	253° 38' 43"	-25° 07' 20"	0° 59' 03"	16' 05.35"	276° 16' 25"	0.53353
2	255° 47' 58"	-2° 33' 52"	254° 16' 52"	-25° 13' 52"	0° 59' 04"	16' 05.69"	276° 0' 06"	0.53825
3	256° 23' 03"	-2° 36' 33"	254° 55' 06"	-25° 20' 14"	0° 59' 05"	16' 06.03"	275° 43' 40"	0.54298
4	256° 58' 10"	-2° 39' 13"	255° 33' 26"	-25° 26' 27"	0° 59' 06"	16' 06.36"	275° 27' 05"	0.54771
5	257° 33' 19"	-2° 41' 52"	256° 11' 51"	-25° 32' 30"	0° 59' 08"	16' 06.70"	275° 10' 23"	0.55244
6	258° 08' 29"	-2° 44' 30"	256° 50' 22"	-25° 38' 23"	0° 59' 09"	16' 07.03"	274° 53' 34"	0.55717
7	258° 43' 41"	-2° 47' 08"	257° 28' 58"	-25° 44' 07"	0° 59' 10"	16' 07.36"	274° 36' 37"	0.56189
8	259° 18' 54"	-2° 49' 44"	258° 07' 39"	-25° 49' 40"	0° 59' 11"	16' 07.69"	274° 19' 33"	0.56661
9	259° 54' 10"	-2° 52' 19"	258° 46' 26"	-25° 55' 03"	0° 59' 12"	16' 08.02"	274° 2' 22"	0.57133
10	260° 29' 26"	-2° 54' 54"	259° 25' 18"	-26° 00' 17"	0° 59' 14"	16' 08.34"	273° 45' 04"	0.57605
11	261° 04' 45"	-2° 57' 27"	260° 04' 15"	-26° 05' 20"	0° 59' 15"	16' 08.66"	273° 27' 39"	0.58076
12	261° 40' 05"	-2° 59' 60"	260° 43' 16"	-26° 10' 13"	0° 59' 16"	16' 08.98"	273° 10' 07"	0.58547
13	262° 15' 27"	-3° 02' 31"	261° 22' 23"	-26° 14' 55"	0° 59' 17"	16' 09.30"	272° 52' 28"	0.59018
14	262° 50' 50"	-3° 05' 02"	262° 01' 34"	-26° 19' 27"	0° 59' 18"	16' 09.62"	272° 34' 43"	0.59488
15	263° 26' 15"	-3° 07' 31"	262° 40' 50"	-26° 23' 49"	0° 59' 19"	16' 09.94"	272° 16' 51"	0.59957
16	264° 01' 41"	-3° 09' 59"	263° 20' 10"	-26° 27' 60"	0° 59' 21"	16' 10.25"	271° 58' 54"	0.60426
17	264° 37' 09"	-3° 12' 26"	263° 59' 35"	-26° 31' 60"	0° 59' 22"	16' 10.56"	271° 40' 50"	0.60894
18	265° 12' 39"	-3° 14' 52"	264° 39' 04"	-26° 35' 50"	0° 59' 23"	16' 10.87"	271° 22' 40"	0.61362
19	265° 48' 11"	-3° 17' 17"	265° 18' 37"	-26° 39' 28"	0° 59' 24"	16' 11.17"	271° 4' 24"	0.61828
20	266° 23' 43"	-3° 19' 40"	265° 58' 15"	-26° 42' 56"	0° 59' 25"	16' 11.48"	270° 46' 02"	0.62294
21	266° 59' 18"	-3° 22' 03"	266° 37' 56"	-26° 46' 14"	0° 59' 26"	16' 11.78"	270° 27' 35"	0.62760
22	267° 34' 54"	-3° 24' 24"	267° 17' 41"	-26° 49' 20"	0° 59' 27"	16' 12.08"	270° 9' 03"	0.63224
23	268° 10' 31"	-3° 26' 44"	267° 57' 29"	-26° 52' 15"	0° 59' 28"	16' 12.37"	269° 50' 25"	0.63687
24	268° 46' 11"	-3° 29' 03"	268° 37' 22"	-26° 54' 59"	0° 59' 29"	16' 12.67"	269° 31' 42"	0.64150



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	162° 26' 27"	-0.18"	163° 48' 08"	6° 53' 44"	1.0083801	15' 51.65"	23° 26' 17"	1 m 07 s
1	162° 28' 52"	-0.18"	163° 50' 23"	6° 52' 48"	1.0083696	15' 51.66"	23° 26' 17"	1 m 08 s
2	162° 31' 18"	-0.18"	163° 52' 39"	6° 51' 53"	1.0083591	15' 51.67"	23° 26' 17"	1 m 09 s
3	162° 33' 43"	-0.19"	163° 54' 54"	6° 50' 57"	1.0083485	15' 51.68"	23° 26' 17"	1 m 09 s
4	162° 36' 08"	-0.19"	163° 57' 09"	6° 50' 02"	1.0083380	15' 51.69"	23° 26' 17"	1 m 10 s
5	162° 38' 34"	-0.20"	163° 59' 25"	6° 49' 06"	1.0083274	15' 51.70"	23° 26' 17"	1 m 11 s
6	162° 40' 59"	-0.20"	164° 01' 40"	6° 48' 10"	1.0083169	15' 51.71"	23° 26' 17"	1 m 12 s
7	162° 43' 24"	-0.20"	164° 03' 55"	6° 47' 15"	1.0083063	15' 51.72"	23° 26' 18"	1 m 13 s
8	162° 45' 50"	-0.21"	164° 06' 10"	6° 46' 19"	1.0082957	15' 51.73"	23° 26' 18"	1 m 13 s
9	162° 48' 15"	-0.21"	164° 08' 26"	6° 45' 24"	1.0082852	15' 51.74"	23° 26' 18"	1 m 14 s
10	162° 50' 41"	-0.21"	164° 10' 41"	6° 44' 28"	1.0082746	15' 51.75"	23° 26' 18"	1 m 15 s
11	162° 53' 06"	-0.22"	164° 12' 56"	6° 43' 32"	1.0082640	15' 51.76"	23° 26' 18"	1 m 16 s
12	162° 55' 31"	-0.22"	164° 15' 12"	6° 42' 37"	1.0082535	15' 51.77"	23° 26' 18"	1 m 17 s
13	162° 57' 57"	-0.22"	164° 17' 27"	6° 41' 41"	1.0082429	15' 51.78"	23° 26' 18"	1 m 18 s
14	163° 00' 22"	-0.23"	164° 19' 42"	6° 40' 45"	1.0082323	15' 51.79"	23° 26' 18"	1 m 19 s
15	163° 02' 47"	-0.23"	164° 21' 57"	6° 39' 50"	1.0082217	15' 51.80"	23° 26' 18"	1 m 19 s
16	163° 05' 13"	-0.24"	164° 24' 12"	6° 38' 54"	1.0082111	15' 51.81"	23° 26' 18"	1 m 20 s
17	163° 07' 38"	-0.24"	164° 26' 28"	6° 37' 58"	1.0082005	15' 51.82"	23° 26' 18"	1 m 21 s
18	163° 10' 04"	-0.24"	164° 28' 43"	6° 37' 02"	1.0081899	15' 51.83"	23° 26' 18"	1 m 22 s
19	163° 12' 29"	-0.25"	164° 30' 58"	6° 36' 07"	1.0081793	15' 51.84"	23° 26' 18"	1 m 23 s
20	163° 14' 54"	-0.25"	164° 33' 13"	6° 35' 11"	1.0081687	15' 51.85"	23° 26' 18"	1 m 24 s
21	163° 17' 20"	-0.25"	164° 35' 28"	6° 34' 15"	1.0081581	15' 51.86"	23° 26' 18"	1 m 24 s
22	163° 19' 45"	-0.25"	164° 37' 44"	6° 33' 19"	1.0081475	15' 51.87"	23° 26' 18"	1 m 25 s
23	163° 22' 11"	-0.26"	164° 39' 59"	6° 32' 24"	1.0081369	15' 51.88"	23° 26' 18"	1 m 26 s
24	163° 24' 36"	-0.26"	164° 42' 14"	6° 31' 28"	1.0081263	15' 51.89"	23° 26' 18"	1 m 27 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	268° 46' 11"	-3° 29' 03"	268° 37' 22"	-26° 54' 59"	0° 59' 29"	16' 12.67"	269° 31' 42"	0.64150
1	269° 21' 51"	-3° 31' 20"	269° 17' 17"	-26° 57' 32"	0° 59' 31"	16' 12.96"	269° 12' 54"	0.64611
2	269° 57' 33"	-3° 33' 36"	269° 57' 16"	-26° 59' 54"	0° 59' 32"	16' 13.25"	268° 54' 01"	0.65072
3	270° 33' 17"	-3° 35' 51"	270° 37' 18"	-27° 02' 04"	0° 59' 33"	16' 13.53"	268° 35' 03"	0.65531
4	271° 09' 02"	-3° 38' 05"	271° 17' 23"	-27° 04' 04"	0° 59' 34"	16' 13.82"	268° 16' 01"	0.65989
5	271° 44' 49"	-3° 40' 17"	271° 57' 31"	-27° 05' 52"	0° 59' 35"	16' 14.10"	267° 56' 54"	0.66446
6	272° 20' 38"	-3° 42' 28"	272° 37' 41"	-27° 07' 28"	0° 59' 36"	16' 14.37"	267° 37' 43"	0.66902
7	272° 56' 27"	-3° 44' 37"	273° 17' 54"	-27° 08' 54"	0° 59' 37"	16' 14.65"	267° 18' 28"	0.67356
8	273° 32' 19"	-3° 46' 45"	273° 58' 10"	-27° 10' 07"	0° 59' 38"	16' 14.92"	266° 59' 09"	0.67809
9	274° 08' 11"	-3° 48' 52"	274° 38' 27"	-27° 11' 10"	0° 59' 39"	16' 15.19"	266° 39' 46"	0.68261
10	274° 44' 05"	-3° 50' 57"	275° 18' 47"	-27° 12' 01"	0° 59' 40"	16' 15.45"	266° 20' 19"	0.68711
11	275° 20' 01"	-3° 53' 01"	275° 59' 09"	-27° 12' 40"	0° 59' 41"	16' 15.71"	266° 0' 49"	0.69159
12	275° 55' 58"	-3° 55' 04"	276° 39' 33"	-27° 13' 08"	0° 59' 42"	16' 15.97"	265° 41' 15"	0.69606
13	276° 31' 57"	-3° 57' 04"	277° 19' 58"	-27° 13' 24"	0° 59' 43"	16' 16.23"	265° 21' 39"	0.70052
14	277° 07' 57"	-3° 59' 04"	278° 00' 25"	-27° 13' 28"	0° 59' 43"	16' 16.48"	265° 1' 59"	0.70496
15	277° 43' 58"	-4° 01' 02"	278° 40' 53"	-27° 13' 21"	0° 59' 44"	16' 16.73"	264° 42' 16"	0.70938
16	278° 20' 00"	-4° 02' 58"	279° 21' 23"	-27° 13' 03"	0° 59' 45"	16' 16.97"	264° 22' 30"	0.71379
17	278° 56' 04"	-4° 04' 53"	280° 01' 53"	-27° 12' 32"	0° 59' 46"	16' 17.22"	264° 2' 42"	0.71817
18	279° 32' 10"	-4° 06' 46"	280° 42' 24"	-27° 11' 50"	0° 59' 47"	16' 17.45"	263° 42' 51"	0.72254
19	280° 08' 17"	-4° 08' 38"	281° 22' 56"	-27° 10' 56"	0° 59' 48"	16' 17.69"	263° 22' 58"	0.72689
20	280° 44' 25"	-4° 10' 28"	282° 03' 29"	-27° 09' 51"	0° 59' 49"	16' 17.92"	263° 3' 03"	0.73122
21	281° 20' 34"	-4° 12' 16"	282° 44' 02"	-27° 08' 34"	0° 59' 50"	16' 18.15"	262° 43' 05"	0.73553
22	281° 56' 45"	-4° 14' 03"	283° 24' 35"	-27° 07' 05"	0° 59' 50"	16' 18.37"	262° 23' 06"	0.73982
23	282° 32' 57"	-4° 15' 48"	284° 05' 09"	-27° 05' 24"	0° 59' 51"	16' 18.59"	262° 3' 05"	0.74409
24	283° 09' 10"	-4° 17' 32"	284° 45' 42"	-27° 03' 32"	0° 59' 52"	16' 18.80"	261° 43' 02"	0.74834

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	163° 24' 36"	-0.26"	164° 42' 14"	6° 31' 28"	1.0081263	15' 51.89"	23° 26' 18"	1 m 27 s
1	163° 27' 02"	-0.26"	164° 44' 29"	6° 30' 32"	1.0081157	15' 51.90"	23° 26' 18"	1 m 28 s
2	163° 29' 27"	-0.27"	164° 46' 44"	6° 29' 36"	1.0081051	15' 51.91"	23° 26' 18"	1 m 29 s
3	163° 31' 52"	-0.27"	164° 48' 59"	6° 28' 40"	1.0080945	15' 51.92"	23° 26' 18"	1 m 29 s
4	163° 34' 18"	-0.27"	164° 51' 15"	6° 27' 45"	1.0080838	15' 51.93"	23° 26' 18"	1 m 30 s
5	163° 36' 43"	-0.28"	164° 53' 30"	6° 26' 49"	1.0080732	15' 51.94"	23° 26' 18"	1 m 31 s
6	163° 39' 09"	-0.28"	164° 55' 45"	6° 25' 53"	1.0080626	15' 51.95"	23° 26' 18"	1 m 32 s
7	163° 41' 34"	-0.28"	164° 57' 60"	6° 24' 57"	1.0080520	15' 51.96"	23° 26' 18"	1 m 33 s
8	163° 43' 60"	-0.28"	165° 00' 15"	6° 24' 01"	1.0080413	15' 51.97"	23° 26' 18"	1 m 34 s
9	163° 46' 25"	-0.29"	165° 02' 30"	6° 23' 05"	1.0080307	15' 51.98"	23° 26' 18"	1 m 34 s
10	163° 48' 50"	-0.29"	165° 04' 45"	6° 22' 09"	1.0080201	15' 51.99"	23° 26' 18"	1 m 35 s
11	163° 51' 16"	-0.29"	165° 07' 00"	6° 21' 13"	1.0080094	15' 52.01"	23° 26' 18"	1 m 36 s
12	163° 53' 41"	-0.29"	165° 09' 16"	6° 20' 18"	1.0079988	15' 52.02"	23° 26' 18"	1 m 37 s
13	163° 56' 07"	-0.30"	165° 11' 31"	6° 19' 22"	1.0079881	15' 52.03"	23° 26' 18"	1 m 38 s
14	163° 58' 32"	-0.30"	165° 13' 46"	6° 18' 26"	1.0079775	15' 52.04"	23° 26' 18"	1 m 39 s
15	164° 00' 58"	-0.30"	165° 16' 01"	6° 17' 30"	1.0079668	15' 52.05"	23° 26' 18"	1 m 40 s
16	164° 03' 23"	-0.30"	165° 18' 16"	6° 16' 34"	1.0079562	15' 52.06"	23° 26' 18"	1 m 40 s
17	164° 05' 49"	-0.30"	165° 20' 31"	6° 15' 38"	1.0079455	15' 52.07"	23° 26' 18"	1 m 41 s
18	164° 08' 14"	-0.31"	165° 22' 46"	6° 14' 42"	1.0079349	15' 52.08"	23° 26' 18"	1 m 42 s
19	164° 10' 40"	-0.31"	165° 25' 01"	6° 13' 46"	1.0079242	15' 52.09"	23° 26' 18"	1 m 43 s
20	164° 13' 05"	-0.31"	165° 27' 16"	6° 12' 50"	1.0079135	15' 52.10"	23° 26' 18"	1 m 44 s
21	164° 15' 30"	-0.31"	165° 29' 31"	6° 11' 54"	1.0079029	15' 52.11"	23° 26' 18"	1 m 45 s
22	164° 17' 56"	-0.32"	165° 31' 46"	6° 10' 58"	1.0078922	15' 52.12"	23° 26' 18"	1 m 45 s
23	164° 20' 21"	-0.32"	165° 34' 01"	6° 10' 02"	1.0078815	15' 52.13"	23° 26' 18"	1 m 46 s
24	164° 22' 47"	-0.32"	165° 36' 16"	6° 09' 06"	1.0078709	15' 52.14"	23° 26' 18"	1 m 47 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	283° 09' 10"	-4° 17' 32"	284° 45' 42"	-27° 03' 32"	0° 59' 52"	16' 18.80"	261° 43' 02"	0.74834
1	283° 45' 24"	-4° 19' 14"	285° 26' 15"	-27° 01' 28"	0° 59' 53"	16' 19.02"	261° 22' 57"	0.75257
2	284° 21' 40"	-4° 20' 54"	286° 06' 48"	-26° 59' 12"	0° 59' 54"	16' 19.22"	261° 2' 52"	0.75677
3	284° 57' 53"	-4° 22' 32"	286° 47' 17"	-26° 56' 45"	0° 59' 54"	16' 19.43"	260° 42' 46"	0.76095
4	285° 34' 11"	-4° 24' 09"	287° 27' 48"	-26° 54' 06"	0° 59' 55"	16' 19.63"	260° 22' 38"	0.76511
5	286° 10' 31"	-4° 25' 44"	288° 08' 19"	-26° 51' 15"	0° 59' 56"	16' 19.82"	260° 2' 28"	0.76924
6	286° 46' 51"	-4° 27' 17"	288° 48' 49"	-26° 48' 13"	0° 59' 56"	16' 20.01"	259° 42' 18"	0.77335
7	287° 23' 13"	-4° 28' 49"	289° 29' 17"	-26° 44' 59"	0° 59' 57"	16' 20.20"	259° 22' 07"	0.77744
8	287° 59' 35"	-4° 30' 19"	290° 09' 45"	-26° 41' 34"	0° 59' 58"	16' 20.38"	259° 1' 54"	0.78150
9	288° 35' 59"	-4° 31' 47"	290° 50' 10"	-26° 37' 57"	0° 59' 58"	16' 20.56"	258° 41' 42"	0.78554
10	289° 12' 24"	-4° 33' 13"	291° 30' 35"	-26° 34' 08"	0° 59' 59"	16' 20.73"	258° 21' 28"	0.78955
11	289° 48' 50"	-4° 34' 37"	292° 10' 57"	-26° 30' 08"	0° 59' 60"	16' 20.90"	258° 1' 14"	0.79353
12	290° 25' 17"	-4° 35' 60"	292° 51' 18"	-26° 25' 56"	1° 00' 00"	16' 21.07"	257° 41' 00"	0.79749
13	291° 01' 45"	-4° 37' 20"	293° 31' 36"	-26° 21' 33"	1° 00' 01"	16' 21.23"	257° 20' 46"	0.80142
14	291° 38' 13"	-4° 38' 39"	294° 11' 53"	-26° 16' 59"	1° 00' 01"	16' 21.38"	257° 0' 31"	0.80532
15	292° 14' 43"	-4° 39' 56"	294° 52' 07"	-26° 12' 13"	1° 00' 02"	16' 21.53"	256° 40' 15"	0.80920
16	292° 51' 14"	-4° 41' 11"	295° 32' 18"	-26° 07' 16"	1° 00' 03"	16' 21.68"	256° 20' 00"	0.81304
17	293° 27' 46"	-4° 42' 25"	296° 12' 27"	-26° 02' 08"	1° 00' 03"	16' 21.82"	255° 59' 45"	0.81686
18	294° 04' 19"	-4° 43' 36"	296° 52' 34"	-25° 56' 49"	1° 00' 04"	16' 21.95"	255° 39' 29"	0.82064
19	294° 40' 52"	-4° 44' 45"	297° 32' 37"	-25° 51' 18"	1° 00' 04"	16' 22.08"	255° 19' 13"	0.82440
20	295° 17' 26"	-4° 45' 53"	298° 12' 38"	-25° 45' 36"	1° 00' 04"	16' 22.21"	254° 58' 58"	0.82813
21	295° 54' 02"	-4° 46' 59"	298° 52' 35"	-25° 39' 43"	1° 00' 05"	16' 22.33"	254° 38' 42"	0.83182
22	296° 30' 38"	-4° 48' 02"	299° 32' 29"	-25° 33' 39"	1° 00' 05"	16' 22.45"	254° 18' 26"	0.83549
23	297° 07' 14"	-4° 49' 04"	300° 12' 19"	-25° 27' 25"	1° 00' 06"	16' 22.56"	253° 58' 10"	0.83912
24	297° 43' 52"	-4° 50' 04"	300° 52' 07"	-25° 20' 59"	1° 00' 06"	16' 22.66"	253° 37' 54"	0.84272

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	164° 22' 47"	-0.32"	165° 36' 16"	6° 09' 06"	1.0078709	15' 52.14"	23° 26' 18"	1 m 47 s
1	164° 25' 12"	-0.32"	165° 38' 31"	6° 08' 10"	1.0078602	15' 52.15"	23° 26' 18"	1 m 48 s
2	164° 27' 38"	-0.32"	165° 40' 46"	6° 07' 14"	1.0078495	15' 52.16"	23° 26' 18"	1 m 49 s
3	164° 30' 03"	-0.32"	165° 43' 01"	6° 06' 18"	1.0078388	15' 52.17"	23° 26' 18"	1 m 50 s
4	164° 32' 29"	-0.33"	165° 45' 16"	6° 05' 21"	1.0078282	15' 52.18"	23° 26' 18"	1 m 51 s
5	164° 34' 54"	-0.33"	165° 47' 31"	6° 04' 25"	1.0078175	15' 52.19"	23° 26' 18"	1 m 51 s
6	164° 37' 20"	-0.33"	165° 49' 46"	6° 03' 29"	1.0078068	15' 52.20"	23° 26' 18"	1 m 52 s
7	164° 39' 45"	-0.33"	165° 52' 01"	6° 02' 33"	1.0077961	15' 52.21"	23° 26' 18"	1 m 53 s
8	164° 42' 11"	-0.33"	165° 54' 16"	6° 01' 37"	1.0077854	15' 52.22"	23° 26' 18"	1 m 54 s
9	164° 44' 36"	-0.33"	165° 56' 31"	6° 00' 41"	1.0077747	15' 52.23"	23° 26' 18"	1 m 55 s
10	164° 47' 02"	-0.33"	165° 58' 46"	5° 59' 45"	1.0077640	15' 52.24"	23° 26' 18"	1 m 56 s
11	164° 49' 27"	-0.34"	166° 01' 01"	5° 58' 49"	1.0077534	15' 52.25"	23° 26' 18"	1 m 57 s
12	164° 51' 53"	-0.34"	166° 03' 16"	5° 57' 52"	1.0077427	15' 52.26"	23° 26' 18"	1 m 57 s
13	164° 54' 18"	-0.34"	166° 05' 31"	5° 56' 56"	1.0077320	15' 52.27"	23° 26' 18"	1 m 58 s
14	164° 56' 44"	-0.34"	166° 07' 46"	5° 55' 60"	1.0077213	15' 52.28"	23° 26' 18"	1 m 59 s
15	164° 59' 09"	-0.34"	166° 10' 01"	5° 55' 04"	1.0077106	15' 52.29"	23° 26' 18"	1 m 60 s
16	165° 01' 35"	-0.34"	166° 12' 16"	5° 54' 08"	1.0076999	15' 52.30"	23° 26' 18"	2 m 01 s
17	165° 04' 00"	-0.34"	166° 14' 31"	5° 53' 11"	1.0076892	15' 52.31"	23° 26' 18"	2 m 02 s
18	165° 06' 26"	-0.34"	166° 16' 46"	5° 52' 15"	1.0076784	15' 52.32"	23° 26' 18"	2 m 03 s
19	165° 08' 51"	-0.34"	166° 19' 01"	5° 51' 19"	1.0076677	15' 52.33"	23° 26' 18"	2 m 03 s
20	165° 11' 17"	-0.35"	166° 21' 16"	5° 50' 23"	1.0076570	15' 52.34"	23° 26' 18"	2 m 04 s
21	165° 13' 43"	-0.35"	166° 23' 31"	5° 49' 26"	1.0076463	15' 52.35"	23° 26' 18"	2 m 05 s
22	165° 16' 08"	-0.35"	166° 25' 46"	5° 48' 30"	1.0076356	15' 52.36"	23° 26' 18"	2 m 06 s
23	165° 18' 34"	-0.35"	166° 28' 00"	5° 47' 34"	1.0076249	15' 52.37"	23° 26' 18"	2 m 07 s
24	165° 20' 59"	-0.35"	166° 30' 15"	5° 46' 38"	1.0076142	15' 52.38"	23° 26' 18"	2 m 08 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	297° 43' 52"	-4° 50' 04"	300° 52' 07"	-25° 20' 59"	1° 00' 06"	16' 22.66"	253° 37' 54"	0.84272
1	298° 20' 30"	-4° 51' 01"	301° 31' 50"	-25° 14' 23"	1° 00' 06"	16' 22.76"	253° 17' 38"	0.84629
2	298° 57' 09"	-4° 51' 57"	302° 11' 30"	-25° 07' 36"	1° 00' 07"	16' 22.86"	252° 57' 21"	0.84982
3	299° 33' 48"	-4° 52' 51"	302° 51' 06"	-25° 00' 38"	1° 00' 07"	16' 22.95"	252° 37' 04"	0.85332
4	300° 10' 29"	-4° 53' 43"	303° 30' 38"	-24° 53' 30"	1° 00' 07"	16' 23.03"	252° 16' 47"	0.85679
5	300° 47' 09"	-4° 54' 33"	304° 10' 06"	-24° 46' 11"	1° 00' 08"	16' 23.11"	251° 56' 30"	0.86022
6	301° 23' 51"	-4° 55' 21"	304° 49' 29"	-24° 38' 41"	1° 00' 08"	16' 23.18"	251° 36' 12"	0.86362
7	302° 00' 33"	-4° 56' 06"	305° 28' 49"	-24° 31' 02"	1° 00' 08"	16' 23.25"	251° 15' 54"	0.86699
8	302° 37' 15"	-4° 56' 50"	306° 08' 04"	-24° 23' 12"	1° 00' 09"	16' 23.31"	250° 55' 34"	0.87032
9	303° 13' 58"	-4° 57' 32"	306° 47' 14"	-24° 15' 11"	1° 00' 09"	16' 23.37"	250° 35' 14"	0.87361
10	303° 50' 42"	-4° 58' 12"	307° 26' 20"	-24° 07' 01"	1° 00' 09"	16' 23.42"	250° 14' 52"	0.87686
11	304° 27' 26"	-4° 58' 49"	308° 05' 22"	-23° 58' 41"	1° 00' 09"	16' 23.47"	249° 54' 30"	0.88008
12	305° 04' 10"	-4° 59' 25"	308° 44' 18"	-23° 50' 11"	1° 00' 09"	16' 23.51"	249° 34' 05"	0.88327
13	305° 40' 55"	-4° 59' 59"	309° 23' 10"	-23° 41' 31"	1° 00' 09"	16' 23.54"	249° 13' 39"	0.88641
14	306° 17' 40"	-5° 00' 30"	310° 01' 57"	-23° 32' 41"	1° 00' 09"	16' 23.57"	248° 53' 11"	0.88952
15	306° 54' 25"	-5° 00' 60"	310° 40' 39"	-23° 23' 41"	1° 00' 10"	16' 23.59"	248° 32' 41"	0.89259
16	307° 31' 11"	-5° 01' 27"	311° 19' 16"	-23° 14' 32"	1° 00' 10"	16' 23.61"	248° 12' 08"	0.89562
17	308° 07' 57"	-5° 01' 52"	311° 57' 48"	-23° 05' 13"	1° 00' 10"	16' 23.62"	247° 51' 32"	0.89862
18	308° 44' 43"	-5° 02' 15"	312° 36' 14"	-22° 55' 45"	1° 00' 10"	16' 23.62"	247° 30' 52"	0.90157
19	309° 21' 29"	-5° 02' 37"	313° 14' 36"	-22° 46' 08"	1° 00' 10"	16' 23.62"	247° 10' 09"	0.90448
20	309° 58' 16"	-5° 02' 56"	313° 52' 52"	-22° 36' 21"	1° 00' 10"	16' 23.62"	246° 49' 22"	0.90736
21	310° 35' 02"	-5° 03' 13"	314° 31' 02"	-22° 26' 26"	1° 00' 10"	16' 23.60"	246° 28' 29"	0.91019
22	311° 11' 49"	-5° 03' 28"	315° 09' 08"	-22° 16' 21"	1° 00' 10"	16' 23.58"	246° 7' 32"	0.91299
23	311° 48' 36"	-5° 03' 40"	315° 47' 07"	-22° 06' 08"	1° 00' 09"	16' 23.56"	245° 46' 29"	0.91574
24	312° 25' 23"	-5° 03' 51"	316° 25' 01"	-21° 55' 46"	1° 00' 09"	16' 23.53"	245° 25' 20"	0.91845

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	165° 20' 59"	-0.35"	166° 30' 15"	5° 46' 38"	1.0076142	15' 52.38"	23° 26' 18"	2 m 08 s
1	165° 23' 25"	-0.35"	166° 32' 30"	5° 45' 41"	1.0076035	15' 52.39"	23° 26' 18"	2 m 08 s
2	165° 25' 50"	-0.35"	166° 34' 45"	5° 44' 45"	1.0075927	15' 52.40"	23° 26' 18"	2 m 09 s
3	165° 28' 16"	-0.35"	166° 37' 00"	5° 43' 49"	1.0075820	15' 52.41"	23° 26' 18"	2 m 10 s
4	165° 30' 41"	-0.35"	166° 39' 15"	5° 42' 52"	1.0075713	15' 52.42"	23° 26' 18"	2 m 11 s
5	165° 33' 07"	-0.35"	166° 41' 30"	5° 41' 56"	1.0075606	15' 52.43"	23° 26' 18"	2 m 12 s
6	165° 35' 32"	-0.35"	166° 43' 45"	5° 40' 60"	1.0075498	15' 52.44"	23° 26' 18"	2 m 13 s
7	165° 37' 58"	-0.35"	166° 45' 60"	5° 40' 03"	1.0075391	15' 52.45"	23° 26' 18"	2 m 14 s
8	165° 40' 24"	-0.35"	166° 48' 14"	5° 39' 07"	1.0075284	15' 52.46"	23° 26' 18"	2 m 15 s
9	165° 42' 49"	-0.35"	166° 50' 29"	5° 38' 11"	1.0075176	15' 52.47"	23° 26' 18"	2 m 15 s
10	165° 45' 15"	-0.35"	166° 52' 44"	5° 37' 14"	1.0075069	15' 52.48"	23° 26' 18"	2 m 16 s
11	165° 47' 40"	-0.35"	166° 54' 59"	5° 36' 18"	1.0074962	15' 52.49"	23° 26' 18"	2 m 17 s
12	165° 50' 06"	-0.35"	166° 57' 14"	5° 35' 21"	1.0074854	15' 52.50"	23° 26' 18"	2 m 18 s
13	165° 52' 31"	-0.35"	166° 59' 29"	5° 34' 25"	1.0074747	15' 52.51"	23° 26' 18"	2 m 19 s
14	165° 54' 57"	-0.35"	167° 01' 44"	5° 33' 29"	1.0074640	15' 52.52"	23° 26' 18"	2 m 20 s
15	165° 57' 23"	-0.35"	167° 03' 58"	5° 32' 32"	1.0074532	15' 52.53"	23° 26' 18"	2 m 21 s
16	165° 59' 48"	-0.35"	167° 06' 13"	5° 31' 36"	1.0074425	15' 52.54"	23° 26' 18"	2 m 21 s
17	166° 02' 14"	-0.35"	167° 08' 28"	5° 30' 39"	1.0074317	15' 52.55"	23° 26' 18"	2 m 22 s
18	166° 04' 39"	-0.35"	167° 10' 43"	5° 29' 43"	1.0074210	15' 52.56"	23° 26' 18"	2 m 23 s
19	166° 07' 05"	-0.35"	167° 12' 58"	5° 28' 46"	1.0074103	15' 52.57"	23° 26' 18"	2 m 24 s
20	166° 09' 31"	-0.35"	167° 15' 12"	5° 27' 50"	1.0073995	15' 52.58"	23° 26' 18"	2 m 25 s
21	166° 11' 56"	-0.35"	167° 17' 27"	5° 26' 53"	1.0073888	15' 52.59"	23° 26' 18"	2 m 26 s
22	166° 14' 22"	-0.35"	167° 19' 42"	5° 25' 57"	1.0073780	15' 52.60"	23° 26' 18"	2 m 27 s
23	166° 16' 47"	-0.35"	167° 21' 57"	5° 25' 00"	1.0073673	15' 52.61"	23° 26' 18"	2 m 27 s
24	166° 19' 13"	-0.35"	167° 24' 12"	5° 24' 04"	1.0073565	15' 52.62"	23° 26' 18"	2 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	312° 25' 23"	-5° 03' 51"	316° 25' 01"	-21° 55' 46"	1° 00' 09"	16' 23.53"	245° 25' 20"	0.91845
1	313° 02' 10"	-5° 03' 60"	317° 02' 50"	-21° 45' 15"	1° 00' 09"	16' 23.49"	245° 4' 03"	0.92112
2	313° 38' 56"	-5° 04' 06"	317° 40' 33"	-21° 34' 35"	1° 00' 09"	16' 23.45"	244° 42' 39"	0.92375
3	314° 15' 43"	-5° 04' 11"	318° 18' 11"	-21° 23' 47"	1° 00' 09"	16' 23.40"	244° 21' 06"	0.92634
4	314° 52' 30"	-5° 04' 13"	318° 55' 42"	-21° 12' 51"	1° 00' 09"	16' 23.34"	243° 59' 24"	0.92889
5	315° 29' 17"	-5° 04' 13"	319° 33' 08"	-21° 01' 46"	1° 00' 08"	16' 23.28"	243° 37' 31"	0.93139
6	316° 06' 03"	-5° 04' 11"	320° 10' 28"	-20° 50' 33"	1° 00' 08"	16' 23.22"	243° 15' 27"	0.93385
7	316° 42' 49"	-5° 04' 07"	320° 47' 43"	-20° 39' 13"	1° 00' 08"	16' 23.14"	242° 53' 11"	0.93627
8	317° 19' 35"	-5° 04' 01"	321° 24' 51"	-20° 27' 44"	1° 00' 08"	16' 23.06"	242° 30' 41"	0.93864
9	317° 56' 21"	-5° 03' 53"	322° 01' 54"	-20° 16' 07"	1° 00' 07"	16' 22.98"	242° 7' 57"	0.94097
10	318° 33' 06"	-5° 03' 43"	322° 38' 51"	-20° 04' 23"	1° 00' 07"	16' 22.88"	241° 44' 56"	0.94326
11	319° 09' 52"	-5° 03' 30"	323° 15' 42"	-19° 52' 31"	1° 00' 07"	16' 22.78"	241° 21' 38"	0.94550
12	319° 46' 36"	-5° 03' 16"	323° 52' 27"	-19° 40' 32"	1° 00' 06"	16' 22.68"	240° 58' 00"	0.94770
13	320° 23' 21"	-5° 02' 59"	324° 29' 07"	-19° 28' 25"	1° 00' 06"	16' 22.57"	240° 34' 02"	0.94986
14	321° 00' 05"	-5° 02' 41"	325° 05' 40"	-19° 16' 12"	1° 00' 05"	16' 22.45"	240° 9' 41"	0.95197
15	321° 36' 48"	-5° 02' 20"	325° 42' 07"	-19° 03' 51"	1° 00' 05"	16' 22.33"	239° 44' 54"	0.95403
16	322° 13' 31"	-5° 01' 57"	326° 18' 29"	-18° 51' 23"	1° 00' 04"	16' 22.20"	239° 19' 41"	0.95605
17	322° 50' 14"	-5° 01' 32"	326° 54' 45"	-18° 38' 48"	1° 00' 04"	16' 22.06"	238° 53' 58"	0.95803
18	323° 26' 56"	-5° 01' 05"	327° 30' 54"	-18° 26' 06"	1° 00' 03"	16' 21.92"	238° 27' 42"	0.95996
19	324° 03' 37"	-5° 00' 36"	328° 06' 58"	-18° 13' 18"	1° 00' 03"	16' 21.77"	238° 0' 51"	0.96184
20	324° 40' 18"	-5° 00' 05"	328° 42' 56"	-18° 00' 23"	1° 00' 02"	16' 21.61"	237° 33' 21"	0.96368
21	325° 16' 58"	-4° 59' 32"	329° 18' 48"	-17° 47' 22"	1° 00' 02"	16' 21.45"	237° 5' 08"	0.96547
22	325° 53' 37"	-4° 58' 57"	329° 54' 35"	-17° 34' 14"	1° 00' 01"	16' 21.29"	236° 36' 10"	0.96721
23	326° 30' 16"	-4° 58' 20"	330° 30' 15"	-17° 21' 00"	1° 00' 00"	16' 21.11"	236° 6' 20"	0.96891
24	327° 06' 53"	-4° 57' 41"	331° 05' 50"	-17° 07' 40"	0° 59' 60"	16' 20.93"	235° 35' 35"	0.97057



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	166° 19' 13"	-0.35"	167° 24' 12"	5° 24' 04"	1.0073565	15' 52.62"	23° 26' 18"	2 m 28 s
1	166° 21' 39"	-0.35"	167° 26' 26"	5° 23' 07"	1.0073458	15' 52.63"	23° 26' 18"	2 m 29 s
2	166° 24' 04"	-0.35"	167° 28' 41"	5° 22' 11"	1.0073350	15' 52.64"	23° 26' 18"	2 m 30 s
3	166° 26' 30"	-0.34"	167° 30' 56"	5° 21' 14"	1.0073242	15' 52.65"	23° 26' 18"	2 m 31 s
4	166° 28' 55"	-0.34"	167° 33' 11"	5° 20' 18"	1.0073135	15' 52.66"	23° 26' 18"	2 m 32 s
5	166° 31' 21"	-0.34"	167° 35' 26"	5° 19' 21"	1.0073027	15' 52.67"	23° 26' 18"	2 m 33 s
6	166° 33' 47"	-0.34"	167° 37' 40"	5° 18' 24"	1.0072920	15' 52.68"	23° 26' 18"	2 m 33 s
7	166° 36' 12"	-0.34"	167° 39' 55"	5° 17' 28"	1.0072812	15' 52.69"	23° 26' 18"	2 m 34 s
8	166° 38' 38"	-0.34"	167° 42' 10"	5° 16' 31"	1.0072704	15' 52.70"	23° 26' 18"	2 m 35 s
9	166° 41' 04"	-0.34"	167° 44' 25"	5° 15' 35"	1.0072597	15' 52.71"	23° 26' 18"	2 m 36 s
10	166° 43' 29"	-0.34"	167° 46' 39"	5° 14' 38"	1.0072489	15' 52.72"	23° 26' 18"	2 m 37 s
11	166° 45' 55"	-0.34"	167° 48' 54"	5° 13' 41"	1.0072381	15' 52.73"	23° 26' 18"	2 m 38 s
12	166° 48' 21"	-0.34"	167° 51' 09"	5° 12' 45"	1.0072274	15' 52.74"	23° 26' 18"	2 m 39 s
13	166° 50' 46"	-0.33"	167° 53' 24"	5° 11' 48"	1.0072166	15' 52.75"	23° 26' 18"	2 m 40 s
14	166° 53' 12"	-0.33"	167° 55' 38"	5° 10' 52"	1.0072058	15' 52.76"	23° 26' 18"	2 m 40 s
15	166° 55' 38"	-0.33"	167° 57' 53"	5° 09' 55"	1.0071951	15' 52.77"	23° 26' 18"	2 m 41 s
16	166° 58' 03"	-0.33"	168° 00' 08"	5° 08' 58"	1.0071843	15' 52.78"	23° 26' 18"	2 m 42 s
17	167° 00' 29"	-0.33"	168° 02' 22"	5° 08' 02"	1.0071735	15' 52.80"	23° 26' 18"	2 m 43 s
18	167° 02' 54"	-0.33"	168° 04' 37"	5° 07' 05"	1.0071628	15' 52.81"	23° 26' 18"	2 m 44 s
19	167° 05' 20"	-0.32"	168° 06' 52"	5° 06' 08"	1.0071520	15' 52.82"	23° 26' 18"	2 m 45 s
20	167° 07' 46"	-0.32"	168° 09' 07"	5° 05' 11"	1.0071412	15' 52.83"	23° 26' 18"	2 m 46 s
21	167° 10' 12"	-0.32"	168° 11' 21"	5° 04' 15"	1.0071304	15' 52.84"	23° 26' 18"	2 m 46 s
22	167° 12' 37"	-0.32"	168° 13' 36"	5° 03' 18"	1.0071196	15' 52.85"	23° 26' 18"	2 m 47 s
23	167° 15' 03"	-0.32"	168° 15' 51"	5° 02' 21"	1.0071089	15' 52.86"	23° 26' 18"	2 m 48 s
24	167° 17' 29"	-0.32"	168° 18' 05"	5° 01' 25"	1.0070981	15' 52.87"	23° 26' 18"	2 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	327° 06' 53"	-4° 57' 41"	331° 05' 50"	-17° 07' 40"	0° 59' 60"	16' 20.93"	235° 35' 35"	0.97057
1	327° 43' 31"	-4° 56' 60"	331° 41' 18"	-16° 54' 14"	0° 59' 59"	16' 20.75"	235° 3' 48"	0.97217
2	328° 20' 07"	-4° 56' 16"	332° 16' 41"	-16° 40' 43"	0° 59' 58"	16' 20.55"	234° 30' 54"	0.97373
3	328° 56' 42"	-4° 55' 31"	332° 51' 58"	-16° 27' 05"	0° 59' 58"	16' 20.36"	233° 56' 46"	0.97525
4	329° 33' 17"	-4° 54' 44"	333° 27' 10"	-16° 13' 22"	0° 59' 57"	16' 20.15"	233° 21' 16"	0.97671
5	330° 09' 50"	-4° 53' 54"	334° 02' 15"	-15° 59' 34"	0° 59' 56"	16' 19.94"	232° 44' 16"	0.97813
6	330° 46' 23"	-4° 53' 03"	334° 37' 15"	-15° 45' 40"	0° 59' 55"	16' 19.72"	232° 5' 36"	0.97950
7	331° 22' 54"	-4° 52' 10"	335° 12' 10"	-15° 31' 41"	0° 59' 55"	16' 19.50"	231° 25' 05"	0.98083
8	331° 59' 25"	-4° 51' 15"	335° 46' 58"	-15° 17' 37"	0° 59' 54"	16' 19.27"	230° 42' 31"	0.98210
9	332° 35' 54"	-4° 50' 18"	336° 21' 41"	-15° 03' 28"	0° 59' 53"	16' 19.03"	229° 57' 40"	0.98333
10	333° 12' 23"	-4° 49' 19"	336° 56' 19"	-14° 49' 13"	0° 59' 52"	16' 18.79"	229° 10' 16"	0.98452
11	333° 48' 50"	-4° 48' 18"	337° 30' 50"	-14° 34' 54"	0° 59' 51"	16' 18.55"	228° 20' 00"	0.98565
12	334° 25' 16"	-4° 47' 15"	338° 05' 17"	-14° 20' 31"	0° 59' 50"	16' 18.29"	227° 26' 32"	0.98674
13	335° 01' 41"	-4° 46' 10"	338° 39' 38"	-14° 06' 03"	0° 59' 49"	16' 18.03"	226° 29' 27"	0.98778
14	335° 38' 04"	-4° 45' 03"	339° 13' 53"	-13° 51' 30"	0° 59' 48"	16' 17.77"	225° 28' 17"	0.98877
15	336° 14' 27"	-4° 43' 54"	339° 48' 03"	-13° 36' 53"	0° 59' 47"	16' 17.50"	224° 22' 29"	0.98972
16	336° 50' 48"	-4° 42' 44"	340° 22' 08"	-13° 22' 12"	0° 59' 46"	16' 17.22"	223° 11' 26"	0.99061
17	337° 27' 08"	-4° 41' 31"	340° 56' 08"	-13° 07' 27"	0° 59' 45"	16' 16.94"	221° 54' 21"	0.99146
18	338° 03' 26"	-4° 40' 17"	341° 30' 02"	-12° 52' 38"	0° 59' 44"	16' 16.65"	220° 30' 24"	0.99226
19	338° 39' 43"	-4° 39' 01"	342° 03' 51"	-12° 37' 45"	0° 59' 43"	16' 16.35"	218° 58' 31"	0.99302
20	339° 15' 59"	-4° 37' 43"	342° 37' 35"	-12° 22' 48"	0° 59' 42"	16' 16.05"	217° 17' 29"	0.99372
21	339° 52' 13"	-4° 36' 23"	343° 11' 14"	-12° 07' 48"	0° 59' 41"	16' 15.74"	215° 25' 50"	0.99438
22	340° 28' 26"	-4° 35' 01"	343° 44' 48"	-11° 52' 44"	0° 59' 40"	16' 15.43"	213° 21' 52"	0.99499
23	341° 04' 37"	-4° 33' 38"	344° 18' 17"	-11° 37' 37"	0° 59' 38"	16' 15.12"	211° 3' 31"	0.99555
24	341° 40' 46"	-4° 32' 13"	344° 51' 41"	-11° 22' 26"	0° 59' 37"	16' 14.79"	208° 28' 24"	0.99607

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	167° 17' 29"	-0.32"	168° 18' 05"	5° 01' 25"	1.0070981	15' 52.87"	23° 26' 18"	2 m 49 s
1	167° 19' 54"	-0.31"	168° 20' 20"	5° 00' 28"	1.0070873	15' 52.88"	23° 26' 18"	2 m 50 s
2	167° 22' 20"	-0.31"	168° 22' 35"	4° 59' 31"	1.0070765	15' 52.89"	23° 26' 18"	2 m 51 s
3	167° 24' 46"	-0.31"	168° 24' 49"	4° 58' 34"	1.0070657	15' 52.90"	23° 26' 18"	2 m 52 s
4	167° 27' 11"	-0.31"	168° 27' 04"	4° 57' 38"	1.0070549	15' 52.91"	23° 26' 18"	2 m 53 s
5	167° 29' 37"	-0.31"	168° 29' 19"	4° 56' 41"	1.0070442	15' 52.92"	23° 26' 18"	2 m 53 s
6	167° 32' 03"	-0.30"	168° 31' 33"	4° 55' 44"	1.0070334	15' 52.93"	23° 26' 18"	2 m 54 s
7	167° 34' 28"	-0.30"	168° 33' 48"	4° 54' 47"	1.0070226	15' 52.94"	23° 26' 18"	2 m 55 s
8	167° 36' 54"	-0.30"	168° 36' 03"	4° 53' 50"	1.0070118	15' 52.95"	23° 26' 18"	2 m 56 s
9	167° 39' 20"	-0.30"	168° 38' 17"	4° 52' 54"	1.0070010	15' 52.96"	23° 26' 18"	2 m 57 s
10	167° 41' 46"	-0.29"	168° 40' 32"	4° 51' 57"	1.0069902	15' 52.97"	23° 26' 18"	2 m 58 s
11	167° 44' 11"	-0.29"	168° 42' 47"	4° 50' 60"	1.0069794	15' 52.98"	23° 26' 18"	2 m 59 s
12	167° 46' 37"	-0.29"	168° 45' 01"	4° 50' 03"	1.0069686	15' 52.99"	23° 26' 18"	2 m 60 s
13	167° 49' 03"	-0.29"	168° 47' 16"	4° 49' 06"	1.0069578	15' 53.00"	23° 26' 18"	3 m 00 s
14	167° 51' 28"	-0.28"	168° 49' 31"	4° 48' 09"	1.0069470	15' 53.01"	23° 26' 18"	3 m 01 s
15	167° 53' 54"	-0.28"	168° 51' 45"	4° 47' 13"	1.0069362	15' 53.02"	23° 26' 18"	3 m 02 s
16	167° 56' 20"	-0.28"	168° 54' 00"	4° 46' 16"	1.0069254	15' 53.03"	23° 26' 18"	3 m 03 s
17	167° 58' 46"	-0.28"	168° 56' 15"	4° 45' 19"	1.0069146	15' 53.04"	23° 26' 18"	3 m 04 s
18	168° 01' 11"	-0.27"	168° 58' 29"	4° 44' 22"	1.0069038	15' 53.05"	23° 26' 18"	3 m 05 s
19	168° 03' 37"	-0.27"	169° 00' 44"	4° 43' 25"	1.0068930	15' 53.06"	23° 26' 18"	3 m 06 s
20	168° 06' 03"	-0.27"	169° 02' 59"	4° 42' 28"	1.0068822	15' 53.07"	23° 26' 18"	3 m 07 s
21	168° 08' 29"	-0.27"	169° 05' 13"	4° 41' 31"	1.0068714	15' 53.08"	23° 26' 18"	3 m 07 s
22	168° 10' 54"	-0.26"	169° 07' 28"	4° 40' 34"	1.0068606	15' 53.09"	23° 26' 18"	3 m 08 s
23	168° 13' 20"	-0.26"	169° 09' 42"	4° 39' 37"	1.0068498	15' 53.10"	23° 26' 18"	3 m 09 s
24	168° 15' 46"	-0.26"	169° 11' 57"	4° 38' 40"	1.0068390	15' 53.11"	23° 26' 18"	3 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	341° 40' 46"	-4° 32' 13"	344° 51' 41"	-11° 22' 26"	0° 59' 37"	16' 14.79"	208° 28' 24"	0.99607
1	342° 16' 55"	-4° 30' 46"	345° 24' 60"	-11° 07' 12"	0° 59' 36"	16' 14.46"	205° 33' 43"	0.99654
2	342° 53' 01"	-4° 29' 17"	345° 58' 14"	-10° 51' 56"	0° 59' 35"	16' 14.13"	202° 16' 14"	0.99696
3	343° 29' 06"	-4° 27' 47"	346° 31' 23"	-10° 36' 36"	0° 59' 34"	16' 13.79"	198° 32' 25"	0.99733
4	344° 05' 09"	-4° 26' 15"	347° 04' 28"	-10° 21' 13"	0° 59' 32"	16' 13.44"	194° 18' 32"	0.99766
5	344° 41' 11"	-4° 24' 41"	347° 37' 28"	-10° 05' 48"	0° 59' 31"	16' 13.09"	189° 30' 59"	0.99793
6	345° 17' 11"	-4° 23' 05"	348° 10' 23"	-9° 50' 20"	0° 59' 30"	16' 12.74"	184° 7' 02"	0.99816
7	345° 53' 09"	-4° 21' 28"	348° 43' 14"	-9° 34' 49"	0° 59' 28"	16' 12.38"	178° 5' 40"	0.99835
8	346° 29' 05"	-4° 19' 49"	349° 16' 01"	-9° 19' 16"	0° 59' 27"	16' 12.01"	171° 28' 48"	0.99848
9	347° 04' 60"	-4° 18' 09"	349° 48' 43"	-9° 03' 41"	0° 59' 26"	16' 11.64"	164° 22' 23"	0.99857
10	347° 40' 52"	-4° 16' 27"	350° 21' 21"	-8° 48' 04"	0° 59' 24"	16' 11.26"	156° 56' 43"	0.99862
11	348° 16' 43"	-4° 14' 43"	350° 53' 54"	-8° 32' 24"	0° 59' 23"	16' 10.88"	149° 25' 31"	0.99861
12	348° 52' 32"	-4° 12' 57"	351° 26' 23"	-8° 16' 43"	0° 59' 21"	16' 10.49"	142° 3' 32"	0.99856
13	349° 28' 20"	-4° 11' 10"	351° 58' 48"	-8° 00' 59"	0° 59' 20"	16' 10.10"	135° 3' 50"	0.99846
14	350° 04' 05"	-4° 09' 22"	352° 31' 09"	-7° 45' 14"	0° 59' 19"	16' 09.71"	128° 35' 45"	0.99832
15	350° 39' 48"	-4° 07' 32"	353° 03' 26"	-7° 29' 27"	0° 59' 17"	16' 09.31"	122° 44' 15"	0.99813
16	351° 15' 30"	-4° 05' 40"	353° 35' 39"	-7° 13' 39"	0° 59' 16"	16' 08.90"	117° 30' 27"	0.99790
17	351° 51' 09"	-4° 03' 47"	354° 07' 48"	-6° 57' 49"	0° 59' 14"	16' 08.49"	112° 52' 53"	0.99761
18	352° 26' 46"	-4° 01' 53"	354° 39' 53"	-6° 41' 58"	0° 59' 13"	16' 08.07"	108° 48' 28"	0.99729
19	353° 02' 22"	-3° 59' 57"	355° 11' 54"	-6° 26' 05"	0° 59' 11"	16' 07.65"	105° 13' 36"	0.99691
20	353° 37' 55"	-3° 57' 59"	355° 43' 52"	-6° 10' 12"	0° 59' 09"	16' 07.23"	102° 4' 32"	0.99649
21	354° 13' 26"	-3° 56' 00"	356° 15' 46"	-5° 54' 17"	0° 59' 08"	16' 06.80"	99° 17' 47"	0.99603
22	354° 48' 55"	-3° 53' 60"	356° 47' 36"	-5° 38' 21"	0° 59' 06"	16' 06.37"	96° 50' 14"	0.99552
23	355° 24' 22"	-3° 51' 58"	357° 19' 23"	-5° 22' 25"	0° 59' 05"	16' 05.93"	94° 39' 12"	0.99497
24	355° 59' 47"	-3° 49' 55"	357° 51' 07"	-5° 06' 27"	0° 59' 03"	16' 05.49"	92° 42' 20"	0.99437



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	168° 15' 46"	-0.26"	169° 11' 57"	4° 38' 40"	1.0068390	15' 53.11"	23° 26' 18"	3 m 10 s
1	168° 18' 12"	-0.25"	169° 14' 12"	4° 37' 43"	1.0068282	15' 53.12"	23° 26' 18"	3 m 11 s
2	168° 20' 37"	-0.25"	169° 16' 26"	4° 36' 46"	1.0068174	15' 53.13"	23° 26' 18"	3 m 12 s
3	168° 23' 03"	-0.25"	169° 18' 41"	4° 35' 49"	1.0068066	15' 53.14"	23° 26' 18"	3 m 13 s
4	168° 25' 29"	-0.24"	169° 20' 55"	4° 34' 53"	1.0067958	15' 53.15"	23° 26' 18"	3 m 14 s
5	168° 27' 55"	-0.24"	169° 23' 10"	4° 33' 56"	1.0067850	15' 53.16"	23° 26' 18"	3 m 14 s
6	168° 30' 20"	-0.24"	169° 25' 25"	4° 32' 59"	1.0067742	15' 53.17"	23° 26' 18"	3 m 15 s
7	168° 32' 46"	-0.23"	169° 27' 39"	4° 32' 02"	1.0067634	15' 53.18"	23° 26' 18"	3 m 16 s
8	168° 35' 12"	-0.23"	169° 29' 54"	4° 31' 05"	1.0067525	15' 53.19"	23° 26' 18"	3 m 17 s
9	168° 37' 38"	-0.23"	169° 32' 08"	4° 30' 08"	1.0067417	15' 53.20"	23° 26' 18"	3 m 18 s
10	168° 40' 04"	-0.22"	169° 34' 23"	4° 29' 10"	1.0067309	15' 53.21"	23° 26' 18"	3 m 19 s
11	168° 42' 29"	-0.22"	169° 36' 38"	4° 28' 13"	1.0067201	15' 53.22"	23° 26' 18"	3 m 20 s
12	168° 44' 55"	-0.22"	169° 38' 52"	4° 27' 16"	1.0067093	15' 53.23"	23° 26' 18"	3 m 21 s
13	168° 47' 21"	-0.21"	169° 41' 07"	4° 26' 19"	1.0066984	15' 53.24"	23° 26' 18"	3 m 21 s
14	168° 49' 47"	-0.21"	169° 43' 21"	4° 25' 22"	1.0066876	15' 53.25"	23° 26' 18"	3 m 22 s
15	168° 52' 13"	-0.21"	169° 45' 36"	4° 24' 25"	1.0066768	15' 53.27"	23° 26' 18"	3 m 23 s
16	168° 54' 38"	-0.20"	169° 47' 50"	4° 23' 28"	1.0066660	15' 53.28"	23° 26' 18"	3 m 24 s
17	168° 57' 04"	-0.20"	169° 50' 05"	4° 22' 31"	1.0066552	15' 53.29"	23° 26' 18"	3 m 25 s
18	168° 59' 30"	-0.19"	169° 52' 20"	4° 21' 34"	1.0066443	15' 53.30"	23° 26' 18"	3 m 26 s
19	169° 01' 56"	-0.19"	169° 54' 34"	4° 20' 37"	1.0066335	15' 53.31"	23° 26' 18"	3 m 27 s
20	169° 04' 22"	-0.19"	169° 56' 49"	4° 19' 40"	1.0066227	15' 53.32"	23° 26' 18"	3 m 28 s
21	169° 06' 47"	-0.18"	169° 59' 03"	4° 18' 43"	1.0066119	15' 53.33"	23° 26' 18"	3 m 28 s
22	169° 09' 13"	-0.18"	170° 01' 18"	4° 17' 46"	1.0066010	15' 53.34"	23° 26' 18"	3 m 29 s
23	169° 11' 39"	-0.18"	170° 03' 32"	4° 16' 48"	1.0065902	15' 53.35"	23° 26' 18"	3 m 30 s
24	169° 14' 05"	-0.17"	170° 05' 47"	4° 15' 51"	1.0065794	15' 53.36"	23° 26' 18"	3 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	355° 59' 47"	-3° 49' 55"	357° 51' 07"	-5° 06' 27"	0° 59' 03"	16' 05.49"	92° 42' 20"	0.99437
1	356° 35' 09"	-3° 47' 51"	358° 22' 47"	-4° 50' 29"	0° 59' 01"	16' 05.04"	90° 57' 41"	0.99373
2	357° 10' 30"	-3° 45' 45"	358° 54' 24"	-4° 34' 31"	0° 58' 60"	16' 04.59"	89° 23' 35"	0.99304
3	357° 45' 48"	-3° 43' 38"	359° 25' 57"	-4° 18' 32"	0° 58' 58"	16' 04.14"	87° 58' 40"	0.99231
4	358° 21' 04"	-3° 41' 29"	359° 57' 28"	-4° 02' 32"	0° 58' 56"	16' 03.68"	86° 41' 43"	0.99153
5	358° 56' 18"	-3° 39' 19"	0° 28' 55"	-3° 46' 32"	0° 58' 55"	16' 03.22"	85° 31' 45"	0.99071
6	359° 31' 29"	-3° 37' 08"	1° 00' 19"	-3° 30' 32"	0° 58' 53"	16' 02.75"	84° 27' 55"	0.98985
7	0° 06' 39"	-3° 34' 56"	1° 31' 41"	-3° 14' 32"	0° 58' 51"	16' 02.28"	83° 29' 30"	0.98894
8	0° 41' 46"	-3° 32' 42"	2° 02' 59"	-2° 58' 32"	0° 58' 50"	16' 01.81"	82° 35' 54"	0.98799
9	1° 16' 50"	-3° 30' 28"	2° 34' 15"	-2° 42' 32"	0° 58' 48"	16' 01.34"	81° 46' 34"	0.98700
10	1° 51' 53"	-3° 28' 12"	3° 05' 28"	-2° 26' 32"	0° 58' 46"	16' 00.86"	81° 1' 04"	0.98597
11	2° 26' 53"	-3° 25' 55"	3° 36' 38"	-2° 10' 32"	0° 58' 44"	16' 00.37"	80° 18' 59"	0.98489
12	3° 01' 50"	-3° 23' 36"	4° 07' 45"	-1° 54' 33"	0° 58' 43"	15' 59.89"	79° 39' 60"	0.98377
13	3° 36' 45"	-3° 21' 17"	4° 38' 50"	-1° 38' 34"	0° 58' 41"	15' 59.40"	79° 3' 48"	0.98261
14	4° 11' 38"	-3° 18' 56"	5° 09' 53"	-1° 22' 36"	0° 58' 39"	15' 58.90"	78° 30' 09"	0.98141
15	4° 46' 29"	-3° 16' 35"	5° 40' 53"	-1° 06' 38"	0° 58' 37"	15' 58.41"	77° 58' 48"	0.98017
16	5° 21' 17"	-3° 14' 12"	6° 11' 50"	0° -50' 41"	0° 58' 35"	15' 57.91"	77° 29' 33"	0.97888
17	5° 56' 02"	-3° 11' 48"	6° 42' 46"	0° -34' 45"	0° 58' 33"	15' 57.40"	77° 2' 14"	0.97756
18	6° 30' 45"	-3° 09' 24"	7° 13' 39"	0° -18' 49"	0° 58' 32"	15' 56.90"	76° 36' 42"	0.97619
19	7° 05' 26"	-3° 06' 58"	7° 44' 30"	0° -2' 55"	0° 58' 30"	15' 56.39"	76° 12' 48"	0.97479
20	7° 40' 04"	-3° 04' 31"	8° 15' 19"	0° 12' 59"	0° 58' 28"	15' 55.88"	75° 50' 24"	0.97334
21	8° 14' 40"	-3° 02' 03"	8° 46' 06"	0° 28' 51"	0° 58' 26"	15' 55.37"	75° 29' 24"	0.97186
22	8° 49' 13"	-2° 59' 35"	9° 16' 51"	0° 44' 42"	0° 58' 24"	15' 54.85"	75° 9' 43"	0.97033
23	9° 23' 44"	-2° 57' 05"	9° 47' 34"	1° 00' 32"	0° 58' 22"	15' 54.33"	74° 51' 13"	0.96877
24	9° 58' 12"	-2° 54' 34"	10° 18' 16"	1° 16' 21"	0° 58' 20"	15' 53.81"	74° 33' 52"	0.96717

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	169° 14' 05"	-0.17"	170° 05' 47"	4° 15' 51"	1.0065794	15' 53.36"	23° 26' 18"	3 m 31 s
1	169° 16' 31"	-0.17"	170° 08' 01"	4° 14' 54"	1.0065685	15' 53.37"	23° 26' 18"	3 m 32 s
2	169° 18' 57"	-0.16"	170° 10' 16"	4° 13' 57"	1.0065577	15' 53.38"	23° 26' 18"	3 m 33 s
3	169° 21' 23"	-0.16"	170° 12' 30"	4° 12' 60"	1.0065469	15' 53.39"	23° 26' 18"	3 m 34 s
4	169° 23' 48"	-0.16"	170° 14' 45"	4° 12' 03"	1.0065360	15' 53.40"	23° 26' 18"	3 m 35 s
5	169° 26' 14"	-0.15"	170° 16' 60"	4° 11' 06"	1.0065252	15' 53.41"	23° 26' 18"	3 m 36 s
6	169° 28' 40"	-0.15"	170° 19' 14"	4° 10' 08"	1.0065143	15' 53.42"	23° 26' 18"	3 m 36 s
7	169° 31' 06"	-0.14"	170° 21' 29"	4° 09' 11"	1.0065035	15' 53.43"	23° 26' 18"	3 m 37 s
8	169° 33' 32"	-0.14"	170° 23' 43"	4° 08' 14"	1.0064927	15' 53.44"	23° 26' 18"	3 m 38 s
9	169° 35' 58"	-0.13"	170° 25' 58"	4° 07' 17"	1.0064818	15' 53.45"	23° 26' 18"	3 m 39 s
10	169° 38' 24"	-0.13"	170° 28' 12"	4° 06' 20"	1.0064710	15' 53.46"	23° 26' 18"	3 m 40 s
11	169° 40' 49"	-0.13"	170° 30' 27"	4° 05' 22"	1.0064601	15' 53.47"	23° 26' 18"	3 m 41 s
12	169° 43' 15"	-0.12"	170° 32' 41"	4° 04' 25"	1.0064493	15' 53.48"	23° 26' 18"	3 m 42 s
13	169° 45' 41"	-0.12"	170° 34' 56"	4° 03' 28"	1.0064384	15' 53.49"	23° 26' 18"	3 m 43 s
14	169° 48' 07"	-0.11"	170° 37' 10"	4° 02' 31"	1.0064276	15' 53.50"	23° 26' 18"	3 m 43 s
15	169° 50' 33"	-0.11"	170° 39' 25"	4° 01' 33"	1.0064167	15' 53.51"	23° 26' 18"	3 m 44 s
16	169° 52' 59"	-0.10"	170° 41' 39"	4° 00' 36"	1.0064059	15' 53.52"	23° 26' 18"	3 m 45 s
17	169° 55' 25"	-0.10"	170° 43' 54"	3° 59' 39"	1.0063950	15' 53.53"	23° 26' 18"	3 m 46 s
18	169° 57' 51"	-0.09"	170° 46' 08"	3° 58' 42"	1.0063842	15' 53.54"	23° 26' 18"	3 m 47 s
19	170° 00' 17"	-0.09"	170° 48' 23"	3° 57' 44"	1.0063733	15' 53.55"	23° 26' 18"	3 m 48 s
20	170° 02' 42"	-0.08"	170° 50' 37"	3° 56' 47"	1.0063625	15' 53.56"	23° 26' 18"	3 m 49 s
21	170° 05' 08"	-0.08"	170° 52' 52"	3° 55' 50"	1.0063516	15' 53.57"	23° 26' 18"	3 m 50 s
22	170° 07' 34"	-0.08"	170° 55' 06"	3° 54' 52"	1.0063408	15' 53.58"	23° 26' 18"	3 m 51 s
23	170° 10' 00"	-0.07"	170° 57' 21"	3° 53' 55"	1.0063299	15' 53.59"	23° 26' 18"	3 m 51 s
24	170° 12' 26"	-0.07"	170° 59' 35"	3° 52' 58"	1.0063190	15' 53.60"	23° 26' 18"	3 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	9° 58' 12"	-2° 54' 34"	10° 18' 16"	1° 16' 21"	0° 58' 20"	15' 53.81"	74° 33' 52"	0.96717
1	10° 32' 38"	-2° 52' 03"	10° 48' 55"	1° 32' 08"	0° 58' 18"	15' 53.29"	74° 17' 34"	0.96553
2	11° 07' 01"	-2° 49' 30"	11° 19' 33"	1° 47' 53"	0° 58' 16"	15' 52.76"	74° 2' 15"	0.96385
3	11° 41' 22"	-2° 46' 57"	11° 50' 10"	2° 03' 37"	0° 58' 14"	15' 52.23"	73° 47' 51"	0.96213
4	12° 15' 40"	-2° 44' 23"	12° 20' 45"	2° 19' 20"	0° 58' 13"	15' 51.70"	73° 34' 21"	0.96038
5	12° 49' 55"	-2° 41' 48"	12° 51' 18"	2° 35' 00"	0° 58' 11"	15' 51.17"	73° 21' 39"	0.95858
6	13° 24' 08"	-2° 39' 13"	13° 21' 50"	2° 50' 39"	0° 58' 09"	15' 50.64"	73° 9' 45"	0.95676
7	13° 58' 19"	-2° 36' 36"	13° 52' 20"	3° 06' 16"	0° 58' 07"	15' 50.10"	72° 58' 34"	0.95489
8	14° 32' 27"	-2° 33' 59"	14° 22' 50"	3° 21' 51"	0° 58' 05"	15' 49.57"	72° 48' 06"	0.95299
9	15° 06' 32"	-2° 31' 21"	14° 53' 18"	3° 37' 24"	0° 58' 03"	15' 49.03"	72° 38' 17"	0.95105
10	15° 40' 35"	-2° 28' 42"	15° 23' 45"	3° 52' 55"	0° 58' 01"	15' 48.49"	72° 29' 06"	0.94908
11	16° 14' 35"	-2° 26' 03"	15° 54' 11"	4° 08' 23"	0° 57' 59"	15' 47.94"	72° 20' 31"	0.94707
12	16° 48' 32"	-2° 23' 23"	16° 24' 35"	4° 23' 50"	0° 57' 57"	15' 47.40"	72° 12' 31"	0.94503
13	17° 22' 27"	-2° 20' 42"	16° 54' 59"	4° 39' 14"	0° 57' 55"	15' 46.86"	72° 5' 03"	0.94295
14	17° 56' 19"	-2° 18' 01"	17° 25' 22"	4° 54' 35"	0° 57' 53"	15' 46.31"	71° 58' 07"	0.94084
15	18° 30' 09"	-2° 15' 19"	17° 55' 44"	5° 09' 54"	0° 57' 51"	15' 45.76"	71° 51' 40"	0.93869
16	19° 03' 56"	-2° 12' 36"	18° 26' 06"	5° 25' 11"	0° 57' 49"	15' 45.21"	71° 45' 43"	0.93651
17	19° 37' 41"	-2° 09' 53"	18° 56' 27"	5° 40' 25"	0° 57' 47"	15' 44.67"	71° 40' 14"	0.93430
18	20° 11' 23"	-2° 07' 09"	19° 26' 47"	5° 55' 36"	0° 57' 45"	15' 44.12"	71° 35' 11"	0.93205
19	20° 45' 02"	-2° 04' 25"	19° 57' 06"	6° 10' 43"	0° 57' 43"	15' 43.56"	71° 30' 34"	0.92977
20	21° 18' 38"	-2° 01' 40"	20° 27' 25"	6° 25' 50"	0° 57' 41"	15' 43.01"	71° 26' 21"	0.92746
21	21° 52' 13"	-1° 58' 55"	20° 57' 43"	6° 40' 53"	0° 57' 39"	15' 42.46"	71° 22' 32"	0.92511
22	22° 25' 44"	-1° 56' 09"	21° 28' 01"	6° 55' 53"	0° 57' 37"	15' 41.91"	71° 19' 07"	0.92274
23	22° 59' 13"	-1° 53' 23"	21° 58' 19"	7° 10' 50"	0° 57' 35"	15' 41.35"	71° 16' 04"	0.92033
24	23° 32' 39"	-1° 50' 36"	22° 28' 37"	7° 25' 44"	0° 57' 32"	15' 40.80"	71° 13' 22"	0.91789



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	170° 12' 26"	-0.07"	170° 59' 35"	3° 52' 58"	1.0063190	15' 53.60"	23° 26' 18"	3 m 52 s
1	170° 14' 52"	-0.06"	171° 01' 50"	3° 52' 00"	1.0063082	15' 53.61"	23° 26' 18"	3 m 53 s
2	170° 17' 18"	-0.06"	171° 04' 04"	3° 51' 03"	1.0062973	15' 53.62"	23° 26' 18"	3 m 54 s
3	170° 19' 44"	-0.05"	171° 06' 19"	3° 50' 06"	1.0062865	15' 53.64"	23° 26' 18"	3 m 55 s
4	170° 22' 10"	-0.05"	171° 08' 33"	3° 49' 08"	1.0062756	15' 53.65"	23° 26' 18"	3 m 56 s
5	170° 24' 36"	-0.04"	171° 10' 48"	3° 48' 11"	1.0062647	15' 53.66"	23° 26' 18"	3 m 57 s
6	170° 27' 02"	-0.04"	171° 13' 02"	3° 47' 14"	1.0062539	15' 53.67"	23° 26' 18"	3 m 58 s
7	170° 29' 28"	-0.03"	171° 15' 17"	3° 46' 16"	1.0062430	15' 53.68"	23° 26' 18"	3 m 59 s
8	170° 31' 54"	-0.03"	171° 17' 31"	3° 45' 19"	1.0062321	15' 53.69"	23° 26' 18"	3 m 59 s
9	170° 34' 19"	-0.02"	171° 19' 46"	3° 44' 22"	1.0062212	15' 53.70"	23° 26' 18"	4 m 00 s
10	170° 36' 45"	-0.02"	171° 22' 00"	3° 43' 24"	1.0062104	15' 53.71"	23° 26' 18"	4 m 01 s
11	170° 39' 11"	-0.01"	171° 24' 15"	3° 42' 27"	1.0061995	15' 53.72"	23° 26' 18"	4 m 02 s
12	170° 41' 37"	-0.01"	171° 26' 29"	3° 41' 29"	1.0061886	15' 53.73"	23° 26' 18"	4 m 03 s
13	170° 44' 03"	-0.00"	171° 28' 44"	3° 40' 32"	1.0061777	15' 53.74"	23° 26' 18"	4 m 04 s
14	170° 46' 29"	0.00"	171° 30' 58"	3° 39' 35"	1.0061669	15' 53.75"	23° 26' 18"	4 m 05 s
15	170° 48' 55"	0.01"	171° 33' 13"	3° 38' 37"	1.0061560	15' 53.76"	23° 26' 18"	4 m 06 s
16	170° 51' 21"	0.01"	171° 35' 27"	3° 37' 40"	1.0061451	15' 53.77"	23° 26' 18"	4 m 06 s
17	170° 53' 47"	0.02"	171° 37' 41"	3° 36' 42"	1.0061342	15' 53.78"	23° 26' 18"	4 m 07 s
18	170° 56' 13"	0.02"	171° 39' 56"	3° 35' 45"	1.0061233	15' 53.79"	23° 26' 18"	4 m 08 s
19	170° 58' 39"	0.03"	171° 42' 10"	3° 34' 47"	1.0061124	15' 53.80"	23° 26' 18"	4 m 09 s
20	171° 01' 05"	0.03"	171° 44' 25"	3° 33' 50"	1.0061016	15' 53.81"	23° 26' 18"	4 m 10 s
21	171° 03' 31"	0.04"	171° 46' 39"	3° 32' 53"	1.0060907	15' 53.82"	23° 26' 18"	4 m 11 s
22	171° 05' 57"	0.04"	171° 48' 54"	3° 31' 55"	1.0060798	15' 53.83"	23° 26' 18"	4 m 12 s
23	171° 08' 23"	0.05"	171° 51' 08"	3° 30' 58"	1.0060689	15' 53.84"	23° 26' 18"	4 m 13 s
24	171° 10' 49"	0.05"	171° 53' 23"	3° 30' 00"	1.0060580	15' 53.85"	23° 26' 18"	4 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	23° 32' 39"	-1° 50' 36"	22° 28' 37"	7° 25' 44"	0° 57' 32"	15' 40.80"	71° 13' 22"	0.91789
1	24° 06' 03"	-1° 47' 49"	22° 58' 54"	7° 40' 34"	0° 57' 30"	15' 40.24"	71° 11' 01"	0.91542
2	24° 39' 24"	-1° 45' 01"	23° 29' 11"	7° 55' 22"	0° 57' 28"	15' 39.69"	71° 9' 01"	0.91293
3	25° 12' 42"	-1° 42' 13"	23° 59' 28"	8° 10' 06"	0° 57' 26"	15' 39.13"	71° 7' 20"	0.91040
4	25° 45' 58"	-1° 39' 24"	24° 29' 45"	8° 24' 47"	0° 57' 24"	15' 38.58"	71° 5' 59"	0.90784
5	26° 19' 11"	-1° 36' 36"	25° 00' 01"	8° 39' 24"	0° 57' 22"	15' 38.02"	71° 4' 56"	0.90525
6	26° 52' 21"	-1° 33' 47"	25° 30' 18"	8° 53' 58"	0° 57' 20"	15' 37.47"	71° 4' 11"	0.90263
7	27° 25' 29"	-1° 30' 57"	26° 00' 35"	9° 08' 28"	0° 57' 18"	15' 36.91"	71° 3' 43"	0.89999
8	27° 58' 35"	-1° 28' 07"	26° 30' 53"	9° 22' 55"	0° 57' 16"	15' 36.36"	71° 3' 33"	0.89731
9	28° 31' 38"	-1° 25' 17"	27° 01' 10"	9° 37' 18"	0° 57' 14"	15' 35.80"	71° 3' 40"	0.89461
10	29° 04' 38"	-1° 22' 27"	27° 31' 28"	9° 51' 38"	0° 57' 12"	15' 35.25"	71° 4' 03"	0.89188
11	29° 37' 36"	-1° 19' 36"	28° 01' 46"	10° 05' 53"	0° 57' 10"	15' 34.69"	71° 4' 42"	0.88912
12	30° 10' 31"	-1° 16' 46"	28° 32' 04"	10° 20' 05"	0° 57' 08"	15' 34.14"	71° 5' 36"	0.88634
13	30° 43' 23"	-1° 13' 54"	29° 02' 23"	10° 34' 13"	0° 57' 06"	15' 33.59"	71° 6' 46"	0.88352
14	31° 16' 13"	-1° 11' 03"	29° 32' 42"	10° 48' 17"	0° 57' 04"	15' 33.04"	71° 8' 11"	0.88069
15	31° 49' 01"	-1° 08' 12"	30° 03' 02"	11° 02' 17"	0° 57' 02"	15' 32.48"	71° 9' 50"	0.87782
16	32° 21' 45"	-1° 05' 20"	30° 33' 22"	11° 16' 13"	0° 56' 60"	15' 31.93"	71° 11' 44"	0.87493
17	32° 54' 28"	-1° 02' 28"	31° 03' 43"	11° 30' 05"	0° 56' 58"	15' 31.38"	71° 13' 52"	0.87202
18	33° 27' 08"	0°-59' 36"	31° 34' 05"	11° 43' 52"	0° 56' 56"	15' 30.83"	71° 16' 13"	0.86908
19	33° 59' 45"	0°-56' 44"	32° 04' 28"	11° 57' 36"	0° 56' 54"	15' 30.29"	71° 18' 48"	0.86612
20	34° 32' 20"	0°-53' 52"	32° 34' 51"	12° 11' 15"	0° 56' 52"	15' 29.74"	71° 21' 36"	0.86313
21	35° 04' 52"	0°-51' 00"	33° 05' 15"	12° 24' 50"	0° 56' 50"	15' 29.19"	71° 24' 37"	0.86012
22	35° 37' 22"	0°-48' 08"	33° 35' 40"	12° 38' 20"	0° 56' 48"	15' 28.65"	71° 27' 51"	0.85708
23	36° 09' 49"	0°-45' 15"	34° 06' 06"	12° 51' 46"	0° 56' 46"	15' 28.10"	71° 31' 18"	0.85402
24	36° 42' 14"	0°-42' 23"	34° 36' 33"	13° 05' 08"	0° 56' 44"	15' 27.56"	71° 34' 56"	0.85094

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	171° 10' 49"	0.05"	171° 53' 23"	3° 30' 00"	1.0060580	15' 53.85"	23° 26' 18"	4 m 14 s
1	171° 13' 15"	0.06"	171° 55' 37"	3° 29' 03"	1.0060471	15' 53.86"	23° 26' 18"	4 m 14 s
2	171° 15' 41"	0.06"	171° 57' 52"	3° 28' 05"	1.0060362	15' 53.87"	23° 26' 18"	4 m 15 s
3	171° 18' 07"	0.07"	172° 00' 06"	3° 27' 08"	1.0060253	15' 53.88"	23° 26' 18"	4 m 16 s
4	171° 20' 33"	0.07"	172° 02' 20"	3° 26' 10"	1.0060144	15' 53.89"	23° 26' 18"	4 m 17 s
5	171° 22' 59"	0.08"	172° 04' 35"	3° 25' 13"	1.0060035	15' 53.90"	23° 26' 18"	4 m 18 s
6	171° 25' 25"	0.09"	172° 06' 49"	3° 24' 15"	1.0059926	15' 53.91"	23° 26' 18"	4 m 19 s
7	171° 27' 51"	0.09"	172° 09' 04"	3° 23' 18"	1.0059817	15' 53.92"	23° 26' 18"	4 m 20 s
8	171° 30' 17"	0.10"	172° 11' 18"	3° 22' 20"	1.0059708	15' 53.93"	23° 26' 18"	4 m 21 s
9	171° 32' 43"	0.10"	172° 13' 33"	3° 21' 22"	1.0059599	15' 53.94"	23° 26' 18"	4 m 22 s
10	171° 35' 09"	0.11"	172° 15' 47"	3° 20' 25"	1.0059490	15' 53.95"	23° 26' 18"	4 m 22 s
11	171° 37' 35"	0.11"	172° 18' 02"	3° 19' 27"	1.0059380	15' 53.97"	23° 26' 18"	4 m 23 s
12	171° 40' 01"	0.12"	172° 20' 16"	3° 18' 30"	1.0059271	15' 53.98"	23° 26' 18"	4 m 24 s
13	171° 42' 28"	0.12"	172° 22' 31"	3° 17' 32"	1.0059162	15' 53.99"	23° 26' 18"	4 m 25 s
14	171° 44' 54"	0.13"	172° 24' 45"	3° 16' 35"	1.0059053	15' 54.00"	23° 26' 18"	4 m 26 s
15	171° 47' 20"	0.13"	172° 26' 59"	3° 15' 37"	1.0058944	15' 54.01"	23° 26' 18"	4 m 27 s
16	171° 49' 46"	0.14"	172° 29' 14"	3° 14' 39"	1.0058835	15' 54.02"	23° 26' 18"	4 m 28 s
17	171° 52' 12"	0.14"	172° 31' 28"	3° 13' 42"	1.0058725	15' 54.03"	23° 26' 18"	4 m 29 s
18	171° 54' 38"	0.15"	172° 33' 43"	3° 12' 44"	1.0058616	15' 54.04"	23° 26' 18"	4 m 30 s
19	171° 57' 04"	0.15"	172° 35' 57"	3° 11' 47"	1.0058507	15' 54.05"	23° 26' 18"	4 m 30 s
20	171° 59' 30"	0.16"	172° 38' 12"	3° 10' 49"	1.0058398	15' 54.06"	23° 26' 18"	4 m 31 s
21	172° 01' 56"	0.17"	172° 40' 26"	3° 09' 51"	1.0058288	15' 54.07"	23° 26' 18"	4 m 32 s
22	172° 04' 22"	0.17"	172° 42' 40"	3° 08' 54"	1.0058179	15' 54.08"	23° 26' 18"	4 m 33 s
23	172° 06' 48"	0.18"	172° 44' 55"	3° 07' 56"	1.0058070	15' 54.09"	23° 26' 18"	4 m 34 s
24	172° 09' 14"	0.18"	172° 47' 09"	3° 06' 58"	1.0057960	15' 54.10"	23° 26' 18"	4 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	36° 42' 14"	0°-42' 23"	34° 36' 33"	13° 05' 08"	0° 56' 44"	15' 27.56"	71° 34' 56"	0.85094
1	37° 14' 36"	0°-39' 31"	35° 07' 00"	13° 18' 24"	0° 56' 42"	15' 27.02"	71° 38' 47"	0.84783
2	37° 46' 56"	0°-36' 38"	35° 37' 29"	13° 31' 37"	0° 56' 40"	15' 26.48"	71° 42' 50"	0.84470
3	38° 19' 13"	0°-33' 46"	36° 07' 59"	13° 44' 44"	0° 56' 38"	15' 25.94"	71° 47' 05"	0.84155
4	38° 51' 29"	0°-30' 53"	36° 38' 30"	13° 57' 47"	0° 56' 36"	15' 25.41"	71° 51' 31"	0.83838
5	39° 23' 41"	0°-28' 01"	37° 09' 03"	14° 10' 46"	0° 56' 34"	15' 24.87"	71° 56' 09"	0.83519
6	39° 55' 51"	0°-25' 09"	37° 39' 36"	14° 23' 39"	0° 56' 32"	15' 24.34"	72° 0' 58"	0.83198
7	40° 27' 59"	0°-22' 16"	38° 10' 11"	14° 36' 27"	0° 56' 30"	15' 23.81"	72° 5' 58"	0.82874
8	41° 00' 05"	0°-19' 24"	38° 40' 47"	14° 49' 11"	0° 56' 28"	15' 23.28"	72° 11' 09"	0.82549
9	41° 32' 08"	0°-16' 32"	39° 11' 25"	15° 01' 50"	0° 56' 26"	15' 22.75"	72° 16' 30"	0.82221
10	42° 04' 08"	0°-13' 40"	39° 42' 03"	15° 14' 23"	0° 56' 24"	15' 22.23"	72° 22' 03"	0.81892
11	42° 36' 07"	0°-10' 48"	40° 12' 43"	15° 26' 52"	0° 56' 22"	15' 21.71"	72° 27' 45"	0.81561
12	43° 08' 03"	0° -7' 56"	40° 43' 25"	15° 39' 15"	0° 56' 21"	15' 21.19"	72° 33' 38"	0.81227
13	43° 39' 56"	0° -5' 05"	41° 14' 08"	15° 51' 34"	0° 56' 19"	15' 20.67"	72° 39' 42"	0.80892
14	44° 11' 48"	0° -2' 14"	41° 44' 53"	16° 03' 47"	0° 56' 17"	15' 20.15"	72° 45' 55"	0.80555
15	44° 43' 37"	0° 00' 38"	42° 15' 39"	16° 15' 55"	0° 56' 15"	15' 19.64"	72° 52' 18"	0.80216
16	45° 15' 24"	0° 03' 29"	42° 46' 27"	16° 27' 57"	0° 56' 13"	15' 19.12"	72° 58' 52"	0.79876
17	45° 47' 08"	0° 06' 20"	43° 17' 16"	16° 39' 54"	0° 56' 11"	15' 18.62"	73° 5' 34"	0.79533
18	46° 18' 50"	0° 09' 10"	43° 48' 07"	16° 51' 46"	0° 56' 09"	15' 18.11"	73° 12' 27"	0.79189
19	46° 50' 31"	0° 12' 01"	44° 18' 60"	17° 03' 33"	0° 56' 07"	15' 17.60"	73° 19' 29"	0.78843
20	47° 22' 08"	0° 14' 51"	44° 49' 54"	17° 15' 13"	0° 56' 06"	15' 17.10"	73° 26' 40"	0.78496
21	47° 53' 44"	0° 17' 40"	45° 20' 50"	17° 26' 49"	0° 56' 04"	15' 16.60"	73° 34' 00"	0.78147
22	48° 25' 17"	0° 20' 30"	45° 51' 48"	17° 38' 19"	0° 56' 02"	15' 16.11"	73° 41' 30"	0.77796
23	48° 56' 49"	0° 23' 19"	46° 22' 48"	17° 49' 43"	0° 56' 00"	15' 15.61"	73° 49' 09"	0.77444
24	49° 28' 18"	0° 26' 08"	46° 53' 49"	18° 01' 01"	0° 55' 58"	15' 15.12"	73° 56' 56"	0.77090



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	172° 09' 14"	0.18"	172° 47' 09"	3° 06' 58"	1.0057960	15' 54.10"	23° 26' 18"	4 m 35 s
1	172° 11' 40"	0.19"	172° 49' 24"	3° 06' 01"	1.0057851	15' 54.11"	23° 26' 18"	4 m 36 s
2	172° 14' 06"	0.19"	172° 51' 38"	3° 05' 03"	1.0057742	15' 54.12"	23° 26' 18"	4 m 37 s
3	172° 16' 33"	0.20"	172° 53' 53"	3° 04' 06"	1.0057632	15' 54.13"	23° 26' 18"	4 m 38 s
4	172° 18' 59"	0.20"	172° 56' 07"	3° 03' 08"	1.0057523	15' 54.14"	23° 26' 18"	4 m 38 s
5	172° 21' 25"	0.21"	172° 58' 22"	3° 02' 10"	1.0057413	15' 54.15"	23° 26' 18"	4 m 39 s
6	172° 23' 51"	0.21"	173° 00' 36"	3° 01' 13"	1.0057304	15' 54.16"	23° 26' 18"	4 m 40 s
7	172° 26' 17"	0.22"	173° 02' 50"	3° 00' 15"	1.0057194	15' 54.17"	23° 26' 18"	4 m 41 s
8	172° 28' 43"	0.23"	173° 05' 05"	2° 59' 17"	1.0057085	15' 54.18"	23° 26' 18"	4 m 42 s
9	172° 31' 09"	0.23"	173° 07' 19"	2° 58' 19"	1.0056975	15' 54.19"	23° 26' 18"	4 m 43 s
10	172° 33' 35"	0.24"	173° 09' 34"	2° 57' 22"	1.0056866	15' 54.20"	23° 26' 18"	4 m 44 s
11	172° 36' 02"	0.24"	173° 11' 48"	2° 56' 24"	1.0056756	15' 54.21"	23° 26' 18"	4 m 45 s
12	172° 38' 28"	0.25"	173° 14' 03"	2° 55' 26"	1.0056647	15' 54.22"	23° 26' 18"	4 m 46 s
13	172° 40' 54"	0.25"	173° 16' 17"	2° 54' 29"	1.0056537	15' 54.24"	23° 26' 18"	4 m 47 s
14	172° 43' 20"	0.26"	173° 18' 31"	2° 53' 31"	1.0056428	15' 54.25"	23° 26' 18"	4 m 47 s
15	172° 45' 46"	0.26"	173° 20' 46"	2° 52' 33"	1.0056318	15' 54.26"	23° 26' 18"	4 m 48 s
16	172° 48' 12"	0.27"	173° 23' 00"	2° 51' 35"	1.0056208	15' 54.27"	23° 26' 18"	4 m 49 s
17	172° 50' 38"	0.27"	173° 25' 15"	2° 50' 38"	1.0056099	15' 54.28"	23° 26' 18"	4 m 50 s
18	172° 53' 05"	0.28"	173° 27' 29"	2° 49' 40"	1.0055989	15' 54.29"	23° 26' 18"	4 m 51 s
19	172° 55' 31"	0.28"	173° 29' 44"	2° 48' 42"	1.0055879	15' 54.30"	23° 26' 18"	4 m 52 s
20	172° 57' 57"	0.29"	173° 31' 58"	2° 47' 44"	1.0055769	15' 54.31"	23° 26' 18"	4 m 53 s
21	173° 00' 23"	0.30"	173° 34' 12"	2° 46' 47"	1.0055660	15' 54.32"	23° 26' 18"	4 m 54 s
22	173° 02' 49"	0.30"	173° 36' 27"	2° 45' 49"	1.0055550	15' 54.33"	23° 26' 18"	4 m 55 s
23	173° 05' 15"	0.31"	173° 38' 41"	2° 44' 51"	1.0055440	15' 54.34"	23° 26' 18"	4 m 55 s
24	173° 07' 42"	0.31"	173° 40' 56"	2° 43' 53"	1.0055330	15' 54.35"	23° 26' 18"	4 m 56 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	49° 28' 18"	0° 26' 08"	46° 53' 49"	18° 01' 01"	0° 55' 58"	15' 15.12"	73° 56' 56"	0.77090
1	49° 59' 45"	0° 28' 57"	47° 24' 53"	18° 12' 14"	0° 55' 56"	15' 14.64"	74° 4' 53"	0.76735
2	50° 31' 10"	0° 31' 45"	47° 55' 58"	18° 23' 21"	0° 55' 55"	15' 14.15"	74° 12' 58"	0.76378
3	51° 02' 33"	0° 34' 33"	48° 27' 05"	18° 34' 22"	0° 55' 53"	15' 13.67"	74° 21' 12"	0.76020
4	51° 33' 53"	0° 37' 21"	48° 58' 14"	18° 45' 18"	0° 55' 51"	15' 13.19"	74° 29' 34"	0.75660
5	52° 05' 12"	0° 40' 06"	49° 29' 25"	18° 56' 05"	0° 55' 49"	15' 12.71"	74° 38' 07"	0.75299
6	52° 36' 29"	0° 42' 53"	50° 00' 38"	19° 06' 48"	0° 55' 48"	15' 12.24"	74° 46' 46"	0.74937
7	53° 07' 43"	0° 45' 39"	50° 31' 53"	19° 17' 26"	0° 55' 46"	15' 11.77"	74° 55' 34"	0.74573
8	53° 38' 56"	0° 48' 25"	51° 03' 10"	19° 27' 58"	0° 55' 44"	15' 11.31"	75° 4' 29"	0.74208
9	54° 10' 06"	0° 51' 11"	51° 34' 28"	19° 38' 23"	0° 55' 43"	15' 10.84"	75° 13' 33"	0.73841
10	54° 41' 15"	0° 53' 57"	52° 05' 49"	19° 48' 43"	0° 55' 41"	15' 10.38"	75° 22' 45"	0.73474
11	55° 12' 21"	0° 56' 41"	52° 37' 12"	19° 58' 56"	0° 55' 39"	15' 09.93"	75° 32' 05"	0.73105
12	55° 43' 26"	0° 59' 26"	53° 08' 37"	20° 09' 03"	0° 55' 38"	15' 09.48"	75° 41' 32"	0.72735
13	56° 14' 29"	1° 02' 10"	53° 40' 03"	20° 19' 04"	0° 55' 36"	15' 09.03"	75° 51' 08"	0.72364
14	56° 45' 30"	1° 04' 53"	54° 11' 32"	20° 28' 59"	0° 55' 34"	15' 08.58"	76° 0' 51"	0.71991
15	57° 16' 28"	1° 07' 36"	54° 43' 03"	20° 38' 48"	0° 55' 33"	15' 08.14"	76° 10' 41"	0.71618
16	57° 47' 26"	1° 10' 19"	55° 14' 36"	20° 48' 30"	0° 55' 31"	15' 07.70"	76° 20' 39"	0.71243
17	58° 18' 21"	1° 13' 01"	55° 46' 12"	20° 58' 05"	0° 55' 29"	15' 07.26"	76° 30' 45"	0.70868
18	58° 49' 14"	1° 15' 43"	56° 17' 49"	21° 07' 35"	0° 55' 28"	15' 06.83"	76° 40' 58"	0.70491
19	59° 20' 06"	1° 18' 24"	56° 49' 28"	21° 16' 58"	0° 55' 26"	15' 06.40"	76° 51' 18"	0.70113
20	59° 50' 55"	1° 21' 04"	57° 21' 10"	21° 26' 14"	0° 55' 25"	15' 05.98"	77° 1' 45"	0.69735
21	60° 21' 43"	1° 23' 44"	57° 52' 53"	21° 35' 24"	0° 55' 23"	15' 05.56"	77° 12' 19"	0.69355
22	60° 52' 30"	1° 26' 23"	58° 24' 39"	21° 44' 28"	0° 55' 22"	15' 05.14"	77° 23' 01"	0.68975
23	61° 23' 14"	1° 29' 02"	58° 56' 27"	21° 53' 24"	0° 55' 20"	15' 04.73"	77° 33' 49"	0.68593
24	61° 53' 57"	1° 31' 40"	59° 28' 17"	22° 02' 15"	0° 55' 19"	15' 04.32"	77° 44' 44"	0.68211

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	173° 07' 42"	0.31"	173° 40' 56"	2° 43' 53"	1.0055330	15' 54.35"	23° 26' 18"	4 m 56 s
1	173° 10' 08"	0.32"	173° 43' 10"	2° 42' 56"	1.0055220	15' 54.36"	23° 26' 18"	4 m 57 s
2	173° 12' 34"	0.32"	173° 45' 25"	2° 41' 58"	1.0055111	15' 54.37"	23° 26' 18"	4 m 58 s
3	173° 15' 00"	0.33"	173° 47' 39"	2° 40' 60"	1.0055001	15' 54.38"	23° 26' 18"	4 m 59 s
4	173° 17' 26"	0.33"	173° 49' 53"	2° 40' 02"	1.0054891	15' 54.39"	23° 26' 18"	4 m 60 s
5	173° 19' 52"	0.34"	173° 52' 08"	2° 39' 04"	1.0054781	15' 54.40"	23° 26' 18"	5 m 01 s
6	173° 22' 19"	0.34"	173° 54' 22"	2° 38' 06"	1.0054671	15' 54.41"	23° 26' 18"	5 m 02 s
7	173° 24' 45"	0.35"	173° 56' 37"	2° 37' 09"	1.0054561	15' 54.42"	23° 26' 18"	5 m 03 s
8	173° 27' 11"	0.35"	173° 58' 51"	2° 36' 11"	1.0054451	15' 54.43"	23° 26' 18"	5 m 03 s
9	173° 29' 37"	0.36"	174° 01' 05"	2° 35' 13"	1.0054341	15' 54.44"	23° 26' 18"	5 m 04 s
10	173° 32' 04"	0.36"	174° 03' 20"	2° 34' 15"	1.0054231	15' 54.45"	23° 26' 18"	5 m 05 s
11	173° 34' 30"	0.37"	174° 05' 34"	2° 33' 17"	1.0054121	15' 54.46"	23° 26' 18"	5 m 06 s
12	173° 36' 56"	0.37"	174° 07' 49"	2° 32' 19"	1.0054011	15' 54.47"	23° 26' 18"	5 m 07 s
13	173° 39' 22"	0.38"	174° 10' 03"	2° 31' 22"	1.0053901	15' 54.49"	23° 26' 18"	5 m 08 s
14	173° 41' 48"	0.38"	174° 12' 18"	2° 30' 24"	1.0053791	15' 54.50"	23° 26' 18"	5 m 09 s
15	173° 44' 15"	0.39"	174° 14' 32"	2° 29' 26"	1.0053680	15' 54.51"	23° 26' 18"	5 m 10 s
16	173° 46' 41"	0.39"	174° 16' 46"	2° 28' 28"	1.0053570	15' 54.52"	23° 26' 18"	5 m 11 s
17	173° 49' 07"	0.40"	174° 19' 01"	2° 27' 30"	1.0053460	15' 54.53"	23° 26' 18"	5 m 11 s
18	173° 51' 33"	0.40"	174° 21' 15"	2° 26' 32"	1.0053350	15' 54.54"	23° 26' 18"	5 m 12 s
19	173° 53' 60"	0.41"	174° 23' 30"	2° 25' 34"	1.0053240	15' 54.55"	23° 26' 18"	5 m 13 s
20	173° 56' 26"	0.41"	174° 25' 44"	2° 24' 36"	1.0053129	15' 54.56"	23° 26' 18"	5 m 14 s
21	173° 58' 52"	0.42"	174° 27' 59"	2° 23' 39"	1.0053019	15' 54.57"	23° 26' 18"	5 m 15 s
22	174° 01' 18"	0.42"	174° 30' 13"	2° 22' 41"	1.0052909	15' 54.58"	23° 26' 18"	5 m 16 s
23	174° 03' 45"	0.43"	174° 32' 27"	2° 21' 43"	1.0052798	15' 54.59"	23° 26' 18"	5 m 17 s
24	174° 06' 11"	0.43"	174° 34' 42"	2° 20' 45"	1.0052688	15' 54.60"	23° 26' 18"	5 m 18 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	61° 53' 57"	1° 31' 40"	59° 28' 17"	22° 02' 15"	0° 55' 19"	15' 04.32"	77° 44' 44"	0.68211
1	62° 24' 38"	1° 34' 18"	60° 00' 09"	22° 10' 58"	0° 55' 17"	15' 03.92"	77° 55' 46"	0.67828
2	62° 55' 18"	1° 36' 55"	60° 32' 03"	22° 19' 35"	0° 55' 16"	15' 03.52"	78° 6' 55"	0.67444
3	63° 25' 56"	1° 39' 32"	61° 03' 59"	22° 28' 05"	0° 55' 14"	15' 03.12"	78° 18' 10"	0.67059
4	63° 56' 32"	1° 42' 08"	61° 35' 58"	22° 36' 29"	0° 55' 13"	15' 02.73"	78° 29' 32"	0.66674
5	64° 27' 06"	1° 44' 43"	62° 07' 58"	22° 44' 45"	0° 55' 11"	15' 02.34"	78° 41' 01"	0.66288
6	64° 57' 39"	1° 47' 18"	62° 40' 01"	22° 52' 55"	0° 55' 10"	15' 01.96"	78° 52' 35"	0.65901
7	65° 28' 11"	1° 49' 51"	63° 12' 06"	23° 00' 58"	0° 55' 09"	15' 01.58"	79° 4' 17"	0.65513
8	65° 58' 41"	1° 52' 25"	63° 44' 13"	23° 08' 54"	0° 55' 07"	15' 01.20"	79° 16' 04"	0.65124
9	66° 29' 09"	1° 54' 58"	64° 16' 22"	23° 16' 43"	0° 55' 06"	15' 00.83"	79° 27' 57"	0.64735
10	66° 59' 36"	1° 57' 30"	64° 48' 33"	23° 24' 25"	0° 55' 04"	15' 00.46"	79° 39' 57"	0.64346
11	67° 30' 02"	2° 00' 01"	65° 20' 46"	23° 32' 00"	0° 55' 03"	15' 00.10"	79° 52' 02"	0.63956
12	68° 00' 26"	2° 02' 32"	65° 53' 01"	23° 39' 28"	0° 55' 02"	14' 59.74"	80° 4' 14"	0.63565
13	68° 30' 48"	2° 05' 01"	66° 25' 18"	23° 46' 49"	0° 55' 00"	14' 59.38"	80° 16' 31"	0.63173
14	69° 01' 09"	2° 07' 31"	66° 57' 37"	23° 54' 04"	0° 54' 59"	14' 59.03"	80° 28' 54"	0.62782
15	69° 31' 29"	2° 09' 59"	67° 29' 58"	24° 01' 10"	0° 54' 58"	14' 58.69"	80° 41' 23"	0.62389
16	70° 01' 47"	2° 12' 27"	68° 02' 21"	24° 08' 10"	0° 54' 57"	14' 58.34"	80° 53' 57"	0.61996
17	70° 32' 04"	2° 14' 54"	68° 34' 46"	24° 15' 03"	0° 54' 55"	14' 58.01"	81° 6' 37"	0.61603
18	71° 02' 20"	2° 17' 21"	69° 07' 13"	24° 21' 48"	0° 54' 54"	14' 57.67"	81° 19' 23"	0.61209
19	71° 32' 34"	2° 19' 46"	69° 39' 42"	24° 28' 26"	0° 54' 53"	14' 57.35"	81° 32' 13"	0.60815
20	72° 02' 47"	2° 22' 11"	70° 12' 13"	24° 34' 57"	0° 54' 52"	14' 57.02"	81° 45' 09"	0.60420
21	72° 32' 59"	2° 24' 35"	70° 44' 46"	24° 41' 21"	0° 54' 51"	14' 56.70"	81° 58' 10"	0.60025
22	73° 03' 10"	2° 26' 58"	71° 17' 20"	24° 47' 37"	0° 54' 49"	14' 56.39"	82° 11' 17"	0.59630
23	73° 33' 19"	2° 29' 21"	71° 49' 57"	24° 53' 46"	0° 54' 48"	14' 56.08"	82° 24' 28"	0.59234
24	74° 03' 28"	2° 31' 43"	72° 22' 35"	24° 59' 48"	0° 54' 47"	14' 55.77"	82° 37' 44"	0.58838

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	174° 06' 11"	0.43"	174° 34' 42"	2° 20' 45"	1.0052688	15' 54.60"	23° 26' 18"	5 m 18 s
1	174° 08' 37"	0.44"	174° 36' 56"	2° 19' 47"	1.0052578	15' 54.61"	23° 26' 18"	5 m 19 s
2	174° 11' 03"	0.44"	174° 39' 11"	2° 18' 49"	1.0052467	15' 54.62"	23° 26' 18"	5 m 20 s
3	174° 13' 30"	0.45"	174° 41' 25"	2° 17' 51"	1.0052357	15' 54.63"	23° 26' 18"	5 m 20 s
4	174° 15' 56"	0.45"	174° 43' 40"	2° 16' 53"	1.0052246	15' 54.64"	23° 26' 18"	5 m 21 s
5	174° 18' 22"	0.46"	174° 45' 54"	2° 15' 55"	1.0052136	15' 54.65"	23° 26' 18"	5 m 22 s
6	174° 20' 49"	0.46"	174° 48' 08"	2° 14' 57"	1.0052025	15' 54.66"	23° 26' 18"	5 m 23 s
7	174° 23' 15"	0.47"	174° 50' 23"	2° 13' 59"	1.0051915	15' 54.67"	23° 26' 18"	5 m 24 s
8	174° 25' 41"	0.47"	174° 52' 37"	2° 13' 01"	1.0051804	15' 54.68"	23° 26' 18"	5 m 25 s
9	174° 28' 07"	0.48"	174° 54' 52"	2° 12' 03"	1.0051693	15' 54.69"	23° 26' 18"	5 m 26 s
10	174° 30' 34"	0.48"	174° 57' 06"	2° 11' 05"	1.0051583	15' 54.71"	23° 26' 18"	5 m 27 s
11	174° 33' 00"	0.49"	174° 59' 21"	2° 10' 07"	1.0051472	15' 54.72"	23° 26' 18"	5 m 28 s
12	174° 35' 26"	0.49"	175° 01' 35"	2° 09' 10"	1.0051362	15' 54.73"	23° 26' 18"	5 m 28 s
13	174° 37' 53"	0.50"	175° 03' 49"	2° 08' 12"	1.0051251	15' 54.74"	23° 26' 18"	5 m 29 s
14	174° 40' 19"	0.50"	175° 06' 04"	2° 07' 14"	1.0051140	15' 54.75"	23° 26' 18"	5 m 30 s
15	174° 42' 45"	0.51"	175° 08' 18"	2° 06' 16"	1.0051029	15' 54.76"	23° 26' 18"	5 m 31 s
16	174° 45' 12"	0.51"	175° 10' 33"	2° 05' 18"	1.0050919	15' 54.77"	23° 26' 18"	5 m 32 s
17	174° 47' 38"	0.52"	175° 12' 47"	2° 04' 20"	1.0050808	15' 54.78"	23° 26' 18"	5 m 33 s
18	174° 50' 04"	0.52"	175° 15' 02"	2° 03' 22"	1.0050697	15' 54.79"	23° 26' 18"	5 m 34 s
19	174° 52' 31"	0.52"	175° 17' 16"	2° 02' 24"	1.0050586	15' 54.80"	23° 26' 18"	5 m 35 s
20	174° 54' 57"	0.53"	175° 19' 31"	2° 01' 26"	1.0050475	15' 54.81"	23° 26' 18"	5 m 36 s
21	174° 57' 23"	0.53"	175° 21' 45"	2° 00' 28"	1.0050364	15' 54.82"	23° 26' 18"	5 m 36 s
22	174° 59' 50"	0.54"	175° 23' 59"	1° 59' 30"	1.0050253	15' 54.83"	23° 26' 18"	5 m 37 s
23	175° 02' 16"	0.54"	175° 26' 14"	1° 58' 31"	1.0050142	15' 54.84"	23° 26' 18"	5 m 38 s
24	175° 04' 42"	0.55"	175° 28' 28"	1° 57' 33"	1.0050031	15' 54.85"	23° 26' 18"	5 m 39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	74° 03' 28"	2° 31' 43"	72° 22' 35"	24° 59' 48"	0° 54' 47"	14' 55.77"	82° 37' 44"	0.58838
1	74° 33' 35"	2° 34' 04"	72° 55' 15"	25° 05' 43"	0° 54' 46"	14' 55.47"	82° 51' 05"	0.58442
2	75° 03' 40"	2° 36' 24"	73° 27' 57"	25° 11' 29"	0° 54' 45"	14' 55.17"	83° 4' 31"	0.58046
3	75° 33' 45"	2° 38' 43"	74° 00' 41"	25° 17' 09"	0° 54' 44"	14' 54.88"	83° 18' 02"	0.57649
4	76° 03' 49"	2° 41' 02"	74° 33' 26"	25° 22' 41"	0° 54' 43"	14' 54.60"	83° 31' 37"	0.57252
5	76° 33' 51"	2° 43' 19"	75° 06' 13"	25° 28' 06"	0° 54' 42"	14' 54.31"	83° 45' 17"	0.56855
6	77° 03' 53"	2° 45' 36"	75° 39' 01"	25° 33' 23"	0° 54' 41"	14' 54.03"	83° 59' 01"	0.56457
7	77° 33' 53"	2° 47' 52"	76° 11' 51"	25° 38' 32"	0° 54' 40"	14' 53.76"	84° 12' 50"	0.56060
8	78° 03' 53"	2° 50' 08"	76° 44' 43"	25° 43' 34"	0° 54' 39"	14' 53.49"	84° 26' 43"	0.55662
9	78° 33' 51"	2° 52' 22"	77° 17' 36"	25° 48' 29"	0° 54' 38"	14' 53.23"	84° 40' 40"	0.55265
10	79° 03' 49"	2° 54' 35"	77° 50' 31"	25° 53' 16"	0° 54' 37"	14' 52.97"	84° 54' 41"	0.54867
11	79° 33' 45"	2° 56' 48"	78° 23' 27"	25° 57' 55"	0° 54' 36"	14' 52.72"	85° 8' 46"	0.54469
12	80° 03' 41"	2° 58' 60"	78° 56' 25"	26° 02' 27"	0° 54' 35"	14' 52.47"	85° 22' 55"	0.54071
13	80° 33' 36"	3° 01' 10"	79° 29' 24"	26° 06' 51"	0° 54' 34"	14' 52.22"	85° 37' 08"	0.53673
14	81° 03' 30"	3° 03' 20"	80° 02' 24"	26° 11' 07"	0° 54' 33"	14' 51.98"	85° 51' 25"	0.53275
15	81° 33' 23"	3° 05' 29"	80° 35' 26"	26° 15' 16"	0° 54' 32"	14' 51.75"	86° 5' 45"	0.52877
16	82° 03' 15"	3° 07' 38"	81° 08' 29"	26° 19' 17"	0° 54' 32"	14' 51.52"	86° 20' 09"	0.52480
17	82° 33' 06"	3° 09' 45"	81° 41' 33"	26° 23' 10"	0° 54' 31"	14' 51.29"	86° 34' 37"	0.52082
18	83° 02' 57"	3° 11' 51"	82° 14' 38"	26° 26' 56"	0° 54' 30"	14' 51.07"	86° 49' 08"	0.51684
19	83° 32' 47"	3° 13' 57"	82° 47' 45"	26° 30' 34"	0° 54' 29"	14' 50.86"	87° 3' 42"	0.51286
20	84° 02' 36"	3° 16' 01"	83° 20' 52"	26° 34' 04"	0° 54' 28"	14' 50.65"	87° 18' 19"	0.50889
21	84° 32' 24"	3° 18' 04"	83° 54' 01"	26° 37' 26"	0° 54' 28"	14' 50.44"	87° 32' 60"	0.50491
22	85° 02' 12"	3° 20' 07"	84° 27' 11"	26° 40' 41"	0° 54' 27"	14' 50.24"	87° 47' 43"	0.50094
23	85° 31' 59"	3° 22' 09"	85° 00' 21"	26° 43' 48"	0° 54' 26"	14' 50.04"	88° 2' 30"	0.49697
24	86° 01' 45"	3° 24' 09"	85° 33' 33"	26° 46' 47"	0° 54' 26"	14' 49.85"	88° 17' 19"	0.49300

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	175° 04' 42"	0.55"	175° 28' 28"	1° 57' 33"	1.0050031	15' 54.85"	23° 26' 18"	5 m 39 s
1	175° 07' 09"	0.55"	175° 30' 43"	1° 56' 35"	1.0049920	15' 54.86"	23° 26' 18"	5 m 40 s
2	175° 09' 35"	0.55"	175° 32' 57"	1° 55' 37"	1.0049809	15' 54.87"	23° 26' 18"	5 m 41 s
3	175° 12' 02"	0.56"	175° 35' 12"	1° 54' 39"	1.0049698	15' 54.88"	23° 26' 18"	5 m 42 s
4	175° 14' 28"	0.56"	175° 37' 26"	1° 53' 41"	1.0049587	15' 54.89"	23° 26' 18"	5 m 43 s
5	175° 16' 54"	0.57"	175° 39' 41"	1° 52' 43"	1.0049476	15' 54.91"	23° 26' 18"	5 m 44 s
6	175° 19' 21"	0.57"	175° 41' 55"	1° 51' 45"	1.0049365	15' 54.92"	23° 26' 18"	5 m 44 s
7	175° 21' 47"	0.57"	175° 44' 09"	1° 50' 47"	1.0049254	15' 54.93"	23° 26' 18"	5 m 45 s
8	175° 24' 13"	0.58"	175° 46' 24"	1° 49' 49"	1.0049143	15' 54.94"	23° 26' 18"	5 m 46 s
9	175° 26' 40"	0.58"	175° 48' 38"	1° 48' 51"	1.0049031	15' 54.95"	23° 26' 18"	5 m 47 s
10	175° 29' 06"	0.59"	175° 50' 53"	1° 47' 53"	1.0048920	15' 54.96"	23° 26' 18"	5 m 48 s
11	175° 31' 33"	0.59"	175° 53' 07"	1° 46' 55"	1.0048809	15' 54.97"	23° 26' 18"	5 m 49 s
12	175° 33' 59"	0.59"	175° 55' 22"	1° 45' 57"	1.0048697	15' 54.98"	23° 26' 18"	5 m 50 s
13	175° 36' 25"	0.60"	175° 57' 36"	1° 44' 59"	1.0048586	15' 54.99"	23° 26' 18"	5 m 51 s
14	175° 38' 52"	0.60"	175° 59' 51"	1° 44' 01"	1.0048475	15' 55.00"	23° 26' 18"	5 m 52 s
15	175° 41' 18"	0.61"	176° 02' 05"	1° 43' 03"	1.0048363	15' 55.01"	23° 26' 18"	5 m 53 s
16	175° 43' 45"	0.61"	176° 04' 20"	1° 42' 04"	1.0048252	15' 55.02"	23° 26' 18"	5 m 53 s
17	175° 46' 11"	0.61"	176° 06' 34"	1° 41' 06"	1.0048140	15' 55.03"	23° 26' 18"	5 m 54 s
18	175° 48' 37"	0.62"	176° 08' 48"	1° 40' 08"	1.0048029	15' 55.04"	23° 26' 18"	5 m 55 s
19	175° 51' 04"	0.62"	176° 11' 03"	1° 39' 10"	1.0047917	15' 55.05"	23° 26' 18"	5 m 56 s
20	175° 53' 30"	0.62"	176° 13' 17"	1° 38' 12"	1.0047806	15' 55.06"	23° 26' 18"	5 m 57 s
21	175° 55' 57"	0.63"	176° 15' 32"	1° 37' 14"	1.0047694	15' 55.07"	23° 26' 18"	5 m 58 s
22	175° 58' 23"	0.63"	176° 17' 46"	1° 36' 16"	1.0047583	15' 55.09"	23° 26' 18"	5 m 59 s
23	176° 00' 50"	0.63"	176° 20' 01"	1° 35' 18"	1.0047471	15' 55.10"	23° 26' 18"	5 m 60 s
24	176° 03' 16"	0.64"	176° 22' 15"	1° 34' 19"	1.0047359	15' 55.11"	23° 26' 18"	6 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	86° 01' 45"	3° 24' 09"	85° 33' 33"	26° 46' 47"	0° 54' 26"	14' 49.85"	88° 17' 19"	0.49300
1	86° 31' 31"	3° 26' 09"	86° 06' 45"	26° 49' 38"	0° 54' 25"	14' 49.67"	88° 32' 12"	0.48904
2	87° 01' 16"	3° 28' 08"	86° 39' 58"	26° 52' 21"	0° 54' 24"	14' 49.48"	88° 47' 06"	0.48507
3	87° 31' 00"	3° 30' 05"	87° 13' 12"	26° 54' 57"	0° 54' 24"	14' 49.31"	89° 2' 04"	0.48111
4	88° 00' 44"	3° 32' 02"	87° 46' 27"	26° 57' 24"	0° 54' 23"	14' 49.14"	89° 17' 04"	0.47715
5	88° 30' 28"	3° 33' 58"	88° 19' 42"	26° 59' 44"	0° 54' 22"	14' 48.97"	89° 32' 06"	0.47320
6	89° 00' 11"	3° 35' 53"	88° 52' 58"	27° 01' 56"	0° 54' 22"	14' 48.81"	89° 47' 11"	0.46924
7	89° 29' 53"	3° 37' 46"	89° 26' 15"	27° 04' 00"	0° 54' 21"	14' 48.65"	90° 2' 18"	0.46529
8	89° 59' 35"	3° 39' 39"	89° 59' 32"	27° 05' 57"	0° 54' 21"	14' 48.50"	90° 17' 27"	0.46135
9	90° 29' 17"	3° 41' 31"	90° 32' 50"	27° 07' 45"	0° 54' 20"	14' 48.35"	90° 32' 38"	0.45741
10	90° 58' 58"	3° 43' 21"	91° 06' 08"	27° 09' 26"	0° 54' 19"	14' 48.21"	90° 47' 51"	0.45347
11	91° 28' 38"	3° 45' 11"	91° 39' 26"	27° 10' 58"	0° 54' 19"	14' 48.07"	91° 3' 07"	0.44953
12	91° 58' 18"	3° 46' 60"	92° 12' 45"	27° 12' 23"	0° 54' 18"	14' 47.94"	91° 18' 23"	0.44560
13	92° 27' 58"	3° 48' 47"	92° 46' 03"	27° 13' 40"	0° 54' 18"	14' 47.81"	91° 33' 42"	0.44168
14	92° 57' 38"	3° 50' 34"	93° 19' 23"	27° 14' 49"	0° 54' 18"	14' 47.69"	91° 49' 02"	0.43776
15	93° 27' 17"	3° 52' 19"	93° 52' 42"	27° 15' 50"	0° 54' 17"	14' 47.57"	92° 4' 23"	0.43384
16	93° 56' 56"	3° 54' 04"	94° 26' 01"	27° 16' 43"	0° 54' 17"	14' 47.46"	92° 19' 46"	0.42993
17	94° 26' 35"	3° 55' 47"	94° 59' 21"	27° 17' 28"	0° 54' 16"	14' 47.35"	92° 35' 11"	0.42602
18	94° 56' 13"	3° 57' 29"	95° 32' 40"	27° 18' 05"	0° 54' 16"	14' 47.25"	92° 50' 36"	0.42212
19	95° 25' 51"	3° 59' 10"	96° 05' 59"	27° 18' 34"	0° 54' 16"	14' 47.15"	93° 6' 03"	0.41823
20	95° 55' 29"	4° 00' 51"	96° 39' 18"	27° 18' 56"	0° 54' 15"	14' 47.06"	93° 21' 31"	0.41434
21	96° 25' 07"	4° 02' 30"	97° 12' 37"	27° 19' 09"	0° 54' 15"	14' 46.97"	93° 36' 60"	0.41046
22	96° 54' 45"	4° 04' 07"	97° 45' 56"	27° 19' 15"	0° 54' 15"	14' 46.89"	93° 52' 29"	0.40658
23	97° 24' 22"	4° 05' 44"	98° 19' 15"	27° 19' 13"	0° 54' 14"	14' 46.81"	94° 7' 60"	0.40271
24	97° 53' 60"	4° 07' 20"	98° 52' 33"	27° 19' 03"	0° 54' 14"	14' 46.73"	94° 23' 31"	0.39885



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	176° 03' 16"	0.64"	176° 22' 15"	1° 34' 19"	1.0047359	15' 55.11"	23° 26' 18"	6 m 01 s
1	176° 05' 43"	0.64"	176° 24' 30"	1° 33' 21"	1.0047248	15' 55.12"	23° 26' 18"	6 m 01 s
2	176° 08' 09"	0.64"	176° 26' 44"	1° 32' 23"	1.0047136	15' 55.13"	23° 26' 18"	6 m 02 s
3	176° 10' 35"	0.65"	176° 28' 59"	1° 31' 25"	1.0047024	15' 55.14"	23° 26' 18"	6 m 03 s
4	176° 13' 02"	0.65"	176° 31' 13"	1° 30' 27"	1.0046912	15' 55.15"	23° 26' 18"	6 m 04 s
5	176° 15' 28"	0.65"	176° 33' 28"	1° 29' 29"	1.0046801	15' 55.16"	23° 26' 18"	6 m 05 s
6	176° 17' 55"	0.66"	176° 35' 42"	1° 28' 31"	1.0046689	15' 55.17"	23° 26' 18"	6 m 06 s
7	176° 20' 21"	0.66"	176° 37' 57"	1° 27' 32"	1.0046577	15' 55.18"	23° 26' 18"	6 m 07 s
8	176° 22' 48"	0.66"	176° 40' 11"	1° 26' 34"	1.0046465	15' 55.19"	23° 26' 18"	6 m 08 s
9	176° 25' 14"	0.67"	176° 42' 26"	1° 25' 36"	1.0046353	15' 55.20"	23° 26' 18"	6 m 09 s
10	176° 27' 41"	0.67"	176° 44' 40"	1° 24' 38"	1.0046241	15' 55.21"	23° 26' 18"	6 m 09 s
11	176° 30' 07"	0.67"	176° 46' 54"	1° 23' 40"	1.0046129	15' 55.22"	23° 26' 18"	6 m 10 s
12	176° 32' 34"	0.68"	176° 49' 09"	1° 22' 42"	1.0046017	15' 55.23"	23° 26' 18"	6 m 11 s
13	176° 35' 00"	0.68"	176° 51' 23"	1° 21' 43"	1.0045905	15' 55.24"	23° 26' 18"	6 m 12 s
14	176° 37' 27"	0.68"	176° 53' 38"	1° 20' 45"	1.0045793	15' 55.26"	23° 26' 18"	6 m 13 s
15	176° 39' 53"	0.68"	176° 55' 52"	1° 19' 47"	1.0045681	15' 55.27"	23° 26' 18"	6 m 14 s
16	176° 42' 20"	0.69"	176° 58' 07"	1° 18' 49"	1.0045569	15' 55.28"	23° 26' 18"	6 m 15 s
17	176° 44' 46"	0.69"	177° 00' 21"	1° 17' 51"	1.0045456	15' 55.29"	23° 26' 18"	6 m 16 s
18	176° 47' 13"	0.69"	177° 02' 36"	1° 16' 52"	1.0045344	15' 55.30"	23° 26' 18"	6 m 17 s
19	176° 49' 39"	0.69"	177° 04' 50"	1° 15' 54"	1.0045232	15' 55.31"	23° 26' 18"	6 m 17 s
20	176° 52' 06"	0.70"	177° 07' 05"	1° 14' 56"	1.0045120	15' 55.32"	23° 26' 18"	6 m 18 s
21	176° 54' 32"	0.70"	177° 09' 19"	1° 13' 58"	1.0045007	15' 55.33"	23° 26' 18"	6 m 19 s
22	176° 56' 59"	0.70"	177° 11' 34"	1° 12' 60"	1.0044895	15' 55.34"	23° 26' 18"	6 m 20 s
23	176° 59' 25"	0.70"	177° 13' 48"	1° 12' 01"	1.0044783	15' 55.35"	23° 26' 18"	6 m 21 s
24	177° 01' 52"	0.71"	177° 16' 03"	1° 11' 03"	1.0044670	15' 55.36"	23° 26' 18"	6 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	97° 53' 60"	4° 07' 20"	98° 52' 33"	27° 19' 03"	0° 54' 14"	14' 46.73"	94° 23' 31"	0.39885
1	98° 23' 37"	4° 08' 55"	99° 25' 51"	27° 18' 45"	0° 54' 14"	14' 46.67"	94° 39' 02"	0.39499
2	98° 53' 14"	4° 10' 28"	99° 59' 08"	27° 18' 19"	0° 54' 14"	14' 46.60"	94° 54' 35"	0.39114
3	99° 22' 51"	4° 12' 00"	100° 32' 25"	27° 17' 45"	0° 54' 13"	14' 46.54"	95° 10' 07"	0.38730
4	99° 52' 28"	4° 13' 32"	101° 05' 41"	27° 17' 03"	0° 54' 13"	14' 46.49"	95° 25' 40"	0.38346
5	100° 22' 05"	4° 15' 02"	101° 38' 57"	27° 16' 13"	0° 54' 13"	14' 46.44"	95° 41' 14"	0.37964
6	100° 51' 42"	4° 16' 31"	102° 12' 12"	27° 15' 16"	0° 54' 13"	14' 46.40"	95° 56' 47"	0.37582
7	101° 21' 19"	4° 17' 58"	102° 45' 26"	27° 14' 11"	0° 54' 13"	14' 46.36"	96° 12' 21"	0.37200
8	101° 50' 56"	4° 19' 25"	103° 18' 40"	27° 12' 58"	0° 54' 13"	14' 46.32"	96° 27' 55"	0.36820
9	102° 20' 33"	4° 20' 50"	103° 51' 53"	27° 11' 37"	0° 54' 12"	14' 46.29"	96° 43' 28"	0.36440
10	102° 50' 11"	4° 22' 15"	104° 25' 05"	27° 10' 08"	0° 54' 12"	14' 46.27"	96° 59' 02"	0.36061
11	103° 19' 48"	4° 23' 38"	104° 58' 15"	27° 08' 31"	0° 54' 12"	14' 46.25"	97° 14' 35"	0.35684
12	103° 49' 26"	4° 24' 60"	105° 31' 25"	27° 06' 47"	0° 54' 12"	14' 46.23"	97° 30' 08"	0.35306
13	104° 19' 03"	4° 26' 21"	106° 04' 34"	27° 04' 55"	0° 54' 12"	14' 46.22"	97° 45' 40"	0.34930
14	104° 48' 41"	4° 27' 40"	106° 37' 42"	27° 02' 55"	0° 54' 12"	14' 46.21"	98° 1' 12"	0.34555
15	105° 18' 19"	4° 28' 59"	107° 10' 49"	27° 00' 47"	0° 54' 12"	14' 46.21"	98° 16' 44"	0.34181
16	105° 47' 57"	4° 30' 16"	107° 43' 54"	26° 58' 31"	0° 54' 12"	14' 46.22"	98° 32' 15"	0.33808
17	106° 17' 36"	4° 31' 32"	108° 16' 59"	26° 56' 08"	0° 54' 12"	14' 46.23"	98° 47' 45"	0.33435
18	106° 47' 14"	4° 32' 47"	108° 50' 02"	26° 53' 37"	0° 54' 12"	14' 46.24"	99° 3' 14"	0.33064
19	107° 16' 53"	4° 34' 00"	109° 23' 03"	26° 50' 58"	0° 54' 12"	14' 46.26"	99° 18' 43"	0.32694
20	107° 46' 32"	4° 35' 13"	109° 56' 04"	26° 48' 12"	0° 54' 12"	14' 46.28"	99° 34' 11"	0.32324
21	108° 16' 12"	4° 36' 24"	110° 29' 03"	26° 45' 18"	0° 54' 12"	14' 46.30"	99° 49' 37"	0.31956
22	108° 45' 52"	4° 37' 34"	111° 02' 00"	26° 42' 16"	0° 54' 13"	14' 46.34"	100° 5' 03"	0.31589
23	109° 15' 32"	4° 38' 42"	111° 34' 56"	26° 39' 07"	0° 54' 13"	14' 46.37"	100° 20' 27"	0.31223
24	109° 45' 12"	4° 39' 50"	112° 07' 50"	26° 35' 50"	0° 54' 13"	14' 46.41"	100° 35' 51"	0.30858

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	177° 01' 52"	0.71"	177° 16' 03"	1° 11' 03"	1.0044670	15' 55.36"	23° 26' 18"	6 m 22 s
1	177° 04' 19"	0.71"	177° 18' 17"	1° 10' 05"	1.0044558	15' 55.37"	23° 26' 18"	6 m 23 s
2	177° 06' 45"	0.71"	177° 20' 32"	1° 09' 07"	1.0044445	15' 55.38"	23° 26' 18"	6 m 24 s
3	177° 09' 12"	0.71"	177° 22' 46"	1° 08' 09"	1.0044333	15' 55.39"	23° 26' 18"	6 m 25 s
4	177° 11' 38"	0.72"	177° 25' 01"	1° 07' 10"	1.0044220	15' 55.41"	23° 26' 18"	6 m 26 s
5	177° 14' 05"	0.72"	177° 27' 16"	1° 06' 12"	1.0044108	15' 55.42"	23° 26' 18"	6 m 26 s
6	177° 16' 31"	0.72"	177° 29' 30"	1° 05' 14"	1.0043995	15' 55.43"	23° 26' 18"	6 m 27 s
7	177° 18' 58"	0.72"	177° 31' 45"	1° 04' 16"	1.0043882	15' 55.44"	23° 26' 18"	6 m 28 s
8	177° 21' 24"	0.72"	177° 33' 59"	1° 03' 17"	1.0043770	15' 55.45"	23° 26' 18"	6 m 29 s
9	177° 23' 51"	0.73"	177° 36' 14"	1° 02' 19"	1.0043657	15' 55.46"	23° 26' 18"	6 m 30 s
10	177° 26' 18"	0.73"	177° 38' 28"	1° 01' 21"	1.0043544	15' 55.47"	23° 26' 18"	6 m 31 s
11	177° 28' 44"	0.73"	177° 40' 43"	1° 00' 23"	1.0043431	15' 55.48"	23° 26' 18"	6 m 32 s
12	177° 31' 11"	0.73"	177° 42' 57"	0° 59' 24"	1.0043319	15' 55.49"	23° 26' 18"	6 m 33 s
13	177° 33' 37"	0.73"	177° 45' 12"	0° 58' 26"	1.0043206	15' 55.50"	23° 26' 18"	6 m 34 s
14	177° 36' 04"	0.73"	177° 47' 26"	0° 57' 28"	1.0043093	15' 55.51"	23° 26' 18"	6 m 34 s
15	177° 38' 30"	0.74"	177° 49' 41"	0° 56' 30"	1.0042980	15' 55.52"	23° 26' 18"	6 m 35 s
16	177° 40' 57"	0.74"	177° 51' 55"	0° 55' 31"	1.0042867	15' 55.53"	23° 26' 18"	6 m 36 s
17	177° 43' 24"	0.74"	177° 54' 10"	0° 54' 33"	1.0042754	15' 55.54"	23° 26' 18"	6 m 37 s
18	177° 45' 50"	0.74"	177° 56' 24"	0° 53' 35"	1.0042641	15' 55.56"	23° 26' 18"	6 m 38 s
19	177° 48' 17"	0.74"	177° 58' 39"	0° 52' 36"	1.0042528	15' 55.57"	23° 26' 18"	6 m 39 s
20	177° 50' 44"	0.74"	178° 00' 53"	0° 51' 38"	1.0042415	15' 55.58"	23° 26' 18"	6 m 40 s
21	177° 53' 10"	0.74"	178° 03' 08"	0° 50' 40"	1.0042302	15' 55.59"	23° 26' 18"	6 m 41 s
22	177° 55' 37"	0.75"	178° 05' 23"	0° 49' 42"	1.0042189	15' 55.60"	23° 26' 18"	6 m 41 s
23	177° 58' 03"	0.75"	178° 07' 37"	0° 48' 43"	1.0042076	15' 55.61"	23° 26' 18"	6 m 42 s
24	178° 00' 30"	0.75"	178° 09' 52"	0° 47' 45"	1.0041962	15' 55.62"	23° 26' 18"	6 m 43 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	109° 45' 12"	4° 39' 50"	112° 07' 50"	26° 35' 50"	0° 54' 13"	14' 46.41"	100° 35' 51"	0.30858
1	110° 14' 53"	4° 40' 56"	112° 40' 43"	26° 32' 25"	0° 54' 13"	14' 46.46"	100° 51' 13"	0.30494
2	110° 44' 35"	4° 42' 01"	113° 13' 34"	26° 28' 53"	0° 54' 13"	14' 46.51"	101° 6' 33"	0.30131
3	111° 14' 16"	4° 43' 05"	113° 46' 24"	26° 25' 14"	0° 54' 13"	14' 46.56"	101° 21' 53"	0.29769
4	111° 43' 58"	4° 44' 07"	114° 19' 11"	26° 21' 26"	0° 54' 14"	14' 46.62"	101° 37' 10"	0.29409
5	112° 13' 41"	4° 45' 08"	114° 51' 57"	26° 17' 32"	0° 54' 14"	14' 46.69"	101° 52' 27"	0.29050
6	112° 43' 24"	4° 46' 08"	115° 24' 41"	26° 13' 29"	0° 54' 14"	14' 46.75"	102° 7' 42"	0.28692
7	113° 13' 08"	4° 47' 07"	115° 57' 23"	26° 09' 20"	0° 54' 14"	14' 46.83"	102° 22' 55"	0.28335
8	113° 42' 52"	4° 48' 04"	116° 30' 04"	26° 05' 02"	0° 54' 15"	14' 46.90"	102° 38' 06"	0.27980
9	114° 12' 36"	4° 49' 00"	117° 02' 42"	26° 00' 38"	0° 54' 15"	14' 46.98"	102° 53' 16"	0.27626
10	114° 42' 22"	4° 49' 55"	117° 35' 18"	25° 56' 06"	0° 54' 15"	14' 47.07"	103° 8' 24"	0.27273
11	115° 12' 07"	4° 50' 49"	118° 07' 53"	25° 51' 26"	0° 54' 16"	14' 47.16"	103° 23' 30"	0.26921
12	115° 41' 54"	4° 51' 41"	118° 40' 25"	25° 46' 40"	0° 54' 16"	14' 47.25"	103° 38' 34"	0.26571
13	116° 11' 40"	4° 52' 32"	119° 12' 55"	25° 41' 46"	0° 54' 16"	14' 47.35"	103° 53' 36"	0.26222
14	116° 41' 28"	4° 53' 21"	119° 45' 23"	25° 36' 44"	0° 54' 17"	14' 47.46"	104° 8' 36"	0.25875
15	117° 11' 16"	4° 54' 09"	120° 17' 49"	25° 31' 36"	0° 54' 17"	14' 47.56"	104° 23' 34"	0.25528
16	117° 41' 05"	4° 54' 56"	120° 50' 13"	25° 26' 20"	0° 54' 18"	14' 47.68"	104° 38' 30"	0.25184
17	118° 10' 54"	4° 55' 42"	121° 22' 34"	25° 20' 57"	0° 54' 18"	14' 47.79"	104° 53' 24"	0.24841
18	118° 40' 44"	4° 56' 26"	121° 54' 54"	25° 15' 27"	0° 54' 18"	14' 47.91"	105° 8' 16"	0.24499
19	119° 10' 35"	4° 57' 09"	122° 27' 11"	25° 09' 49"	0° 54' 19"	14' 48.04"	105° 23' 05"	0.24158
20	119° 40' 27"	4° 57' 51"	122° 59' 25"	25° 04' 05"	0° 54' 19"	14' 48.17"	105° 37' 53"	0.23820
21	120° 10' 19"	4° 58' 31"	123° 31' 38"	24° 58' 13"	0° 54' 20"	14' 48.30"	105° 52' 38"	0.23482
22	120° 40' 12"	4° 59' 10"	124° 03' 48"	24° 52' 14"	0° 54' 20"	14' 48.44"	106° 7' 20"	0.23147
23	121° 10' 06"	4° 59' 48"	124° 35' 55"	24° 46' 09"	0° 54' 21"	14' 48.58"	106° 22' 01"	0.22812
24	121° 40' 01"	5° 00' 24"	125° 08' 00"	24° 39' 56"	0° 54' 21"	14' 48.72"	106° 36' 39"	0.22480

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	178° 00' 30"	0.75"	178° 09' 52"	0° 47' 45"	1.0041962	15' 55.62"	23° 26' 18"	6 m 43 s
1	178° 02' 57"	0.75"	178° 12' 06"	0° 46' 47"	1.0041849	15' 55.63"	23° 26' 18"	6 m 44 s
2	178° 05' 23"	0.75"	178° 14' 21"	0° 45' 48"	1.0041736	15' 55.64"	23° 26' 18"	6 m 45 s
3	178° 07' 50"	0.75"	178° 16' 35"	0° 44' 50"	1.0041623	15' 55.65"	23° 26' 18"	6 m 46 s
4	178° 10' 17"	0.75"	178° 18' 50"	0° 43' 52"	1.0041509	15' 55.66"	23° 26' 18"	6 m 47 s
5	178° 12' 43"	0.75"	178° 21' 05"	0° 42' 54"	1.0041396	15' 55.67"	23° 26' 18"	6 m 48 s
6	178° 15' 10"	0.75"	178° 23' 19"	0° 41' 55"	1.0041282	15' 55.68"	23° 26' 18"	6 m 49 s
7	178° 17' 37"	0.75"	178° 25' 34"	0° 40' 57"	1.0041169	15' 55.70"	23° 26' 18"	6 m 49 s
8	178° 20' 03"	0.76"	178° 27' 48"	0° 39' 59"	1.0041056	15' 55.71"	23° 26' 18"	6 m 50 s
9	178° 22' 30"	0.76"	178° 30' 03"	0° 39' 00"	1.0040942	15' 55.72"	23° 26' 18"	6 m 51 s
10	178° 24' 56"	0.76"	178° 32' 17"	0° 38' 02"	1.0040828	15' 55.73"	23° 26' 18"	6 m 52 s
11	178° 27' 23"	0.76"	178° 34' 32"	0° 37' 04"	1.0040715	15' 55.74"	23° 26' 18"	6 m 53 s
12	178° 29' 50"	0.76"	178° 36' 47"	0° 36' 05"	1.0040601	15' 55.75"	23° 26' 18"	6 m 54 s
13	178° 32' 17"	0.76"	178° 39' 01"	0° 35' 07"	1.0040488	15' 55.76"	23° 26' 18"	6 m 55 s
14	178° 34' 43"	0.76"	178° 41' 16"	0° 34' 09"	1.0040374	15' 55.77"	23° 26' 18"	6 m 56 s
15	178° 37' 10"	0.76"	178° 43' 30"	0° 33' 10"	1.0040260	15' 55.78"	23° 26' 18"	6 m 57 s
16	178° 39' 37"	0.76"	178° 45' 45"	0° 32' 12"	1.0040146	15' 55.79"	23° 26' 18"	6 m 57 s
17	178° 42' 03"	0.76"	178° 47' 60"	0° 31' 14"	1.0040033	15' 55.80"	23° 26' 18"	6 m 58 s
18	178° 44' 30"	0.76"	178° 50' 14"	0° 30' 15"	1.0039919	15' 55.81"	23° 26' 18"	6 m 59 s
19	178° 46' 57"	0.76"	178° 52' 29"	0° 29' 17"	1.0039805	15' 55.83"	23° 26' 18"	7 m 00 s
20	178° 49' 23"	0.76"	178° 54' 43"	0° 28' 19"	1.0039691	15' 55.84"	23° 26' 18"	7 m 01 s
21	178° 51' 50"	0.76"	178° 56' 58"	0° 27' 20"	1.0039577	15' 55.85"	23° 26' 18"	7 m 02 s
22	178° 54' 17"	0.76"	178° 59' 13"	0° 26' 22"	1.0039463	15' 55.86"	23° 26' 18"	7 m 03 s
23	178° 56' 43"	0.76"	179° 01' 27"	0° 25' 24"	1.0039349	15' 55.87"	23° 26' 18"	7 m 04 s
24	178° 59' 10"	0.76"	179° 03' 42"	0° 24' 25"	1.0039235	15' 55.88"	23° 26' 18"	7 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	121° 40' 01"	5° 00' 24"	125° 08' 00"	24° 39' 56"	0° 54' 21"	14' 48.72"	106° 36' 39"	0.22480
1	122° 09' 56"	5° 00' 59"	125° 40' 03"	24° 33' 36"	0° 54' 22"	14' 48.87"	106° 51' 14"	0.22149
2	122° 39' 52"	5° 01' 33"	126° 12' 04"	24° 27' 10"	0° 54' 22"	14' 49.03"	107° 5' 47"	0.21819
3	123° 09' 49"	5° 02' 05"	126° 44' 01"	24° 20' 36"	0° 54' 23"	14' 49.18"	107° 20' 18"	0.21491
4	123° 39' 47"	5° 02' 36"	127° 15' 57"	24° 13' 56"	0° 54' 24"	14' 49.34"	107° 34' 46"	0.21165
5	124° 09' 46"	5° 03' 05"	127° 47' 50"	24° 07' 08"	0° 54' 24"	14' 49.51"	107° 49' 12"	0.20841
6	124° 39' 45"	5° 03' 33"	128° 19' 40"	24° 00' 14"	0° 54' 25"	14' 49.68"	108° 3' 36"	0.20518
7	125° 09' 46"	5° 04' 00"	128° 51' 28"	23° 53' 13"	0° 54' 26"	14' 49.85"	108° 17' 56"	0.20197
8	125° 39' 47"	5° 04' 25"	129° 23' 13"	23° 46' 06"	0° 54' 26"	14' 50.03"	108° 32' 15"	0.19877
9	126° 09' 49"	5° 04' 49"	129° 54' 55"	23° 38' 52"	0° 54' 27"	14' 50.21"	108° 46' 31"	0.19560
10	126° 39' 52"	5° 05' 12"	130° 26' 36"	23° 31' 31"	0° 54' 28"	14' 50.39"	109° 0' 44"	0.19244
11	127° 09' 57"	5° 05' 33"	130° 58' 13"	23° 24' 03"	0° 54' 28"	14' 50.58"	109° 14' 55"	0.18930
12	127° 40' 02"	5° 05' 53"	131° 29' 48"	23° 16' 29"	0° 54' 29"	14' 50.78"	109° 29' 03"	0.18618
13	128° 10' 08"	5° 06' 11"	132° 01' 20"	23° 08' 48"	0° 54' 30"	14' 50.97"	109° 43' 09"	0.18307
14	128° 40' 15"	5° 06' 28"	132° 32' 49"	23° 01' 01"	0° 54' 30"	14' 51.17"	109° 57' 13"	0.17999
15	129° 10' 23"	5° 06' 44"	133° 04' 16"	22° 53' 07"	0° 54' 31"	14' 51.37"	110° 11' 14"	0.17692
16	129° 40' 32"	5° 06' 58"	133° 35' 40"	22° 45' 07"	0° 54' 32"	14' 51.58"	110° 25' 12"	0.17388
17	130° 10' 42"	5° 07' 11"	134° 07' 02"	22° 37' 00"	0° 54' 33"	14' 51.79"	110° 39' 08"	0.17085
18	130° 40' 53"	5° 07' 22"	134° 38' 21"	22° 28' 47"	0° 54' 33"	14' 52.01"	110° 53' 02"	0.16784
19	131° 11' 05"	5° 07' 32"	135° 09' 37"	22° 20' 28"	0° 54' 34"	14' 52.22"	111° 6' 54"	0.16485
20	131° 41' 19"	5° 07' 40"	135° 40' 51"	22° 12' 02"	0° 54' 35"	14' 52.45"	111° 20' 43"	0.16188
21	132° 11' 33"	5° 07' 47"	136° 12' 02"	22° 03' 30"	0° 54' 36"	14' 52.67"	111° 34' 29"	0.15893
22	132° 41' 48"	5° 07' 53"	136° 43' 10"	21° 54' 52"	0° 54' 37"	14' 52.90"	111° 48' 14"	0.15600
23	133° 12' 05"	5° 07' 57"	137° 14' 15"	21° 46' 08"	0° 54' 38"	14' 53.13"	112° 1' 56"	0.15309
24	133° 42' 22"	5° 07' 60"	137° 45' 18"	21° 37' 18"	0° 54' 38"	14' 53.36"	112° 15' 36"	0.15021

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	178° 59' 10"	0.76"	179° 03' 42"	0° 24' 25"	1.0039235	15' 55.88"	23° 26' 18"	7 m 05 s
1	179° 01' 37"	0.76"	179° 05' 56"	0° 23' 27"	1.0039121	15' 55.89"	23° 26' 18"	7 m 05 s
2	179° 04' 04"	0.76"	179° 08' 11"	0° 22' 29"	1.0039007	15' 55.90"	23° 26' 18"	7 m 06 s
3	179° 06' 30"	0.76"	179° 10' 26"	0° 21' 30"	1.0038893	15' 55.91"	23° 26' 18"	7 m 07 s
4	179° 08' 57"	0.76"	179° 12' 40"	0° 20' 32"	1.0038778	15' 55.92"	23° 26' 18"	7 m 08 s
5	179° 11' 24"	0.76"	179° 14' 55"	0° 19' 34"	1.0038664	15' 55.93"	23° 26' 18"	7 m 09 s
6	179° 13' 51"	0.76"	179° 17' 10"	0° 18' 35"	1.0038550	15' 55.94"	23° 26' 18"	7 m 10 s
7	179° 16' 17"	0.76"	179° 19' 24"	0° 17' 37"	1.0038436	15' 55.96"	23° 26' 18"	7 m 11 s
8	179° 18' 44"	0.76"	179° 21' 39"	0° 16' 38"	1.0038321	15' 55.97"	23° 26' 18"	7 m 12 s
9	179° 21' 11"	0.76"	179° 23' 53"	0° 15' 40"	1.0038207	15' 55.98"	23° 26' 18"	7 m 12 s
10	179° 23' 38"	0.76"	179° 26' 08"	0° 14' 42"	1.0038093	15' 55.99"	23° 26' 18"	7 m 13 s
11	179° 26' 04"	0.76"	179° 28' 23"	0° 13' 43"	1.0037978	15' 56.00"	23° 26' 18"	7 m 14 s
12	179° 28' 31"	0.75"	179° 30' 37"	0° 12' 45"	1.0037864	15' 56.01"	23° 26' 18"	7 m 15 s
13	179° 30' 58"	0.75"	179° 32' 52"	0° 11' 47"	1.0037749	15' 56.02"	23° 26' 18"	7 m 16 s
14	179° 33' 25"	0.75"	179° 35' 07"	0° 10' 48"	1.0037635	15' 56.03"	23° 26' 18"	7 m 17 s
15	179° 35' 51"	0.75"	179° 37' 21"	0° 09' 50"	1.0037520	15' 56.04"	23° 26' 18"	7 m 18 s
16	179° 38' 18"	0.75"	179° 39' 36"	0° 08' 51"	1.0037405	15' 56.05"	23° 26' 18"	7 m 19 s
17	179° 40' 45"	0.75"	179° 41' 51"	0° 07' 53"	1.0037291	15' 56.06"	23° 26' 18"	7 m 20 s
18	179° 43' 12"	0.75"	179° 44' 05"	0° 06' 55"	1.0037176	15' 56.08"	23° 26' 18"	7 m 20 s
19	179° 45' 39"	0.75"	179° 46' 20"	0° 05' 56"	1.0037061	15' 56.09"	23° 26' 18"	7 m 21 s
20	179° 48' 05"	0.75"	179° 48' 35"	0° 04' 58"	1.0036946	15' 56.10"	23° 26' 18"	7 m 22 s
21	179° 50' 32"	0.75"	179° 50' 49"	0° 03' 60"	1.0036832	15' 56.11"	23° 26' 18"	7 m 23 s
22	179° 52' 59"	0.74"	179° 53' 04"	0° 03' 01"	1.0036717	15' 56.12"	23° 26' 18"	7 m 24 s
23	179° 55' 26"	0.74"	179° 55' 19"	0° 02' 03"	1.0036602	15' 56.13"	23° 26' 18"	7 m 25 s
24	179° 57' 53"	0.74"	179° 57' 33"	0° 01' 04"	1.0036487	15' 56.14"	23° 26' 18"	7 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	133° 42' 22"	5° 07' 60"	137° 45' 18"	21° 37' 18"	0° 54' 38"	14' 53.36"	112° 15' 36"	0.15021
1	134° 12' 41"	5° 08' 01"	138° 16' 18"	21° 28' 21"	0° 54' 39"	14' 53.60"	112° 29' 15"	0.14734
2	134° 43' 01"	5° 08' 01"	138° 47' 16"	21° 19' 19"	0° 54' 40"	14' 53.84"	112° 42' 51"	0.14449
3	135° 13' 22"	5° 07' 59"	139° 18' 11"	21° 10' 10"	0° 54' 41"	14' 54.09"	112° 56' 25"	0.14167
4	135° 43' 44"	5° 07' 56"	139° 49' 03"	21° 00' 56"	0° 54' 42"	14' 54.34"	113° 9' 57"	0.13887
5	136° 14' 08"	5° 07' 52"	140° 19' 52"	20° 51' 35"	0° 54' 43"	14' 54.59"	113° 23' 28"	0.13609
6	136° 44' 32"	5° 07' 46"	140° 50' 39"	20° 42' 09"	0° 54' 44"	14' 54.84"	113° 36' 56"	0.13333
7	137° 14' 58"	5° 07' 38"	141° 21' 23"	20° 32' 36"	0° 54' 45"	14' 55.10"	113° 50' 23"	0.13059
8	137° 45' 25"	5° 07' 29"	141° 52' 05"	20° 22' 58"	0° 54' 46"	14' 55.36"	114° 3' 49"	0.12787
9	138° 15' 53"	5° 07' 19"	142° 22' 44"	20° 13' 15"	0° 54' 47"	14' 55.62"	114° 17' 13"	0.12518
10	138° 46' 22"	5° 07' 07"	142° 53' 20"	20° 03' 25"	0° 54' 48"	14' 55.89"	114° 30' 36"	0.12251
11	139° 16' 53"	5° 06' 54"	143° 23' 54"	19° 53' 30"	0° 54' 49"	14' 56.16"	114° 43' 58"	0.11987
12	139° 47' 25"	5° 06' 39"	143° 54' 25"	19° 43' 29"	0° 54' 50"	14' 56.43"	114° 57' 18"	0.11724
13	140° 17' 58"	5° 06' 23"	144° 24' 54"	19° 33' 23"	0° 54' 51"	14' 56.71"	115° 10' 38"	0.11464
14	140° 48' 32"	5° 06' 05"	144° 55' 20"	19° 23' 11"	0° 54' 52"	14' 56.99"	115° 23' 57"	0.11207
15	141° 19' 08"	5° 05' 46"	145° 25' 44"	19° 12' 53"	0° 54' 53"	14' 57.27"	115° 37' 15"	0.10951
16	141° 49' 45"	5° 05' 25"	145° 56' 05"	19° 02' 30"	0° 54' 54"	14' 57.55"	115° 50' 33"	0.10699
17	142° 20' 23"	5° 05' 03"	146° 26' 23"	18° 52' 02"	0° 54' 55"	14' 57.84"	116° 3' 51"	0.10448
18	142° 51' 02"	5° 04' 40"	146° 56' 39"	18° 41' 28"	0° 54' 56"	14' 58.13"	116° 17' 08"	0.10200
19	143° 21' 43"	5° 04' 15"	147° 26' 53"	18° 30' 49"	0° 54' 57"	14' 58.42"	116° 30' 26"	0.09955
20	143° 52' 25"	5° 03' 48"	147° 57' 04"	18° 20' 05"	0° 54' 58"	14' 58.72"	116° 43' 44"	0.09712
21	144° 23' 09"	5° 03' 20"	148° 27' 12"	18° 09' 15"	0° 54' 59"	14' 59.01"	116° 57' 02"	0.09471
22	144° 53' 53"	5° 02' 50"	148° 57' 19"	17° 58' 20"	0° 55' 00"	14' 59.31"	117° 10' 22"	0.09233
23	145° 24' 39"	5° 02' 19"	149° 27' 22"	17° 47' 21"	0° 55' 01"	14' 59.62"	117° 23' 42"	0.08998
24	145° 55' 27"	5° 01' 47"	149° 57' 24"	17° 36' 16"	0° 55' 02"	14' 59.92"	117° 37' 04"	0.08765

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	179° 57' 53"	0.74"	179° 57' 33"	0° 01' 04"	1.0036487	15' 56.14"	23° 26' 18"	7 m 26 s
1	180° 00' 19"	0.74"	179° 59' 48"	0° 00' 06"	1.0036372	15' 56.15"	23° 26' 18"	7 m 27 s
2	180° 02' 46"	0.74"	180° 02' 03"	0° 00' 52"	1.0036257	15' 56.16"	23° 26' 18"	7 m 27 s
3	180° 05' 13"	0.74"	180° 04' 18"	0° -1' 51"	1.0036142	15' 56.17"	23° 26' 18"	7 m 28 s
4	180° 07' 40"	0.73"	180° 06' 32"	0° -2' 49"	1.0036027	15' 56.19"	23° 26' 18"	7 m 29 s
5	180° 10' 07"	0.73"	180° 08' 47"	0° -3' 48"	1.0035912	15' 56.20"	23° 26' 18"	7 m 30 s
6	180° 12' 33"	0.73"	180° 11' 02"	0° -4' 46"	1.0035797	15' 56.21"	23° 26' 18"	7 m 31 s
7	180° 15' 00"	0.73"	180° 13' 16"	0° -5' 44"	1.0035681	15' 56.22"	23° 26' 18"	7 m 32 s
8	180° 17' 27"	0.73"	180° 15' 31"	0° -6' 43"	1.0035566	15' 56.23"	23° 26' 18"	7 m 33 s
9	180° 19' 54"	0.73"	180° 17' 46"	0° -7' 41"	1.0035451	15' 56.24"	23° 26' 18"	7 m 34 s
10	180° 22' 21"	0.72"	180° 20' 01"	0° -8' 40"	1.0035335	15' 56.25"	23° 26' 18"	7 m 35 s
11	180° 24' 48"	0.72"	180° 22' 15"	0° -9' 38"	1.0035220	15' 56.26"	23° 26' 18"	7 m 35 s
12	180° 27' 14"	0.72"	180° 24' 30"	0° -10' 37"	1.0035105	15' 56.27"	23° 26' 18"	7 m 36 s
13	180° 29' 41"	0.72"	180° 26' 45"	0° -11' 35"	1.0034989	15' 56.28"	23° 26' 18"	7 m 37 s
14	180° 32' 08"	0.72"	180° 28' 59"	0° -12' 33"	1.0034874	15' 56.30"	23° 26' 18"	7 m 38 s
15	180° 34' 35"	0.71"	180° 31' 14"	0° -13' 32"	1.0034758	15' 56.31"	23° 26' 18"	7 m 39 s
16	180° 37' 02"	0.71"	180° 33' 29"	0° -14' 30"	1.0034643	15' 56.32"	23° 26' 18"	7 m 40 s
17	180° 39' 29"	0.71"	180° 35' 44"	0° -15' 29"	1.0034527	15' 56.33"	23° 26' 18"	7 m 41 s
18	180° 41' 56"	0.71"	180° 37' 58"	0° -16' 27"	1.0034412	15' 56.34"	23° 26' 18"	7 m 42 s
19	180° 44' 23"	0.70"	180° 40' 13"	0° -17' 25"	1.0034296	15' 56.35"	23° 26' 18"	7 m 42 s
20	180° 46' 49"	0.70"	180° 42' 28"	0° -18' 24"	1.0034180	15' 56.36"	23° 26' 18"	7 m 43 s
21	180° 49' 16"	0.70"	180° 44' 43"	0° -19' 22"	1.0034065	15' 56.37"	23° 26' 18"	7 m 44 s
22	180° 51' 43"	0.70"	180° 46' 58"	0° -20' 21"	1.0033949	15' 56.38"	23° 26' 18"	7 m 45 s
23	180° 54' 10"	0.69"	180° 49' 12"	0° -21' 19"	1.0033833	15' 56.39"	23° 26' 18"	7 m 46 s
24	180° 56' 37"	0.69"	180° 51' 27"	0° -22' 18"	1.0033717	15' 56.41"	23° 26' 18"	7 m 47 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	145° 55' 27"	5° 01' 47"	149° 57' 24"	17° 36' 16"	0° 55' 02"	14' 59.92"	117° 37' 04"	0.08765
1	146° 26' 16"	5° 01' 13"	150° 27' 23"	17° 25' 06"	0° 55' 04"	15' 00.23"	117° 50' 27"	0.08535
2	146° 57' 06"	5° 00' 37"	150° 57' 20"	17° 13' 50"	0° 55' 05"	15' 00.54"	118° 3' 53"	0.08307
3	147° 27' 57"	5° 00' 01"	151° 27' 15"	17° 02' 30"	0° 55' 06"	15' 00.85"	118° 17' 20"	0.08082
4	147° 58' 50"	4° 59' 22"	151° 57' 07"	16° 51' 06"	0° 55' 07"	15' 01.17"	118° 30' 50"	0.07860
5	148° 29' 44"	4° 58' 42"	152° 26' 57"	16° 39' 36"	0° 55' 08"	15' 01.48"	118° 44' 24"	0.07641
6	149° 00' 40"	4° 58' 01"	152° 56' 45"	16° 28' 01"	0° 55' 09"	15' 01.80"	118° 58' 00"	0.07424
7	149° 31' 37"	4° 57' 18"	153° 26' 31"	16° 16' 22"	0° 55' 11"	15' 02.12"	119° 11' 41"	0.07210
8	150° 02' 35"	4° 56' 33"	153° 56' 14"	16° 04' 38"	0° 55' 12"	15' 02.45"	119° 25' 25"	0.06998
9	150° 33' 35"	4° 55' 47"	154° 25' 56"	15° 52' 49"	0° 55' 13"	15' 02.77"	119° 39' 15"	0.06790
10	151° 04' 37"	4° 54' 60"	154° 55' 35"	15° 40' 55"	0° 55' 14"	15' 03.10"	119° 53' 10"	0.06584
11	151° 35' 39"	4° 54' 11"	155° 25' 12"	15° 28' 57"	0° 55' 15"	15' 03.43"	120° 7' 11"	0.06381
12	152° 06' 43"	4° 53' 21"	155° 54' 48"	15° 16' 55"	0° 55' 17"	15' 03.76"	120° 21' 18"	0.06181
13	152° 37' 49"	4° 52' 29"	156° 24' 21"	15° 04' 48"	0° 55' 18"	15' 04.09"	120° 35' 32"	0.05983
14	153° 08' 56"	4° 51' 35"	156° 53' 52"	14° 52' 36"	0° 55' 19"	15' 04.43"	120° 49' 54"	0.05789
15	153° 40' 04"	4° 50' 41"	157° 23' 22"	14° 40' 21"	0° 55' 20"	15' 04.77"	121° 4' 25"	0.05597
16	154° 11' 14"	4° 49' 44"	157° 52' 49"	14° 28' 00"	0° 55' 21"	15' 05.11"	121° 19' 05"	0.05409
17	154° 42' 25"	4° 48' 46"	158° 22' 15"	14° 15' 36"	0° 55' 23"	15' 05.45"	121° 33' 55"	0.05223
18	155° 13' 38"	4° 47' 47"	158° 51' 39"	14° 03' 07"	0° 55' 24"	15' 05.79"	121° 48' 56"	0.05040
19	155° 44' 52"	4° 46' 46"	159° 21' 01"	13° 50' 35"	0° 55' 25"	15' 06.13"	122° 4' 09"	0.04860
20	156° 16' 08"	4° 45' 44"	159° 50' 22"	13° 37' 58"	0° 55' 27"	15' 06.48"	122° 19' 36"	0.04684
21	156° 47' 25"	4° 44' 40"	160° 19' 40"	13° 25' 16"	0° 55' 28"	15' 06.83"	122° 35' 17"	0.04510
22	157° 18' 43"	4° 43' 35"	160° 48' 58"	13° 12' 31"	0° 55' 29"	15' 07.18"	122° 51' 13"	0.04339
23	157° 50' 03"	4° 42' 28"	161° 18' 13"	12° 59' 42"	0° 55' 30"	15' 07.53"	123° 7' 26"	0.04172
24	158° 21' 25"	4° 41' 20"	161° 47' 27"	12° 46' 49"	0° 55' 32"	15' 07.88"	123° 23' 57"	0.04007

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	180° 56' 37"	0.69"	180° 51' 27"	0°-22' 18"	1.0033717	15' 56.41"	23° 26' 18"	7 m 47 s
1	180° 59' 04"	0.69"	180° 53' 42"	0°-23' 16"	1.0033601	15' 56.42"	23° 26' 18"	7 m 48 s
2	181° 01' 31"	0.69"	180° 55' 57"	0°-24' 14"	1.0033485	15' 56.43"	23° 26' 18"	7 m 49 s
3	181° 03' 58"	0.68"	180° 58' 11"	0°-25' 13"	1.0033369	15' 56.44"	23° 26' 18"	7 m 49 s
4	181° 06' 25"	0.68"	181° 00' 26"	0°-26' 11"	1.0033253	15' 56.45"	23° 26' 18"	7 m 50 s
5	181° 08' 51"	0.68"	181° 02' 41"	0°-27' 10"	1.0033137	15' 56.46"	23° 26' 18"	7 m 51 s
6	181° 11' 18"	0.68"	181° 04' 56"	0°-28' 08"	1.0033021	15' 56.47"	23° 26' 18"	7 m 52 s
7	181° 13' 45"	0.67"	181° 07' 11"	0°-29' 07"	1.0032905	15' 56.48"	23° 26' 18"	7 m 53 s
8	181° 16' 12"	0.67"	181° 09' 25"	0°-30' 05"	1.0032789	15' 56.49"	23° 26' 18"	7 m 54 s
9	181° 18' 39"	0.67"	181° 11' 40"	0°-31' 03"	1.0032673	15' 56.50"	23° 26' 18"	7 m 55 s
10	181° 21' 06"	0.66"	181° 13' 55"	0°-32' 02"	1.0032556	15' 56.52"	23° 26' 18"	7 m 56 s
11	181° 23' 33"	0.66"	181° 16' 10"	0°-33' 00"	1.0032440	15' 56.53"	23° 26' 18"	7 m 56 s
12	181° 25' 60"	0.66"	181° 18' 25"	0°-33' 59"	1.0032324	15' 56.54"	23° 26' 18"	7 m 57 s
13	181° 28' 27"	0.65"	181° 20' 39"	0°-34' 57"	1.0032207	15' 56.55"	23° 26' 18"	7 m 58 s
14	181° 30' 54"	0.65"	181° 22' 54"	0°-35' 56"	1.0032091	15' 56.56"	23° 26' 18"	7 m 59 s
15	181° 33' 21"	0.65"	181° 25' 09"	0°-36' 54"	1.0031975	15' 56.57"	23° 26' 18"	7 m 60 s
16	181° 35' 48"	0.64"	181° 27' 24"	0°-37' 52"	1.0031858	15' 56.58"	23° 26' 18"	8 m 01 s
17	181° 38' 15"	0.64"	181° 29' 39"	0°-38' 51"	1.0031742	15' 56.59"	23° 26' 18"	8 m 02 s
18	181° 40' 42"	0.64"	181° 31' 54"	0°-39' 49"	1.0031625	15' 56.60"	23° 26' 18"	8 m 02 s
19	181° 43' 09"	0.63"	181° 34' 08"	0°-40' 48"	1.0031509	15' 56.62"	23° 26' 18"	8 m 03 s
20	181° 45' 36"	0.63"	181° 36' 23"	0°-41' 46"	1.0031392	15' 56.63"	23° 26' 18"	8 m 04 s
21	181° 48' 03"	0.63"	181° 38' 38"	0°-42' 45"	1.0031275	15' 56.64"	23° 26' 18"	8 m 05 s
22	181° 50' 30"	0.62"	181° 40' 53"	0°-43' 43"	1.0031159	15' 56.65"	23° 26' 18"	8 m 06 s
23	181° 52' 56"	0.62"	181° 43' 08"	0°-44' 41"	1.0031042	15' 56.66"	23° 26' 18"	8 m 07 s
24	181° 55' 23"	0.62"	181° 45' 23"	0°-45' 40"	1.0030925	15' 56.67"	23° 26' 18"	8 m 08 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	158° 21' 25"	4° 41' 20"	161° 47' 27"	12° 46' 49"	0° 55' 32"	15' 07.88"	123° 23' 57"	0.04007
1	158° 52' 48"	4° 40' 10"	162° 16' 39"	12° 33' 52"	0° 55' 33"	15' 08.24"	123° 40' 49"	0.03846
2	159° 24' 12"	4° 38' 59"	162° 45' 50"	12° 20' 52"	0° 55' 34"	15' 08.59"	123° 58' 02"	0.03687
3	159° 55' 38"	4° 37' 47"	163° 14' 60"	12° 07' 47"	0° 55' 36"	15' 08.95"	124° 15' 39"	0.03532
4	160° 27' 05"	4° 36' 33"	163° 44' 08"	11° 54' 39"	0° 55' 37"	15' 09.31"	124° 33' 41"	0.03380
5	160° 58' 34"	4° 35' 17"	164° 13' 15"	11° 41' 27"	0° 55' 38"	15' 09.67"	124° 52' 11"	0.03231
6	161° 30' 05"	4° 33' 60"	164° 42' 20"	11° 28' 11"	0° 55' 40"	15' 10.03"	125° 11' 12"	0.03086
7	162° 01' 36"	4° 32' 41"	165° 11' 24"	11° 14' 52"	0° 55' 41"	15' 10.39"	125° 30' 45"	0.02943
8	162° 33' 10"	4° 31' 22"	165° 40' 27"	11° 01' 30"	0° 55' 42"	15' 10.75"	125° 50' 55"	0.02804
9	163° 04' 44"	4° 30' 00"	166° 09' 29"	10° 48' 04"	0° 55' 44"	15' 11.11"	126° 11' 43"	0.02668
10	163° 36' 21"	4° 28' 37"	166° 38' 30"	10° 34' 34"	0° 55' 45"	15' 11.48"	126° 33' 15"	0.02535
11	164° 07' 59"	4° 27' 13"	167° 07' 29"	10° 21' 01"	0° 55' 46"	15' 11.85"	126° 55' 33"	0.02406
12	164° 39' 38"	4° 25' 47"	167° 36' 28"	10° 07' 25"	0° 55' 48"	15' 12.21"	127° 18' 43"	0.02280
13	165° 11' 19"	4° 24' 20"	168° 05' 25"	9° 53' 46"	0° 55' 49"	15' 12.58"	127° 42' 49"	0.02157
14	165° 43' 01"	4° 22' 52"	168° 34' 22"	9° 40' 03"	0° 55' 50"	15' 12.95"	128° 7' 57"	0.02038
15	166° 14' 45"	4° 21' 21"	169° 03' 17"	9° 26' 17"	0° 55' 52"	15' 13.32"	128° 34' 13"	0.01922
16	166° 46' 30"	4° 19' 50"	169° 32' 12"	9° 12' 29"	0° 55' 53"	15' 13.69"	129° 1' 44"	0.01809
17	167° 18' 17"	4° 18' 17"	170° 01' 06"	8° 58' 37"	0° 55' 54"	15' 14.06"	129° 30' 37"	0.01700
18	167° 50' 05"	4° 16' 43"	170° 29' 60"	8° 44' 42"	0° 55' 56"	15' 14.44"	130° 1' 02"	0.01594
19	168° 21' 55"	4° 15' 07"	170° 58' 52"	8° 30' 44"	0° 55' 57"	15' 14.81"	130° 33' 09"	0.01492
20	168° 53' 46"	4° 13' 30"	171° 27' 44"	8° 16' 44"	0° 55' 58"	15' 15.18"	131° 7' 08"	0.01393
21	169° 25' 39"	4° 11' 51"	171° 56' 36"	8° 02' 40"	0° 55' 60"	15' 15.56"	131° 43' 13"	0.01298
22	169° 57' 33"	4° 10' 12"	172° 25' 27"	7° 48' 34"	0° 56' 01"	15' 15.93"	132° 21' 38"	0.01206
23	170° 29' 29"	4° 08' 30"	172° 54' 17"	7° 34' 25"	0° 56' 03"	15' 16.31"	133° 2' 41"	0.01118
24	171° 01' 26"	4° 06' 47"	173° 23' 07"	7° 20' 14"	0° 56' 04"	15' 16.68"	133° 46' 41"	0.01033

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	181° 55' 23"	0.62"	181° 45' 23"	0°-45' 40"	1.0030925	15' 56.67"	23° 26' 18"	8 m 08 s
1	181° 57' 50"	0.61"	181° 47' 38"	0°-46' 38"	1.0030808	15' 56.68"	23° 26' 18"	8 m 09 s
2	182° 00' 17"	0.61"	181° 49' 53"	0°-47' 37"	1.0030691	15' 56.69"	23° 26' 18"	8 m 09 s
3	182° 02' 44"	0.60"	181° 52' 07"	0°-48' 35"	1.0030574	15' 56.70"	23° 26' 18"	8 m 10 s
4	182° 05' 11"	0.60"	181° 54' 22"	0°-49' 34"	1.0030457	15' 56.72"	23° 26' 18"	8 m 11 s
5	182° 07' 38"	0.60"	181° 56' 37"	0°-50' 32"	1.0030340	15' 56.73"	23° 26' 18"	8 m 12 s
6	182° 10' 05"	0.59"	181° 58' 52"	0°-51' 31"	1.0030223	15' 56.74"	23° 26' 18"	8 m 13 s
7	182° 12' 32"	0.59"	182° 01' 07"	0°-52' 29"	1.0030106	15' 56.75"	23° 26' 18"	8 m 14 s
8	182° 14' 59"	0.59"	182° 03' 22"	0°-53' 27"	1.0029989	15' 56.76"	23° 26' 18"	8 m 15 s
9	182° 17' 26"	0.58"	182° 05' 37"	0°-54' 26"	1.0029872	15' 56.77"	23° 26' 18"	8 m 16 s
10	182° 19' 53"	0.58"	182° 07' 52"	0°-55' 24"	1.0029755	15' 56.78"	23° 26' 18"	8 m 16 s
11	182° 22' 20"	0.57"	182° 10' 07"	0°-56' 23"	1.0029638	15' 56.79"	23° 26' 18"	8 m 17 s
12	182° 24' 47"	0.57"	182° 12' 22"	0°-57' 21"	1.0029520	15' 56.81"	23° 26' 18"	8 m 18 s
13	182° 27' 15"	0.56"	182° 14' 36"	0°-58' 20"	1.0029403	15' 56.82"	23° 26' 18"	8 m 19 s
14	182° 29' 42"	0.56"	182° 16' 51"	0°-59' 18"	1.0029286	15' 56.83"	23° 26' 18"	8 m 20 s
15	182° 32' 09"	0.56"	182° 19' 06"	-1° 00' 16"	1.0029168	15' 56.84"	23° 26' 18"	8 m 21 s
16	182° 34' 36"	0.55"	182° 21' 21"	-1° 01' 15"	1.0029051	15' 56.85"	23° 26' 18"	8 m 22 s
17	182° 37' 03"	0.55"	182° 23' 36"	-1° 02' 13"	1.0028933	15' 56.86"	23° 26' 18"	8 m 22 s
18	182° 39' 30"	0.54"	182° 25' 51"	-1° 03' 12"	1.0028816	15' 56.87"	23° 26' 18"	8 m 23 s
19	182° 41' 57"	0.54"	182° 28' 06"	-1° 04' 10"	1.0028698	15' 56.88"	23° 26' 18"	8 m 24 s
20	182° 44' 24"	0.53"	182° 30' 21"	-1° 05' 09"	1.0028581	15' 56.90"	23° 26' 18"	8 m 25 s
21	182° 46' 51"	0.53"	182° 32' 36"	-1° 06' 07"	1.0028463	15' 56.91"	23° 26' 18"	8 m 26 s
22	182° 49' 18"	0.53"	182° 34' 51"	-1° 07' 06"	1.0028346	15' 56.92"	23° 26' 18"	8 m 27 s
23	182° 51' 45"	0.52"	182° 37' 06"	-1° 08' 04"	1.0028228	15' 56.93"	23° 26' 18"	8 m 28 s
24	182° 54' 12"	0.52"	182° 39' 21"	-1° 09' 02"	1.0028110	15' 56.94"	23° 26' 18"	8 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	171° 01' 26"	4° 06' 47"	173° 23' 07"	7° 20' 14"	0° 56' 04"	15' 16.68"	133° 46' 41"	0.01033
1	171° 33' 25"	4° 05' 03"	173° 51' 57"	7° 05' 60"	0° 56' 05"	15' 17.06"	134° 34' 01"	0.00951
2	172° 05' 25"	4° 03' 18"	174° 20' 46"	6° 51' 43"	0° 56' 07"	15' 17.44"	135° 25' 08"	0.00874
3	172° 37' 27"	4° 01' 31"	174° 49' 35"	6° 37' 24"	0° 56' 08"	15' 17.81"	136° 20' 33"	0.00799
4	173° 09' 30"	3° 59' 43"	175° 18' 24"	6° 23' 03"	0° 56' 10"	15' 18.19"	137° 20' 52"	0.00729
5	173° 41' 35"	3° 57' 53"	175° 47' 12"	6° 08' 39"	0° 56' 11"	15' 18.57"	138° 26' 50"	0.00662
6	174° 13' 41"	3° 56' 02"	176° 16' 01"	5° 54' 13"	0° 56' 12"	15' 18.95"	139° 39' 17"	0.00598
7	174° 45' 49"	3° 54' 10"	176° 44' 49"	5° 39' 44"	0° 56' 14"	15' 19.33"	140° 59' 17"	0.00539
8	175° 17' 58"	3° 52' 16"	177° 13' 38"	5° 25' 14"	0° 56' 15"	15' 19.71"	142° 28' 02"	0.00483
9	175° 50' 09"	3° 50' 22"	177° 42' 26"	5° 10' 41"	0° 56' 16"	15' 20.08"	144° 7' 02"	0.00430
10	176° 22' 21"	3° 48' 25"	178° 11' 15"	4° 56' 07"	0° 56' 18"	15' 20.46"	145° 58' 07"	0.00381
11	176° 54' 34"	3° 46' 28"	178° 40' 04"	4° 41' 30"	0° 56' 19"	15' 20.84"	148° 3' 28"	0.00336
12	177° 26' 49"	3° 44' 29"	179° 08' 53"	4° 26' 51"	0° 56' 21"	15' 21.22"	150° 25' 45"	0.00295
13	177° 59' 06"	3° 42' 29"	179° 37' 42"	4° 12' 11"	0° 56' 22"	15' 21.60"	153° 8' 10"	0.00257
14	178° 31' 24"	3° 40' 27"	180° 06' 32"	3° 57' 29"	0° 56' 23"	15' 21.98"	156° 14' 37"	0.00223
15	179° 03' 44"	3° 38' 24"	180° 35' 22"	3° 42' 45"	0° 56' 25"	15' 22.36"	159° 49' 37"	0.00193
16	179° 36' 05"	3° 36' 20"	181° 04' 13"	3° 27' 59"	0° 56' 26"	15' 22.74"	163° 58' 19"	0.00167
17	180° 08' 27"	3° 34' 15"	181° 33' 04"	3° 13' 12"	0° 56' 28"	15' 23.12"	168° 46' 12"	0.00144
18	180° 40' 51"	3° 32' 09"	182° 01' 55"	2° 58' 23"	0° 56' 29"	15' 23.50"	174° 18' 26"	0.00125
19	181° 13' 16"	3° 30' 01"	182° 30' 48"	2° 43' 32"	0° 56' 30"	15' 23.88"	180° 38' 32"	0.00110
20	181° 45' 43"	3° 27' 52"	182° 59' 41"	2° 28' 40"	0° 56' 32"	15' 24.25"	187° 46' 28"	0.00099
21	182° 18' 11"	3° 25' 41"	183° 28' 35"	2° 13' 47"	0° 56' 33"	15' 24.63"	195° 36' 25"	0.00092
22	182° 50' 41"	3° 23' 30"	183° 57' 29"	1° 58' 53"	0° 56' 35"	15' 25.01"	203° 55' 23"	0.00088
23	183° 23' 12"	3° 21' 17"	184° 26' 25"	1° 43' 57"	0° 56' 36"	15' 25.39"	212° 24' 08"	0.00088
24	183° 55' 45"	3° 19' 03"	184° 55' 21"	1° 28' 60"	0° 56' 37"	15' 25.76"	220° 41' 02"	0.00092

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	182° 54' 12"	0.52"	182° 39' 21"	-1° 09' 02"	1.0028110	15' 56.94"	23° 26' 18"	8 m 28 s
1	182° 56' 39"	0.51"	182° 41' 36"	-1° 10' 01"	1.0027992	15' 56.95"	23° 26' 18"	8 m 29 s
2	182° 59' 06"	0.51"	182° 43' 51"	-1° 10' 59"	1.0027875	15' 56.96"	23° 26' 18"	8 m 30 s
3	183° 01' 33"	0.50"	182° 46' 06"	-1° 11' 58"	1.0027757	15' 56.97"	23° 26' 18"	8 m 31 s
4	183° 04' 00"	0.50"	182° 48' 21"	-1° 12' 56"	1.0027639	15' 56.99"	23° 26' 18"	8 m 32 s
5	183° 06' 27"	0.49"	182° 50' 36"	-1° 13' 55"	1.0027521	15' 57.00"	23° 26' 18"	8 m 33 s
6	183° 08' 54"	0.49"	182° 52' 51"	-1° 14' 53"	1.0027403	15' 57.01"	23° 26' 18"	8 m 34 s
7	183° 11' 22"	0.48"	182° 55' 06"	-1° 15' 51"	1.0027285	15' 57.02"	23° 26' 18"	8 m 35 s
8	183° 13' 49"	0.48"	182° 57' 21"	-1° 16' 50"	1.0027167	15' 57.03"	23° 26' 18"	8 m 35 s
9	183° 16' 16"	0.47"	182° 59' 36"	-1° 17' 48"	1.0027049	15' 57.04"	23° 26' 18"	8 m 36 s
10	183° 18' 43"	0.47"	183° 01' 51"	-1° 18' 47"	1.0026931	15' 57.05"	23° 26' 18"	8 m 37 s
11	183° 21' 10"	0.46"	183° 04' 06"	-1° 19' 45"	1.0026812	15' 57.06"	23° 26' 18"	8 m 38 s
12	183° 23' 37"	0.46"	183° 06' 21"	-1° 20' 44"	1.0026694	15' 57.08"	23° 26' 18"	8 m 39 s
13	183° 26' 04"	0.45"	183° 08' 36"	-1° 21' 42"	1.0026576	15' 57.09"	23° 26' 18"	8 m 40 s
14	183° 28' 31"	0.45"	183° 10' 51"	-1° 22' 40"	1.0026458	15' 57.10"	23° 26' 18"	8 m 41 s
15	183° 30' 58"	0.44"	183° 13' 06"	-1° 23' 39"	1.0026339	15' 57.11"	23° 26' 18"	8 m 41 s
16	183° 33' 26"	0.44"	183° 15' 21"	-1° 24' 37"	1.0026221	15' 57.12"	23° 26' 18"	8 m 42 s
17	183° 35' 53"	0.43"	183° 17' 36"	-1° 25' 36"	1.0026103	15' 57.13"	23° 26' 18"	8 m 43 s
18	183° 38' 20"	0.43"	183° 19' 51"	-1° 26' 34"	1.0025984	15' 57.14"	23° 26' 18"	8 m 44 s
19	183° 40' 47"	0.42"	183° 22' 06"	-1° 27' 33"	1.0025866	15' 57.15"	23° 26' 18"	8 m 45 s
20	183° 43' 14"	0.42"	183° 24' 21"	-1° 28' 31"	1.0025747	15' 57.17"	23° 26' 18"	8 m 46 s
21	183° 45' 41"	0.41"	183° 26' 37"	-1° 29' 29"	1.0025629	15' 57.18"	23° 26' 18"	8 m 47 s
22	183° 48' 08"	0.41"	183° 28' 52"	-1° 30' 28"	1.0025510	15' 57.19"	23° 26' 18"	8 m 47 s
23	183° 50' 35"	0.40"	183° 31' 07"	-1° 31' 26"	1.0025391	15' 57.20"	23° 26' 18"	8 m 48 s
24	183° 53' 03"	0.40"	183° 33' 22"	-1° 32' 25"	1.0025273	15' 57.21"	23° 26' 18"	8 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	183° 55' 45"	3° 19' 03"	184° 55' 21"	1° 28' 60"	0° 56' 37"	15' 25.76"	220° 41' 02"	0.00092
1	184° 28' 19"	3° 16' 48"	185° 24' 19"	1° 14' 02"	0° 56' 39"	15' 26.14"	228° 27' 16"	0.00100
2	185° 00' 54"	3° 14' 32"	185° 53' 17"	0° 59' 02"	0° 56' 40"	15' 26.52"	235° 30' 28"	0.00112
3	185° 33' 31"	3° 12' 14"	186° 22' 17"	0° 44' 02"	0° 56' 41"	15' 26.89"	241° 45' 22"	0.00128
4	186° 06' 09"	3° 09' 55"	186° 51' 18"	0° 29' 01"	0° 56' 43"	15' 27.27"	247° 12' 22"	0.00147
5	186° 38' 49"	3° 07' 36"	187° 20' 20"	0° 13' 59"	0° 56' 44"	15' 27.64"	251° 55' 10"	0.00171
6	187° 11' 30"	3° 05' 15"	187° 49' 24"	0° -1' 04"	0° 56' 46"	15' 28.02"	255° 58' 60"	0.00198
7	187° 44' 13"	3° 02' 52"	188° 18' 28"	0° -16' 07"	0° 56' 47"	15' 28.39"	259° 29' 20"	0.00229
8	188° 16' 57"	3° 00' 29"	188° 47' 35"	0° -31' 11"	0° 56' 48"	15' 28.76"	262° 31' 17"	0.00264
9	188° 49' 42"	2° 58' 05"	189° 16' 43"	0° -46' 16"	0° 56' 50"	15' 29.13"	265° 9' 20"	0.00304
10	189° 22' 29"	2° 55' 39"	189° 45' 52"	-1° 01' 21"	0° 56' 51"	15' 29.50"	267° 27' 16"	0.00347
11	189° 55' 17"	2° 53' 13"	190° 15' 03"	-1° 16' 27"	0° 56' 52"	15' 29.87"	269° 28' 17"	0.00394
12	190° 28' 07"	2° 50' 45"	190° 44' 16"	-1° 31' 33"	0° 56' 54"	15' 30.24"	271° 14' 59"	0.00444
13	191° 00' 58"	2° 48' 16"	191° 13' 30"	-1° 46' 40"	0° 56' 55"	15' 30.61"	272° 49' 32"	0.00499
14	191° 33' 50"	2° 45' 47"	191° 42' 46"	-2° 01' 47"	0° 56' 56"	15' 30.98"	274° 13' 43"	0.00558
15	192° 06' 44"	2° 43' 16"	192° 12' 05"	-2° 16' 53"	0° 56' 58"	15' 31.35"	275° 29' 00"	0.00621
16	192° 39' 39"	2° 40' 44"	192° 41' 25"	-2° 32' 00"	0° 56' 59"	15' 31.71"	276° 36' 36"	0.00688
17	193° 12' 35"	2° 38' 11"	193° 10' 47"	-2° 47' 07"	0° 57' 00"	15' 32.08"	277° 37' 32"	0.00758
18	193° 45' 33"	2° 35' 37"	193° 40' 11"	-3° 02' 15"	0° 57' 02"	15' 32.44"	278° 32' 38"	0.00833
19	194° 18' 32"	2° 33' 03"	194° 09' 37"	-3° 17' 21"	0° 57' 03"	15' 32.81"	279° 22' 39"	0.00912
20	194° 51' 33"	2° 30' 27"	194° 39' 06"	-3° 32' 28"	0° 57' 04"	15' 33.17"	280° 8' 09"	0.00994
21	195° 24' 34"	2° 27' 50"	195° 08' 37"	-3° 47' 35"	0° 57' 06"	15' 33.53"	280° 49' 40"	0.01081
22	195° 57' 38"	2° 25' 12"	195° 38' 10"	-4° 02' 41"	0° 57' 07"	15' 33.89"	281° 27' 38"	0.01171
23	196° 30' 42"	2° 22' 34"	196° 07' 46"	-4° 17' 47"	0° 57' 08"	15' 34.25"	282° 2' 25"	0.01266
24	197° 03' 48"	2° 19' 54"	196° 37' 24"	-4° 32' 52"	0° 57' 10"	15' 34.61"	282° 34' 22"	0.01365

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	183° 53' 03"	0.40"	183° 33' 22"	-1° 32' 25"	1.0025273	15' 57.21"	23° 26' 18"	8 m 49 s
1	183° 55' 30"	0.39"	183° 35' 37"	-1° 33' 23"	1.0025154	15' 57.22"	23° 26' 18"	8 m 50 s
2	183° 57' 57"	0.39"	183° 37' 52"	-1° 34' 22"	1.0025035	15' 57.23"	23° 26' 18"	8 m 51 s
3	184° 00' 24"	0.38"	183° 40' 07"	-1° 35' 20"	1.0024917	15' 57.24"	23° 26' 18"	8 m 52 s
4	184° 02' 51"	0.38"	183° 42' 22"	-1° 36' 18"	1.0024798	15' 57.26"	23° 26' 18"	8 m 53 s
5	184° 05' 18"	0.37"	183° 44' 37"	-1° 37' 17"	1.0024679	15' 57.27"	23° 26' 18"	8 m 54 s
6	184° 07' 46"	0.37"	183° 46' 52"	-1° 38' 15"	1.0024560	15' 57.28"	23° 26' 18"	8 m 54 s
7	184° 10' 13"	0.36"	183° 49' 08"	-1° 39' 14"	1.0024441	15' 57.29"	23° 26' 18"	8 m 55 s
8	184° 12' 40"	0.36"	183° 51' 23"	-1° 40' 12"	1.0024322	15' 57.30"	23° 26' 18"	8 m 56 s
9	184° 15' 07"	0.35"	183° 53' 38"	-1° 41' 10"	1.0024203	15' 57.31"	23° 26' 18"	8 m 57 s
10	184° 17' 34"	0.35"	183° 55' 53"	-1° 42' 09"	1.0024084	15' 57.32"	23° 26' 18"	8 m 58 s
11	184° 20' 01"	0.34"	183° 58' 08"	-1° 43' 07"	1.0023965	15' 57.34"	23° 26' 18"	8 m 58 s
12	184° 22' 29"	0.33"	184° 00' 23"	-1° 44' 06"	1.0023846	15' 57.35"	23° 26' 18"	8 m 59 s
13	184° 24' 56"	0.33"	184° 02' 39"	-1° 45' 04"	1.0023727	15' 57.36"	23° 26' 18"	9 m 00 s
14	184° 27' 23"	0.32"	184° 04' 54"	-1° 46' 02"	1.0023608	15' 57.37"	23° 26' 18"	9 m 01 s
15	184° 29' 50"	0.32"	184° 07' 09"	-1° 47' 01"	1.0023488	15' 57.38"	23° 26' 18"	9 m 02 s
16	184° 32' 17"	0.31"	184° 09' 24"	-1° 47' 59"	1.0023369	15' 57.39"	23° 26' 18"	9 m 03 s
17	184° 34' 45"	0.31"	184° 11' 39"	-1° 48' 58"	1.0023250	15' 57.40"	23° 26' 18"	9 m 04 s
18	184° 37' 12"	0.30"	184° 13' 54"	-1° 49' 56"	1.0023130	15' 57.42"	23° 26' 18"	9 m 04 s
19	184° 39' 39"	0.30"	184° 16' 10"	-1° 50' 54"	1.0023011	15' 57.43"	23° 26' 18"	9 m 05 s
20	184° 42' 06"	0.29"	184° 18' 25"	-1° 51' 53"	1.0022892	15' 57.44"	23° 26' 18"	9 m 06 s
21	184° 44' 33"	0.29"	184° 20' 40"	-1° 52' 51"	1.0022772	15' 57.45"	23° 26' 18"	9 m 07 s
22	184° 47' 01"	0.28"	184° 22' 55"	-1° 53' 50"	1.0022653	15' 57.46"	23° 26' 18"	9 m 08 s
23	184° 49' 28"	0.27"	184° 25' 10"	-1° 54' 48"	1.0022533	15' 57.47"	23° 26' 18"	9 m 09 s
24	184° 51' 55"	0.27"	184° 27' 26"	-1° 55' 46"	1.0022414	15' 57.48"	23° 26' 18"	9 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	197° 03' 48"	2° 19' 54"	196° 37' 24"	-4° 32' 52"	0° 57' 10"	15' 34.61"	282° 34' 22"	0.01365
1	197° 36' 55"	2° 17' 14"	197° 07' 04"	-4° 47' 57"	0° 57' 11"	15' 34.97"	283° 3' 44"	0.01467
2	198° 10' 04"	2° 14' 32"	197° 36' 48"	-5° 03' 01"	0° 57' 12"	15' 35.32"	283° 30' 47"	0.01574
3	198° 43' 13"	2° 11' 50"	198° 06' 34"	-5° 18' 05"	0° 57' 14"	15' 35.68"	283° 55' 43"	0.01684
4	199° 16' 25"	2° 09' 07"	198° 36' 22"	-5° 33' 07"	0° 57' 15"	15' 36.03"	284° 18' 43"	0.01799
5	199° 49' 37"	2° 06' 23"	199° 06' 14"	-5° 48' 09"	0° 57' 16"	15' 36.38"	284° 39' 57"	0.01917
6	200° 22' 51"	2° 03' 38"	199° 36' 08"	-6° 03' 10"	0° 57' 18"	15' 36.73"	284° 59' 35"	0.02040
7	200° 56' 06"	2° 00' 52"	200° 06' 05"	-6° 18' 10"	0° 57' 19"	15' 37.08"	285° 17' 43"	0.02166
8	201° 29' 22"	1° 58' 06"	200° 36' 05"	-6° 33' 09"	0° 57' 20"	15' 37.43"	285° 34' 28"	0.02296
9	202° 02' 40"	1° 55' 18"	201° 06' 08"	-6° 48' 07"	0° 57' 21"	15' 37.78"	285° 49' 57"	0.02431
10	202° 35' 58"	1° 52' 30"	201° 36' 15"	-7° 03' 04"	0° 57' 23"	15' 38.13"	286° 4' 15"	0.02569
11	203° 09' 19"	1° 49' 41"	202° 06' 24"	-7° 17' 59"	0° 57' 24"	15' 38.47"	286° 17' 27"	0.02712
12	203° 42' 40"	1° 46' 52"	202° 36' 37"	-7° 32' 53"	0° 57' 25"	15' 38.81"	286° 29' 38"	0.02858
13	204° 16' 03"	1° 44' 01"	203° 06' 53"	-7° 47' 45"	0° 57' 26"	15' 39.15"	286° 40' 51"	0.03008
14	204° 49' 26"	1° 41' 10"	203° 37' 12"	-8° 02' 36"	0° 57' 28"	15' 39.50"	286° 51' 09"	0.03162
15	205° 22' 52"	1° 38' 19"	204° 07' 35"	-8° 17' 26"	0° 57' 29"	15' 39.83"	287° 0' 37"	0.03321
16	205° 56' 18"	1° 35' 26"	204° 38' 02"	-8° 32' 13"	0° 57' 30"	15' 40.17"	287° 9' 17"	0.03483
17	206° 29' 46"	1° 32' 33"	205° 08' 32"	-8° 46' 59"	0° 57' 31"	15' 40.51"	287° 17' 12"	0.03649
18	207° 03' 14"	1° 29' 39"	205° 39' 05"	-9° 01' 43"	0° 57' 33"	15' 40.84"	287° 24' 24"	0.03819
19	207° 36' 44"	1° 26' 45"	206° 09' 42"	-9° 16' 25"	0° 57' 34"	15' 41.17"	287° 30' 55"	0.03993
20	208° 10' 16"	1° 23' 50"	206° 40' 24"	-9° 31' 05"	0° 57' 35"	15' 41.51"	287° 36' 48"	0.04171
21	208° 43' 48"	1° 20' 54"	207° 11' 08"	-9° 45' 43"	0° 57' 36"	15' 41.84"	287° 42' 04"	0.04352
22	209° 17' 22"	1° 17' 58"	207° 41' 57"	-10° 00' 19"	0° 57' 37"	15' 42.16"	287° 46' 45"	0.04538
23	209° 50' 57"	1° 15' 01"	208° 12' 50"	-10° 14' 52"	0° 57' 39"	15' 42.49"	287° 50' 53"	0.04728
24	210° 24' 33"	1° 12' 04"	208° 43' 46"	-10° 29' 23"	0° 57' 40"	15' 42.82"	287° 54' 29"	0.04921

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	184° 51' 55"	0.27"	184° 27' 26"	-1° 55' 46"	1.0022414	15' 57.48"	23° 26' 18"	9 m 10 s
1	184° 54' 22"	0.26"	184° 29' 41"	-1° 56' 45"	1.0022294	15' 57.50"	23° 26' 18"	9 m 10 s
2	184° 56' 50"	0.26"	184° 31' 56"	-1° 57' 43"	1.0022175	15' 57.51"	23° 26' 18"	9 m 11 s
3	184° 59' 17"	0.25"	184° 34' 11"	-1° 58' 42"	1.0022055	15' 57.52"	23° 26' 18"	9 m 12 s
4	185° 01' 44"	0.25"	184° 36' 27"	-1° 59' 40"	1.0021935	15' 57.53"	23° 26' 18"	9 m 13 s
5	185° 04' 11"	0.24"	184° 38' 42"	-2° 00' 38"	1.0021815	15' 57.54"	23° 26' 18"	9 m 14 s
6	185° 06' 38"	0.23"	184° 40' 57"	-2° 01' 37"	1.0021696	15' 57.55"	23° 26' 18"	9 m 15 s
7	185° 09' 06"	0.23"	184° 43' 12"	-2° 02' 35"	1.0021576	15' 57.56"	23° 26' 18"	9 m 15 s
8	185° 11' 33"	0.22"	184° 45' 28"	-2° 03' 33"	1.0021456	15' 57.58"	23° 26' 18"	9 m 16 s
9	185° 14' 00"	0.22"	184° 47' 43"	-2° 04' 32"	1.0021336	15' 57.59"	23° 26' 18"	9 m 17 s
10	185° 16' 27"	0.21"	184° 49' 58"	-2° 05' 30"	1.0021216	15' 57.60"	23° 26' 18"	9 m 18 s
11	185° 18' 55"	0.21"	184° 52' 13"	-2° 06' 29"	1.0021096	15' 57.61"	23° 26' 18"	9 m 19 s
12	185° 21' 22"	0.20"	184° 54' 29"	-2° 07' 27"	1.0020976	15' 57.62"	23° 26' 18"	9 m 20 s
13	185° 23' 49"	0.20"	184° 56' 44"	-2° 08' 25"	1.0020856	15' 57.63"	23° 26' 18"	9 m 20 s
14	185° 26' 17"	0.19"	184° 58' 59"	-2° 09' 24"	1.0020736	15' 57.64"	23° 26' 18"	9 m 21 s
15	185° 28' 44"	0.18"	185° 01' 15"	-2° 10' 22"	1.0020616	15' 57.66"	23° 26' 18"	9 m 22 s
16	185° 31' 11"	0.18"	185° 03' 30"	-2° 11' 20"	1.0020496	15' 57.67"	23° 26' 18"	9 m 23 s
17	185° 33' 38"	0.17"	185° 05' 45"	-2° 12' 19"	1.0020376	15' 57.68"	23° 26' 18"	9 m 24 s
18	185° 36' 06"	0.17"	185° 08' 01"	-2° 13' 17"	1.0020256	15' 57.69"	23° 26' 18"	9 m 25 s
19	185° 38' 33"	0.16"	185° 10' 16"	-2° 14' 15"	1.0020136	15' 57.70"	23° 26' 18"	9 m 26 s
20	185° 41' 00"	0.16"	185° 12' 31"	-2° 15' 14"	1.0020015	15' 57.71"	23° 26' 18"	9 m 26 s
21	185° 43' 28"	0.15"	185° 14' 47"	-2° 16' 12"	1.0019895	15' 57.72"	23° 26' 18"	9 m 27 s
22	185° 45' 55"	0.14"	185° 17' 02"	-2° 17' 10"	1.0019775	15' 57.74"	23° 26' 18"	9 m 28 s
23	185° 48' 22"	0.14"	185° 19' 17"	-2° 18' 09"	1.0019655	15' 57.75"	23° 26' 18"	9 m 29 s
24	185° 50' 49"	0.13"	185° 21' 33"	-2° 19' 07"	1.0019534	15' 57.76"	23° 26' 18"	9 m 30 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	210° 24' 33"	1° 12' 04"	208° 43' 46"	-10° 29' 23"	0° 57' 40"	15' 42.82"	287° 54' 29"	0.04921
1	210° 58' 10"	1° 09' 06"	209° 14' 47"	-10° 43' 52"	0° 57' 41"	15' 43.14"	287° 57' 34"	0.05119
2	211° 31' 49"	1° 06' 07"	209° 45' 52"	-10° 58' 18"	0° 57' 42"	15' 43.46"	288° 0' 10"	0.05320
3	212° 05' 29"	1° 03' 08"	210° 17' 01"	-11° 12' 42"	0° 57' 43"	15' 43.78"	288° 2' 18"	0.05525
4	212° 39' 09"	1° 00' 09"	210° 48' 14"	-11° 27' 03"	0° 57' 45"	15' 44.10"	288° 3' 58"	0.05734
5	213° 12' 51"	0° 57' 09"	211° 19' 32"	-11° 41' 21"	0° 57' 46"	15' 44.42"	288° 5' 13"	0.05947
6	213° 46' 35"	0° 54' 09"	211° 50' 54"	-11° 55' 36"	0° 57' 47"	15' 44.73"	288° 6' 02"	0.06163
7	214° 20' 19"	0° 51' 08"	212° 22' 20"	-12° 09' 48"	0° 57' 48"	15' 45.05"	288° 6' 27"	0.06384
8	214° 54' 04"	0° 48' 07"	212° 53' 51"	-12° 23' 57"	0° 57' 49"	15' 45.36"	288° 6' 28"	0.06608
9	215° 27' 51"	0° 45' 05"	213° 25' 26"	-12° 38' 03"	0° 57' 50"	15' 45.67"	288° 6' 07"	0.06836
10	216° 01' 39"	0° 42' 03"	213° 57' 06"	-12° 52' 06"	0° 57' 51"	15' 45.98"	288° 5' 23"	0.07068
11	216° 35' 28"	0° 39' 01"	214° 28' 51"	-13° 06' 06"	0° 57' 53"	15' 46.28"	288° 4' 18"	0.07303
12	217° 09' 18"	0° 35' 58"	215° 00' 40"	-13° 20' 02"	0° 57' 54"	15' 46.59"	288° 2' 52"	0.07543
13	217° 43' 09"	0° 32' 55"	215° 32' 34"	-13° 33' 55"	0° 57' 55"	15' 46.89"	288° 1' 05"	0.07786
14	218° 17' 01"	0° 29' 52"	216° 04' 33"	-13° 47' 44"	0° 57' 56"	15' 47.20"	287° 58' 59"	0.08032
15	218° 50' 55"	0° 26' 48"	216° 36' 37"	-14° 01' 29"	0° 57' 57"	15' 47.50"	287° 56' 33"	0.08283
16	219° 24' 49"	0° 23' 44"	217° 08' 45"	-14° 15' 11"	0° 57' 58"	15' 47.79"	287° 53' 49"	0.08537
17	219° 58' 45"	0° 20' 40"	217° 40' 59"	-14° 28' 49"	0° 57' 59"	15' 48.09"	287° 50' 46"	0.08795
18	220° 32' 42"	0° 17' 35"	218° 13' 18"	-14° 42' 23"	0° 58' 00"	15' 48.38"	287° 47' 25"	0.09056
19	221° 06' 39"	0° 14' 31"	218° 45' 41"	-14° 55' 53"	0° 58' 01"	15' 48.68"	287° 43' 46"	0.09321
20	221° 40' 38"	0° 11' 26"	219° 18' 10"	-15° 09' 18"	0° 58' 02"	15' 48.97"	287° 39' 51"	0.09590
21	222° 14' 38"	0° 08' 21"	219° 50' 44"	-15° 22' 40"	0° 58' 04"	15' 49.26"	287° 35' 38"	0.09862
22	222° 48' 39"	0° 05' 16"	220° 23' 23"	-15° 35' 57"	0° 58' 05"	15' 49.54"	287° 31' 09"	0.10138
23	223° 22' 41"	0° 02' 10"	220° 56' 08"	-15° 49' 10"	0° 58' 06"	15' 49.83"	287° 26' 23"	0.10418
24	223° 56' 45"	0° 00' 55"	221° 28' 57"	-16° 02' 18"	0° 58' 07"	15' 50.11"	287° 21' 22"	0.10701



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	185° 50' 49"	0.13"	185° 21' 33"	-2° 19' 07"	1.0019534	15' 57.76"	23° 26' 18"	9 m 30 s
1	185° 53' 17"	0.13"	185° 23' 48"	-2° 20' 05"	1.0019414	15' 57.77"	23° 26' 18"	9 m 31 s
2	185° 55' 44"	0.12"	185° 26' 04"	-2° 21' 04"	1.0019293	15' 57.78"	23° 26' 18"	9 m 31 s
3	185° 58' 11"	0.12"	185° 28' 19"	-2° 22' 02"	1.0019173	15' 57.79"	23° 26' 18"	9 m 32 s
4	186° 00' 39"	0.11"	185° 30' 34"	-2° 23' 00"	1.0019052	15' 57.81"	23° 26' 18"	9 m 33 s
5	186° 03' 06"	0.10"	185° 32' 50"	-2° 23' 59"	1.0018932	15' 57.82"	23° 26' 18"	9 m 34 s
6	186° 05' 33"	0.10"	185° 35' 05"	-2° 24' 57"	1.0018811	15' 57.83"	23° 26' 18"	9 m 35 s
7	186° 08' 01"	0.09"	185° 37' 20"	-2° 25' 55"	1.0018691	15' 57.84"	23° 26' 18"	9 m 36 s
8	186° 10' 28"	0.09"	185° 39' 36"	-2° 26' 54"	1.0018570	15' 57.85"	23° 26' 18"	9 m 36 s
9	186° 12' 55"	0.08"	185° 41' 51"	-2° 27' 52"	1.0018450	15' 57.86"	23° 26' 18"	9 m 37 s
10	186° 15' 23"	0.08"	185° 44' 07"	-2° 28' 50"	1.0018329	15' 57.87"	23° 26' 18"	9 m 38 s
11	186° 17' 50"	0.07"	185° 46' 22"	-2° 29' 49"	1.0018208	15' 57.89"	23° 26' 18"	9 m 39 s
12	186° 20' 17"	0.07"	185° 48' 38"	-2° 30' 47"	1.0018088	15' 57.90"	23° 26' 18"	9 m 40 s
13	186° 22' 45"	0.06"	185° 50' 53"	-2° 31' 45"	1.0017967	15' 57.91"	23° 26' 18"	9 m 41 s
14	186° 25' 12"	0.05"	185° 53' 09"	-2° 32' 44"	1.0017846	15' 57.92"	23° 26' 18"	9 m 41 s
15	186° 27' 39"	0.05"	185° 55' 24"	-2° 33' 42"	1.0017725	15' 57.93"	23° 26' 18"	9 m 42 s
16	186° 30' 07"	0.04"	185° 57' 39"	-2° 34' 40"	1.0017604	15' 57.94"	23° 26' 18"	9 m 43 s
17	186° 32' 34"	0.04"	185° 59' 55"	-2° 35' 39"	1.0017483	15' 57.96"	23° 26' 18"	9 m 44 s
18	186° 35' 01"	0.03"	186° 02' 10"	-2° 36' 37"	1.0017363	15' 57.97"	23° 26' 18"	9 m 45 s
19	186° 37' 29"	0.03"	186° 04' 26"	-2° 37' 35"	1.0017242	15' 57.98"	23° 26' 18"	9 m 46 s
20	186° 39' 56"	0.02"	186° 06' 41"	-2° 38' 33"	1.0017121	15' 57.99"	23° 26' 18"	9 m 46 s
21	186° 42' 23"	0.02"	186° 08' 57"	-2° 39' 32"	1.0017000	15' 58.00"	23° 26' 18"	9 m 47 s
22	186° 44' 51"	0.01"	186° 11' 12"	-2° 40' 30"	1.0016879	15' 58.01"	23° 26' 18"	9 m 48 s
23	186° 47' 18"	0.00"	186° 13' 28"	-2° 41' 28"	1.0016758	15' 58.02"	23° 26' 18"	9 m 49 s
24	186° 49' 46"	-0.00"	186° 15' 43"	-2° 42' 27"	1.0016637	15' 58.04"	23° 26' 18"	9 m 50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	223° 56' 45"	0° 00' 55"	221° 28' 57"	-16° 02' 18"	0° 58' 07"	15' 50.11"	287° 21' 22"	0.10701
1	224° 30' 49"	0° -4' 01"	222° 01' 52"	-16° 15' 22"	0° 58' 08"	15' 50.40"	287° 16' 05"	0.10987
2	225° 04' 54"	0° -7' 06"	222° 34' 53"	-16° 28' 21"	0° 58' 09"	15' 50.68"	287° 10' 33"	0.11277
3	225° 39' 01"	0° -10' 12"	223° 07' 59"	-16° 41' 16"	0° 58' 10"	15' 50.95"	287° 4' 45"	0.11571
4	226° 13' 08"	0° -13' 18"	223° 41' 10"	-16° 54' 05"	0° 58' 11"	15' 51.23"	286° 58' 43"	0.11868
5	226° 47' 17"	0° -16' 24"	224° 14' 27"	-17° 06' 49"	0° 58' 12"	15' 51.51"	286° 52' 26"	0.12168
6	227° 21' 26"	0° -19' 29"	224° 47' 49"	-17° 19' 29"	0° 58' 13"	15' 51.78"	286° 45' 54"	0.12472
7	227° 55' 37"	0° -22' 35"	225° 21' 17"	-17° 32' 03"	0° 58' 14"	15' 52.05"	286° 39' 09"	0.12779
8	228° 29' 48"	0° -25' 41"	225° 54' 51"	-17° 44' 32"	0° 58' 15"	15' 52.32"	286° 32' 09"	0.13090
9	229° 04' 01"	0° -28' 47"	226° 28' 30"	-17° 56' 56"	0° 58' 16"	15' 52.59"	286° 24' 55"	0.13404
10	229° 38' 15"	0° -31' 52"	227° 02' 15"	-18° 09' 14"	0° 58' 17"	15' 52.85"	286° 17' 28"	0.13721
11	230° 12' 29"	0° -34' 58"	227° 36' 06"	-18° 21' 27"	0° 58' 18"	15' 53.11"	286° 9' 48"	0.14042
12	230° 46' 45"	0° -38' 03"	228° 10' 02"	-18° 33' 34"	0° 58' 19"	15' 53.38"	286° 1' 54"	0.14366
13	231° 21' 02"	0° -41' 08"	228° 44' 04"	-18° 45' 35"	0° 58' 20"	15' 53.64"	285° 53' 47"	0.14693
14	231° 55' 19"	0° -44' 14"	229° 18' 12"	-18° 57' 31"	0° 58' 21"	15' 53.89"	285° 45' 27"	0.15023
15	232° 29' 38"	0° -47' 19"	229° 52' 26"	-19° 09' 20"	0° 58' 21"	15' 54.15"	285° 36' 54"	0.15356
16	233° 03' 58"	0° -50' 23"	230° 26' 45"	-19° 21' 04"	0° 58' 22"	15' 54.40"	285° 28' 09"	0.15693
17	233° 38' 18"	0° -53' 28"	231° 01' 11"	-19° 32' 41"	0° 58' 23"	15' 54.66"	285° 19' 11"	0.16033
18	234° 12' 40"	0° -56' 32"	231° 35' 42"	-19° 44' 12"	0° 58' 24"	15' 54.91"	285° 10' 01"	0.16376
19	234° 47' 03"	0° -59' 37"	232° 10' 19"	-19° 55' 37"	0° 58' 25"	15' 55.16"	285° 0' 39"	0.16722
20	235° 21' 26"	-1° 02' 40"	232° 45' 02"	-20° 06' 56"	0° 58' 26"	15' 55.40"	284° 51' 04"	0.17071
21	235° 55' 51"	-1° 05' 44"	233° 19' 51"	-20° 18' 08"	0° 58' 27"	15' 55.65"	284° 41' 18"	0.17423
22	236° 30' 16"	-1° 08' 47"	233° 54' 46"	-20° 29' 13"	0° 58' 28"	15' 55.89"	284° 31' 20"	0.17778
23	237° 04' 43"	-1° 11' 50"	234° 29' 47"	-20° 40' 12"	0° 58' 29"	15' 56.13"	284° 21' 10"	0.18137
24	237° 39' 10"	-1° 14' 53"	235° 04' 54"	-20° 51' 04"	0° 58' 30"	15' 56.37"	284° 10' 49"	0.18498

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	186° 49' 46"	-0.00"	186° 15' 43"	-2° 42' 27"	1.0016637	15' 58.04"	23° 26' 18"	9 m 50 s
1	186° 52' 13"	-0.01"	186° 17' 59"	-2° 43' 25"	1.0016515	15' 58.05"	23° 26' 18"	9 m 51 s
2	186° 54' 40"	-0.01"	186° 20' 14"	-2° 44' 23"	1.0016394	15' 58.06"	23° 26' 18"	9 m 51 s
3	186° 57' 08"	-0.02"	186° 22' 30"	-2° 45' 21"	1.0016273	15' 58.07"	23° 26' 18"	9 m 52 s
4	186° 59' 35"	-0.02"	186° 24' 46"	-2° 46' 20"	1.0016152	15' 58.08"	23° 26' 18"	9 m 53 s
5	187° 02' 03"	-0.03"	186° 27' 01"	-2° 47' 18"	1.0016031	15' 58.09"	23° 26' 18"	9 m 54 s
6	187° 04' 30"	-0.03"	186° 29' 17"	-2° 48' 16"	1.0015910	15' 58.11"	23° 26' 18"	9 m 55 s
7	187° 06' 57"	-0.04"	186° 31' 32"	-2° 49' 14"	1.0015788	15' 58.12"	23° 26' 18"	9 m 55 s
8	187° 09' 25"	-0.04"	186° 33' 48"	-2° 50' 13"	1.0015667	15' 58.13"	23° 26' 18"	9 m 56 s
9	187° 11' 52"	-0.05"	186° 36' 03"	-2° 51' 11"	1.0015546	15' 58.14"	23° 26' 18"	9 m 57 s
10	187° 14' 20"	-0.05"	186° 38' 19"	-2° 52' 09"	1.0015425	15' 58.15"	23° 26' 18"	9 m 58 s
11	187° 16' 47"	-0.06"	186° 40' 34"	-2° 53' 07"	1.0015303	15' 58.16"	23° 26' 18"	9 m 59 s
12	187° 19' 14"	-0.07"	186° 42' 50"	-2° 54' 06"	1.0015182	15' 58.18"	23° 26' 18"	9 m 60 s
13	187° 21' 42"	-0.07"	186° 45' 06"	-2° 55' 04"	1.0015060	15' 58.19"	23° 26' 18"	10 m 00 s
14	187° 24' 09"	-0.08"	186° 47' 21"	-2° 56' 02"	1.0014939	15' 58.20"	23° 26' 18"	10 m 01 s
15	187° 26' 37"	-0.08"	186° 49' 37"	-2° 57' 00"	1.0014818	15' 58.21"	23° 26' 18"	10 m 02 s
16	187° 29' 04"	-0.09"	186° 51' 53"	-2° 57' 59"	1.0014696	15' 58.22"	23° 26' 18"	10 m 03 s
17	187° 31' 31"	-0.09"	186° 54' 08"	-2° 58' 57"	1.0014575	15' 58.23"	23° 26' 18"	10 m 04 s
18	187° 33' 59"	-0.10"	186° 56' 24"	-2° 59' 55"	1.0014453	15' 58.25"	23° 26' 18"	10 m 05 s
19	187° 36' 26"	-0.10"	186° 58' 39"	-3° 00' 53"	1.0014332	15' 58.26"	23° 26' 18"	10 m 05 s
20	187° 38' 54"	-0.11"	187° 00' 55"	-3° 01' 51"	1.0014210	15' 58.27"	23° 26' 18"	10 m 06 s
21	187° 41' 21"	-0.11"	187° 03' 11"	-3° 02' 50"	1.0014089	15' 58.28"	23° 26' 18"	10 m 07 s
22	187° 43' 49"	-0.12"	187° 05' 26"	-3° 03' 48"	1.0013967	15' 58.29"	23° 26' 18"	10 m 08 s
23	187° 46' 16"	-0.12"	187° 07' 42"	-3° 04' 46"	1.0013845	15' 58.30"	23° 26' 18"	10 m 09 s
24	187° 48' 44"	-0.13"	187° 09' 58"	-3° 05' 44"	1.0013724	15' 58.31"	23° 26' 18"	10 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	237° 39' 10"	-1° 14' 53"	235° 04' 54"	-20° 51' 04"	0° 58' 30"	15' 56.37"	284° 10' 49"	0.18498
1	238° 13' 39"	-1° 17' 55"	235° 40' 07"	-21° 01' 49"	0° 58' 31"	15' 56.61"	284° 0' 17"	0.18862
2	238° 48' 08"	-1° 20' 57"	236° 15' 25"	-21° 12' 27"	0° 58' 31"	15' 56.84"	283° 49' 33"	0.19229
3	239° 22' 38"	-1° 23' 58"	236° 50' 50"	-21° 22' 58"	0° 58' 32"	15' 57.08"	283° 38' 38"	0.19598
4	239° 57' 10"	-1° 26' 59"	237° 26' 20"	-21° 33' 22"	0° 58' 33"	15' 57.31"	283° 27' 32"	0.19971
5	240° 31' 42"	-1° 30' 00"	238° 01' 57"	-21° 43' 38"	0° 58' 34"	15' 57.54"	283° 16' 15"	0.20346
6	241° 06' 15"	-1° 33' 00"	238° 37' 39"	-21° 53' 47"	0° 58' 35"	15' 57.77"	283° 4' 47"	0.20725
7	241° 40' 49"	-1° 35' 60"	239° 13' 28"	-22° 03' 49"	0° 58' 36"	15' 57.99"	282° 53' 09"	0.21105
8	242° 15' 24"	-1° 38' 59"	239° 49' 22"	-22° 13' 43"	0° 58' 36"	15' 58.22"	282° 41' 20"	0.21489
9	242° 49' 60"	-1° 41' 58"	240° 25' 22"	-22° 23' 29"	0° 58' 37"	15' 58.44"	282° 29' 20"	0.21875
10	243° 24' 37"	-1° 44' 56"	241° 01' 28"	-22° 33' 08"	0° 58' 38"	15' 58.66"	282° 17' 11"	0.22264
11	243° 59' 14"	-1° 47' 53"	241° 37' 40"	-22° 42' 39"	0° 58' 39"	15' 58.88"	282° 4' 51"	0.22656
12	244° 33' 53"	-1° 50' 50"	242° 13' 58"	-22° 52' 02"	0° 58' 40"	15' 59.09"	281° 52' 21"	0.23050
13	245° 08' 33"	-1° 53' 47"	242° 50' 21"	-23° 01' 16"	0° 58' 40"	15' 59.31"	281° 39' 41"	0.23447
14	245° 43' 13"	-1° 56' 42"	243° 26' 50"	-23° 10' 23"	0° 58' 41"	15' 59.52"	281° 26' 52"	0.23846
15	246° 17' 54"	-1° 59' 37"	244° 03' 25"	-23° 19' 22"	0° 58' 42"	15' 59.73"	281° 13' 52"	0.24248
16	246° 52' 37"	-2° 02' 32"	244° 40' 06"	-23° 28' 12"	0° 58' 43"	15' 59.94"	281° 0' 44"	0.24652
17	247° 27' 20"	-2° 05' 26"	245° 16' 53"	-23° 36' 54"	0° 58' 44"	16' 00.15"	280° 47' 25"	0.25058
18	248° 02' 04"	-2° 08' 19"	245° 53' 45"	-23° 45' 27"	0° 58' 44"	16' 00.36"	280° 33' 58"	0.25467
19	248° 36' 49"	-2° 11' 11"	246° 30' 43"	-23° 53' 52"	0° 58' 45"	16' 00.56"	280° 20' 21"	0.25878
20	249° 11' 35"	-2° 14' 03"	247° 07' 46"	-24° 02' 08"	0° 58' 46"	16' 00.76"	280° 6' 35"	0.26292
21	249° 46' 21"	-2° 16' 53"	247° 44' 55"	-24° 10' 15"	0° 58' 46"	16' 00.96"	279° 52' 40"	0.26708
22	250° 21' 09"	-2° 19' 44"	248° 22' 09"	-24° 18' 13"	0° 58' 47"	16' 01.16"	279° 38' 36"	0.27126
23	250° 55' 57"	-2° 22' 33"	248° 59' 29"	-24° 26' 03"	0° 58' 48"	16' 01.35"	279° 24' 24"	0.27546
24	251° 30' 46"	-2° 25' 21"	249° 36' 54"	-24° 33' 43"	0° 58' 49"	16' 01.55"	279° 10' 03"	0.27968



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	187° 48' 44"	-0.13"	187° 09' 58"	-3° 05' 44"	1.0013724	15' 58.31"	23° 26' 18"	10 m 09 s
1	187° 51' 11"	-0.13"	187° 12' 13"	-3° 06' 42"	1.0013602	15' 58.33"	23° 26' 18"	10 m 10 s
2	187° 53' 38"	-0.14"	187° 14' 29"	-3° 07' 41"	1.0013480	15' 58.34"	23° 26' 18"	10 m 11 s
3	187° 56' 06"	-0.14"	187° 16' 45"	-3° 08' 39"	1.0013359	15' 58.35"	23° 26' 18"	10 m 12 s
4	187° 58' 33"	-0.15"	187° 19' 01"	-3° 09' 37"	1.0013237	15' 58.36"	23° 26' 18"	10 m 13 s
5	188° 01' 01"	-0.15"	187° 21' 16"	-3° 10' 35"	1.0013115	15' 58.37"	23° 26' 18"	10 m 13 s
6	188° 03' 28"	-0.16"	187° 23' 32"	-3° 11' 33"	1.0012994	15' 58.38"	23° 26' 18"	10 m 14 s
7	188° 05' 56"	-0.16"	187° 25' 48"	-3° 12' 32"	1.0012872	15' 58.40"	23° 26' 18"	10 m 15 s
8	188° 08' 23"	-0.17"	187° 28' 03"	-3° 13' 30"	1.0012750	15' 58.41"	23° 26' 18"	10 m 16 s
9	188° 10' 51"	-0.17"	187° 30' 19"	-3° 14' 28"	1.0012628	15' 58.42"	23° 26' 18"	10 m 17 s
10	188° 13' 18"	-0.18"	187° 32' 35"	-3° 15' 26"	1.0012506	15' 58.43"	23° 26' 18"	10 m 18 s
11	188° 15' 46"	-0.18"	187° 34' 51"	-3° 16' 24"	1.0012385	15' 58.44"	23° 26' 18"	10 m 18 s
12	188° 18' 13"	-0.18"	187° 37' 06"	-3° 17' 22"	1.0012263	15' 58.45"	23° 26' 18"	10 m 19 s
13	188° 20' 41"	-0.19"	187° 39' 22"	-3° 18' 21"	1.0012141	15' 58.47"	23° 26' 18"	10 m 20 s
14	188° 23' 08"	-0.19"	187° 41' 38"	-3° 19' 19"	1.0012019	15' 58.48"	23° 26' 18"	10 m 21 s
15	188° 25' 36"	-0.20"	187° 43' 54"	-3° 20' 17"	1.0011897	15' 58.49"	23° 26' 18"	10 m 22 s
16	188° 28' 03"	-0.20"	187° 46' 10"	-3° 21' 15"	1.0011775	15' 58.50"	23° 26' 18"	10 m 22 s
17	188° 30' 31"	-0.21"	187° 48' 25"	-3° 22' 13"	1.0011653	15' 58.51"	23° 26' 18"	10 m 23 s
18	188° 32' 58"	-0.21"	187° 50' 41"	-3° 23' 11"	1.0011531	15' 58.52"	23° 26' 18"	10 m 24 s
19	188° 35' 26"	-0.22"	187° 52' 57"	-3° 24' 09"	1.0011409	15' 58.54"	23° 26' 18"	10 m 25 s
20	188° 37' 53"	-0.22"	187° 55' 13"	-3° 25' 07"	1.0011287	15' 58.55"	23° 26' 18"	10 m 26 s
21	188° 40' 21"	-0.22"	187° 57' 29"	-3° 26' 06"	1.0011165	15' 58.56"	23° 26' 18"	10 m 26 s
22	188° 42' 48"	-0.23"	187° 59' 44"	-3° 27' 04"	1.0011043	15' 58.57"	23° 26' 18"	10 m 27 s
23	188° 45' 16"	-0.23"	188° 02' 00"	-3° 28' 02"	1.0010921	15' 58.58"	23° 26' 18"	10 m 28 s
24	188° 47' 43"	-0.24"	188° 04' 16"	-3° 28' 60"	1.0010799	15' 58.59"	23° 26' 18"	10 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	251° 30' 46"	-2° 25' 21"	249° 36' 54"	-24° 33' 43"	0° 58' 49"	16' 01.55"	279° 10' 03"	0.27968
1	252° 05' 37"	-2° 28' 09"	250° 14' 24"	-24° 41' 15"	0° 58' 49"	16' 01.74"	278° 55' 34"	0.28393
2	252° 40' 27"	-2° 30' 56"	250° 51' 60"	-24° 48' 37"	0° 58' 50"	16' 01.93"	278° 40' 56"	0.28819
3	253° 15' 19"	-2° 33' 42"	251° 29' 41"	-24° 55' 50"	0° 58' 51"	16' 02.12"	278° 26' 10"	0.29248
4	253° 50' 12"	-2° 36' 27"	252° 07' 27"	-25° 02' 54"	0° 58' 51"	16' 02.31"	278° 11' 16"	0.29678
5	254° 25' 05"	-2° 39' 11"	252° 45' 18"	-25° 09' 48"	0° 58' 52"	16' 02.49"	277° 56' 15"	0.30111
6	254° 59' 60"	-2° 41' 54"	253° 23' 14"	-25° 16' 33"	0° 58' 53"	16' 02.68"	277° 41' 05"	0.30545
7	255° 34' 55"	-2° 44' 37"	254° 01' 14"	-25° 23' 08"	0° 58' 53"	16' 02.86"	277° 25' 48"	0.30982
8	256° 09' 51"	-2° 47' 18"	254° 39' 29"	-25° 29' 33"	0° 58' 54"	16' 03.04"	277° 10' 24"	0.31420
9	256° 44' 48"	-2° 49' 58"	255° 17' 31"	-25° 35' 49"	0° 58' 55"	16' 03.21"	276° 54' 52"	0.31860
10	257° 19' 46"	-2° 52' 38"	255° 55' 46"	-25° 41' 55"	0° 58' 55"	16' 03.39"	276° 39' 13"	0.32302
11	257° 54' 44"	-2° 55' 16"	256° 34' 05"	-25° 47' 51"	0° 58' 56"	16' 03.56"	276° 23' 27"	0.32746
12	258° 29' 43"	-2° 57' 53"	257° 12' 30"	-25° 53' 37"	0° 58' 57"	16' 03.73"	276° 7' 34"	0.33191
13	259° 04' 43"	-3° 00' 30"	257° 50' 58"	-25° 59' 13"	0° 58' 57"	16' 03.90"	275° 51' 34"	0.33638
14	259° 39' 44"	-3° 03' 05"	258° 29' 31"	-26° 04' 39"	0° 58' 58"	16' 04.07"	275° 35' 28"	0.34086
15	260° 14' 46"	-3° 05' 39"	259° 08' 09"	-26° 09' 55"	0° 58' 59"	16' 04.24"	275° 19' 15"	0.34536
16	260° 49' 49"	-3° 08' 12"	259° 46' 50"	-26° 15' 01"	0° 58' 59"	16' 04.40"	275° 2' 56"	0.34988
17	261° 24' 52"	-3° 10' 44"	260° 25' 35"	-26° 19' 56"	0° 58' 60"	16' 04.56"	274° 46' 31"	0.35441
18	261° 59' 56"	-3° 13' 14"	261° 04' 24"	-26° 24' 41"	0° 59' 00"	16' 04.73"	274° 30' 01"	0.35896
19	262° 35' 01"	-3° 15' 44"	261° 43' 17"	-26° 29' 15"	0° 59' 01"	16' 04.88"	274° 13' 24"	0.36352
20	263° 10' 07"	-3° 18' 12"	262° 22' 14"	-26° 33' 39"	0° 59' 01"	16' 05.04"	273° 56' 42"	0.36809
21	263° 45' 13"	-3° 20' 40"	263° 01' 15"	-26° 37' 53"	0° 59' 02"	16' 05.19"	273° 39' 54"	0.37268
22	264° 20' 20"	-3° 23' 06"	263° 40' 18"	-26° 41' 56"	0° 59' 03"	16' 05.35"	273° 23' 01"	0.37728
23	264° 55' 28"	-3° 25' 31"	264° 19' 26"	-26° 45' 48"	0° 59' 03"	16' 05.50"	273° 6' 03"	0.38189
24	265° 30' 37"	-3° 27' 54"	264° 58' 36"	-26° 49' 30"	0° 59' 04"	16' 05.65"	272° 48' 60"	0.38651

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	188° 47' 43"	-0.24"	188° 04' 16"	-3° 28' 60"	1.0010799	15' 58.59"	23° 26' 18"	10 m 29 s
1	188° 50' 11"	-0.24"	188° 06' 32"	-3° 29' 58"	1.0010677	15' 58.61"	23° 26' 18"	10 m 30 s
2	188° 52' 38"	-0.25"	188° 08' 48"	-3° 30' 56"	1.0010555	15' 58.62"	23° 26' 18"	10 m 30 s
3	188° 55' 06"	-0.25"	188° 11' 04"	-3° 31' 54"	1.0010433	15' 58.63"	23° 26' 18"	10 m 31 s
4	188° 57' 33"	-0.25"	188° 13' 20"	-3° 32' 52"	1.0010311	15' 58.64"	23° 26' 18"	10 m 32 s
5	189° 00' 01"	-0.26"	188° 15' 36"	-3° 33' 50"	1.0010189	15' 58.65"	23° 26' 18"	10 m 33 s
6	189° 02' 28"	-0.26"	188° 17' 51"	-3° 34' 48"	1.0010067	15' 58.66"	23° 26' 18"	10 m 34 s
7	189° 04' 56"	-0.27"	188° 20' 07"	-3° 35' 47"	1.0009945	15' 58.68"	23° 26' 18"	10 m 34 s
8	189° 07' 24"	-0.27"	188° 22' 23"	-3° 36' 45"	1.0009823	15' 58.69"	23° 26' 18"	10 m 35 s
9	189° 09' 51"	-0.27"	188° 24' 39"	-3° 37' 43"	1.0009700	15' 58.70"	23° 26' 18"	10 m 36 s
10	189° 12' 19"	-0.28"	188° 26' 55"	-3° 38' 41"	1.0009578	15' 58.71"	23° 26' 18"	10 m 37 s
11	189° 14' 46"	-0.28"	188° 29' 11"	-3° 39' 39"	1.0009456	15' 58.72"	23° 26' 18"	10 m 38 s
12	189° 17' 14"	-0.29"	188° 31' 27"	-3° 40' 37"	1.0009334	15' 58.74"	23° 26' 18"	10 m 38 s
13	189° 19' 41"	-0.29"	188° 33' 43"	-3° 41' 35"	1.0009212	15' 58.75"	23° 26' 18"	10 m 39 s
14	189° 22' 09"	-0.29"	188° 35' 59"	-3° 42' 33"	1.0009090	15' 58.76"	23° 26' 18"	10 m 40 s
15	189° 24' 36"	-0.30"	188° 38' 15"	-3° 43' 31"	1.0008967	15' 58.77"	23° 26' 18"	10 m 41 s
16	189° 27' 04"	-0.30"	188° 40' 31"	-3° 44' 29"	1.0008845	15' 58.78"	23° 26' 18"	10 m 42 s
17	189° 29' 32"	-0.30"	188° 42' 47"	-3° 45' 27"	1.0008723	15' 58.79"	23° 26' 18"	10 m 42 s
18	189° 31' 59"	-0.31"	188° 45' 03"	-3° 46' 25"	1.0008601	15' 58.81"	23° 26' 18"	10 m 43 s
19	189° 34' 27"	-0.31"	188° 47' 19"	-3° 47' 23"	1.0008479	15' 58.82"	23° 26' 18"	10 m 44 s
20	189° 36' 54"	-0.31"	188° 49' 35"	-3° 48' 21"	1.0008356	15' 58.83"	23° 26' 18"	10 m 45 s
21	189° 39' 22"	-0.32"	188° 51' 51"	-3° 49' 19"	1.0008234	15' 58.84"	23° 26' 18"	10 m 46 s
22	189° 41' 50"	-0.32"	188° 54' 07"	-3° 50' 17"	1.0008112	15' 58.85"	23° 26' 18"	10 m 46 s
23	189° 44' 17"	-0.32"	188° 56' 23"	-3° 51' 15"	1.0007990	15' 58.86"	23° 26' 18"	10 m 47 s
24	189° 46' 45"	-0.33"	188° 58' 39"	-3° 52' 13"	1.0007867	15' 58.88"	23° 26' 18"	10 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	265° 30' 37"	-3° 27' 54"	264° 58' 36"	-26° 49' 30"	0° 59' 04"	16' 05.65"	272° 48' 60"	0.38651
1	266° 05' 46"	-3° 30' 16"	265° 37' 50"	-26° 53' 01"	0° 59' 04"	16' 05.79"	272° 31' 52"	0.39115
2	266° 40' 56"	-3° 32' 37"	266° 17' 06"	-26° 56' 21"	0° 59' 05"	16' 05.94"	272° 14' 40"	0.39579
3	267° 16' 07"	-3° 34' 57"	266° 56' 26"	-26° 59' 30"	0° 59' 05"	16' 06.08"	271° 57' 23"	0.40045
4	267° 51' 19"	-3° 37' 16"	267° 35' 48"	-27° 02' 29"	0° 59' 06"	16' 06.22"	271° 40' 02"	0.40512
5	268° 26' 31"	-3° 39' 33"	268° 15' 13"	-27° 05' 16"	0° 59' 06"	16' 06.36"	271° 22' 37"	0.40980
6	269° 01' 45"	-3° 41' 48"	268° 54' 41"	-27° 07' 53"	0° 59' 07"	16' 06.50"	271° 5' 08"	0.41448
7	269° 36' 59"	-3° 44' 03"	269° 34' 10"	-27° 10' 18"	0° 59' 07"	16' 06.64"	270° 47' 35"	0.41918
8	270° 12' 13"	-3° 46' 16"	270° 13' 43"	-27° 12' 33"	0° 59' 08"	16' 06.77"	270° 29' 59"	0.42388
9	270° 47' 28"	-3° 48' 27"	270° 53' 17"	-27° 14' 36"	0° 59' 08"	16' 06.90"	270° 12' 20"	0.42860
10	271° 22' 44"	-3° 50' 38"	271° 32' 53"	-27° 16' 29"	0° 59' 09"	16' 07.03"	269° 54' 37"	0.43332
11	271° 58' 01"	-3° 52' 47"	272° 12' 31"	-27° 18' 10"	0° 59' 09"	16' 07.16"	269° 36' 51"	0.43804
12	272° 33' 18"	-3° 54' 54"	272° 52' 11"	-27° 19' 40"	0° 59' 10"	16' 07.28"	269° 19' 03"	0.44278
13	273° 08' 37"	-3° 56' 60"	273° 31' 52"	-27° 20' 59"	0° 59' 10"	16' 07.41"	269° 1' 12"	0.44752
14	273° 43' 55"	-3° 59' 04"	274° 11' 35"	-27° 22' 07"	0° 59' 11"	16' 07.53"	268° 43' 19"	0.45227
15	274° 19' 15"	-4° 01' 07"	274° 51' 19"	-27° 23' 03"	0° 59' 11"	16' 07.65"	268° 25' 23"	0.45702
16	274° 54' 35"	-4° 03' 09"	275° 31' 04"	-27° 23' 48"	0° 59' 11"	16' 07.77"	268° 7' 25"	0.46177
17	275° 29' 56"	-4° 05' 09"	276° 10' 50"	-27° 24' 22"	0° 59' 12"	16' 07.88"	267° 49' 25"	0.46654
18	276° 05' 17"	-4° 07' 07"	276° 50' 38"	-27° 24' 45"	0° 59' 12"	16' 07.99"	267° 31' 24"	0.47130
19	276° 40' 39"	-4° 09' 04"	277° 30' 26"	-27° 24' 56"	0° 59' 13"	16' 08.10"	267° 13' 21"	0.47607
20	277° 16' 02"	-4° 10' 60"	278° 10' 14"	-27° 24' 56"	0° 59' 13"	16' 08.21"	266° 55' 17"	0.48084
21	277° 51' 25"	-4° 12' 53"	278° 50' 03"	-27° 24' 45"	0° 59' 13"	16' 08.32"	266° 37' 12"	0.48562
22	278° 26' 49"	-4° 14' 46"	279° 29' 52"	-27° 24' 22"	0° 59' 14"	16' 08.43"	266° 19' 06"	0.49040
23	279° 02' 14"	-4° 16' 36"	280° 09' 42"	-27° 23' 49"	0° 59' 14"	16' 08.53"	266° 0' 59"	0.49518
24	279° 37' 39"	-4° 18' 25"	280° 49' 31"	-27° 23' 03"	0° 59' 15"	16' 08.63"	265° 42' 52"	0.49996



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	189° 46' 45"	-0.33"	188° 58' 39"	-3° 52' 13"	1.0007867	15' 58.88"	23° 26' 18"	10 m 48 s
1	189° 49' 12"	-0.33"	189° 00' 55"	-3° 53' 11"	1.0007745	15' 58.89"	23° 26' 18"	10 m 49 s
2	189° 51' 40"	-0.33"	189° 03' 11"	-3° 54' 09"	1.0007623	15' 58.90"	23° 26' 18"	10 m 50 s
3	189° 54' 07"	-0.34"	189° 05' 27"	-3° 55' 07"	1.0007501	15' 58.91"	23° 26' 18"	10 m 50 s
4	189° 56' 35"	-0.34"	189° 07' 43"	-3° 56' 05"	1.0007378	15' 58.92"	23° 26' 18"	10 m 51 s
5	189° 59' 03"	-0.34"	189° 09' 59"	-3° 57' 03"	1.0007256	15' 58.93"	23° 26' 18"	10 m 52 s
6	190° 01' 30"	-0.35"	189° 12' 15"	-3° 58' 01"	1.0007134	15' 58.95"	23° 26' 18"	10 m 53 s
7	190° 03' 58"	-0.35"	189° 14' 31"	-3° 58' 59"	1.0007011	15' 58.96"	23° 26' 18"	10 m 54 s
8	190° 06' 26"	-0.35"	189° 16' 47"	-3° 59' 57"	1.0006889	15' 58.97"	23° 26' 18"	10 m 54 s
9	190° 08' 53"	-0.35"	189° 19' 04"	-4° 00' 55"	1.0006767	15' 58.98"	23° 26' 18"	10 m 55 s
10	190° 11' 21"	-0.36"	189° 21' 20"	-4° 01' 53"	1.0006645	15' 58.99"	23° 26' 18"	10 m 56 s
11	190° 13' 48"	-0.36"	189° 23' 36"	-4° 02' 51"	1.0006522	15' 59.00"	23° 26' 18"	10 m 57 s
12	190° 16' 16"	-0.36"	189° 25' 52"	-4° 03' 49"	1.0006400	15' 59.02"	23° 26' 18"	10 m 57 s
13	190° 18' 44"	-0.37"	189° 28' 08"	-4° 04' 47"	1.0006278	15' 59.03"	23° 26' 18"	10 m 58 s
14	190° 21' 11"	-0.37"	189° 30' 24"	-4° 05' 45"	1.0006155	15' 59.04"	23° 26' 18"	10 m 59 s
15	190° 23' 39"	-0.37"	189° 32' 40"	-4° 06' 42"	1.0006033	15' 59.05"	23° 26' 18"	10 m 60 s
16	190° 26' 07"	-0.37"	189° 34' 56"	-4° 07' 40"	1.0005911	15' 59.06"	23° 26' 18"	11 m 01 s
17	190° 28' 34"	-0.38"	189° 37' 13"	-4° 08' 38"	1.0005788	15' 59.07"	23° 26' 18"	11 m 01 s
18	190° 31' 02"	-0.38"	189° 39' 29"	-4° 09' 36"	1.0005666	15' 59.09"	23° 26' 18"	11 m 02 s
19	190° 33' 30"	-0.38"	189° 41' 45"	-4° 10' 34"	1.0005544	15' 59.10"	23° 26' 18"	11 m 03 s
20	190° 35' 57"	-0.38"	189° 44' 01"	-4° 11' 32"	1.0005422	15' 59.11"	23° 26' 18"	11 m 04 s
21	190° 38' 25"	-0.39"	189° 46' 17"	-4° 12' 30"	1.0005299	15' 59.12"	23° 26' 18"	11 m 05 s
22	190° 40' 52"	-0.39"	189° 48' 34"	-4° 13' 28"	1.0005177	15' 59.13"	23° 26' 18"	11 m 05 s
23	190° 43' 20"	-0.39"	189° 50' 50"	-4° 14' 26"	1.0005055	15' 59.15"	23° 26' 18"	11 m 06 s
24	190° 45' 48"	-0.39"	189° 53' 06"	-4° 15' 23"	1.0004932	15' 59.16"	23° 26' 18"	11 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	279° 37' 39"	-4° 18' 25"	280° 49' 31"	-27° 23' 03"	0° 59' 15"	16' 08.63"	265° 42' 52"	0.49996
1	280° 13' 05"	-4° 20' 13"	281° 29' 20"	-27° 22' 07"	0° 59' 15"	16' 08.73"	265° 24' 44"	0.50474
2	280° 48' 31"	-4° 21' 59"	282° 09' 09"	-27° 20' 59"	0° 59' 15"	16' 08.82"	265° 6' 36"	0.50952
3	281° 23' 58"	-4° 23' 43"	282° 48' 58"	-27° 19' 40"	0° 59' 16"	16' 08.92"	264° 48' 28"	0.51431
4	281° 59' 25"	-4° 25' 25"	283° 28' 46"	-27° 18' 09"	0° 59' 16"	16' 09.01"	264° 30' 20"	0.51909
5	282° 34' 54"	-4° 27' 06"	284° 08' 33"	-27° 16' 28"	0° 59' 16"	16' 09.10"	264° 12' 12"	0.52387
6	283° 10' 22"	-4° 28' 45"	284° 48' 20"	-27° 14' 35"	0° 59' 17"	16' 09.19"	263° 54' 06"	0.52865
7	283° 45' 52"	-4° 30' 23"	285° 28' 06"	-27° 12' 31"	0° 59' 17"	16' 09.27"	263° 35' 59"	0.53343
8	284° 21' 21"	-4° 31' 59"	286° 07' 50"	-27° 10' 15"	0° 59' 17"	16' 09.36"	263° 17' 54"	0.53820
9	284° 56' 52"	-4° 33' 33"	286° 47' 33"	-27° 07' 48"	0° 59' 18"	16' 09.44"	262° 59' 50"	0.54298
10	285° 32' 23"	-4° 35' 05"	287° 27' 15"	-27° 05' 11"	0° 59' 18"	16' 09.52"	262° 41' 47"	0.54775
11	286° 07' 54"	-4° 36' 35"	288° 06' 56"	-27° 02' 21"	0° 59' 18"	16' 09.59"	262° 23' 45"	0.55251
12	286° 43' 26"	-4° 38' 04"	288° 46' 34"	-26° 59' 21"	0° 59' 18"	16' 09.67"	262° 5' 45"	0.55728
13	287° 18' 58"	-4° 39' 31"	289° 26' 11"	-26° 56' 10"	0° 59' 19"	16' 09.74"	261° 47' 47"	0.56203
14	287° 54' 31"	-4° 40' 57"	290° 05' 46"	-26° 52' 48"	0° 59' 19"	16' 09.81"	261° 29' 50"	0.56679
15	288° 30' 05"	-4° 42' 20"	290° 45' 19"	-26° 49' 14"	0° 59' 19"	16' 09.88"	261° 11' 56"	0.57154
16	289° 05' 35"	-4° 43' 42"	291° 24' 46"	-26° 45' 30"	0° 59' 19"	16' 09.94"	260° 54' 06"	0.57627
17	289° 41' 09"	-4° 45' 02"	292° 04' 14"	-26° 41' 35"	0° 59' 20"	16' 10.00"	260° 36' 17"	0.58100
18	290° 16' 44"	-4° 46' 20"	292° 43' 40"	-26° 37' 28"	0° 59' 20"	16' 10.06"	260° 18' 30"	0.58573
19	290° 52' 19"	-4° 47' 36"	293° 23' 04"	-26° 33' 11"	0° 59' 20"	16' 10.12"	260° 0' 46"	0.59045
20	291° 27' 55"	-4° 48' 50"	294° 02' 25"	-26° 28' 43"	0° 59' 20"	16' 10.18"	259° 43' 04"	0.59517
21	292° 03' 31"	-4° 50' 03"	294° 41' 43"	-26° 24' 04"	0° 59' 21"	16' 10.23"	259° 25' 26"	0.59987
22	292° 39' 07"	-4° 51' 14"	295° 20' 58"	-26° 19' 14"	0° 59' 21"	16' 10.28"	259° 7' 51"	0.60457
23	293° 14' 44"	-4° 52' 23"	296° 00' 10"	-26° 14' 14"	0° 59' 21"	16' 10.33"	258° 50' 19"	0.60926
24	293° 50' 21"	-4° 53' 30"	296° 39' 19"	-26° 09' 02"	0° 59' 21"	16' 10.37"	258° 32' 51"	0.61394

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	190° 45' 48"	-0.39"	189° 53' 06"	-4° 15' 23"	1.0004932	15' 59.16"	23° 26' 18"	11 m 07 s
1	190° 48' 15"	-0.39"	189° 55' 22"	-4° 16' 21"	1.0004810	15' 59.17"	23° 26' 18"	11 m 08 s
2	190° 50' 43"	-0.40"	189° 57' 39"	-4° 17' 19"	1.0004688	15' 59.18"	23° 26' 18"	11 m 08 s
3	190° 53' 11"	-0.40"	189° 59' 55"	-4° 18' 17"	1.0004566	15' 59.19"	23° 26' 18"	11 m 09 s
4	190° 55' 38"	-0.40"	190° 02' 11"	-4° 19' 15"	1.0004443	15' 59.20"	23° 26' 18"	11 m 10 s
5	190° 58' 06"	-0.40"	190° 04' 27"	-4° 20' 13"	1.0004321	15' 59.22"	23° 26' 18"	11 m 11 s
6	191° 00' 34"	-0.40"	190° 06' 44"	-4° 21' 11"	1.0004199	15' 59.23"	23° 26' 18"	11 m 12 s
7	191° 03' 02"	-0.41"	190° 08' 60"	-4° 22' 08"	1.0004076	15' 59.24"	23° 26' 18"	11 m 12 s
8	191° 05' 29"	-0.41"	190° 11' 16"	-4° 23' 06"	1.0003954	15' 59.25"	23° 26' 18"	11 m 13 s
9	191° 07' 57"	-0.41"	190° 13' 33"	-4° 24' 04"	1.0003832	15' 59.26"	23° 26' 18"	11 m 14 s
10	191° 10' 25"	-0.41"	190° 15' 49"	-4° 25' 02"	1.0003710	15' 59.27"	23° 26' 18"	11 m 15 s
11	191° 12' 52"	-0.41"	190° 18' 05"	-4° 25' 60"	1.0003587	15' 59.29"	23° 26' 18"	11 m 15 s
12	191° 15' 20"	-0.41"	190° 20' 22"	-4° 26' 57"	1.0003465	15' 59.30"	23° 26' 18"	11 m 16 s
13	191° 17' 48"	-0.42"	190° 22' 38"	-4° 27' 55"	1.0003343	15' 59.31"	23° 26' 18"	11 m 17 s
14	191° 20' 15"	-0.42"	190° 24' 54"	-4° 28' 53"	1.0003221	15' 59.32"	23° 26' 18"	11 m 18 s
15	191° 22' 43"	-0.42"	190° 27' 11"	-4° 29' 51"	1.0003099	15' 59.33"	23° 26' 18"	11 m 18 s
16	191° 25' 11"	-0.42"	190° 29' 27"	-4° 30' 49"	1.0002976	15' 59.34"	23° 26' 18"	11 m 19 s
17	191° 27' 39"	-0.42"	190° 31' 43"	-4° 31' 46"	1.0002854	15' 59.36"	23° 26' 18"	11 m 20 s
18	191° 30' 06"	-0.42"	190° 33' 60"	-4° 32' 44"	1.0002732	15' 59.37"	23° 26' 18"	11 m 21 s
19	191° 32' 34"	-0.42"	190° 36' 16"	-4° 33' 42"	1.0002610	15' 59.38"	23° 26' 18"	11 m 22 s
20	191° 35' 02"	-0.42"	190° 38' 32"	-4° 34' 40"	1.0002488	15' 59.39"	23° 26' 18"	11 m 22 s
21	191° 37' 29"	-0.43"	190° 40' 49"	-4° 35' 37"	1.0002365	15' 59.40"	23° 26' 18"	11 m 23 s
22	191° 39' 57"	-0.43"	190° 43' 05"	-4° 36' 35"	1.0002243	15' 59.41"	23° 26' 18"	11 m 24 s
23	191° 42' 25"	-0.43"	190° 45' 22"	-4° 37' 33"	1.0002121	15' 59.43"	23° 26' 18"	11 m 25 s
24	191° 44' 53"	-0.43"	190° 47' 38"	-4° 38' 31"	1.0001999	15' 59.44"	23° 26' 18"	11 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	293° 50' 21"	-4° 53' 30"	296° 39' 19"	-26° 09' 02"	0° 59' 21"	16' 10.37"	258° 32' 51"	0.61394
1	294° 25' 59"	-4° 54' 35"	297° 18' 25"	-26° 03' 41"	0° 59' 21"	16' 10.42"	258° 15' 27"	0.61860
2	295° 01' 37"	-4° 55' 38"	297° 57' 27"	-25° 58' 09"	0° 59' 21"	16' 10.46"	257° 58' 06"	0.62326
3	295° 37' 16"	-4° 56' 39"	298° 36' 26"	-25° 52' 26"	0° 59' 21"	16' 10.50"	257° 40' 49"	0.62791
4	296° 12' 54"	-4° 57' 39"	299° 15' 22"	-25° 46' 33"	0° 59' 22"	16' 10.53"	257° 23' 36"	0.63254
5	296° 48' 33"	-4° 58' 36"	299° 54' 13"	-25° 40' 29"	0° 59' 22"	16' 10.56"	257° 6' 28"	0.63717
6	297° 24' 13"	-4° 59' 32"	300° 33' 01"	-25° 34' 15"	0° 59' 22"	16' 10.59"	256° 49' 24"	0.64178
7	297° 59' 53"	-5° 00' 26"	301° 11' 45"	-25° 27' 51"	0° 59' 22"	16' 10.62"	256° 32' 24"	0.64638
8	298° 35' 33"	-5° 01' 17"	301° 50' 26"	-25° 21' 16"	0° 59' 22"	16' 10.65"	256° 15' 29"	0.65096
9	299° 11' 13"	-5° 02' 07"	302° 29' 02"	-25° 14' 32"	0° 59' 22"	16' 10.67"	255° 58' 38"	0.65554
10	299° 46' 54"	-5° 02' 55"	303° 07' 34"	-25° 07' 37"	0° 59' 22"	16' 10.69"	255° 41' 52"	0.66009
11	300° 22' 34"	-5° 03' 41"	303° 46' 01"	-25° 00' 33"	0° 59' 22"	16' 10.71"	255° 25' 11"	0.66464
12	300° 58' 16"	-5° 04' 25"	304° 24' 25"	-24° 53' 19"	0° 59' 22"	16' 10.72"	255° 8' 36"	0.66917
13	301° 33' 57"	-5° 05' 07"	305° 02' 44"	-24° 45' 54"	0° 59' 22"	16' 10.73"	254° 52' 05"	0.67368
14	302° 09' 38"	-5° 05' 47"	305° 40' 58"	-24° 38' 20"	0° 59' 22"	16' 10.74"	254° 35' 40"	0.67818
15	302° 45' 20"	-5° 06' 25"	306° 19' 08"	-24° 30' 36"	0° 59' 22"	16' 10.75"	254° 19' 20"	0.68266
16	303° 21' 02"	-5° 07' 01"	306° 57' 14"	-24° 22' 43"	0° 59' 22"	16' 10.75"	254° 3' 05"	0.68712
17	303° 56' 44"	-5° 07' 35"	307° 35' 15"	-24° 14' 40"	0° 59' 22"	16' 10.75"	253° 46' 56"	0.69157
18	304° 32' 27"	-5° 08' 08"	308° 13' 11"	-24° 06' 28"	0° 59' 22"	16' 10.75"	253° 30' 52"	0.69600
19	305° 08' 09"	-5° 08' 38"	308° 51' 02"	-23° 58' 06"	0° 59' 22"	16' 10.74"	253° 14' 55"	0.70041
20	305° 43' 52"	-5° 09' 06"	309° 28' 48"	-23° 49' 35"	0° 59' 22"	16' 10.73"	252° 59' 02"	0.70480
21	306° 19' 35"	-5° 09' 32"	310° 06' 30"	-23° 40' 55"	0° 59' 22"	16' 10.72"	252° 43' 16"	0.70918
22	306° 55' 17"	-5° 09' 56"	310° 44' 06"	-23° 32' 06"	0° 59' 22"	16' 10.71"	252° 27' 36"	0.71353
23	307° 31' 00"	-5° 10' 18"	311° 21' 38"	-23° 23' 07"	0° 59' 22"	16' 10.69"	252° 12' 02"	0.71787
24	308° 06' 43"	-5° 10' 39"	311° 59' 04"	-23° 14' 00"	0° 59' 22"	16' 10.67"	251° 56' 34"	0.72218



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	191° 44' 53"	-0.43"	190° 47' 38"	-4° 38' 31"	1.0001999	15' 59.44"	23° 26' 18"	11 m 25 s
1	191° 47' 20"	-0.43"	190° 49' 55"	-4° 39' 28"	1.0001877	15' 59.45"	23° 26' 18"	11 m 26 s
2	191° 49' 48"	-0.43"	190° 52' 11"	-4° 40' 26"	1.0001755	15' 59.46"	23° 26' 18"	11 m 27 s
3	191° 52' 16"	-0.43"	190° 54' 28"	-4° 41' 24"	1.0001633	15' 59.47"	23° 26' 18"	11 m 28 s
4	191° 54' 44"	-0.43"	190° 56' 44"	-4° 42' 21"	1.0001510	15' 59.49"	23° 26' 18"	11 m 28 s
5	191° 57' 11"	-0.43"	190° 59' 00"	-4° 43' 19"	1.0001388	15' 59.50"	23° 26' 18"	11 m 29 s
6	191° 59' 39"	-0.43"	191° 01' 17"	-4° 44' 17"	1.0001266	15' 59.51"	23° 26' 18"	11 m 30 s
7	192° 02' 07"	-0.43"	191° 03' 33"	-4° 45' 15"	1.0001144	15' 59.52"	23° 26' 18"	11 m 31 s
8	192° 04' 35"	-0.43"	191° 05' 50"	-4° 46' 12"	1.0001022	15' 59.53"	23° 26' 18"	11 m 31 s
9	192° 07' 02"	-0.43"	191° 08' 06"	-4° 47' 10"	1.0000900	15' 59.54"	23° 26' 18"	11 m 32 s
10	192° 09' 30"	-0.43"	191° 10' 23"	-4° 48' 08"	1.0000778	15' 59.56"	23° 26' 18"	11 m 33 s
11	192° 11' 58"	-0.43"	191° 12' 40"	-4° 49' 05"	1.0000656	15' 59.57"	23° 26' 18"	11 m 34 s
12	192° 14' 26"	-0.43"	191° 14' 56"	-4° 50' 03"	1.0000534	15' 59.58"	23° 26' 18"	11 m 34 s
13	192° 16' 53"	-0.44"	191° 17' 13"	-4° 51' 00"	1.0000412	15' 59.59"	23° 26' 18"	11 m 35 s
14	192° 19' 21"	-0.44"	191° 19' 29"	-4° 51' 58"	1.0000290	15' 59.60"	23° 26' 18"	11 m 36 s
15	192° 21' 49"	-0.44"	191° 21' 46"	-4° 52' 56"	1.0000168	15' 59.61"	23° 26' 18"	11 m 37 s
16	192° 24' 17"	-0.44"	191° 24' 02"	-4° 53' 53"	1.0000046	15' 59.63"	23° 26' 18"	11 m 37 s
17	192° 26' 45"	-0.44"	191° 26' 19"	-4° 54' 51"	0.9999924	15' 59.64"	23° 26' 18"	11 m 38 s
18	192° 29' 12"	-0.44"	191° 28' 36"	-4° 55' 49"	0.9999802	15' 59.65"	23° 26' 18"	11 m 39 s
19	192° 31' 40"	-0.44"	191° 30' 52"	-4° 56' 46"	0.9999680	15' 59.66"	23° 26' 18"	11 m 40 s
20	192° 34' 08"	-0.44"	191° 33' 09"	-4° 57' 44"	0.9999559	15' 59.67"	23° 26' 18"	11 m 40 s
21	192° 36' 36"	-0.43"	191° 35' 25"	-4° 58' 41"	0.9999437	15' 59.68"	23° 26' 18"	11 m 41 s
22	192° 39' 04"	-0.43"	191° 37' 42"	-4° 59' 39"	0.9999315	15' 59.70"	23° 26' 18"	11 m 42 s
23	192° 41' 31"	-0.43"	191° 39' 59"	-5° 00' 37"	0.9999193	15' 59.71"	23° 26' 18"	11 m 43 s
24	192° 43' 59"	-0.43"	191° 42' 15"	-5° 01' 34"	0.9999071	15' 59.72"	23° 26' 18"	11 m 43 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	308° 06' 43"	-5° 10' 39"	311° 59' 04"	-23° 14' 00"	0° 59' 22"	16' 10.67"	251° 56' 34"	0.72218
1	308° 42' 26"	-5° 10' 57"	312° 36' 25"	-23° 04' 44"	0° 59' 22"	16' 10.65"	251° 41' 12"	0.72648
2	309° 18' 10"	-5° 11' 13"	313° 13' 42"	-22° 55' 19"	0° 59' 22"	16' 10.62"	251° 25' 56"	0.73075
3	309° 53' 53"	-5° 11' 27"	313° 50' 52"	-22° 45' 45"	0° 59' 22"	16' 10.59"	251° 10' 47"	0.73500
4	310° 29' 36"	-5° 11' 39"	314° 27' 58"	-22° 36' 03"	0° 59' 22"	16' 10.56"	250° 55' 43"	0.73923
5	311° 05' 19"	-5° 11' 49"	315° 04' 58"	-22° 26' 13"	0° 59' 22"	16' 10.52"	250° 40' 46"	0.74344
6	311° 41' 02"	-5° 11' 57"	315° 41' 54"	-22° 16' 13"	0° 59' 21"	16' 10.49"	250° 25' 56"	0.74763
7	312° 16' 46"	-5° 12' 04"	316° 18' 43"	-22° 06' 06"	0° 59' 21"	16' 10.44"	250° 11' 12"	0.75179
8	312° 52' 29"	-5° 12' 08"	316° 55' 28"	-21° 55' 50"	0° 59' 21"	16' 10.40"	249° 56' 34"	0.75593
9	313° 28' 12"	-5° 12' 10"	317° 32' 06"	-21° 45' 26"	0° 59' 21"	16' 10.35"	249° 42' 03"	0.76004
10	314° 03' 55"	-5° 12' 10"	318° 08' 40"	-21° 34' 55"	0° 59' 21"	16' 10.30"	249° 27' 39"	0.76413
11	314° 39' 38"	-5° 12' 08"	318° 45' 08"	-21° 24' 15"	0° 59' 21"	16' 10.25"	249° 13' 21"	0.76820
12	315° 15' 21"	-5° 12' 04"	319° 21' 31"	-21° 13' 27"	0° 59' 20"	16' 10.19"	248° 59' 10"	0.77224
13	315° 51' 03"	-5° 11' 58"	319° 57' 48"	-21° 02' 32"	0° 59' 20"	16' 10.13"	248° 45' 05"	0.77626
14	316° 26' 46"	-5° 11' 50"	320° 33' 60"	-20° 51' 29"	0° 59' 20"	16' 10.06"	248° 31' 07"	0.78024
15	317° 02' 28"	-5° 11' 39"	321° 10' 06"	-20° 40' 18"	0° 59' 20"	16' 10.00"	248° 17' 15"	0.78421
16	317° 38' 10"	-5° 11' 27"	321° 46' 06"	-20° 29' 00"	0° 59' 19"	16' 09.93"	248° 3' 30"	0.78814
17	318° 13' 52"	-5° 11' 13"	322° 22' 02"	-20° 17' 35"	0° 59' 19"	16' 09.85"	247° 49' 52"	0.79205
18	318° 49' 34"	-5° 10' 57"	322° 57' 51"	-20° 06' 02"	0° 59' 19"	16' 09.78"	247° 36' 21"	0.79594
19	319° 25' 16"	-5° 10' 39"	323° 33' 36"	-19° 54' 22"	0° 59' 19"	16' 09.69"	247° 22' 56"	0.79979
20	320° 00' 57"	-5° 10' 19"	324° 09' 14"	-19° 42' 36"	0° 59' 18"	16' 09.61"	247° 9' 37"	0.80362
21	320° 36' 38"	-5° 09' 57"	324° 44' 47"	-19° 30' 42"	0° 59' 18"	16' 09.52"	246° 56' 25"	0.80741
22	321° 12' 19"	-5° 09' 33"	325° 20' 15"	-19° 18' 41"	0° 59' 18"	16' 09.43"	246° 43' 20"	0.81118
23	321° 47' 59"	-5° 09' 07"	325° 55' 37"	-19° 06' 34"	0° 59' 17"	16' 09.34"	246° 30' 21"	0.81492
24	322° 23' 40"	-5° 08' 39"	326° 30' 54"	-18° 54' 20"	0° 59' 17"	16' 09.24"	246° 17' 29"	0.81863

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	192° 43' 59"	-0.43"	191° 42' 15"	-5° 01' 34"	0.9999071	15' 59.72"	23° 26' 18"	11 m 43 s
1	192° 46' 27"	-0.43"	191° 44' 32"	-5° 02' 32"	0.9998949	15' 59.73"	23° 26' 18"	11 m 44 s
2	192° 48' 55"	-0.43"	191° 46' 49"	-5° 03' 29"	0.9998828	15' 59.74"	23° 26' 18"	11 m 45 s
3	192° 51' 23"	-0.43"	191° 49' 05"	-5° 04' 27"	0.9998706	15' 59.75"	23° 26' 18"	11 m 46 s
4	192° 53' 50"	-0.43"	191° 51' 22"	-5° 05' 24"	0.9998584	15' 59.77"	23° 26' 18"	11 m 46 s
5	192° 56' 18"	-0.43"	191° 53' 39"	-5° 06' 22"	0.9998462	15' 59.78"	23° 26' 18"	11 m 47 s
6	192° 58' 46"	-0.43"	191° 55' 56"	-5° 07' 19"	0.9998341	15' 59.79"	23° 26' 18"	11 m 48 s
7	193° 01' 14"	-0.43"	191° 58' 12"	-5° 08' 17"	0.9998219	15' 59.80"	23° 26' 18"	11 m 49 s
8	193° 03' 42"	-0.43"	192° 00' 29"	-5° 09' 15"	0.9998097	15' 59.81"	23° 26' 18"	11 m 49 s
9	193° 06' 10"	-0.43"	192° 02' 46"	-5° 10' 12"	0.9997976	15' 59.82"	23° 26' 18"	11 m 50 s
10	193° 08' 37"	-0.43"	192° 05' 02"	-5° 11' 10"	0.9997854	15' 59.84"	23° 26' 18"	11 m 51 s
11	193° 11' 05"	-0.43"	192° 07' 19"	-5° 12' 07"	0.9997732	15' 59.85"	23° 26' 18"	11 m 52 s
12	193° 13' 33"	-0.43"	192° 09' 36"	-5° 13' 05"	0.9997611	15' 59.86"	23° 26' 18"	11 m 52 s
13	193° 16' 01"	-0.42"	192° 11' 53"	-5° 14' 02"	0.9997489	15' 59.87"	23° 26' 18"	11 m 53 s
14	193° 18' 29"	-0.42"	192° 14' 10"	-5° 14' 59"	0.9997367	15' 59.88"	23° 26' 18"	11 m 54 s
15	193° 20' 57"	-0.42"	192° 16' 26"	-5° 15' 57"	0.9997246	15' 59.89"	23° 26' 18"	11 m 55 s
16	193° 23' 25"	-0.42"	192° 18' 43"	-5° 16' 54"	0.9997124	15' 59.91"	23° 26' 18"	11 m 55 s
17	193° 25' 52"	-0.42"	192° 21' 00"	-5° 17' 52"	0.9997003	15' 59.92"	23° 26' 18"	11 m 56 s
18	193° 28' 20"	-0.42"	192° 23' 17"	-5° 18' 49"	0.9996881	15' 59.93"	23° 26' 18"	11 m 57 s
19	193° 30' 48"	-0.42"	192° 25' 34"	-5° 19' 47"	0.9996760	15' 59.94"	23° 26' 18"	11 m 58 s
20	193° 33' 16"	-0.42"	192° 27' 51"	-5° 20' 44"	0.9996638	15' 59.95"	23° 26' 18"	11 m 58 s
21	193° 35' 44"	-0.41"	192° 30' 07"	-5° 21' 42"	0.9996517	15' 59.96"	23° 26' 18"	11 m 59 s
22	193° 38' 12"	-0.41"	192° 32' 24"	-5° 22' 39"	0.9996396	15' 59.98"	23° 26' 18"	11 m 60 s
23	193° 40' 40"	-0.41"	192° 34' 41"	-5° 23' 36"	0.9996274	15' 59.99"	23° 26' 18"	12 m 01 s
24	193° 43' 08"	-0.41"	192° 36' 58"	-5° 24' 34"	0.9996153	15' 60.00"	23° 26' 18"	12 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	322° 23' 40"	-5° 08' 39"	326° 30' 54"	-18° 54' 20"	0° 59' 17"	16' 09.24"	246° 17' 29"	0.81863
1	322° 59' 19"	-5° 08' 08"	327° 06' 05"	-18° 41' 59"	0° 59' 17"	16' 09.14"	246° 4' 43"	0.82231
2	323° 34' 59"	-5° 07' 36"	327° 41' 11"	-18° 29' 32"	0° 59' 16"	16' 09.04"	245° 52' 04"	0.82596
3	324° 10' 38"	-5° 07' 02"	328° 16' 12"	-18° 16' 58"	0° 59' 16"	16' 08.93"	245° 39' 31"	0.82958
4	324° 46' 17"	-5° 06' 26"	328° 51' 07"	-18° 04' 19"	0° 59' 15"	16' 08.82"	245° 27' 05"	0.83317
5	325° 21' 55"	-5° 05' 48"	329° 25' 56"	-17° 51' 33"	0° 59' 15"	16' 08.70"	245° 14' 44"	0.83672
6	325° 57' 33"	-5° 05' 08"	330° 00' 41"	-17° 38' 41"	0° 59' 14"	16' 08.58"	245° 2' 30"	0.84025
7	326° 33' 10"	-5° 04' 26"	330° 35' 20"	-17° 25' 43"	0° 59' 14"	16' 08.46"	244° 50' 22"	0.84374
8	327° 08' 47"	-5° 03' 42"	331° 09' 53"	-17° 12' 40"	0° 59' 14"	16' 08.34"	244° 38' 20"	0.84720
9	327° 44' 24"	-5° 02' 57"	331° 44' 21"	-16° 59' 30"	0° 59' 13"	16' 08.21"	244° 26' 24"	0.85063
10	328° 19' 60"	-5° 02' 09"	332° 18' 45"	-16° 46' 15"	0° 59' 13"	16' 08.07"	244° 14' 34"	0.85402
11	328° 55' 35"	-5° 01' 19"	332° 53' 02"	-16° 32' 55"	0° 59' 12"	16' 07.94"	244° 2' 49"	0.85738
12	329° 31' 10"	-5° 00' 28"	333° 27' 15"	-16° 19' 29"	0° 59' 12"	16' 07.80"	243° 51' 11"	0.86071
13	330° 06' 44"	-4° 59' 34"	334° 01' 22"	-16° 05' 57"	0° 59' 11"	16' 07.65"	243° 39' 38"	0.86400
14	330° 42' 18"	-4° 58' 39"	334° 35' 25"	-15° 52' 21"	0° 59' 11"	16' 07.51"	243° 28' 10"	0.86726
15	331° 17' 51"	-4° 57' 41"	335° 09' 22"	-15° 38' 39"	0° 59' 10"	16' 07.36"	243° 16' 48"	0.87049
16	331° 53' 24"	-4° 56' 42"	335° 43' 14"	-15° 24' 52"	0° 59' 09"	16' 07.20"	243° 5' 31"	0.87368
17	332° 28' 56"	-4° 55' 41"	336° 17' 02"	-15° 11' 01"	0° 59' 09"	16' 07.04"	242° 54' 19"	0.87683
18	333° 04' 27"	-4° 54' 38"	336° 50' 44"	-14° 57' 04"	0° 59' 08"	16' 06.88"	242° 43' 12"	0.87995
19	333° 39' 58"	-4° 53' 33"	337° 24' 21"	-14° 43' 03"	0° 59' 08"	16' 06.72"	242° 32' 09"	0.88304
20	334° 15' 27"	-4° 52' 26"	337° 57' 54"	-14° 28' 57"	0° 59' 07"	16' 06.55"	242° 21' 11"	0.88609
21	334° 50' 57"	-4° 51' 17"	338° 31' 21"	-14° 14' 47"	0° 59' 06"	16' 06.38"	242° 10' 18"	0.88910
22	335° 26' 25"	-4° 50' 07"	339° 04' 44"	-14° 00' 32"	0° 59' 06"	16' 06.20"	241° 59' 29"	0.89207
23	336° 01' 53"	-4° 48' 55"	339° 38' 02"	-13° 46' 13"	0° 59' 05"	16' 06.02"	241° 48' 43"	0.89501
24	336° 37' 20"	-4° 47' 41"	340° 11' 16"	-13° 31' 50"	0° 59' 04"	16' 05.84"	241° 38' 02"	0.89791

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	193° 43' 08"	-0.41"	192° 36' 58"	-5° 24' 34"	0.9996153	15' 60.00"	23° 26' 18"	12 m 01 s
1	193° 45' 35"	-0.41"	192° 39' 15"	-5° 25' 31"	0.9996032	16' 00.01"	23° 26' 18"	12 m 02 s
2	193° 48' 03"	-0.41"	192° 41' 32"	-5° 26' 29"	0.9995910	16' 00.02"	23° 26' 18"	12 m 03 s
3	193° 50' 31"	-0.40"	192° 43' 49"	-5° 27' 26"	0.9995789	16' 00.03"	23° 26' 18"	12 m 03 s
4	193° 52' 59"	-0.40"	192° 46' 06"	-5° 28' 23"	0.9995668	16' 00.05"	23° 26' 18"	12 m 04 s
5	193° 55' 27"	-0.40"	192° 48' 23"	-5° 29' 21"	0.9995546	16' 00.06"	23° 26' 18"	12 m 05 s
6	193° 57' 55"	-0.40"	192° 50' 40"	-5° 30' 18"	0.9995425	16' 00.07"	23° 26' 18"	12 m 06 s
7	194° 00' 23"	-0.40"	192° 52' 57"	-5° 31' 15"	0.9995304	16' 00.08"	23° 26' 18"	12 m 06 s
8	194° 02' 51"	-0.39"	192° 55' 14"	-5° 32' 13"	0.9995183	16' 00.09"	23° 26' 18"	12 m 07 s
9	194° 05' 19"	-0.39"	192° 57' 31"	-5° 33' 10"	0.9995062	16' 00.10"	23° 26' 18"	12 m 08 s
10	194° 07' 47"	-0.39"	192° 59' 48"	-5° 34' 07"	0.9994941	16' 00.12"	23° 26' 18"	12 m 09 s
11	194° 10' 15"	-0.39"	193° 02' 05"	-5° 35' 05"	0.9994819	16' 00.13"	23° 26' 18"	12 m 09 s
12	194° 12' 42"	-0.39"	193° 04' 22"	-5° 36' 02"	0.9994698	16' 00.14"	23° 26' 18"	12 m 10 s
13	194° 15' 10"	-0.38"	193° 06' 39"	-5° 36' 59"	0.9994577	16' 00.15"	23° 26' 18"	12 m 11 s
14	194° 17' 38"	-0.38"	193° 08' 56"	-5° 37' 57"	0.9994456	16' 00.16"	23° 26' 18"	12 m 11 s
15	194° 20' 06"	-0.38"	193° 11' 13"	-5° 38' 54"	0.9994335	16' 00.17"	23° 26' 18"	12 m 12 s
16	194° 22' 34"	-0.38"	193° 13' 30"	-5° 39' 51"	0.9994214	16' 00.19"	23° 26' 18"	12 m 13 s
17	194° 25' 02"	-0.37"	193° 15' 47"	-5° 40' 49"	0.9994093	16' 00.20"	23° 26' 18"	12 m 14 s
18	194° 27' 30"	-0.37"	193° 18' 04"	-5° 41' 46"	0.9993972	16' 00.21"	23° 26' 18"	12 m 15 s
19	194° 29' 58"	-0.37"	193° 20' 21"	-5° 42' 43"	0.9993851	16' 00.22"	23° 26' 18"	12 m 15 s
20	194° 32' 26"	-0.37"	193° 22' 38"	-5° 43' 40"	0.9993731	16' 00.23"	23° 26' 18"	12 m 16 s
21	194° 34' 54"	-0.36"	193° 24' 55"	-5° 44' 38"	0.9993610	16' 00.24"	23° 26' 18"	12 m 16 s
22	194° 37' 22"	-0.36"	193° 27' 12"	-5° 45' 35"	0.9993489	16' 00.26"	23° 26' 18"	12 m 17 s
23	194° 39' 50"	-0.36"	193° 29' 29"	-5° 46' 32"	0.9993368	16' 00.27"	23° 26' 18"	12 m 18 s
24	194° 42' 18"	-0.36"	193° 31' 47"	-5° 47' 29"	0.9993247	16' 00.28"	23° 26' 18"	12 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	336° 37' 20"	-4° 47' 41"	340° 11' 16"	-13° 31' 50"	0° 59' 04"	16' 05.84"	241° 38' 02"	0.89791
1	337° 12' 46"	-4° 46' 25"	340° 44' 24"	-13° 17' 23"	0° 59' 04"	16' 05.65"	241° 27' 24"	0.90078
2	337° 48' 11"	-4° 45' 07"	341° 17' 28"	-13° 02' 51"	0° 59' 03"	16' 05.46"	241° 16' 50"	0.90360
3	338° 23' 35"	-4° 43' 47"	341° 50' 28"	-12° 48' 16"	0° 59' 02"	16' 05.26"	241° 6' 18"	0.90639
4	338° 58' 59"	-4° 42' 26"	342° 23' 23"	-12° 33' 37"	0° 59' 02"	16' 05.06"	240° 55' 49"	0.90914
5	339° 34' 22"	-4° 41' 03"	342° 56' 14"	-12° 18' 54"	0° 59' 01"	16' 04.86"	240° 45' 23"	0.91186
6	340° 09' 44"	-4° 39' 38"	343° 29' 00"	-12° 04' 08"	0° 59' 00"	16' 04.66"	240° 34' 59"	0.91453
7	340° 45' 05"	-4° 38' 12"	344° 01' 42"	-11° 49' 18"	0° 58' 59"	16' 04.45"	240° 24' 36"	0.91717
8	341° 20' 25"	-4° 36' 43"	344° 34' 20"	-11° 34' 24"	0° 58' 58"	16' 04.23"	240° 14' 15"	0.91976
9	341° 55' 44"	-4° 35' 13"	345° 06' 53"	-11° 19' 28"	0° 58' 58"	16' 04.02"	240° 3' 55"	0.92232
10	342° 31' 02"	-4° 33' 41"	345° 39' 23"	-11° 04' 28"	0° 58' 57"	16' 03.79"	239° 53' 36"	0.92484
11	343° 06' 19"	-4° 32' 08"	346° 11' 48"	-10° 49' 25"	0° 58' 56"	16' 03.57"	239° 43' 17"	0.92732
12	343° 41' 35"	-4° 30' 33"	346° 44' 09"	-10° 34' 19"	0° 58' 55"	16' 03.34"	239° 32' 58"	0.92976
13	344° 16' 50"	-4° 28' 56"	347° 16' 26"	-10° 19' 10"	0° 58' 54"	16' 03.11"	239° 22' 38"	0.93216
14	344° 52' 04"	-4° 27' 17"	347° 48' 39"	-10° 03' 58"	0° 58' 54"	16' 02.87"	239° 12' 17"	0.93452
15	345° 27' 17"	-4° 25' 37"	348° 20' 49"	-9° 48' 44"	0° 58' 53"	16' 02.64"	239° 1' 54"	0.93684
16	346° 02' 29"	-4° 23' 56"	348° 52' 54"	-9° 33' 27"	0° 58' 52"	16' 02.39"	238° 51' 28"	0.93911
17	346° 37' 40"	-4° 22' 12"	349° 24' 56"	-9° 18' 07"	0° 58' 51"	16' 02.15"	238° 40' 59"	0.94135
18	347° 12' 49"	-4° 20' 27"	349° 56' 54"	-9° 02' 45"	0° 58' 50"	16' 01.90"	238° 30' 27"	0.94355
19	347° 47' 58"	-4° 18' 41"	350° 28' 49"	-8° 47' 20"	0° 58' 49"	16' 01.64"	238° 19' 50"	0.94571
20	348° 23' 05"	-4° 16' 53"	351° 00' 40"	-8° 31' 54"	0° 58' 48"	16' 01.38"	238° 9' 07"	0.94782
21	348° 58' 11"	-4° 15' 03"	351° 32' 27"	-8° 16' 25"	0° 58' 47"	16' 01.12"	237° 58' 18"	0.94990
22	349° 33' 16"	-4° 13' 12"	352° 04' 11"	-8° 00' 54"	0° 58' 46"	16' 00.86"	237° 47' 22"	0.95193
23	350° 08' 20"	-4° 11' 19"	352° 35' 52"	-7° 45' 21"	0° 58' 45"	16' 00.59"	237° 36' 18"	0.95392
24	350° 43' 23"	-4° 09' 24"	353° 07' 29"	-7° 29' 46"	0° 58' 44"	16' 00.32"	237° 25' 04"	0.95587

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	194° 42' 18"	-0.36"	193° 31' 47"	-5° 47' 29"	0.9993247	16' 00.28"	23° 26' 18"	12 m 19 s
1	194° 44' 46"	-0.35"	193° 34' 04"	-5° 48' 26"	0.9993126	16' 00.29"	23° 26' 18"	12 m 19 s
2	194° 47' 14"	-0.35"	193° 36' 21"	-5° 49' 24"	0.9993006	16' 00.30"	23° 26' 18"	12 m 20 s
3	194° 49' 42"	-0.35"	193° 38' 38"	-5° 50' 21"	0.9992885	16' 00.31"	23° 26' 18"	12 m 21 s
4	194° 52' 10"	-0.34"	193° 40' 55"	-5° 51' 18"	0.9992764	16' 00.32"	23° 26' 18"	12 m 21 s
5	194° 54' 38"	-0.34"	193° 43' 12"	-5° 52' 15"	0.9992644	16' 00.34"	23° 26' 18"	12 m 22 s
6	194° 57' 06"	-0.34"	193° 45' 30"	-5° 53' 12"	0.9992523	16' 00.35"	23° 26' 18"	12 m 23 s
7	194° 59' 34"	-0.34"	193° 47' 47"	-5° 54' 10"	0.9992402	16' 00.36"	23° 26' 18"	12 m 24 s
8	195° 02' 02"	-0.33"	193° 50' 04"	-5° 55' 07"	0.9992282	16' 00.37"	23° 26' 18"	12 m 24 s
9	195° 04' 30"	-0.33"	193° 52' 21"	-5° 56' 04"	0.9992161	16' 00.38"	23° 26' 18"	12 m 25 s
10	195° 06' 58"	-0.33"	193° 54' 39"	-5° 57' 01"	0.9992041	16' 00.39"	23° 26' 18"	12 m 26 s
11	195° 09' 26"	-0.32"	193° 56' 56"	-5° 57' 58"	0.9991920	16' 00.41"	23° 26' 18"	12 m 26 s
12	195° 11' 54"	-0.32"	193° 59' 13"	-5° 58' 55"	0.9991800	16' 00.42"	23° 26' 18"	12 m 27 s
13	195° 14' 22"	-0.32"	194° 01' 30"	-5° 59' 52"	0.9991679	16' 00.43"	23° 26' 18"	12 m 28 s
14	195° 16' 50"	-0.31"	194° 03' 48"	-6° 00' 50"	0.9991559	16' 00.44"	23° 26' 18"	12 m 29 s
15	195° 19' 18"	-0.31"	194° 06' 05"	-6° 01' 47"	0.9991439	16' 00.45"	23° 26' 18"	12 m 29 s
16	195° 21' 46"	-0.31"	194° 08' 22"	-6° 02' 44"	0.9991318	16' 00.46"	23° 26' 18"	12 m 30 s
17	195° 24' 14"	-0.30"	194° 10' 40"	-6° 03' 41"	0.9991198	16' 00.48"	23° 26' 18"	12 m 31 s
18	195° 26' 42"	-0.30"	194° 12' 57"	-6° 04' 38"	0.9991078	16' 00.49"	23° 26' 18"	12 m 31 s
19	195° 29' 10"	-0.29"	194° 15' 14"	-6° 05' 35"	0.9990957	16' 00.50"	23° 26' 18"	12 m 32 s
20	195° 31' 38"	-0.29"	194° 17' 32"	-6° 06' 32"	0.9990837	16' 00.51"	23° 26' 18"	12 m 33 s
21	195° 34' 06"	-0.29"	194° 19' 49"	-6° 07' 29"	0.9990717	16' 00.52"	23° 26' 18"	12 m 33 s
22	195° 36' 34"	-0.28"	194° 22' 07"	-6° 08' 26"	0.9990597	16' 00.53"	23° 26' 18"	12 m 34 s
23	195° 39' 02"	-0.28"	194° 24' 24"	-6° 09' 23"	0.9990477	16' 00.54"	23° 26' 18"	12 m 35 s
24	195° 41' 30"	-0.28"	194° 26' 41"	-6° 10' 20"	0.9990356	16' 00.56"	23° 26' 18"	12 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	350° 43' 23"	-4° 09' 24"	353° 07' 29"	-7° 29' 46"	0° 58' 44"	16' 00.32"	237° 25' 04"	0.95587
1	351° 18' 24"	-4° 07' 29"	353° 39' 03"	-7° 14' 09"	0° 58' 43"	16' 00.04"	237° 13' 39"	0.95778
2	351° 53' 24"	-4° 05' 31"	354° 10' 34"	-6° 58' 31"	0° 58' 42"	15' 59.76"	237° 2' 02"	0.95965
3	352° 28' 23"	-4° 03' 33"	354° 42' 02"	-6° 42' 51"	0° 58' 41"	15' 59.48"	236° 50' 12"	0.96147
4	353° 03' 20"	-4° 01' 32"	355° 13' 27"	-6° 27' 10"	0° 58' 40"	15' 59.19"	236° 38' 06"	0.96325
5	353° 38' 16"	-3° 59' 31"	355° 44' 48"	-6° 11' 27"	0° 58' 39"	15' 58.91"	236° 25' 44"	0.96499
6	354° 13' 11"	-3° 57' 28"	356° 16' 07"	-5° 55' 43"	0° 58' 38"	15' 58.61"	236° 13' 03"	0.96669
7	354° 48' 04"	-3° 55' 23"	356° 47' 23"	-5° 39' 58"	0° 58' 37"	15' 58.32"	236° 0' 00"	0.96835
8	355° 22' 56"	-3° 53' 17"	357° 18' 36"	-5° 24' 11"	0° 58' 36"	15' 58.02"	235° 46' 35"	0.96996
9	355° 57' 47"	-3° 51' 10"	357° 49' 47"	-5° 08' 23"	0° 58' 35"	15' 57.71"	235° 32' 43"	0.97153
10	356° 32' 36"	-3° 49' 01"	358° 20' 55"	-4° 52' 35"	0° 58' 33"	15' 57.41"	235° 18' 22"	0.97306
11	357° 07' 24"	-3° 46' 51"	358° 51' 60"	-4° 36' 46"	0° 58' 32"	15' 57.10"	235° 3' 30"	0.97454
12	357° 42' 11"	-3° 44' 40"	359° 23' 03"	-4° 20' 55"	0° 58' 31"	15' 56.78"	234° 48' 01"	0.97599
13	358° 16' 55"	-3° 42' 27"	359° 54' 03"	-4° 05' 05"	0° 58' 30"	15' 56.46"	234° 31' 53"	0.97739
14	358° 51' 39"	-3° 40' 14"	0° 25' 01"	-3° 49' 13"	0° 58' 29"	15' 56.14"	234° 15' 00"	0.97874
15	359° 26' 21"	-3° 37' 58"	0° 55' 56"	-3° 33' 21"	0° 58' 28"	15' 55.82"	233° 57' 18"	0.98006
16	0° 01' 01"	-3° 35' 42"	1° 26' 50"	-3° 17' 29"	0° 58' 26"	15' 55.49"	233° 38' 41"	0.98133
17	0° 35' 40"	-3° 33' 24"	1° 57' 41"	-3° 01' 36"	0° 58' 25"	15' 55.16"	233° 19' 02"	0.98256
18	1° 10' 18"	-3° 31' 06"	2° 28' 30"	-2° 45' 43"	0° 58' 24"	15' 54.83"	232° 58' 13"	0.98374
19	1° 44' 53"	-3° 28' 45"	2° 59' 17"	-2° 29' 50"	0° 58' 23"	15' 54.49"	232° 36' 07"	0.98489
20	2° 19' 28"	-3° 26' 24"	3° 30' 02"	-2° 13' 56"	0° 58' 22"	15' 54.15"	232° 12' 33"	0.98599
21	2° 54' 00"	-3° 24' 02"	4° 00' 45"	-1° 58' 03"	0° 58' 20"	15' 53.81"	231° 47' 21"	0.98704
22	3° 28' 31"	-3° 21' 38"	4° 31' 26"	-1° 42' 10"	0° 58' 19"	15' 53.47"	231° 20' 15"	0.98806
23	4° 03' 01"	-3° 19' 14"	5° 02' 05"	-1° 26' 17"	0° 58' 18"	15' 53.12"	230° 51' 03"	0.98903
24	4° 37' 29"	-3° 16' 48"	5° 32' 43"	-1° 10' 24"	0° 58' 16"	15' 52.77"	230° 19' 24"	0.98996



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	195° 41' 30"	-0.28"	194° 26' 41"	-6° 10' 20"	0.9990356	16' 00.56"	23° 26' 18"	12 m 36 s
1	195° 43' 58"	-0.27"	194° 28' 59"	-6° 11' 17"	0.9990236	16' 00.57"	23° 26' 18"	12 m 36 s
2	195° 46' 26"	-0.27"	194° 31' 16"	-6° 12' 14"	0.9990116	16' 00.58"	23° 26' 18"	12 m 37 s
3	195° 48' 54"	-0.26"	194° 33' 34"	-6° 13' 11"	0.9989996	16' 00.59"	23° 26' 18"	12 m 38 s
4	195° 51' 22"	-0.26"	194° 35' 51"	-6° 14' 08"	0.9989876	16' 00.60"	23° 26' 18"	12 m 38 s
5	195° 53' 50"	-0.26"	194° 38' 09"	-6° 15' 05"	0.9989756	16' 00.61"	23° 26' 18"	12 m 39 s
6	195° 56' 18"	-0.25"	194° 40' 26"	-6° 16' 02"	0.9989636	16' 00.63"	23° 26' 18"	12 m 40 s
7	195° 58' 46"	-0.25"	194° 42' 44"	-6° 16' 59"	0.9989516	16' 00.64"	23° 26' 18"	12 m 40 s
8	196° 01' 14"	-0.24"	194° 45' 01"	-6° 17' 56"	0.9989396	16' 00.65"	23° 26' 18"	12 m 41 s
9	196° 03' 42"	-0.24"	194° 47' 19"	-6° 18' 53"	0.9989277	16' 00.66"	23° 26' 18"	12 m 42 s
10	196° 06' 11"	-0.24"	194° 49' 36"	-6° 19' 50"	0.9989157	16' 00.67"	23° 26' 18"	12 m 43 s
11	196° 08' 39"	-0.23"	194° 51' 54"	-6° 20' 47"	0.9989037	16' 00.68"	23° 26' 18"	12 m 43 s
12	196° 11' 07"	-0.23"	194° 54' 11"	-6° 21' 44"	0.9988917	16' 00.69"	23° 26' 18"	12 m 44 s
13	196° 13' 35"	-0.22"	194° 56' 29"	-6° 22' 41"	0.9988797	16' 00.71"	23° 26' 18"	12 m 45 s
14	196° 16' 03"	-0.22"	194° 58' 46"	-6° 23' 38"	0.9988678	16' 00.72"	23° 26' 18"	12 m 45 s
15	196° 18' 31"	-0.22"	195° 01' 04"	-6° 24' 34"	0.9988558	16' 00.73"	23° 26' 18"	12 m 46 s
16	196° 20' 59"	-0.21"	195° 03' 21"	-6° 25' 31"	0.9988438	16' 00.74"	23° 26' 18"	12 m 47 s
17	196° 23' 27"	-0.21"	195° 05' 39"	-6° 26' 28"	0.9988319	16' 00.75"	23° 26' 18"	12 m 47 s
18	196° 25' 55"	-0.20"	195° 07' 57"	-6° 27' 25"	0.9988199	16' 00.76"	23° 26' 18"	12 m 48 s
19	196° 28' 23"	-0.20"	195° 10' 14"	-6° 28' 22"	0.9988080	16' 00.78"	23° 26' 18"	12 m 49 s
20	196° 30' 52"	-0.19"	195° 12' 32"	-6° 29' 19"	0.9987960	16' 00.79"	23° 26' 18"	12 m 49 s
21	196° 33' 20"	-0.19"	195° 14' 50"	-6° 30' 16"	0.9987840	16' 00.80"	23° 26' 18"	12 m 50 s
22	196° 35' 48"	-0.18"	195° 17' 07"	-6° 31' 12"	0.9987721	16' 00.81"	23° 26' 18"	12 m 51 s
23	196° 38' 16"	-0.18"	195° 19' 25"	-6° 32' 09"	0.9987601	16' 00.82"	23° 26' 18"	12 m 51 s
24	196° 40' 44"	-0.18"	195° 21' 43"	-6° 33' 06"	0.9987482	16' 00.83"	23° 26' 18"	12 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	4° 37' 29"	-3° 16' 48"	5° 32' 43"	-1° 10' 24"	0° 58' 16"	15' 52.77"	230° 19' 24"	0.98996
1	5° 11' 55"	-3° 14' 21"	6° 03' 19"	0° 54' 31"	0° 58' 15"	15' 52.41"	229° 44' 58"	0.99084
2	5° 46' 19"	-3° 11' 53"	6° 33' 53"	0° 38' 39"	0° 58' 14"	15' 52.05"	229° 7' 19"	0.99168
3	6° 20' 42"	-3° 09' 24"	7° 04' 26"	0° 22' 48"	0° 58' 12"	15' 51.69"	228° 25' 57"	0.99248
4	6° 55' 03"	-3° 06' 54"	7° 34' 57"	0° 6' 57"	0° 58' 11"	15' 51.33"	227° 40' 14"	0.99324
5	7° 29' 23"	-3° 04' 23"	8° 05' 27"	0° 08' 54"	0° 58' 10"	15' 50.96"	226° 49' 26"	0.99395
6	8° 03' 41"	-3° 01' 51"	8° 35' 56"	0° 24' 43"	0° 58' 08"	15' 50.59"	225° 52' 36"	0.99462
7	8° 37' 57"	-2° 59' 18"	9° 06' 23"	0° 40' 32"	0° 58' 07"	15' 50.22"	224° 48' 37"	0.99525
8	9° 12' 11"	-2° 56' 44"	9° 36' 50"	0° 56' 20"	0° 58' 06"	15' 49.85"	223° 36' 02"	0.99583
9	9° 46' 24"	-2° 54' 09"	10° 07' 15"	1° 12' 07"	0° 58' 04"	15' 49.47"	222° 13' 00"	0.99638
10	10° 20' 34"	-2° 51' 33"	10° 37' 38"	1° 27' 53"	0° 58' 03"	15' 49.09"	220° 37' 13"	0.99688
11	10° 54' 43"	-2° 48' 56"	11° 08' 01"	1° 43' 37"	0° 58' 02"	15' 48.70"	218° 45' 38"	0.99733
12	11° 28' 51"	-2° 46' 18"	11° 38' 23"	1° 59' 21"	0° 58' 00"	15' 48.32"	216° 34' 16"	0.99775
13	12° 02' 56"	-2° 43' 40"	12° 08' 44"	2° 15' 03"	0° 57' 59"	15' 47.93"	213° 57' 50"	0.99812
14	12° 36' 60"	-2° 41' 01"	12° 39' 05"	2° 30' 44"	0° 57' 57"	15' 47.54"	210° 49' 19"	0.99845
15	13° 11' 02"	-2° 38' 20"	13° 09' 24"	2° 46' 23"	0° 57' 56"	15' 47.15"	206° 59' 19"	0.99874
16	13° 45' 02"	-2° 35' 39"	13° 39' 43"	3° 02' 01"	0° 57' 54"	15' 46.75"	202° 15' 26"	0.99898
17	14° 18' 60"	-2° 32' 58"	14° 10' 01"	3° 17' 37"	0° 57' 53"	15' 46.35"	196° 21' 59"	0.99918
18	14° 52' 56"	-2° 30' 15"	14° 40' 19"	3° 33' 11"	0° 57' 51"	15' 45.95"	189° 0' 56"	0.99934
19	15° 26' 51"	-2° 27' 32"	15° 10' 36"	3° 48' 44"	0° 57' 50"	15' 45.55"	179° 56' 26"	0.99946
20	16° 00' 43"	-2° 24' 48"	15° 40' 52"	4° 04' 15"	0° 57' 48"	15' 45.15"	169° 5' 27"	0.99954
21	16° 34' 34"	-2° 22' 03"	16° 11' 08"	4° 19' 44"	0° 57' 47"	15' 44.74"	156° 52' 55"	0.99958
22	17° 08' 23"	-2° 19' 17"	16° 41' 24"	4° 35' 11"	0° 57' 45"	15' 44.33"	144° 16' 44"	0.99957
23	17° 42' 10"	-2° 16' 31"	17° 11' 40"	4° 50' 35"	0° 57' 44"	15' 43.92"	132° 26' 23"	0.99952
24	18° 15' 55"	-2° 13' 44"	17° 41' 55"	5° 05' 58"	0° 57' 42"	15' 43.51"	122° 9' 52"	0.99943

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	196° 40' 44"	-0.18"	195° 21' 43"	-6° 33' 06"	0.9987482	16' 00.83"	23° 26' 18"	12 m 52 s
1	196° 43' 12"	-0.17"	195° 24' 00"	-6° 34' 03"	0.9987363	16' 00.84"	23° 26' 18"	12 m 53 s
2	196° 45' 40"	-0.17"	195° 26' 18"	-6° 34' 60"	0.9987243	16' 00.86"	23° 26' 18"	12 m 53 s
3	196° 48' 08"	-0.16"	195° 28' 36"	-6° 35' 57"	0.9987124	16' 00.87"	23° 26' 18"	12 m 54 s
4	196° 50' 37"	-0.16"	195° 30' 54"	-6° 36' 53"	0.9987005	16' 00.88"	23° 26' 18"	12 m 55 s
5	196° 53' 05"	-0.15"	195° 33' 11"	-6° 37' 50"	0.9986885	16' 00.89"	23° 26' 18"	12 m 55 s
6	196° 55' 33"	-0.15"	195° 35' 29"	-6° 38' 47"	0.9986766	16' 00.90"	23° 26' 18"	12 m 56 s
7	196° 58' 01"	-0.14"	195° 37' 47"	-6° 39' 44"	0.9986647	16' 00.91"	23° 26' 18"	12 m 57 s
8	197° 00' 29"	-0.14"	195° 40' 05"	-6° 40' 40"	0.9986528	16' 00.92"	23° 26' 18"	12 m 57 s
9	197° 02' 57"	-0.13"	195° 42' 22"	-6° 41' 37"	0.9986409	16' 00.94"	23° 26' 18"	12 m 58 s
10	197° 05' 26"	-0.13"	195° 44' 40"	-6° 42' 34"	0.9986289	16' 00.95"	23° 26' 18"	12 m 59 s
11	197° 07' 54"	-0.12"	195° 46' 58"	-6° 43' 30"	0.9986170	16' 00.96"	23° 26' 18"	12 m 60 s
12	197° 10' 22"	-0.12"	195° 49' 16"	-6° 44' 27"	0.9986051	16' 00.97"	23° 26' 18"	13 m 00 s
13	197° 12' 50"	-0.11"	195° 51' 34"	-6° 45' 24"	0.9985932	16' 00.98"	23° 26' 18"	13 m 01 s
14	197° 15' 18"	-0.11"	195° 53' 52"	-6° 46' 21"	0.9985813	16' 00.99"	23° 26' 18"	13 m 02 s
15	197° 17' 46"	-0.10"	195° 56' 10"	-6° 47' 17"	0.9985694	16' 01.00"	23° 26' 18"	13 m 02 s
16	197° 20' 15"	-0.10"	195° 58' 27"	-6° 48' 14"	0.9985575	16' 01.02"	23° 26' 18"	13 m 03 s
17	197° 22' 43"	-0.09"	196° 00' 45"	-6° 49' 11"	0.9985456	16' 01.03"	23° 26' 18"	13 m 04 s
18	197° 25' 11"	-0.09"	196° 03' 03"	-6° 50' 07"	0.9985337	16' 01.04"	23° 26' 18"	13 m 04 s
19	197° 27' 39"	-0.08"	196° 05' 21"	-6° 51' 04"	0.9985219	16' 01.05"	23° 26' 18"	13 m 05 s
20	197° 30' 07"	-0.08"	196° 07' 39"	-6° 52' 00"	0.9985100	16' 01.06"	23° 26' 18"	13 m 06 s
21	197° 32' 36"	-0.07"	196° 09' 57"	-6° 52' 57"	0.9984981	16' 01.07"	23° 26' 18"	13 m 06 s
22	197° 35' 04"	-0.07"	196° 12' 15"	-6° 53' 54"	0.9984862	16' 01.08"	23° 26' 18"	13 m 07 s
23	197° 37' 32"	-0.06"	196° 14' 33"	-6° 54' 50"	0.9984743	16' 01.10"	23° 26' 18"	13 m 07 s
24	197° 40' 00"	-0.06"	196° 16' 51"	-6° 55' 47"	0.9984625	16' 01.11"	23° 26' 18"	13 m 08 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	18° 15' 55"	-2° 13' 44"	17° 41' 55"	5° 05' 58"	0° 57' 42"	15' 43.51"	122° 9' 52"	0.99943
1	18° 49' 38"	-2° 10' 57"	18° 12' 10"	5° 21' 19"	0° 57' 41"	15' 43.09"	113° 41' 26"	0.99930
2	19° 23' 19"	-2° 08' 09"	18° 42' 25"	5° 36' 37"	0° 57' 39"	15' 42.68"	106° 52' 17"	0.99913
3	19° 56' 58"	-2° 05' 20"	19° 12' 40"	5° 51' 53"	0° 57' 38"	15' 42.26"	101° 24' 60"	0.99892
4	20° 30' 35"	-2° 02' 31"	19° 42' 56"	6° 07' 06"	0° 57' 36"	15' 41.84"	97° 2' 03"	0.99866
5	21° 04' 11"	-1° 59' 41"	20° 13' 11"	6° 22' 17"	0° 57' 35"	15' 41.41"	93° 28' 48"	0.99837
6	21° 37' 44"	-1° 56' 51"	20° 43' 26"	6° 37' 25"	0° 57' 33"	15' 40.99"	90° 33' 55"	0.99804
7	22° 11' 16"	-1° 53' 60"	21° 13' 41"	6° 52' 31"	0° 57' 32"	15' 40.56"	88° 8' 52"	0.99766
8	22° 44' 45"	-1° 51' 09"	21° 43' 57"	7° 07' 34"	0° 57' 30"	15' 40.13"	86° 7' 14"	0.99725
9	23° 18' 13"	-1° 48' 17"	22° 14' 13"	7° 22' 34"	0° 57' 28"	15' 39.70"	84° 24' 13"	0.99679
10	23° 51' 38"	-1° 45' 24"	22° 44' 29"	7° 37' 32"	0° 57' 27"	15' 39.27"	82° 56' 12"	0.99630
11	24° 25' 02"	-1° 42' 32"	23° 14' 46"	7° 52' 26"	0° 57' 25"	15' 38.84"	81° 40' 22"	0.99576
12	24° 58' 23"	-1° 39' 38"	23° 45' 03"	8° 07' 17"	0° 57' 24"	15' 38.41"	80° 34' 35"	0.99519
13	25° 31' 43"	-1° 36' 45"	24° 15' 21"	8° 22' 06"	0° 57' 22"	15' 37.97"	79° 37' 10"	0.99457
14	26° 05' 00"	-1° 33' 51"	24° 45' 39"	8° 36' 51"	0° 57' 21"	15' 37.54"	78° 46' 46"	0.99392
15	26° 38' 16"	-1° 30' 56"	25° 15' 58"	8° 51' 33"	0° 57' 19"	15' 37.10"	78° 2' 20"	0.99323
16	27° 11' 30"	-1° 28' 02"	25° 46' 18"	9° 06' 11"	0° 57' 17"	15' 36.66"	77° 23' 00"	0.99250
17	27° 44' 41"	-1° 25' 07"	26° 16' 38"	9° 20' 47"	0° 57' 16"	15' 36.22"	76° 48' 04"	0.99173
18	28° 17' 51"	-1° 22' 11"	26° 46' 59"	9° 35' 19"	0° 57' 14"	15' 35.78"	76° 16' 56"	0.99092
19	28° 50' 58"	-1° 19' 15"	27° 17' 21"	9° 49' 47"	0° 57' 12"	15' 35.33"	75° 49' 09"	0.99007
20	29° 24' 04"	-1° 16' 20"	27° 47' 44"	10° 04' 12"	0° 57' 11"	15' 34.89"	75° 24' 17"	0.98919
21	29° 57' 07"	-1° 13' 23"	28° 18' 07"	10° 18' 33"	0° 57' 09"	15' 34.45"	75° 2' 01"	0.98826
22	30° 30' 09"	-1° 10' 27"	28° 48' 32"	10° 32' 51"	0° 57' 08"	15' 34.00"	74° 42' 04"	0.98730
23	31° 03' 08"	-1° 07' 30"	29° 18' 57"	10° 47' 05"	0° 57' 06"	15' 33.55"	74° 24' 10"	0.98631
24	31° 36' 05"	-1° 04' 33"	29° 49' 24"	11° 01' 15"	0° 57' 04"	15' 33.11"	74° 8' 07"	0.98527

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	197° 40' 00"	-0.06"	196° 16' 51"	-6° 55' 47"	0.9984625	16' 01.11"	23° 26' 18"	13 m 08 s
1	197° 42' 28"	-0.05"	196° 19' 09"	-6° 56' 43"	0.9984506	16' 01.12"	23° 26' 18"	13 m 09 s
2	197° 44' 57"	-0.05"	196° 21' 27"	-6° 57' 40"	0.9984387	16' 01.13"	23° 26' 18"	13 m 09 s
3	197° 47' 25"	-0.04"	196° 23' 45"	-6° 58' 37"	0.9984269	16' 01.14"	23° 26' 18"	13 m 10 s
4	197° 49' 53"	-0.04"	196° 26' 03"	-6° 59' 33"	0.9984150	16' 01.15"	23° 26' 18"	13 m 11 s
5	197° 52' 21"	-0.03"	196° 28' 21"	-7° 00' 30"	0.9984032	16' 01.16"	23° 26' 18"	13 m 11 s
6	197° 54' 50"	-0.03"	196° 30' 39"	-7° 01' 26"	0.9983913	16' 01.18"	23° 26' 18"	13 m 12 s
7	197° 57' 18"	-0.02"	196° 32' 57"	-7° 02' 23"	0.9983795	16' 01.19"	23° 26' 18"	13 m 13 s
8	197° 59' 46"	-0.02"	196° 35' 15"	-7° 03' 19"	0.9983676	16' 01.20"	23° 26' 18"	13 m 13 s
9	198° 02' 14"	-0.01"	196° 37' 33"	-7° 04' 16"	0.9983558	16' 01.21"	23° 26' 18"	13 m 14 s
10	198° 04' 43"	-0.01"	196° 39' 52"	-7° 05' 12"	0.9983439	16' 01.22"	23° 26' 18"	13 m 15 s
11	198° 07' 11"	-0.00"	196° 42' 10"	-7° 06' 09"	0.9983321	16' 01.23"	23° 26' 18"	13 m 15 s
12	198° 09' 39"	0.00"	196° 44' 28"	-7° 07' 05"	0.9983203	16' 01.24"	23° 26' 18"	13 m 16 s
13	198° 12' 07"	0.01"	196° 46' 46"	-7° 08' 02"	0.9983084	16' 01.26"	23° 26' 18"	13 m 17 s
14	198° 14' 36"	0.01"	196° 49' 04"	-7° 08' 58"	0.9982966	16' 01.27"	23° 26' 18"	13 m 17 s
15	198° 17' 04"	0.02"	196° 51' 22"	-7° 09' 55"	0.9982848	16' 01.28"	23° 26' 18"	13 m 18 s
16	198° 19' 32"	0.03"	196° 53' 41"	-7° 10' 51"	0.9982729	16' 01.29"	23° 26' 18"	13 m 19 s
17	198° 22' 00"	0.03"	196° 55' 59"	-7° 11' 47"	0.9982611	16' 01.30"	23° 26' 18"	13 m 19 s
18	198° 24' 29"	0.04"	196° 58' 17"	-7° 12' 44"	0.9982493	16' 01.31"	23° 26' 18"	13 m 20 s
19	198° 26' 57"	0.04"	197° 00' 35"	-7° 13' 40"	0.9982375	16' 01.32"	23° 26' 18"	13 m 21 s
20	198° 29' 25"	0.05"	197° 02' 53"	-7° 14' 37"	0.9982257	16' 01.34"	23° 26' 18"	13 m 21 s
21	198° 31' 54"	0.05"	197° 05' 12"	-7° 15' 33"	0.9982139	16' 01.35"	23° 26' 18"	13 m 22 s
22	198° 34' 22"	0.06"	197° 07' 30"	-7° 16' 29"	0.9982021	16' 01.36"	23° 26' 18"	13 m 22 s
23	198° 36' 50"	0.06"	197° 09' 48"	-7° 17' 26"	0.9981903	16' 01.37"	23° 26' 18"	13 m 23 s
24	198° 39' 18"	0.07"	197° 12' 07"	-7° 18' 22"	0.9981785	16' 01.38"	23° 26' 18"	13 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	31° 36' 05"	-1° 04' 33"	29° 49' 24"	11° 01' 15"	0° 57' 04"	15' 33.11"	74° 8' 07"	0.98527
1	32° 09' 01"	-1° 01' 36"	30° 19' 52"	11° 15' 21"	0° 57' 03"	15' 32.66"	73° 53' 45"	0.98420
2	32° 41' 54"	0°-58' 39"	30° 50' 21"	11° 29' 23"	0° 57' 01"	15' 32.21"	73° 40' 54"	0.98309
3	33° 14' 45"	0°-55' 41"	31° 20' 51"	11° 43' 22"	0° 56' 59"	15' 31.76"	73° 29' 26"	0.98194
4	33° 47' 34"	0°-52' 44"	31° 51' 22"	11° 57' 16"	0° 56' 58"	15' 31.31"	73° 19' 13"	0.98076
5	34° 20' 22"	0°-49' 46"	32° 21' 55"	12° 11' 06"	0° 56' 56"	15' 30.86"	73° 10' 09"	0.97954
6	34° 53' 07"	0°-46' 48"	32° 52' 29"	12° 24' 52"	0° 56' 54"	15' 30.41"	73° 2' 09"	0.97829
7	35° 25' 50"	0°-43' 50"	33° 23' 04"	12° 38' 34"	0° 56' 53"	15' 29.96"	72° 55' 09"	0.97700
8	35° 58' 31"	0°-40' 52"	33° 53' 40"	12° 52' 11"	0° 56' 51"	15' 29.51"	72° 49' 02"	0.97567
9	36° 31' 10"	0°-37' 54"	34° 24' 19"	13° 05' 44"	0° 56' 49"	15' 29.06"	72° 43' 46"	0.97431
10	37° 03' 47"	0°-34' 56"	34° 54' 58"	13° 19' 12"	0° 56' 48"	15' 28.60"	72° 39' 17"	0.97291
11	37° 36' 22"	0°-31' 58"	35° 25' 39"	13° 32' 36"	0° 56' 46"	15' 28.15"	72° 35' 32"	0.97148
12	38° 08' 55"	0°-29' 00"	35° 56' 22"	13° 45' 56"	0° 56' 44"	15' 27.70"	72° 32' 28"	0.97001
13	38° 41' 26"	0°-26' 02"	36° 27' 06"	13° 59' 11"	0° 56' 43"	15' 27.25"	72° 30' 03"	0.96851
14	39° 13' 55"	0°-23' 04"	36° 57' 52"	14° 12' 21"	0° 56' 41"	15' 26.80"	72° 28' 14"	0.96698
15	39° 46' 22"	0°-20' 06"	37° 28' 40"	14° 25' 26"	0° 56' 39"	15' 26.34"	72° 26' 60"	0.96541
16	40° 18' 46"	0°-17' 08"	37° 59' 29"	14° 38' 27"	0° 56' 38"	15' 25.89"	72° 26' 17"	0.96380
17	40° 51' 09"	0°-14' 10"	38° 30' 20"	14° 51' 23"	0° 56' 36"	15' 25.44"	72° 26' 05"	0.96217
18	41° 23' 30"	0°-11' 13"	39° 01' 13"	15° 04' 14"	0° 56' 34"	15' 24.99"	72° 26' 23"	0.96050
19	41° 55' 49"	0° -8' 15"	39° 32' 07"	15° 16' 60"	0° 56' 33"	15' 24.54"	72° 27' 07"	0.95880
20	42° 28' 06"	0° -5' 18"	40° 03' 04"	15° 29' 40"	0° 56' 31"	15' 24.08"	72° 28' 18"	0.95706
21	43° 00' 20"	0° -2' 20"	40° 34' 02"	15° 42' 16"	0° 56' 29"	15' 23.63"	72° 29' 54"	0.95529
22	43° 32' 33"	0° 00' 37"	41° 05' 02"	15° 54' 47"	0° 56' 28"	15' 23.18"	72° 31' 54"	0.95349
23	44° 04' 44"	0° 03' 34"	41° 36' 04"	16° 07' 12"	0° 56' 26"	15' 22.73"	72° 34' 17"	0.95166
24	44° 36' 52"	0° 06' 31"	42° 07' 08"	16° 19' 33"	0° 56' 25"	15' 22.28"	72° 37' 02"	0.94980

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	198° 39' 18"	0.07"	197° 12' 07"	-7° 18' 22"	0.9981785	16' 01.38"	23° 26' 18"	13 m 24 s
1	198° 41' 47"	0.07"	197° 14' 25"	-7° 19' 18"	0.9981667	16' 01.39"	23° 26' 18"	13 m 24 s
2	198° 44' 15"	0.08"	197° 16' 43"	-7° 20' 15"	0.9981549	16' 01.40"	23° 26' 18"	13 m 25 s
3	198° 46' 43"	0.08"	197° 19' 02"	-7° 21' 11"	0.9981431	16' 01.42"	23° 26' 18"	13 m 26 s
4	198° 49' 12"	0.09"	197° 21' 20"	-7° 22' 07"	0.9981313	16' 01.43"	23° 26' 18"	13 m 26 s
5	198° 51' 40"	0.10"	197° 23' 38"	-7° 23' 04"	0.9981195	16' 01.44"	23° 26' 18"	13 m 27 s
6	198° 54' 08"	0.10"	197° 25' 57"	-7° 23' 60"	0.9981077	16' 01.45"	23° 26' 18"	13 m 28 s
7	198° 56' 37"	0.11"	197° 28' 15"	-7° 24' 56"	0.9980959	16' 01.46"	23° 26' 18"	13 m 28 s
8	198° 59' 05"	0.11"	197° 30' 33"	-7° 25' 53"	0.9980842	16' 01.47"	23° 26' 18"	13 m 29 s
9	199° 01' 33"	0.12"	197° 32' 52"	-7° 26' 49"	0.9980724	16' 01.48"	23° 26' 18"	13 m 29 s
10	199° 04' 02"	0.12"	197° 35' 10"	-7° 27' 45"	0.9980606	16' 01.49"	23° 26' 18"	13 m 30 s
11	199° 06' 30"	0.13"	197° 37' 29"	-7° 28' 41"	0.9980488	16' 01.51"	23° 26' 18"	13 m 31 s
12	199° 08' 58"	0.13"	197° 39' 47"	-7° 29' 37"	0.9980371	16' 01.52"	23° 26' 18"	13 m 31 s
13	199° 11' 27"	0.14"	197° 42' 06"	-7° 30' 34"	0.9980253	16' 01.53"	23° 26' 18"	13 m 32 s
14	199° 13' 55"	0.14"	197° 44' 24"	-7° 31' 30"	0.9980135	16' 01.54"	23° 26' 18"	13 m 33 s
15	199° 16' 24"	0.15"	197° 46' 43"	-7° 32' 26"	0.9980018	16' 01.55"	23° 26' 18"	13 m 33 s
16	199° 18' 52"	0.15"	197° 49' 01"	-7° 33' 22"	0.9979900	16' 01.56"	23° 26' 18"	13 m 34 s
17	199° 21' 20"	0.16"	197° 51' 20"	-7° 34' 18"	0.9979783	16' 01.57"	23° 26' 18"	13 m 34 s
18	199° 23' 49"	0.17"	197° 53' 38"	-7° 35' 15"	0.9979665	16' 01.59"	23° 26' 18"	13 m 35 s
19	199° 26' 17"	0.17"	197° 55' 57"	-7° 36' 11"	0.9979548	16' 01.60"	23° 26' 18"	13 m 36 s
20	199° 28' 45"	0.18"	197° 58' 15"	-7° 37' 07"	0.9979430	16' 01.61"	23° 26' 18"	13 m 36 s
21	199° 31' 14"	0.18"	198° 00' 34"	-7° 38' 03"	0.9979313	16' 01.62"	23° 26' 18"	13 m 37 s
22	199° 33' 42"	0.19"	198° 02' 53"	-7° 38' 59"	0.9979196	16' 01.63"	23° 26' 18"	13 m 38 s
23	199° 36' 11"	0.19"	198° 05' 11"	-7° 39' 55"	0.9979078	16' 01.64"	23° 26' 18"	13 m 38 s
24	199° 38' 39"	0.20"	198° 07' 30"	-7° 40' 51"	0.9978961	16' 01.65"	23° 26' 18"	13 m 39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	44° 36' 52"	0° 06' 31"	42° 07' 08"	16° 19' 33"	0° 56' 25"	15' 22.28"	72° 37' 02"	0.94980
1	45° 08' 59"	0° 09' 27"	42° 38' 14"	16° 31' 48"	0° 56' 23"	15' 21.84"	72° 40' 07"	0.94790
2	45° 41' 04"	0° 12' 24"	43° 09' 22"	16° 43' 57"	0° 56' 21"	15' 21.39"	72° 43' 33"	0.94597
3	46° 13' 07"	0° 15' 20"	43° 40' 32"	16° 56' 01"	0° 56' 20"	15' 20.94"	72° 47' 18"	0.94401
4	46° 45' 07"	0° 18' 16"	44° 11' 44"	17° 08' 00"	0° 56' 18"	15' 20.50"	72° 51' 22"	0.94203
5	47° 17' 06"	0° 21' 11"	44° 42' 58"	17° 19' 53"	0° 56' 16"	15' 20.05"	72° 55' 44"	0.94001
6	47° 49' 03"	0° 24' 07"	45° 14' 14"	17° 31' 41"	0° 56' 15"	15' 19.61"	73° 0' 24"	0.93796
7	48° 20' 58"	0° 27' 02"	45° 45' 32"	17° 43' 23"	0° 56' 13"	15' 19.16"	73° 5' 20"	0.93588
8	48° 52' 51"	0° 29' 56"	46° 16' 53"	17° 54' 59"	0° 56' 11"	15' 18.72"	73° 10' 32"	0.93377
9	49° 24' 42"	0° 32' 51"	46° 48' 15"	18° 06' 30"	0° 56' 10"	15' 18.28"	73° 16' 00"	0.93163
10	49° 56' 31"	0° 35' 43"	47° 19' 41"	18° 17' 52"	0° 56' 08"	15' 17.84"	73° 21' 48"	0.92946
11	50° 28' 18"	0° 38' 36"	47° 51' 07"	18° 29' 11"	0° 56' 07"	15' 17.40"	73° 27' 46"	0.92726
12	51° 00' 03"	0° 41' 30"	48° 22' 36"	18° 40' 24"	0° 56' 05"	15' 16.96"	73° 33' 59"	0.92504
13	51° 31' 46"	0° 44' 23"	48° 54' 08"	18° 51' 31"	0° 56' 03"	15' 16.52"	73° 40' 26"	0.92278
14	52° 03' 28"	0° 47' 15"	49° 25' 41"	19° 02' 33"	0° 56' 02"	15' 16.09"	73° 47' 06"	0.92050
15	52° 35' 07"	0° 50' 07"	49° 57' 17"	19° 13' 28"	0° 56' 00"	15' 15.65"	73° 53' 59"	0.91819
16	53° 06' 44"	0° 52' 59"	50° 28' 55"	19° 24' 17"	0° 55' 59"	15' 15.22"	74° 1' 06"	0.91585
17	53° 38' 20"	0° 55' 51"	51° 00' 35"	19° 34' 60"	0° 55' 57"	15' 14.79"	74° 8' 24"	0.91349
18	54° 09' 54"	0° 58' 41"	51° 32' 17"	19° 45' 36"	0° 55' 55"	15' 14.36"	74° 15' 56"	0.91109
19	54° 41' 26"	1° 01' 32"	52° 04' 02"	19° 56' 07"	0° 55' 54"	15' 13.93"	74° 23' 39"	0.90867
20	55° 12' 56"	1° 04' 22"	52° 35' 49"	20° 06' 31"	0° 55' 52"	15' 13.51"	74° 31' 33"	0.90623
21	55° 44' 24"	1° 07' 11"	53° 07' 38"	20° 16' 49"	0° 55' 51"	15' 13.08"	74° 39' 39"	0.90375
22	56° 15' 50"	1° 10' 00"	53° 39' 30"	20° 27' 01"	0° 55' 49"	15' 12.66"	74° 47' 57"	0.90125
23	56° 47' 15"	1° 12' 49"	54° 11' 23"	20° 37' 06"	0° 55' 48"	15' 12.24"	74° 56' 25"	0.89873
24	57° 18' 37"	1° 15' 37"	54° 43' 20"	20° 47' 04"	0° 55' 46"	15' 11.82"	75° 5' 04"	0.89618

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Oblliquity	Equation Of Time
0	199° 38' 39"	0.20"	198° 07' 30"	-7° 40' 51"	0.9978961	16' 01.65"	23° 26' 18"	13 m 39 s
1	199° 41' 07"	0.20"	198° 09' 48"	-7° 41' 47"	0.9978844	16' 01.66"	23° 26' 18"	13 m 39 s
2	199° 43' 36"	0.21"	198° 12' 07"	-7° 42' 44"	0.9978726	16' 01.68"	23° 26' 18"	13 m 40 s
3	199° 46' 04"	0.21"	198° 14' 26"	-7° 43' 40"	0.9978609	16' 01.69"	23° 26' 18"	13 m 41 s
4	199° 48' 33"	0.22"	198° 16' 44"	-7° 44' 36"	0.9978492	16' 01.70"	23° 26' 18"	13 m 41 s
5	199° 51' 01"	0.22"	198° 19' 03"	-7° 45' 32"	0.9978375	16' 01.71"	23° 26' 18"	13 m 42 s
6	199° 53' 29"	0.23"	198° 21' 22"	-7° 46' 28"	0.9978257	16' 01.72"	23° 26' 18"	13 m 42 s
7	199° 55' 58"	0.24"	198° 23' 41"	-7° 47' 24"	0.9978140	16' 01.73"	23° 26' 18"	13 m 43 s
8	199° 58' 26"	0.24"	198° 25' 59"	-7° 48' 20"	0.9978023	16' 01.74"	23° 26' 18"	13 m 44 s
9	200° 00' 55"	0.25"	198° 28' 18"	-7° 49' 16"	0.9977906	16' 01.75"	23° 26' 18"	13 m 44 s
10	200° 03' 23"	0.25"	198° 30' 37"	-7° 50' 12"	0.9977789	16' 01.77"	23° 26' 18"	13 m 45 s
11	200° 05' 52"	0.26"	198° 32' 56"	-7° 51' 08"	0.9977672	16' 01.78"	23° 26' 18"	13 m 46 s
12	200° 08' 20"	0.26"	198° 35' 14"	-7° 52' 04"	0.9977555	16' 01.79"	23° 26' 18"	13 m 46 s
13	200° 10' 48"	0.27"	198° 37' 33"	-7° 52' 60"	0.9977438	16' 01.80"	23° 26' 18"	13 m 47 s
14	200° 13' 17"	0.27"	198° 39' 52"	-7° 53' 56"	0.9977321	16' 01.81"	23° 26' 18"	13 m 47 s
15	200° 15' 45"	0.28"	198° 42' 11"	-7° 54' 52"	0.9977204	16' 01.82"	23° 26' 18"	13 m 48 s
16	200° 18' 14"	0.28"	198° 44' 30"	-7° 55' 47"	0.9977087	16' 01.83"	23° 26' 18"	13 m 49 s
17	200° 20' 42"	0.29"	198° 46' 49"	-7° 56' 43"	0.9976970	16' 01.85"	23° 26' 18"	13 m 49 s
18	200° 23' 11"	0.29"	198° 49' 08"	-7° 57' 39"	0.9976853	16' 01.86"	23° 26' 18"	13 m 50 s
19	200° 25' 39"	0.30"	198° 51' 26"	-7° 58' 35"	0.9976737	16' 01.87"	23° 26' 18"	13 m 50 s
20	200° 28' 08"	0.30"	198° 53' 45"	-7° 59' 31"	0.9976620	16' 01.88"	23° 26' 18"	13 m 51 s
21	200° 30' 36"	0.31"	198° 56' 04"	-8° 00' 27"	0.9976503	16' 01.89"	23° 26' 18"	13 m 52 s
22	200° 33' 05"	0.31"	198° 58' 23"	-8° 01' 23"	0.9976386	16' 01.90"	23° 26' 18"	13 m 52 s
23	200° 35' 33"	0.32"	199° 00' 42"	-8° 02' 19"	0.9976270	16' 01.91"	23° 26' 18"	13 m 53 s
24	200° 38' 02"	0.32"	199° 03' 01"	-8° 03' 14"	0.9976153	16' 01.92"	23° 26' 18"	13 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	57° 18' 37"	1° 15' 37"	54° 43' 20"	20° 47' 04"	0° 55' 46"	15' 11.82"	75° 5' 04"	0.89618
1	57° 49' 58"	1° 18' 24"	55° 15' 18"	20° 56' 57"	0° 55' 45"	15' 11.41"	75° 13' 53"	0.89360
2	58° 21' 17"	1° 21' 11"	55° 47' 19"	21° 06' 42"	0° 55' 43"	15' 10.99"	75° 22' 52"	0.89100
3	58° 52' 35"	1° 23' 57"	56° 19' 22"	21° 16' 21"	0° 55' 42"	15' 10.58"	75° 32' 01"	0.88838
4	59° 23' 50"	1° 26' 43"	56° 51' 27"	21° 25' 54"	0° 55' 40"	15' 10.17"	75° 41' 21"	0.88573
5	59° 55' 04"	1° 29' 28"	57° 23' 34"	21° 35' 20"	0° 55' 39"	15' 09.76"	75° 50' 49"	0.88305
6	60° 26' 16"	1° 32' 12"	57° 55' 44"	21° 44' 39"	0° 55' 37"	15' 09.35"	76° 0' 27"	0.88035
7	60° 57' 26"	1° 34' 56"	58° 27' 56"	21° 53' 51"	0° 55' 36"	15' 08.95"	76° 10' 14"	0.87763
8	61° 28' 35"	1° 37' 40"	59° 00' 10"	22° 02' 57"	0° 55' 34"	15' 08.55"	76° 20' 11"	0.87488
9	61° 59' 41"	1° 40' 22"	59° 32' 27"	22° 11' 55"	0° 55' 33"	15' 08.15"	76° 30' 16"	0.87211
10	62° 30' 46"	1° 43' 04"	60° 04' 46"	22° 20' 47"	0° 55' 31"	15' 07.75"	76° 40' 29"	0.86932
11	63° 01' 50"	1° 45' 46"	60° 37' 07"	22° 29' 32"	0° 55' 30"	15' 07.36"	76° 50' 51"	0.86651
12	63° 32' 51"	1° 48' 27"	61° 09' 30"	22° 38' 10"	0° 55' 28"	15' 06.97"	77° 1' 22"	0.86367
13	64° 03' 51"	1° 51' 07"	61° 41' 55"	22° 46' 41"	0° 55' 27"	15' 06.58"	77° 12' 01"	0.86081
14	64° 34' 50"	1° 53' 46"	62° 14' 23"	22° 55' 05"	0° 55' 25"	15' 06.19"	77° 22' 47"	0.85792
15	65° 05' 47"	1° 56' 25"	62° 46' 53"	23° 03' 22"	0° 55' 24"	15' 05.81"	77° 33' 42"	0.85502
16	65° 36' 42"	1° 59' 03"	63° 19' 24"	23° 11' 31"	0° 55' 23"	15' 05.42"	77° 44' 44"	0.85209
17	66° 07' 35"	2° 01' 40"	63° 51' 59"	23° 19' 34"	0° 55' 21"	15' 05.05"	77° 55' 54"	0.84915
18	66° 38' 27"	2° 04' 16"	64° 24' 35"	23° 27' 30"	0° 55' 20"	15' 04.67"	78° 7' 11"	0.84618
19	67° 09' 17"	2° 06' 52"	64° 57' 13"	23° 35' 18"	0° 55' 19"	15' 04.30"	78° 18' 35"	0.84319
20	67° 40' 06"	2° 09' 27"	65° 29' 53"	23° 42' 59"	0° 55' 17"	15' 03.93"	78° 30' 07"	0.84018
21	68° 10' 53"	2° 12' 02"	66° 02' 36"	23° 50' 33"	0° 55' 16"	15' 03.56"	78° 41' 45"	0.83715
22	68° 41' 39"	2° 14' 35"	66° 35' 20"	23° 57' 59"	0° 55' 14"	15' 03.19"	78° 53' 31"	0.83410
23	69° 12' 23"	2° 17' 08"	67° 08' 07"	24° 05' 18"	0° 55' 13"	15' 02.83"	79° 5' 23"	0.83103
24	69° 43' 05"	2° 19' 40"	67° 40' 55"	24° 12' 30"	0° 55' 12"	15' 02.48"	79° 17' 21"	0.82795

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	200° 38' 02"	0.32"	199° 03' 01"	-8° 03' 14"	0.9976153	16' 01.92"	23° 26' 18"	13 m 53 s
1	200° 40' 30"	0.33"	199° 05' 20"	-8° 04' 10"	0.9976036	16' 01.94"	23° 26' 18"	13 m 54 s
2	200° 42' 59"	0.33"	199° 07' 39"	-8° 05' 06"	0.9975920	16' 01.95"	23° 26' 18"	13 m 55 s
3	200° 45' 27"	0.34"	199° 09' 58"	-8° 06' 02"	0.9975803	16' 01.96"	23° 26' 18"	13 m 55 s
4	200° 47' 56"	0.34"	199° 12' 17"	-8° 06' 58"	0.9975686	16' 01.97"	23° 26' 18"	13 m 56 s
5	200° 50' 24"	0.35"	199° 14' 36"	-8° 07' 53"	0.9975570	16' 01.98"	23° 26' 18"	13 m 56 s
6	200° 52' 53"	0.35"	199° 16' 55"	-8° 08' 49"	0.9975453	16' 01.99"	23° 26' 18"	13 m 57 s
7	200° 55' 21"	0.36"	199° 19' 14"	-8° 09' 45"	0.9975337	16' 02.00"	23° 26' 18"	13 m 58 s
8	200° 57' 50"	0.36"	199° 21' 33"	-8° 10' 41"	0.9975220	16' 02.01"	23° 26' 18"	13 m 58 s
9	201° 00' 18"	0.37"	199° 23' 52"	-8° 11' 36"	0.9975104	16' 02.03"	23° 26' 18"	13 m 59 s
10	201° 02' 47"	0.37"	199° 26' 11"	-8° 12' 32"	0.9974987	16' 02.04"	23° 26' 18"	13 m 59 s
11	201° 05' 15"	0.38"	199° 28' 31"	-8° 13' 28"	0.9974871	16' 02.05"	23° 26' 18"	13 m 60 s
12	201° 07' 44"	0.38"	199° 30' 50"	-8° 14' 23"	0.9974754	16' 02.06"	23° 26' 18"	14 m 00 s
13	201° 10' 12"	0.39"	199° 33' 09"	-8° 15' 19"	0.9974638	16' 02.07"	23° 26' 18"	14 m 01 s
14	201° 12' 41"	0.39"	199° 35' 28"	-8° 16' 15"	0.9974522	16' 02.08"	23° 26' 18"	14 m 02 s
15	201° 15' 09"	0.40"	199° 37' 47"	-8° 17' 10"	0.9974405	16' 02.09"	23° 26' 18"	14 m 02 s
16	201° 17' 38"	0.40"	199° 40' 06"	-8° 18' 06"	0.9974289	16' 02.10"	23° 26' 18"	14 m 03 s
17	201° 20' 07"	0.41"	199° 42' 26"	-8° 19' 02"	0.9974173	16' 02.11"	23° 26' 18"	14 m 03 s
18	201° 22' 35"	0.41"	199° 44' 45"	-8° 19' 57"	0.9974056	16' 02.13"	23° 26' 18"	14 m 04 s
19	201° 25' 04"	0.41"	199° 47' 04"	-8° 20' 53"	0.9973940	16' 02.14"	23° 26' 18"	14 m 05 s
20	201° 27' 32"	0.42"	199° 49' 23"	-8° 21' 49"	0.9973824	16' 02.15"	23° 26' 18"	14 m 05 s
21	201° 30' 01"	0.42"	199° 51' 43"	-8° 22' 44"	0.9973708	16' 02.16"	23° 26' 18"	14 m 06 s
22	201° 32' 29"	0.43"	199° 54' 02"	-8° 23' 40"	0.9973592	16' 02.17"	23° 26' 18"	14 m 06 s
23	201° 34' 58"	0.43"	199° 56' 21"	-8° 24' 35"	0.9973475	16' 02.18"	23° 26' 18"	14 m 07 s
24	201° 37' 27"	0.44"	199° 58' 41"	-8° 25' 31"	0.9973359	16' 02.19"	23° 26' 18"	14 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	69° 43' 05"	2° 19' 40"	67° 40' 55"	24° 12' 30"	0° 55' 12"	15' 02.48"	79° 17' 21"	0.82795
1	70° 13' 46"	2° 22' 11"	68° 13' 45"	24° 19' 34"	0° 55' 11"	15' 02.12"	79° 29' 27"	0.82484
2	70° 44' 26"	2° 24' 42"	68° 46' 38"	24° 26' 31"	0° 55' 09"	15' 01.77"	79° 41' 38"	0.82171
3	71° 15' 04"	2° 27' 11"	69° 19' 32"	24° 33' 21"	0° 55' 08"	15' 01.42"	79° 53' 56"	0.81856
4	71° 45' 40"	2° 29' 40"	69° 52' 28"	24° 40' 03"	0° 55' 07"	15' 01.07"	80° 6' 19"	0.81540
5	72° 16' 16"	2° 32' 08"	70° 25' 26"	24° 46' 37"	0° 55' 05"	15' 00.73"	80° 18' 49"	0.81222
6	72° 46' 49"	2° 34' 35"	70° 58' 25"	24° 53' 04"	0° 55' 04"	15' 00.39"	80° 31' 25"	0.80902
7	73° 17' 22"	2° 37' 01"	71° 31' 27"	24° 59' 23"	0° 55' 03"	15' 00.06"	80° 44' 06"	0.80580
8	73° 47' 53"	2° 39' 26"	72° 04' 30"	25° 05' 35"	0° 55' 02"	14' 59.72"	80° 56' 52"	0.80256
9	74° 18' 22"	2° 41' 51"	72° 37' 34"	25° 11' 39"	0° 55' 01"	14' 59.40"	81° 9' 45"	0.79931
10	74° 48' 50"	2° 44' 15"	73° 10' 41"	25° 17' 35"	0° 54' 59"	14' 59.07"	81° 22' 42"	0.79604
11	75° 19' 17"	2° 46' 37"	73° 43' 49"	25° 23' 24"	0° 54' 58"	14' 58.75"	81° 35' 45"	0.79275
12	75° 49' 43"	2° 48' 59"	74° 16' 59"	25° 29' 05"	0° 54' 57"	14' 58.43"	81° 48' 53"	0.78945
13	76° 20' 07"	2° 51' 20"	74° 50' 10"	25° 34' 39"	0° 54' 56"	14' 58.12"	82° 2' 06"	0.78613
14	76° 50' 30"	2° 53' 40"	75° 23' 22"	25° 40' 04"	0° 54' 55"	14' 57.80"	82° 15' 23"	0.78279
15	77° 20' 51"	2° 55' 59"	75° 56' 37"	25° 45' 22"	0° 54' 54"	14' 57.50"	82° 28' 46"	0.77944
16	77° 51' 12"	2° 58' 18"	76° 29' 52"	25° 50' 32"	0° 54' 52"	14' 57.19"	82° 42' 13"	0.77607
17	78° 21' 31"	3° 00' 35"	77° 03' 09"	25° 55' 34"	0° 54' 51"	14' 56.89"	82° 55' 44"	0.77269
18	78° 51' 49"	3° 02' 51"	77° 36' 27"	26° 00' 29"	0° 54' 50"	14' 56.60"	83° 9' 20"	0.76929
19	79° 22' 05"	3° 05' 07"	78° 09' 47"	26° 05' 16"	0° 54' 49"	14' 56.30"	83° 23' 01"	0.76587
20	79° 52' 21"	3° 07' 21"	78° 43' 07"	26° 09' 54"	0° 54' 48"	14' 56.02"	83° 36' 45"	0.76245
21	80° 22' 35"	3° 09' 35"	79° 16' 29"	26° 14' 25"	0° 54' 47"	14' 55.73"	83° 50' 33"	0.75900
22	80° 52' 48"	3° 11' 47"	79° 49' 52"	26° 18' 48"	0° 54' 46"	14' 55.45"	84° 4' 26"	0.75555
23	81° 23' 00"	3° 13' 59"	80° 23' 16"	26° 23' 03"	0° 54' 45"	14' 55.17"	84° 18' 22"	0.75207
24	81° 53' 11"	3° 16' 10"	80° 56' 41"	26° 27' 10"	0° 54' 44"	14' 54.90"	84° 32' 22"	0.74859

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	201° 37' 27"	0.44"	199° 58' 41"	-8° 25' 31"	0.9973359	16' 02.19"	23° 26' 18"	14 m 07 s
1	201° 39' 55"	0.44"	200° 00' 60"	-8° 26' 26"	0.9973243	16' 02.20"	23° 26' 18"	14 m 08 s
2	201° 42' 24"	0.45"	200° 03' 19"	-8° 27' 22"	0.9973127	16' 02.22"	23° 26' 18"	14 m 09 s
3	201° 44' 52"	0.45"	200° 05' 39"	-8° 28' 17"	0.9973011	16' 02.23"	23° 26' 18"	14 m 09 s
4	201° 47' 21"	0.45"	200° 07' 58"	-8° 29' 13"	0.9972895	16' 02.24"	23° 26' 18"	14 m 10 s
5	201° 49' 50"	0.46"	200° 10' 17"	-8° 30' 08"	0.9972779	16' 02.25"	23° 26' 18"	14 m 10 s
6	201° 52' 18"	0.46"	200° 12' 37"	-8° 31' 04"	0.9972663	16' 02.26"	23° 26' 18"	14 m 11 s
7	201° 54' 47"	0.47"	200° 14' 56"	-8° 31' 59"	0.9972547	16' 02.27"	23° 26' 18"	14 m 11 s
8	201° 57' 15"	0.47"	200° 17' 16"	-8° 32' 55"	0.9972431	16' 02.28"	23° 26' 18"	14 m 12 s
9	201° 59' 44"	0.48"	200° 19' 35"	-8° 33' 50"	0.9972315	16' 02.29"	23° 26' 18"	14 m 13 s
10	202° 02' 13"	0.48"	200° 21' 54"	-8° 34' 46"	0.9972199	16' 02.31"	23° 26' 18"	14 m 13 s
11	202° 04' 41"	0.48"	200° 24' 14"	-8° 35' 41"	0.9972083	16' 02.32"	23° 26' 18"	14 m 14 s
12	202° 07' 10"	0.49"	200° 26' 33"	-8° 36' 36"	0.9971967	16' 02.33"	23° 26' 18"	14 m 14 s
13	202° 09' 38"	0.49"	200° 28' 53"	-8° 37' 32"	0.9971852	16' 02.34"	23° 26' 18"	14 m 15 s
14	202° 12' 07"	0.50"	200° 31' 12"	-8° 38' 27"	0.9971736	16' 02.35"	23° 26' 18"	14 m 15 s
15	202° 14' 36"	0.50"	200° 33' 32"	-8° 39' 23"	0.9971620	16' 02.36"	23° 26' 18"	14 m 16 s
16	202° 17' 04"	0.50"	200° 35' 52"	-8° 40' 18"	0.9971504	16' 02.37"	23° 26' 18"	14 m 16 s
17	202° 19' 33"	0.51"	200° 38' 11"	-8° 41' 13"	0.9971388	16' 02.38"	23° 26' 18"	14 m 17 s
18	202° 22' 02"	0.51"	200° 40' 31"	-8° 42' 09"	0.9971273	16' 02.39"	23° 26' 18"	14 m 18 s
19	202° 24' 30"	0.52"	200° 42' 50"	-8° 43' 04"	0.9971157	16' 02.41"	23° 26' 18"	14 m 18 s
20	202° 26' 59"	0.52"	200° 45' 10"	-8° 43' 59"	0.9971041	16' 02.42"	23° 26' 18"	14 m 19 s
21	202° 29' 28"	0.52"	200° 47' 30"	-8° 44' 54"	0.9970926	16' 02.43"	23° 26' 18"	14 m 19 s
22	202° 31' 56"	0.53"	200° 49' 49"	-8° 45' 50"	0.9970810	16' 02.44"	23° 26' 18"	14 m 20 s
23	202° 34' 25"	0.53"	200° 52' 09"	-8° 46' 45"	0.9970694	16' 02.45"	23° 26' 18"	14 m 20 s
24	202° 36' 54"	0.53"	200° 54' 29"	-8° 47' 40"	0.9970579	16' 02.46"	23° 26' 18"	14 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	81° 53' 11"	3° 16' 10"	80° 56' 41"	26° 27' 10"	0° 54' 44"	14' 54.90"	84° 32' 22"	0.74859
1	82° 23' 21"	3° 18' 19"	81° 30' 08"	26° 31' 10"	0° 54' 43"	14' 54.63"	84° 46' 25"	0.74509
2	82° 53' 29"	3° 20' 28"	82° 03' 35"	26° 35' 01"	0° 54' 42"	14' 54.37"	85° 0' 32"	0.74158
3	83° 23' 37"	3° 22' 35"	82° 37' 03"	26° 38' 44"	0° 54' 41"	14' 54.11"	85° 14' 42"	0.73805
4	83° 53' 44"	3° 24' 42"	83° 10' 31"	26° 42' 19"	0° 54' 40"	14' 53.85"	85° 28' 56"	0.73451
5	84° 23' 49"	3° 26' 48"	83° 44' 01"	26° 45' 47"	0° 54' 39"	14' 53.60"	85° 43' 12"	0.73096
6	84° 53' 54"	3° 28' 52"	84° 17' 31"	26° 49' 06"	0° 54' 38"	14' 53.35"	85° 57' 32"	0.72740
7	85° 23' 57"	3° 30' 56"	84° 51' 02"	26° 52' 17"	0° 54' 37"	14' 53.10"	86° 11' 54"	0.72382
8	85° 53' 60"	3° 32' 58"	85° 24' 34"	26° 55' 21"	0° 54' 37"	14' 52.86"	86° 26' 19"	0.72024
9	86° 24' 01"	3° 34' 60"	85° 58' 06"	26° 58' 16"	0° 54' 36"	14' 52.63"	86° 40' 47"	0.71664
10	86° 54' 02"	3° 37' 00"	86° 31' 38"	27° 01' 03"	0° 54' 35"	14' 52.40"	86° 55' 18"	0.71302
11	87° 24' 02"	3° 38' 59"	87° 05' 12"	27° 03' 42"	0° 54' 34"	14' 52.17"	87° 9' 51"	0.70940
12	87° 54' 01"	3° 40' 58"	87° 38' 45"	27° 06' 13"	0° 54' 33"	14' 51.95"	87° 24' 26"	0.70577
13	88° 23' 59"	3° 42' 55"	88° 12' 19"	27° 08' 37"	0° 54' 32"	14' 51.73"	87° 39' 04"	0.70212
14	88° 53' 56"	3° 44' 51"	88° 45' 53"	27° 10' 52"	0° 54' 32"	14' 51.51"	87° 53' 43"	0.69847
15	89° 23' 52"	3° 46' 46"	89° 19' 27"	27° 12' 59"	0° 54' 31"	14' 51.30"	88° 8' 25"	0.69480
16	89° 53' 47"	3° 48' 40"	89° 53' 02"	27° 14' 58"	0° 54' 30"	14' 51.10"	88° 23' 08"	0.69112
17	90° 23' 42"	3° 50' 33"	90° 26' 36"	27° 16' 48"	0° 54' 29"	14' 50.90"	88° 37' 54"	0.68744
18	90° 53' 36"	3° 52' 25"	91° 00' 11"	27° 18' 31"	0° 54' 29"	14' 50.70"	88° 52' 40"	0.68374
19	91° 23' 29"	3° 54' 15"	91° 33' 46"	27° 20' 06"	0° 54' 28"	14' 50.51"	89° 7' 29"	0.68003
20	91° 53' 21"	3° 56' 05"	92° 07' 20"	27° 21' 33"	0° 54' 27"	14' 50.32"	89° 22' 19"	0.67632
21	92° 23' 13"	3° 57' 54"	92° 40' 55"	27° 22' 51"	0° 54' 27"	14' 50.14"	89° 37' 10"	0.67259
22	92° 53' 04"	3° 59' 41"	93° 14' 29"	27° 24' 02"	0° 54' 26"	14' 49.96"	89° 52' 03"	0.66885
23	93° 22' 54"	4° 01' 27"	93° 48' 03"	27° 25' 04"	0° 54' 25"	14' 49.79"	90° 6' 56"	0.66511
24	93° 52' 44"	4° 03' 12"	94° 21' 37"	27° 25' 59"	0° 54' 25"	14' 49.62"	90° 21' 51"	0.66136

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	202° 36' 54"	0.53"	200° 54' 29"	-8° 47' 40"	0.9970579	16' 02.46"	23° 26' 18"	14 m 21 s
1	202° 39' 22"	0.54"	200° 56' 48"	-8° 48' 35"	0.9970463	16' 02.47"	23° 26' 18"	14 m 21 s
2	202° 41' 51"	0.54"	200° 59' 08"	-8° 49' 31"	0.9970348	16' 02.48"	23° 26' 18"	14 m 22 s
3	202° 44' 20"	0.54"	201° 01' 28"	-8° 50' 26"	0.9970232	16' 02.50"	23° 26' 18"	14 m 23 s
4	202° 46' 48"	0.55"	201° 03' 47"	-8° 51' 21"	0.9970116	16' 02.51"	23° 26' 18"	14 m 23 s
5	202° 49' 17"	0.55"	201° 06' 07"	-8° 52' 16"	0.9970001	16' 02.52"	23° 26' 18"	14 m 24 s
6	202° 51' 46"	0.55"	201° 08' 27"	-8° 53' 11"	0.9969885	16' 02.53"	23° 26' 18"	14 m 24 s
7	202° 54' 15"	0.56"	201° 10' 47"	-8° 54' 07"	0.9969770	16' 02.54"	23° 26' 18"	14 m 25 s
8	202° 56' 43"	0.56"	201° 13' 06"	-8° 55' 02"	0.9969655	16' 02.55"	23° 26' 18"	14 m 25 s
9	202° 59' 12"	0.56"	201° 15' 26"	-8° 55' 57"	0.9969539	16' 02.56"	23° 26' 18"	14 m 26 s
10	203° 01' 41"	0.57"	201° 17' 46"	-8° 56' 52"	0.9969424	16' 02.57"	23° 26' 18"	14 m 26 s
11	203° 04' 09"	0.57"	201° 20' 06"	-8° 57' 47"	0.9969308	16' 02.58"	23° 26' 18"	14 m 27 s
12	203° 06' 38"	0.57"	201° 22' 26"	-8° 58' 42"	0.9969193	16' 02.60"	23° 26' 18"	14 m 27 s
13	203° 09' 07"	0.58"	201° 24' 46"	-8° 59' 37"	0.9969078	16' 02.61"	23° 26' 18"	14 m 28 s
14	203° 11' 36"	0.58"	201° 27' 06"	-9° 00' 32"	0.9968962	16' 02.62"	23° 26' 18"	14 m 28 s
15	203° 14' 04"	0.58"	201° 29' 25"	-9° 01' 27"	0.9968847	16' 02.63"	23° 26' 18"	14 m 29 s
16	203° 16' 33"	0.59"	201° 31' 45"	-9° 02' 22"	0.9968732	16' 02.64"	23° 26' 18"	14 m 30 s
17	203° 19' 02"	0.59"	201° 34' 05"	-9° 03' 17"	0.9968616	16' 02.65"	23° 26' 18"	14 m 30 s
18	203° 21' 31"	0.59"	201° 36' 25"	-9° 04' 12"	0.9968501	16' 02.66"	23° 26' 18"	14 m 31 s
19	203° 23' 59"	0.59"	201° 38' 45"	-9° 05' 07"	0.9968386	16' 02.67"	23° 26' 18"	14 m 31 s
20	203° 26' 28"	0.60"	201° 41' 05"	-9° 06' 02"	0.9968271	16' 02.68"	23° 26' 18"	14 m 32 s
21	203° 28' 57"	0.60"	201° 43' 25"	-9° 06' 57"	0.9968155	16' 02.70"	23° 26' 18"	14 m 32 s
22	203° 31' 26"	0.60"	201° 45' 45"	-9° 07' 52"	0.9968040	16' 02.71"	23° 26' 18"	14 m 33 s
23	203° 33' 54"	0.61"	201° 48' 05"	-9° 08' 47"	0.9967925	16' 02.72"	23° 26' 18"	14 m 33 s
24	203° 36' 23"	0.61"	201° 50' 25"	-9° 09' 42"	0.9967810	16' 02.73"	23° 26' 18"	14 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	93° 52' 44"	4° 03' 12"	94° 21' 37"	27° 25' 59"	0° 54' 25"	14' 49.62"	90° 21' 51"	0.66136
1	94° 22' 33"	4° 04' 56"	94° 55' 10"	27° 26' 45"	0° 54' 24"	14' 49.45"	90° 36' 46"	0.65760
2	94° 52' 21"	4° 06' 39"	95° 28' 43"	27° 27' 23"	0° 54' 23"	14' 49.29"	90° 51' 43"	0.65383
3	95° 22' 09"	4° 08' 21"	96° 02' 16"	27° 27' 53"	0° 54' 23"	14' 49.14"	91° 6' 40"	0.65005
4	95° 51' 56"	4° 10' 01"	96° 35' 48"	27° 28' 16"	0° 54' 22"	14' 48.99"	91° 21' 37"	0.64627
5	96° 21' 43"	4° 11' 41"	97° 09' 19"	27° 28' 30"	0° 54' 22"	14' 48.84"	91° 36' 35"	0.64247
6	96° 51' 29"	4° 13' 19"	97° 42' 50"	27° 28' 36"	0° 54' 21"	14' 48.70"	91° 51' 34"	0.63867
7	97° 21' 14"	4° 14' 56"	98° 16' 20"	27° 28' 34"	0° 54' 21"	14' 48.56"	92° 6' 32"	0.63487
8	97° 50' 59"	4° 16' 32"	98° 49' 49"	27° 28' 24"	0° 54' 20"	14' 48.43"	92° 21' 31"	0.63105
9	98° 20' 44"	4° 18' 06"	99° 23' 18"	27° 28' 06"	0° 54' 20"	14' 48.30"	92° 36' 30"	0.62723
10	98° 50' 28"	4° 19' 40"	99° 56' 45"	27° 27' 40"	0° 54' 19"	14' 48.18"	92° 51' 29"	0.62340
11	99° 20' 12"	4° 21' 12"	100° 30' 12"	27° 27' 07"	0° 54' 19"	14' 48.07"	93° 6' 28"	0.61957
12	99° 49' 55"	4° 22' 43"	101° 03' 38"	27° 26' 25"	0° 54' 19"	14' 47.95"	93° 21' 26"	0.61572
13	100° 19' 38"	4° 24' 13"	101° 37' 02"	27° 25' 35"	0° 54' 18"	14' 47.85"	93° 36' 24"	0.61188
14	100° 49' 20"	4° 25' 42"	102° 10' 26"	27° 24' 37"	0° 54' 18"	14' 47.74"	93° 51' 22"	0.60802
15	101° 19' 03"	4° 27' 09"	102° 43' 48"	27° 23' 32"	0° 54' 17"	14' 47.64"	94° 6' 19"	0.60416
16	101° 48' 44"	4° 28' 36"	103° 17' 10"	27° 22' 18"	0° 54' 17"	14' 47.55"	94° 21' 15"	0.60030
17	102° 18' 26"	4° 30' 01"	103° 50' 29"	27° 20' 57"	0° 54' 17"	14' 47.46"	94° 36' 11"	0.59643
18	102° 48' 07"	4° 31' 25"	104° 23' 48"	27° 19' 27"	0° 54' 16"	14' 47.38"	94° 51' 06"	0.59255
19	103° 17' 48"	4° 32' 47"	104° 57' 05"	27° 17' 50"	0° 54' 16"	14' 47.30"	95° 5' 60"	0.58867
20	103° 47' 29"	4° 34' 09"	105° 30' 21"	27° 16' 05"	0° 54' 16"	14' 47.23"	95° 20' 53"	0.58479
21	104° 17' 09"	4° 35' 29"	106° 03' 36"	27° 14' 12"	0° 54' 16"	14' 47.16"	95° 35' 44"	0.58090
22	104° 46' 50"	4° 36' 48"	106° 36' 49"	27° 12' 11"	0° 54' 15"	14' 47.09"	95° 50' 35"	0.57701
23	105° 16' 30"	4° 38' 06"	107° 09' 60"	27° 10' 03"	0° 54' 15"	14' 47.04"	96° 5' 24"	0.57311
24	105° 46' 10"	4° 39' 22"	107° 43' 10"	27° 07' 46"	0° 54' 15"	14' 46.98"	96° 20' 12"	0.56921



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	203° 36' 23"	0.61"	201° 50' 25"	-9° 09' 42"	0.9967810	16' 02.73"	23° 26' 18"	14 m 34 s
1	203° 38' 52"	0.61"	201° 52' 45"	-9° 10' 37"	0.9967695	16' 02.74"	23° 26' 18"	14 m 34 s
2	203° 41' 21"	0.61"	201° 55' 05"	-9° 11' 32"	0.9967580	16' 02.75"	23° 26' 18"	14 m 35 s
3	203° 43' 49"	0.62"	201° 57' 26"	-9° 12' 27"	0.9967465	16' 02.76"	23° 26' 18"	14 m 35 s
4	203° 46' 18"	0.62"	201° 59' 46"	-9° 13' 22"	0.9967349	16' 02.77"	23° 26' 18"	14 m 36 s
5	203° 48' 47"	0.62"	202° 02' 06"	-9° 14' 17"	0.9967234	16' 02.78"	23° 26' 18"	14 m 36 s
6	203° 51' 16"	0.62"	202° 04' 26"	-9° 15' 12"	0.9967119	16' 02.80"	23° 26' 18"	14 m 37 s
7	203° 53' 45"	0.62"	202° 06' 46"	-9° 16' 06"	0.9967004	16' 02.81"	23° 26' 18"	14 m 37 s
8	203° 56' 13"	0.63"	202° 09' 06"	-9° 17' 01"	0.9966889	16' 02.82"	23° 26' 18"	14 m 38 s
9	203° 58' 42"	0.63"	202° 11' 26"	-9° 17' 56"	0.9966774	16' 02.83"	23° 26' 18"	14 m 38 s
10	204° 01' 11"	0.63"	202° 13' 47"	-9° 18' 51"	0.9966659	16' 02.84"	23° 26' 18"	14 m 39 s
11	204° 03' 40"	0.63"	202° 16' 07"	-9° 19' 46"	0.9966544	16' 02.85"	23° 26' 18"	14 m 39 s
12	204° 06' 09"	0.63"	202° 18' 27"	-9° 20' 40"	0.9966429	16' 02.86"	23° 26' 18"	14 m 40 s
13	204° 08' 38"	0.64"	202° 20' 47"	-9° 21' 35"	0.9966315	16' 02.87"	23° 26' 18"	14 m 41 s
14	204° 11' 06"	0.64"	202° 23' 08"	-9° 22' 30"	0.9966200	16' 02.88"	23° 26' 18"	14 m 41 s
15	204° 13' 35"	0.64"	202° 25' 28"	-9° 23' 25"	0.9966085	16' 02.90"	23° 26' 18"	14 m 42 s
16	204° 16' 04"	0.64"	202° 27' 48"	-9° 24' 19"	0.9965970	16' 02.91"	23° 26' 18"	14 m 42 s
17	204° 18' 33"	0.64"	202° 30' 08"	-9° 25' 14"	0.9965855	16' 02.92"	23° 26' 18"	14 m 43 s
18	204° 21' 02"	0.65"	202° 32' 29"	-9° 26' 09"	0.9965740	16' 02.93"	23° 26' 18"	14 m 43 s
19	204° 23' 31"	0.65"	202° 34' 49"	-9° 27' 03"	0.9965625	16' 02.94"	23° 26' 18"	14 m 44 s
20	204° 25' 59"	0.65"	202° 37' 10"	-9° 27' 58"	0.9965511	16' 02.95"	23° 26' 18"	14 m 44 s
21	204° 28' 28"	0.65"	202° 39' 30"	-9° 28' 53"	0.9965396	16' 02.96"	23° 26' 18"	14 m 45 s
22	204° 30' 57"	0.65"	202° 41' 50"	-9° 29' 47"	0.9965281	16' 02.97"	23° 26' 18"	14 m 45 s
23	204° 33' 26"	0.65"	202° 44' 11"	-9° 30' 42"	0.9965166	16' 02.98"	23° 26' 18"	14 m 46 s
24	204° 35' 55"	0.66"	202° 46' 31"	-9° 31' 37"	0.9965051	16' 03.00"	23° 26' 18"	14 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	105° 46' 10"	4° 39' 22"	107° 43' 10"	27° 07' 46"	0° 54' 15"	14' 46.98"	96° 20' 12"	0.56921
1	106° 15' 49"	4° 40' 37"	108° 16' 18"	27° 05' 22"	0° 54' 15"	14' 46.93"	96° 34' 58"	0.56530
2	106° 45' 29"	4° 41' 51"	108° 49' 24"	27° 02' 50"	0° 54' 15"	14' 46.89"	96° 49' 42"	0.56139
3	107° 15' 09"	4° 43' 04"	109° 22' 28"	27° 00' 11"	0° 54' 14"	14' 46.85"	97° 4' 25"	0.55748
4	107° 44' 48"	4° 44' 15"	109° 55' 31"	26° 57' 24"	0° 54' 14"	14' 46.81"	97° 19' 06"	0.55356
5	108° 14' 28"	4° 45' 25"	110° 28' 32"	26° 54' 29"	0° 54' 14"	14' 46.79"	97° 33' 46"	0.54964
6	108° 44' 07"	4° 46' 34"	111° 01' 31"	26° 51' 26"	0° 54' 14"	14' 46.76"	97° 48' 23"	0.54572
7	109° 13' 46"	4° 47' 42"	111° 34' 28"	26° 48' 16"	0° 54' 14"	14' 46.74"	98° 2' 58"	0.54180
8	109° 43' 26"	4° 48' 48"	112° 07' 23"	26° 44' 58"	0° 54' 14"	14' 46.73"	98° 17' 31"	0.53787
9	110° 13' 05"	4° 49' 53"	112° 40' 16"	26° 41' 33"	0° 54' 14"	14' 46.72"	98° 32' 02"	0.53394
10	110° 42' 44"	4° 50' 57"	113° 13' 07"	26° 37' 60"	0° 54' 14"	14' 46.71"	98° 46' 30"	0.53001
11	111° 12' 24"	4° 51' 59"	113° 45' 56"	26° 34' 19"	0° 54' 14"	14' 46.71"	99° 0' 56"	0.52608
12	111° 42' 04"	4° 53' 01"	114° 18' 43"	26° 30' 31"	0° 54' 14"	14' 46.72"	99° 15' 20"	0.52214
13	112° 11' 43"	4° 54' 00"	114° 51' 28"	26° 26' 36"	0° 54' 14"	14' 46.73"	99° 29' 41"	0.51821
14	112° 41' 23"	4° 54' 59"	115° 24' 10"	26° 22' 33"	0° 54' 14"	14' 46.75"	99° 43' 60"	0.51427
15	113° 11' 03"	4° 55' 56"	115° 56' 50"	26° 18' 23"	0° 54' 14"	14' 46.77"	99° 58' 15"	0.51033
16	113° 40' 43"	4° 56' 52"	116° 29' 28"	26° 14' 05"	0° 54' 14"	14' 46.79"	100° 12' 28"	0.50639
17	114° 10' 24"	4° 57' 47"	117° 02' 03"	26° 09' 40"	0° 54' 14"	14' 46.82"	100° 26' 38"	0.50245
18	114° 40' 04"	4° 58' 40"	117° 34' 36"	26° 05' 07"	0° 54' 15"	14' 46.86"	100° 40' 46"	0.49851
19	115° 09' 45"	4° 59' 32"	118° 07' 07"	26° 00' 27"	0° 54' 15"	14' 46.90"	100° 54' 50"	0.49457
20	115° 39' 26"	5° 00' 23"	118° 39' 35"	25° 55' 40"	0° 54' 15"	14' 46.95"	101° 8' 51"	0.49063
21	116° 09' 07"	5° 01' 12"	119° 12' 01"	25° 50' 46"	0° 54' 15"	14' 47.00"	101° 22' 49"	0.48668
22	116° 38' 49"	5° 01' 60"	119° 44' 25"	25° 45' 44"	0° 54' 15"	14' 47.05"	101° 36' 43"	0.48274
23	117° 08' 31"	5° 02' 47"	120° 16' 46"	25° 40' 35"	0° 54' 15"	14' 47.11"	101° 50' 35"	0.47880
24	117° 38' 13"	5° 03' 32"	120° 49' 04"	25° 35' 19"	0° 54' 16"	14' 47.18"	102° 4' 23"	0.47486

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	204° 35' 55"	0.66"	202° 46' 31"	-9° 31' 37"	0.9965051	16' 03.00"	23° 26' 18"	14 m 46 s
1	204° 38' 24"	0.66"	202° 48' 52"	-9° 32' 31"	0.9964937	16' 03.01"	23° 26' 18"	14 m 47 s
2	204° 40' 53"	0.66"	202° 51' 12"	-9° 33' 26"	0.9964822	16' 03.02"	23° 26' 18"	14 m 47 s
3	204° 43' 22"	0.66"	202° 53' 32"	-9° 34' 20"	0.9964707	16' 03.03"	23° 26' 18"	14 m 48 s
4	204° 45' 50"	0.66"	202° 55' 53"	-9° 35' 15"	0.9964593	16' 03.04"	23° 26' 18"	14 m 48 s
5	204° 48' 19"	0.66"	202° 58' 13"	-9° 36' 09"	0.9964478	16' 03.05"	23° 26' 18"	14 m 49 s
6	204° 50' 48"	0.66"	203° 00' 34"	-9° 37' 04"	0.9964363	16' 03.06"	23° 26' 18"	14 m 49 s
7	204° 53' 17"	0.66"	203° 02' 55"	-9° 37' 58"	0.9964249	16' 03.07"	23° 26' 18"	14 m 50 s
8	204° 55' 46"	0.66"	203° 05' 15"	-9° 38' 53"	0.9964134	16' 03.08"	23° 26' 18"	14 m 50 s
9	204° 58' 15"	0.67"	203° 07' 36"	-9° 39' 47"	0.9964019	16' 03.10"	23° 26' 18"	14 m 51 s
10	205° 00' 44"	0.67"	203° 09' 56"	-9° 40' 42"	0.9963905	16' 03.11"	23° 26' 18"	14 m 51 s
11	205° 03' 13"	0.67"	203° 12' 17"	-9° 41' 36"	0.9963790	16' 03.12"	23° 26' 18"	14 m 52 s
12	205° 05' 42"	0.67"	203° 14' 37"	-9° 42' 31"	0.9963676	16' 03.13"	23° 26' 18"	14 m 52 s
13	205° 08' 11"	0.67"	203° 16' 58"	-9° 43' 25"	0.9963561	16' 03.14"	23° 26' 18"	14 m 52 s
14	205° 10' 39"	0.67"	203° 19' 19"	-9° 44' 20"	0.9963447	16' 03.15"	23° 26' 18"	14 m 53 s
15	205° 13' 08"	0.67"	203° 21' 39"	-9° 45' 14"	0.9963332	16' 03.16"	23° 26' 18"	14 m 53 s
16	205° 15' 37"	0.67"	203° 24' 00"	-9° 46' 08"	0.9963218	16' 03.17"	23° 26' 18"	14 m 54 s
17	205° 18' 06"	0.67"	203° 26' 21"	-9° 47' 03"	0.9963103	16' 03.18"	23° 26' 18"	14 m 54 s
18	205° 20' 35"	0.67"	203° 28' 42"	-9° 47' 57"	0.9962989	16' 03.19"	23° 26' 18"	14 m 55 s
19	205° 23' 04"	0.67"	203° 31' 02"	-9° 48' 51"	0.9962874	16' 03.21"	23° 26' 18"	14 m 55 s
20	205° 25' 33"	0.67"	203° 33' 23"	-9° 49' 46"	0.9962760	16' 03.22"	23° 26' 18"	14 m 56 s
21	205° 28' 02"	0.67"	203° 35' 44"	-9° 50' 40"	0.9962645	16' 03.23"	23° 26' 18"	14 m 56 s
22	205° 30' 31"	0.67"	203° 38' 05"	-9° 51' 34"	0.9962531	16' 03.24"	23° 26' 18"	14 m 57 s
23	205° 32' 60"	0.67"	203° 40' 25"	-9° 52' 29"	0.9962416	16' 03.25"	23° 26' 18"	14 m 57 s
24	205° 35' 29"	0.67"	203° 42' 46"	-9° 53' 23"	0.9962302	16' 03.26"	23° 26' 18"	14 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	117° 38' 13"	5° 03' 32"	120° 49' 04"	25° 35' 19"	0° 54' 16"	14' 47.18"	102° 4' 23"	0.47486
1	118° 07' 56"	5° 04' 16"	121° 21' 20"	25° 29' 56"	0° 54' 16"	14' 47.25"	102° 18' 07"	0.47092
2	118° 37' 39"	5° 04' 58"	121° 53' 33"	25° 24' 26"	0° 54' 16"	14' 47.33"	102° 31' 48"	0.46698
3	119° 07' 22"	5° 05' 40"	122° 25' 44"	25° 18' 49"	0° 54' 17"	14' 47.41"	102° 45' 26"	0.46304
4	119° 37' 06"	5° 06' 20"	122° 57' 52"	25° 13' 04"	0° 54' 17"	14' 47.49"	102° 58' 60"	0.45911
5	120° 06' 50"	5° 06' 58"	123° 29' 57"	25° 07' 13"	0° 54' 17"	14' 47.58"	103° 12' 30"	0.45517
6	120° 36' 35"	5° 07' 35"	124° 01' 60"	25° 01' 15"	0° 54' 18"	14' 47.68"	103° 25' 56"	0.45124
7	121° 06' 20"	5° 08' 11"	124° 33' 60"	24° 55' 09"	0° 54' 18"	14' 47.78"	103° 39' 19"	0.44731
8	121° 36' 06"	5° 08' 45"	125° 05' 57"	24° 48' 57"	0° 54' 18"	14' 47.88"	103° 52' 37"	0.44338
9	122° 05' 52"	5° 09' 18"	125° 37' 51"	24° 42' 38"	0° 54' 19"	14' 47.99"	104° 5' 52"	0.43945
10	122° 35' 39"	5° 09' 50"	126° 09' 43"	24° 36' 12"	0° 54' 19"	14' 48.11"	104° 19' 03"	0.43553
11	123° 05' 26"	5° 10' 20"	126° 41' 32"	24° 29' 40"	0° 54' 20"	14' 48.23"	104° 32' 09"	0.43161
12	123° 35' 14"	5° 10' 49"	127° 13' 19"	24° 23' 00"	0° 54' 20"	14' 48.35"	104° 45' 12"	0.42769
13	124° 05' 03"	5° 11' 17"	127° 45' 02"	24° 16' 14"	0° 54' 20"	14' 48.48"	104° 58' 10"	0.42378
14	124° 34' 52"	5° 11' 43"	128° 16' 43"	24° 09' 21"	0° 54' 21"	14' 48.62"	105° 11' 04"	0.41986
15	125° 04' 42"	5° 12' 08"	128° 48' 21"	24° 02' 21"	0° 54' 21"	14' 48.76"	105° 23' 54"	0.41596
16	125° 34' 32"	5° 12' 31"	129° 19' 56"	23° 55' 15"	0° 54' 22"	14' 48.90"	105° 36' 40"	0.41205
17	126° 04' 24"	5° 12' 53"	129° 51' 28"	23° 48' 02"	0° 54' 23"	14' 49.05"	105° 49' 21"	0.40815
18	126° 34' 15"	5° 13' 14"	130° 22' 58"	23° 40' 43"	0° 54' 23"	14' 49.21"	106° 1' 58"	0.40425
19	127° 04' 08"	5° 13' 33"	130° 54' 24"	23° 33' 17"	0° 54' 24"	14' 49.37"	106° 14' 30"	0.40036
20	127° 34' 01"	5° 13' 50"	131° 25' 48"	23° 25' 44"	0° 54' 24"	14' 49.53"	106° 26' 58"	0.39647
21	128° 03' 55"	5° 14' 07"	131° 57' 09"	23° 18' 05"	0° 54' 25"	14' 49.70"	106° 39' 21"	0.39259
22	128° 33' 50"	5° 14' 22"	132° 28' 27"	23° 10' 20"	0° 54' 26"	14' 49.87"	106° 51' 39"	0.38871
23	129° 03' 46"	5° 14' 35"	132° 59' 43"	23° 02' 28"	0° 54' 26"	14' 50.05"	107° 3' 53"	0.38484
24	129° 33' 43"	5° 14' 47"	133° 30' 55"	22° 54' 30"	0° 54' 27"	14' 50.23"	107° 16' 02"	0.38097

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	205° 35' 29"	0.67"	203° 42' 46"	-9° 53' 23"	0.9962302	16' 03.26"	23° 26' 18"	14 m 58 s
1	205° 37' 58"	0.67"	203° 45' 07"	-9° 54' 17"	0.9962188	16' 03.27"	23° 26' 18"	14 m 58 s
2	205° 40' 27"	0.67"	203° 47' 28"	-9° 55' 11"	0.9962073	16' 03.28"	23° 26' 18"	14 m 59 s
3	205° 42' 56"	0.67"	203° 49' 49"	-9° 56' 05"	0.9961959	16' 03.29"	23° 26' 18"	14 m 59 s
4	205° 45' 25"	0.67"	203° 52' 10"	-9° 56' 60"	0.9961845	16' 03.31"	23° 26' 18"	14 m 60 s
5	205° 47' 54"	0.67"	203° 54' 31"	-9° 57' 54"	0.9961730	16' 03.32"	23° 26' 18"	15 m 00 s
6	205° 50' 23"	0.67"	203° 56' 51"	-9° 58' 48"	0.9961616	16' 03.33"	23° 26' 18"	15 m 01 s
7	205° 52' 52"	0.67"	203° 59' 12"	-9° 59' 42"	0.9961502	16' 03.34"	23° 26' 18"	15 m 01 s
8	205° 55' 21"	0.67"	204° 01' 33"	-10° 00' 36"	0.9961387	16' 03.35"	23° 26' 18"	15 m 02 s
9	205° 57' 50"	0.67"	204° 03' 54"	-10° 01' 30"	0.9961273	16' 03.36"	23° 26' 18"	15 m 02 s
10	206° 00' 19"	0.67"	204° 06' 15"	-10° 02' 25"	0.9961159	16' 03.37"	23° 26' 18"	15 m 02 s
11	206° 02' 48"	0.67"	204° 08' 36"	-10° 03' 19"	0.9961045	16' 03.38"	23° 26' 18"	15 m 03 s
12	206° 05' 17"	0.67"	204° 10' 57"	-10° 04' 13"	0.9960930	16' 03.39"	23° 26' 18"	15 m 03 s
13	206° 07' 46"	0.67"	204° 13' 18"	-10° 05' 07"	0.9960816	16' 03.41"	23° 26' 18"	15 m 04 s
14	206° 10' 15"	0.67"	204° 15' 39"	-10° 06' 01"	0.9960702	16' 03.42"	23° 26' 18"	15 m 04 s
15	206° 12' 44"	0.67"	204° 18' 01"	-10° 06' 55"	0.9960588	16' 03.43"	23° 26' 18"	15 m 05 s
16	206° 15' 13"	0.67"	204° 20' 22"	-10° 07' 49"	0.9960473	16' 03.44"	23° 26' 18"	15 m 05 s
17	206° 17' 42"	0.67"	204° 22' 43"	-10° 08' 43"	0.9960359	16' 03.45"	23° 26' 18"	15 m 06 s
18	206° 20' 11"	0.67"	204° 25' 04"	-10° 09' 37"	0.9960245	16' 03.46"	23° 26' 18"	15 m 06 s
19	206° 22' 40"	0.67"	204° 27' 25"	-10° 10' 31"	0.9960131	16' 03.47"	23° 26' 18"	15 m 07 s
20	206° 25' 09"	0.66"	204° 29' 46"	-10° 11' 25"	0.9960017	16' 03.48"	23° 26' 18"	15 m 07 s
21	206° 27' 38"	0.66"	204° 32' 07"	-10° 12' 19"	0.9959903	16' 03.49"	23° 26' 18"	15 m 08 s
22	206° 30' 07"	0.66"	204° 34' 28"	-10° 13' 13"	0.9959788	16' 03.50"	23° 26' 18"	15 m 08 s
23	206° 32' 36"	0.66"	204° 36' 50"	-10° 14' 07"	0.9959674	16' 03.52"	23° 26' 18"	15 m 08 s
24	206° 35' 05"	0.66"	204° 39' 11"	-10° 15' 00"	0.9959560	16' 03.53"	23° 26' 18"	15 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	129° 33' 43"	5° 14' 47"	133° 30' 55"	22° 54' 30"	0° 54' 27"	14' 50.23"	107° 16' 02"	0.38097
1	130° 03' 40"	5° 14' 58"	134° 02' 05"	22° 46' 26"	0° 54' 28"	14' 50.42"	107° 28' 07"	0.37711
2	130° 33' 38"	5° 15' 07"	134° 33' 12"	22° 38' 15"	0° 54' 28"	14' 50.61"	107° 40' 06"	0.37325
3	131° 03' 37"	5° 15' 15"	135° 04' 16"	22° 29' 58"	0° 54' 29"	14' 50.81"	107° 52' 01"	0.36940
4	131° 33' 37"	5° 15' 21"	135° 35' 17"	22° 21' 35"	0° 54' 30"	14' 51.01"	108° 3' 51"	0.36556
5	132° 03' 38"	5° 15' 26"	136° 06' 15"	22° 13' 06"	0° 54' 31"	14' 51.22"	108° 15' 36"	0.36172
6	132° 33' 40"	5° 15' 30"	136° 37' 11"	22° 04' 31"	0° 54' 31"	14' 51.43"	108° 27' 16"	0.35789
7	133° 03' 43"	5° 15' 32"	137° 08' 04"	21° 55' 49"	0° 54' 32"	14' 51.65"	108° 38' 51"	0.35406
8	133° 33' 47"	5° 15' 32"	137° 38' 54"	21° 47' 02"	0° 54' 33"	14' 51.87"	108° 50' 21"	0.35025
9	134° 03' 51"	5° 15' 31"	138° 09' 41"	21° 38' 08"	0° 54' 34"	14' 52.09"	109° 1' 46"	0.34643
10	134° 33' 57"	5° 15' 29"	138° 40' 25"	21° 29' 09"	0° 54' 35"	14' 52.32"	109° 13' 06"	0.34263
11	135° 04' 04"	5° 15' 25"	139° 11' 07"	21° 20' 04"	0° 54' 35"	14' 52.56"	109° 24' 21"	0.33884
12	135° 34' 12"	5° 15' 20"	139° 41' 46"	21° 10' 52"	0° 54' 36"	14' 52.79"	109° 35' 31"	0.33505
13	136° 04' 21"	5° 15' 14"	140° 12' 22"	21° 01' 35"	0° 54' 37"	14' 53.04"	109° 46' 35"	0.33127
14	136° 34' 31"	5° 15' 06"	140° 42' 56"	20° 52' 12"	0° 54' 38"	14' 53.28"	109° 57' 34"	0.32750
15	137° 04' 42"	5° 14' 56"	141° 13' 26"	20° 42' 44"	0° 54' 39"	14' 53.54"	110° 8' 28"	0.32374
16	137° 34' 54"	5° 14' 45"	141° 43' 54"	20° 33' 09"	0° 54' 40"	14' 53.79"	110° 19' 17"	0.31998
17	138° 05' 07"	5° 14' 33"	142° 14' 20"	20° 23' 29"	0° 54' 41"	14' 54.05"	110° 30' 00"	0.31624
18	138° 35' 22"	5° 14' 19"	142° 44' 43"	20° 13' 43"	0° 54' 42"	14' 54.32"	110° 40' 39"	0.31250
19	139° 05' 38"	5° 14' 03"	143° 15' 03"	20° 03' 52"	0° 54' 43"	14' 54.59"	110° 51' 11"	0.30877
20	139° 35' 55"	5° 13' 46"	143° 45' 20"	19° 53' 55"	0° 54' 44"	14' 54.86"	111° 1' 39"	0.30506
21	140° 06' 13"	5° 13' 28"	144° 15' 35"	19° 43' 53"	0° 54' 45"	14' 55.14"	111° 12' 01"	0.30135
22	140° 36' 32"	5° 13' 08"	144° 45' 48"	19° 33' 45"	0° 54' 46"	14' 55.42"	111° 22' 17"	0.29765
23	141° 06' 53"	5° 12' 47"	145° 15' 57"	19° 23' 31"	0° 54' 47"	14' 55.71"	111° 32' 29"	0.29397
24	141° 37' 14"	5° 12' 24"	145° 46' 05"	19° 13' 12"	0° 54' 48"	14' 56.00"	111° 42' 34"	0.29029

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	206° 35' 05"	0.66"	204° 39' 11"	-10° 15' 00"	0.9959560	16' 03.53"	23° 26' 18"	15 m 09 s
1	206° 37' 34"	0.66"	204° 41' 32"	-10° 15' 54"	0.9959446	16' 03.54"	23° 26' 18"	15 m 09 s
2	206° 40' 03"	0.66"	204° 43' 53"	-10° 16' 48"	0.9959332	16' 03.55"	23° 26' 18"	15 m 10 s
3	206° 42' 32"	0.66"	204° 46' 15"	-10° 17' 42"	0.9959218	16' 03.56"	23° 26' 18"	15 m 10 s
4	206° 45' 01"	0.66"	204° 48' 36"	-10° 18' 36"	0.9959104	16' 03.57"	23° 26' 18"	15 m 11 s
5	206° 47' 30"	0.65"	204° 50' 57"	-10° 19' 30"	0.9958990	16' 03.58"	23° 26' 18"	15 m 11 s
6	206° 49' 60"	0.65"	204° 53' 19"	-10° 20' 24"	0.9958876	16' 03.59"	23° 26' 18"	15 m 12 s
7	206° 52' 29"	0.65"	204° 55' 40"	-10° 21' 17"	0.9958762	16' 03.60"	23° 26' 18"	15 m 12 s
8	206° 54' 58"	0.65"	204° 58' 01"	-10° 22' 11"	0.9958648	16' 03.61"	23° 26' 18"	15 m 12 s
9	206° 57' 27"	0.65"	205° 00' 23"	-10° 23' 05"	0.9958534	16' 03.63"	23° 26' 18"	15 m 13 s
10	206° 59' 56"	0.65"	205° 02' 44"	-10° 23' 59"	0.9958420	16' 03.64"	23° 26' 18"	15 m 13 s
11	207° 02' 25"	0.64"	205° 05' 05"	-10° 24' 52"	0.9958306	16' 03.65"	23° 26' 18"	15 m 14 s
12	207° 04' 54"	0.64"	205° 07' 27"	-10° 25' 46"	0.9958192	16' 03.66"	23° 26' 18"	15 m 14 s
13	207° 07' 23"	0.64"	205° 09' 48"	-10° 26' 40"	0.9958078	16' 03.67"	23° 26' 18"	15 m 15 s
14	207° 09' 52"	0.64"	205° 12' 10"	-10° 27' 33"	0.9957964	16' 03.68"	23° 26' 18"	15 m 15 s
15	207° 12' 21"	0.64"	205° 14' 31"	-10° 28' 27"	0.9957850	16' 03.69"	23° 26' 18"	15 m 15 s
16	207° 14' 51"	0.64"	205° 16' 53"	-10° 29' 21"	0.9957736	16' 03.70"	23° 26' 18"	15 m 16 s
17	207° 17' 20"	0.63"	205° 19' 14"	-10° 30' 14"	0.9957622	16' 03.71"	23° 26' 18"	15 m 16 s
18	207° 19' 49"	0.63"	205° 21' 36"	-10° 31' 08"	0.9957508	16' 03.73"	23° 26' 18"	15 m 17 s
19	207° 22' 18"	0.63"	205° 23' 57"	-10° 32' 01"	0.9957394	16' 03.74"	23° 26' 18"	15 m 17 s
20	207° 24' 47"	0.63"	205° 26' 19"	-10° 32' 55"	0.9957280	16' 03.75"	23° 26' 18"	15 m 18 s
21	207° 27' 16"	0.62"	205° 28' 40"	-10° 33' 49"	0.9957166	16' 03.76"	23° 26' 18"	15 m 18 s
22	207° 29' 45"	0.62"	205° 31' 02"	-10° 34' 42"	0.9957052	16' 03.77"	23° 26' 18"	15 m 18 s
23	207° 32' 15"	0.62"	205° 33' 24"	-10° 35' 36"	0.9956938	16' 03.78"	23° 26' 18"	15 m 19 s
24	207° 34' 44"	0.62"	205° 35' 45"	-10° 36' 29"	0.9956825	16' 03.79"	23° 26' 18"	15 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	141° 37' 14"	5° 12' 24"	145° 46' 05"	19° 13' 12"	0° 54' 48"	14' 56.00"	111° 42' 34"	0.29029
1	142° 07' 38"	5° 12' 00"	146° 16' 10"	19° 02' 48"	0° 54' 49"	14' 56.29"	111° 52' 34"	0.28663
2	142° 38' 02"	5° 11' 34"	146° 46' 12"	18° 52' 19"	0° 54' 50"	14' 56.59"	112° 2' 29"	0.28297
3	143° 08' 28"	5° 11' 07"	147° 16' 12"	18° 41' 44"	0° 54' 51"	14' 56.90"	112° 12' 18"	0.27933
4	143° 38' 55"	5° 10' 39"	147° 46' 09"	18° 31' 04"	0° 54' 52"	14' 57.20"	112° 22' 02"	0.27570
5	144° 09' 23"	5° 10' 08"	148° 16' 04"	18° 20' 19"	0° 54' 54"	14' 57.52"	112° 31' 40"	0.27208
6	144° 39' 53"	5° 09' 37"	148° 45' 57"	18° 09' 28"	0° 54' 55"	14' 57.83"	112° 41' 12"	0.26847
7	145° 10' 24"	5° 09' 04"	149° 15' 48"	17° 58' 33"	0° 54' 56"	14' 58.15"	112° 50' 39"	0.26488
8	145° 40' 57"	5° 08' 29"	149° 45' 36"	17° 47' 32"	0° 54' 57"	14' 58.47"	113° 0' 00"	0.26129
9	146° 11' 30"	5° 07' 53"	150° 15' 22"	17° 36' 27"	0° 54' 58"	14' 58.80"	113° 9' 16"	0.25772
10	146° 42' 06"	5° 07' 16"	150° 45' 05"	17° 25' 16"	0° 54' 60"	14' 59.13"	113° 18' 26"	0.25416
11	147° 12' 43"	5° 06' 36"	151° 14' 47"	17° 14' 00"	0° 55' 01"	14' 59.47"	113° 27' 30"	0.25062
12	147° 43' 21"	5° 05' 56"	151° 44' 26"	17° 02' 40"	0° 55' 02"	14' 59.81"	113° 36' 29"	0.24709
13	148° 14' 00"	5° 05' 14"	152° 14' 03"	16° 51' 15"	0° 55' 03"	15' 00.15"	113° 45' 22"	0.24357
14	148° 44' 42"	5° 04' 30"	152° 43' 38"	16° 39' 44"	0° 55' 05"	15' 00.49"	113° 54' 09"	0.24007
15	149° 15' 24"	5° 03' 45"	153° 13' 11"	16° 28' 09"	0° 55' 06"	15' 00.84"	114° 2' 51"	0.23658
16	149° 46' 09"	5° 02' 59"	153° 42' 42"	16° 16' 30"	0° 55' 07"	15' 01.20"	114° 11' 27"	0.23310
17	150° 16' 54"	5° 02' 11"	154° 12' 11"	16° 04' 45"	0° 55' 08"	15' 01.55"	114° 19' 57"	0.22964
18	150° 47' 41"	5° 01' 21"	154° 41' 38"	15° 52' 56"	0° 55' 10"	15' 01.91"	114° 28' 21"	0.22620
19	151° 18' 30"	5° 00' 30"	155° 11' 03"	15° 41' 03"	0° 55' 11"	15' 02.28"	114° 36' 40"	0.22277
20	151° 49' 21"	4° 59' 38"	155° 40' 27"	15° 29' 04"	0° 55' 12"	15' 02.65"	114° 44' 53"	0.21935
21	152° 20' 13"	4° 58' 44"	156° 09' 48"	15° 17' 02"	0° 55' 14"	15' 03.02"	114° 53' 00"	0.21595
22	152° 51' 06"	4° 57' 48"	156° 39' 08"	15° 04' 54"	0° 55' 15"	15' 03.39"	115° 1' 02"	0.21257
23	153° 22' 01"	4° 56' 52"	157° 08' 26"	14° 52' 43"	0° 55' 17"	15' 03.77"	115° 8' 58"	0.20920
24	153° 52' 58"	4° 55' 53"	157° 37' 42"	14° 40' 27"	0° 55' 18"	15' 04.15"	115° 16' 47"	0.20585



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	207° 34' 44"	0.62"	205° 35' 45"	-10° 36' 29"	0.9956825	16' 03.79"	23° 26' 18"	15 m 19 s
1	207° 37' 13"	0.62"	205° 38' 07"	-10° 37' 23"	0.9956711	16' 03.80"	23° 26' 18"	15 m 20 s
2	207° 39' 42"	0.61"	205° 40' 29"	-10° 38' 16"	0.9956597	16' 03.81"	23° 26' 18"	15 m 20 s
3	207° 42' 11"	0.61"	205° 42' 50"	-10° 39' 10"	0.9956483	16' 03.82"	23° 26' 18"	15 m 21 s
4	207° 44' 40"	0.61"	205° 45' 12"	-10° 40' 03"	0.9956369	16' 03.84"	23° 26' 18"	15 m 21 s
5	207° 47' 09"	0.61"	205° 47' 34"	-10° 40' 57"	0.9956255	16' 03.85"	23° 26' 18"	15 m 21 s
6	207° 49' 39"	0.60"	205° 49' 55"	-10° 41' 50"	0.9956141	16' 03.86"	23° 26' 18"	15 m 22 s
7	207° 52' 08"	0.60"	205° 52' 17"	-10° 42' 43"	0.9956028	16' 03.87"	23° 26' 18"	15 m 22 s
8	207° 54' 37"	0.60"	205° 54' 39"	-10° 43' 37"	0.9955914	16' 03.88"	23° 26' 18"	15 m 23 s
9	207° 57' 06"	0.59"	205° 57' 01"	-10° 44' 30"	0.9955800	16' 03.89"	23° 26' 18"	15 m 23 s
10	207° 59' 35"	0.59"	205° 59' 23"	-10° 45' 23"	0.9955686	16' 03.90"	23° 26' 18"	15 m 23 s
11	208° 02' 05"	0.59"	206° 01' 44"	-10° 46' 17"	0.9955572	16' 03.91"	23° 26' 18"	15 m 24 s
12	208° 04' 34"	0.59"	206° 04' 06"	-10° 47' 10"	0.9955459	16' 03.92"	23° 26' 18"	15 m 24 s
13	208° 07' 03"	0.58"	206° 06' 28"	-10° 48' 03"	0.9955345	16' 03.93"	23° 26' 18"	15 m 25 s
14	208° 09' 32"	0.58"	206° 08' 50"	-10° 48' 57"	0.9955231	16' 03.95"	23° 26' 18"	15 m 25 s
15	208° 12' 01"	0.58"	206° 11' 12"	-10° 49' 50"	0.9955117	16' 03.96"	23° 26' 18"	15 m 25 s
16	208° 14' 31"	0.57"	206° 13' 34"	-10° 50' 43"	0.9955004	16' 03.97"	23° 26' 18"	15 m 26 s
17	208° 16' 60"	0.57"	206° 15' 56"	-10° 51' 36"	0.9954890	16' 03.98"	23° 26' 18"	15 m 26 s
18	208° 19' 29"	0.57"	206° 18' 18"	-10° 52' 30"	0.9954776	16' 03.99"	23° 26' 18"	15 m 27 s
19	208° 21' 58"	0.56"	206° 20' 40"	-10° 53' 23"	0.9954662	16' 04.00"	23° 26' 18"	15 m 27 s
20	208° 24' 27"	0.56"	206° 23' 02"	-10° 54' 16"	0.9954549	16' 04.01"	23° 26' 18"	15 m 27 s
21	208° 26' 57"	0.56"	206° 25' 24"	-10° 55' 09"	0.9954435	16' 04.02"	23° 26' 18"	15 m 28 s
22	208° 29' 26"	0.55"	206° 27' 46"	-10° 56' 02"	0.9954321	16' 04.03"	23° 26' 18"	15 m 28 s
23	208° 31' 55"	0.55"	206° 30' 08"	-10° 56' 56"	0.9954207	16' 04.04"	23° 26' 18"	15 m 29 s
24	208° 34' 24"	0.55"	206° 32' 30"	-10° 57' 49"	0.9954094	16' 04.06"	23° 26' 18"	15 m 29 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	153° 52' 58"	4° 55' 53"	157° 37' 42"	14° 40' 27"	0° 55' 18"	15' 04.15"	115° 16' 47"	0.20585
1	154° 23' 57"	4° 54' 53"	158° 06' 56"	14° 28' 06"	0° 55' 19"	15' 04.54"	115° 24' 32"	0.20252
2	154° 54' 57"	4° 53' 52"	158° 36' 09"	14° 15' 41"	0° 55' 21"	15' 04.92"	115° 32' 10"	0.19920
3	155° 25' 58"	4° 52' 49"	159° 05' 21"	14° 03' 12"	0° 55' 22"	15' 05.31"	115° 39' 43"	0.19590
4	155° 57' 02"	4° 51' 44"	159° 34' 31"	13° 50' 39"	0° 55' 24"	15' 05.71"	115° 47' 10"	0.19262
5	156° 28' 07"	4° 50' 38"	160° 03' 39"	13° 38' 02"	0° 55' 25"	15' 06.11"	115° 54' 31"	0.18935
6	156° 59' 14"	4° 49' 31"	160° 32' 46"	13° 25' 20"	0° 55' 27"	15' 06.51"	116° 01' 46"	0.18611
7	157° 30' 22"	4° 48' 22"	161° 01' 51"	13° 12' 34"	0° 55' 28"	15' 06.91"	116° 08' 56"	0.18288
8	158° 01' 32"	4° 47' 12"	161° 30' 56"	12° 59' 45"	0° 55' 30"	15' 07.32"	116° 15' 60"	0.17967
9	158° 32' 44"	4° 45' 60"	161° 59' 58"	12° 46' 51"	0° 55' 31"	15' 07.72"	116° 22' 58"	0.17648
10	159° 03' 58"	4° 44' 47"	162° 29' 00"	12° 33' 54"	0° 55' 33"	15' 08.14"	116° 29' 50"	0.17331
11	159° 35' 13"	4° 43' 32"	162° 58' 01"	12° 20' 52"	0° 55' 34"	15' 08.55"	116° 36' 37"	0.17015
12	160° 06' 31"	4° 42' 15"	163° 26' 60"	12° 07' 47"	0° 55' 36"	15' 08.97"	116° 43' 18"	0.16702
13	160° 37' 50"	4° 40' 58"	163° 55' 58"	11° 54' 38"	0° 55' 37"	15' 09.39"	116° 49' 53"	0.16391
14	161° 09' 10"	4° 39' 38"	164° 24' 55"	11° 41' 25"	0° 55' 39"	15' 09.81"	116° 56' 23"	0.16081
15	161° 40' 33"	4° 38' 18"	164° 53' 51"	11° 28' 08"	0° 55' 40"	15' 10.24"	117° 02' 47"	0.15774
16	162° 11' 57"	4° 36' 55"	165° 22' 46"	11° 14' 48"	0° 55' 42"	15' 10.67"	117° 09' 05"	0.15469
17	162° 43' 24"	4° 35' 32"	165° 51' 41"	11° 01' 24"	0° 55' 43"	15' 11.10"	117° 15' 17"	0.15166
18	163° 14' 52"	4° 34' 07"	166° 20' 34"	10° 47' 56"	0° 55' 45"	15' 11.53"	117° 21' 24"	0.14865
19	163° 46' 21"	4° 32' 40"	166° 49' 27"	10° 34' 25"	0° 55' 47"	15' 11.97"	117° 27' 26"	0.14566
20	164° 17' 53"	4° 31' 12"	167° 18' 19"	10° 20' 51"	0° 55' 48"	15' 12.40"	117° 33' 21"	0.14270
21	164° 49' 27"	4° 29' 42"	167° 47' 10"	10° 07' 13"	0° 55' 50"	15' 12.84"	117° 39' 11"	0.13975
22	165° 21' 02"	4° 28' 11"	168° 16' 00"	9° 53' 31"	0° 55' 52"	15' 13.29"	117° 44' 56"	0.13683
23	165° 52' 39"	4° 26' 39"	168° 44' 50"	9° 39' 47"	0° 55' 53"	15' 13.73"	117° 50' 35"	0.13393
24	166° 24' 19"	4° 25' 05"	169° 13' 40"	9° 25' 59"	0° 55' 55"	15' 14.18"	117° 56' 08"	0.13106

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	208° 34' 24"	0.55"	206° 32' 30"	-10° 57' 49"	0.9954094	16' 04.06"	23° 26' 18"	15 m 29 s
1	208° 36' 54"	0.54"	206° 34' 52"	-10° 58' 42"	0.9953980	16' 04.07"	23° 26' 18"	15 m 29 s
2	208° 39' 23"	0.54"	206° 37' 14"	-10° 59' 35"	0.9953866	16' 04.08"	23° 26' 18"	15 m 30 s
3	208° 41' 52"	0.54"	206° 39' 36"	-11° 00' 28"	0.9953753	16' 04.09"	23° 26' 18"	15 m 30 s
4	208° 44' 21"	0.53"	206° 41' 58"	-11° 01' 21"	0.9953639	16' 04.10"	23° 26' 18"	15 m 31 s
5	208° 46' 51"	0.53"	206° 44' 20"	-11° 02' 14"	0.9953525	16' 04.11"	23° 26' 18"	15 m 31 s
6	208° 49' 20"	0.53"	206° 46' 42"	-11° 03' 07"	0.9953412	16' 04.12"	23° 26' 18"	15 m 31 s
7	208° 51' 49"	0.52"	206° 49' 05"	-11° 03' 60"	0.9953298	16' 04.13"	23° 26' 18"	15 m 32 s
8	208° 54' 18"	0.52"	206° 51' 27"	-11° 04' 53"	0.9953184	16' 04.14"	23° 26' 18"	15 m 32 s
9	208° 56' 48"	0.51"	206° 53' 49"	-11° 05' 46"	0.9953071	16' 04.15"	23° 26' 18"	15 m 33 s
10	208° 59' 17"	0.51"	206° 56' 11"	-11° 06' 39"	0.9952957	16' 04.17"	23° 26' 18"	15 m 33 s
11	209° 01' 46"	0.51"	206° 58' 33"	-11° 07' 32"	0.9952843	16' 04.18"	23° 26' 18"	15 m 33 s
12	209° 04' 16"	0.50"	207° 00' 56"	-11° 08' 25"	0.9952730	16' 04.19"	23° 26' 18"	15 m 34 s
13	209° 06' 45"	0.50"	207° 03' 18"	-11° 09' 18"	0.9952616	16' 04.20"	23° 26' 18"	15 m 34 s
14	209° 09' 14"	0.49"	207° 05' 40"	-11° 10' 10"	0.9952502	16' 04.21"	23° 26' 18"	15 m 34 s
15	209° 11' 43"	0.49"	207° 08' 03"	-11° 11' 03"	0.9952389	16' 04.22"	23° 26' 18"	15 m 35 s
16	209° 14' 13"	0.49"	207° 10' 25"	-11° 11' 56"	0.9952275	16' 04.23"	23° 26' 18"	15 m 35 s
17	209° 16' 42"	0.48"	207° 12' 47"	-11° 12' 49"	0.9952162	16' 04.24"	23° 26' 18"	15 m 36 s
18	209° 19' 11"	0.48"	207° 15' 10"	-11° 13' 42"	0.9952048	16' 04.25"	23° 26' 18"	15 m 36 s
19	209° 21' 41"	0.47"	207° 17' 32"	-11° 14' 35"	0.9951934	16' 04.26"	23° 26' 18"	15 m 36 s
20	209° 24' 10"	0.47"	207° 19' 55"	-11° 15' 27"	0.9951821	16' 04.28"	23° 26' 18"	15 m 37 s
21	209° 26' 39"	0.47"	207° 22' 17"	-11° 16' 20"	0.9951707	16' 04.29"	23° 26' 18"	15 m 37 s
22	209° 29' 09"	0.46"	207° 24' 39"	-11° 17' 13"	0.9951594	16' 04.30"	23° 26' 18"	15 m 37 s
23	209° 31' 38"	0.46"	207° 27' 02"	-11° 18' 06"	0.9951480	16' 04.31"	23° 26' 18"	15 m 38 s
24	209° 34' 07"	0.45"	207° 29' 24"	-11° 18' 58"	0.9951366	16' 04.32"	23° 26' 18"	15 m 38 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	166° 24' 19"	4° 25' 05"	169° 13' 40"	9° 25' 59"	0° 55' 55"	15' 14.18"	117° 56' 08"	0.13106
1	166° 55' 60"	4° 23' 29"	169° 42' 29"	9° 12' 08"	0° 55' 56"	15' 14.63"	118° 1' 36"	0.12820
2	167° 27' 43"	4° 21' 53"	170° 11' 17"	8° 58' 13"	0° 55' 58"	15' 15.08"	118° 6' 59"	0.12537
3	167° 59' 27"	4° 20' 14"	170° 40' 05"	8° 44' 16"	0° 55' 60"	15' 15.53"	118° 12' 16"	0.12257
4	168° 31' 14"	4° 18' 35"	171° 08' 53"	8° 30' 15"	0° 56' 01"	15' 15.98"	118° 17' 28"	0.11979
5	169° 03' 03"	4° 16' 53"	171° 37' 41"	8° 16' 12"	0° 56' 03"	15' 16.44"	118° 22' 34"	0.11703
6	169° 34' 53"	4° 15' 11"	172° 06' 28"	8° 02' 05"	0° 56' 05"	15' 16.90"	118° 27' 36"	0.11430
7	170° 06' 46"	4° 13' 27"	172° 35' 16"	7° 47' 56"	0° 56' 06"	15' 17.36"	118° 32' 32"	0.11159
8	170° 38' 41"	4° 11' 41"	173° 04' 03"	7° 33' 43"	0° 56' 08"	15' 17.82"	118° 37' 22"	0.10891
9	171° 10' 37"	4° 09' 55"	173° 32' 50"	7° 19' 28"	0° 56' 10"	15' 18.28"	118° 42' 08"	0.10625
10	171° 42' 35"	4° 08' 06"	174° 01' 37"	7° 05' 10"	0° 56' 12"	15' 18.75"	118° 46' 49"	0.10362
11	172° 14' 36"	4° 06' 17"	174° 30' 25"	6° 50' 49"	0° 56' 13"	15' 19.22"	118° 51' 24"	0.10102
12	172° 46' 38"	4° 04' 25"	174° 59' 12"	6° 36' 26"	0° 56' 15"	15' 19.68"	118° 55' 55"	0.09844
13	173° 18' 42"	4° 02' 33"	175° 28' 00"	6° 21' 60"	0° 56' 17"	15' 20.15"	119° 0' 20"	0.09589
14	173° 50' 48"	4° 00' 39"	175° 56' 48"	6° 07' 31"	0° 56' 18"	15' 20.62"	119° 4' 41"	0.09337
15	174° 22' 57"	3° 58' 44"	176° 25' 36"	5° 53' 00"	0° 56' 20"	15' 21.09"	119° 8' 57"	0.09087
16	174° 55' 07"	3° 56' 47"	176° 54' 25"	5° 38' 27"	0° 56' 22"	15' 21.57"	119° 13' 09"	0.08840
17	175° 27' 19"	3° 54' 49"	177° 23' 14"	5° 23' 51"	0° 56' 24"	15' 22.04"	119° 17' 16"	0.08596
18	175° 59' 33"	3° 52' 50"	177° 52' 04"	5° 09' 13"	0° 56' 25"	15' 22.52"	119° 21' 19"	0.08354
19	176° 31' 49"	3° 50' 49"	178° 20' 54"	4° 54' 32"	0° 56' 27"	15' 22.99"	119° 25' 17"	0.08116
20	177° 04' 07"	3° 48' 47"	178° 49' 45"	4° 39' 50"	0° 56' 29"	15' 23.47"	119° 29' 11"	0.07880
21	177° 36' 28"	3° 46' 43"	179° 18' 37"	4° 25' 05"	0° 56' 31"	15' 23.95"	119° 33' 01"	0.07648
22	178° 08' 50"	3° 44' 39"	179° 47' 30"	4° 10' 18"	0° 56' 32"	15' 24.43"	119° 36' 47"	0.07418
23	178° 41' 14"	3° 42' 32"	180° 16' 23"	3° 55' 29"	0° 56' 34"	15' 24.91"	119° 40' 29"	0.07191
24	179° 13' 40"	3° 40' 25"	180° 45' 17"	3° 40' 38"	0° 56' 36"	15' 25.39"	119° 44' 07"	0.06967

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	209° 34' 07"	0.45"	207° 29' 24"	-11° 18' 58"	0.9951366	16' 04.32"	23° 26' 18"	15 m 38 s
1	209° 36' 37"	0.45"	207° 31' 47"	-11° 19' 51"	0.9951253	16' 04.33"	23° 26' 18"	15 m 38 s
2	209° 39' 06"	0.44"	207° 34' 09"	-11° 20' 44"	0.9951139	16' 04.34"	23° 26' 18"	15 m 39 s
3	209° 41' 35"	0.44"	207° 36' 32"	-11° 21' 36"	0.9951026	16' 04.35"	23° 26' 18"	15 m 39 s
4	209° 44' 05"	0.43"	207° 38' 54"	-11° 22' 29"	0.9950912	16' 04.36"	23° 26' 18"	15 m 40 s
5	209° 46' 34"	0.43"	207° 41' 17"	-11° 23' 22"	0.9950799	16' 04.37"	23° 26' 18"	15 m 40 s
6	209° 49' 03"	0.43"	207° 43' 40"	-11° 24' 14"	0.9950685	16' 04.39"	23° 26' 18"	15 m 40 s
7	209° 51' 33"	0.42"	207° 46' 02"	-11° 25' 07"	0.9950572	16' 04.40"	23° 26' 18"	15 m 41 s
8	209° 54' 02"	0.42"	207° 48' 25"	-11° 25' 59"	0.9950458	16' 04.41"	23° 26' 18"	15 m 41 s
9	209° 56' 31"	0.41"	207° 50' 48"	-11° 26' 52"	0.9950344	16' 04.42"	23° 26' 18"	15 m 41 s
10	209° 59' 01"	0.41"	207° 53' 10"	-11° 27' 44"	0.9950231	16' 04.43"	23° 26' 18"	15 m 42 s
11	210° 01' 30"	0.40"	207° 55' 33"	-11° 28' 37"	0.9950117	16' 04.44"	23° 26' 18"	15 m 42 s
12	210° 03' 60"	0.40"	207° 57' 56"	-11° 29' 29"	0.9950004	16' 04.45"	23° 26' 18"	15 m 42 s
13	210° 06' 29"	0.39"	208° 00' 18"	-11° 30' 22"	0.9949890	16' 04.46"	23° 26' 18"	15 m 43 s
14	210° 08' 58"	0.39"	208° 02' 41"	-11° 31' 14"	0.9949777	16' 04.47"	23° 26' 18"	15 m 43 s
15	210° 11' 28"	0.38"	208° 05' 04"	-11° 32' 07"	0.9949663	16' 04.48"	23° 26' 18"	15 m 43 s
16	210° 13' 57"	0.38"	208° 07' 27"	-11° 32' 59"	0.9949550	16' 04.50"	23° 26' 18"	15 m 44 s
17	210° 16' 26"	0.37"	208° 09' 49"	-11° 33' 52"	0.9949436	16' 04.51"	23° 26' 18"	15 m 44 s
18	210° 18' 56"	0.37"	208° 12' 12"	-11° 34' 44"	0.9949323	16' 04.52"	23° 26' 18"	15 m 44 s
19	210° 21' 25"	0.36"	208° 14' 35"	-11° 35' 36"	0.9949209	16' 04.53"	23° 26' 18"	15 m 45 s
20	210° 23' 55"	0.36"	208° 16' 58"	-11° 36' 29"	0.9949096	16' 04.54"	23° 26' 18"	15 m 45 s
21	210° 26' 24"	0.35"	208° 19' 21"	-11° 37' 21"	0.9948982	16' 04.55"	23° 26' 18"	15 m 46 s
22	210° 28' 54"	0.35"	208° 21' 44"	-11° 38' 13"	0.9948869	16' 04.56"	23° 26' 18"	15 m 46 s
23	210° 31' 23"	0.34"	208° 24' 06"	-11° 39' 06"	0.9948755	16' 04.57"	23° 26' 18"	15 m 46 s
24	210° 33' 52"	0.34"	208° 26' 29"	-11° 39' 58"	0.9948642	16' 04.58"	23° 26' 18"	15 m 47 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	179° 13' 40"	3° 40' 25"	180° 45' 17"	3° 40' 38"	0° 56' 36"	15' 25.39"	119° 44' 07"	0.06967
1	179° 46' 08"	3° 38' 16"	181° 14' 12"	3° 25' 45"	0° 56' 38"	15' 25.87"	119° 47' 42"	0.06746
2	180° 18' 38"	3° 36' 06"	181° 43' 08"	3° 10' 50"	0° 56' 39"	15' 26.35"	119° 51' 14"	0.06529
3	180° 51' 10"	3° 33' 55"	182° 12' 06"	2° 55' 54"	0° 56' 41"	15' 26.83"	119° 54' 43"	0.06314
4	181° 23' 45"	3° 31' 42"	182° 41' 04"	2° 40' 55"	0° 56' 43"	15' 27.32"	119° 58' 08"	0.06102
5	181° 56' 21"	3° 29' 28"	183° 10' 04"	2° 25' 55"	0° 56' 45"	15' 27.80"	120° 1' 32"	0.05894
6	182° 28' 59"	3° 27' 12"	183° 39' 05"	2° 10' 54"	0° 56' 47"	15' 28.28"	120° 4' 52"	0.05689
7	183° 01' 39"	3° 24' 56"	184° 08' 07"	1° 55' 50"	0° 56' 48"	15' 28.76"	120° 8' 11"	0.05486
8	183° 34' 22"	3° 22' 38"	184° 37' 11"	1° 40' 46"	0° 56' 50"	15' 29.25"	120° 11' 27"	0.05288
9	184° 07' 06"	3° 20' 19"	185° 06' 16"	1° 25' 39"	0° 56' 52"	15' 29.73"	120° 14' 42"	0.05092
10	184° 39' 52"	3° 17' 58"	185° 35' 22"	1° 10' 32"	0° 56' 54"	15' 30.22"	120° 17' 56"	0.04899
11	185° 12' 41"	3° 15' 37"	186° 04' 31"	0° 55' 23"	0° 56' 55"	15' 30.70"	120° 21' 09"	0.04710
12	185° 45' 31"	3° 13' 14"	186° 33' 41"	0° 40' 13"	0° 56' 57"	15' 31.18"	120° 24' 22"	0.04525
13	186° 18' 23"	3° 10' 50"	187° 02' 52"	0° 25' 02"	0° 56' 59"	15' 31.67"	120° 27' 34"	0.04342
14	186° 51' 18"	3° 08' 25"	187° 32' 06"	0° 09' 49"	0° 57' 01"	15' 32.15"	120° 30' 47"	0.04163
15	187° 24' 14"	3° 05' 58"	188° 01' 21"	0° -5' 24"	0° 57' 03"	15' 32.63"	120° 34' 01"	0.03988
16	187° 57' 12"	3° 03' 31"	188° 30' 39"	0° -20' 39"	0° 57' 04"	15' 33.12"	120° 37' 17"	0.03815
17	188° 30' 13"	3° 01' 02"	188° 59' 58"	0° -35' 54"	0° 57' 06"	15' 33.60"	120° 40' 35"	0.03647
18	189° 03' 15"	2° 58' 32"	189° 29' 20"	0° -51' 10"	0° 57' 08"	15' 34.08"	120° 43' 56"	0.03481
19	189° 36' 19"	2° 56' 01"	189° 58' 43"	-1° 06' 27"	0° 57' 10"	15' 34.56"	120° 47' 20"	0.03320
20	190° 09' 26"	2° 53' 28"	190° 28' 09"	-1° 21' 45"	0° 57' 11"	15' 35.04"	120° 50' 49"	0.03161
21	190° 42' 34"	2° 50' 55"	190° 57' 37"	-1° 37' 03"	0° 57' 13"	15' 35.52"	120° 54' 24"	0.03007
22	191° 15' 45"	2° 48' 20"	191° 27' 08"	-1° 52' 22"	0° 57' 15"	15' 36.00"	120° 58' 05"	0.02856
23	191° 48' 57"	2° 45' 44"	191° 56' 40"	-2° 07' 42"	0° 57' 17"	15' 36.48"	121° 1' 54"	0.02708
24	192° 22' 11"	2° 43' 08"	192° 26' 16"	-2° 23' 02"	0° 57' 18"	15' 36.96"	121° 5' 53"	0.02565

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	210° 33' 52"	0.34"	208° 26' 29"	-11° 39' 58"	0.9948642	16' 04.58"	23° 26' 18"	15 m 47 s
1	210° 36' 22"	0.33"	208° 28' 52"	-11° 40' 50"	0.9948528	16' 04.59"	23° 26' 18"	15 m 47 s
2	210° 38' 51"	0.33"	208° 31' 15"	-11° 41' 42"	0.9948415	16' 04.61"	23° 26' 18"	15 m 47 s
3	210° 41' 21"	0.32"	208° 33' 38"	-11° 42' 35"	0.9948301	16' 04.62"	23° 26' 18"	15 m 48 s
4	210° 43' 50"	0.32"	208° 36' 01"	-11° 43' 27"	0.9948188	16' 04.63"	23° 26' 18"	15 m 48 s
5	210° 46' 20"	0.31"	208° 38' 24"	-11° 44' 19"	0.9948074	16' 04.64"	23° 26' 18"	15 m 48 s
6	210° 48' 49"	0.31"	208° 40' 47"	-11° 45' 11"	0.9947961	16' 04.65"	23° 26' 18"	15 m 49 s
7	210° 51' 18"	0.30"	208° 43' 10"	-11° 46' 03"	0.9947847	16' 04.66"	23° 26' 18"	15 m 49 s
8	210° 53' 48"	0.30"	208° 45' 33"	-11° 46' 55"	0.9947734	16' 04.67"	23° 26' 18"	15 m 49 s
9	210° 56' 17"	0.29"	208° 47' 57"	-11° 47' 47"	0.9947620	16' 04.68"	23° 26' 18"	15 m 49 s
10	210° 58' 47"	0.29"	208° 50' 20"	-11° 48' 40"	0.9947507	16' 04.69"	23° 26' 18"	15 m 50 s
11	211° 01' 16"	0.28"	208° 52' 43"	-11° 49' 32"	0.9947393	16' 04.70"	23° 26' 18"	15 m 50 s
12	211° 03' 46"	0.27"	208° 55' 06"	-11° 50' 24"	0.9947280	16' 04.72"	23° 26' 18"	15 m 50 s
13	211° 06' 15"	0.27"	208° 57' 29"	-11° 51' 16"	0.9947167	16' 04.73"	23° 26' 18"	15 m 51 s
14	211° 08' 45"	0.26"	208° 59' 52"	-11° 52' 08"	0.9947053	16' 04.74"	23° 26' 18"	15 m 51 s
15	211° 11' 14"	0.26"	209° 02' 15"	-11° 52' 60"	0.9946940	16' 04.75"	23° 26' 18"	15 m 51 s
16	211° 13' 44"	0.25"	209° 04' 39"	-11° 53' 52"	0.9946826	16' 04.76"	23° 26' 18"	15 m 52 s
17	211° 16' 13"	0.25"	209° 07' 02"	-11° 54' 44"	0.9946713	16' 04.77"	23° 26' 18"	15 m 52 s
18	211° 18' 43"	0.24"	209° 09' 25"	-11° 55' 36"	0.9946599	16' 04.78"	23° 26' 18"	15 m 52 s
19	211° 21' 12"	0.24"	209° 11' 48"	-11° 56' 27"	0.9946486	16' 04.79"	23° 26' 18"	15 m 53 s
20	211° 23' 41"	0.23"	209° 14' 12"	-11° 57' 19"	0.9946372	16' 04.80"	23° 26' 18"	15 m 53 s
21	211° 26' 11"	0.23"	209° 16' 35"	-11° 58' 11"	0.9946259	16' 04.82"	23° 26' 18"	15 m 53 s
22	211° 28' 40"	0.22"	209° 18' 58"	-11° 59' 03"	0.9946146	16' 04.83"	23° 26' 18"	15 m 54 s
23	211° 31' 10"	0.22"	209° 21' 22"	-11° 59' 55"	0.9946032	16' 04.84"	23° 26' 18"	15 m 54 s
24	211° 33' 39"	0.21"	209° 23' 45"	-12° 00' 47"	0.9945919	16' 04.85"	23° 26' 18"	15 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	192° 22' 11"	2° 43' 08"	192° 26' 16"	-2° 23' 02"	0° 57' 18"	15' 36.96"	121° 5' 53"	0.02565
1	192° 55' 28"	2° 40' 30"	192° 55' 54"	-2° 38' 22"	0° 57' 20"	15' 37.44"	121° 10' 01"	0.02425
2	193° 28' 46"	2° 37' 51"	193° 25' 34"	-2° 53' 42"	0° 57' 22"	15' 37.91"	121° 14' 22"	0.02288
3	194° 02' 06"	2° 35' 11"	193° 55' 17"	-3° 09' 03"	0° 57' 24"	15' 38.39"	121° 18' 57"	0.02156
4	194° 35' 29"	2° 32' 30"	194° 25' 03"	-3° 24' 24"	0° 57' 25"	15' 38.86"	121° 23' 48"	0.02027
5	195° 08' 53"	2° 29' 48"	194° 54' 52"	-3° 39' 44"	0° 57' 27"	15' 39.33"	121° 28' 57"	0.01902
6	195° 42' 19"	2° 27' 04"	195° 24' 44"	-3° 55' 05"	0° 57' 29"	15' 39.80"	121° 34' 28"	0.01780
7	196° 15' 47"	2° 24' 20"	195° 54' 39"	-4° 10' 26"	0° 57' 31"	15' 40.27"	121° 40' 23"	0.01663
8	196° 49' 17"	2° 21' 35"	196° 24' 36"	-4° 25' 47"	0° 57' 32"	15' 40.74"	121° 46' 46"	0.01549
9	197° 22' 50"	2° 18' 49"	196° 54' 37"	-4° 41' 07"	0° 57' 34"	15' 41.21"	121° 53' 41"	0.01439
10	197° 56' 24"	2° 16' 02"	197° 24' 41"	-4° 56' 27"	0° 57' 36"	15' 41.68"	122° 1' 12"	0.01333
11	198° 29' 59"	2° 13' 14"	197° 54' 48"	-5° 11' 46"	0° 57' 37"	15' 42.14"	122° 9' 26"	0.01231
12	199° 03' 37"	2° 10' 25"	198° 24' 59"	-5° 27' 05"	0° 57' 39"	15' 42.60"	122° 18' 28"	0.01133
13	199° 37' 17"	2° 07' 35"	198° 55' 12"	-5° 42' 24"	0° 57' 41"	15' 43.06"	122° 28' 27"	0.01039
14	200° 10' 59"	2° 04' 44"	199° 25' 30"	-5° 57' 42"	0° 57' 42"	15' 43.52"	122° 39' 31"	0.00949
15	200° 44' 42"	2° 01' 52"	199° 55' 51"	-6° 12' 59"	0° 57' 44"	15' 43.98"	122° 51' 52"	0.00863
16	201° 18' 28"	1° 58' 60"	200° 26' 15"	-6° 28' 15"	0° 57' 46"	15' 44.43"	123° 5' 42"	0.00781
17	201° 52' 15"	1° 56' 06"	200° 56' 43"	-6° 43' 31"	0° 57' 47"	15' 44.89"	123° 21' 17"	0.00702
18	202° 26' 04"	1° 53' 12"	201° 27' 15"	-6° 58' 45"	0° 57' 49"	15' 45.34"	123° 38' 58"	0.00628
19	202° 59' 56"	1° 50' 17"	201° 57' 50"	-7° 13' 58"	0° 57' 51"	15' 45.79"	123° 59' 09"	0.00558
20	203° 33' 49"	1° 47' 21"	202° 28' 30"	-7° 29' 10"	0° 57' 52"	15' 46.24"	124° 22' 20"	0.00493
21	204° 07' 43"	1° 44' 24"	202° 59' 13"	-7° 44' 21"	0° 57' 54"	15' 46.68"	124° 49' 12"	0.00431
22	204° 41' 40"	1° 41' 26"	203° 30' 00"	-7° 59' 31"	0° 57' 56"	15' 47.12"	125° 20' 35"	0.00373
23	205° 15' 39"	1° 38' 28"	204° 00' 51"	-8° 14' 39"	0° 57' 57"	15' 47.56"	125° 57' 37"	0.00320
24	205° 49' 39"	1° 35' 29"	204° 31' 47"	-8° 29' 46"	0° 57' 59"	15' 48.00"	126° 41' 49"	0.00270

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	211° 33' 39"	0.21"	209° 23' 45"	-12° 00' 47"	0.9945919	16' 04.85"	23° 26' 18"	15 m 54 s
1	211° 36' 09"	0.20"	209° 26' 08"	-12° 01' 39"	0.9945805	16' 04.86"	23° 26' 18"	15 m 55 s
2	211° 38' 38"	0.20"	209° 28' 32"	-12° 02' 30"	0.9945692	16' 04.87"	23° 26' 18"	15 m 55 s
3	211° 41' 08"	0.19"	209° 30' 55"	-12° 03' 22"	0.9945578	16' 04.88"	23° 26' 18"	15 m 55 s
4	211° 43' 38"	0.19"	209° 33' 19"	-12° 04' 14"	0.9945465	16' 04.89"	23° 26' 18"	15 m 55 s
5	211° 46' 07"	0.18"	209° 35' 42"	-12° 05' 06"	0.9945352	16' 04.90"	23° 26' 18"	15 m 56 s
6	211° 48' 37"	0.18"	209° 38' 06"	-12° 05' 57"	0.9945238	16' 04.91"	23° 26' 18"	15 m 56 s
7	211° 51' 06"	0.17"	209° 40' 29"	-12° 06' 49"	0.9945125	16' 04.93"	23° 26' 18"	15 m 56 s
8	211° 53' 36"	0.17"	209° 42' 53"	-12° 07' 41"	0.9945011	16' 04.94"	23° 26' 18"	15 m 57 s
9	211° 56' 05"	0.16"	209° 45' 16"	-12° 08' 32"	0.9944898	16' 04.95"	23° 26' 18"	15 m 57 s
10	211° 58' 35"	0.15"	209° 47' 40"	-12° 09' 24"	0.9944785	16' 04.96"	23° 26' 18"	15 m 57 s
11	212° 01' 04"	0.15"	209° 50' 03"	-12° 10' 16"	0.9944671	16' 04.97"	23° 26' 18"	15 m 57 s
12	212° 03' 34"	0.14"	209° 52' 27"	-12° 11' 07"	0.9944558	16' 04.98"	23° 26' 18"	15 m 58 s
13	212° 06' 03"	0.14"	209° 54' 51"	-12° 11' 59"	0.9944444	16' 04.99"	23° 26' 18"	15 m 58 s
14	212° 08' 33"	0.13"	209° 57' 14"	-12° 12' 50"	0.9944331	16' 05.00"	23° 26' 18"	15 m 58 s
15	212° 11' 02"	0.13"	209° 59' 38"	-12° 13' 42"	0.9944218	16' 05.01"	23° 26' 18"	15 m 59 s
16	212° 13' 32"	0.12"	210° 02' 01"	-12° 14' 33"	0.9944104	16' 05.02"	23° 26' 18"	15 m 59 s
17	212° 16' 02"	0.11"	210° 04' 25"	-12° 15' 25"	0.9943991	16' 05.04"	23° 26' 18"	15 m 59 s
18	212° 18' 31"	0.11"	210° 06' 49"	-12° 16' 16"	0.9943877	16' 05.05"	23° 26' 18"	15 m 59 s
19	212° 21' 01"	0.10"	210° 09' 13"	-12° 17' 08"	0.9943764	16' 05.06"	23° 26' 18"	15 m 60 s
20	212° 23' 30"	0.10"	210° 11' 36"	-12° 17' 59"	0.9943651	16' 05.07"	23° 26' 18"	16 m 00 s
21	212° 25' 60"	0.09"	210° 14' 00"	-12° 18' 51"	0.9943537	16' 05.08"	23° 26' 18"	16 m 00 s
22	212° 28' 29"	0.09"	210° 16' 24"	-12° 19' 42"	0.9943424	16' 05.09"	23° 26' 18"	16 m 01 s
23	212° 30' 59"	0.08"	210° 18' 48"	-12° 20' 33"	0.9943311	16' 05.10"	23° 26' 18"	16 m 01 s
24	212° 33' 29"	0.07"	210° 21' 12"	-12° 21' 25"	0.9943197	16' 05.11"	23° 26' 18"	16 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	205° 49' 39"	1° 35' 29"	204° 31' 47"	-8° 29' 46"	0° 57' 59"	15' 48.00"	126° 41' 49"	0.00270
1	206° 23' 41"	1° 32' 29"	205° 02' 46"	-8° 44' 51"	0° 58' 01"	15' 48.44"	127° 35' 17"	0.00225
2	206° 57' 45"	1° 29' 29"	205° 33' 50"	-8° 59' 55"	0° 58' 02"	15' 48.87"	128° 40' 58"	0.00184
3	207° 31' 51"	1° 26' 27"	206° 04' 58"	-9° 14' 56"	0° 58' 04"	15' 49.30"	130° 3' 13"	0.00148
4	208° 05' 58"	1° 23' 26"	206° 36' 11"	-9° 29' 56"	0° 58' 05"	15' 49.73"	131° 48' 33"	0.00115
5	208° 40' 08"	1° 20' 23"	207° 07' 28"	-9° 44' 54"	0° 58' 07"	15' 50.16"	134° 7' 21"	0.00087
6	209° 14' 18"	1° 17' 20"	207° 38' 49"	-9° 59' 49"	0° 58' 08"	15' 50.58"	137° 16' 47"	0.00063
7	209° 48' 31"	1° 14' 16"	208° 10' 15"	-10° 14' 43"	0° 58' 10"	15' 51.00"	141° 47' 17"	0.00044
8	210° 22' 45"	1° 11' 12"	208° 41' 45"	-10° 29' 34"	0° 58' 11"	15' 51.42"	148° 35' 36"	0.00028
9	210° 57' 02"	1° 08' 06"	209° 13' 21"	-10° 44' 24"	0° 58' 13"	15' 51.83"	159° 31' 24"	0.00017
10	211° 31' 20"	1° 05' 01"	209° 45' 01"	-10° 59' 10"	0° 58' 14"	15' 52.25"	177° 41' 03"	0.00011
11	212° 05' 39"	1° 01' 55"	210° 16' 46"	-11° 13' 55"	0° 58' 16"	15' 52.65"	204° 36' 05"	0.00008
12	212° 40' 01"	0° 58' 48"	210° 48' 35"	-11° 28' 36"	0° 58' 17"	15' 53.06"	231° 59' 05"	0.00010
13	213° 14' 24"	0° 55' 41"	211° 20' 30"	-11° 43' 15"	0° 58' 19"	15' 53.46"	250° 49' 13"	0.00017
14	213° 48' 49"	0° 52' 33"	211° 52' 30"	-11° 57' 51"	0° 58' 20"	15' 53.86"	262° 9' 45"	0.00027
15	214° 23' 15"	0° 49' 25"	212° 24' 34"	-12° 12' 24"	0° 58' 22"	15' 54.26"	269° 11' 02"	0.00042
16	214° 57' 43"	0° 46' 16"	212° 56' 44"	-12° 26' 55"	0° 58' 23"	15' 54.65"	273° 48' 11"	0.00062
17	215° 32' 13"	0° 43' 07"	213° 28' 59"	-12° 41' 22"	0° 58' 25"	15' 55.04"	277° 0' 51"	0.00086
18	216° 06' 44"	0° 39' 57"	214° 01' 19"	-12° 55' 46"	0° 58' 26"	15' 55.43"	279° 20' 50"	0.00114
19	216° 41' 17"	0° 36' 47"	214° 33' 45"	-13° 10' 06"	0° 58' 28"	15' 55.81"	281° 6' 04"	0.00147
20	217° 15' 52"	0° 33' 37"	215° 06' 16"	-13° 24' 23"	0° 58' 29"	15' 56.19"	282° 27' 16"	0.00184
21	217° 50' 28"	0° 30' 26"	215° 38' 52"	-13° 38' 37"	0° 58' 30"	15' 56.57"	283° 31' 13"	0.00226
22	218° 25' 05"	0° 27' 15"	216° 11' 34"	-13° 52' 47"	0° 58' 32"	15' 56.94"	284° 22' 23"	0.00272
23	218° 59' 45"	0° 24' 04"	216° 44' 21"	-14° 06' 53"	0° 58' 33"	15' 57.31"	285° 3' 48"	0.00322
24	219° 34' 25"	0° 20' 52"	217° 17' 13"	-14° 20' 56"	0° 58' 34"	15' 57.68"	285° 37' 37"	0.00377

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	212° 33' 29"	0.07"	210° 21' 12"	-12° 21' 25"	0.9943197	16' 05.11"	23° 26' 18"	16 m 01 s
1	212° 35' 58"	0.07"	210° 23' 35"	-12° 22' 16"	0.9943084	16' 05.12"	23° 26' 18"	16 m 01 s
2	212° 38' 28"	0.06"	210° 25' 59"	-12° 23' 07"	0.9942971	16' 05.13"	23° 26' 18"	16 m 02 s
3	212° 40' 57"	0.06"	210° 28' 23"	-12° 23' 59"	0.9942857	16' 05.15"	23° 26' 18"	16 m 02 s
4	212° 43' 27"	0.05"	210° 30' 47"	-12° 24' 50"	0.9942744	16' 05.16"	23° 26' 18"	16 m 02 s
5	212° 45' 57"	0.05"	210° 33' 11"	-12° 25' 41"	0.9942631	16' 05.17"	23° 26' 18"	16 m 03 s
6	212° 48' 26"	0.04"	210° 35' 35"	-12° 26' 32"	0.9942517	16' 05.18"	23° 26' 18"	16 m 03 s
7	212° 50' 56"	0.03"	210° 37' 59"	-12° 27' 24"	0.9942404	16' 05.19"	23° 26' 18"	16 m 03 s
8	212° 53' 25"	0.03"	210° 40' 23"	-12° 28' 15"	0.9942290	16' 05.20"	23° 26' 18"	16 m 03 s
9	212° 55' 55"	0.02"	210° 42' 47"	-12° 29' 06"	0.9942177	16' 05.21"	23° 26' 18"	16 m 04 s
10	212° 58' 25"	0.02"	210° 45' 11"	-12° 29' 57"	0.9942064	16' 05.22"	23° 26' 18"	16 m 04 s
11	213° 00' 54"	0.01"	210° 47' 35"	-12° 30' 48"	0.9941951	16' 05.23"	23° 26' 18"	16 m 04 s
12	213° 03' 24"	0.01"	210° 49' 59"	-12° 31' 39"	0.9941837	16' 05.24"	23° 26' 18"	16 m 04 s
13	213° 05' 54"	0.00"	210° 52' 23"	-12° 32' 31"	0.9941724	16' 05.26"	23° 26' 18"	16 m 05 s
14	213° 08' 23"	-0.00"	210° 54' 47"	-12° 33' 22"	0.9941611	16' 05.27"	23° 26' 18"	16 m 05 s
15	213° 10' 53"	-0.01"	210° 57' 11"	-12° 34' 13"	0.9941497	16' 05.28"	23° 26' 18"	16 m 05 s
16	213° 13' 22"	-0.02"	210° 59' 35"	-12° 35' 04"	0.9941384	16' 05.29"	23° 26' 18"	16 m 05 s
17	213° 15' 52"	-0.02"	211° 01' 59"	-12° 35' 55"	0.9941271	16' 05.30"	23° 26' 18"	16 m 06 s
18	213° 18' 22"	-0.03"	211° 04' 24"	-12° 36' 46"	0.9941157	16' 05.31"	23° 26' 18"	16 m 06 s
19	213° 20' 51"	-0.03"	211° 06' 48"	-12° 37' 37"	0.9941044	16' 05.32"	23° 26' 18"	16 m 06 s
20	213° 23' 21"	-0.04"	211° 09' 12"	-12° 38' 28"	0.9940931	16' 05.33"	23° 26' 18"	16 m 06 s
21	213° 25' 51"	-0.04"	211° 11' 36"	-12° 39' 19"	0.9940818	16' 05.34"	23° 26' 18"	16 m 07 s
22	213° 28' 20"	-0.05"	211° 14' 00"	-12° 40' 10"	0.9940704	16' 05.35"	23° 26' 18"	16 m 07 s
23	213° 30' 50"	-0.05"	211° 16' 25"	-12° 41' 00"	0.9940591	16' 05.37"	23° 26' 18"	16 m 07 s
24	213° 33' 20"	-0.06"	211° 18' 49"	-12° 41' 51"	0.9940478	16' 05.38"	23° 26' 18"	16 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	219° 34' 25"	0° 20' 52"	217° 17' 13"	-14° 20' 56"	0° 58' 34"	15' 57.68"	285° 37' 37"	0.00377
1	220° 09' 08"	0° 17' 40"	217° 50' 12"	-14° 34' 55"	0° 58' 36"	15' 58.04"	286° 5' 24"	0.00437
2	220° 43' 51"	0° 14' 28"	218° 23' 15"	-14° 48' 49"	0° 58' 37"	15' 58.40"	286° 28' 16"	0.00501
3	221° 18' 37"	0° 11' 16"	218° 56' 25"	-15° 02' 40"	0° 58' 38"	15' 58.75"	286° 47' 08"	0.00569
4	221° 53' 23"	0° 08' 03"	219° 29' 40"	-15° 16' 26"	0° 58' 40"	15' 59.10"	287° 2' 38"	0.00642
5	222° 28' 12"	0° 04' 50"	220° 03' 01"	-15° 30' 08"	0° 58' 41"	15' 59.45"	287° 15' 19"	0.00719
6	223° 03' 01"	0° 01' 38"	220° 36' 28"	-15° 43' 46"	0° 58' 42"	15' 59.79"	287° 25' 35"	0.00801
7	223° 37' 52"	0° -1' 36"	221° 10' 01"	-15° 57' 19"	0° 58' 43"	16' 00.13"	287° 33' 46"	0.00887
8	224° 12' 45"	0° -4' 49"	221° 43' 39"	-16° 10' 47"	0° 58' 45"	16' 00.47"	287° 40' 10"	0.00978
9	224° 47' 39"	0° -8' 02"	222° 17' 24"	-16° 24' 10"	0° 58' 46"	16' 00.80"	287° 44' 58"	0.01073
10	225° 22' 34"	0° -11' 16"	222° 51' 14"	-16° 37' 29"	0° 58' 47"	16' 01.13"	287° 48' 23"	0.01173
11	225° 57' 31"	0° -14' 29"	223° 25' 11"	-16° 50' 43"	0° 58' 48"	16' 01.46"	287° 50' 34"	0.01277
12	226° 32' 29"	0° -17' 43"	223° 59' 13"	-17° 03' 52"	0° 58' 49"	16' 01.78"	287° 51' 37"	0.01386
13	227° 07' 28"	0° -20' 56"	224° 33' 22"	-17° 16' 55"	0° 58' 51"	16' 02.09"	287° 51' 41"	0.01499
14	227° 42' 29"	0° -24' 10"	225° 07' 36"	-17° 29' 53"	0° 58' 52"	16' 02.40"	287° 50' 50"	0.01617
15	228° 17' 30"	0° -27' 23"	225° 41' 57"	-17° 42' 46"	0° 58' 53"	16' 02.71"	287° 49' 09"	0.01739
16	228° 52' 34"	0° -30' 37"	226° 16' 24"	-17° 55' 33"	0° 58' 54"	16' 03.02"	287° 46' 43"	0.01866
17	229° 27' 38"	0° -33' 50"	226° 50' 57"	-18° 08' 15"	0° 58' 55"	16' 03.32"	287° 43' 35"	0.01997
18	230° 02' 44"	0° -37' 03"	227° 25' 36"	-18° 20' 50"	0° 58' 56"	16' 03.61"	287° 39' 48"	0.02132
19	230° 37' 51"	0° -40' 17"	228° 00' 22"	-18° 33' 20"	0° 58' 57"	16' 03.90"	287° 35' 25"	0.02272
20	231° 12' 59"	0° -43' 30"	228° 35' 14"	-18° 45' 44"	0° 58' 58"	16' 04.19"	287° 30' 29"	0.02417
21	231° 48' 09"	0° -46' 42"	229° 10' 12"	-18° 58' 02"	0° 58' 59"	16' 04.47"	287° 25' 02"	0.02566
22	232° 23' 19"	0° -49' 55"	229° 45' 16"	-19° 10' 14"	0° 59' 00"	16' 04.75"	287° 19' 05"	0.02719
23	232° 58' 31"	0° -53' 08"	230° 20' 26"	-19° 22' 20"	0° 59' 01"	16' 05.03"	287° 12' 40"	0.02877
24	233° 33' 44"	0° -56' 20"	230° 55' 43"	-19° 34' 19"	0° 59' 02"	16' 05.30"	287° 5' 49"	0.03039

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	213° 33' 20"	-0.06"	211° 18' 49"	-12° 41' 51"	0.9940478	16' 05.38"	23° 26' 18"	16 m 07 s
1	213° 35' 49"	-0.07"	211° 21' 13"	-12° 42' 42"	0.9940365	16' 05.39"	23° 26' 18"	16 m 08 s
2	213° 38' 19"	-0.07"	211° 23' 38"	-12° 43' 33"	0.9940251	16' 05.40"	23° 26' 18"	16 m 08 s
3	213° 40' 49"	-0.08"	211° 26' 02"	-12° 44' 24"	0.9940138	16' 05.41"	23° 26' 18"	16 m 08 s
4	213° 43' 18"	-0.08"	211° 28' 26"	-12° 45' 15"	0.9940025	16' 05.42"	23° 26' 18"	16 m 08 s
5	213° 45' 48"	-0.09"	211° 30' 51"	-12° 46' 05"	0.9939912	16' 05.43"	23° 26' 18"	16 m 09 s
6	213° 48' 18"	-0.09"	211° 33' 15"	-12° 46' 56"	0.9939798	16' 05.44"	23° 26' 18"	16 m 09 s
7	213° 50' 47"	-0.10"	211° 35' 39"	-12° 47' 47"	0.9939685	16' 05.45"	23° 26' 18"	16 m 09 s
8	213° 53' 17"	-0.10"	211° 38' 04"	-12° 48' 38"	0.9939572	16' 05.46"	23° 26' 17"	16 m 09 s
9	213° 55' 47"	-0.11"	211° 40' 28"	-12° 49' 28"	0.9939459	16' 05.48"	23° 26' 17"	16 m 10 s
10	213° 58' 16"	-0.11"	211° 42' 53"	-12° 50' 19"	0.9939346	16' 05.49"	23° 26' 17"	16 m 10 s
11	214° 00' 46"	-0.12"	211° 45' 17"	-12° 51' 10"	0.9939232	16' 05.50"	23° 26' 17"	16 m 10 s
12	214° 03' 16"	-0.13"	211° 47' 42"	-12° 52' 00"	0.9939119	16' 05.51"	23° 26' 17"	16 m 10 s
13	214° 05' 46"	-0.13"	211° 50' 06"	-12° 52' 51"	0.9939006	16' 05.52"	23° 26' 17"	16 m 10 s
14	214° 08' 15"	-0.14"	211° 52' 31"	-12° 53' 41"	0.9938893	16' 05.53"	23° 26' 17"	16 m 11 s
15	214° 10' 45"	-0.14"	211° 54' 55"	-12° 54' 32"	0.9938780	16' 05.54"	23° 26' 17"	16 m 11 s
16	214° 13' 15"	-0.15"	211° 57' 20"	-12° 55' 22"	0.9938666	16' 05.55"	23° 26' 17"	16 m 11 s
17	214° 15' 44"	-0.15"	211° 59' 45"	-12° 56' 13"	0.9938553	16' 05.56"	23° 26' 17"	16 m 11 s
18	214° 18' 14"	-0.16"	212° 02' 09"	-12° 57' 04"	0.9938440	16' 05.57"	23° 26' 17"	16 m 12 s
19	214° 20' 44"	-0.16"	212° 04' 34"	-12° 57' 54"	0.9938327	16' 05.59"	23° 26' 17"	16 m 12 s
20	214° 23' 14"	-0.17"	212° 06' 59"	-12° 58' 44"	0.9938214	16' 05.60"	23° 26' 17"	16 m 12 s
21	214° 25' 43"	-0.17"	212° 09' 23"	-12° 59' 35"	0.9938101	16' 05.61"	23° 26' 17"	16 m 12 s
22	214° 28' 13"	-0.18"	212° 11' 48"	-13° 00' 25"	0.9937988	16' 05.62"	23° 26' 17"	16 m 12 s
23	214° 30' 43"	-0.18"	212° 14' 13"	-13° 01' 16"	0.9937875	16' 05.63"	23° 26' 17"	16 m 13 s
24	214° 33' 13"	-0.19"	212° 16' 37"	-13° 02' 06"	0.9937761	16' 05.64"	23° 26' 17"	16 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	233° 33' 44"	0°-56' 20"	230° 55' 43"	-19° 34' 19"	0° 59' 02"	16' 05.30"	287° 5' 49"	0.03039
1	234° 08' 58"	0°-59' 32"	231° 31' 06"	-19° 46' 11"	0° 59' 03"	16' 05.56"	286° 58' 34"	0.03205
2	234° 44' 13"	-1° 02' 44"	232° 06' 36"	-19° 57' 57"	0° 59' 04"	16' 05.82"	286° 50' 55"	0.03376
3	235° 19' 29"	-1° 05' 55"	232° 42' 12"	-20° 09' 36"	0° 59' 05"	16' 06.08"	286° 42' 53"	0.03551
4	235° 54' 47"	-1° 09' 06"	233° 17' 54"	-20° 21' 09"	0° 59' 06"	16' 06.33"	286° 34' 30"	0.03731
5	236° 30' 05"	-1° 12' 17"	233° 53' 42"	-20° 32' 34"	0° 59' 07"	16' 06.58"	286° 25' 47"	0.03915
6	237° 05' 24"	-1° 15' 27"	234° 29' 37"	-20° 43' 53"	0° 59' 08"	16' 06.83"	286° 16' 44"	0.04104
7	237° 40' 45"	-1° 18' 37"	235° 05' 38"	-20° 55' 04"	0° 59' 09"	16' 07.07"	286° 7' 22"	0.04296
8	238° 16' 06"	-1° 21' 47"	235° 41' 45"	-21° 06' 08"	0° 59' 10"	16' 07.30"	285° 57' 42"	0.04493
9	238° 51' 29"	-1° 24' 56"	236° 17' 59"	-21° 17' 04"	0° 59' 11"	16' 07.53"	285° 47' 44"	0.04695
10	239° 26' 52"	-1° 28' 05"	236° 54' 19"	-21° 27' 53"	0° 59' 11"	16' 07.76"	285° 37' 30"	0.04900
11	240° 02' 17"	-1° 31' 13"	237° 30' 45"	-21° 38' 35"	0° 59' 12"	16' 07.98"	285° 26' 59"	0.05110
12	240° 37' 42"	-1° 34' 21"	238° 07' 17"	-21° 49' 08"	0° 59' 13"	16' 08.20"	285° 16' 12"	0.05324
13	241° 13' 08"	-1° 37' 28"	238° 43' 56"	-21° 59' 34"	0° 59' 14"	16' 08.41"	285° 5' 11"	0.05543
14	241° 48' 36"	-1° 40' 35"	239° 20' 40"	-22° 09' 52"	0° 59' 15"	16' 08.62"	284° 53' 54"	0.05765
15	242° 24' 04"	-1° 43' 41"	239° 57' 31"	-22° 20' 02"	0° 59' 15"	16' 08.82"	284° 42' 23"	0.05992
16	242° 59' 33"	-1° 46' 46"	240° 34' 28"	-22° 30' 04"	0° 59' 16"	16' 09.02"	284° 30' 38"	0.06223
17	243° 35' 02"	-1° 49' 51"	241° 11' 31"	-22° 39' 58"	0° 59' 17"	16' 09.22"	284° 18' 39"	0.06458
18	244° 10' 33"	-1° 52' 55"	241° 48' 41"	-22° 49' 43"	0° 59' 17"	16' 09.41"	284° 6' 27"	0.06698
19	244° 46' 04"	-1° 55' 59"	242° 25' 56"	-22° 59' 20"	0° 59' 18"	16' 09.59"	283° 54' 02"	0.06941
20	245° 21' 37"	-1° 59' 02"	243° 03' 17"	-23° 08' 48"	0° 59' 19"	16' 09.77"	283° 41' 25"	0.07189
21	245° 57' 10"	-2° 02' 04"	243° 40' 44"	-23° 18' 08"	0° 59' 19"	16' 09.95"	283° 28' 35"	0.07440
22	246° 32' 43"	-2° 05' 05"	244° 18' 17"	-23° 27' 18"	0° 59' 20"	16' 10.12"	283° 15' 33"	0.07696
23	247° 08' 18"	-2° 08' 06"	244° 55' 56"	-23° 36' 20"	0° 59' 21"	16' 10.29"	283° 2' 20"	0.07956
24	247° 43' 53"	-2° 11' 06"	245° 33' 40"	-23° 45' 13"	0° 59' 21"	16' 10.46"	282° 48' 55"	0.08219

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	214° 33' 13"	-0.19"	212° 16' 37"	-13° 02' 06"	0.9937761	16' 05.64"	23° 26' 17"	16 m 13 s
1	214° 35' 42"	-0.19"	212° 19' 02"	-13° 02' 56"	0.9937648	16' 05.65"	23° 26' 17"	16 m 13 s
2	214° 38' 12"	-0.20"	212° 21' 27"	-13° 03' 47"	0.9937535	16' 05.66"	23° 26' 17"	16 m 13 s
3	214° 40' 42"	-0.20"	212° 23' 52"	-13° 04' 37"	0.9937422	16' 05.67"	23° 26' 17"	16 m 13 s
4	214° 43' 12"	-0.21"	212° 26' 17"	-13° 05' 27"	0.9937309	16' 05.68"	23° 26' 17"	16 m 14 s
5	214° 45' 41"	-0.21"	212° 28' 41"	-13° 06' 18"	0.9937196	16' 05.69"	23° 26' 17"	16 m 14 s
6	214° 48' 11"	-0.22"	212° 31' 06"	-13° 07' 08"	0.9937083	16' 05.71"	23° 26' 17"	16 m 14 s
7	214° 50' 41"	-0.22"	212° 33' 31"	-13° 07' 58"	0.9936970	16' 05.72"	23° 26' 17"	16 m 14 s
8	214° 53' 11"	-0.23"	212° 35' 56"	-13° 08' 48"	0.9936857	16' 05.73"	23° 26' 17"	16 m 15 s
9	214° 55' 40"	-0.23"	212° 38' 21"	-13° 09' 38"	0.9936744	16' 05.74"	23° 26' 17"	16 m 15 s
10	214° 58' 10"	-0.24"	212° 40' 46"	-13° 10' 29"	0.9936631	16' 05.75"	23° 26' 17"	16 m 15 s
11	215° 00' 40"	-0.24"	212° 43' 11"	-13° 11' 19"	0.9936518	16' 05.76"	23° 26' 17"	16 m 15 s
12	215° 03' 10"	-0.25"	212° 45' 36"	-13° 12' 09"	0.9936405	16' 05.77"	23° 26' 17"	16 m 15 s
13	215° 05' 39"	-0.25"	212° 48' 01"	-13° 12' 59"	0.9936292	16' 05.78"	23° 26' 17"	16 m 15 s
14	215° 08' 09"	-0.26"	212° 50' 26"	-13° 13' 49"	0.9936179	16' 05.79"	23° 26' 17"	16 m 16 s
15	215° 10' 39"	-0.26"	212° 52' 51"	-13° 14' 39"	0.9936066	16' 05.80"	23° 26' 17"	16 m 16 s
16	215° 13' 09"	-0.27"	212° 55' 16"	-13° 15' 29"	0.9935953	16' 05.82"	23° 26' 17"	16 m 16 s
17	215° 15' 39"	-0.27"	212° 57' 41"	-13° 16' 19"	0.9935840	16' 05.83"	23° 26' 17"	16 m 16 s
18	215° 18' 08"	-0.28"	213° 00' 06"	-13° 17' 09"	0.9935728	16' 05.84"	23° 26' 17"	16 m 16 s
19	215° 20' 38"	-0.28"	213° 02' 31"	-13° 17' 59"	0.9935615	16' 05.85"	23° 26' 17"	16 m 17 s
20	215° 23' 08"	-0.28"	213° 04' 56"	-13° 18' 49"	0.9935502	16' 05.86"	23° 26' 17"	16 m 17 s
21	215° 25' 38"	-0.29"	213° 07' 21"	-13° 19' 39"	0.9935389	16' 05.87"	23° 26' 17"	16 m 17 s
22	215° 28' 08"	-0.29"	213° 09' 47"	-13° 20' 29"	0.9935276	16' 05.88"	23° 26' 17"	16 m 17 s
23	215° 30' 37"	-0.30"	213° 12' 12"	-13° 21' 19"	0.9935163	16' 05.89"	23° 26' 17"	16 m 17 s
24	215° 33' 07"	-0.30"	213° 14' 37"	-13° 22' 09"	0.9935050	16' 05.90"	23° 26' 17"	16 m 18 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	247° 43' 53"	-2° 11' 06"	245° 33' 40"	-23° 45' 13"	0° 59' 21"	16' 10.46"	282° 48' 55"	0.08219
1	248° 19' 29"	-2° 14' 05"	246° 11' 30"	-23° 53' 57"	0° 59' 22"	16' 10.62"	282° 35' 19"	0.08487
2	248° 55' 05"	-2° 17' 04"	246° 49' 26"	-24° 02' 32"	0° 59' 22"	16' 10.77"	282° 21' 32"	0.08759
3	249° 30' 43"	-2° 20' 01"	247° 27' 28"	-24° 10' 58"	0° 59' 23"	16' 10.92"	282° 7' 35"	0.09034
4	250° 06' 21"	-2° 22' 58"	248° 05' 35"	-24° 19' 14"	0° 59' 24"	16' 11.07"	281° 53' 27"	0.09314
5	250° 41' 59"	-2° 25' 53"	248° 43' 47"	-24° 27' 21"	0° 59' 24"	16' 11.21"	281° 39' 10"	0.09597
6	251° 17' 38"	-2° 28' 48"	249° 22' 05"	-24° 35' 18"	0° 59' 25"	16' 11.34"	281° 24' 42"	0.09885
7	251° 53' 18"	-2° 31' 42"	250° 00' 28"	-24° 43' 06"	0° 59' 25"	16' 11.48"	281° 10' 05"	0.10176
8	252° 28' 58"	-2° 34' 35"	250° 38' 56"	-24° 50' 44"	0° 59' 26"	16' 11.60"	280° 55' 18"	0.10471
9	253° 04' 39"	-2° 37' 27"	251° 17' 30"	-24° 58' 12"	0° 59' 26"	16' 11.73"	280° 40' 22"	0.10769
10	253° 40' 21"	-2° 40' 18"	251° 56' 08"	-25° 05' 31"	0° 59' 26"	16' 11.85"	280° 25' 18"	0.11072
11	254° 16' 03"	-2° 43' 09"	252° 34' 51"	-25° 12' 39"	0° 59' 27"	16' 11.96"	280° 10' 04"	0.11378
12	254° 51' 45"	-2° 45' 58"	253° 13' 40"	-25° 19' 38"	0° 59' 27"	16' 12.07"	279° 54' 42"	0.11688
13	255° 27' 28"	-2° 48' 46"	253° 52' 33"	-25° 26' 26"	0° 59' 28"	16' 12.18"	279° 39' 12"	0.12001
14	256° 03' 11"	-2° 51' 32"	254° 31' 30"	-25° 33' 04"	0° 59' 28"	16' 12.28"	279° 23' 34"	0.12318
15	256° 38' 55"	-2° 54' 18"	255° 10' 33"	-25° 39' 32"	0° 59' 28"	16' 12.38"	279° 7' 47"	0.12639
16	257° 14' 40"	-2° 57' 03"	255° 49' 39"	-25° 45' 49"	0° 59' 29"	16' 12.47"	278° 51' 54"	0.12963
17	257° 50' 24"	-2° 59' 47"	256° 28' 51"	-25° 51' 56"	0° 59' 29"	16' 12.56"	278° 35' 52"	0.13291
18	258° 26' 09"	-3° 02' 29"	257° 08' 06"	-25° 57' 53"	0° 59' 29"	16' 12.65"	278° 19' 44"	0.13622
19	259° 01' 55"	-3° 05' 10"	257° 47' 25"	-26° 03' 39"	0° 59' 30"	16' 12.73"	278° 3' 28"	0.13957
20	259° 37' 41"	-3° 07' 51"	258° 26' 49"	-26° 09' 14"	0° 59' 30"	16' 12.80"	277° 47' 06"	0.14295
21	260° 13' 27"	-3° 10' 30"	259° 06' 16"	-26° 14' 39"	0° 59' 30"	16' 12.87"	277° 30' 37"	0.14637
22	260° 49' 13"	-3° 13' 07"	259° 45' 47"	-26° 19' 52"	0° 59' 30"	16' 12.94"	277° 14' 02"	0.14981
23	261° 25' 00"	-3° 15' 44"	260° 25' 22"	-26° 24' 55"	0° 59' 31"	16' 13.01"	276° 57' 20"	0.15330
24	262° 00' 47"	-3° 18' 19"	261° 05' 01"	-26° 29' 48"	0° 59' 31"	16' 13.07"	276° 40' 33"	0.15681

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	215° 33' 07"	-0.30"	213° 14' 37"	-13° 22' 09"	0.9935050	16' 05.90"	23° 26' 17"	16 m 18 s
1	215° 35' 37"	-0.31"	213° 17' 02"	-13° 22' 58"	0.9934938	16' 05.91"	23° 26' 17"	16 m 18 s
2	215° 38' 07"	-0.31"	213° 19' 27"	-13° 23' 48"	0.9934825	16' 05.93"	23° 26' 17"	16 m 18 s
3	215° 40' 37"	-0.32"	213° 21' 53"	-13° 24' 38"	0.9934712	16' 05.94"	23° 26' 17"	16 m 18 s
4	215° 43' 06"	-0.32"	213° 24' 18"	-13° 25' 28"	0.9934599	16' 05.95"	23° 26' 17"	16 m 18 s
5	215° 45' 36"	-0.32"	213° 26' 43"	-13° 26' 17"	0.9934487	16' 05.96"	23° 26' 17"	16 m 18 s
6	215° 48' 06"	-0.33"	213° 29' 09"	-13° 27' 07"	0.9934374	16' 05.97"	23° 26' 17"	16 m 19 s
7	215° 50' 36"	-0.33"	213° 31' 34"	-13° 27' 57"	0.9934261	16' 05.98"	23° 26' 17"	16 m 19 s
8	215° 53' 06"	-0.34"	213° 33' 59"	-13° 28' 47"	0.9934148	16' 05.99"	23° 26' 17"	16 m 19 s
9	215° 55' 36"	-0.34"	213° 36' 25"	-13° 29' 36"	0.9934036	16' 06.00"	23° 26' 17"	16 m 19 s
10	215° 58' 06"	-0.34"	213° 38' 50"	-13° 30' 26"	0.9933923	16' 06.01"	23° 26' 17"	16 m 19 s
11	216° 00' 35"	-0.35"	213° 41' 16"	-13° 31' 15"	0.9933810	16' 06.02"	23° 26' 17"	16 m 19 s
12	216° 03' 05"	-0.35"	213° 43' 41"	-13° 32' 05"	0.9933698	16' 06.04"	23° 26' 17"	16 m 20 s
13	216° 05' 35"	-0.36"	213° 46' 07"	-13° 32' 55"	0.9933585	16' 06.05"	23° 26' 17"	16 m 20 s
14	216° 08' 05"	-0.36"	213° 48' 32"	-13° 33' 44"	0.9933472	16' 06.06"	23° 26' 17"	16 m 20 s
15	216° 10' 35"	-0.36"	213° 50' 58"	-13° 34' 34"	0.9933360	16' 06.07"	23° 26' 17"	16 m 20 s
16	216° 13' 05"	-0.37"	213° 53' 23"	-13° 35' 23"	0.9933247	16' 06.08"	23° 26' 17"	16 m 20 s
17	216° 15' 34"	-0.37"	213° 55' 49"	-13° 36' 13"	0.9933135	16' 06.09"	23° 26' 17"	16 m 20 s
18	216° 18' 04"	-0.38"	213° 58' 14"	-13° 37' 02"	0.9933022	16' 06.10"	23° 26' 17"	16 m 21 s
19	216° 20' 34"	-0.38"	214° 00' 40"	-13° 37' 52"	0.9932910	16' 06.11"	23° 26' 17"	16 m 21 s
20	216° 23' 04"	-0.38"	214° 03' 05"	-13° 38' 41"	0.9932797	16' 06.12"	23° 26' 17"	16 m 21 s
21	216° 25' 34"	-0.39"	214° 05' 31"	-13° 39' 30"	0.9932685	16' 06.13"	23° 26' 17"	16 m 21 s
22	216° 28' 04"	-0.39"	214° 07' 57"	-13° 40' 20"	0.9932572	16' 06.14"	23° 26' 17"	16 m 21 s
23	216° 30' 34"	-0.39"	214° 10' 22"	-13° 41' 09"	0.9932460	16' 06.16"	23° 26' 17"	16 m 21 s
24	216° 33' 04"	-0.40"	214° 12' 48"	-13° 41' 58"	0.9932347	16' 06.17"	23° 26' 17"	16 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	262° 00' 47"	-3° 18' 19"	261° 05' 01"	-26° 29' 48"	0° 59' 31"	16' 13.07"	276° 40' 33"	0.15681
1	262° 36' 35"	-3° 20' 53"	261° 44' 42"	-26° 34' 29"	0° 59' 31"	16' 13.12"	276° 23' 40"	0.16036
2	263° 12' 22"	-3° 23' 25"	262° 24' 27"	-26° 38' 59"	0° 59' 31"	16' 13.17"	276° 6' 41"	0.16394
3	263° 48' 10"	-3° 25' 57"	263° 04' 15"	-26° 43' 18"	0° 59' 31"	16' 13.22"	275° 49' 37"	0.16755
4	264° 23' 58"	-3° 28' 27"	263° 44' 07"	-26° 47' 26"	0° 59' 32"	16' 13.26"	275° 32' 28"	0.17119
5	264° 59' 47"	-3° 30' 55"	264° 24' 01"	-26° 51' 23"	0° 59' 32"	16' 13.30"	275° 15' 14"	0.17487
6	265° 35' 35"	-3° 33' 23"	265° 03' 57"	-26° 55' 08"	0° 59' 32"	16' 13.34"	274° 57' 55"	0.17857
7	266° 11' 24"	-3° 35' 49"	265° 43' 57"	-26° 58' 43"	0° 59' 32"	16' 13.37"	274° 40' 32"	0.18231
8	266° 47' 13"	-3° 38' 13"	266° 23' 58"	-27° 02' 06"	0° 59' 32"	16' 13.40"	274° 23' 04"	0.18607
9	267° 23' 02"	-3° 40' 36"	267° 04' 02"	-27° 05' 18"	0° 59' 32"	16' 13.42"	274° 5' 32"	0.18986
10	267° 58' 51"	-3° 42' 58"	267° 44' 09"	-27° 08' 18"	0° 59' 32"	16' 13.44"	273° 47' 57"	0.19369
11	268° 34' 40"	-3° 45' 18"	268° 24' 17"	-27° 11' 07"	0° 59' 32"	16' 13.45"	273° 30' 18"	0.19754
12	269° 10' 30"	-3° 47' 37"	269° 04' 27"	-27° 13' 44"	0° 59' 32"	16' 13.47"	273° 12' 35"	0.20142
13	269° 46' 19"	-3° 49' 54"	269° 44' 38"	-27° 16' 10"	0° 59' 32"	16' 13.47"	272° 54' 50"	0.20533
14	270° 22' 09"	-3° 52' 10"	270° 24' 52"	-27° 18' 25"	0° 59' 32"	16' 13.48"	272° 37' 01"	0.20926
15	270° 57' 58"	-3° 54' 24"	271° 05' 06"	-27° 20' 28"	0° 59' 32"	16' 13.48"	272° 19' 10"	0.21322
16	271° 33' 48"	-3° 56' 36"	271° 45' 22"	-27° 22' 19"	0° 59' 32"	16' 13.48"	272° 1' 16"	0.21721
17	272° 09' 37"	-3° 58' 48"	272° 25' 39"	-27° 23' 59"	0° 59' 32"	16' 13.47"	271° 43' 19"	0.22123
18	272° 45' 27"	-4° 00' 57"	273° 05' 57"	-27° 25' 28"	0° 59' 32"	16' 13.46"	271° 25' 21"	0.22527
19	273° 21' 16"	-4° 03' 05"	273° 46' 16"	-27° 26' 44"	0° 59' 32"	16' 13.44"	271° 7' 21"	0.22934
20	273° 57' 06"	-4° 05' 12"	274° 26' 35"	-27° 27' 50"	0° 59' 32"	16' 13.43"	270° 49' 18"	0.23343
21	274° 32' 55"	-4° 07' 16"	275° 06' 55"	-27° 28' 43"	0° 59' 32"	16' 13.40"	270° 31' 15"	0.23754
22	275° 08' 45"	-4° 09' 19"	275° 47' 15"	-27° 29' 25"	0° 59' 32"	16' 13.38"	270° 13' 10"	0.24168
23	275° 44' 34"	-4° 11' 21"	276° 27' 35"	-27° 29' 55"	0° 59' 32"	16' 13.35"	269° 55' 04"	0.24585
24	276° 20' 23"	-4° 13' 21"	277° 07' 56"	-27° 30' 14"	0° 59' 32"	16' 13.32"	269° 36' 57"	0.25003

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	216° 33' 04"	-0.40"	214° 12' 48"	-13° 41' 58"	0.9932347	16' 06.17"	23° 26' 17"	16 m 21 s
1	216° 35' 33"	-0.40"	214° 15' 14"	-13° 42' 48"	0.9932235	16' 06.18"	23° 26' 17"	16 m 22 s
2	216° 38' 03"	-0.40"	214° 17' 39"	-13° 43' 37"	0.9932123	16' 06.19"	23° 26' 17"	16 m 22 s
3	216° 40' 33"	-0.41"	214° 20' 05"	-13° 44' 26"	0.9932010	16' 06.20"	23° 26' 17"	16 m 22 s
4	216° 43' 03"	-0.41"	214° 22' 31"	-13° 45' 15"	0.9931898	16' 06.21"	23° 26' 17"	16 m 22 s
5	216° 45' 33"	-0.41"	214° 24' 57"	-13° 46' 05"	0.9931786	16' 06.22"	23° 26' 17"	16 m 22 s
6	216° 48' 03"	-0.42"	214° 27' 22"	-13° 46' 54"	0.9931673	16' 06.23"	23° 26' 17"	16 m 22 s
7	216° 50' 33"	-0.42"	214° 29' 48"	-13° 47' 43"	0.9931561	16' 06.24"	23° 26' 17"	16 m 22 s
8	216° 53' 03"	-0.42"	214° 32' 14"	-13° 48' 32"	0.9931449	16' 06.25"	23° 26' 17"	16 m 23 s
9	216° 55' 33"	-0.43"	214° 34' 40"	-13° 49' 21"	0.9931337	16' 06.26"	23° 26' 17"	16 m 23 s
10	216° 58' 03"	-0.43"	214° 37' 06"	-13° 50' 10"	0.9931224	16' 06.28"	23° 26' 17"	16 m 23 s
11	217° 00' 32"	-0.43"	214° 39' 32"	-13° 50' 59"	0.9931112	16' 06.29"	23° 26' 17"	16 m 23 s
12	217° 03' 02"	-0.44"	214° 41' 58"	-13° 51' 48"	0.9931000	16' 06.30"	23° 26' 17"	16 m 23 s
13	217° 05' 32"	-0.44"	214° 44' 24"	-13° 52' 37"	0.9930888	16' 06.31"	23° 26' 17"	16 m 23 s
14	217° 08' 02"	-0.44"	214° 46' 50"	-13° 53' 26"	0.9930776	16' 06.32"	23° 26' 17"	16 m 23 s
15	217° 10' 32"	-0.44"	214° 49' 16"	-13° 54' 15"	0.9930664	16' 06.33"	23° 26' 17"	16 m 24 s
16	217° 13' 02"	-0.45"	214° 51' 42"	-13° 55' 04"	0.9930552	16' 06.34"	23° 26' 17"	16 m 24 s
17	217° 15' 32"	-0.45"	214° 54' 08"	-13° 55' 53"	0.9930440	16' 06.35"	23° 26' 17"	16 m 24 s
18	217° 18' 02"	-0.45"	214° 56' 34"	-13° 56' 42"	0.9930328	16' 06.36"	23° 26' 17"	16 m 24 s
19	217° 20' 32"	-0.46"	214° 58' 60"	-13° 57' 31"	0.9930216	16' 06.37"	23° 26' 17"	16 m 24 s
20	217° 23' 02"	-0.46"	215° 01' 26"	-13° 58' 20"	0.9930104	16' 06.38"	23° 26' 17"	16 m 24 s
21	217° 25' 32"	-0.46"	215° 03' 52"	-13° 59' 09"	0.9929992	16' 06.40"	23° 26' 17"	16 m 24 s
22	217° 28' 02"	-0.46"	215° 06' 18"	-13° 59' 58"	0.9929880	16' 06.41"	23° 26' 17"	16 m 24 s
23	217° 30' 32"	-0.47"	215° 08' 44"	-14° 00' 46"	0.9929768	16' 06.42"	23° 26' 17"	16 m 25 s
24	217° 33' 02"	-0.47"	215° 11' 10"	-14° 01' 35"	0.9929656	16' 06.43"	23° 26' 17"	16 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	276° 20' 23"	-4° 13' 21"	277° 07' 56"	-27° 30' 14"	0° 59' 32"	16' 13.32"	269° 36' 57"	0.25003
1	276° 56' 12"	-4° 15' 19"	277° 48' 16"	-27° 30' 21"	0° 59' 32"	16' 13.28"	269° 18' 50"	0.25424
2	277° 32' 01"	-4° 17' 16"	278° 28' 35"	-27° 30' 16"	0° 59' 32"	16' 13.24"	269° 0' 42"	0.25847
3	278° 07' 50"	-4° 19' 11"	279° 08' 55"	-27° 29' 60"	0° 59' 31"	16' 13.20"	268° 42' 34"	0.26273
4	278° 43' 39"	-4° 21' 04"	279° 49' 13"	-27° 29' 32"	0° 59' 31"	16' 13.16"	268° 24' 26"	0.26700
5	279° 19' 28"	-4° 22' 55"	280° 29' 31"	-27° 28' 53"	0° 59' 31"	16' 13.11"	268° 6' 18"	0.27130
6	279° 55' 16"	-4° 24' 45"	281° 09' 48"	-27° 28' 01"	0° 59' 31"	16' 13.06"	267° 48' 11"	0.27562
7	280° 31' 04"	-4° 26' 33"	281° 50' 04"	-27° 26' 59"	0° 59' 31"	16' 13.00"	267° 30' 04"	0.27996
8	281° 06' 52"	-4° 28' 19"	282° 30' 18"	-27° 25' 45"	0° 59' 30"	16' 12.94"	267° 11' 58"	0.28431
9	281° 42' 40"	-4° 30' 04"	283° 10' 31"	-27° 24' 19"	0° 59' 30"	16' 12.88"	266° 53' 53"	0.28869
10	282° 18' 28"	-4° 31' 47"	283° 50' 43"	-27° 22' 42"	0° 59' 30"	16' 12.81"	266° 35' 49"	0.29308
11	282° 54' 15"	-4° 33' 28"	284° 30' 52"	-27° 20' 53"	0° 59' 30"	16' 12.75"	266° 17' 46"	0.29750
12	283° 30' 02"	-4° 35' 07"	285° 11' 00"	-27° 18' 53"	0° 59' 29"	16' 12.67"	265° 59' 45"	0.30193
13	284° 05' 49"	-4° 36' 44"	285° 51' 06"	-27° 16' 41"	0° 59' 29"	16' 12.60"	265° 41' 46"	0.30638
14	284° 41' 35"	-4° 38' 20"	286° 31' 10"	-27° 14' 18"	0° 59' 29"	16' 12.52"	265° 23' 49"	0.31084
15	285° 17' 21"	-4° 39' 54"	287° 11' 11"	-27° 11' 44"	0° 59' 29"	16' 12.44"	265° 5' 55"	0.31533
16	285° 53' 07"	-4° 41' 26"	287° 51' 10"	-27° 08' 58"	0° 59' 28"	16' 12.36"	264° 48' 02"	0.31983
17	286° 28' 52"	-4° 42' 56"	288° 31' 07"	-27° 06' 01"	0° 59' 28"	16' 12.27"	264° 30' 12"	0.32434
18	287° 04' 38"	-4° 44' 24"	289° 11' 00"	-27° 02' 53"	0° 59' 28"	16' 12.18"	264° 12' 25"	0.32887
19	287° 40' 22"	-4° 45' 50"	289° 50' 51"	-26° 59' 34"	0° 59' 27"	16' 12.09"	263° 54' 41"	0.33341
20	288° 16' 07"	-4° 47' 15"	290° 30' 39"	-26° 56' 03"	0° 59' 27"	16' 12.00"	263° 37' 00"	0.33797
21	288° 51' 51"	-4° 48' 37"	291° 10' 24"	-26° 52' 21"	0° 59' 27"	16' 11.90"	263° 19' 22"	0.34254
22	289° 27' 35"	-4° 49' 58"	291° 50' 05"	-26° 48' 29"	0° 59' 26"	16' 11.80"	263° 1' 48"	0.34713
23	290° 03' 18"	-4° 51' 17"	292° 29' 43"	-26° 44' 25"	0° 59' 26"	16' 11.69"	262° 44' 18"	0.35173
24	290° 39' 01"	-4° 52' 34"	293° 09' 18"	-26° 40' 11"	0° 59' 25"	16' 11.59"	262° 26' 51"	0.35634



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	217° 33' 02"	-0.47"	215° 11' 10"	-14° 01' 35"	0.9929656	16' 06.43"	23° 26' 17"	16 m 25 s
1	217° 35' 32"	-0.47"	215° 13' 36"	-14° 02' 24"	0.9929544	16' 06.44"	23° 26' 17"	16 m 25 s
2	217° 38' 01"	-0.47"	215° 16' 03"	-14° 03' 13"	0.9929432	16' 06.45"	23° 26' 17"	16 m 25 s
3	217° 40' 31"	-0.47"	215° 18' 29"	-14° 04' 01"	0.9929321	16' 06.46"	23° 26' 17"	16 m 25 s
4	217° 43' 01"	-0.48"	215° 20' 55"	-14° 04' 50"	0.9929209	16' 06.47"	23° 26' 17"	16 m 25 s
5	217° 45' 31"	-0.48"	215° 23' 21"	-14° 05' 39"	0.9929097	16' 06.48"	23° 26' 17"	16 m 25 s
6	217° 48' 01"	-0.48"	215° 25' 48"	-14° 06' 27"	0.9928985	16' 06.49"	23° 26' 17"	16 m 25 s
7	217° 50' 31"	-0.48"	215° 28' 14"	-14° 07' 16"	0.9928874	16' 06.50"	23° 26' 17"	16 m 25 s
8	217° 53' 01"	-0.48"	215° 30' 40"	-14° 08' 04"	0.9928762	16' 06.52"	23° 26' 17"	16 m 25 s
9	217° 55' 31"	-0.49"	215° 33' 07"	-14° 08' 53"	0.9928651	16' 06.53"	23° 26' 17"	16 m 26 s
10	217° 58' 01"	-0.49"	215° 35' 33"	-14° 09' 41"	0.9928539	16' 06.54"	23° 26' 17"	16 m 26 s
11	218° 00' 31"	-0.49"	215° 37' 59"	-14° 10' 30"	0.9928427	16' 06.55"	23° 26' 17"	16 m 26 s
12	218° 03' 01"	-0.49"	215° 40' 26"	-14° 11' 18"	0.9928316	16' 06.56"	23° 26' 17"	16 m 26 s
13	218° 05' 31"	-0.49"	215° 42' 52"	-14° 12' 07"	0.9928204	16' 06.57"	23° 26' 17"	16 m 26 s
14	218° 08' 01"	-0.50"	215° 45' 19"	-14° 12' 55"	0.9928093	16' 06.58"	23° 26' 17"	16 m 26 s
15	218° 10' 31"	-0.50"	215° 47' 45"	-14° 13' 44"	0.9927982	16' 06.59"	23° 26' 17"	16 m 26 s
16	218° 13' 01"	-0.50"	215° 50' 11"	-14° 14' 32"	0.9927870	16' 06.60"	23° 26' 17"	16 m 26 s
17	218° 15' 31"	-0.50"	215° 52' 38"	-14° 15' 20"	0.9927759	16' 06.61"	23° 26' 17"	16 m 26 s
18	218° 18' 01"	-0.50"	215° 55' 04"	-14° 16' 09"	0.9927647	16' 06.62"	23° 26' 17"	16 m 26 s
19	218° 20' 31"	-0.50"	215° 57' 31"	-14° 16' 57"	0.9927536	16' 06.63"	23° 26' 17"	16 m 27 s
20	218° 23' 01"	-0.50"	215° 59' 58"	-14° 17' 45"	0.9927425	16' 06.65"	23° 26' 17"	16 m 27 s
21	218° 25' 31"	-0.51"	216° 02' 24"	-14° 18' 34"	0.9927314	16' 06.66"	23° 26' 17"	16 m 27 s
22	218° 28' 01"	-0.51"	216° 04' 51"	-14° 19' 22"	0.9927203	16' 06.67"	23° 26' 17"	16 m 27 s
23	218° 30' 31"	-0.51"	216° 07' 17"	-14° 20' 10"	0.9927091	16' 06.68"	23° 26' 17"	16 m 27 s
24	218° 33' 01"	-0.51"	216° 09' 44"	-14° 20' 58"	0.9926980	16' 06.69"	23° 26' 17"	16 m 27 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	290° 39' 01"	-4° 52' 34"	293° 09' 18"	-26° 40' 11"	0° 59' 25"	16' 11.59"	262° 26' 51"	0.35634
1	291° 14' 43"	-4° 53' 49"	293° 48' 49"	-26° 35' 45"	0° 59' 25"	16' 11.48"	262° 9' 28"	0.36096
2	291° 50' 25"	-4° 55' 02"	294° 28' 16"	-26° 31' 09"	0° 59' 25"	16' 11.37"	261° 52' 10"	0.36560
3	292° 26' 07"	-4° 56' 14"	295° 07' 39"	-26° 26' 22"	0° 59' 24"	16' 11.25"	261° 34' 55"	0.37024
4	293° 01' 48"	-4° 57' 23"	295° 46' 59"	-26° 21' 24"	0° 59' 24"	16' 11.14"	261° 17' 46"	0.37490
5	293° 37' 24"	-4° 58' 30"	296° 26' 10"	-26° 16' 16"	0° 59' 23"	16' 11.02"	261° 0' 42"	0.37955
6	294° 13' 04"	-4° 59' 36"	297° 05' 21"	-26° 10' 57"	0° 59' 23"	16' 10.90"	260° 43' 42"	0.38423
7	294° 48' 44"	-5° 00' 39"	297° 44' 28"	-26° 05' 28"	0° 59' 22"	16' 10.77"	260° 26' 47"	0.38891
8	295° 24' 23"	-5° 01' 41"	298° 23' 30"	-25° 59' 48"	0° 59' 22"	16' 10.65"	260° 9' 56"	0.39361
9	296° 00' 02"	-5° 02' 40"	299° 02' 28"	-25° 53' 58"	0° 59' 22"	16' 10.52"	259° 53' 11"	0.39831
10	296° 35' 40"	-5° 03' 38"	299° 41' 21"	-25° 47' 57"	0° 59' 21"	16' 10.39"	259° 36' 32"	0.40302
11	297° 11' 17"	-5° 04' 34"	300° 20' 10"	-25° 41' 47"	0° 59' 21"	16' 10.25"	259° 19' 57"	0.40774
12	297° 46' 54"	-5° 05' 27"	300° 58' 53"	-25° 35' 26"	0° 59' 20"	16' 10.12"	259° 3' 29"	0.41246
13	298° 22' 31"	-5° 06' 19"	301° 37' 32"	-25° 28' 55"	0° 59' 20"	16' 09.98"	258° 47' 06"	0.41719
14	298° 58' 06"	-5° 07' 09"	302° 16' 06"	-25° 22' 14"	0° 59' 19"	16' 09.84"	258° 30' 50"	0.42192
15	299° 33' 41"	-5° 07' 57"	302° 54' 35"	-25° 15' 23"	0° 59' 19"	16' 09.69"	258° 14' 39"	0.42667
16	300° 09' 16"	-5° 08' 43"	303° 32' 59"	-25° 08' 23"	0° 59' 18"	16' 09.55"	257° 58' 34"	0.43141
17	300° 44' 50"	-5° 09' 26"	304° 11' 17"	-25° 01' 13"	0° 59' 17"	16' 09.40"	257° 42' 36"	0.43616
18	301° 20' 23"	-5° 10' 08"	304° 49' 31"	-24° 53' 53"	0° 59' 17"	16' 09.25"	257° 26' 44"	0.44092
19	301° 55' 56"	-5° 10' 48"	305° 27' 39"	-24° 46' 23"	0° 59' 16"	16' 09.10"	257° 10' 59"	0.44568
20	302° 31' 28"	-5° 11' 26"	306° 05' 41"	-24° 38' 44"	0° 59' 16"	16' 08.94"	256° 55' 21"	0.45044
21	303° 06' 60"	-5° 12' 02"	306° 43' 38"	-24° 30' 56"	0° 59' 15"	16' 08.79"	256° 39' 49"	0.45520
22	303° 42' 31"	-5° 12' 36"	307° 21' 30"	-24° 22' 58"	0° 59' 15"	16' 08.63"	256° 24' 24"	0.45997
23	304° 18' 01"	-5° 13' 08"	307° 59' 16"	-24° 14' 51"	0° 59' 14"	16' 08.47"	256° 9' 06"	0.46474
24	304° 53' 30"	-5° 13' 37"	308° 36' 56"	-24° 06' 35"	0° 59' 13"	16' 08.31"	255° 53' 55"	0.46951

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	218° 33' 01"	-0.51"	216° 09' 44"	-14° 20' 58"	0.9926980	16' 06.69"	23° 26' 17"	16 m 27 s
1	218° 35' 31"	-0.51"	216° 12' 11"	-14° 21' 46"	0.9926869	16' 06.70"	23° 26' 17"	16 m 27 s
2	218° 38' 01"	-0.51"	216° 14' 37"	-14° 22' 35"	0.9926758	16' 06.71"	23° 26' 17"	16 m 27 s
3	218° 40' 31"	-0.51"	216° 17' 04"	-14° 23' 23"	0.9926647	16' 06.72"	23° 26' 17"	16 m 27 s
4	218° 43' 01"	-0.51"	216° 19' 31"	-14° 24' 11"	0.9926536	16' 06.73"	23° 26' 17"	16 m 27 s
5	218° 45' 31"	-0.51"	216° 21' 57"	-14° 24' 59"	0.9926425	16' 06.74"	23° 26' 17"	16 m 27 s
6	218° 48' 01"	-0.52"	216° 24' 24"	-14° 25' 47"	0.9926314	16' 06.75"	23° 26' 17"	16 m 27 s
7	218° 50' 31"	-0.52"	216° 26' 51"	-14° 26' 35"	0.9926203	16' 06.76"	23° 26' 17"	16 m 27 s
8	218° 53' 01"	-0.52"	216° 29' 18"	-14° 27' 23"	0.9926093	16' 06.78"	23° 26' 17"	16 m 28 s
9	218° 55' 31"	-0.52"	216° 31' 45"	-14° 28' 11"	0.9925982	16' 06.79"	23° 26' 17"	16 m 28 s
10	218° 58' 01"	-0.52"	216° 34' 11"	-14° 28' 59"	0.9925871	16' 06.80"	23° 26' 17"	16 m 28 s
11	219° 00' 31"	-0.52"	216° 36' 38"	-14° 29' 47"	0.9925760	16' 06.81"	23° 26' 17"	16 m 28 s
12	219° 03' 02"	-0.52"	216° 39' 05"	-14° 30' 35"	0.9925650	16' 06.82"	23° 26' 17"	16 m 28 s
13	219° 05' 32"	-0.52"	216° 41' 32"	-14° 31' 22"	0.9925539	16' 06.83"	23° 26' 17"	16 m 28 s
14	219° 08' 02"	-0.52"	216° 43' 59"	-14° 32' 10"	0.9925428	16' 06.84"	23° 26' 17"	16 m 28 s
15	219° 10' 32"	-0.52"	216° 46' 26"	-14° 32' 58"	0.9925318	16' 06.85"	23° 26' 17"	16 m 28 s
16	219° 13' 02"	-0.52"	216° 48' 53"	-14° 33' 46"	0.9925207	16' 06.86"	23° 26' 17"	16 m 28 s
17	219° 15' 32"	-0.52"	216° 51' 20"	-14° 34' 34"	0.9925097	16' 06.87"	23° 26' 17"	16 m 28 s
18	219° 18' 02"	-0.52"	216° 53' 47"	-14° 35' 21"	0.9924986	16' 06.88"	23° 26' 17"	16 m 28 s
19	219° 20' 32"	-0.52"	216° 56' 14"	-14° 36' 09"	0.9924876	16' 06.89"	23° 26' 17"	16 m 28 s
20	219° 23' 02"	-0.52"	216° 58' 41"	-14° 36' 57"	0.9924766	16' 06.90"	23° 26' 17"	16 m 28 s
21	219° 25' 32"	-0.52"	217° 01' 08"	-14° 37' 45"	0.9924655	16' 06.92"	23° 26' 17"	16 m 28 s
22	219° 28' 02"	-0.52"	217° 03' 35"	-14° 38' 33"	0.9924545	16' 06.93"	23° 26' 17"	16 m 28 s
23	219° 30' 32"	-0.52"	217° 06' 02"	-14° 39' 20"	0.9924435	16' 06.94"	23° 26' 17"	16 m 28 s
24	219° 33' 02"	-0.52"	217° 08' 29"	-14° 40' 07"	0.9924325	16' 06.95"	23° 26' 17"	16 m 28 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	304° 53' 30"	-5° 13' 37"	308° 36' 56"	-24° 06' 35"	0° 59' 13"	16' 08.31"	255° 53' 55"	0.46951
1	305° 28' 59"	-5° 14' 05"	309° 14' 31"	-23° 58' 10"	0° 59' 13"	16' 08.14"	255° 38' 51"	0.47428
2	306° 04' 27"	-5° 14' 31"	309° 51' 59"	-23° 49' 36"	0° 59' 12"	16' 07.98"	255° 23' 55"	0.47905
3	306° 39' 55"	-5° 14' 55"	310° 29' 23"	-23° 40' 53"	0° 59' 12"	16' 07.81"	255° 9' 05"	0.48382
4	307° 15' 21"	-5° 15' 17"	311° 06' 40"	-23° 32' 01"	0° 59' 11"	16' 07.64"	254° 54' 24"	0.48859
5	307° 50' 47"	-5° 15' 37"	311° 43' 51"	-23° 23' 01"	0° 59' 10"	16' 07.46"	254° 39' 49"	0.49336
6	308° 26' 12"	-5° 15' 54"	312° 20' 57"	-23° 13' 52"	0° 59' 10"	16' 07.29"	254° 25' 23"	0.49813
7	309° 01' 37"	-5° 16' 10"	312° 57' 56"	-23° 04' 35"	0° 59' 09"	16' 07.11"	254° 11' 04"	0.50290
8	309° 37' 01"	-5° 16' 24"	313° 34' 50"	-22° 55' 09"	0° 59' 08"	16' 06.94"	253° 56' 53"	0.50766
9	310° 12' 24"	-5° 16' 36"	314° 11' 38"	-22° 45' 35"	0° 59' 08"	16' 06.76"	253° 42' 49"	0.51242
10	310° 47' 46"	-5° 16' 46"	314° 48' 19"	-22° 35' 53"	0° 59' 07"	16' 06.58"	253° 28' 54"	0.51718
11	311° 23' 07"	-5° 16' 53"	315° 24' 55"	-22° 26' 02"	0° 59' 06"	16' 06.39"	253° 15' 06"	0.52194
12	311° 58' 28"	-5° 16' 59"	316° 01' 25"	-22° 16' 04"	0° 59' 06"	16' 06.21"	253° 1' 27"	0.52669
13	312° 33' 48"	-5° 17' 03"	316° 37' 48"	-22° 05' 58"	0° 59' 05"	16' 06.02"	252° 47' 55"	0.53143
14	313° 09' 07"	-5° 17' 05"	317° 14' 06"	-21° 55' 44"	0° 59' 04"	16' 05.83"	252° 34' 32"	0.53618
15	313° 44' 25"	-5° 17' 05"	317° 50' 17"	-21° 45' 22"	0° 59' 04"	16' 05.64"	252° 21' 17"	0.54091
16	314° 19' 43"	-5° 17' 02"	318° 26' 23"	-21° 34' 53"	0° 59' 03"	16' 05.45"	252° 8' 10"	0.54564
17	314° 54' 59"	-5° 16' 58"	319° 02' 22"	-21° 24' 16"	0° 59' 02"	16' 05.25"	251° 55' 12"	0.55037
18	315° 30' 15"	-5° 16' 52"	319° 38' 15"	-21° 13' 31"	0° 59' 02"	16' 05.06"	251° 42' 21"	0.55508
19	316° 05' 30"	-5° 16' 44"	320° 14' 02"	-21° 02' 40"	0° 59' 01"	16' 04.86"	251° 29' 40"	0.55979
20	316° 40' 44"	-5° 16' 34"	320° 49' 43"	-20° 51' 41"	0° 59' 00"	16' 04.66"	251° 17' 06"	0.56450
21	317° 15' 57"	-5° 16' 22"	321° 25' 18"	-20° 40' 35"	0° 58' 59"	16' 04.46"	251° 4' 42"	0.56919
22	317° 51' 10"	-5° 16' 08"	322° 00' 47"	-20° 29' 22"	0° 58' 59"	16' 04.26"	250° 52' 25"	0.57388
23	318° 26' 21"	-5° 15' 52"	322° 36' 10"	-20° 18' 02"	0° 58' 58"	16' 04.06"	250° 40' 18"	0.57856
24	319° 01' 32"	-5° 15' 33"	323° 11' 26"	-20° 06' 36"	0° 58' 57"	16' 03.85"	250° 28' 18"	0.58323



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	219° 33' 02"	-0.52"	217° 08' 29"	-14° 40' 07"	0.9924325	16' 06.95"	23° 26' 17"	16 m 28 s
1	219° 35' 32"	-0.52"	217° 10' 56"	-14° 40' 55"	0.9924214	16' 06.96"	23° 26' 17"	16 m 29 s
2	219° 38' 02"	-0.52"	217° 13' 24"	-14° 41' 43"	0.9924104	16' 06.97"	23° 26' 17"	16 m 29 s
3	219° 40' 33"	-0.52"	217° 15' 51"	-14° 42' 30"	0.9923994	16' 06.98"	23° 26' 17"	16 m 29 s
4	219° 43' 03"	-0.52"	217° 18' 18"	-14° 43' 18"	0.9923884	16' 06.99"	23° 26' 17"	16 m 29 s
5	219° 45' 33"	-0.52"	217° 20' 45"	-14° 44' 05"	0.9923774	16' 07.00"	23° 26' 17"	16 m 29 s
6	219° 48' 03"	-0.52"	217° 23' 12"	-14° 44' 53"	0.9923664	16' 07.01"	23° 26' 17"	16 m 29 s
7	219° 50' 33"	-0.52"	217° 25' 40"	-14° 45' 40"	0.9923554	16' 07.02"	23° 26' 17"	16 m 29 s
8	219° 53' 03"	-0.52"	217° 28' 07"	-14° 46' 27"	0.9923445	16' 07.03"	23° 26' 17"	16 m 29 s
9	219° 55' 33"	-0.52"	217° 30' 34"	-14° 47' 15"	0.9923335	16' 07.04"	23° 26' 17"	16 m 29 s
10	219° 58' 03"	-0.52"	217° 33' 02"	-14° 48' 02"	0.9923225	16' 07.05"	23° 26' 17"	16 m 29 s
11	220° 00' 33"	-0.52"	217° 35' 29"	-14° 48' 49"	0.9923115	16' 07.07"	23° 26' 17"	16 m 29 s
12	220° 03' 03"	-0.52"	217° 37' 56"	-14° 49' 37"	0.9923006	16' 07.08"	23° 26' 17"	16 m 29 s
13	220° 05' 34"	-0.52"	217° 40' 24"	-14° 50' 24"	0.9922896	16' 07.09"	23° 26' 17"	16 m 29 s
14	220° 08' 04"	-0.51"	217° 42' 51"	-14° 51' 11"	0.9922786	16' 07.10"	23° 26' 17"	16 m 29 s
15	220° 10' 34"	-0.51"	217° 45' 19"	-14° 51' 58"	0.9922677	16' 07.11"	23° 26' 17"	16 m 29 s
16	220° 13' 04"	-0.51"	217° 47' 46"	-14° 52' 46"	0.9922567	16' 07.12"	23° 26' 17"	16 m 29 s
17	220° 15' 34"	-0.51"	217° 50' 14"	-14° 53' 33"	0.9922458	16' 07.13"	23° 26' 17"	16 m 29 s
18	220° 18' 04"	-0.51"	217° 52' 41"	-14° 54' 20"	0.9922349	16' 07.14"	23° 26' 17"	16 m 29 s
19	220° 20' 34"	-0.51"	217° 55' 09"	-14° 55' 07"	0.9922239	16' 07.15"	23° 26' 17"	16 m 29 s
20	220° 23' 04"	-0.51"	217° 57' 36"	-14° 55' 54"	0.9922130	16' 07.16"	23° 26' 17"	16 m 29 s
21	220° 25' 35"	-0.51"	218° 00' 04"	-14° 56' 41"	0.9922021	16' 07.17"	23° 26' 17"	16 m 29 s
22	220° 28' 05"	-0.51"	218° 02' 31"	-14° 57' 28"	0.9921912	16' 07.18"	23° 26' 17"	16 m 29 s
23	220° 30' 35"	-0.51"	218° 04' 59"	-14° 58' 15"	0.9921802	16' 07.19"	23° 26' 17"	16 m 29 s
24	220° 33' 05"	-0.50"	218° 07' 26"	-14° 59' 02"	0.9921693	16' 07.20"	23° 26' 17"	16 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	319° 01' 32"	-5° 15' 33"	323° 11' 26"	-20° 06' 36"	0° 58' 57"	16' 03.85"	250° 28' 18"	0.58323
1	319° 36' 42"	-5° 15' 13"	323° 46' 37"	-19° 55' 02"	0° 58' 56"	16' 03.64"	250° 16' 28"	0.58789
2	320° 11' 50"	-5° 14' 52"	324° 21' 42"	-19° 43' 22"	0° 58' 56"	16' 03.44"	250° 4' 46"	0.59254
3	320° 46' 58"	-5° 14' 28"	324° 56' 41"	-19° 31' 36"	0° 58' 55"	16' 03.23"	249° 53' 13"	0.59717
4	321° 22' 05"	-5° 14' 02"	325° 31' 33"	-19° 19' 43"	0° 58' 54"	16' 03.01"	249° 41' 49"	0.60180
5	321° 57' 12"	-5° 13' 34"	326° 06' 20"	-19° 07' 44"	0° 58' 53"	16' 02.80"	249° 30' 33"	0.60642
6	322° 32' 17"	-5° 13' 04"	326° 41' 01"	-18° 55' 38"	0° 58' 52"	16' 02.59"	249° 19' 26"	0.61103
7	323° 07' 21"	-5° 12' 33"	327° 15' 36"	-18° 43' 27"	0° 58' 52"	16' 02.37"	249° 8' 28"	0.61562
8	323° 42' 24"	-5° 11' 59"	327° 50' 05"	-18° 31' 09"	0° 58' 51"	16' 02.15"	248° 57' 39"	0.62020
9	324° 17' 27"	-5° 11' 23"	328° 24' 28"	-18° 18' 45"	0° 58' 50"	16' 01.94"	248° 46' 58"	0.62477
10	324° 52' 28"	-5° 10' 46"	328° 58' 46"	-18° 06' 16"	0° 58' 49"	16' 01.72"	248° 36' 27"	0.62932
11	325° 27' 29"	-5° 10' 07"	329° 32' 58"	-17° 53' 41"	0° 58' 48"	16' 01.49"	248° 26' 04"	0.63386
12	326° 02' 28"	-5° 09' 25"	330° 07' 04"	-17° 41' 00"	0° 58' 48"	16' 01.27"	248° 15' 50"	0.63839
13	326° 37' 27"	-5° 08' 42"	330° 41' 04"	-17° 28' 14"	0° 58' 47"	16' 01.05"	248° 5' 46"	0.64290
14	327° 12' 25"	-5° 07' 57"	331° 14' 59"	-17° 15' 22"	0° 58' 46"	16' 00.82"	247° 55' 50"	0.64740
15	327° 47' 21"	-5° 07' 10"	331° 48' 48"	-17° 02' 25"	0° 58' 45"	16' 00.59"	247° 46' 02"	0.65188
16	328° 22' 17"	-5° 06' 21"	332° 22' 31"	-16° 49' 23"	0° 58' 44"	16' 00.37"	247° 36' 24"	0.65635
17	328° 57' 11"	-5° 05' 31"	332° 56' 09"	-16° 36' 16"	0° 58' 43"	16' 00.14"	247° 26' 55"	0.66080
18	329° 32' 05"	-5° 04' 38"	333° 29' 42"	-16° 23' 03"	0° 58' 43"	15' 59.90"	247° 17' 35"	0.66524
19	330° 06' 58"	-5° 03' 44"	334° 03' 09"	-16° 09' 46"	0° 58' 42"	15' 59.67"	247° 8' 23"	0.66965
20	330° 41' 49"	-5° 02' 48"	334° 36' 30"	-15° 56' 23"	0° 58' 41"	15' 59.44"	246° 59' 21"	0.67405
21	331° 16' 40"	-5° 01' 50"	335° 09' 47"	-15° 42' 56"	0° 58' 40"	15' 59.20"	246° 50' 28"	0.67844
22	331° 51' 30"	-5° 00' 50"	335° 42' 58"	-15° 29' 25"	0° 58' 39"	15' 58.97"	246° 41' 43"	0.68280
23	332° 26' 18"	-4° 59' 48"	336° 16' 04"	-15° 15' 48"	0° 58' 38"	15' 58.73"	246° 33' 07"	0.68715
24	333° 01' 06"	-4° 58' 45"	336° 49' 04"	-15° 02' 08"	0° 58' 37"	15' 58.49"	246° 24' 41"	0.69148

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	220° 33' 05"	-0.50"	218° 07' 26"	-14° 59' 02"	0.9921693	16' 07.20"	23° 26' 17"	16 m 29 s
1	220° 35' 35"	-0.50"	218° 09' 54"	-14° 59' 49"	0.9921584	16' 07.21"	23° 26' 17"	16 m 29 s
2	220° 38' 05"	-0.50"	218° 12' 22"	-15° 00' 36"	0.9921475	16' 07.23"	23° 26' 17"	16 m 29 s
3	220° 40' 35"	-0.50"	218° 14' 49"	-15° 01' 23"	0.9921366	16' 07.24"	23° 26' 17"	16 m 29 s
4	220° 43' 06"	-0.50"	218° 17' 17"	-15° 02' 10"	0.9921258	16' 07.25"	23° 26' 17"	16 m 29 s
5	220° 45' 36"	-0.50"	218° 19' 45"	-15° 02' 57"	0.9921149	16' 07.26"	23° 26' 18"	16 m 29 s
6	220° 48' 06"	-0.49"	218° 22' 12"	-15° 03' 44"	0.9921040	16' 07.27"	23° 26' 18"	16 m 29 s
7	220° 50' 36"	-0.49"	218° 24' 40"	-15° 04' 31"	0.9920931	16' 07.28"	23° 26' 18"	16 m 29 s
8	220° 53' 06"	-0.49"	218° 27' 08"	-15° 05' 17"	0.9920823	16' 07.29"	23° 26' 18"	16 m 29 s
9	220° 55' 36"	-0.49"	218° 29' 36"	-15° 06' 04"	0.9920714	16' 07.30"	23° 26' 18"	16 m 29 s
10	220° 58' 07"	-0.49"	218° 32' 04"	-15° 06' 51"	0.9920605	16' 07.31"	23° 26' 18"	16 m 29 s
11	221° 00' 37"	-0.49"	218° 34' 31"	-15° 07' 38"	0.9920497	16' 07.32"	23° 26' 18"	16 m 29 s
12	221° 03' 07"	-0.48"	218° 36' 59"	-15° 08' 24"	0.9920388	16' 07.33"	23° 26' 18"	16 m 29 s
13	221° 05' 37"	-0.48"	218° 39' 27"	-15° 09' 11"	0.9920280	16' 07.34"	23° 26' 18"	16 m 29 s
14	221° 08' 07"	-0.48"	218° 41' 55"	-15° 09' 57"	0.9920172	16' 07.35"	23° 26' 18"	16 m 29 s
15	221° 10' 37"	-0.48"	218° 44' 23"	-15° 10' 44"	0.9920063	16' 07.36"	23° 26' 18"	16 m 29 s
16	221° 13' 08"	-0.47"	218° 46' 51"	-15° 11' 31"	0.9919955	16' 07.37"	23° 26' 18"	16 m 29 s
17	221° 15' 38"	-0.47"	218° 49' 19"	-15° 12' 17"	0.9919847	16' 07.38"	23° 26' 18"	16 m 29 s
18	221° 18' 08"	-0.47"	218° 51' 47"	-15° 13' 04"	0.9919739	16' 07.39"	23° 26' 18"	16 m 29 s
19	221° 20' 38"	-0.47"	218° 54' 15"	-15° 13' 50"	0.9919631	16' 07.40"	23° 26' 18"	16 m 29 s
20	221° 23' 08"	-0.47"	218° 56' 43"	-15° 14' 37"	0.9919522	16' 07.42"	23° 26' 18"	16 m 29 s
21	221° 25' 39"	-0.46"	218° 59' 11"	-15° 15' 23"	0.9919414	16' 07.43"	23° 26' 18"	16 m 29 s
22	221° 28' 09"	-0.46"	219° 01' 39"	-15° 16' 10"	0.9919307	16' 07.44"	23° 26' 18"	16 m 29 s
23	221° 30' 39"	-0.46"	219° 04' 07"	-15° 16' 56"	0.9919199	16' 07.45"	23° 26' 18"	16 m 29 s
24	221° 33' 09"	-0.46"	219° 06' 35"	-15° 17' 42"	0.9919091	16' 07.46"	23° 26' 18"	16 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	333° 01' 06"	-4° 58' 45"	336° 49' 04"	-15° 02' 08"	0° 58' 37"	15' 58.49"	246° 24' 41"	0.69148
1	333° 35' 52"	-4° 57' 39"	337° 21' 60"	-14° 48' 22"	0° 58' 37"	15' 58.25"	246° 16' 23"	0.69579
2	334° 10' 38"	-4° 56' 32"	337° 54' 50"	-14° 34' 33"	0° 58' 36"	15' 58.01"	246° 8' 14"	0.70008
3	334° 45' 22"	-4° 55' 24"	338° 27' 36"	-14° 20' 39"	0° 58' 35"	15' 57.76"	246° 0' 15"	0.70435
4	335° 20' 05"	-4° 54' 13"	339° 00' 16"	-14° 06' 42"	0° 58' 34"	15' 57.52"	245° 52' 24"	0.70860
5	335° 54' 47"	-4° 53' 01"	339° 32' 52"	-13° 52' 40"	0° 58' 33"	15' 57.27"	245° 44' 42"	0.71283
6	336° 29' 29"	-4° 51' 46"	340° 05' 23"	-13° 38' 34"	0° 58' 32"	15' 57.03"	245° 37' 09"	0.71704
7	337° 04' 09"	-4° 50' 31"	340° 37' 49"	-13° 24' 24"	0° 58' 31"	15' 56.78"	245° 29' 45"	0.72123
8	337° 38' 48"	-4° 49' 13"	341° 10' 10"	-13° 10' 11"	0° 58' 30"	15' 56.53"	245° 22' 30"	0.72540
9	338° 13' 26"	-4° 47' 54"	341° 42' 27"	-12° 55' 54"	0° 58' 29"	15' 56.28"	245° 15' 24"	0.72954
10	338° 48' 02"	-4° 46' 33"	342° 14' 39"	-12° 41' 34"	0° 58' 28"	15' 56.02"	245° 8' 26"	0.73367
11	339° 22' 38"	-4° 45' 10"	342° 46' 46"	-12° 27' 10"	0° 58' 27"	15' 55.77"	245° 1' 38"	0.73777
12	339° 57' 13"	-4° 43' 46"	343° 18' 50"	-12° 12' 43"	0° 58' 27"	15' 55.52"	244° 54' 59"	0.74185
13	340° 31' 46"	-4° 42' 19"	343° 50' 48"	-11° 58' 12"	0° 58' 26"	15' 55.26"	244° 48' 28"	0.74590
14	341° 06' 19"	-4° 40' 52"	344° 22' 43"	-11° 43' 38"	0° 58' 25"	15' 55.00"	244° 42' 06"	0.74994
15	341° 40' 50"	-4° 39' 22"	344° 54' 33"	-11° 29' 01"	0° 58' 24"	15' 54.75"	244° 35' 53"	0.75394
16	342° 15' 20"	-4° 37' 51"	345° 26' 18"	-11° 14' 21"	0° 58' 23"	15' 54.49"	244° 29' 49"	0.75793
17	342° 49' 49"	-4° 36' 19"	345° 58' 00"	-10° 59' 38"	0° 58' 22"	15' 54.23"	244° 23' 54"	0.76189
18	343° 24' 17"	-4° 34' 44"	346° 29' 38"	-10° 44' 52"	0° 58' 21"	15' 53.96"	244° 18' 08"	0.76583
19	343° 58' 44"	-4° 33' 09"	347° 01' 11"	-10° 30' 04"	0° 58' 20"	15' 53.70"	244° 12' 30"	0.76974
20	344° 33' 09"	-4° 31' 31"	347° 32' 41"	-10° 15' 13"	0° 58' 19"	15' 53.44"	244° 7' 02"	0.77362
21	345° 07' 34"	-4° 29' 52"	348° 04' 07"	-10° 00' 19"	0° 58' 18"	15' 53.17"	244° 1' 42"	0.77748
22	345° 41' 57"	-4° 28' 11"	348° 35' 29"	-9° 45' 22"	0° 58' 17"	15' 52.90"	243° 56' 31"	0.78132
23	346° 16' 19"	-4° 26' 29"	349° 06' 47"	-9° 30' 24"	0° 58' 16"	15' 52.64"	243° 51' 28"	0.78512
24	346° 50' 40"	-4° 24' 46"	349° 38' 02"	-9° 15' 23"	0° 58' 15"	15' 52.37"	243° 46' 35"	0.78891



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	221° 33' 09"	-0.46"	219° 06' 35"	-15° 17' 42"	0.9919091	16' 07.46"	23° 26' 18"	16 m 29 s
1	221° 35' 39"	-0.45"	219° 09' 03"	-15° 18' 29"	0.9918983	16' 07.47"	23° 26' 18"	16 m 29 s
2	221° 38' 10"	-0.45"	219° 11' 32"	-15° 19' 15"	0.9918875	16' 07.48"	23° 26' 18"	16 m 29 s
3	221° 40' 40"	-0.45"	219° 13' 60"	-15° 20' 01"	0.9918768	16' 07.49"	23° 26' 18"	16 m 29 s
4	221° 43' 10"	-0.45"	219° 16' 28"	-15° 20' 48"	0.9918660	16' 07.50"	23° 26' 18"	16 m 29 s
5	221° 45' 40"	-0.44"	219° 18' 56"	-15° 21' 34"	0.9918553	16' 07.51"	23° 26' 18"	16 m 29 s
6	221° 48' 11"	-0.44"	219° 21' 24"	-15° 22' 20"	0.9918445	16' 07.52"	23° 26' 18"	16 m 29 s
7	221° 50' 41"	-0.44"	219° 23' 53"	-15° 23' 06"	0.9918338	16' 07.53"	23° 26' 18"	16 m 29 s
8	221° 53' 11"	-0.43"	219° 26' 21"	-15° 23' 52"	0.9918230	16' 07.54"	23° 26' 18"	16 m 29 s
9	221° 55' 41"	-0.43"	219° 28' 49"	-15° 24' 39"	0.9918123	16' 07.55"	23° 26' 18"	16 m 29 s
10	221° 58' 11"	-0.43"	219° 31' 18"	-15° 25' 25"	0.9918016	16' 07.56"	23° 26' 18"	16 m 29 s
11	222° 00' 42"	-0.42"	219° 33' 46"	-15° 26' 11"	0.9917909	16' 07.57"	23° 26' 18"	16 m 29 s
12	222° 03' 12"	-0.42"	219° 36' 14"	-15° 26' 57"	0.9917802	16' 07.58"	23° 26' 18"	16 m 29 s
13	222° 05' 42"	-0.42"	219° 38' 43"	-15° 27' 43"	0.9917694	16' 07.59"	23° 26' 18"	16 m 29 s
14	222° 08' 12"	-0.42"	219° 41' 11"	-15° 28' 29"	0.9917587	16' 07.60"	23° 26' 18"	16 m 29 s
15	222° 10' 43"	-0.41"	219° 43' 39"	-15° 29' 15"	0.9917481	16' 07.61"	23° 26' 18"	16 m 29 s
16	222° 13' 13"	-0.41"	219° 46' 08"	-15° 30' 01"	0.9917374	16' 07.63"	23° 26' 18"	16 m 29 s
17	222° 15' 43"	-0.41"	219° 48' 36"	-15° 30' 47"	0.9917267	16' 07.64"	23° 26' 18"	16 m 29 s
18	222° 18' 13"	-0.40"	219° 51' 05"	-15° 31' 33"	0.9917160	16' 07.65"	23° 26' 18"	16 m 28 s
19	222° 20' 44"	-0.40"	219° 53' 33"	-15° 32' 18"	0.9917053	16' 07.66"	23° 26' 18"	16 m 28 s
20	222° 23' 14"	-0.40"	219° 56' 02"	-15° 33' 04"	0.9916947	16' 07.67"	23° 26' 18"	16 m 28 s
21	222° 25' 44"	-0.39"	219° 58' 30"	-15° 33' 50"	0.9916840	16' 07.68"	23° 26' 18"	16 m 28 s
22	222° 28' 15"	-0.39"	220° 00' 59"	-15° 34' 36"	0.9916734	16' 07.69"	23° 26' 18"	16 m 28 s
23	222° 30' 45"	-0.39"	220° 03' 28"	-15° 35' 22"	0.9916627	16' 07.70"	23° 26' 18"	16 m 28 s
24	222° 33' 15"	-0.38"	220° 05' 56"	-15° 36' 07"	0.9916521	16' 07.71"	23° 26' 18"	16 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	346° 50' 40"	-4° 24' 46"	349° 38' 02"	-9° 15' 23"	0° 58' 15"	15' 52.37"	243° 46' 35"	0.78891
1	347° 24' 60"	-4° 23' 00"	350° 09' 13"	-9° 00' 19"	0° 58' 14"	15' 52.10"	243° 41' 50"	0.79266
2	347° 59' 18"	-4° 21' 14"	350° 40' 21"	-8° 45' 14"	0° 58' 13"	15' 51.83"	243° 37' 14"	0.79639
3	348° 33' 36"	-4° 19' 25"	351° 11' 25"	-8° 30' 06"	0° 58' 12"	15' 51.55"	243° 32' 47"	0.80009
4	349° 07' 52"	-4° 17' 36"	351° 42' 25"	-8° 14' 57"	0° 58' 11"	15' 51.28"	243° 28' 28"	0.80376
5	349° 42' 07"	-4° 15' 44"	352° 13' 23"	-7° 59' 45"	0° 58' 10"	15' 51.00"	243° 24' 18"	0.80741
6	350° 16' 21"	-4° 13' 52"	352° 44' 17"	-7° 44' 32"	0° 58' 09"	15' 50.73"	243° 20' 17"	0.81102
7	350° 50' 33"	-4° 11' 58"	353° 15' 08"	-7° 29' 16"	0° 58' 08"	15' 50.45"	243° 16' 25"	0.81461
8	351° 24' 45"	-4° 10' 02"	353° 45' 56"	-7° 13' 60"	0° 58' 07"	15' 50.17"	243° 12' 41"	0.81817
9	351° 58' 55"	-4° 08' 05"	354° 16' 41"	-6° 58' 41"	0° 58' 06"	15' 49.89"	243° 9' 06"	0.82170
10	352° 33' 04"	-4° 06' 07"	354° 47' 23"	-6° 43' 21"	0° 58' 05"	15' 49.61"	243° 5' 39"	0.82521
11	353° 07' 12"	-4° 04' 07"	355° 18' 02"	-6° 27' 60"	0° 58' 04"	15' 49.33"	243° 2' 21"	0.82868
12	353° 41' 18"	-4° 02' 06"	355° 48' 38"	-6° 12' 37"	0° 58' 03"	15' 49.05"	242° 59' 12"	0.83212
13	354° 15' 23"	-4° 00' 03"	356° 19' 11"	-5° 57' 13"	0° 58' 02"	15' 48.76"	242° 56' 12"	0.83553
14	354° 49' 28"	-3° 57' 59"	356° 49' 42"	-5° 41' 48"	0° 58' 01"	15' 48.48"	242° 53' 20"	0.83892
15	355° 23' 30"	-3° 55' 54"	357° 20' 10"	-5° 26' 22"	0° 57' 60"	15' 48.19"	242° 50' 37"	0.84227
16	355° 57' 32"	-3° 53' 48"	357° 50' 36"	-5° 10' 54"	0° 57' 59"	15' 47.90"	242° 48' 02"	0.84559
17	356° 31' 32"	-3° 51' 40"	358° 20' 59"	-4° 55' 26"	0° 57' 57"	15' 47.61"	242° 45' 36"	0.84888
18	357° 05' 31"	-3° 49' 31"	358° 51' 20"	-4° 39' 57"	0° 57' 56"	15' 47.32"	242° 43' 19"	0.85214
19	357° 39' 29"	-3° 47' 20"	359° 21' 39"	-4° 24' 27"	0° 57' 55"	15' 47.03"	242° 41' 10"	0.85537
20	358° 13' 26"	-3° 45' 09"	359° 51' 55"	-4° 08' 56"	0° 57' 54"	15' 46.74"	242° 39' 10"	0.85857
21	358° 47' 21"	-3° 42' 56"	0° 22' 09"	-3° 53' 24"	0° 57' 53"	15' 46.44"	242° 37' 18"	0.86173
22	359° 21' 15"	-3° 40' 42"	0° 52' 21"	-3° 37' 53"	0° 57' 52"	15' 46.15"	242° 35' 35"	0.86486
23	359° 55' 08"	-3° 38' 26"	1° 22' 31"	-3° 22' 20"	0° 57' 51"	15' 45.85"	242° 34' 01"	0.86796
24	0° 28' 59"	-3° 36' 10"	1° 52' 39"	-3° 06' 47"	0° 57' 50"	15' 45.55"	242° 32' 35"	0.87103

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	222° 33' 15"	-0.38"	220° 05' 56"	-15° 36' 07"	0.9916521	16' 07.71"	23° 26' 18"	16 m 28 s
1	222° 35' 45"	-0.38"	220° 08' 25"	-15° 36' 53"	0.9916414	16' 07.72"	23° 26' 18"	16 m 28 s
2	222° 38' 16"	-0.37"	220° 10' 53"	-15° 37' 39"	0.9916308	16' 07.73"	23° 26' 18"	16 m 28 s
3	222° 40' 46"	-0.37"	220° 13' 22"	-15° 38' 24"	0.9916202	16' 07.74"	23° 26' 18"	16 m 28 s
4	222° 43' 16"	-0.37"	220° 15' 51"	-15° 39' 10"	0.9916096	16' 07.75"	23° 26' 18"	16 m 28 s
5	222° 45' 46"	-0.36"	220° 18' 20"	-15° 39' 56"	0.9915990	16' 07.76"	23° 26' 18"	16 m 28 s
6	222° 48' 17"	-0.36"	220° 20' 48"	-15° 40' 41"	0.9915884	16' 07.77"	23° 26' 18"	16 m 28 s
7	222° 50' 47"	-0.36"	220° 23' 17"	-15° 41' 27"	0.9915778	16' 07.78"	23° 26' 18"	16 m 28 s
8	222° 53' 17"	-0.35"	220° 25' 46"	-15° 42' 12"	0.9915672	16' 07.79"	23° 26' 18"	16 m 28 s
9	222° 55' 48"	-0.35"	220° 28' 15"	-15° 42' 58"	0.9915566	16' 07.80"	23° 26' 18"	16 m 28 s
10	222° 58' 18"	-0.34"	220° 30' 44"	-15° 43' 43"	0.9915460	16' 07.81"	23° 26' 18"	16 m 28 s
11	223° 00' 48"	-0.34"	220° 33' 12"	-15° 44' 29"	0.9915354	16' 07.82"	23° 26' 18"	16 m 27 s
12	223° 03' 19"	-0.34"	220° 35' 41"	-15° 45' 14"	0.9915249	16' 07.83"	23° 26' 18"	16 m 27 s
13	223° 05' 49"	-0.33"	220° 38' 10"	-15° 45' 59"	0.9915143	16' 07.84"	23° 26' 18"	16 m 27 s
14	223° 08' 19"	-0.33"	220° 40' 39"	-15° 46' 45"	0.9915038	16' 07.85"	23° 26' 18"	16 m 27 s
15	223° 10' 50"	-0.32"	220° 43' 08"	-15° 47' 30"	0.9914932	16' 07.86"	23° 26' 18"	16 m 27 s
16	223° 13' 20"	-0.32"	220° 45' 37"	-15° 48' 15"	0.9914827	16' 07.87"	23° 26' 18"	16 m 27 s
17	223° 15' 50"	-0.31"	220° 48' 06"	-15° 49' 01"	0.9914722	16' 07.88"	23° 26' 18"	16 m 27 s
18	223° 18' 21"	-0.31"	220° 50' 35"	-15° 49' 46"	0.9914616	16' 07.89"	23° 26' 18"	16 m 27 s
19	223° 20' 51"	-0.31"	220° 53' 04"	-15° 50' 31"	0.9914511	16' 07.90"	23° 26' 18"	16 m 27 s
20	223° 23' 21"	-0.30"	220° 55' 33"	-15° 51' 16"	0.9914406	16' 07.91"	23° 26' 18"	16 m 27 s
21	223° 25' 51"	-0.30"	220° 58' 02"	-15° 52' 01"	0.9914301	16' 07.93"	23° 26' 18"	16 m 27 s
22	223° 28' 22"	-0.29"	221° 00' 31"	-15° 52' 47"	0.9914196	16' 07.94"	23° 26' 18"	16 m 27 s
23	223° 30' 52"	-0.29"	221° 03' 00"	-15° 53' 32"	0.9914091	16' 07.95"	23° 26' 18"	16 m 26 s
24	223° 33' 23"	-0.28"	221° 05' 29"	-15° 54' 17"	0.9913986	16' 07.96"	23° 26' 18"	16 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	0° 28' 59"	-3° 36' 10"	1° 52' 39"	-3° 06' 47"	0° 57' 50"	15' 45.55"	242° 32' 35"	0.87103
1	1° 02' 49"	-3° 33' 52"	2° 22' 45"	-2° 51' 14"	0° 57' 49"	15' 45.26"	242° 31' 17"	0.87407
2	1° 36' 38"	-3° 31' 33"	2° 52' 50"	-2° 35' 40"	0° 57' 48"	15' 44.96"	242° 30' 09"	0.87707
3	2° 10' 26"	-3° 29' 13"	3° 22' 52"	-2° 20' 07"	0° 57' 47"	15' 44.66"	242° 29' 08"	0.88004
4	2° 44' 12"	-3° 26' 52"	3° 52' 53"	-2° 04' 33"	0° 57' 46"	15' 44.35"	242° 28' 17"	0.88298
5	3° 17' 57"	-3° 24' 30"	4° 22' 52"	-1° 48' 59"	0° 57' 44"	15' 44.05"	242° 27' 34"	0.88588
6	3° 51' 40"	-3° 22' 07"	4° 52' 50"	-1° 33' 25"	0° 57' 43"	15' 43.75"	242° 26' 59"	0.88875
7	4° 25' 23"	-3° 19' 42"	5° 22' 47"	-1° 17' 51"	0° 57' 42"	15' 43.44"	242° 26' 33"	0.89158
8	4° 59' 04"	-3° 17' 17"	5° 52' 42"	-1° 02' 18"	0° 57' 41"	15' 43.14"	242° 26' 16"	0.89439
9	5° 32' 43"	-3° 14' 50"	6° 22' 35"	0° 46' 45"	0° 57' 40"	15' 42.83"	242° 26' 07"	0.89715
10	6° 06' 22"	-3° 12' 23"	6° 52' 28"	0° 31' 12"	0° 57' 39"	15' 42.52"	242° 26' 07"	0.89989
11	6° 39' 59"	-3° 09' 54"	7° 22' 19"	0° 15' 39"	0° 57' 38"	15' 42.21"	242° 26' 15"	0.90259
12	7° 13' 34"	-3° 07' 25"	7° 52' 09"	0° 00' -7"	0° 57' 37"	15' 41.90"	242° 26' 32"	0.90525
13	7° 47' 09"	-3° 04' 54"	8° 21' 58"	0° 15' 25"	0° 57' 35"	15' 41.59"	242° 26' 57"	0.90788
14	8° 20' 42"	-3° 02' 23"	8° 51' 46"	0° 30' 56"	0° 57' 34"	15' 41.28"	242° 27' 32"	0.91047
15	8° 54' 14"	-2° 59' 50"	9° 21' 33"	0° 46' 26"	0° 57' 33"	15' 40.96"	242° 28' 14"	0.91303
16	9° 27' 44"	-2° 57' 17"	9° 51' 19"	1° 01' 55"	0° 57' 32"	15' 40.65"	242° 29' 06"	0.91556
17	10° 01' 13"	-2° 54' 42"	10° 21' 05"	1° 17' 24"	0° 57' 31"	15' 40.33"	242° 30' 06"	0.91804
18	10° 34' 41"	-2° 52' 07"	10° 50' 50"	1° 32' 52"	0° 57' 30"	15' 40.01"	242° 31' 15"	0.92050
19	11° 08' 07"	-2° 49' 31"	11° 20' 34"	1° 48' 19"	0° 57' 28"	15' 39.70"	242° 32' 32"	0.92292
20	11° 41' 32"	-2° 46' 54"	11° 50' 18"	2° 03' 44"	0° 57' 27"	15' 39.38"	242° 33' 58"	0.92530
21	12° 14' 55"	-2° 44' 16"	12° 20' 01"	2° 19' 09"	0° 57' 26"	15' 39.06"	242° 35' 33"	0.92764
22	12° 48' 17"	-2° 41' 38"	12° 49' 43"	2° 34' 32"	0° 57' 25"	15' 38.74"	242° 37' 17"	0.92995
23	13° 21' 38"	-2° 38' 58"	13° 19' 26"	2° 49' 55"	0° 57' 24"	15' 38.41"	242° 39' 09"	0.93222
24	13° 54' 58"	-2° 36' 18"	13° 49' 08"	3° 05' 15"	0° 57' 23"	15' 38.09"	242° 41' 11"	0.93446



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	223° 33' 23"	-0.28"	221° 05' 29"	-15° 54' 17"	0.9913986	16' 07.96"	23° 26' 18"	16 m 26 s
1	223° 35' 53"	-0.28"	221° 07' 58"	-15° 55' 02"	0.9913881	16' 07.97"	23° 26' 18"	16 m 26 s
2	223° 38' 23"	-0.28"	221° 10' 28"	-15° 55' 47"	0.9913777	16' 07.98"	23° 26' 17"	16 m 26 s
3	223° 40' 54"	-0.27"	221° 12' 57"	-15° 56' 32"	0.9913672	16' 07.99"	23° 26' 17"	16 m 26 s
4	223° 43' 24"	-0.27"	221° 15' 26"	-15° 57' 17"	0.9913567	16' 08.00"	23° 26' 17"	16 m 26 s
5	223° 45' 54"	-0.26"	221° 17' 55"	-15° 58' 02"	0.9913463	16' 08.01"	23° 26' 17"	16 m 26 s
6	223° 48' 25"	-0.26"	221° 20' 25"	-15° 58' 47"	0.9913358	16' 08.02"	23° 26' 17"	16 m 26 s
7	223° 50' 55"	-0.25"	221° 22' 54"	-15° 59' 31"	0.9913254	16' 08.03"	23° 26' 17"	16 m 26 s
8	223° 53' 25"	-0.25"	221° 25' 23"	-16° 00' 16"	0.9913150	16' 08.04"	23° 26' 17"	16 m 26 s
9	223° 55' 56"	-0.24"	221° 27' 52"	-16° 01' 01"	0.9913045	16' 08.05"	23° 26' 17"	16 m 25 s
10	223° 58' 26"	-0.24"	221° 30' 22"	-16° 01' 46"	0.9912941	16' 08.06"	23° 26' 17"	16 m 25 s
11	224° 00' 56"	-0.23"	221° 32' 51"	-16° 02' 31"	0.9912837	16' 08.07"	23° 26' 17"	16 m 25 s
12	224° 03' 27"	-0.23"	221° 35' 21"	-16° 03' 15"	0.9912733	16' 08.08"	23° 26' 17"	16 m 25 s
13	224° 05' 57"	-0.22"	221° 37' 50"	-16° 04' 00"	0.9912629	16' 08.09"	23° 26' 17"	16 m 25 s
14	224° 08' 28"	-0.22"	221° 40' 19"	-16° 04' 45"	0.9912525	16' 08.10"	23° 26' 17"	16 m 25 s
15	224° 10' 58"	-0.21"	221° 42' 49"	-16° 05' 30"	0.9912421	16' 08.11"	23° 26' 17"	16 m 25 s
16	224° 13' 28"	-0.21"	221° 45' 18"	-16° 06' 14"	0.9912317	16' 08.12"	23° 26' 17"	16 m 25 s
17	224° 15' 59"	-0.20"	221° 47' 48"	-16° 06' 59"	0.9912214	16' 08.13"	23° 26' 17"	16 m 25 s
18	224° 18' 29"	-0.20"	221° 50' 17"	-16° 07' 43"	0.9912110	16' 08.14"	23° 26' 17"	16 m 24 s
19	224° 20' 60"	-0.20"	221° 52' 47"	-16° 08' 28"	0.9912006	16' 08.15"	23° 26' 17"	16 m 24 s
20	224° 23' 30"	-0.19"	221° 55' 16"	-16° 09' 12"	0.9911903	16' 08.16"	23° 26' 17"	16 m 24 s
21	224° 26' 00"	-0.19"	221° 57' 46"	-16° 09' 57"	0.9911799	16' 08.17"	23° 26' 17"	16 m 24 s
22	224° 28' 31"	-0.18"	222° 00' 16"	-16° 10' 41"	0.9911696	16' 08.18"	23° 26' 17"	16 m 24 s
23	224° 31' 01"	-0.18"	222° 02' 45"	-16° 11' 26"	0.9911593	16' 08.19"	23° 26' 17"	16 m 24 s
24	224° 33' 32"	-0.17"	222° 05' 15"	-16° 12' 10"	0.9911489	16' 08.20"	23° 26' 17"	16 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	13° 54' 58"	-2° 36' 18"	13° 49' 08"	3° 05' 15"	0° 57' 23"	15' 38.09"	242° 41' 11"	0.93446
1	14° 28' 16"	-2° 33' 37"	14° 18' 49"	3° 20' 35"	0° 57' 21"	15' 37.77"	242° 43' 21"	0.93666
2	15° 01' 32"	-2° 30' 55"	14° 48' 31"	3° 35' 53"	0° 57' 20"	15' 37.44"	242° 45' 40"	0.93883
3	15° 34' 48"	-2° 28' 12"	15° 18' 12"	3° 51' 09"	0° 57' 19"	15' 37.11"	242° 48' 08"	0.94095
4	16° 08' 01"	-2° 25' 29"	15° 47' 54"	4° 06' 24"	0° 57' 18"	15' 36.79"	242° 50' 45"	0.94304
5	16° 41' 14"	-2° 22' 45"	16° 17' 35"	4° 21' 37"	0° 57' 17"	15' 36.46"	242° 53' 31"	0.94510
6	17° 14' 25"	-2° 20' 00"	16° 47' 17"	4° 36' 49"	0° 57' 15"	15' 36.13"	242° 56' 27"	0.94711
7	17° 47' 35"	-2° 17' 15"	17° 16' 58"	4° 51' 58"	0° 57' 14"	15' 35.80"	242° 59' 31"	0.94909
8	18° 20' 43"	-2° 14' 29"	17° 46' 40"	5° 07' 06"	0° 57' 13"	15' 35.47"	243° 2' 45"	0.95104
9	18° 53' 50"	-2° 11' 42"	18° 16' 22"	5° 22' 12"	0° 57' 12"	15' 35.14"	243° 6' 08"	0.95294
10	19° 26' 55"	-2° 08' 55"	18° 46' 04"	5° 37' 16"	0° 57' 10"	15' 34.81"	243° 9' 40"	0.95481
11	19° 59' 59"	-2° 06' 07"	19° 15' 47"	5° 52' 17"	0° 57' 09"	15' 34.47"	243° 13' 22"	0.95664
12	20° 33' 02"	-2° 03' 19"	19° 45' 30"	6° 07' 17"	0° 57' 08"	15' 34.14"	243° 17' 13"	0.95843
13	21° 06' 03"	-2° 00' 30"	20° 15' 14"	6° 22' 14"	0° 57' 07"	15' 33.80"	243° 21' 14"	0.96019
14	21° 39' 03"	-1° 57' 40"	20° 44' 58"	6° 37' 09"	0° 57' 06"	15' 33.47"	243° 25' 25"	0.96191
15	22° 12' 01"	-1° 54' 50"	21° 14' 43"	6° 52' 02"	0° 57' 04"	15' 33.13"	243° 29' 46"	0.96359
16	22° 44' 58"	-1° 51' 59"	21° 44' 28"	7° 06' 52"	0° 57' 03"	15' 32.79"	243° 34' 17"	0.96523
17	23° 17' 54"	-1° 49' 08"	22° 14' 15"	7° 21' 40"	0° 57' 02"	15' 32.45"	243° 38' 58"	0.96683
18	23° 50' 48"	-1° 46' 16"	22° 44' 02"	7° 36' 25"	0° 57' 01"	15' 32.11"	243° 43' 50"	0.96840
19	24° 23' 41"	-1° 43' 24"	23° 13' 49"	7° 51' 07"	0° 56' 59"	15' 31.77"	243° 48' 52"	0.96993
20	24° 56' 32"	-1° 40' 32"	23° 43' 38"	8° 05' 47"	0° 56' 58"	15' 31.43"	243° 54' 05"	0.97142
21	25° 29' 22"	-1° 37' 39"	24° 13' 28"	8° 20' 24"	0° 56' 57"	15' 31.09"	243° 59' 29"	0.97287
22	26° 02' 10"	-1° 34' 45"	24° 43' 19"	8° 34' 58"	0° 56' 56"	15' 30.75"	244° 5' 05"	0.97429
23	26° 34' 57"	-1° 31' 52"	25° 13' 10"	8° 49' 30"	0° 56' 54"	15' 30.41"	244° 10' 52"	0.97567
24	27° 07' 42"	-1° 28' 57"	25° 43' 03"	9° 03' 58"	0° 56' 53"	15' 30.06"	244° 16' 51"	0.97701

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	224° 33' 32"	-0.17"	222° 05' 15"	-16° 12' 10"	0.9911489	16' 08.20"	23° 26' 17"	16 m 24 s
1	224° 36' 02"	-0.17"	222° 07' 45"	-16° 12' 55"	0.9911386	16' 08.21"	23° 26' 17"	16 m 24 s
2	224° 38' 32"	-0.16"	222° 10' 14"	-16° 13' 39"	0.9911283	16' 08.22"	23° 26' 17"	16 m 23 s
3	224° 41' 03"	-0.15"	222° 12' 44"	-16° 14' 23"	0.9911180	16' 08.23"	23° 26' 17"	16 m 23 s
4	224° 43' 33"	-0.15"	222° 15' 14"	-16° 15' 08"	0.9911077	16' 08.24"	23° 26' 17"	16 m 23 s
5	224° 46' 04"	-0.14"	222° 17' 43"	-16° 15' 52"	0.9910974	16' 08.25"	23° 26' 17"	16 m 23 s
6	224° 48' 34"	-0.14"	222° 20' 13"	-16° 16' 36"	0.9910871	16' 08.26"	23° 26' 17"	16 m 23 s
7	224° 51' 05"	-0.13"	222° 22' 43"	-16° 17' 20"	0.9910768	16' 08.27"	23° 26' 17"	16 m 23 s
8	224° 53' 35"	-0.13"	222° 25' 13"	-16° 18' 04"	0.9910666	16' 08.28"	23° 26' 17"	16 m 23 s
9	224° 56' 05"	-0.12"	222° 27' 43"	-16° 18' 49"	0.9910563	16' 08.29"	23° 26' 17"	16 m 23 s
10	224° 58' 36"	-0.12"	222° 30' 12"	-16° 19' 33"	0.9910461	16' 08.30"	23° 26' 17"	16 m 22 s
11	225° 01' 06"	-0.11"	222° 32' 42"	-16° 20' 17"	0.9910358	16' 08.31"	23° 26' 17"	16 m 22 s
12	225° 03' 37"	-0.11"	222° 35' 12"	-16° 21' 01"	0.9910256	16' 08.32"	23° 26' 17"	16 m 22 s
13	225° 06' 07"	-0.10"	222° 37' 42"	-16° 21' 45"	0.9910153	16' 08.33"	23° 26' 17"	16 m 22 s
14	225° 08' 38"	-0.10"	222° 40' 12"	-16° 22' 29"	0.9910051	16' 08.34"	23° 26' 17"	16 m 22 s
15	225° 11' 08"	-0.09"	222° 42' 42"	-16° 23' 13"	0.9909949	16' 08.35"	23° 26' 17"	16 m 22 s
16	225° 13' 39"	-0.09"	222° 45' 12"	-16° 23' 57"	0.9909847	16' 08.36"	23° 26' 17"	16 m 21 s
17	225° 16' 09"	-0.08"	222° 47' 42"	-16° 24' 41"	0.9909745	16' 08.37"	23° 26' 17"	16 m 21 s
18	225° 18' 40"	-0.08"	222° 50' 12"	-16° 25' 25"	0.9909643	16' 08.38"	23° 26' 17"	16 m 21 s
19	225° 21' 10"	-0.07"	222° 52' 42"	-16° 26' 09"	0.9909541	16' 08.39"	23° 26' 17"	16 m 21 s
20	225° 23' 41"	-0.07"	222° 55' 12"	-16° 26' 52"	0.9909439	16' 08.40"	23° 26' 17"	16 m 21 s
21	225° 26' 11"	-0.06"	222° 57' 42"	-16° 27' 36"	0.9909337	16' 08.41"	23° 26' 17"	16 m 21 s
22	225° 28' 41"	-0.06"	223° 00' 13"	-16° 28' 20"	0.9909235	16' 08.42"	23° 26' 17"	16 m 21 s
23	225° 31' 12"	-0.05"	223° 02' 43"	-16° 29' 04"	0.9909134	16' 08.43"	23° 26' 17"	16 m 20 s
24	225° 33' 42"	-0.04"	223° 05' 13"	-16° 29' 47"	0.9909032	16' 08.44"	23° 26' 17"	16 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	27° 07' 42"	-1° 28' 57"	25° 43' 03"	9° 03' 58"	0° 56' 53"	15' 30.06"	244° 16' 51"	0.97701
1	27° 40' 26"	-1° 26' 03"	26° 12' 57"	9° 18' 23"	0° 56' 52"	15' 29.72"	244° 23' 03"	0.97831
2	28° 13' 09"	-1° 23' 08"	26° 42' 52"	9° 32' 45"	0° 56' 51"	15' 29.37"	244° 29' 27"	0.97957
3	28° 45' 50"	-1° 20' 13"	27° 12' 49"	9° 47' 05"	0° 56' 49"	15' 29.03"	244° 36' 04"	0.98080
4	29° 18' 29"	-1° 17' 17"	27° 42' 47"	10° 01' 20"	0° 56' 48"	15' 28.68"	244° 42' 55"	0.98198
5	29° 51' 08"	-1° 14' 21"	28° 12' 46"	10° 15' 33"	0° 56' 47"	15' 28.33"	244° 50' 01"	0.98313
6	30° 23' 44"	-1° 11' 25"	28° 42' 46"	10° 29' 42"	0° 56' 45"	15' 27.99"	244° 57' 21"	0.98424
7	30° 56' 20"	-1° 08' 29"	29° 12' 48"	10° 43' 48"	0° 56' 44"	15' 27.64"	245° 4' 58"	0.98532
8	31° 28' 54"	-1° 05' 32"	29° 42' 52"	10° 57' 50"	0° 56' 43"	15' 27.29"	245° 12' 51"	0.98635
9	32° 01' 26"	-1° 02' 35"	30° 12' 57"	11° 11' 49"	0° 56' 42"	15' 26.94"	245° 21' 02"	0.98735
10	32° 33' 57"	0°-59' 38"	30° 43' 04"	11° 25' 44"	0° 56' 40"	15' 26.59"	245° 29' 32"	0.98831
11	33° 06' 26"	0°-56' 41"	31° 13' 12"	11° 39' 36"	0° 56' 39"	15' 26.24"	245° 38' 22"	0.98923
12	33° 38' 54"	0°-53' 44"	31° 43' 22"	11° 53' 23"	0° 56' 38"	15' 25.89"	245° 47' 35"	0.99011
13	34° 11' 21"	0°-50' 46"	32° 13' 34"	12° 07' 07"	0° 56' 36"	15' 25.54"	245° 57' 12"	0.99096
14	34° 43' 46"	0°-47' 48"	32° 43' 48"	12° 20' 47"	0° 56' 35"	15' 25.19"	246° 7' 15"	0.99176
15	35° 16' 09"	0°-44' 51"	33° 14' 03"	12° 34' 23"	0° 56' 34"	15' 24.84"	246° 17' 47"	0.99253
16	35° 48' 31"	0°-41' 53"	33° 44' 21"	12° 47' 56"	0° 56' 33"	15' 24.48"	246° 28' 53"	0.99326
17	36° 20' 52"	0°-38' 55"	34° 14' 40"	13° 01' 24"	0° 56' 31"	15' 24.13"	246° 40' 35"	0.99395
18	36° 53' 11"	0°-35' 57"	34° 45' 01"	13° 14' 48"	0° 56' 30"	15' 23.78"	246° 52' 60"	0.99461
19	37° 25' 29"	0°-32' 58"	35° 15' 24"	13° 28' 07"	0° 56' 29"	15' 23.43"	247° 6' 13"	0.99523
20	37° 57' 45"	0°-30' 00"	35° 45' 49"	13° 41' 23"	0° 56' 27"	15' 23.07"	247° 20' 23"	0.99581
21	38° 29' 60"	0°-27' 02"	36° 16' 16"	13° 54' 34"	0° 56' 26"	15' 22.72"	247° 35' 41"	0.99635
22	39° 02' 13"	0°-24' 04"	36° 46' 46"	14° 07' 41"	0° 56' 25"	15' 22.36"	247° 52' 20"	0.99685
23	39° 34' 25"	0°-21' 06"	37° 17' 17"	14° 20' 43"	0° 56' 24"	15' 22.01"	248° 10' 39"	0.99732
24	40° 06' 35"	0°-18' 07"	37° 47' 51"	14° 33' 41"	0° 56' 22"	15' 21.66"	248° 31' 02"	0.99774



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	225° 33' 42"	-0.04"	223° 05' 13"	-16° 29' 47"	0.9909032	16' 08.44"	23° 26' 17"	16 m 20 s
1	225° 36' 13"	-0.04"	223° 07' 43"	-16° 30' 31"	0.9908931	16' 08.45"	23° 26' 17"	16 m 20 s
2	225° 38' 43"	-0.03"	223° 10' 13"	-16° 31' 15"	0.9908829	16' 08.46"	23° 26' 17"	16 m 20 s
3	225° 41' 14"	-0.03"	223° 12' 44"	-16° 31' 58"	0.9908728	16' 08.47"	23° 26' 17"	16 m 20 s
4	225° 43' 44"	-0.02"	223° 15' 14"	-16° 32' 42"	0.9908626	16' 08.48"	23° 26' 17"	16 m 20 s
5	225° 46' 15"	-0.02"	223° 17' 44"	-16° 33' 26"	0.9908525	16' 08.49"	23° 26' 17"	16 m 19 s
6	225° 48' 45"	-0.01"	223° 20' 14"	-16° 34' 09"	0.9908424	16' 08.50"	23° 26' 17"	16 m 19 s
7	225° 51' 16"	-0.01"	223° 22' 45"	-16° 34' 53"	0.9908323	16' 08.51"	23° 26' 17"	16 m 19 s
8	225° 53' 46"	-0.00"	223° 25' 15"	-16° 35' 36"	0.9908222	16' 08.52"	23° 26' 17"	16 m 19 s
9	225° 56' 17"	0.00"	223° 27' 45"	-16° 36' 20"	0.9908121	16' 08.53"	23° 26' 17"	16 m 19 s
10	225° 58' 47"	0.01"	223° 30' 16"	-16° 37' 03"	0.9908020	16' 08.54"	23° 26' 17"	16 m 19 s
11	226° 01' 18"	0.01"	223° 32' 46"	-16° 37' 47"	0.9907919	16' 08.55"	23° 26' 17"	16 m 18 s
12	226° 03' 48"	0.02"	223° 35' 17"	-16° 38' 30"	0.9907818	16' 08.56"	23° 26' 17"	16 m 18 s
13	226° 06' 19"	0.03"	223° 37' 47"	-16° 39' 13"	0.9907718	16' 08.57"	23° 26' 17"	16 m 18 s
14	226° 08' 50"	0.03"	223° 40' 18"	-16° 39' 57"	0.9907617	16' 08.58"	23° 26' 17"	16 m 18 s
15	226° 11' 20"	0.04"	223° 42' 48"	-16° 40' 40"	0.9907517	16' 08.59"	23° 26' 17"	16 m 18 s
16	226° 13' 51"	0.04"	223° 45' 19"	-16° 41' 23"	0.9907416	16' 08.60"	23° 26' 17"	16 m 17 s
17	226° 16' 21"	0.05"	223° 47' 49"	-16° 42' 06"	0.9907316	16' 08.61"	23° 26' 17"	16 m 17 s
18	226° 18' 52"	0.05"	223° 50' 20"	-16° 42' 50"	0.9907215	16' 08.62"	23° 26' 17"	16 m 17 s
19	226° 21' 22"	0.06"	223° 52' 50"	-16° 43' 33"	0.9907115	16' 08.63"	23° 26' 17"	16 m 17 s
20	226° 23' 53"	0.06"	223° 55' 21"	-16° 44' 16"	0.9907015	16' 08.64"	23° 26' 17"	16 m 17 s
21	226° 26' 23"	0.07"	223° 57' 52"	-16° 44' 59"	0.9906915	16' 08.65"	23° 26' 17"	16 m 16 s
22	226° 28' 54"	0.07"	224° 00' 22"	-16° 45' 42"	0.9906815	16' 08.66"	23° 26' 17"	16 m 16 s
23	226° 31' 24"	0.08"	224° 02' 53"	-16° 46' 25"	0.9906715	16' 08.67"	23° 26' 17"	16 m 16 s
24	226° 33' 55"	0.08"	224° 05' 24"	-16° 47' 08"	0.9906615	16' 08.68"	23° 26' 17"	16 m 16 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	40° 06' 35"	0°-18' 07"	37° 47' 51"	14° 33' 41"	0° 56' 22"	15' 21.66"	248° 31' 02"	0.99774
1	40° 38' 44"	0°-15' 09"	38° 18' 27"	14° 46' 35"	0° 56' 21"	15' 21.30"	248° 54' 06"	0.99814
2	41° 10' 52"	0°-12' 11"	38° 49' 05"	14° 59' 23"	0° 56' 20"	15' 20.95"	249° 20' 40"	0.99849
3	41° 42' 58"	0° -9' 13"	39° 19' 45"	15° 12' 07"	0° 56' 18"	15' 20.59"	249° 52' 01"	0.99881
4	42° 15' 02"	0° -6' 15"	39° 50' 28"	15° 24' 47"	0° 56' 17"	15' 20.24"	250° 30' 06"	0.99908
5	42° 47' 05"	0° -3' 17"	40° 21' 13"	15° 37' 21"	0° 56' 16"	15' 19.88"	251° 18' 12"	0.99933
6	43° 19' 06"	0° 00'-20"	40° 51' 60"	15° 49' 51"	0° 56' 14"	15' 19.53"	252° 22' 11"	0.99953
7	43° 51' 07"	0° 02' 38"	41° 22' 50"	16° 02' 16"	0° 56' 13"	15' 19.17"	253° 53' 36"	0.99970
8	44° 23' 05"	0° 05' 35"	41° 53' 42"	16° 14' 35"	0° 56' 12"	15' 18.82"	256° 18' 52"	0.99983
9	44° 55' 02"	0° 08' 33"	42° 24' 36"	16° 26' 50"	0° 56' 11"	15' 18.46"	260° 53' 42"	0.99992
10	45° 26' 58"	0° 11' 30"	42° 55' 33"	16° 38' 60"	0° 56' 09"	15' 18.11"	273° 3' 58"	0.99998
11	45° 58' 52"	0° 14' 27"	43° 26' 33"	16° 51' 04"	0° 56' 08"	15' 17.75"	334° 34' 15"	1.00000
12	46° 30' 45"	0° 17' 23"	43° 57' 35"	17° 03' 03"	0° 56' 07"	15' 17.40"	40° 44' 40"	0.99998
13	47° 02' 36"	0° 20' 20"	44° 28' 39"	17° 14' 57"	0° 56' 05"	15' 17.05"	53° 43' 43"	0.99992
14	47° 34' 26"	0° 23' 16"	44° 59' 46"	17° 26' 46"	0° 56' 04"	15' 16.69"	58° 29' 60"	0.99983
15	48° 06' 14"	0° 26' 10"	45° 30' 57"	17° 38' 27"	0° 56' 03"	15' 16.34"	61° 1' 11"	0.99971
16	48° 38' 01"	0° 29' 05"	46° 02' 09"	17° 50' 05"	0° 56' 01"	15' 15.99"	62° 35' 17"	0.99954
17	49° 09' 47"	0° 32' 01"	46° 33' 24"	18° 01' 37"	0° 56' 00"	15' 15.63"	63° 41' 24"	0.99935
18	49° 41' 31"	0° 34' 56"	47° 04' 42"	18° 13' 04"	0° 55' 59"	15' 15.28"	64° 31' 31"	0.99911
19	50° 13' 13"	0° 37' 51"	47° 36' 02"	18° 24' 25"	0° 55' 58"	15' 14.93"	65° 11' 39"	0.99884
20	50° 44' 54"	0° 40' 45"	48° 07' 24"	18° 35' 40"	0° 55' 56"	15' 14.58"	65° 45' 10"	0.99853
21	51° 16' 34"	0° 43' 39"	48° 38' 50"	18° 46' 50"	0° 55' 55"	15' 14.23"	66° 14' 04"	0.99819
22	51° 48' 12"	0° 46' 33"	49° 10' 18"	18° 57' 54"	0° 55' 54"	15' 13.87"	66° 39' 39"	0.99781
23	52° 19' 49"	0° 49' 26"	49° 41' 49"	19° 08' 52"	0° 55' 52"	15' 13.52"	67° 2' 46"	0.99740
24	52° 51' 24"	0° 52' 19"	50° 13' 22"	19° 19' 44"	0° 55' 51"	15' 13.17"	67° 24' 01"	0.99695

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	226° 33' 55"	0.08"	224° 05' 24"	-16° 47' 08"	0.9906615	16' 08.68"	23° 26' 17"	16 m 16 s
1	226° 36' 26"	0.09"	224° 07' 54"	-16° 47' 51"	0.9906515	16' 08.69"	23° 26' 17"	16 m 16 s
2	226° 38' 56"	0.10"	224° 10' 25"	-16° 48' 34"	0.9906415	16' 08.70"	23° 26' 17"	16 m 15 s
3	226° 41' 27"	0.10"	224° 12' 56"	-16° 49' 17"	0.9906316	16' 08.71"	23° 26' 17"	16 m 15 s
4	226° 43' 57"	0.11"	224° 15' 27"	-16° 49' 60"	0.9906216	16' 08.71"	23° 26' 17"	16 m 15 s
5	226° 46' 28"	0.11"	224° 17' 57"	-16° 50' 43"	0.9906117	16' 08.72"	23° 26' 17"	16 m 15 s
6	226° 48' 58"	0.12"	224° 20' 28"	-16° 51' 26"	0.9906017	16' 08.73"	23° 26' 17"	16 m 15 s
7	226° 51' 29"	0.12"	224° 22' 59"	-16° 52' 08"	0.9905918	16' 08.74"	23° 26' 17"	16 m 14 s
8	226° 53' 60"	0.13"	224° 25' 30"	-16° 52' 51"	0.9905818	16' 08.75"	23° 26' 17"	16 m 14 s
9	226° 56' 30"	0.13"	224° 28' 01"	-16° 53' 34"	0.9905719	16' 08.76"	23° 26' 17"	16 m 14 s
10	226° 59' 01"	0.14"	224° 30' 32"	-16° 54' 17"	0.9905620	16' 08.77"	23° 26' 17"	16 m 14 s
11	227° 01' 31"	0.14"	224° 33' 03"	-16° 54' 59"	0.9905521	16' 08.78"	23° 26' 17"	16 m 14 s
12	227° 04' 02"	0.15"	224° 35' 34"	-16° 55' 42"	0.9905422	16' 08.79"	23° 26' 17"	16 m 13 s
13	227° 06' 33"	0.15"	224° 38' 05"	-16° 56' 25"	0.9905323	16' 08.80"	23° 26' 17"	16 m 13 s
14	227° 09' 03"	0.16"	224° 40' 36"	-16° 57' 07"	0.9905224	16' 08.81"	23° 26' 17"	16 m 13 s
15	227° 11' 34"	0.16"	224° 43' 07"	-16° 57' 50"	0.9905125	16' 08.82"	23° 26' 17"	16 m 13 s
16	227° 14' 04"	0.17"	224° 45' 38"	-16° 58' 32"	0.9905026	16' 08.83"	23° 26' 17"	16 m 13 s
17	227° 16' 35"	0.18"	224° 48' 09"	-16° 59' 15"	0.9904928	16' 08.84"	23° 26' 17"	16 m 12 s
18	227° 19' 06"	0.18"	224° 50' 40"	-16° 59' 57"	0.9904829	16' 08.85"	23° 26' 17"	16 m 12 s
19	227° 21' 36"	0.19"	224° 53' 11"	-17° 00' 40"	0.9904730	16' 08.86"	23° 26' 17"	16 m 12 s
20	227° 24' 07"	0.19"	224° 55' 42"	-17° 01' 22"	0.9904632	16' 08.87"	23° 26' 17"	16 m 12 s
21	227° 26' 37"	0.20"	224° 58' 13"	-17° 02' 05"	0.9904534	16' 08.88"	23° 26' 17"	16 m 11 s
22	227° 29' 08"	0.20"	225° 00' 45"	-17° 02' 47"	0.9904435	16' 08.89"	23° 26' 17"	16 m 11 s
23	227° 31' 39"	0.21"	225° 03' 16"	-17° 03' 29"	0.9904337	16' 08.90"	23° 26' 17"	16 m 11 s
24	227° 34' 09"	0.21"	225° 05' 47"	-17° 04' 12"	0.9904239	16' 08.91"	23° 26' 17"	16 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	52° 51' 24"	0° 52' 19"	50° 13' 22"	19° 19' 44"	0° 55' 51"	15' 13.17"	67° 24' 01"	0.99695
1	53° 22' 58"	0° 55' 12"	50° 44' 58"	19° 30' 30"	0° 55' 50"	15' 12.82"	67° 43' 49"	0.99646
2	53° 54' 30"	0° 58' 04"	51° 16' 37"	19° 41' 11"	0° 55' 49"	15' 12.48"	68° 2' 29"	0.99594
3	54° 26' 01"	1° 00' 56"	51° 48' 19"	19° 51' 45"	0° 55' 47"	15' 12.13"	68° 20' 14"	0.99539
4	54° 57' 31"	1° 03' 47"	52° 20' 03"	20° 02' 13"	0° 55' 46"	15' 11.78"	68° 37' 16"	0.99480
5	55° 28' 59"	1° 06' 38"	52° 51' 50"	20° 12' 35"	0° 55' 45"	15' 11.43"	68° 53' 43"	0.99417
6	56° 00' 26"	1° 09' 28"	53° 23' 40"	20° 22' 51"	0° 55' 43"	15' 11.09"	69° 9' 40"	0.99351
7	56° 31' 51"	1° 12' 18"	53° 55' 32"	20° 32' 60"	0° 55' 42"	15' 10.74"	69° 25' 14"	0.99282
8	57° 03' 15"	1° 15' 07"	54° 27' 27"	20° 43' 03"	0° 55' 41"	15' 10.40"	69° 40' 29"	0.99209
9	57° 34' 37"	1° 17' 56"	54° 59' 25"	20° 52' 60"	0° 55' 40"	15' 10.05"	69° 55' 28"	0.99133
10	58° 05' 59"	1° 20' 45"	55° 31' 26"	21° 02' 50"	0° 55' 38"	15' 09.71"	70° 10' 14"	0.99053
11	58° 37' 18"	1° 23' 32"	56° 03' 29"	21° 12' 34"	0° 55' 37"	15' 09.37"	70° 24' 49"	0.98970
12	59° 08' 36"	1° 26' 20"	56° 35' 35"	21° 22' 12"	0° 55' 36"	15' 09.03"	70° 39' 15"	0.98884
13	59° 39' 53"	1° 29' 06"	57° 07' 44"	21° 31' 42"	0° 55' 35"	15' 08.69"	70° 53' 34"	0.98794
14	60° 11' 09"	1° 31' 52"	57° 39' 55"	21° 41' 07"	0° 55' 33"	15' 08.35"	71° 7' 47"	0.98701
15	60° 42' 23"	1° 34' 38"	58° 12' 09"	21° 50' 24"	0° 55' 32"	15' 08.01"	71° 21' 56"	0.98604
16	61° 13' 36"	1° 37' 23"	58° 44' 26"	21° 59' 35"	0° 55' 31"	15' 07.68"	71° 36' 01"	0.98505
17	61° 44' 47"	1° 40' 07"	59° 16' 45"	22° 08' 39"	0° 55' 30"	15' 07.34"	71° 50' 04"	0.98402
18	62° 15' 57"	1° 42' 51"	59° 49' 07"	22° 17' 36"	0° 55' 28"	15' 07.01"	72° 4' 05"	0.98295
19	62° 47' 05"	1° 45' 34"	60° 21' 31"	22° 26' 27"	0° 55' 27"	15' 06.67"	72° 18' 04"	0.98186
20	63° 18' 13"	1° 48' 16"	60° 53' 58"	22° 35' 10"	0° 55' 26"	15' 06.34"	72° 32' 03"	0.98073
21	63° 49' 19"	1° 50' 58"	61° 26' 28"	22° 43' 47"	0° 55' 25"	15' 06.01"	72° 46' 02"	0.97957
22	64° 20' 23"	1° 53' 39"	61° 59' 00"	22° 52' 17"	0° 55' 24"	15' 05.68"	73° 0' 01"	0.97837
23	64° 51' 26"	1° 56' 20"	62° 31' 35"	23° 00' 39"	0° 55' 22"	15' 05.35"	73° 14' 00"	0.97715
24	65° 22' 28"	1° 58' 59"	63° 04' 12"	23° 08' 55"	0° 55' 21"	15' 05.03"	73° 28' 01"	0.97589



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	227° 34' 09"	0.21"	225° 05' 47"	-17° 04' 12"	0.9904239	16' 08.91"	23° 26' 17"	16 m 11 s
1	227° 36' 40"	0.22"	225° 08' 18"	-17° 04' 54"	0.9904141	16' 08.92"	23° 26' 17"	16 m 10 s
2	227° 39' 11"	0.22"	225° 10' 49"	-17° 05' 36"	0.9904043	16' 08.93"	23° 26' 17"	16 m 10 s
3	227° 41' 41"	0.23"	225° 13' 21"	-17° 06' 18"	0.9903945	16' 08.94"	23° 26' 17"	16 m 10 s
4	227° 44' 12"	0.23"	225° 15' 52"	-17° 07' 01"	0.9903847	16' 08.95"	23° 26' 17"	16 m 10 s
5	227° 46' 43"	0.24"	225° 18' 23"	-17° 07' 43"	0.9903749	16' 08.96"	23° 26' 17"	16 m 09 s
6	227° 49' 13"	0.24"	225° 20' 55"	-17° 08' 25"	0.9903651	16' 08.97"	23° 26' 17"	16 m 09 s
7	227° 51' 44"	0.25"	225° 23' 26"	-17° 09' 07"	0.9903553	16' 08.98"	23° 26' 17"	16 m 09 s
8	227° 54' 15"	0.25"	225° 25' 58"	-17° 09' 49"	0.9903456	16' 08.99"	23° 26' 17"	16 m 09 s
9	227° 56' 45"	0.26"	225° 28' 29"	-17° 10' 31"	0.9903358	16' 08.99"	23° 26' 17"	16 m 09 s
10	227° 59' 16"	0.26"	225° 31' 01"	-17° 11' 13"	0.9903261	16' 09.00"	23° 26' 17"	16 m 08 s
11	228° 01' 47"	0.27"	225° 33' 32"	-17° 11' 55"	0.9903163	16' 09.01"	23° 26' 17"	16 m 08 s
12	228° 04' 17"	0.27"	225° 36' 03"	-17° 12' 37"	0.9903066	16' 09.02"	23° 26' 17"	16 m 08 s
13	228° 06' 48"	0.28"	225° 38' 35"	-17° 13' 19"	0.9902968	16' 09.03"	23° 26' 17"	16 m 08 s
14	228° 09' 19"	0.28"	225° 41' 07"	-17° 14' 01"	0.9902871	16' 09.04"	23° 26' 17"	16 m 07 s
15	228° 11' 49"	0.29"	225° 43' 38"	-17° 14' 43"	0.9902774	16' 09.05"	23° 26' 17"	16 m 07 s
16	228° 14' 20"	0.29"	225° 46' 10"	-17° 15' 24"	0.9902677	16' 09.06"	23° 26' 17"	16 m 07 s
17	228° 16' 51"	0.30"	225° 48' 41"	-17° 16' 06"	0.9902580	16' 09.07"	23° 26' 17"	16 m 06 s
18	228° 19' 21"	0.30"	225° 51' 13"	-17° 16' 48"	0.9902483	16' 09.08"	23° 26' 17"	16 m 06 s
19	228° 21' 52"	0.31"	225° 53' 45"	-17° 17' 30"	0.9902386	16' 09.09"	23° 26' 17"	16 m 06 s
20	228° 24' 23"	0.31"	225° 56' 16"	-17° 18' 11"	0.9902289	16' 09.10"	23° 26' 17"	16 m 06 s
21	228° 26' 53"	0.31"	225° 58' 48"	-17° 18' 53"	0.9902193	16' 09.11"	23° 26' 17"	16 m 05 s
22	228° 29' 24"	0.32"	226° 01' 20"	-17° 19' 35"	0.9902096	16' 09.12"	23° 26' 17"	16 m 05 s
23	228° 31' 55"	0.32"	226° 03' 51"	-17° 20' 16"	0.9901999	16' 09.13"	23° 26' 17"	16 m 05 s
24	228° 34' 26"	0.33"	226° 06' 23"	-17° 20' 58"	0.9901903	16' 09.14"	23° 26' 17"	16 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	65° 22' 28"	1° 58' 59"	63° 04' 12"	23° 08' 55"	0° 55' 21"	15' 05.03"	73° 28' 01"	0.97589
1	65° 53' 29"	2° 01' 38"	63° 36' 52"	23° 17' 03"	0° 55' 20"	15' 04.70"	73° 42' 02"	0.97460
2	66° 24' 28"	2° 04' 17"	64° 09' 34"	23° 25' 05"	0° 55' 19"	15' 04.38"	73° 56' 05"	0.97328
3	66° 55' 26"	2° 06' 54"	64° 42' 19"	23° 32' 59"	0° 55' 18"	15' 04.05"	74° 10' 10"	0.97193
4	67° 26' 22"	2° 09' 31"	65° 15' 06"	23° 40' 46"	0° 55' 16"	15' 03.73"	74° 24' 17"	0.97054
5	67° 57' 17"	2° 12' 07"	65° 47' 56"	23° 48' 25"	0° 55' 15"	15' 03.41"	74° 38' 25"	0.96913
6	68° 28' 11"	2° 14' 42"	66° 20' 47"	23° 55' 58"	0° 55' 14"	15' 03.10"	74° 52' 36"	0.96768
7	68° 59' 04"	2° 17' 17"	66° 53' 41"	24° 03' 23"	0° 55' 13"	15' 02.78"	75° 6' 49"	0.96621
8	69° 29' 55"	2° 19' 51"	67° 26' 38"	24° 10' 40"	0° 55' 12"	15' 02.47"	75° 21' 04"	0.96470
9	70° 00' 45"	2° 22' 24"	67° 59' 36"	24° 17' 50"	0° 55' 11"	15' 02.15"	75° 35' 22"	0.96316
10	70° 31' 34"	2° 24' 56"	68° 32' 37"	24° 24' 53"	0° 55' 10"	15' 01.84"	75° 49' 42"	0.96160
11	71° 02' 21"	2° 27' 27"	69° 05' 40"	24° 31' 48"	0° 55' 08"	15' 01.53"	76° 4' 05"	0.96000
12	71° 33' 07"	2° 29' 58"	69° 38' 45"	24° 38' 36"	0° 55' 07"	15' 01.23"	76° 18' 31"	0.95837
13	72° 03' 52"	2° 32' 27"	70° 11' 52"	24° 45' 16"	0° 55' 06"	15' 00.92"	76° 32' 59"	0.95671
14	72° 34' 36"	2° 34' 56"	70° 45' 02"	24° 51' 49"	0° 55' 05"	15' 00.62"	76° 47' 29"	0.95503
15	73° 05' 19"	2° 37' 24"	71° 18' 13"	24° 58' 14"	0° 55' 04"	15' 00.32"	77° 2' 03"	0.95331
16	73° 35' 60"	2° 39' 51"	71° 51' 26"	25° 04' 31"	0° 55' 03"	15' 00.02"	77° 16' 39"	0.95157
17	74° 06' 40"	2° 42' 18"	72° 24' 41"	25° 10' 41"	0° 55' 02"	14' 59.72"	77° 31' 18"	0.94979
18	74° 37' 19"	2° 44' 43"	72° 57' 58"	25° 16' 43"	0° 55' 01"	14' 59.42"	77° 45' 59"	0.94799
19	75° 07' 56"	2° 47' 07"	73° 31' 17"	25° 22' 37"	0° 54' 60"	14' 59.13"	78° 0' 43"	0.94616
20	75° 38' 32"	2° 49' 31"	74° 04' 38"	25° 28' 24"	0° 54' 58"	14' 58.84"	78° 15' 30"	0.94430
21	76° 09' 08"	2° 51' 54"	74° 38' 00"	25° 34' 03"	0° 54' 57"	14' 58.55"	78° 30' 19"	0.94241
22	76° 39' 42"	2° 54' 15"	75° 11' 24"	25° 39' 33"	0° 54' 56"	14' 58.26"	78° 45' 11"	0.94050
23	77° 10' 14"	2° 56' 36"	75° 44' 50"	25° 44' 56"	0° 54' 55"	14' 57.98"	79° 0' 06"	0.93855
24	77° 40' 46"	2° 58' 56"	76° 18' 17"	25° 50' 12"	0° 54' 54"	14' 57.69"	79° 15' 03"	0.93658

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	228° 34' 26"	0.33"	226° 06' 23"	-17° 20' 58"	0.9901903	16' 09.14"	23° 26' 17"	16 m 05 s
1	228° 36' 56"	0.33"	226° 08' 55"	-17° 21' 39"	0.9901806	16' 09.15"	23° 26' 17"	16 m 04 s
2	228° 39' 27"	0.34"	226° 11' 27"	-17° 22' 21"	0.9901710	16' 09.16"	23° 26' 17"	16 m 04 s
3	228° 41' 58"	0.34"	226° 13' 59"	-17° 23' 02"	0.9901614	16' 09.17"	23° 26' 17"	16 m 04 s
4	228° 44' 28"	0.35"	226° 16' 31"	-17° 23' 44"	0.9901517	16' 09.17"	23° 26' 17"	16 m 04 s
5	228° 46' 59"	0.35"	226° 19' 02"	-17° 24' 25"	0.9901421	16' 09.18"	23° 26' 17"	16 m 03 s
6	228° 49' 30"	0.36"	226° 21' 34"	-17° 25' 07"	0.9901325	16' 09.19"	23° 26' 17"	16 m 03 s
7	228° 52' 01"	0.36"	226° 24' 06"	-17° 25' 48"	0.9901229	16' 09.20"	23° 26' 17"	16 m 03 s
8	228° 54' 31"	0.36"	226° 26' 38"	-17° 26' 29"	0.9901133	16' 09.21"	23° 26' 17"	16 m 02 s
9	228° 57' 02"	0.37"	226° 29' 10"	-17° 27' 11"	0.9901037	16' 09.22"	23° 26' 17"	16 m 02 s
10	228° 59' 33"	0.37"	226° 31' 42"	-17° 27' 52"	0.9900941	16' 09.23"	23° 26' 17"	16 m 02 s
11	229° 02' 04"	0.38"	226° 34' 14"	-17° 28' 33"	0.9900846	16' 09.24"	23° 26' 17"	16 m 02 s
12	229° 04' 34"	0.38"	226° 36' 46"	-17° 29' 14"	0.9900750	16' 09.25"	23° 26' 17"	16 m 01 s
13	229° 07' 05"	0.39"	226° 39' 18"	-17° 29' 56"	0.9900654	16' 09.26"	23° 26' 17"	16 m 01 s
14	229° 09' 36"	0.39"	226° 41' 50"	-17° 30' 37"	0.9900559	16' 09.27"	23° 26' 17"	16 m 01 s
15	229° 12' 07"	0.39"	226° 44' 22"	-17° 31' 18"	0.9900463	16' 09.28"	23° 26' 17"	16 m 00 s
16	229° 14' 37"	0.40"	226° 46' 55"	-17° 31' 59"	0.9900368	16' 09.29"	23° 26' 17"	16 m 00 s
17	229° 17' 08"	0.40"	226° 49' 27"	-17° 32' 40"	0.9900272	16' 09.30"	23° 26' 17"	15 m 60 s
18	229° 19' 39"	0.41"	226° 51' 59"	-17° 33' 21"	0.9900177	16' 09.31"	23° 26' 17"	15 m 60 s
19	229° 22' 10"	0.41"	226° 54' 31"	-17° 34' 02"	0.9900082	16' 09.32"	23° 26' 17"	15 m 59 s
20	229° 24' 40"	0.41"	226° 57' 03"	-17° 34' 43"	0.9899987	16' 09.32"	23° 26' 17"	15 m 59 s
21	229° 27' 11"	0.42"	226° 59' 36"	-17° 35' 24"	0.9899892	16' 09.33"	23° 26' 17"	15 m 59 s
22	229° 29' 42"	0.42"	227° 02' 08"	-17° 36' 05"	0.9899797	16' 09.34"	23° 26' 17"	15 m 58 s
23	229° 32' 13"	0.43"	227° 04' 40"	-17° 36' 46"	0.9899702	16' 09.35"	23° 26' 17"	15 m 58 s
24	229° 34' 44"	0.43"	227° 07' 12"	-17° 37' 26"	0.9899607	16' 09.36"	23° 26' 17"	15 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	77° 40' 46"	2° 58' 56"	76° 18' 17"	25° 50' 12"	0° 54' 54"	14' 57.69"	79° 15' 03"	0.93658
1	78° 11' 17"	3° 01' 15"	76° 51' 46"	25° 55' 19"	0° 54' 53"	14' 57.41"	79° 30' 02"	0.93458
2	78° 41' 46"	3° 03' 33"	77° 25' 16"	26° 00' 18"	0° 54' 52"	14' 57.13"	79° 45' 04"	0.93256
3	79° 12' 14"	3° 05' 50"	77° 58' 48"	26° 05' 10"	0° 54' 51"	14' 56.86"	80° 0' 08"	0.93051
4	79° 42' 41"	3° 08' 06"	78° 32' 21"	26° 09' 53"	0° 54' 50"	14' 56.59"	80° 15' 14"	0.92843
5	80° 13' 07"	3° 10' 21"	79° 05' 55"	26° 14' 29"	0° 54' 49"	14' 56.31"	80° 30' 23"	0.92632
6	80° 43' 32"	3° 12' 35"	79° 39' 31"	26° 18' 56"	0° 54' 48"	14' 56.05"	80° 45' 34"	0.92419
7	81° 13' 56"	3° 14' 48"	80° 13' 07"	26° 23' 16"	0° 54' 47"	14' 55.78"	81° 0' 47"	0.92203
8	81° 44' 18"	3° 17' 01"	80° 46' 45"	26° 27' 27"	0° 54' 46"	14' 55.52"	81° 16' 02"	0.91984
9	82° 14' 40"	3° 19' 12"	81° 20' 24"	26° 31' 31"	0° 54' 45"	14' 55.26"	81° 31' 19"	0.91763
10	82° 45' 00"	3° 21' 22"	81° 54' 04"	26° 35' 26"	0° 54' 44"	14' 55.00"	81° 46' 37"	0.91539
11	83° 15' 20"	3° 23' 31"	82° 27' 45"	26° 39' 13"	0° 54' 43"	14' 54.74"	82° 1' 58"	0.91313
12	83° 45' 38"	3° 25' 39"	83° 01' 27"	26° 42' 53"	0° 54' 43"	14' 54.49"	82° 17' 21"	0.91084
13	84° 15' 56"	3° 27' 46"	83° 35' 09"	26° 46' 24"	0° 54' 42"	14' 54.24"	82° 32' 45"	0.90853
14	84° 46' 12"	3° 29' 52"	84° 08' 52"	26° 49' 47"	0° 54' 41"	14' 53.99"	82° 48' 10"	0.90619
15	85° 16' 27"	3° 31' 56"	84° 42' 36"	26° 53' 01"	0° 54' 40"	14' 53.75"	83° 3' 38"	0.90383
16	85° 46' 41"	3° 34' 00"	85° 16' 21"	26° 56' 08"	0° 54' 39"	14' 53.51"	83° 19' 06"	0.90144
17	86° 16' 55"	3° 36' 03"	85° 50' 06"	26° 59' 07"	0° 54' 38"	14' 53.27"	83° 34' 36"	0.89903
18	86° 47' 07"	3° 38' 05"	86° 23' 52"	27° 01' 57"	0° 54' 37"	14' 53.03"	83° 50' 08"	0.89659
19	87° 17' 18"	3° 40' 05"	86° 57' 38"	27° 04' 40"	0° 54' 36"	14' 52.80"	84° 5' 40"	0.89413
20	87° 47' 29"	3° 42' 05"	87° 31' 24"	27° 07' 14"	0° 54' 35"	14' 52.57"	84° 21' 14"	0.89165
21	88° 17' 38"	3° 44' 03"	88° 05' 11"	27° 09' 40"	0° 54' 35"	14' 52.34"	84° 36' 49"	0.88914
22	88° 47' 47"	3° 46' 00"	88° 38' 58"	27° 11' 57"	0° 54' 34"	14' 52.12"	84° 52' 24"	0.88661
23	89° 17' 54"	3° 47' 57"	89° 12' 45"	27° 14' 07"	0° 54' 33"	14' 51.90"	85° 8' 01"	0.88405
24	89° 48' 01"	3° 49' 52"	89° 46' 33"	27° 16' 08"	0° 54' 32"	14' 51.68"	85° 23' 38"	0.88147

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	229° 34' 44"	0.43"	227° 07' 12"	-17° 37' 26"	0.9899607	16' 09.36"	23° 26' 17"	15 m 58 s
1	229° 37' 14"	0.43"	227° 09' 45"	-17° 38' 07"	0.9899512	16' 09.37"	23° 26' 17"	15 m 57 s
2	229° 39' 45"	0.44"	227° 12' 17"	-17° 38' 48"	0.9899417	16' 09.38"	23° 26' 17"	15 m 57 s
3	229° 42' 16"	0.44"	227° 14' 49"	-17° 39' 29"	0.9899322	16' 09.39"	23° 26' 17"	15 m 57 s
4	229° 44' 47"	0.44"	227° 17' 22"	-17° 40' 09"	0.9899228	16' 09.40"	23° 26' 17"	15 m 56 s
5	229° 47' 18"	0.45"	227° 19' 54"	-17° 40' 50"	0.9899133	16' 09.41"	23° 26' 17"	15 m 56 s
6	229° 49' 48"	0.45"	227° 22' 27"	-17° 41' 31"	0.9899039	16' 09.42"	23° 26' 17"	15 m 56 s
7	229° 52' 19"	0.46"	227° 24' 59"	-17° 42' 11"	0.9898944	16' 09.43"	23° 26' 17"	15 m 56 s
8	229° 54' 50"	0.46"	227° 27' 32"	-17° 42' 52"	0.9898850	16' 09.44"	23° 26' 17"	15 m 55 s
9	229° 57' 21"	0.46"	227° 30' 04"	-17° 43' 32"	0.9898756	16' 09.45"	23° 26' 17"	15 m 55 s
10	229° 59' 52"	0.47"	227° 32' 37"	-17° 44' 13"	0.9898661	16' 09.45"	23° 26' 17"	15 m 55 s
11	230° 02' 22"	0.47"	227° 35' 09"	-17° 44' 53"	0.9898567	16' 09.46"	23° 26' 17"	15 m 54 s
12	230° 04' 53"	0.47"	227° 37' 42"	-17° 45' 34"	0.9898473	16' 09.47"	23° 26' 17"	15 m 54 s
13	230° 07' 24"	0.48"	227° 40' 14"	-17° 46' 14"	0.9898379	16' 09.48"	23° 26' 17"	15 m 54 s
14	230° 09' 55"	0.48"	227° 42' 47"	-17° 46' 55"	0.9898285	16' 09.49"	23° 26' 17"	15 m 53 s
15	230° 12' 26"	0.48"	227° 45' 20"	-17° 47' 35"	0.9898191	16' 09.50"	23° 26' 17"	15 m 53 s
16	230° 14' 57"	0.49"	227° 47' 52"	-17° 48' 15"	0.9898098	16' 09.51"	23° 26' 17"	15 m 53 s
17	230° 17' 27"	0.49"	227° 50' 25"	-17° 48' 56"	0.9898004	16' 09.52"	23° 26' 17"	15 m 52 s
18	230° 19' 58"	0.49"	227° 52' 58"	-17° 49' 36"	0.9897910	16' 09.53"	23° 26' 17"	15 m 52 s
19	230° 22' 29"	0.49"	227° 55' 30"	-17° 50' 16"	0.9897817	16' 09.54"	23° 26' 17"	15 m 52 s
20	230° 25' 00"	0.50"	227° 58' 03"	-17° 50' 56"	0.9897723	16' 09.55"	23° 26' 17"	15 m 51 s
21	230° 27' 31"	0.50"	228° 00' 36"	-17° 51' 36"	0.9897630	16' 09.56"	23° 26' 17"	15 m 51 s
22	230° 30' 02"	0.50"	228° 03' 09"	-17° 52' 16"	0.9897536	16' 09.56"	23° 26' 17"	15 m 51 s
23	230° 32' 33"	0.51"	228° 05' 42"	-17° 52' 57"	0.9897443	16' 09.57"	23° 26' 17"	15 m 50 s
24	230° 35' 03"	0.51"	228° 08' 14"	-17° 53' 37"	0.9897349	16' 09.58"	23° 26' 17"	15 m 50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	89° 48' 01"	3° 49' 52"	89° 46' 33"	27° 16' 08"	0° 54' 32"	14' 51.68"	85° 23' 38"	0.88147
1	90° 18' 06"	3° 51' 46"	90° 20' 20"	27° 18' 01"	0° 54' 31"	14' 51.47"	85° 39' 15"	0.87887
2	90° 48' 11"	3° 53' 38"	90° 54' 07"	27° 19' 47"	0° 54' 31"	14' 51.26"	85° 54' 54"	0.87625
3	91° 18' 15"	3° 55' 30"	91° 27' 54"	27° 21' 23"	0° 54' 30"	14' 51.05"	86° 10' 33"	0.87360
4	91° 48' 18"	3° 57' 21"	92° 01' 41"	27° 22' 52"	0° 54' 29"	14' 50.84"	86° 26' 12"	0.87094
5	92° 18' 21"	3° 59' 10"	92° 35' 28"	27° 24' 13"	0° 54' 28"	14' 50.64"	86° 41' 51"	0.86825
6	92° 48' 22"	4° 00' 58"	93° 09' 14"	27° 25' 25"	0° 54' 28"	14' 50.44"	86° 57' 31"	0.86553
7	93° 18' 23"	4° 02' 45"	93° 43' 00"	27° 26' 29"	0° 54' 27"	14' 50.25"	87° 13' 11"	0.86280
8	93° 48' 22"	4° 04' 31"	94° 16' 46"	27° 27' 25"	0° 54' 26"	14' 50.06"	87° 28' 51"	0.86004
9	94° 18' 21"	4° 06' 16"	94° 50' 31"	27° 28' 13"	0° 54' 26"	14' 49.87"	87° 44' 30"	0.85727
10	94° 48' 20"	4° 07' 59"	95° 24' 15"	27° 28' 52"	0° 54' 25"	14' 49.68"	88° 0' 10"	0.85447
11	95° 18' 17"	4° 09' 42"	95° 57' 59"	27° 29' 24"	0° 54' 24"	14' 49.50"	88° 15' 49"	0.85165
12	95° 48' 14"	4° 11' 23"	96° 31' 42"	27° 29' 47"	0° 54' 24"	14' 49.32"	88° 31' 28"	0.84881
13	96° 18' 10"	4° 13' 03"	97° 05' 24"	27° 30' 02"	0° 54' 23"	14' 49.15"	88° 47' 06"	0.84595
14	96° 48' 05"	4° 14' 42"	97° 39' 06"	27° 30' 09"	0° 54' 22"	14' 48.98"	89° 2' 44"	0.84307
15	97° 17' 59"	4° 16' 19"	98° 12' 46"	27° 30' 08"	0° 54' 22"	14' 48.81"	89° 18' 21"	0.84017
16	97° 47' 53"	4° 17' 56"	98° 46' 26"	27° 29' 59"	0° 54' 21"	14' 48.65"	89° 33' 57"	0.83724
17	98° 17' 46"	4° 19' 31"	99° 20' 04"	27° 29' 42"	0° 54' 21"	14' 48.49"	89° 49' 33"	0.83430
18	98° 47' 38"	4° 21' 05"	99° 53' 42"	27° 29' 17"	0° 54' 20"	14' 48.33"	90° 5' 07"	0.83134
19	99° 17' 30"	4° 22' 38"	100° 27' 18"	27° 28' 43"	0° 54' 19"	14' 48.18"	90° 20' 41"	0.82836
20	99° 47' 21"	4° 24' 09"	101° 00' 53"	27° 28' 02"	0° 54' 19"	14' 48.03"	90° 36' 13"	0.82536
21	100° 17' 12"	4° 25' 40"	101° 34' 26"	27° 27' 12"	0° 54' 18"	14' 47.89"	90° 51' 44"	0.82234
22	100° 47' 01"	4° 27' 09"	102° 07' 58"	27° 26' 15"	0° 54' 18"	14' 47.75"	91° 7' 14"	0.81931
23	101° 16' 51"	4° 28' 36"	102° 41' 29"	27° 25' 09"	0° 54' 17"	14' 47.61"	91° 22' 43"	0.81625
24	101° 46' 39"	4° 30' 03"	103° 14' 59"	27° 23' 56"	0° 54' 17"	14' 47.48"	91° 38' 09"	0.81318

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	230° 35' 03"	0.51"	228° 08' 14"	-17° 53' 37"	0.9897349	16' 09.58"	23° 26' 17"	15 m 50 s
1	230° 37' 34"	0.51"	228° 10' 47"	-17° 54' 17"	0.9897256	16' 09.59"	23° 26' 17"	15 m 50 s
2	230° 40' 05"	0.51"	228° 13' 20"	-17° 54' 57"	0.9897163	16' 09.60"	23° 26' 17"	15 m 49 s
3	230° 42' 36"	0.52"	228° 15' 53"	-17° 55' 37"	0.9897070	16' 09.61"	23° 26' 17"	15 m 49 s
4	230° 45' 07"	0.52"	228° 18' 26"	-17° 56' 17"	0.9896977	16' 09.62"	23° 26' 17"	15 m 49 s
5	230° 47' 38"	0.52"	228° 20' 59"	-17° 56' 56"	0.9896884	16' 09.63"	23° 26' 17"	15 m 48 s
6	230° 50' 09"	0.52"	228° 23' 32"	-17° 57' 36"	0.9896791	16' 09.64"	23° 26' 17"	15 m 48 s
7	230° 52' 40"	0.53"	228° 26' 05"	-17° 58' 16"	0.9896698	16' 09.65"	23° 26' 17"	15 m 47 s
8	230° 55' 11"	0.53"	228° 28' 38"	-17° 58' 56"	0.9896606	16' 09.66"	23° 26' 17"	15 m 47 s
9	230° 57' 41"	0.53"	228° 31' 11"	-17° 59' 36"	0.9896513	16' 09.66"	23° 26' 17"	15 m 47 s
10	231° 00' 12"	0.53"	228° 33' 44"	-18° 00' 15"	0.9896420	16' 09.67"	23° 26' 17"	15 m 46 s
11	231° 02' 43"	0.54"	228° 36' 17"	-18° 00' 55"	0.9896328	16' 09.68"	23° 26' 17"	15 m 46 s
12	231° 05' 14"	0.54"	228° 38' 50"	-18° 01' 35"	0.9896235	16' 09.69"	23° 26' 17"	15 m 46 s
13	231° 07' 45"	0.54"	228° 41' 23"	-18° 02' 14"	0.9896143	16' 09.70"	23° 26' 17"	15 m 45 s
14	231° 10' 16"	0.54"	228° 43' 57"	-18° 02' 54"	0.9896050	16' 09.71"	23° 26' 17"	15 m 45 s
15	231° 12' 47"	0.55"	228° 46' 30"	-18° 03' 34"	0.9895958	16' 09.72"	23° 26' 17"	15 m 45 s
16	231° 15' 18"	0.55"	228° 49' 03"	-18° 04' 13"	0.9895866	16' 09.73"	23° 26' 17"	15 m 44 s
17	231° 17' 49"	0.55"	228° 51' 36"	-18° 04' 53"	0.9895774	16' 09.74"	23° 26' 17"	15 m 44 s
18	231° 20' 20"	0.55"	228° 54' 09"	-18° 05' 32"	0.9895681	16' 09.75"	23° 26' 17"	15 m 44 s
19	231° 22' 51"	0.55"	228° 56' 43"	-18° 06' 12"	0.9895589	16' 09.76"	23° 26' 17"	15 m 43 s
20	231° 25' 21"	0.56"	228° 59' 16"	-18° 06' 51"	0.9895497	16' 09.76"	23° 26' 17"	15 m 43 s
21	231° 27' 52"	0.56"	229° 01' 49"	-18° 07' 30"	0.9895406	16' 09.77"	23° 26' 17"	15 m 42 s
22	231° 30' 23"	0.56"	229° 04' 23"	-18° 08' 10"	0.9895314	16' 09.78"	23° 26' 17"	15 m 42 s
23	231° 32' 54"	0.56"	229° 06' 56"	-18° 08' 49"	0.9895222	16' 09.79"	23° 26' 17"	15 m 42 s
24	231° 35' 25"	0.56"	229° 09' 29"	-18° 09' 28"	0.9895130	16' 09.80"	23° 26' 17"	15 m 41 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	101° 46' 39"	4° 30' 03"	103° 14' 59"	27° 23' 56"	0° 54' 17"	14' 47.48"	91° 38' 09"	0.81318
1	102° 16' 27"	4° 31' 28"	103° 48' 26"	27° 22' 35"	0° 54' 16"	14' 47.35"	91° 53' 35"	0.81008
2	102° 46' 15"	4° 32' 52"	104° 21' 52"	27° 21' 05"	0° 54' 16"	14' 47.22"	92° 8' 58"	0.80697
3	103° 16' 02"	4° 34' 15"	104° 55' 17"	27° 19' 28"	0° 54' 15"	14' 47.10"	92° 24' 20"	0.80384
4	103° 45' 48"	4° 35' 37"	105° 28' 40"	27° 17' 43"	0° 54' 15"	14' 46.98"	92° 39' 40"	0.80069
5	104° 15' 34"	4° 36' 57"	106° 02' 01"	27° 15' 50"	0° 54' 15"	14' 46.87"	92° 54' 58"	0.79753
6	104° 45' 20"	4° 38' 16"	106° 35' 20"	27° 13' 49"	0° 54' 14"	14' 46.76"	93° 10' 14"	0.79435
7	105° 15' 05"	4° 39' 34"	107° 08' 37"	27° 11' 40"	0° 54' 14"	14' 46.66"	93° 25' 27"	0.79115
8	105° 44' 49"	4° 40' 50"	107° 41' 52"	27° 09' 23"	0° 54' 13"	14' 46.56"	93° 40' 39"	0.78793
9	106° 14' 33"	4° 42' 05"	108° 15' 05"	27° 06' 59"	0° 54' 13"	14' 46.46"	93° 55' 48"	0.78470
10	106° 44' 17"	4° 43' 19"	108° 48' 17"	27° 04' 27"	0° 54' 13"	14' 46.37"	94° 10' 55"	0.78145
11	107° 14' 00"	4° 44' 32"	109° 21' 26"	27° 01' 47"	0° 54' 12"	14' 46.28"	94° 25' 59"	0.77818
12	107° 43' 43"	4° 45' 43"	109° 54' 32"	26° 58' 59"	0° 54' 12"	14' 46.19"	94° 41' 01"	0.77490
13	108° 13' 25"	4° 46' 53"	110° 27' 37"	26° 56' 04"	0° 54' 12"	14' 46.11"	94° 55' 60"	0.77160
14	108° 43' 08"	4° 48' 02"	111° 00' 40"	26° 53' 01"	0° 54' 12"	14' 46.03"	95° 10' 56"	0.76828
15	109° 12' 49"	4° 49' 09"	111° 33' 40"	26° 49' 50"	0° 54' 11"	14' 45.96"	95° 25' 50"	0.76495
16	109° 42' 31"	4° 50' 16"	112° 06' 37"	26° 46' 32"	0° 54' 11"	14' 45.90"	95° 40' 40"	0.76161
17	110° 12' 12"	4° 51' 20"	112° 39' 33"	26° 43' 07"	0° 54' 11"	14' 45.83"	95° 55' 28"	0.75824
18	110° 41' 53"	4° 52' 24"	113° 12' 25"	26° 39' 33"	0° 54' 11"	14' 45.77"	96° 10' 12"	0.75487
19	111° 11' 33"	4° 53' 26"	113° 45' 16"	26° 35' 52"	0° 54' 10"	14' 45.72"	96° 24' 53"	0.75147
20	111° 41' 13"	4° 54' 27"	114° 18' 04"	26° 32' 04"	0° 54' 10"	14' 45.67"	96° 39' 32"	0.74807
21	112° 10' 53"	4° 55' 26"	114° 50' 49"	26° 28' 08"	0° 54' 10"	14' 45.62"	96° 54' 06"	0.74465
22	112° 40' 33"	4° 56' 25"	115° 23' 32"	26° 24' 05"	0° 54' 10"	14' 45.58"	97° 8' 38"	0.74121
23	113° 10' 13"	4° 57' 21"	115° 56' 11"	26° 19' 55"	0° 54' 10"	14' 45.54"	97° 23' 06"	0.73776
24	113° 39' 52"	4° 58' 17"	116° 28' 49"	26° 15' 37"	0° 54' 10"	14' 45.51"	97° 37' 30"	0.73429



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	231° 35' 25"	0.56"	229° 09' 29"	-18° 09' 28"	0.9895130	16' 09.80"	23° 26' 17"	15 m 41 s
1	231° 37' 56"	0.56"	229° 12' 03"	-18° 10' 08"	0.9895038	16' 09.81"	23° 26' 17"	15 m 41 s
2	231° 40' 27"	0.57"	229° 14' 36"	-18° 10' 47"	0.9894947	16' 09.82"	23° 26' 17"	15 m 41 s
3	231° 42' 58"	0.57"	229° 17' 10"	-18° 11' 26"	0.9894855	16' 09.83"	23° 26' 17"	15 m 40 s
4	231° 45' 29"	0.57"	229° 19' 43"	-18° 12' 05"	0.9894764	16' 09.84"	23° 26' 17"	15 m 40 s
5	231° 48' 00"	0.57"	229° 22' 17"	-18° 12' 44"	0.9894672	16' 09.85"	23° 26' 17"	15 m 39 s
6	231° 50' 31"	0.57"	229° 24' 50"	-18° 13' 23"	0.9894581	16' 09.85"	23° 26' 17"	15 m 39 s
7	231° 53' 02"	0.57"	229° 27' 24"	-18° 14' 02"	0.9894490	16' 09.86"	23° 26' 17"	15 m 39 s
8	231° 55' 33"	0.57"	229° 29' 57"	-18° 14' 41"	0.9894399	16' 09.87"	23° 26' 17"	15 m 38 s
9	231° 58' 04"	0.57"	229° 32' 31"	-18° 15' 20"	0.9894307	16' 09.88"	23° 26' 17"	15 m 38 s
10	232° 00' 35"	0.58"	229° 35' 04"	-18° 15' 59"	0.9894216	16' 09.89"	23° 26' 17"	15 m 37 s
11	232° 03' 06"	0.58"	229° 37' 38"	-18° 16' 38"	0.9894125	16' 09.90"	23° 26' 17"	15 m 37 s
12	232° 05' 37"	0.58"	229° 40' 12"	-18° 17' 17"	0.9894034	16' 09.91"	23° 26' 17"	15 m 37 s
13	232° 08' 08"	0.58"	229° 42' 45"	-18° 17' 56"	0.9893943	16' 09.92"	23° 26' 17"	15 m 36 s
14	232° 10' 39"	0.58"	229° 45' 19"	-18° 18' 35"	0.9893853	16' 09.93"	23° 26' 17"	15 m 36 s
15	232° 13' 10"	0.58"	229° 47' 53"	-18° 19' 14"	0.9893762	16' 09.93"	23° 26' 17"	15 m 35 s
16	232° 15' 41"	0.58"	229° 50' 27"	-18° 19' 52"	0.9893671	16' 09.94"	23° 26' 17"	15 m 35 s
17	232° 18' 12"	0.58"	229° 53' 00"	-18° 20' 31"	0.9893580	16' 09.95"	23° 26' 17"	15 m 35 s
18	232° 20' 43"	0.58"	229° 55' 34"	-18° 21' 10"	0.9893490	16' 09.96"	23° 26' 17"	15 m 34 s
19	232° 23' 14"	0.58"	229° 58' 08"	-18° 21' 48"	0.9893399	16' 09.97"	23° 26' 17"	15 m 34 s
20	232° 25' 45"	0.58"	230° 00' 42"	-18° 22' 27"	0.9893309	16' 09.98"	23° 26' 17"	15 m 33 s
21	232° 28' 16"	0.59"	230° 03' 16"	-18° 23' 06"	0.9893218	16' 09.99"	23° 26' 17"	15 m 33 s
22	232° 30' 47"	0.59"	230° 05' 49"	-18° 23' 44"	0.9893128	16' 10.00"	23° 26' 17"	15 m 33 s
23	232° 33' 18"	0.59"	230° 08' 23"	-18° 24' 23"	0.9893038	16' 10.01"	23° 26' 17"	15 m 32 s
24	232° 35' 49"	0.59"	230° 10' 57"	-18° 25' 01"	0.9892947	16' 10.01"	23° 26' 17"	15 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	113° 39' 52"	4° 58' 17"	116° 28' 49"	26° 15' 37"	0° 54' 10"	14' 45.51"	97° 37' 30"	0.73429
1	114° 09' 31"	4° 59' 11"	117° 01' 23"	26° 11' 12"	0° 54' 09"	14' 45.48"	97° 51' 51"	0.73082
2	114° 39' 10"	5° 00' 04"	117° 33' 55"	26° 06' 39"	0° 54' 09"	14' 45.46"	98° 6' 08"	0.72732
3	115° 08' 49"	5° 00' 56"	118° 06' 24"	26° 01' 59"	0° 54' 09"	14' 45.44"	98° 20' 22"	0.72382
4	115° 38' 28"	5° 01' 46"	118° 38' 50"	25° 57' 12"	0° 54' 09"	14' 45.43"	98° 34' 31"	0.72030
5	116° 08' 07"	5° 02' 35"	119° 11' 13"	25° 52' 18"	0° 54' 09"	14' 45.42"	98° 48' 37"	0.71676
6	116° 37' 45"	5° 03' 22"	119° 43' 34"	25° 47' 17"	0° 54' 09"	14' 45.41"	99° 2' 39"	0.71322
7	117° 07' 24"	5° 04' 08"	120° 15' 51"	25° 42' 08"	0° 54' 09"	14' 45.41"	99° 16' 37"	0.70966
8	117° 37' 02"	5° 04' 53"	120° 48' 06"	25° 36' 53"	0° 54' 09"	14' 45.41"	99° 30' 30"	0.70609
9	118° 06' 41"	5° 05' 36"	121° 20' 17"	25° 31' 30"	0° 54' 09"	14' 45.42"	99° 44' 20"	0.70250
10	118° 36' 19"	5° 06' 18"	121° 52' 26"	25° 26' 01"	0° 54' 09"	14' 45.43"	99° 58' 05"	0.69891
11	119° 05' 58"	5° 06' 59"	122° 24' 31"	25° 20' 24"	0° 54' 09"	14' 45.45"	100° 11' 46"	0.69530
12	119° 35' 36"	5° 07' 39"	122° 56' 34"	25° 14' 41"	0° 54' 09"	14' 45.47"	100° 25' 23"	0.69168
13	120° 05' 15"	5° 08' 17"	123° 28' 33"	25° 08' 50"	0° 54' 10"	14' 45.50"	100° 38' 55"	0.68804
14	120° 34' 53"	5° 08' 53"	124° 00' 30"	25° 02' 53"	0° 54' 10"	14' 45.53"	100° 52' 23"	0.68440
15	121° 04' 32"	5° 09' 28"	124° 32' 23"	24° 56' 49"	0° 54' 10"	14' 45.57"	101° 5' 47"	0.68074
16	121° 34' 11"	5° 10' 02"	125° 04' 13"	24° 50' 38"	0° 54' 10"	14' 45.61"	101° 19' 05"	0.67708
17	122° 03' 50"	5° 10' 35"	125° 35' 60"	24° 44' 20"	0° 54' 10"	14' 45.66"	101° 32' 20"	0.67340
18	122° 33' 29"	5° 11' 06"	126° 07' 44"	24° 37' 56"	0° 54' 10"	14' 45.71"	101° 45' 29"	0.66971
19	123° 03' 08"	5° 11' 35"	126° 39' 24"	24° 31' 25"	0° 54' 11"	14' 45.76"	101° 58' 34"	0.66601
20	123° 32' 47"	5° 12' 04"	127° 11' 02"	24° 24' 47"	0° 54' 11"	14' 45.82"	102° 11' 34"	0.66230
21	124° 02' 27"	5° 12' 31"	127° 42' 36"	24° 18' 03"	0° 54' 11"	14' 45.89"	102° 24' 29"	0.65858
22	124° 32' 06"	5° 12' 56"	128° 14' 07"	24° 11' 12"	0° 54' 11"	14' 45.96"	102° 37' 19"	0.65485
23	125° 01' 46"	5° 13' 21"	128° 45' 35"	24° 04' 15"	0° 54' 11"	14' 46.03"	102° 50' 05"	0.65110
24	125° 31' 27"	5° 13' 43"	129° 16' 60"	23° 57' 11"	0° 54' 12"	14' 46.11"	103° 2' 45"	0.64735

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	232° 35' 49"	0.59"	230° 10' 57"	-18° 25' 01"	0.9892947	16' 10.01"	23° 26' 17"	15 m 32 s
1	232° 38' 20"	0.59"	230° 13' 31"	-18° 25' 40"	0.9892857	16' 10.02"	23° 26' 17"	15 m 31 s
2	232° 40' 51"	0.59"	230° 16' 05"	-18° 26' 18"	0.9892767	16' 10.03"	23° 26' 17"	15 m 31 s
3	232° 43' 22"	0.59"	230° 18' 39"	-18° 26' 56"	0.9892677	16' 10.04"	23° 26' 17"	15 m 31 s
4	232° 45' 53"	0.59"	230° 21' 13"	-18° 27' 35"	0.9892587	16' 10.05"	23° 26' 17"	15 m 30 s
5	232° 48' 24"	0.59"	230° 23' 47"	-18° 28' 13"	0.9892497	16' 10.06"	23° 26' 17"	15 m 30 s
6	232° 50' 55"	0.59"	230° 26' 21"	-18° 28' 51"	0.9892407	16' 10.07"	23° 26' 17"	15 m 29 s
7	232° 53' 26"	0.59"	230° 28' 55"	-18° 29' 30"	0.9892318	16' 10.08"	23° 26' 17"	15 m 29 s
8	232° 55' 57"	0.59"	230° 31' 29"	-18° 30' 08"	0.9892228	16' 10.08"	23° 26' 17"	15 m 28 s
9	232° 58' 28"	0.59"	230° 34' 03"	-18° 30' 46"	0.9892138	16' 10.09"	23° 26' 17"	15 m 28 s
10	233° 00' 59"	0.59"	230° 36' 38"	-18° 31' 24"	0.9892049	16' 10.10"	23° 26' 17"	15 m 28 s
11	233° 03' 30"	0.59"	230° 39' 12"	-18° 32' 02"	0.9891959	16' 10.11"	23° 26' 17"	15 m 27 s
12	233° 06' 01"	0.59"	230° 41' 46"	-18° 32' 40"	0.9891870	16' 10.12"	23° 26' 17"	15 m 27 s
13	233° 08' 32"	0.59"	230° 44' 20"	-18° 33' 18"	0.9891780	16' 10.13"	23° 26' 17"	15 m 26 s
14	233° 11' 04"	0.59"	230° 46' 54"	-18° 33' 56"	0.9891691	16' 10.14"	23° 26' 17"	15 m 26 s
15	233° 13' 35"	0.59"	230° 49' 29"	-18° 34' 34"	0.9891601	16' 10.15"	23° 26' 17"	15 m 25 s
16	233° 16' 06"	0.59"	230° 52' 03"	-18° 35' 12"	0.9891512	16' 10.16"	23° 26' 17"	15 m 25 s
17	233° 18' 37"	0.59"	230° 54' 37"	-18° 35' 50"	0.9891423	16' 10.16"	23° 26' 17"	15 m 25 s
18	233° 21' 08"	0.59"	230° 57' 12"	-18° 36' 28"	0.9891334	16' 10.17"	23° 26' 17"	15 m 24 s
19	233° 23' 39"	0.58"	230° 59' 46"	-18° 37' 06"	0.9891245	16' 10.18"	23° 26' 17"	15 m 24 s
20	233° 26' 10"	0.58"	231° 02' 20"	-18° 37' 44"	0.9891156	16' 10.19"	23° 26' 17"	15 m 23 s
21	233° 28' 41"	0.58"	231° 04' 55"	-18° 38' 22"	0.9891067	16' 10.20"	23° 26' 17"	15 m 23 s
22	233° 31' 12"	0.58"	231° 07' 29"	-18° 38' 59"	0.9890978	16' 10.21"	23° 26' 17"	15 m 22 s
23	233° 33' 43"	0.58"	231° 10' 04"	-18° 39' 37"	0.9890889	16' 10.22"	23° 26' 17"	15 m 22 s
24	233° 36' 14"	0.58"	231° 12' 38"	-18° 40' 15"	0.9890800	16' 10.22"	23° 26' 17"	15 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	125° 31' 27"	5° 13' 43"	129° 16' 60"	23° 57' 11"	0° 54' 12"	14' 46.11"	103° 2' 45"	0.64735
1	126° 01' 07"	5° 14' 05"	129° 48' 21"	23° 50' 01"	0° 54' 12"	14' 46.20"	103° 15' 20"	0.64359
2	126° 30' 48"	5° 14' 25"	130° 19' 40"	23° 42' 44"	0° 54' 12"	14' 46.29"	103° 27' 51"	0.63982
3	127° 00' 29"	5° 14' 43"	130° 50' 55"	23° 35' 22"	0° 54' 13"	14' 46.38"	103° 40' 16"	0.63604
4	127° 30' 10"	5° 15' 00"	131° 22' 06"	23° 27' 52"	0° 54' 13"	14' 46.48"	103° 52' 36"	0.63225
5	127° 59' 52"	5° 15' 16"	131° 53' 15"	23° 20' 17"	0° 54' 14"	14' 46.58"	104° 4' 51"	0.62845
6	128° 29' 34"	5° 15' 31"	132° 24' 20"	23° 12' 35"	0° 54' 14"	14' 46.69"	104° 17' 00"	0.62465
7	128° 59' 17"	5° 15' 44"	132° 55' 23"	23° 04' 47"	0° 54' 14"	14' 46.81"	104° 29' 04"	0.62083
8	129° 28' 60"	5° 15' 55"	133° 26' 22"	22° 56' 53"	0° 54' 15"	14' 46.92"	104° 41' 03"	0.61701
9	129° 58' 43"	5° 16' 05"	133° 57' 17"	22° 48' 52"	0° 54' 15"	14' 47.05"	104° 52' 57"	0.61317
10	130° 28' 27"	5° 16' 14"	134° 28' 10"	22° 40' 46"	0° 54' 16"	14' 47.18"	105° 4' 45"	0.60933
11	130° 58' 11"	5° 16' 22"	134° 58' 59"	22° 32' 34"	0° 54' 16"	14' 47.31"	105° 16' 27"	0.60549
12	131° 27' 56"	5° 16' 28"	135° 29' 45"	22° 24' 15"	0° 54' 17"	14' 47.45"	105° 28' 05"	0.60163
13	131° 57' 41"	5° 16' 32"	136° 00' 28"	22° 15' 51"	0° 54' 17"	14' 47.59"	105° 39' 36"	0.59777
14	132° 27' 27"	5° 16' 35"	136° 31' 08"	22° 07' 21"	0° 54' 18"	14' 47.74"	105° 51' 02"	0.59390
15	132° 57' 14"	5° 16' 37"	137° 01' 45"	21° 58' 45"	0° 54' 18"	14' 47.89"	106° 2' 23"	0.59002
16	133° 27' 01"	5° 16' 37"	137° 32' 18"	21° 50' 03"	0° 54' 19"	14' 48.05"	106° 13' 38"	0.58613
17	133° 56' 48"	5° 16' 36"	138° 02' 49"	21° 41' 15"	0° 54' 19"	14' 48.21"	106° 24' 47"	0.58224
18	134° 26' 36"	5° 16' 33"	138° 33' 16"	21° 32' 22"	0° 54' 20"	14' 48.38"	106° 35' 50"	0.57834
19	134° 56' 25"	5° 16' 30"	139° 03' 40"	21° 23' 22"	0° 54' 21"	14' 48.55"	106° 46' 48"	0.57444
20	135° 26' 14"	5° 16' 24"	139° 34' 01"	21° 14' 17"	0° 54' 21"	14' 48.73"	106° 57' 40"	0.57052
21	135° 56' 05"	5° 16' 17"	140° 04' 19"	21° 05' 07"	0° 54' 22"	14' 48.92"	107° 8' 26"	0.56661
22	136° 25' 55"	5° 16' 09"	140° 34' 34"	20° 55' 51"	0° 54' 23"	14' 49.10"	107° 19' 06"	0.56268
23	136° 55' 47"	5° 15' 59"	141° 04' 46"	20° 46' 29"	0° 54' 23"	14' 49.30"	107° 29' 41"	0.55875
24	137° 25' 39"	5° 15' 48"	141° 34' 55"	20° 37' 02"	0° 54' 24"	14' 49.49"	107° 40' 09"	0.55482

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	233° 36' 14"	0.58"	231° 12' 38"	-18° 40' 15"	0.9890800	16' 10.22"	23° 26' 17"	15 m 21 s
1	233° 38' 46"	0.58"	231° 15' 12"	-18° 40' 52"	0.9890711	16' 10.23"	23° 26' 17"	15 m 21 s
2	233° 41' 17"	0.58"	231° 17' 47"	-18° 41' 30"	0.9890623	16' 10.24"	23° 26' 17"	15 m 21 s
3	233° 43' 48"	0.58"	231° 20' 21"	-18° 42' 07"	0.9890534	16' 10.25"	23° 26' 17"	15 m 20 s
4	233° 46' 19"	0.58"	231° 22' 56"	-18° 42' 45"	0.9890446	16' 10.26"	23° 26' 17"	15 m 20 s
5	233° 48' 50"	0.58"	231° 25' 31"	-18° 43' 23"	0.9890357	16' 10.27"	23° 26' 17"	15 m 19 s
6	233° 51' 21"	0.57"	231° 28' 05"	-18° 43' 60"	0.9890269	16' 10.28"	23° 26' 17"	15 m 19 s
7	233° 53' 52"	0.57"	231° 30' 40"	-18° 44' 37"	0.9890180	16' 10.29"	23° 26' 17"	15 m 18 s
8	233° 56' 23"	0.57"	231° 33' 14"	-18° 45' 15"	0.9890092	16' 10.29"	23° 26' 17"	15 m 18 s
9	233° 58' 54"	0.57"	231° 35' 49"	-18° 45' 52"	0.9890004	16' 10.30"	23° 26' 17"	15 m 17 s
10	234° 01' 26"	0.57"	231° 38' 24"	-18° 46' 30"	0.9889916	16' 10.31"	23° 26' 17"	15 m 17 s
11	234° 03' 57"	0.57"	231° 40' 58"	-18° 47' 07"	0.9889827	16' 10.32"	23° 26' 17"	15 m 16 s
12	234° 06' 28"	0.57"	231° 43' 33"	-18° 47' 44"	0.9889739	16' 10.33"	23° 26' 17"	15 m 16 s
13	234° 08' 59"	0.56"	231° 46' 08"	-18° 48' 21"	0.9889651	16' 10.34"	23° 26' 17"	15 m 15 s
14	234° 11' 30"	0.56"	231° 48' 43"	-18° 48' 58"	0.9889563	16' 10.35"	23° 26' 17"	15 m 15 s
15	234° 14' 01"	0.56"	231° 51' 17"	-18° 49' 36"	0.9889475	16' 10.35"	23° 26' 17"	15 m 15 s
16	234° 16' 32"	0.56"	231° 53' 52"	-18° 50' 13"	0.9889388	16' 10.36"	23° 26' 17"	15 m 14 s
17	234° 19' 04"	0.56"	231° 56' 27"	-18° 50' 50"	0.9889300	16' 10.37"	23° 26' 17"	15 m 14 s
18	234° 21' 35"	0.56"	231° 59' 02"	-18° 51' 27"	0.9889212	16' 10.38"	23° 26' 17"	15 m 13 s
19	234° 24' 06"	0.55"	232° 01' 37"	-18° 52' 04"	0.9889124	16' 10.39"	23° 26' 17"	15 m 13 s
20	234° 26' 37"	0.55"	232° 04' 12"	-18° 52' 41"	0.9889037	16' 10.40"	23° 26' 17"	15 m 12 s
21	234° 29' 08"	0.55"	232° 06' 47"	-18° 53' 18"	0.9888949	16' 10.41"	23° 26' 17"	15 m 12 s
22	234° 31' 39"	0.55"	232° 09' 22"	-18° 53' 55"	0.9888862	16' 10.42"	23° 26' 17"	15 m 11 s
23	234° 34' 11"	0.55"	232° 11' 57"	-18° 54' 32"	0.9888774	16' 10.42"	23° 26' 17"	15 m 11 s
24	234° 36' 42"	0.54"	232° 14' 32"	-18° 55' 08"	0.9888687	16' 10.43"	23° 26' 17"	15 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	137° 25' 39"	5° 15' 48"	141° 34' 55"	20° 37' 02"	0° 54' 24"	14' 49.49"	107° 40' 09"	0.55482
1	137° 55' 32"	5° 15' 36"	142° 05' 01"	20° 27' 30"	0° 54' 25"	14' 49.70"	107° 50' 32"	0.55088
2	138° 25' 26"	5° 15' 22"	142° 35' 04"	20° 17' 51"	0° 54' 26"	14' 49.90"	108° 0' 48"	0.54693
3	138° 55' 20"	5° 15' 06"	143° 05' 04"	20° 08' 08"	0° 54' 26"	14' 50.12"	108° 10' 59"	0.54298
4	139° 25' 16"	5° 14' 50"	143° 35' 01"	19° 58' 19"	0° 54' 27"	14' 50.33"	108° 21' 04"	0.53903
5	139° 55' 12"	5° 14' 31"	144° 04' 55"	19° 48' 25"	0° 54' 28"	14' 50.56"	108° 31' 03"	0.53507
6	140° 25' 09"	5° 14' 12"	144° 34' 47"	19° 38' 26"	0° 54' 29"	14' 50.78"	108° 40' 55"	0.53110
7	140° 55' 07"	5° 13' 50"	145° 04' 35"	19° 28' 21"	0° 54' 30"	14' 51.02"	108° 50' 42"	0.52714
8	141° 25' 06"	5° 13' 28"	145° 34' 21"	19° 18' 12"	0° 54' 31"	14' 51.25"	109° 0' 22"	0.52316
9	141° 55' 05"	5° 13' 04"	146° 04' 04"	19° 07' 57"	0° 54' 32"	14' 51.50"	109° 9' 57"	0.51919
10	142° 25' 06"	5° 12' 38"	146° 33' 44"	18° 57' 37"	0° 54' 32"	14' 51.74"	109° 19' 25"	0.51521
11	142° 55' 08"	5° 12' 12"	147° 03' 22"	18° 47' 12"	0° 54' 33"	14' 52.00"	109° 28' 47"	0.51122
12	143° 25' 10"	5° 11' 43"	147° 32' 57"	18° 36' 42"	0° 54' 34"	14' 52.25"	109° 38' 03"	0.50724
13	143° 55' 14"	5° 11' 14"	148° 02' 29"	18° 26' 07"	0° 54' 35"	14' 52.51"	109° 47' 12"	0.50325
14	144° 25' 19"	5° 10' 42"	148° 31' 59"	18° 15' 27"	0° 54' 36"	14' 52.78"	109° 56' 16"	0.49926
15	144° 55' 24"	5° 10' 10"	149° 01' 26"	18° 04' 42"	0° 54' 37"	14' 53.05"	110° 5' 13"	0.49526
16	145° 25' 31"	5° 09' 36"	149° 30' 51"	17° 53' 52"	0° 54' 38"	14' 53.33"	110° 14' 04"	0.49126
17	145° 55' 39"	5° 09' 00"	150° 00' 13"	17° 42' 58"	0° 54' 39"	14' 53.61"	110° 22' 48"	0.48726
18	146° 25' 48"	5° 08' 23"	150° 29' 32"	17° 31' 58"	0° 54' 40"	14' 53.90"	110° 31' 26"	0.48326
19	146° 55' 58"	5° 07' 45"	150° 58' 50"	17° 20' 54"	0° 54' 41"	14' 54.19"	110° 39' 58"	0.47926
20	147° 26' 09"	5° 07' 05"	151° 28' 04"	17° 09' 46"	0° 54' 43"	14' 54.49"	110° 48' 24"	0.47525
21	147° 56' 21"	5° 06' 24"	151° 57' 17"	16° 58' 32"	0° 54' 44"	14' 54.79"	110° 56' 43"	0.47125
22	148° 26' 35"	5° 05' 41"	152° 26' 27"	16° 47' 14"	0° 54' 45"	14' 55.09"	111° 4' 55"	0.46724
23	148° 56' 49"	5° 04' 57"	152° 55' 35"	16° 35' 52"	0° 54' 46"	14' 55.40"	111° 13' 02"	0.46323
24	149° 27' 05"	5° 04' 11"	153° 24' 41"	16° 24' 24"	0° 54' 47"	14' 55.72"	111° 21' 02"	0.45922

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	234° 36' 42"	0.54"	232° 14' 32"	-18° 55' 08"	0.9888687	16' 10.43"	23° 26' 17"	15 m 10 s
1	234° 39' 13"	0.54"	232° 17' 07"	-18° 55' 45"	0.9888599	16' 10.44"	23° 26' 17"	15 m 10 s
2	234° 41' 44"	0.54"	232° 19' 42"	-18° 56' 22"	0.9888512	16' 10.45"	23° 26' 17"	15 m 09 s
3	234° 44' 15"	0.54"	232° 22' 17"	-18° 56' 59"	0.9888425	16' 10.46"	23° 26' 17"	15 m 09 s
4	234° 46' 47"	0.54"	232° 24' 52"	-18° 57' 35"	0.9888338	16' 10.47"	23° 26' 17"	15 m 08 s
5	234° 49' 18"	0.53"	232° 27' 27"	-18° 58' 12"	0.9888251	16' 10.48"	23° 26' 17"	15 m 08 s
6	234° 51' 49"	0.53"	232° 30' 02"	-18° 58' 49"	0.9888163	16' 10.48"	23° 26' 17"	15 m 07 s
7	234° 54' 20"	0.53"	232° 32' 37"	-18° 59' 25"	0.9888076	16' 10.49"	23° 26' 17"	15 m 07 s
8	234° 56' 51"	0.53"	232° 35' 12"	-19° 00' 02"	0.9887989	16' 10.50"	23° 26' 17"	15 m 06 s
9	234° 59' 23"	0.52"	232° 37' 47"	-19° 00' 38"	0.9887903	16' 10.51"	23° 26' 17"	15 m 06 s
10	235° 01' 54"	0.52"	232° 40' 23"	-19° 01' 15"	0.9887816	16' 10.52"	23° 26' 17"	15 m 05 s
11	235° 04' 25"	0.52"	232° 42' 58"	-19° 01' 51"	0.9887729	16' 10.53"	23° 26' 17"	15 m 05 s
12	235° 06' 56"	0.52"	232° 45' 33"	-19° 02' 28"	0.9887642	16' 10.53"	23° 26' 17"	15 m 04 s
13	235° 09' 27"	0.51"	232° 48' 08"	-19° 03' 04"	0.9887555	16' 10.54"	23° 26' 17"	15 m 04 s
14	235° 11' 59"	0.51"	232° 50' 44"	-19° 03' 41"	0.9887469	16' 10.55"	23° 26' 17"	15 m 03 s
15	235° 14' 30"	0.51"	232° 53' 19"	-19° 04' 17"	0.9887382	16' 10.56"	23° 26' 17"	15 m 03 s
16	235° 17' 01"	0.50"	232° 55' 54"	-19° 04' 53"	0.9887296	16' 10.57"	23° 26' 17"	15 m 02 s
17	235° 19' 32"	0.50"	232° 58' 30"	-19° 05' 29"	0.9887209	16' 10.58"	23° 26' 17"	15 m 02 s
18	235° 22' 04"	0.50"	233° 01' 05"	-19° 06' 06"	0.9887123	16' 10.59"	23° 26' 17"	15 m 01 s
19	235° 24' 35"	0.50"	233° 03' 41"	-19° 06' 42"	0.9887036	16' 10.59"	23° 26' 17"	15 m 01 s
20	235° 27' 06"	0.49"	233° 06' 16"	-19° 07' 18"	0.9886950	16' 10.60"	23° 26' 17"	15 m 00 s
21	235° 29' 37"	0.49"	233° 08' 51"	-19° 07' 54"	0.9886864	16' 10.61"	23° 26' 17"	14 m 60 s
22	235° 32' 09"	0.49"	233° 11' 27"	-19° 08' 30"	0.9886778	16' 10.62"	23° 26' 17"	14 m 59 s
23	235° 34' 40"	0.48"	233° 14' 02"	-19° 09' 06"	0.9886692	16' 10.63"	23° 26' 17"	14 m 59 s
24	235° 37' 11"	0.48"	233° 16' 38"	-19° 09' 42"	0.9886605	16' 10.64"	23° 26' 17"	14 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	149° 27' 05"	5° 04' 11"	153° 24' 41"	16° 24' 24"	0° 54' 47"	14' 55.72"	111° 21' 02"	0.45922
1	149° 57' 23"	5° 03' 24"	153° 53' 44"	16° 12' 53"	0° 54' 48"	14' 56.04"	111° 28' 55"	0.45521
2	150° 27' 41"	5° 02' 36"	154° 22' 46"	16° 01' 17"	0° 54' 49"	14' 56.36"	111° 36' 42"	0.45120
3	150° 58' 01"	5° 01' 46"	154° 51' 45"	15° 49' 36"	0° 54' 51"	14' 56.69"	111° 44' 22"	0.44719
4	151° 28' 22"	5° 00' 55"	155° 20' 43"	15° 37' 51"	0° 54' 52"	14' 57.03"	111° 51' 56"	0.44318
5	151° 58' 44"	5° 00' 02"	155° 49' 38"	15° 26' 02"	0° 54' 53"	14' 57.36"	111° 59' 23"	0.43917
6	152° 29' 08"	4° 59' 08"	156° 18' 31"	15° 14' 09"	0° 54' 54"	14' 57.71"	112° 6' 44"	0.43516
7	152° 59' 33"	4° 58' 12"	156° 47' 23"	15° 02' 11"	0° 54' 56"	14' 58.06"	112° 13' 58"	0.43115
8	153° 29' 59"	4° 57' 15"	157° 16' 12"	14° 50' 09"	0° 54' 57"	14' 58.41"	112° 21' 05"	0.42714
9	154° 00' 27"	4° 56' 16"	157° 45' 00"	14° 38' 03"	0° 54' 58"	14' 58.77"	112° 28' 06"	0.42313
10	154° 30' 56"	4° 55' 16"	158° 13' 46"	14° 25' 52"	0° 54' 60"	14' 59.13"	112° 35' 00"	0.41913
11	155° 01' 27"	4° 54' 15"	158° 42' 31"	14° 13' 38"	0° 55' 01"	14' 59.50"	112° 41' 48"	0.41512
12	155° 31' 59"	4° 53' 12"	159° 11' 13"	14° 01' 20"	0° 55' 02"	14' 59.87"	112° 48' 29"	0.41112
13	156° 02' 33"	4° 52' 08"	159° 39' 55"	13° 48' 57"	0° 55' 04"	15' 00.24"	112° 55' 03"	0.40712
14	156° 33' 08"	4° 51' 02"	160° 08' 34"	13° 36' 31"	0° 55' 05"	15' 00.62"	113° 1' 30"	0.40312
15	157° 03' 45"	4° 49' 55"	160° 37' 12"	13° 24' 00"	0° 55' 06"	15' 01.01"	113° 7' 51"	0.39913
16	157° 34' 23"	4° 48' 46"	161° 05' 49"	13° 11' 26"	0° 55' 08"	15' 01.40"	113° 14' 05"	0.39514
17	158° 05' 03"	4° 47' 36"	161° 34' 24"	12° 58' 48"	0° 55' 09"	15' 01.79"	113° 20' 12"	0.39115
18	158° 35' 44"	4° 46' 25"	162° 02' 58"	12° 46' 06"	0° 55' 11"	15' 02.19"	113° 26' 12"	0.38716
19	159° 06' 27"	4° 45' 12"	162° 31' 31"	12° 33' 20"	0° 55' 12"	15' 02.59"	113° 32' 06"	0.38318
20	159° 37' 12"	4° 43' 57"	163° 00' 02"	12° 20' 31"	0° 55' 14"	15' 03.00"	113° 37' 52"	0.37920
21	160° 07' 58"	4° 42' 42"	163° 28' 32"	12° 07' 38"	0° 55' 15"	15' 03.41"	113° 43' 32"	0.37522
22	160° 38' 46"	4° 41' 24"	163° 57' 01"	11° 54' 41"	0° 55' 17"	15' 03.82"	113° 49' 05"	0.37125
23	161° 09' 35"	4° 40' 06"	164° 25' 29"	11° 41' 40"	0° 55' 18"	15' 04.24"	113° 54' 31"	0.36729
24	161° 40' 27"	4° 38' 46"	164° 53' 56"	11° 28' 36"	0° 55' 20"	15' 04.67"	113° 59' 50"	0.36332



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	235° 37' 11"	0.48"	233° 16' 38"	-19° 09' 42"	0.9886605	16' 10.64"	23° 26' 17"	14 m 58 s
1	235° 39' 42"	0.48"	233° 19' 13"	-19° 10' 18"	0.9886519	16' 10.64"	23° 26' 17"	14 m 58 s
2	235° 42' 14"	0.47"	233° 21' 49"	-19° 10' 54"	0.9886433	16' 10.65"	23° 26' 17"	14 m 57 s
3	235° 44' 45"	0.47"	233° 24' 25"	-19° 11' 30"	0.9886347	16' 10.66"	23° 26' 17"	14 m 57 s
4	235° 47' 16"	0.47"	233° 27' 00"	-19° 12' 06"	0.9886262	16' 10.67"	23° 26' 17"	14 m 56 s
5	235° 49' 47"	0.46"	233° 29' 36"	-19° 12' 42"	0.9886176	16' 10.68"	23° 26' 17"	14 m 56 s
6	235° 52' 19"	0.46"	233° 32' 12"	-19° 13' 17"	0.9886090	16' 10.69"	23° 26' 17"	14 m 55 s
7	235° 54' 50"	0.46"	233° 34' 47"	-19° 13' 53"	0.9886004	16' 10.70"	23° 26' 17"	14 m 55 s
8	235° 57' 21"	0.45"	233° 37' 23"	-19° 14' 29"	0.9885919	16' 10.70"	23° 26' 17"	14 m 54 s
9	235° 59' 53"	0.45"	233° 39' 59"	-19° 15' 04"	0.9885833	16' 10.71"	23° 26' 17"	14 m 53 s
10	236° 02' 24"	0.44"	233° 42' 34"	-19° 15' 40"	0.9885747	16' 10.72"	23° 26' 17"	14 m 53 s
11	236° 04' 55"	0.44"	233° 45' 10"	-19° 16' 16"	0.9885662	16' 10.73"	23° 26' 17"	14 m 52 s
12	236° 07' 26"	0.44"	233° 47' 46"	-19° 16' 51"	0.9885576	16' 10.74"	23° 26' 17"	14 m 52 s
13	236° 09' 58"	0.43"	233° 50' 22"	-19° 17' 27"	0.9885491	16' 10.75"	23° 26' 17"	14 m 51 s
14	236° 12' 29"	0.43"	233° 52' 58"	-19° 18' 02"	0.9885406	16' 10.75"	23° 26' 17"	14 m 51 s
15	236° 15' 00"	0.43"	233° 55' 33"	-19° 18' 38"	0.9885320	16' 10.76"	23° 26' 17"	14 m 50 s
16	236° 17' 32"	0.42"	233° 58' 09"	-19° 19' 13"	0.9885235	16' 10.77"	23° 26' 17"	14 m 50 s
17	236° 20' 03"	0.42"	234° 00' 45"	-19° 19' 49"	0.9885150	16' 10.78"	23° 26' 17"	14 m 49 s
18	236° 22' 34"	0.41"	234° 03' 21"	-19° 20' 24"	0.9885065	16' 10.79"	23° 26' 17"	14 m 49 s
19	236° 25' 06"	0.41"	234° 05' 57"	-19° 20' 59"	0.9884979	16' 10.80"	23° 26' 17"	14 m 48 s
20	236° 27' 37"	0.41"	234° 08' 33"	-19° 21' 34"	0.9884894	16' 10.80"	23° 26' 17"	14 m 48 s
21	236° 30' 08"	0.40"	234° 11' 09"	-19° 22' 10"	0.9884809	16' 10.81"	23° 26' 17"	14 m 47 s
22	236° 32' 39"	0.40"	234° 13' 45"	-19° 22' 45"	0.9884724	16' 10.82"	23° 26' 17"	14 m 46 s
23	236° 35' 11"	0.39"	234° 16' 21"	-19° 23' 20"	0.9884639	16' 10.83"	23° 26' 17"	14 m 46 s
24	236° 37' 42"	0.39"	234° 18' 57"	-19° 23' 55"	0.9884555	16' 10.84"	23° 26' 17"	14 m 45 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	161° 40' 27"	4° 38' 46"	164° 53' 56"	11° 28' 36"	0° 55' 20"	15' 04.67"	113° 59' 50"	0.36332
1	162° 11' 19"	4° 37' 24"	165° 22' 22"	11° 15' 29"	0° 55' 21"	15' 05.09"	114° 5' 02"	0.35937
2	162° 42' 14"	4° 36' 02"	165° 50' 47"	11° 02' 18"	0° 55' 23"	15' 05.53"	114° 10' 07"	0.35541
3	163° 13' 11"	4° 34' 37"	166° 19' 12"	10° 49' 03"	0° 55' 25"	15' 05.96"	114° 15' 05"	0.35147
4	163° 44' 09"	4° 33' 12"	166° 47' 35"	10° 35' 46"	0° 55' 26"	15' 06.40"	114° 19' 56"	0.34753
5	164° 15' 09"	4° 31' 44"	167° 15' 58"	10° 22' 24"	0° 55' 28"	15' 06.85"	114° 24' 39"	0.34359
6	164° 46' 11"	4° 30' 16"	167° 44' 20"	10° 08' 60"	0° 55' 30"	15' 07.29"	114° 29' 16"	0.33967
7	165° 17' 14"	4° 28' 46"	168° 12' 42"	9° 55' 32"	0° 55' 31"	15' 07.75"	114° 33' 46"	0.33574
8	165° 48' 20"	4° 27' 15"	168° 41' 03"	9° 42' 01"	0° 55' 33"	15' 08.20"	114° 38' 08"	0.33183
9	166° 19' 27"	4° 25' 42"	169° 09' 23"	9° 28' 27"	0° 55' 35"	15' 08.66"	114° 42' 24"	0.32792
10	166° 50' 36"	4° 24' 08"	169° 37' 43"	9° 14' 49"	0° 55' 36"	15' 09.13"	114° 46' 32"	0.32402
11	167° 21' 47"	4° 22' 32"	170° 06' 03"	9° 01' 09"	0° 55' 38"	15' 09.59"	114° 50' 33"	0.32013
12	167° 53' 00"	4° 20' 55"	170° 34' 23"	8° 47' 25"	0° 55' 40"	15' 10.07"	114° 54' 27"	0.31624
13	168° 24' 15"	4° 19' 17"	171° 02' 42"	8° 33' 39"	0° 55' 41"	15' 10.54"	114° 58' 13"	0.31236
14	168° 55' 32"	4° 17' 37"	171° 31' 01"	8° 19' 49"	0° 55' 43"	15' 11.02"	115° 1' 52"	0.30850
15	169° 26' 51"	4° 15' 56"	171° 59' 20"	8° 05' 57"	0° 55' 45"	15' 11.50"	115° 5' 24"	0.30464
16	169° 58' 12"	4° 14' 14"	172° 27' 39"	7° 52' 01"	0° 55' 47"	15' 11.99"	115° 8' 48"	0.30078
17	170° 29' 35"	4° 12' 30"	172° 55' 58"	7° 38' 03"	0° 55' 49"	15' 12.48"	115° 12' 05"	0.29694
18	171° 00' 59"	4° 10' 45"	173° 24' 17"	7° 24' 02"	0° 55' 50"	15' 12.97"	115° 15' 15"	0.29311
19	171° 32' 26"	4° 08' 58"	173° 52' 36"	7° 09' 58"	0° 55' 52"	15' 13.47"	115° 18' 17"	0.28929
20	172° 03' 55"	4° 07' 10"	174° 20' 55"	6° 55' 52"	0° 55' 54"	15' 13.97"	115° 21' 12"	0.28547
21	172° 35' 26"	4° 05' 21"	174° 49' 15"	6° 41' 43"	0° 55' 56"	15' 14.47"	115° 23' 59"	0.28167
22	173° 06' 59"	4° 03' 30"	175° 17' 35"	6° 27' 31"	0° 55' 58"	15' 14.98"	115° 26' 38"	0.27788
23	173° 38' 34"	4° 01' 38"	175° 45' 56"	6° 13' 17"	0° 55' 60"	15' 15.49"	115° 29' 10"	0.27410
24	174° 10' 12"	3° 59' 44"	176° 14' 17"	5° 58' 60"	0° 56' 01"	15' 16.00"	115° 31' 34"	0.27033

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	236° 37' 42"	0.39"	234° 18' 57"	-19° 23' 55"	0.9884555	16' 10.84"	23° 26' 17"	14 m 45 s
1	236° 40' 13"	0.39"	234° 21' 33"	-19° 24' 30"	0.9884470	16' 10.85"	23° 26' 17"	14 m 45 s
2	236° 42' 45"	0.38"	234° 24' 09"	-19° 25' 05"	0.9884385	16' 10.85"	23° 26' 17"	14 m 44 s
3	236° 45' 16"	0.38"	234° 26' 45"	-19° 25' 40"	0.9884300	16' 10.86"	23° 26' 17"	14 m 44 s
4	236° 47' 47"	0.37"	234° 29' 21"	-19° 26' 15"	0.9884216	16' 10.87"	23° 26' 17"	14 m 43 s
5	236° 50' 19"	0.37"	234° 31' 58"	-19° 26' 50"	0.9884131	16' 10.88"	23° 26' 17"	14 m 43 s
6	236° 52' 50"	0.36"	234° 34' 34"	-19° 27' 25"	0.9884046	16' 10.89"	23° 26' 17"	14 m 42 s
7	236° 55' 22"	0.36"	234° 37' 10"	-19° 28' 00"	0.9883962	16' 10.90"	23° 26' 17"	14 m 41 s
8	236° 57' 53"	0.35"	234° 39' 46"	-19° 28' 35"	0.9883877	16' 10.90"	23° 26' 17"	14 m 41 s
9	237° 00' 24"	0.35"	234° 42' 22"	-19° 29' 10"	0.9883793	16' 10.91"	23° 26' 17"	14 m 40 s
10	237° 02' 56"	0.35"	234° 44' 59"	-19° 29' 45"	0.9883709	16' 10.92"	23° 26' 17"	14 m 40 s
11	237° 05' 27"	0.34"	234° 47' 35"	-19° 30' 19"	0.9883624	16' 10.93"	23° 26' 17"	14 m 39 s
12	237° 07' 58"	0.34"	234° 50' 11"	-19° 30' 54"	0.9883540	16' 10.94"	23° 26' 17"	14 m 39 s
13	237° 10' 30"	0.33"	234° 52' 48"	-19° 31' 29"	0.9883456	16' 10.95"	23° 26' 17"	14 m 38 s
14	237° 13' 01"	0.33"	234° 55' 24"	-19° 32' 03"	0.9883371	16' 10.95"	23° 26' 17"	14 m 37 s
15	237° 15' 32"	0.32"	234° 58' 00"	-19° 32' 38"	0.9883287	16' 10.96"	23° 26' 17"	14 m 37 s
16	237° 18' 04"	0.32"	235° 00' 37"	-19° 33' 12"	0.9883203	16' 10.97"	23° 26' 17"	14 m 36 s
17	237° 20' 35"	0.31"	235° 03' 13"	-19° 33' 47"	0.9883119	16' 10.98"	23° 26' 17"	14 m 36 s
18	237° 23' 07"	0.31"	235° 05' 50"	-19° 34' 21"	0.9883035	16' 10.99"	23° 26' 17"	14 m 35 s
19	237° 25' 38"	0.30"	235° 08' 26"	-19° 34' 56"	0.9882951	16' 11.00"	23° 26' 17"	14 m 35 s
20	237° 28' 09"	0.30"	235° 11' 03"	-19° 35' 30"	0.9882867	16' 11.00"	23° 26' 17"	14 m 34 s
21	237° 30' 41"	0.29"	235° 13' 39"	-19° 36' 05"	0.9882783	16' 11.01"	23° 26' 17"	14 m 33 s
22	237° 33' 12"	0.29"	235° 16' 16"	-19° 36' 39"	0.9882700	16' 11.02"	23° 26' 17"	14 m 33 s
23	237° 35' 44"	0.28"	235° 18' 52"	-19° 37' 13"	0.9882616	16' 11.03"	23° 26' 17"	14 m 32 s
24	237° 38' 15"	0.28"	235° 21' 29"	-19° 37' 48"	0.9882532	16' 11.04"	23° 26' 17"	14 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	174° 10' 12"	3° 59' 44"	176° 14' 17"	5° 58' 60"	0° 56' 01"	15' 16.00"	115° 31' 34"	0.27033
1	174° 41' 51"	3° 57' 50"	176° 42' 38"	5° 44' 40"	0° 56' 03"	15' 16.52"	115° 33' 51"	0.26657
2	175° 13' 32"	3° 55' 54"	177° 11' 00"	5° 30' 19"	0° 56' 05"	15' 17.04"	115° 35' 60"	0.26283
3	175° 45' 16"	3° 53' 56"	177° 39' 23"	5° 15' 54"	0° 56' 07"	15' 17.56"	115° 38' 01"	0.25909
4	176° 17' 02"	3° 51' 57"	178° 07' 47"	5° 01' 28"	0° 56' 09"	15' 18.09"	115° 39' 54"	0.25537
5	176° 48' 50"	3° 49' 57"	178° 36' 11"	4° 46' 59"	0° 56' 11"	15' 18.61"	115° 41' 40"	0.25166
6	177° 20' 40"	3° 47' 56"	179° 04' 36"	4° 32' 28"	0° 56' 13"	15' 19.15"	115° 43' 17"	0.24797
7	177° 52' 32"	3° 45' 53"	179° 33' 03"	4° 17' 55"	0° 56' 15"	15' 19.68"	115° 44' 47"	0.24429
8	178° 24' 27"	3° 43' 49"	180° 01' 30"	4° 03' 20"	0° 56' 17"	15' 20.22"	115° 46' 08"	0.24062
9	178° 56' 24"	3° 41' 44"	180° 29' 58"	3° 48' 42"	0° 56' 19"	15' 20.76"	115° 47' 22"	0.23697
10	179° 28' 23"	3° 39' 37"	180° 58' 28"	3° 34' 03"	0° 56' 21"	15' 21.30"	115° 48' 28"	0.23333
11	180° 00' 24"	3° 37' 29"	181° 26' 59"	3° 19' 21"	0° 56' 23"	15' 21.84"	115° 49' 25"	0.22970
12	180° 32' 28"	3° 35' 20"	181° 55' 31"	3° 04' 38"	0° 56' 25"	15' 22.39"	115° 50' 14"	0.22609
13	181° 04' 34"	3° 33' 09"	182° 24' 04"	2° 49' 53"	0° 56' 27"	15' 22.94"	115° 50' 55"	0.22250
14	181° 36' 42"	3° 30' 57"	182° 52' 39"	2° 35' 06"	0° 56' 29"	15' 23.49"	115° 51' 28"	0.21892
15	182° 08' 53"	3° 28' 44"	183° 21' 16"	2° 20' 17"	0° 56' 31"	15' 24.05"	115° 51' 52"	0.21535
16	182° 41' 06"	3° 26' 30"	183° 49' 54"	2° 05' 26"	0° 56' 33"	15' 24.60"	115° 52' 08"	0.21181
17	183° 13' 21"	3° 24' 14"	184° 18' 33"	1° 50' 34"	0° 56' 35"	15' 25.16"	115° 52' 16"	0.20828
18	183° 45' 39"	3° 21' 58"	184° 47' 15"	1° 35' 40"	0° 56' 37"	15' 25.73"	115° 52' 15"	0.20477
19	184° 17' 58"	3° 19' 39"	185° 15' 58"	1° 20' 45"	0° 56' 39"	15' 26.29"	115° 52' 06"	0.20127
20	184° 50' 21"	3° 17' 20"	185° 44' 43"	1° 05' 48"	0° 56' 41"	15' 26.85"	115° 51' 47"	0.19779
21	185° 22' 45"	3° 14' 60"	186° 13' 31"	0° 50' 50"	0° 56' 43"	15' 27.42"	115° 51' 21"	0.19433
22	185° 55' 13"	3° 12' 38"	186° 42' 20"	0° 35' 50"	0° 56' 45"	15' 27.99"	115° 50' 45"	0.19089
23	186° 27' 42"	3° 10' 15"	187° 11' 11"	0° 20' 49"	0° 56' 48"	15' 28.56"	115° 50' 00"	0.18747
24	187° 00' 14"	3° 07' 51"	187° 40' 05"	0° 05' 46"	0° 56' 50"	15' 29.13"	115° 49' 07"	0.18406



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	237° 38' 15"	0.28"	235° 21' 29"	-19° 37' 48"	0.9882532	16' 11.04"	23° 26' 17"	14 m 32 s
1	237° 40' 46"	0.27"	235° 24' 05"	-19° 38' 22"	0.9882449	16' 11.04"	23° 26' 17"	14 m 31 s
2	237° 43' 18"	0.27"	235° 26' 42"	-19° 38' 56"	0.9882365	16' 11.05"	23° 26' 17"	14 m 30 s
3	237° 45' 49"	0.26"	235° 29' 19"	-19° 39' 30"	0.9882281	16' 11.06"	23° 26' 17"	14 m 30 s
4	237° 48' 21"	0.26"	235° 31' 55"	-19° 40' 04"	0.9882198	16' 11.07"	23° 26' 17"	14 m 29 s
5	237° 50' 52"	0.25"	235° 34' 32"	-19° 40' 38"	0.9882114	16' 11.08"	23° 26' 17"	14 m 29 s
6	237° 53' 23"	0.25"	235° 37' 09"	-19° 41' 12"	0.9882031	16' 11.09"	23° 26' 17"	14 m 28 s
7	237° 55' 55"	0.24"	235° 39' 45"	-19° 41' 46"	0.9881947	16' 11.09"	23° 26' 17"	14 m 27 s
8	237° 58' 26"	0.24"	235° 42' 22"	-19° 42' 20"	0.9881864	16' 11.10"	23° 26' 17"	14 m 27 s
9	238° 00' 58"	0.23"	235° 44' 59"	-19° 42' 54"	0.9881781	16' 11.11"	23° 26' 17"	14 m 26 s
10	238° 03' 29"	0.23"	235° 47' 36"	-19° 43' 28"	0.9881698	16' 11.12"	23° 26' 17"	14 m 26 s
11	238° 06' 01"	0.22"	235° 50' 12"	-19° 44' 02"	0.9881614	16' 11.13"	23° 26' 17"	14 m 25 s
12	238° 08' 32"	0.22"	235° 52' 49"	-19° 44' 36"	0.9881531	16' 11.13"	23° 26' 17"	14 m 24 s
13	238° 11' 04"	0.21"	235° 55' 26"	-19° 45' 09"	0.9881448	16' 11.14"	23° 26' 17"	14 m 24 s
14	238° 13' 35"	0.21"	235° 58' 03"	-19° 45' 43"	0.9881365	16' 11.15"	23° 26' 17"	14 m 23 s
15	238° 16' 06"	0.20"	236° 00' 40"	-19° 46' 17"	0.9881282	16' 11.16"	23° 26' 17"	14 m 23 s
16	238° 18' 38"	0.20"	236° 03' 17"	-19° 46' 51"	0.9881199	16' 11.17"	23° 26' 17"	14 m 22 s
17	238° 21' 09"	0.19"	236° 05' 54"	-19° 47' 24"	0.9881116	16' 11.18"	23° 26' 17"	14 m 21 s
18	238° 23' 41"	0.19"	236° 08' 31"	-19° 47' 58"	0.9881033	16' 11.18"	23° 26' 17"	14 m 21 s
19	238° 26' 12"	0.18"	236° 11' 08"	-19° 48' 31"	0.9880950	16' 11.19"	23° 26' 17"	14 m 20 s
20	238° 28' 44"	0.18"	236° 13' 45"	-19° 49' 05"	0.9880867	16' 11.20"	23° 26' 17"	14 m 20 s
21	238° 31' 15"	0.17"	236° 16' 22"	-19° 49' 38"	0.9880785	16' 11.21"	23° 26' 17"	14 m 19 s
22	238° 33' 47"	0.16"	236° 18' 59"	-19° 50' 12"	0.9880702	16' 11.22"	23° 26' 17"	14 m 18 s
23	238° 36' 18"	0.16"	236° 21' 36"	-19° 50' 45"	0.9880619	16' 11.22"	23° 26' 17"	14 m 18 s
24	238° 38' 50"	0.15"	236° 24' 13"	-19° 51' 18"	0.9880536	16' 11.23"	23° 26' 17"	14 m 17 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	187° 00' 14"	3° 07' 51"	187° 40' 05"	0° 05' 46"	0° 56' 50"	15' 29.13"	115° 49' 07"	0.18406
1	187° 32' 48"	3° 05' 25"	188° 09' 00"	0° -9' 17"	0° 56' 52"	15' 29.71"	115° 48' 05"	0.18068
2	188° 05' 25"	3° 02' 59"	188° 37' 59"	0° -24' 22"	0° 56' 54"	15' 30.28"	115° 46' 53"	0.17731
3	188° 38' 04"	3° 00' 31"	189° 06' 59"	0° -39' 28"	0° 56' 56"	15' 30.86"	115° 45' 33"	0.17397
4	189° 10' 46"	2° 58' 02"	189° 36' 02"	0° -54' 34"	0° 56' 58"	15' 31.44"	115° 44' 03"	0.17064
5	189° 43' 30"	2° 55' 32"	190° 05' 08"	-1° 09' 42"	0° 57' 00"	15' 32.02"	115° 42' 24"	0.16734
6	190° 16' 17"	2° 53' 01"	190° 34' 16"	-1° 24' 51"	0° 57' 02"	15' 32.60"	115° 40' 36"	0.16406
7	190° 49' 06"	2° 50' 28"	191° 03' 27"	-1° 40' 00"	0° 57' 05"	15' 33.19"	115° 38' 38"	0.16080
8	191° 21' 57"	2° 47' 55"	191° 32' 41"	-1° 55' 11"	0° 57' 07"	15' 33.77"	115° 36' 31"	0.15756
9	191° 54' 51"	2° 45' 20"	192° 01' 57"	-2° 10' 22"	0° 57' 09"	15' 34.35"	115° 34' 14"	0.15434
10	192° 27' 48"	2° 42' 45"	192° 31' 17"	-2° 25' 33"	0° 57' 11"	15' 34.94"	115° 31' 47"	0.15115
11	193° 00' 47"	2° 40' 08"	193° 00' 39"	-2° 40' 46"	0° 57' 13"	15' 35.53"	115° 29' 10"	0.14798
12	193° 33' 48"	2° 37' 30"	193° 30' 05"	-2° 55' 58"	0° 57' 15"	15' 36.12"	115° 26' 23"	0.14483
13	194° 06' 52"	2° 34' 51"	193° 59' 34"	-3° 11' 11"	0° 57' 17"	15' 36.70"	115° 23' 27"	0.14171
14	194° 39' 59"	2° 32' 11"	194° 29' 06"	-3° 26' 25"	0° 57' 20"	15' 37.29"	115° 20' 20"	0.13861
15	195° 13' 08"	2° 29' 30"	194° 58' 41"	-3° 41' 39"	0° 57' 22"	15' 37.88"	115° 17' 03"	0.13553
16	195° 46' 20"	2° 26' 48"	195° 28' 20"	-3° 56' 53"	0° 57' 24"	15' 38.47"	115° 13' 35"	0.13248
17	196° 19' 34"	2° 24' 04"	195° 58' 02"	-4° 12' 07"	0° 57' 26"	15' 39.06"	115° 9' 57"	0.12945
18	196° 52' 51"	2° 21' 20"	196° 27' 48"	-4° 27' 22"	0° 57' 28"	15' 39.65"	115° 6' 08"	0.12645
19	197° 26' 10"	2° 18' 35"	196° 57' 37"	-4° 42' 36"	0° 57' 30"	15' 40.25"	115° 2' 09"	0.12348
20	197° 59' 32"	2° 15' 49"	197° 27' 30"	-4° 57' 50"	0° 57' 33"	15' 40.84"	114° 57' 58"	0.12053
21	198° 32' 56"	2° 13' 02"	197° 57' 27"	-5° 13' 05"	0° 57' 35"	15' 41.43"	114° 53' 37"	0.11761
22	199° 06' 23"	2° 10' 13"	198° 27' 28"	-5° 28' 19"	0° 57' 37"	15' 42.02"	114° 49' 04"	0.11471
23	199° 39' 53"	2° 07' 24"	198° 57' 33"	-5° 43' 32"	0° 57' 39"	15' 42.61"	114° 44' 19"	0.11185
24	200° 13' 25"	2° 04' 34"	199° 27' 42"	-5° 58' 46"	0° 57' 41"	15' 43.20"	114° 39' 24"	0.10901

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Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	238° 38' 50"	0.15"	236° 24' 13"	-19° 51' 18"	0.9880536	16' 11.23"	23° 26' 17"	14 m 17 s
1	238° 41' 21"	0.15"	236° 26' 50"	-19° 51' 52"	0.9880454	16' 11.24"	23° 26' 17"	14 m 16 s
2	238° 43' 53"	0.14"	236° 29' 27"	-19° 52' 25"	0.9880371	16' 11.25"	23° 26' 17"	14 m 16 s
3	238° 46' 24"	0.14"	236° 32' 04"	-19° 52' 58"	0.9880289	16' 11.26"	23° 26' 17"	14 m 15 s
4	238° 48' 56"	0.13"	236° 34' 41"	-19° 53' 32"	0.9880206	16' 11.27"	23° 26' 17"	14 m 15 s
5	238° 51' 27"	0.13"	236° 37' 19"	-19° 54' 05"	0.9880124	16' 11.27"	23° 26' 17"	14 m 14 s
6	238° 53' 59"	0.12"	236° 39' 56"	-19° 54' 38"	0.9880042	16' 11.28"	23° 26' 17"	14 m 13 s
7	238° 56' 30"	0.11"	236° 42' 33"	-19° 55' 11"	0.9879959	16' 11.29"	23° 26' 17"	14 m 13 s
8	238° 59' 01"	0.11"	236° 45' 10"	-19° 55' 44"	0.9879877	16' 11.30"	23° 26' 17"	14 m 12 s
9	239° 01' 33"	0.10"	236° 47' 48"	-19° 56' 17"	0.9879795	16' 11.31"	23° 26' 17"	14 m 11 s
10	239° 04' 05"	0.10"	236° 50' 25"	-19° 56' 50"	0.9879712	16' 11.31"	23° 26' 17"	14 m 11 s
11	239° 06' 36"	0.09"	236° 53' 02"	-19° 57' 23"	0.9879630	16' 11.32"	23° 26' 17"	14 m 10 s
12	239° 09' 08"	0.09"	236° 55' 40"	-19° 57' 56"	0.9879548	16' 11.33"	23° 26' 17"	14 m 10 s
13	239° 11' 39"	0.08"	236° 58' 17"	-19° 58' 29"	0.9879466	16' 11.34"	23° 26' 17"	14 m 09 s
14	239° 14' 11"	0.08"	237° 00' 54"	-19° 59' 02"	0.9879384	16' 11.35"	23° 26' 17"	14 m 08 s
15	239° 16' 42"	0.07"	237° 03' 32"	-19° 59' 34"	0.9879302	16' 11.35"	23° 26' 17"	14 m 08 s
16	239° 19' 14"	0.06"	237° 06' 09"	-20° 00' 07"	0.9879220	16' 11.36"	23° 26' 17"	14 m 07 s
17	239° 21' 45"	0.06"	237° 08' 47"	-20° 00' 40"	0.9879138	16' 11.37"	23° 26' 17"	14 m 06 s
18	239° 24' 17"	0.05"	237° 11' 24"	-20° 01' 13"	0.9879056	16' 11.38"	23° 26' 17"	14 m 06 s
19	239° 26' 48"	0.05"	237° 14' 02"	-20° 01' 45"	0.9878974	16' 11.39"	23° 26' 17"	14 m 05 s
20	239° 29' 20"	0.04"	237° 16' 39"	-20° 02' 18"	0.9878893	16' 11.39"	23° 26' 17"	14 m 04 s
21	239° 31' 51"	0.04"	237° 19' 17"	-20° 02' 50"	0.9878811	16' 11.40"	23° 26' 17"	14 m 04 s
22	239° 34' 23"	0.03"	237° 21' 54"	-20° 03' 23"	0.9878729	16' 11.41"	23° 26' 17"	14 m 03 s
23	239° 36' 54"	0.02"	237° 24' 32"	-20° 03' 55"	0.9878647	16' 11.42"	23° 26' 17"	14 m 02 s
24	239° 39' 26"	0.02"	237° 27' 09"	-20° 04' 28"	0.9878566	16' 11.43"	23° 26' 17"	14 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	200° 13' 25"	2° 04' 34"	199° 27' 42"	-5° 58' 46"	0° 57' 41"	15' 43.20"	114° 39' 24"	0.10901
1	200° 46' 59"	2° 01' 43"	199° 57' 55"	-6° 13' 59"	0° 57' 43"	15' 43.79"	114° 34' 16"	0.10620
2	201° 20' 36"	1° 58' 51"	200° 28' 12"	-6° 29' 11"	0° 57' 46"	15' 44.38"	114° 28' 56"	0.10341
3	201° 54' 16"	1° 55' 58"	200° 58' 33"	-6° 44' 23"	0° 57' 48"	15' 44.97"	114° 23' 25"	0.10066
4	202° 27' 58"	1° 53' 05"	201° 28' 59"	-6° 59' 34"	0° 57' 50"	15' 45.56"	114° 17' 41"	0.09793
5	203° 01' 43"	1° 50' 10"	201° 59' 29"	-7° 14' 44"	0° 57' 52"	15' 46.15"	114° 11' 44"	0.09524
6	203° 35' 31"	1° 47' 15"	202° 30' 03"	-7° 29' 54"	0° 57' 54"	15' 46.74"	114° 5' 35"	0.09257
7	204° 09' 21"	1° 44' 18"	203° 00' 42"	-7° 45' 02"	0° 57' 56"	15' 47.33"	113° 59' 13"	0.08994
8	204° 43' 13"	1° 41' 21"	203° 31' 26"	-8° 00' 10"	0° 57' 59"	15' 47.92"	113° 52' 37"	0.08733
9	205° 17' 08"	1° 38' 23"	204° 02' 14"	-8° 15' 17"	0° 58' 01"	15' 48.50"	113° 45' 48"	0.08476
10	205° 51' 06"	1° 35' 24"	204° 33' 07"	-8° 30' 22"	0° 58' 03"	15' 49.09"	113° 38' 45"	0.08222
11	206° 25' 06"	1° 32' 25"	205° 04' 05"	-8° 45' 26"	0° 58' 05"	15' 49.67"	113° 31' 28"	0.07971
12	206° 59' 09"	1° 29' 24"	205° 35' 08"	-9° 00' 29"	0° 58' 07"	15' 50.25"	113° 23' 57"	0.07723
13	207° 33' 15"	1° 26' 23"	206° 06' 16"	-9° 15' 30"	0° 58' 09"	15' 50.83"	113° 16' 11"	0.07479
14	208° 07' 23"	1° 23' 22"	206° 37' 29"	-9° 30' 30"	0° 58' 11"	15' 51.41"	113° 8' 10"	0.07237
15	208° 41' 33"	1° 20' 19"	207° 08' 48"	-9° 45' 28"	0° 58' 14"	15' 51.99"	112° 59' 53"	0.07000
16	209° 15' 46"	1° 17' 16"	207° 40' 11"	-10° 00' 24"	0° 58' 16"	15' 52.57"	112° 51' 21"	0.06765
17	209° 50' 02"	1° 14' 12"	208° 11' 40"	-10° 15' 19"	0° 58' 18"	15' 53.14"	112° 42' 32"	0.06534
18	210° 24' 20"	1° 11' 07"	208° 43' 14"	-10° 30' 11"	0° 58' 20"	15' 53.71"	112° 33' 27"	0.06306
19	210° 58' 41"	1° 08' 02"	209° 14' 53"	-10° 45' 02"	0° 58' 22"	15' 54.28"	112° 24' 05"	0.06082
20	211° 33' 04"	1° 04' 56"	209° 46' 39"	-10° 59' 50"	0° 58' 24"	15' 54.85"	112° 14' 24"	0.05862
21	212° 07' 29"	1° 01' 50"	210° 18' 29"	-11° 14' 37"	0° 58' 26"	15' 55.42"	112° 4' 26"	0.05644
22	212° 41' 58"	0° 58' 43"	210° 50' 26"	-11° 29' 21"	0° 58' 28"	15' 55.99"	111° 54' 09"	0.05431
23	213° 16' 28"	0° 55' 35"	211° 22' 28"	-11° 44' 03"	0° 58' 30"	15' 56.55"	111° 43' 32"	0.05221
24	213° 51' 02"	0° 52' 27"	211° 54' 35"	-11° 58' 42"	0° 58' 32"	15' 57.11"	111° 32' 35"	0.05015



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	239° 39' 26"	0.02"	237° 27' 09"	-20° 04' 28"	0.9878566	16' 11.43"	23° 26' 17"	14 m 02 s
1	239° 41' 57"	0.01"	237° 29' 47"	-20° 05' 00"	0.9878484	16' 11.43"	23° 26' 17"	14 m 01 s
2	239° 44' 29"	0.01"	237° 32' 25"	-20° 05' 33"	0.9878403	16' 11.44"	23° 26' 17"	14 m 00 s
3	239° 47' 01"	0.00"	237° 35' 02"	-20° 06' 05"	0.9878321	16' 11.45"	23° 26' 17"	13 m 60 s
4	239° 49' 32"	-0.00"	237° 37' 40"	-20° 06' 37"	0.9878240	16' 11.46"	23° 26' 17"	13 m 59 s
5	239° 52' 04"	-0.01"	237° 40' 18"	-20° 07' 10"	0.9878158	16' 11.47"	23° 26' 17"	13 m 59 s
6	239° 54' 35"	-0.01"	237° 42' 55"	-20° 07' 42"	0.9878077	16' 11.47"	23° 26' 17"	13 m 58 s
7	239° 57' 07"	-0.02"	237° 45' 33"	-20° 08' 14"	0.9877996	16' 11.48"	23° 26' 17"	13 m 57 s
8	239° 59' 38"	-0.03"	237° 48' 11"	-20° 08' 46"	0.9877914	16' 11.49"	23° 26' 17"	13 m 57 s
9	240° 02' 10"	-0.03"	237° 50' 49"	-20° 09' 18"	0.9877833	16' 11.50"	23° 26' 17"	13 m 56 s
10	240° 04' 41"	-0.04"	237° 53' 26"	-20° 09' 50"	0.9877752	16' 11.51"	23° 26' 17"	13 m 55 s
11	240° 07' 13"	-0.04"	237° 56' 04"	-20° 10' 22"	0.9877671	16' 11.51"	23° 26' 17"	13 m 55 s
12	240° 09' 45"	-0.05"	237° 58' 42"	-20° 10' 54"	0.9877589	16' 11.52"	23° 26' 17"	13 m 54 s
13	240° 12' 16"	-0.05"	238° 01' 20"	-20° 11' 26"	0.9877508	16' 11.53"	23° 26' 17"	13 m 53 s
14	240° 14' 48"	-0.06"	238° 03' 58"	-20° 11' 58"	0.9877427	16' 11.54"	23° 26' 17"	13 m 52 s
15	240° 17' 19"	-0.07"	238° 06' 36"	-20° 12' 30"	0.9877346	16' 11.55"	23° 26' 17"	13 m 52 s
16	240° 19' 51"	-0.07"	238° 09' 14"	-20° 13' 02"	0.9877265	16' 11.55"	23° 26' 17"	13 m 51 s
17	240° 22' 23"	-0.08"	238° 11' 52"	-20° 13' 34"	0.9877184	16' 11.56"	23° 26' 17"	13 m 50 s
18	240° 24' 54"	-0.08"	238° 14' 30"	-20° 14' 05"	0.9877103	16' 11.57"	23° 26' 17"	13 m 50 s
19	240° 27' 26"	-0.09"	238° 17' 08"	-20° 14' 37"	0.9877023	16' 11.58"	23° 26' 17"	13 m 49 s
20	240° 29' 57"	-0.09"	238° 19' 46"	-20° 15' 09"	0.9876942	16' 11.59"	23° 26' 17"	13 m 48 s
21	240° 32' 29"	-0.10"	238° 22' 24"	-20° 15' 40"	0.9876861	16' 11.59"	23° 26' 17"	13 m 48 s
22	240° 35' 01"	-0.10"	238° 25' 02"	-20° 16' 12"	0.9876780	16' 11.60"	23° 26' 17"	13 m 47 s
23	240° 37' 32"	-0.11"	238° 27' 40"	-20° 16' 44"	0.9876699	16' 11.61"	23° 26' 17"	13 m 46 s
24	240° 40' 04"	-0.12"	238° 30' 18"	-20° 17' 15"	0.9876619	16' 11.62"	23° 26' 17"	13 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	213° 51' 02"	0° 52' 27"	211° 54' 35"	-11° 58' 42"	0° 58' 32"	15' 57.11"	111° 32' 35"	0.05015
1	214° 25' 37"	0° 49' 18"	212° 26' 49"	-12° 13' 18"	0° 58' 34"	15' 57.67"	111° 21' 18"	0.04812
2	215° 00' 16"	0° 46' 09"	212° 59' 09"	-12° 27' 52"	0° 58' 36"	15' 58.22"	111° 9' 38"	0.04613
3	215° 34' 56"	0° 42' 59"	213° 31' 34"	-12° 42' 23"	0° 58' 38"	15' 58.77"	110° 57' 36"	0.04418
4	216° 09' 39"	0° 39' 48"	214° 04' 06"	-12° 56' 51"	0° 58' 40"	15' 59.32"	110° 45' 10"	0.04227
5	216° 44' 25"	0° 36' 38"	214° 36' 44"	-13° 11' 17"	0° 58' 42"	15' 59.87"	110° 32' 20"	0.04040
6	217° 19' 13"	0° 33' 26"	215° 09' 28"	-13° 25' 39"	0° 58' 44"	16' 00.41"	110° 19' 04"	0.03856
7	217° 54' 04"	0° 30' 15"	215° 42' 18"	-13° 39' 57"	0° 58' 46"	16' 00.96"	110° 5' 21"	0.03676
8	218° 28' 57"	0° 27' 03"	216° 15' 15"	-13° 54' 13"	0° 58' 48"	16' 01.49"	109° 51' 10"	0.03500
9	219° 03' 52"	0° 23' 50"	216° 48' 18"	-14° 08' 25"	0° 58' 50"	16' 02.03"	109° 36' 28"	0.03329
10	219° 38' 50"	0° 20' 38"	217° 21' 27"	-14° 22' 33"	0° 58' 52"	16' 02.56"	109° 21' 15"	0.03161
11	220° 13' 50"	0° 17' 24"	217° 54' 43"	-14° 36' 38"	0° 58' 54"	16' 03.09"	109° 5' 29"	0.02997
12	220° 48' 52"	0° 14' 11"	218° 28' 06"	-14° 50' 39"	0° 58' 56"	16' 03.61"	108° 49' 07"	0.02837
13	221° 23' 57"	0° 10' 57"	219° 01' 35"	-15° 04' 36"	0° 58' 58"	16' 04.13"	108° 32' 07"	0.02682
14	221° 59' 05"	0° 07' 43"	219° 35' 11"	-15° 18' 30"	0° 59' 00"	16' 04.65"	108° 14' 27"	0.02530
15	222° 34' 14"	0° 04' 29"	220° 08' 53"	-15° 32' 19"	0° 59' 02"	16' 05.17"	107° 56' 03"	0.02383
16	223° 09' 26"	0° 01' 14"	220° 42' 42"	-15° 46' 04"	0° 59' 04"	16' 05.68"	107° 36' 53"	0.02240
17	223° 44' 41"	0° -2' 00"	221° 16' 38"	-15° 59' 44"	0° 59' 06"	16' 06.18"	107° 16' 52"	0.02101
18	224° 19' 57"	0° -5' 15"	221° 50' 41"	-16° 13' 20"	0° 59' 07"	16' 06.68"	106° 55' 57"	0.01966
19	224° 55' 16"	0° -8' 30"	222° 24' 51"	-16° 26' 51"	0° 59' 09"	16' 07.18"	106° 34' 03"	0.01836
20	225° 30' 37"	0° -11' 46"	222° 59' 07"	-16° 40' 18"	0° 59' 11"	16' 07.68"	106° 11' 03"	0.01710
21	226° 06' 00"	0° -15' 01"	223° 33' 31"	-16° 53' 40"	0° 59' 13"	16' 08.17"	105° 46' 52"	0.01588
22	226° 41' 26"	0° -18' 16"	224° 08' 02"	-17° 06' 57"	0° 59' 15"	16' 08.65"	105° 21' 23"	0.01470
23	227° 16' 54"	0° -21' 32"	224° 42' 40"	-17° 20' 09"	0° 59' 16"	16' 09.13"	104° 54' 26"	0.01357
24	227° 52' 24"	0° -24' 47"	225° 17' 25"	-17° 33' 16"	0° 59' 18"	16' 09.61"	104° 25' 53"	0.01249

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	240° 40' 04"	-0.12"	238° 30' 18"	-20° 17' 15"	0.9876619	16' 11.62"	23° 26' 17"	13 m 46 s
1	240° 42' 35"	-0.12"	238° 32' 56"	-20° 17' 47"	0.9876538	16' 11.63"	23° 26' 17"	13 m 45 s
2	240° 45' 07"	-0.13"	238° 35' 34"	-20° 18' 18"	0.9876458	16' 11.63"	23° 26' 17"	13 m 44 s
3	240° 47' 39"	-0.13"	238° 38' 12"	-20° 18' 50"	0.9876377	16' 11.64"	23° 26' 17"	13 m 44 s
4	240° 50' 10"	-0.14"	238° 40' 51"	-20° 19' 21"	0.9876297	16' 11.65"	23° 26' 17"	13 m 43 s
5	240° 52' 42"	-0.14"	238° 43' 29"	-20° 19' 52"	0.9876216	16' 11.66"	23° 26' 17"	13 m 42 s
6	240° 55' 13"	-0.15"	238° 46' 07"	-20° 20' 24"	0.9876136	16' 11.67"	23° 26' 17"	13 m 42 s
7	240° 57' 45"	-0.15"	238° 48' 45"	-20° 20' 55"	0.9876055	16' 11.67"	23° 26' 17"	13 m 41 s
8	241° 00' 17"	-0.16"	238° 51' 23"	-20° 21' 26"	0.9875975	16' 11.68"	23° 26' 17"	13 m 40 s
9	241° 02' 48"	-0.17"	238° 54' 02"	-20° 21' 57"	0.9875895	16' 11.69"	23° 26' 17"	13 m 39 s
10	241° 05' 20"	-0.17"	238° 56' 40"	-20° 22' 28"	0.9875814	16' 11.70"	23° 26' 17"	13 m 39 s
11	241° 07' 52"	-0.18"	238° 59' 18"	-20° 22' 59"	0.9875734	16' 11.70"	23° 26' 17"	13 m 38 s
12	241° 10' 23"	-0.18"	239° 01' 57"	-20° 23' 30"	0.9875654	16' 11.71"	23° 26' 17"	13 m 37 s
13	241° 12' 55"	-0.19"	239° 04' 35"	-20° 24' 01"	0.9875574	16' 11.72"	23° 26' 17"	13 m 37 s
14	241° 15' 27"	-0.19"	239° 07' 14"	-20° 24' 32"	0.9875494	16' 11.73"	23° 26' 17"	13 m 36 s
15	241° 17' 58"	-0.20"	239° 09' 52"	-20° 25' 03"	0.9875414	16' 11.74"	23° 26' 17"	13 m 35 s
16	241° 20' 30"	-0.20"	239° 12' 30"	-20° 25' 34"	0.9875334	16' 11.74"	23° 26' 17"	13 m 34 s
17	241° 23' 01"	-0.21"	239° 15' 09"	-20° 26' 05"	0.9875254	16' 11.75"	23° 26' 17"	13 m 34 s
18	241° 25' 33"	-0.21"	239° 17' 47"	-20° 26' 36"	0.9875174	16' 11.76"	23° 26' 17"	13 m 33 s
19	241° 28' 05"	-0.22"	239° 20' 26"	-20° 27' 07"	0.9875094	16' 11.77"	23° 26' 17"	13 m 32 s
20	241° 30' 36"	-0.23"	239° 23' 04"	-20° 27' 38"	0.9875014	16' 11.78"	23° 26' 17"	13 m 32 s
21	241° 33' 08"	-0.23"	239° 25' 43"	-20° 28' 08"	0.9874934	16' 11.78"	23° 26' 17"	13 m 31 s
22	241° 35' 40"	-0.24"	239° 28' 21"	-20° 28' 39"	0.9874854	16' 11.79"	23° 26' 17"	13 m 30 s
23	241° 38' 11"	-0.24"	239° 30' 60"	-20° 29' 10"	0.9874774	16' 11.80"	23° 26' 17"	13 m 29 s
24	241° 40' 43"	-0.25"	239° 33' 39"	-20° 29' 40"	0.9874695	16' 11.81"	23° 26' 17"	13 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	227° 52' 24"	0°-24' 47"	225° 17' 25"	-17° 33' 16"	0° 59' 18"	16' 09.61"	104° 25' 53"	0.01249
1	228° 27' 56"	0°-28' 03"	225° 52' 17"	-17° 46' 17"	0° 59' 20"	16' 10.08"	103° 55' 30"	0.01144
2	229° 03' 31"	0°-31' 19"	226° 27' 16"	-17° 59' 13"	0° 59' 22"	16' 10.55"	103° 23' 04"	0.01045
3	229° 39' 07"	0°-34' 34"	227° 02' 22"	-18° 12' 04"	0° 59' 23"	16' 11.01"	102° 48' 19"	0.00949
4	230° 14' 46"	0°-37' 50"	227° 37' 36"	-18° 24' 49"	0° 59' 25"	16' 11.47"	102° 10' 53"	0.00859
5	230° 50' 27"	0°-41' 05"	228° 12' 57"	-18° 37' 28"	0° 59' 27"	16' 11.92"	101° 30' 23"	0.00772
6	231° 26' 09"	0°-44' 21"	228° 48' 25"	-18° 50' 01"	0° 59' 28"	16' 12.37"	100° 46' 17"	0.00691
7	232° 01' 54"	0°-47' 36"	229° 24' 00"	-19° 02' 28"	0° 59' 30"	16' 12.81"	99° 57' 60"	0.00614
8	232° 37' 41"	0°-50' 51"	229° 59' 43"	-19° 14' 49"	0° 59' 32"	16' 13.25"	99° 4' 42"	0.00541
9	233° 13' 30"	0°-54' 06"	230° 35' 33"	-19° 27' 04"	0° 59' 33"	16' 13.68"	98° 5' 25"	0.00474
10	233° 49' 22"	0°-57' 21"	231° 11' 31"	-19° 39' 12"	0° 59' 35"	16' 14.11"	96° 58' 50"	0.00410
11	234° 25' 15"	-1° 00' 36"	231° 47' 36"	-19° 51' 14"	0° 59' 36"	16' 14.53"	95° 43' 16"	0.00352
12	235° 01' 10"	-1° 03' 50"	232° 23' 48"	-20° 03' 09"	0° 59' 38"	16' 14.95"	94° 16' 26"	0.00298
13	235° 37' 06"	-1° 07' 04"	233° 00' 07"	-20° 14' 57"	0° 59' 39"	16' 15.36"	92° 35' 16"	0.00249
14	236° 13' 05"	-1° 10' 18"	233° 36' 34"	-20° 26' 38"	0° 59' 41"	16' 15.77"	90° 35' 26"	0.00205
15	236° 49' 06"	-1° 13' 31"	234° 13' 09"	-20° 38' 13"	0° 59' 42"	16' 16.17"	88° 10' 46"	0.00165
16	237° 25' 09"	-1° 16' 45"	234° 49' 50"	-20° 49' 40"	0° 59' 44"	16' 16.56"	85° 12' 15"	0.00130
17	238° 01' 13"	-1° 19' 57"	235° 26' 39"	-21° 00' 60"	0° 59' 45"	16' 16.95"	81° 26' 15"	0.00100
18	238° 37' 19"	-1° 23' 10"	236° 03' 36"	-21° 12' 12"	0° 59' 47"	16' 17.33"	76° 31' 41"	0.00075
19	239° 13' 26"	-1° 26' 22"	236° 40' 38"	-21° 23' 17"	0° 59' 48"	16' 17.71"	69° 56' 06"	0.00054
20	239° 49' 36"	-1° 29' 33"	237° 17' 49"	-21° 34' 14"	0° 59' 49"	16' 18.08"	60° 49' 13"	0.00039
21	240° 25' 48"	-1° 32' 44"	237° 55' 07"	-21° 45' 03"	0° 59' 51"	16' 18.45"	48° 7' 39"	0.00028
22	241° 02' 01"	-1° 35' 55"	238° 32' 33"	-21° 55' 45"	0° 59' 52"	16' 18.80"	31° 13' 60"	0.00022
23	241° 38' 16"	-1° 39' 05"	239° 10' 05"	-22° 06' 19"	0° 59' 53"	16' 19.16"	11° 37' 51"	0.00021
24	242° 14' 33"	-1° 42' 15"	239° 47' 45"	-22° 16' 44"	0° 59' 55"	16' 19.50"	353° 9' 29"	0.00025



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	241° 40' 43"	-0.25"	239° 33' 39"	-20° 29' 40"	0.9874695	16' 11.81"	23° 26' 17"	13 m 29 s
1	241° 43' 15"	-0.25"	239° 36' 17"	-20° 30' 11"	0.9874615	16' 11.82"	23° 26' 17"	13 m 28 s
2	241° 45' 46"	-0.26"	239° 38' 56"	-20° 30' 41"	0.9874535	16' 11.82"	23° 26' 17"	13 m 27 s
3	241° 48' 18"	-0.26"	239° 41' 34"	-20° 31' 12"	0.9874456	16' 11.83"	23° 26' 17"	13 m 27 s
4	241° 50' 50"	-0.27"	239° 44' 13"	-20° 31' 42"	0.9874376	16' 11.84"	23° 26' 17"	13 m 26 s
5	241° 53' 21"	-0.27"	239° 46' 52"	-20° 32' 12"	0.9874297	16' 11.85"	23° 26' 17"	13 m 25 s
6	241° 55' 53"	-0.28"	239° 49' 30"	-20° 32' 43"	0.9874217	16' 11.85"	23° 26' 17"	13 m 24 s
7	241° 58' 25"	-0.28"	239° 52' 09"	-20° 33' 13"	0.9874138	16' 11.86"	23° 26' 17"	13 m 24 s
8	242° 00' 57"	-0.29"	239° 54' 48"	-20° 33' 43"	0.9874058	16' 11.87"	23° 26' 17"	13 m 23 s
9	242° 03' 28"	-0.29"	239° 57' 27"	-20° 34' 14"	0.9873979	16' 11.88"	23° 26' 17"	13 m 22 s
10	242° 05' 60"	-0.30"	240° 00' 06"	-20° 34' 44"	0.9873900	16' 11.89"	23° 26' 17"	13 m 22 s
11	242° 08' 32"	-0.30"	240° 02' 44"	-20° 35' 14"	0.9873820	16' 11.89"	23° 26' 17"	13 m 21 s
12	242° 11' 03"	-0.31"	240° 05' 23"	-20° 35' 44"	0.9873741	16' 11.90"	23° 26' 17"	13 m 20 s
13	242° 13' 35"	-0.31"	240° 08' 02"	-20° 36' 14"	0.9873662	16' 11.91"	23° 26' 17"	13 m 19 s
14	242° 16' 07"	-0.32"	240° 10' 41"	-20° 36' 44"	0.9873583	16' 11.92"	23° 26' 17"	13 m 19 s
15	242° 18' 38"	-0.32"	240° 13' 20"	-20° 37' 14"	0.9873504	16' 11.92"	23° 26' 17"	13 m 18 s
16	242° 21' 10"	-0.33"	240° 15' 59"	-20° 37' 44"	0.9873425	16' 11.93"	23° 26' 17"	13 m 17 s
17	242° 23' 42"	-0.33"	240° 18' 38"	-20° 38' 14"	0.9873346	16' 11.94"	23° 26' 17"	13 m 16 s
18	242° 26' 14"	-0.34"	240° 21' 17"	-20° 38' 44"	0.9873267	16' 11.95"	23° 26' 17"	13 m 16 s
19	242° 28' 45"	-0.34"	240° 23' 56"	-20° 39' 14"	0.9873188	16' 11.96"	23° 26' 17"	13 m 15 s
20	242° 31' 17"	-0.35"	240° 26' 35"	-20° 39' 44"	0.9873109	16' 11.96"	23° 26' 17"	13 m 14 s
21	242° 33' 49"	-0.35"	240° 29' 14"	-20° 40' 13"	0.9873030	16' 11.97"	23° 26' 17"	13 m 13 s
22	242° 36' 20"	-0.35"	240° 31' 53"	-20° 40' 43"	0.9872951	16' 11.98"	23° 26' 17"	13 m 13 s
23	242° 38' 52"	-0.36"	240° 34' 32"	-20° 41' 13"	0.9872872	16' 11.99"	23° 26' 17"	13 m 12 s
24	242° 41' 24"	-0.36"	240° 37' 11"	-20° 41' 42"	0.9872793	16' 11.99"	23° 26' 17"	13 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	242° 14' 33"	-1° 42' 15"	239° 47' 45"	-22° 16' 44"	0° 59' 55"	16' 19.50"	353° 9' 29"	0.00025
1	242° 50' 51"	-1° 45' 24"	240° 25' 32"	-22° 27' 01"	0° 59' 56"	16' 19.84"	338° 34' 48"	0.00033
2	243° 27' 11"	-1° 48' 32"	241° 03' 27"	-22° 37' 10"	0° 59' 57"	16' 20.18"	327° 59' 23"	0.00047
3	244° 03' 32"	-1° 51' 40"	241° 41' 28"	-22° 47' 10"	0° 59' 58"	16' 20.51"	320° 22' 19"	0.00065
4	244° 39' 55"	-1° 54' 47"	242° 19' 37"	-22° 57' 01"	0° 59' 59"	16' 20.83"	314° 46' 09"	0.00089
5	245° 16' 20"	-1° 57' 54"	242° 57' 52"	-23° 06' 44"	1° 00' 01"	16' 21.14"	310° 31' 05"	0.00117
6	245° 52' 46"	-2° 00' 60"	243° 36' 14"	-23° 16' 18"	1° 00' 02"	16' 21.45"	307° 11' 27"	0.00150
7	246° 29' 14"	-2° 04' 05"	244° 14' 44"	-23° 25' 42"	1° 00' 03"	16' 21.75"	304° 30' 44"	0.00188
8	247° 05' 43"	-2° 07' 09"	244° 53' 20"	-23° 34' 58"	1° 00' 04"	16' 22.05"	302° 18' 07"	0.00232
9	247° 42' 13"	-2° 10' 13"	245° 32' 02"	-23° 44' 04"	1° 00' 05"	16' 22.33"	300° 26' 20"	0.00280
10	248° 18' 45"	-2° 13' 16"	246° 10' 52"	-23° 53' 01"	1° 00' 06"	16' 22.62"	298° 50' 21"	0.00333
11	248° 55' 18"	-2° 16' 18"	246° 49' 48"	-24° 01' 49"	1° 00' 07"	16' 22.89"	297° 26' 34"	0.00391
12	249° 31' 53"	-2° 19' 19"	247° 28' 51"	-24° 10' 27"	1° 00' 08"	16' 23.16"	296° 12' 25"	0.00453
13	250° 08' 29"	-2° 22' 20"	248° 07' 60"	-24° 18' 55"	1° 00' 09"	16' 23.42"	295° 5' 58"	0.00521
14	250° 45' 06"	-2° 25' 19"	248° 47' 15"	-24° 27' 14"	1° 00' 10"	16' 23.68"	294° 5' 45"	0.00594
15	251° 21' 44"	-2° 28' 18"	249° 26' 37"	-24° 35' 22"	1° 00' 11"	16' 23.92"	293° 10' 40"	0.00672
16	251° 58' 24"	-2° 31' 15"	250° 06' 05"	-24° 43' 20"	1° 00' 12"	16' 24.16"	292° 19' 49"	0.00755
17	252° 35' 05"	-2° 34' 12"	250° 45' 39"	-24° 51' 09"	1° 00' 12"	16' 24.40"	291° 32' 32"	0.00842
18	253° 11' 46"	-2° 37' 08"	251° 25' 19"	-24° 58' 47"	1° 00' 13"	16' 24.63"	290° 48' 15"	0.00935
19	253° 48' 29"	-2° 40' 02"	252° 05' 05"	-25° 06' 14"	1° 00' 14"	16' 24.85"	290° 6' 33"	0.01032
20	254° 25' 13"	-2° 42' 56"	252° 44' 57"	-25° 13' 32"	1° 00' 15"	16' 25.06"	289° 27' 01"	0.01135
21	255° 01' 58"	-2° 45' 48"	253° 24' 54"	-25° 20' 38"	1° 00' 16"	16' 25.26"	288° 49' 24"	0.01242
22	255° 38' 45"	-2° 48' 40"	254° 04' 57"	-25° 27' 34"	1° 00' 16"	16' 25.46"	288° 13' 24"	0.01355
23	256° 15' 32"	-2° 51' 30"	254° 45' 06"	-25° 34' 20"	1° 00' 17"	16' 25.66"	287° 38' 51"	0.01472
24	256° 52' 20"	-2° 54' 20"	255° 25' 19"	-25° 40' 54"	1° 00' 18"	16' 25.84"	287° 5' 33"	0.01594

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	242° 41' 24"	-0.36"	240° 37' 11"	-20° 41' 42"	0.9872793	16' 11.99"	23° 26' 17"	13 m 11 s
1	242° 43' 56"	-0.37"	240° 39' 50"	-20° 42' 12"	0.9872715	16' 12.00"	23° 26' 17"	13 m 10 s
2	242° 46' 27"	-0.37"	240° 42' 29"	-20° 42' 41"	0.9872636	16' 12.01"	23° 26' 17"	13 m 10 s
3	242° 48' 59"	-0.38"	240° 45' 08"	-20° 43' 11"	0.9872557	16' 12.02"	23° 26' 17"	13 m 09 s
4	242° 51' 31"	-0.38"	240° 47' 47"	-20° 43' 40"	0.9872479	16' 12.03"	23° 26' 17"	13 m 08 s
5	242° 54' 03"	-0.39"	240° 50' 26"	-20° 44' 10"	0.9872400	16' 12.03"	23° 26' 17"	13 m 07 s
6	242° 56' 34"	-0.39"	240° 53' 06"	-20° 44' 39"	0.9872322	16' 12.04"	23° 26' 17"	13 m 07 s
7	242° 59' 06"	-0.39"	240° 55' 45"	-20° 45' 09"	0.9872243	16' 12.05"	23° 26' 17"	13 m 06 s
8	243° 01' 38"	-0.40"	240° 58' 24"	-20° 45' 38"	0.9872165	16' 12.06"	23° 26' 17"	13 m 05 s
9	243° 04' 09"	-0.40"	241° 01' 03"	-20° 46' 07"	0.9872086	16' 12.06"	23° 26' 17"	13 m 04 s
10	243° 06' 41"	-0.41"	241° 03' 43"	-20° 46' 36"	0.9872008	16' 12.07"	23° 26' 17"	13 m 04 s
11	243° 09' 13"	-0.41"	241° 06' 22"	-20° 47' 06"	0.9871930	16' 12.08"	23° 26' 17"	13 m 03 s
12	243° 11' 45"	-0.42"	241° 09' 01"	-20° 47' 35"	0.9871852	16' 12.09"	23° 26' 17"	13 m 02 s
13	243° 14' 16"	-0.42"	241° 11' 40"	-20° 48' 04"	0.9871773	16' 12.09"	23° 26' 17"	13 m 01 s
14	243° 16' 48"	-0.42"	241° 14' 20"	-20° 48' 33"	0.9871695	16' 12.10"	23° 26' 17"	13 m 00 s
15	243° 19' 20"	-0.43"	241° 16' 59"	-20° 49' 02"	0.9871617	16' 12.11"	23° 26' 17"	12 m 60 s
16	243° 21' 52"	-0.43"	241° 19' 39"	-20° 49' 31"	0.9871539	16' 12.12"	23° 26' 17"	12 m 59 s
17	243° 24' 24"	-0.44"	241° 22' 18"	-20° 49' 60"	0.9871461	16' 12.13"	23° 26' 17"	12 m 58 s
18	243° 26' 55"	-0.44"	241° 24' 57"	-20° 50' 29"	0.9871383	16' 12.13"	23° 26' 17"	12 m 57 s
19	243° 29' 27"	-0.44"	241° 27' 37"	-20° 50' 58"	0.9871305	16' 12.14"	23° 26' 17"	12 m 57 s
20	243° 31' 59"	-0.45"	241° 30' 16"	-20° 51' 26"	0.9871227	16' 12.15"	23° 26' 17"	12 m 56 s
21	243° 34' 31"	-0.45"	241° 32' 56"	-20° 51' 55"	0.9871149	16' 12.16"	23° 26' 17"	12 m 55 s
22	243° 37' 02"	-0.46"	241° 35' 35"	-20° 52' 24"	0.9871071	16' 12.16"	23° 26' 17"	12 m 54 s
23	243° 39' 34"	-0.46"	241° 38' 15"	-20° 52' 53"	0.9870993	16' 12.17"	23° 26' 17"	12 m 53 s
24	243° 42' 06"	-0.46"	241° 40' 54"	-20° 53' 21"	0.9870916	16' 12.18"	23° 26' 17"	12 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	256° 52' 20"	-2° 54' 20"	255° 25' 19"	-25° 40' 54"	1° 00' 18"	16' 25.84"	287° 5' 33"	0.01594
1	257° 29' 09"	-2° 57' 08"	256° 05' 38"	-25° 47' 17"	1° 00' 18"	16' 26.02"	286° 33' 22"	0.01721
2	258° 05' 59"	-2° 59' 55"	256° 46' 02"	-25° 53' 30"	1° 00' 19"	16' 26.19"	286° 2' 09"	0.01853
3	258° 42' 49"	-3° 02' 40"	257° 26' 31"	-25° 59' 31"	1° 00' 20"	16' 26.35"	285° 31' 48"	0.01990
4	259° 19' 41"	-3° 05' 25"	258° 07' 05"	-26° 05' 21"	1° 00' 20"	16' 26.51"	285° 2' 13"	0.02131
5	259° 56' 33"	-3° 08' 08"	258° 47' 43"	-26° 11' 00"	1° 00' 21"	16' 26.66"	284° 33' 20"	0.02278
6	260° 33' 26"	-3° 10' 50"	259° 28' 26"	-26° 16' 28"	1° 00' 21"	16' 26.80"	284° 5' 04"	0.02429
7	261° 10' 20"	-3° 13' 31"	260° 09' 13"	-26° 21' 44"	1° 00' 22"	16' 26.94"	283° 37' 21"	0.02585
8	261° 47' 14"	-3° 16' 11"	260° 50' 04"	-26° 26' 48"	1° 00' 22"	16' 27.06"	283° 10' 08"	0.02747
9	262° 24' 09"	-3° 18' 49"	261° 30' 60"	-26° 31' 41"	1° 00' 23"	16' 27.18"	282° 43' 23"	0.02912
10	263° 01' 05"	-3° 21' 25"	262° 11' 59"	-26° 36' 23"	1° 00' 23"	16' 27.30"	282° 17' 02"	0.03083
11	263° 38' 01"	-3° 24' 01"	262° 53' 02"	-26° 40' 52"	1° 00' 24"	16' 27.40"	281° 51' 04"	0.03258
12	264° 14' 58"	-3° 26' 35"	263° 34' 09"	-26° 45' 10"	1° 00' 24"	16' 27.50"	281° 25' 26"	0.03438
13	264° 51' 56"	-3° 29' 07"	264° 15' 19"	-26° 49' 16"	1° 00' 24"	16' 27.59"	281° 0' 07"	0.03623
14	265° 28' 53"	-3° 31' 38"	264° 56' 32"	-26° 53' 10"	1° 00' 25"	16' 27.68"	280° 35' 06"	0.03813
15	266° 05' 52"	-3° 34' 08"	265° 37' 48"	-26° 56' 52"	1° 00' 25"	16' 27.76"	280° 10' 20"	0.04007
16	266° 42' 50"	-3° 36' 36"	266° 19' 07"	-27° 00' 22"	1° 00' 25"	16' 27.83"	279° 45' 49"	0.04206
17	267° 19' 50"	-3° 39' 03"	267° 00' 29"	-27° 03' 40"	1° 00' 25"	16' 27.89"	279° 21' 31"	0.04409
18	267° 56' 49"	-3° 41' 28"	267° 41' 53"	-27° 06' 46"	1° 00' 26"	16' 27.95"	278° 57' 27"	0.04617
19	268° 33' 49"	-3° 43' 52"	268° 23' 20"	-27° 09' 40"	1° 00' 26"	16' 28.00"	278° 33' 34"	0.04830
20	269° 10' 49"	-3° 46' 14"	269° 04' 49"	-27° 12' 21"	1° 00' 26"	16' 28.04"	278° 9' 52"	0.05047
21	269° 47' 49"	-3° 48' 34"	269° 46' 20"	-27° 14' 51"	1° 00' 26"	16' 28.07"	277° 46' 20"	0.05269
22	270° 24' 49"	-3° 50' 53"	270° 27' 52"	-27° 17' 08"	1° 00' 26"	16' 28.10"	277° 22' 58"	0.05495
23	271° 01' 50"	-3° 53' 11"	271° 09' 26"	-27° 19' 13"	1° 00' 26"	16' 28.12"	276° 59' 46"	0.05726
24	271° 38' 51"	-3° 55' 26"	271° 51' 02"	-27° 21' 05"	1° 00' 26"	16' 28.14"	276° 36' 42"	0.05962



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	243° 42' 06"	-0.46"	241° 40' 54"	-20° 53' 21"	0.9870916	16' 12.18"	23° 26' 17"	12 m 53 s
1	243° 44' 38"	-0.47"	241° 43' 34"	-20° 53' 50"	0.9870838	16' 12.19"	23° 26' 17"	12 m 52 s
2	243° 47' 10"	-0.47"	241° 46' 13"	-20° 54' 19"	0.9870760	16' 12.19"	23° 26' 17"	12 m 51 s
3	243° 49' 41"	-0.47"	241° 48' 53"	-20° 54' 47"	0.9870683	16' 12.20"	23° 26' 17"	12 m 50 s
4	243° 52' 13"	-0.48"	241° 51' 33"	-20° 55' 16"	0.9870605	16' 12.21"	23° 26' 17"	12 m 50 s
5	243° 54' 45"	-0.48"	241° 54' 12"	-20° 55' 44"	0.9870528	16' 12.22"	23° 26' 17"	12 m 49 s
6	243° 57' 17"	-0.48"	241° 56' 52"	-20° 56' 13"	0.9870450	16' 12.23"	23° 26' 17"	12 m 48 s
7	243° 59' 48"	-0.49"	241° 59' 32"	-20° 56' 41"	0.9870373	16' 12.23"	23° 26' 17"	12 m 47 s
8	244° 02' 20"	-0.49"	242° 02' 11"	-20° 57' 09"	0.9870295	16' 12.24"	23° 26' 17"	12 m 46 s
9	244° 04' 52"	-0.49"	242° 04' 51"	-20° 57' 38"	0.9870218	16' 12.25"	23° 26' 17"	12 m 46 s
10	244° 07' 24"	-0.50"	242° 07' 31"	-20° 58' 06"	0.9870141	16' 12.26"	23° 26' 17"	12 m 45 s
11	244° 09' 56"	-0.50"	242° 10' 10"	-20° 58' 34"	0.9870063	16' 12.26"	23° 26' 17"	12 m 44 s
12	244° 12' 27"	-0.50"	242° 12' 50"	-20° 59' 02"	0.9869986	16' 12.27"	23° 26' 17"	12 m 43 s
13	244° 14' 59"	-0.51"	242° 15' 30"	-20° 59' 30"	0.9869909	16' 12.28"	23° 26' 17"	12 m 42 s
14	244° 17' 31"	-0.51"	242° 18' 10"	-20° 59' 58"	0.9869832	16' 12.29"	23° 26' 17"	12 m 42 s
15	244° 20' 03"	-0.51"	242° 20' 50"	-21° 00' 26"	0.9869755	16' 12.29"	23° 26' 17"	12 m 41 s
16	244° 22' 35"	-0.52"	242° 23' 29"	-21° 00' 54"	0.9869678	16' 12.30"	23° 26' 17"	12 m 40 s
17	244° 25' 06"	-0.52"	242° 26' 09"	-21° 01' 22"	0.9869601	16' 12.31"	23° 26' 17"	12 m 39 s
18	244° 27' 38"	-0.52"	242° 28' 49"	-21° 01' 50"	0.9869524	16' 12.32"	23° 26' 17"	12 m 38 s
19	244° 30' 10"	-0.52"	242° 31' 29"	-21° 02' 18"	0.9869447	16' 12.32"	23° 26' 17"	12 m 38 s
20	244° 32' 42"	-0.53"	242° 34' 09"	-21° 02' 46"	0.9869370	16' 12.33"	23° 26' 17"	12 m 37 s
21	244° 35' 14"	-0.53"	242° 36' 49"	-21° 03' 14"	0.9869293	16' 12.34"	23° 26' 17"	12 m 36 s
22	244° 37' 46"	-0.53"	242° 39' 29"	-21° 03' 42"	0.9869217	16' 12.35"	23° 26' 17"	12 m 35 s
23	244° 40' 17"	-0.54"	242° 42' 09"	-21° 04' 09"	0.9869140	16' 12.35"	23° 26' 17"	12 m 34 s
24	244° 42' 49"	-0.54"	242° 44' 49"	-21° 04' 37"	0.9869063	16' 12.36"	23° 26' 17"	12 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	271° 38' 51"	-3° 55' 26"	271° 51' 02"	-27° 21' 05"	1° 00' 26"	16' 28.14"	276° 36' 42"	0.05962
1	272° 15' 52"	-3° 57' 40"	272° 32' 39"	-27° 22' 45"	1° 00' 26"	16' 28.15"	276° 13' 47"	0.06201
2	272° 52' 53"	-3° 59' 53"	273° 14' 17"	-27° 24' 13"	1° 00' 26"	16' 28.15"	275° 50' 59"	0.06445
3	273° 29' 54"	-4° 02' 03"	273° 55' 56"	-27° 25' 28"	1° 00' 26"	16' 28.14"	275° 28' 19"	0.06694
4	274° 06' 55"	-4° 04' 12"	274° 37' 35"	-27° 26' 31"	1° 00' 26"	16' 28.13"	275° 5' 47"	0.06947
5	274° 43' 56"	-4° 06' 20"	275° 19' 15"	-27° 27' 22"	1° 00' 26"	16' 28.11"	274° 43' 22"	0.07204
6	275° 20' 57"	-4° 08' 25"	276° 00' 55"	-27° 28' 00"	1° 00' 26"	16' 28.08"	274° 21' 04"	0.07465
7	275° 57' 58"	-4° 10' 29"	276° 42' 35"	-27° 28' 26"	1° 00' 26"	16' 28.04"	273° 58' 52"	0.07731
8	276° 34' 58"	-4° 12' 31"	277° 24' 15"	-27° 28' 39"	1° 00' 26"	16' 28.00"	273° 36' 48"	0.08001
9	277° 11' 59"	-4° 14' 31"	278° 05' 55"	-27° 28' 40"	1° 00' 26"	16' 27.96"	273° 14' 49"	0.08275
10	277° 48' 59"	-4° 16' 30"	278° 47' 34"	-27° 28' 29"	1° 00' 25"	16' 27.90"	272° 52' 58"	0.08553
11	278° 25' 60"	-4° 18' 26"	279° 29' 13"	-27° 28' 05"	1° 00' 25"	16' 27.84"	272° 31' 12"	0.08836
12	279° 02' 60"	-4° 20' 21"	280° 10' 51"	-27° 27' 29"	1° 00' 25"	16' 27.77"	272° 9' 33"	0.09122
13	279° 39' 59"	-4° 22' 14"	280° 52' 28"	-27° 26' 40"	1° 00' 25"	16' 27.70"	271° 48' 00"	0.09413
14	280° 16' 58"	-4° 24' 05"	281° 34' 03"	-27° 25' 39"	1° 00' 24"	16' 27.62"	271° 26' 34"	0.09707
15	280° 53' 57"	-4° 25' 54"	282° 15' 37"	-27° 24' 26"	1° 00' 24"	16' 27.53"	271° 5' 13"	0.10006
16	281° 30' 56"	-4° 27' 42"	282° 57' 09"	-27° 23' 00"	1° 00' 24"	16' 27.44"	270° 43' 59"	0.10308
17	282° 07' 54"	-4° 29' 27"	283° 38' 40"	-27° 21' 22"	1° 00' 23"	16' 27.34"	270° 22' 51"	0.10614
18	282° 44' 52"	-4° 31' 11"	284° 20' 08"	-27° 19' 32"	1° 00' 23"	16' 27.24"	270° 1' 49"	0.10925
19	283° 21' 49"	-4° 32' 53"	285° 01' 35"	-27° 17' 30"	1° 00' 23"	16' 27.12"	269° 40' 54"	0.11239
20	283° 58' 46"	-4° 34' 33"	285° 42' 59"	-27° 15' 15"	1° 00' 22"	16' 27.01"	269° 20' 05"	0.11556
21	284° 35' 42"	-4° 36' 10"	286° 24' 20"	-27° 12' 49"	1° 00' 22"	16' 26.88"	268° 59' 22"	0.11878
22	285° 12' 38"	-4° 37' 46"	287° 05' 39"	-27° 10' 10"	1° 00' 21"	16' 26.75"	268° 38' 46"	0.12203
23	285° 49' 33"	-4° 39' 20"	287° 46' 55"	-27° 07' 19"	1° 00' 21"	16' 26.61"	268° 18' 16"	0.12532
24	286° 26' 27"	-4° 40' 52"	288° 28' 08"	-27° 04' 17"	1° 00' 20"	16' 26.47"	267° 57' 53"	0.12864

27 November 2022

DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	244° 42' 49"	-0.54"	242° 44' 49"	-21° 04' 37"	0.9869063	16' 12.36"	23° 26' 17"	12 m 34 s
1	244° 45' 21"	-0.54"	242° 47' 29"	-21° 05' 05"	0.9868987	16' 12.37"	23° 26' 17"	12 m 33 s
2	244° 47' 53"	-0.54"	242° 50' 09"	-21° 05' 32"	0.9868910	16' 12.38"	23° 26' 17"	12 m 32 s
3	244° 50' 25"	-0.55"	242° 52' 49"	-21° 05' 60"	0.9868834	16' 12.38"	23° 26' 17"	12 m 31 s
4	244° 52' 57"	-0.55"	242° 55' 29"	-21° 06' 27"	0.9868757	16' 12.39"	23° 26' 17"	12 m 30 s
5	244° 55' 28"	-0.55"	242° 58' 09"	-21° 06' 55"	0.9868681	16' 12.40"	23° 26' 17"	12 m 29 s
6	244° 58' 00"	-0.55"	243° 00' 49"	-21° 07' 22"	0.9868604	16' 12.41"	23° 26' 17"	12 m 29 s
7	245° 00' 32"	-0.56"	243° 03' 29"	-21° 07' 50"	0.9868528	16' 12.41"	23° 26' 17"	12 m 28 s
8	245° 03' 04"	-0.56"	243° 06' 09"	-21° 08' 17"	0.9868452	16' 12.42"	23° 26' 17"	12 m 27 s
9	245° 05' 36"	-0.56"	243° 08' 50"	-21° 08' 44"	0.9868376	16' 12.43"	23° 26' 17"	12 m 26 s
10	245° 08' 08"	-0.56"	243° 11' 30"	-21° 09' 12"	0.9868299	16' 12.44"	23° 26' 17"	12 m 25 s
11	245° 10' 39"	-0.56"	243° 14' 10"	-21° 09' 39"	0.9868223	16' 12.44"	23° 26' 17"	12 m 24 s
12	245° 13' 11"	-0.57"	243° 16' 50"	-21° 10' 06"	0.9868147	16' 12.45"	23° 26' 17"	12 m 24 s
13	245° 15' 43"	-0.57"	243° 19' 30"	-21° 10' 33"	0.9868071	16' 12.46"	23° 26' 17"	12 m 23 s
14	245° 18' 15"	-0.57"	243° 22' 11"	-21° 11' 00"	0.9867995	16' 12.47"	23° 26' 17"	12 m 22 s
15	245° 20' 47"	-0.57"	243° 24' 51"	-21° 11' 27"	0.9867919	16' 12.47"	23° 26' 17"	12 m 21 s
16	245° 23' 19"	-0.57"	243° 27' 31"	-21° 11' 54"	0.9867843	16' 12.48"	23° 26' 17"	12 m 20 s
17	245° 25' 51"	-0.58"	243° 30' 11"	-21° 12' 21"	0.9867768	16' 12.49"	23° 26' 17"	12 m 19 s
18	245° 28' 22"	-0.58"	243° 32' 52"	-21° 12' 48"	0.9867692	16' 12.50"	23° 26' 17"	12 m 19 s
19	245° 30' 54"	-0.58"	243° 35' 32"	-21° 13' 15"	0.9867616	16' 12.50"	23° 26' 17"	12 m 18 s
20	245° 33' 26"	-0.58"	243° 38' 12"	-21° 13' 42"	0.9867540	16' 12.51"	23° 26' 17"	12 m 17 s
21	245° 35' 58"	-0.58"	243° 40' 53"	-21° 14' 09"	0.9867465	16' 12.52"	23° 26' 17"	12 m 16 s
22	245° 38' 30"	-0.58"	243° 43' 33"	-21° 14' 35"	0.9867389	16' 12.53"	23° 26' 17"	12 m 15 s
23	245° 41' 02"	-0.59"	243° 46' 14"	-21° 15' 02"	0.9867314	16' 12.53"	23° 26' 17"	12 m 14 s
24	245° 43' 34"	-0.59"	243° 48' 54"	-21° 15' 29"	0.9867238	16' 12.54"	23° 26' 17"	12 m 14 s

(*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	286° 26' 27"	-4° 40' 52"	288° 28' 08"	-27° 04' 17"	1° 00' 20"	16' 26.47"	267° 57' 53"	0.12864
1	287° 03' 21"	-4° 42' 22"	289° 09' 17"	-27° 01' 02"	1° 00' 20"	16' 26.32"	267° 37' 37"	0.13200
2	287° 40' 14"	-4° 43' 50"	289° 50' 24"	-26° 57' 35"	1° 00' 19"	16' 26.17"	267° 17' 27"	0.13540
3	288° 17' 06"	-4° 45' 16"	290° 31' 26"	-26° 53' 57"	1° 00' 18"	16' 26.01"	266° 57' 24"	0.13883
4	288° 53' 58"	-4° 46' 40"	291° 12' 25"	-26° 50' 07"	1° 00' 18"	16' 25.84"	266° 37' 28"	0.14229
5	289° 30' 49"	-4° 48' 02"	291° 53' 20"	-26° 46' 05"	1° 00' 17"	16' 25.67"	266° 17' 39"	0.14579
6	290° 07' 39"	-4° 49' 22"	292° 34' 11"	-26° 41' 52"	1° 00' 17"	16' 25.49"	265° 57' 57"	0.14932
7	290° 44' 28"	-4° 50' 40"	293° 14' 58"	-26° 37' 27"	1° 00' 16"	16' 25.31"	265° 38' 22"	0.15289
8	291° 21' 16"	-4° 51' 56"	293° 55' 41"	-26° 32' 50"	1° 00' 15"	16' 25.12"	265° 18' 54"	0.15648
9	291° 58' 04"	-4° 53' 10"	294° 36' 19"	-26° 28' 02"	1° 00' 14"	16' 24.93"	264° 59' 34"	0.16011
10	292° 34' 50"	-4° 54' 22"	295° 16' 52"	-26° 23' 03"	1° 00' 14"	16' 24.73"	264° 40' 21"	0.16378
11	293° 11' 36"	-4° 55' 32"	295° 57' 21"	-26° 17' 52"	1° 00' 13"	16' 24.52"	264° 21' 16"	0.16747
12	293° 48' 20"	-4° 56' 39"	296° 37' 45"	-26° 12' 30"	1° 00' 12"	16' 24.31"	264° 2' 18"	0.17119
13	294° 25' 04"	-4° 57' 45"	297° 18' 04"	-26° 06' 58"	1° 00' 11"	16' 24.10"	263° 43' 29"	0.17495
14	295° 01' 47"	-4° 58' 49"	297° 58' 17"	-26° 01' 14"	1° 00' 11"	16' 23.88"	263° 24' 46"	0.17873
15	295° 38' 28"	-4° 59' 50"	298° 38' 26"	-25° 55' 19"	1° 00' 10"	16' 23.65"	263° 6' 12"	0.18254
16	296° 15' 09"	-5° 00' 50"	299° 18' 29"	-25° 49' 13"	1° 00' 09"	16' 23.42"	262° 47' 46"	0.18639
17	296° 51' 48"	-5° 01' 47"	299° 58' 26"	-25° 42' 57"	1° 00' 08"	16' 23.19"	262° 29' 28"	0.19026
18	297° 28' 26"	-5° 02' 42"	300° 38' 18"	-25° 36' 30"	1° 00' 07"	16' 22.95"	262° 11' 18"	0.19415
19	298° 05' 00"	-5° 03' 36"	301° 18' 01"	-25° 29' 53"	1° 00' 06"	16' 22.70"	261° 53' 19"	0.19807
20	298° 41' 36"	-5° 04' 27"	301° 57' 41"	-25° 23' 05"	1° 00' 05"	16' 22.45"	261° 35' 25"	0.20203
21	299° 18' 11"	-5° 05' 16"	302° 37' 16"	-25° 16' 06"	1° 00' 04"	16' 22.19"	261° 17' 41"	0.20601
22	299° 54' 44"	-5° 06' 03"	303° 16' 44"	-25° 08' 57"	1° 00' 03"	16' 21.94"	261° 0' 05"	0.21001
23	300° 31' 17"	-5° 06' 47"	303° 56' 07"	-25° 01' 38"	1° 00' 02"	16' 21.67"	260° 42' 37"	0.21404
24	301° 07' 48"	-5° 07' 30"	304° 35' 23"	-24° 54' 09"	1° 00' 02"	16' 21.40"	260° 25' 19"	0.21810

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	245° 43' 34"	-0.59"	243° 48' 54"	-21° 15' 29"	0.9867238	16' 12.54"	23° 26' 17"	12 m 14 s
1	245° 46' 06"	-0.59"	243° 51' 35"	-21° 15' 56"	0.9867163	16' 12.55"	23° 26' 17"	12 m 13 s
2	245° 48' 37"	-0.59"	243° 54' 15"	-21° 16' 22"	0.9867088	16' 12.56"	23° 26' 17"	12 m 12 s
3	245° 51' 09"	-0.59"	243° 56' 55"	-21° 16' 49"	0.9867012	16' 12.56"	23° 26' 17"	12 m 11 s
4	245° 53' 41"	-0.59"	243° 59' 36"	-21° 17' 15"	0.9866937	16' 12.57"	23° 26' 17"	12 m 10 s
5	245° 56' 13"	-0.59"	244° 02' 16"	-21° 17' 42"	0.9866862	16' 12.58"	23° 26' 17"	12 m 09 s
6	245° 58' 45"	-0.59"	244° 04' 57"	-21° 18' 08"	0.9866787	16' 12.59"	23° 26' 17"	12 m 09 s
7	246° 01' 17"	-0.60"	244° 07' 38"	-21° 18' 34"	0.9866712	16' 12.59"	23° 26' 17"	12 m 08 s
8	246° 03' 49"	-0.60"	244° 10' 18"	-21° 19' 01"	0.9866637	16' 12.60"	23° 26' 17"	12 m 07 s
9	246° 06' 21"	-0.60"	244° 12' 59"	-21° 19' 27"	0.9866562	16' 12.61"	23° 26' 17"	12 m 06 s
10	246° 08' 52"	-0.60"	244° 15' 39"	-21° 19' 53"	0.9866487	16' 12.62"	23° 26' 17"	12 m 05 s
11	246° 11' 24"	-0.60"	244° 18' 20"	-21° 20' 20"	0.9866412	16' 12.62"	23° 26' 17"	12 m 04 s
12	246° 13' 56"	-0.60"	244° 21' 01"	-21° 20' 46"	0.9866337	16' 12.63"	23° 26' 17"	12 m 03 s
13	246° 16' 28"	-0.60"	244° 23' 41"	-21° 21' 12"	0.9866263	16' 12.64"	23° 26' 17"	12 m 03 s
14	246° 19' 00"	-0.60"	244° 26' 22"	-21° 21' 38"	0.9866188	16' 12.65"	23° 26' 17"	12 m 02 s
15	246° 21' 32"	-0.60"	244° 29' 03"	-21° 22' 04"	0.9866113	16' 12.65"	23° 26' 17"	12 m 01 s
16	246° 24' 04"	-0.60"	244° 31' 43"	-21° 22' 30"	0.9866039	16' 12.66"	23° 26' 17"	11 m 60 s
17	246° 26' 36"	-0.60"	244° 34' 24"	-21° 22' 56"	0.9865964	16' 12.67"	23° 26' 17"	11 m 59 s
18	246° 29' 08"	-0.60"	244° 37' 05"	-21° 23' 22"	0.9865890	16' 12.67"	23° 26' 17"	11 m 58 s
19	246° 31' 40"	-0.60"	244° 39' 46"	-21° 23' 48"	0.9865815	16' 12.68"	23° 26' 17"	11 m 57 s
20	246° 34' 11"	-0.60"	244° 42' 26"	-21° 24' 14"	0.9865741	16' 12.69"	23° 26' 17"	11 m 57 s
21	246° 36' 43"	-0.60"	244° 45' 07"	-21° 24' 39"	0.9865667	16' 12.70"	23° 26' 17"	11 m 56 s
22	246° 39' 15"	-0.61"	244° 47' 48"	-21° 25' 05"	0.9865593	16' 12.70"	23° 26' 17"	11 m 55 s
23	246° 41' 47"	-0.61"	244° 50' 29"	-21° 25' 31"	0.9865518	16' 12.71"	23° 26' 17"	11 m 54 s
24	246° 44' 19"	-0.61"	244° 53' 10"	-21° 25' 57"	0.9865444	16' 12.72"	23° 26' 17"	11 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	301° 07' 48"	-5° 07' 30"	304° 35' 23"	-24° 54' 09"	1° 00' 02"	16' 21.40"	260° 25' 19"	0.21810
1	301° 44' 17"	-5° 08' 11"	305° 14' 33"	-24° 46' 30"	1° 00' 01"	16' 21.13"	260° 8' 09"	0.22218
2	302° 20' 46"	-5° 08' 49"	305° 53' 36"	-24° 38' 42"	0° 59' 59"	16' 20.85"	259° 51' 08"	0.22629
3	302° 57' 13"	-5° 09' 26"	306° 32' 33"	-24° 30' 43"	0° 59' 58"	16' 20.57"	259° 34' 15"	0.23041
4	303° 33' 39"	-5° 09' 60"	307° 11' 24"	-24° 22' 35"	0° 59' 57"	16' 20.29"	259° 17' 32"	0.23457
5	304° 10' 03"	-5° 10' 32"	307° 50' 08"	-24° 14' 17"	0° 59' 56"	16' 20.00"	259° 0' 58"	0.23874
6	304° 46' 26"	-5° 11' 02"	308° 28' 46"	-24° 05' 49"	0° 59' 55"	16' 19.71"	258° 44' 34"	0.24294
7	305° 22' 48"	-5° 11' 30"	309° 07' 16"	-23° 57' 13"	0° 59' 54"	16' 19.41"	258° 28' 18"	0.24715
8	305° 59' 08"	-5° 11' 56"	309° 45' 40"	-23° 48' 27"	0° 59' 53"	16' 19.11"	258° 12' 12"	0.25139
9	306° 35' 27"	-5° 12' 20"	310° 23' 58"	-23° 39' 32"	0° 59' 52"	16' 18.80"	257° 56' 15"	0.25565
10	307° 11' 44"	-5° 12' 42"	311° 02' 08"	-23° 30' 28"	0° 59' 51"	16' 18.49"	257° 40' 27"	0.25993
11	307° 48' 00"	-5° 13' 01"	311° 40' 11"	-23° 21' 15"	0° 59' 50"	16' 18.18"	257° 24' 50"	0.26423
12	308° 24' 14"	-5° 13' 19"	312° 18' 08"	-23° 11' 53"	0° 59' 49"	16' 17.87"	257° 9' 21"	0.26855
13	309° 00' 27"	-5° 13' 34"	312° 55' 58"	-23° 02' 23"	0° 59' 47"	16' 17.55"	256° 54' 02"	0.27289
14	309° 36' 38"	-5° 13' 47"	313° 33' 40"	-22° 52' 44"	0° 59' 46"	16' 17.22"	256° 38' 53"	0.27725
15	310° 12' 48"	-5° 13' 59"	314° 11' 16"	-22° 42' 57"	0° 59' 45"	16' 16.90"	256° 23' 53"	0.28162
16	310° 48' 56"	-5° 14' 08"	314° 48' 44"	-22° 33' 01"	0° 59' 44"	16' 16.57"	256° 9' 04"	0.28601
17	311° 25' 03"	-5° 14' 15"	315° 26' 06"	-22° 22' 57"	0° 59' 43"	16' 16.23"	255° 54' 24"	0.29042
18	312° 01' 08"	-5° 14' 20"	316° 03' 20"	-22° 12' 45"	0° 59' 41"	16' 15.90"	255° 39' 53"	0.29484
19	312° 37' 11"	-5° 14' 23"	316° 40' 27"	-22° 02' 25"	0° 59' 40"	16' 15.56"	255° 25' 33"	0.29928
20	313° 13' 13"	-5° 14' 24"	317° 17' 27"	-21° 51' 57"	0° 59' 39"	16' 15.22"	255° 11' 22"	0.30373
21	313° 49' 13"	-5° 14' 22"	317° 54' 20"	-21° 41' 22"	0° 59' 38"	16' 14.87"	254° 57' 22"	0.30820
22	314° 25' 11"	-5° 14' 19"	318° 31' 06"	-21° 30' 38"	0° 59' 36"	16' 14.52"	254° 43' 31"	0.31269
23	315° 01' 08"	-5° 14' 14"	319° 07' 44"	-21° 19' 48"	0° 59' 35"	16' 14.17"	254° 29' 51"	0.31718
24	315° 37' 03"	-5° 14' 06"	319° 44' 16"	-21° 08' 49"	0° 59' 34"	16' 13.82"	254° 16' 20"	0.32169

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	246° 44' 19"	-0.61"	244° 53' 10"	-21° 25' 57"	0.9865444	16' 12.72"	23° 26' 17"	11 m 53 s
1	246° 46' 51"	-0.61"	244° 55' 51"	-21° 26' 22"	0.9865370	16' 12.73"	23° 26' 17"	11 m 52 s
2	246° 49' 23"	-0.61"	244° 58' 31"	-21° 26' 48"	0.9865296	16' 12.73"	23° 26' 17"	11 m 51 s
3	246° 51' 55"	-0.61"	245° 01' 12"	-21° 27' 13"	0.9865222	16' 12.74"	23° 26' 17"	11 m 50 s
4	246° 54' 27"	-0.61"	245° 03' 53"	-21° 27' 39"	0.9865149	16' 12.75"	23° 26' 17"	11 m 50 s
5	246° 56' 59"	-0.61"	245° 06' 34"	-21° 28' 04"	0.9865075	16' 12.75"	23° 26' 17"	11 m 49 s
6	246° 59' 31"	-0.61"	245° 09' 15"	-21° 28' 30"	0.9865001	16' 12.76"	23° 26' 17"	11 m 48 s
7	247° 02' 03"	-0.61"	245° 11' 56"	-21° 28' 55"	0.9864927	16' 12.77"	23° 26' 17"	11 m 47 s
8	247° 04' 34"	-0.61"	245° 14' 37"	-21° 29' 20"	0.9864854	16' 12.78"	23° 26' 17"	11 m 46 s
9	247° 07' 06"	-0.60"	245° 17' 18"	-21° 29' 46"	0.9864780	16' 12.78"	23° 26' 17"	11 m 45 s
10	247° 09' 38"	-0.60"	245° 19' 59"	-21° 30' 11"	0.9864707	16' 12.79"	23° 26' 17"	11 m 44 s
11	247° 12' 10"	-0.60"	245° 22' 40"	-21° 30' 36"	0.9864633	16' 12.80"	23° 26' 17"	11 m 43 s
12	247° 14' 42"	-0.60"	245° 25' 21"	-21° 31' 01"	0.9864560	16' 12.81"	23° 26' 17"	11 m 42 s
13	247° 17' 14"	-0.60"	245° 28' 02"	-21° 31' 26"	0.9864487	16' 12.81"	23° 26' 17"	11 m 42 s
14	247° 19' 46"	-0.60"	245° 30' 43"	-21° 31' 51"	0.9864414	16' 12.82"	23° 26' 17"	11 m 41 s
15	247° 22' 18"	-0.60"	245° 33' 25"	-21° 32' 17"	0.9864340	16' 12.83"	23° 26' 17"	11 m 40 s
16	247° 24' 50"	-0.60"	245° 36' 06"	-21° 32' 42"	0.9864267	16' 12.83"	23° 26' 17"	11 m 39 s
17	247° 27' 22"	-0.60"	245° 38' 47"	-21° 33' 06"	0.9864194	16' 12.84"	23° 26' 17"	11 m 38 s
18	247° 29' 54"	-0.60"	245° 41' 28"	-21° 33' 31"	0.9864121	16' 12.85"	23° 26' 17"	11 m 37 s
19	247° 32' 26"	-0.60"	245° 44' 09"	-21° 33' 56"	0.9864048	16' 12.86"	23° 26' 17"	11 m 36 s
20	247° 34' 58"	-0.60"	245° 46' 50"	-21° 34' 21"	0.9863976	16' 12.86"	23° 26' 17"	11 m 35 s
21	247° 37' 30"	-0.60"	245° 49' 32"	-21° 34' 46"	0.9863903	16' 12.87"	23° 26' 17"	11 m 34 s
22	247° 40' 02"	-0.60"	245° 52' 13"	-21° 35' 11"	0.9863830	16' 12.88"	23° 26' 17"	11 m 34 s
23	247° 42' 34"	-0.59"	245° 54' 54"	-21° 35' 35"	0.9863757	16' 12.88"	23° 26' 17"	11 m 33 s
24	247° 45' 05"	-0.59"	245° 57' 35"	-21° 35' 60"	0.9863685	16' 12.89"	23° 26' 17"	11 m 32 s

(*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	315° 37' 03"	-5° 14' 06"	319° 44' 16"	-21° 08' 49"	0° 59' 34"	16' 13.82"	254° 16' 20"	0.32169
1	316° 12' 57"	-5° 13' 57"	320° 20' 40"	-20° 57' 44"	0° 59' 32"	16' 13.46"	254° 2' 59"	0.32622
2	316° 48' 48"	-5° 13' 45"	320° 56' 58"	-20° 46' 31"	0° 59' 31"	16' 13.10"	253° 49' 49"	0.33075
3	317° 24' 38"	-5° 13' 32"	321° 33' 08"	-20° 35' 11"	0° 59' 30"	16' 12.74"	253° 36' 48"	0.33530
4	318° 00' 26"	-5° 13' 16"	322° 09' 11"	-20° 23' 45"	0° 59' 28"	16' 12.37"	253° 23' 57"	0.33986
5	318° 36' 13"	-5° 12' 59"	322° 45' 06"	-20° 12' 11"	0° 59' 27"	16' 12.01"	253° 11' 17"	0.34443
6	319° 11' 57"	-5° 12' 39"	323° 20' 55"	-20° 00' 31"	0° 59' 26"	16' 11.64"	252° 58' 47"	0.34901
7	319° 47' 40"	-5° 12' 18"	323° 56' 37"	-19° 48' 44"	0° 59' 24"	16' 11.27"	252° 46' 27"	0.35360
8	320° 23' 21"	-5° 11' 54"	324° 32' 12"	-19° 36' 51"	0° 59' 23"	16' 10.89"	252° 34' 17"	0.35820
9	320° 59' 01"	-5° 11' 29"	325° 07' 39"	-19° 24' 51"	0° 59' 22"	16' 10.52"	252° 22' 17"	0.36281
10	321° 34' 38"	-5° 11' 01"	325° 43' 00"	-19° 12' 45"	0° 59' 20"	16' 10.14"	252° 10' 27"	0.36742
11	322° 10' 14"	-5° 10' 32"	326° 18' 14"	-19° 00' 33"	0° 59' 19"	16' 09.76"	251° 58' 47"	0.37205
12	322° 45' 48"	-5° 10' 00"	326° 53' 21"	-18° 48' 15"	0° 59' 17"	16' 09.38"	251° 47' 18"	0.37668
13	323° 21' 20"	-5° 09' 27"	327° 28' 21"	-18° 35' 50"	0° 59' 16"	16' 08.99"	251° 35' 58"	0.38132
14	323° 56' 50"	-5° 08' 51"	328° 03' 14"	-18° 23' 21"	0° 59' 15"	16' 08.61"	251° 24' 49"	0.38596
15	324° 32' 19"	-5° 08' 14"	328° 37' 60"	-18° 10' 45"	0° 59' 13"	16' 08.22"	251° 13' 50"	0.39061
16	325° 07' 45"	-5° 07' 35"	329° 12' 39"	-17° 58' 04"	0° 59' 12"	16' 07.83"	251° 3' 01"	0.39527
17	325° 43' 10"	-5° 06' 54"	329° 47' 12"	-17° 45' 17"	0° 59' 10"	16' 07.44"	250° 52' 22"	0.39993
18	326° 18' 33"	-5° 06' 11"	330° 21' 38"	-17° 32' 25"	0° 59' 09"	16' 07.05"	250° 41' 54"	0.40460
19	326° 53' 54"	-5° 05' 26"	330° 55' 58"	-17° 19' 27"	0° 59' 07"	16' 06.65"	250° 31' 35"	0.40927
20	327° 29' 13"	-5° 04' 39"	331° 30' 10"	-17° 06' 25"	0° 59' 06"	16' 06.26"	250° 21' 27"	0.41395
21	328° 04' 30"	-5° 03' 50"	332° 04' 17"	-16° 53' 17"	0° 59' 04"	16' 05.86"	250° 11' 28"	0.41863
22	328° 39' 45"	-5° 02' 60"	332° 38' 17"	-16° 40' 04"	0° 59' 03"	16' 05.46"	250° 1' 40"	0.42331
23	329° 14' 59"	-5° 02' 07"	333° 12' 10"	-16° 26' 47"	0° 59' 02"	16' 05.06"	249° 52' 02"	0.42799
24	329° 50' 10"	-5° 01' 13"	333° 45' 57"	-16° 13' 25"	0° 59' 00"	16' 04.66"	249° 42' 34"	0.43268

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Oblliquity	Equation Of Time
0	247° 45' 05"	-0.59"	245° 57' 35"	-21° 35' 60"	0.9863685	16' 12.89"	23° 26' 17"	11 m 32 s
1	247° 47' 37"	-0.59"	246° 00' 17"	-21° 36' 24"	0.9863612	16' 12.90"	23° 26' 17"	11 m 31 s
2	247° 50' 09"	-0.59"	246° 02' 58"	-21° 36' 49"	0.9863540	16' 12.91"	23° 26' 17"	11 m 30 s
3	247° 52' 41"	-0.59"	246° 05' 39"	-21° 37' 14"	0.9863468	16' 12.91"	23° 26' 17"	11 m 29 s
4	247° 55' 13"	-0.59"	246° 08' 20"	-21° 37' 38"	0.9863395	16' 12.92"	23° 26' 17"	11 m 28 s
5	247° 57' 45"	-0.59"	246° 11' 02"	-21° 38' 02"	0.9863323	16' 12.93"	23° 26' 17"	11 m 27 s
6	248° 00' 17"	-0.59"	246° 13' 43"	-21° 38' 27"	0.9863251	16' 12.93"	23° 26' 17"	11 m 26 s
7	248° 02' 49"	-0.58"	246° 16' 25"	-21° 38' 51"	0.9863179	16' 12.94"	23° 26' 17"	11 m 25 s
8	248° 05' 21"	-0.58"	246° 19' 06"	-21° 39' 15"	0.9863107	16' 12.95"	23° 26' 17"	11 m 25 s
9	248° 07' 53"	-0.58"	246° 21' 47"	-21° 39' 40"	0.9863035	16' 12.96"	23° 26' 17"	11 m 24 s
10	248° 10' 25"	-0.58"	246° 24' 29"	-21° 40' 04"	0.9862963	16' 12.96"	23° 26' 17"	11 m 23 s
11	248° 12' 57"	-0.58"	246° 27' 10"	-21° 40' 28"	0.9862891	16' 12.97"	23° 26' 17"	11 m 22 s
12	248° 15' 29"	-0.58"	246° 29' 52"	-21° 40' 52"	0.9862819	16' 12.98"	23° 26' 17"	11 m 21 s
13	248° 18' 01"	-0.57"	246° 32' 33"	-21° 41' 16"	0.9862748	16' 12.98"	23° 26' 17"	11 m 20 s
14	248° 20' 33"	-0.57"	246° 35' 15"	-21° 41' 40"	0.9862676	16' 12.99"	23° 26' 17"	11 m 19 s
15	248° 23' 05"	-0.57"	246° 37' 56"	-21° 42' 04"	0.9862605	16' 13.00"	23° 26' 17"	11 m 18 s
16	248° 25' 37"	-0.57"	246° 40' 38"	-21° 42' 28"	0.9862533	16' 13.01"	23° 26' 17"	11 m 17 s
17	248° 28' 09"	-0.57"	246° 43' 19"	-21° 42' 52"	0.9862462	16' 13.01"	23° 26' 17"	11 m 16 s
18	248° 30' 41"	-0.57"	246° 46' 01"	-21° 43' 16"	0.9862390	16' 13.02"	23° 26' 17"	11 m 15 s
19	248° 33' 13"	-0.56"	246° 48' 42"	-21° 43' 40"	0.9862319	16' 13.03"	23° 26' 17"	11 m 14 s
20	248° 35' 45"	-0.56"	246° 51' 24"	-21° 44' 04"	0.9862248	16' 13.03"	23° 26' 17"	11 m 14 s
21	248° 38' 17"	-0.56"	246° 54' 06"	-21° 44' 27"	0.9862177	16' 13.04"	23° 26' 17"	11 m 13 s
22	248° 40' 49"	-0.56"	246° 56' 47"	-21° 44' 51"	0.9862106	16' 13.05"	23° 26' 17"	11 m 12 s
23	248° 43' 21"	-0.55"	246° 59' 29"	-21° 45' 15"	0.9862035	16' 13.05"	23° 26' 17"	11 m 11 s
24	248° 45' 53"	-0.55"	247° 02' 11"	-21° 45' 38"	0.9861964	16' 13.06"	23° 26' 17"	11 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	329° 50' 10"	-5° 01' 13"	333° 45' 57"	-16° 13' 25"	0° 59' 00"	16' 04.66"	249° 42' 34"	0.43268
1	330° 25' 20"	-5° 00' 17"	334° 19' 38"	-15° 59' 58"	0° 58' 59"	16' 04.26"	249° 33' 16"	0.43737
2	331° 00' 28"	-4° 59' 19"	334° 53' 12"	-15° 46' 26"	0° 58' 57"	16' 03.86"	249° 24' 08"	0.44205
3	331° 35' 34"	-4° 58' 19"	335° 26' 40"	-15° 32' 50"	0° 58' 56"	16' 03.45"	249° 15' 10"	0.44674
4	332° 10' 37"	-4° 57' 18"	336° 00' 02"	-15° 19' 10"	0° 58' 54"	16' 03.05"	249° 6' 22"	0.45143
5	332° 45' 39"	-4° 56' 14"	336° 33' 18"	-15° 05' 26"	0° 58' 53"	16' 02.64"	248° 57' 44"	0.45612
6	333° 20' 40"	-4° 55' 09"	337° 06' 28"	-14° 51' 37"	0° 58' 51"	16' 02.23"	248° 49' 16"	0.46081
7	333° 55' 38"	-4° 54' 02"	337° 39' 32"	-14° 37' 45"	0° 58' 50"	16' 01.82"	248° 40' 58"	0.46550
8	334° 30' 34"	-4° 52' 54"	338° 12' 30"	-14° 23' 48"	0° 58' 48"	16' 01.41"	248° 32' 50"	0.47019
9	335° 05' 28"	-4° 51' 43"	338° 45' 23"	-14° 09' 48"	0° 58' 47"	16' 01.00"	248° 24' 52"	0.47487
10	335° 40' 21"	-4° 50' 31"	339° 18' 09"	-13° 55' 44"	0° 58' 45"	16' 00.59"	248° 17' 03"	0.47955
11	336° 15' 11"	-4° 49' 17"	339° 50' 50"	-13° 41' 36"	0° 58' 44"	16' 00.18"	248° 9' 25"	0.48423
12	336° 49' 59"	-4° 48' 02"	340° 23' 25"	-13° 27' 25"	0° 58' 42"	15' 59.77"	248° 1' 56"	0.48891
13	337° 24' 46"	-4° 46' 44"	340° 55' 55"	-13° 13' 10"	0° 58' 41"	15' 59.36"	247° 54' 38"	0.49358
14	337° 59' 31"	-4° 45' 25"	341° 28' 19"	-12° 58' 52"	0° 58' 39"	15' 58.94"	247° 47' 29"	0.49825
15	338° 34' 13"	-4° 44' 05"	342° 00' 38"	-12° 44' 31"	0° 58' 38"	15' 58.53"	247° 40' 30"	0.50292
16	339° 08' 54"	-4° 42' 43"	342° 32' 51"	-12° 30' 06"	0° 58' 36"	15' 58.12"	247° 33' 40"	0.50758
17	339° 43' 33"	-4° 41' 19"	343° 04' 59"	-12° 15' 39"	0° 58' 35"	15' 57.70"	247° 27' 01"	0.51223
18	340° 18' 10"	-4° 39' 53"	343° 37' 02"	-12° 01' 08"	0° 58' 33"	15' 57.29"	247° 20' 31"	0.51688
19	340° 52' 45"	-4° 38' 26"	344° 09' 00"	-11° 46' 35"	0° 58' 31"	15' 56.87"	247° 14' 11"	0.52152
20	341° 27' 18"	-4° 36' 57"	344° 40' 53"	-11° 31' 59"	0° 58' 30"	15' 56.46"	247° 8' 00"	0.52616
21	342° 01' 49"	-4° 35' 27"	345° 12' 41"	-11° 17' 20"	0° 58' 28"	15' 56.04"	247° 1' 60"	0.53079
22	342° 36' 18"	-4° 33' 55"	345° 44' 24"	-11° 02' 38"	0° 58' 27"	15' 55.62"	246° 56' 08"	0.53542
23	343° 10' 46"	-4° 32' 21"	346° 16' 02"	-10° 47' 54"	0° 58' 25"	15' 55.21"	246° 50' 27"	0.54003
24	343° 45' 11"	-4° 30' 46"	346° 47' 36"	-10° 33' 08"	0° 58' 24"	15' 54.79"	246° 44' 55"	0.54464

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Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	248° 45' 53"	-0.55"	247° 02' 11"	-21° 45' 38"	0.9861964	16' 13.06"	23° 26' 17"	11 m 10 s
1	248° 48' 25"	-0.55"	247° 04' 52"	-21° 46' 02"	0.9861893	16' 13.07"	23° 26' 17"	11 m 09 s
2	248° 50' 57"	-0.55"	247° 07' 34"	-21° 46' 25"	0.9861822	16' 13.08"	23° 26' 17"	11 m 08 s
3	248° 53' 29"	-0.54"	247° 10' 16"	-21° 46' 49"	0.9861752	16' 13.08"	23° 26' 17"	11 m 07 s
4	248° 56' 01"	-0.54"	247° 12' 57"	-21° 47' 12"	0.9861681	16' 13.09"	23° 26' 17"	11 m 06 s
5	248° 58' 33"	-0.54"	247° 15' 39"	-21° 47' 36"	0.9861611	16' 13.10"	23° 26' 17"	11 m 05 s
6	249° 01' 05"	-0.54"	247° 18' 21"	-21° 47' 59"	0.9861540	16' 13.10"	23° 26' 17"	11 m 04 s
7	249° 03' 37"	-0.53"	247° 21' 03"	-21° 48' 22"	0.9861470	16' 13.11"	23° 26' 17"	11 m 03 s
8	249° 06' 09"	-0.53"	247° 23' 44"	-21° 48' 46"	0.9861400	16' 13.12"	23° 26' 17"	11 m 02 s
9	249° 08' 41"	-0.53"	247° 26' 26"	-21° 49' 09"	0.9861329	16' 13.12"	23° 26' 17"	11 m 01 s
10	249° 11' 13"	-0.53"	247° 29' 08"	-21° 49' 32"	0.9861259	16' 13.13"	23° 26' 17"	11 m 00 s
11	249° 13' 45"	-0.52"	247° 31' 50"	-21° 49' 55"	0.9861189	16' 13.14"	23° 26' 17"	10 m 60 s
12	249° 16' 17"	-0.52"	247° 34' 32"	-21° 50' 18"	0.9861119	16' 13.15"	23° 26' 17"	10 m 59 s
13	249° 18' 49"	-0.52"	247° 37' 14"	-21° 50' 41"	0.9861049	16' 13.15"	23° 26' 17"	10 m 58 s
14	249° 21' 21"	-0.51"	247° 39' 55"	-21° 51' 04"	0.9860980	16' 13.16"	23° 26' 17"	10 m 57 s
15	249° 23' 53"	-0.51"	247° 42' 37"	-21° 51' 27"	0.9860910	16' 13.17"	23° 26' 17"	10 m 56 s
16	249° 26' 25"	-0.51"	247° 45' 19"	-21° 51' 50"	0.9860840	16' 13.17"	23° 26' 17"	10 m 55 s
17	249° 28' 57"	-0.51"	247° 48' 01"	-21° 52' 13"	0.9860771	16' 13.18"	23° 26' 17"	10 m 54 s
18	249° 31' 29"	-0.50"	247° 50' 43"	-21° 52' 36"	0.9860701	16' 13.19"	23° 26' 17"	10 m 53 s
19	249° 34' 01"	-0.50"	247° 53' 25"	-21° 52' 59"	0.9860632	16' 13.19"	23° 26' 17"	10 m 52 s
20	249° 36' 33"	-0.50"	247° 56' 07"	-21° 53' 21"	0.9860562	16' 13.20"	23° 26' 17"	10 m 51 s
21	249° 39' 05"	-0.49"	247° 58' 49"	-21° 53' 44"	0.9860493	16' 13.21"	23° 26' 17"	10 m 50 s
22	249° 41' 37"	-0.49"	248° 01' 31"	-21° 54' 07"	0.9860424	16' 13.21"	23° 26' 17"	10 m 49 s
23	249° 44' 09"	-0.49"	248° 04' 13"	-21° 54' 29"	0.9860355	16' 13.22"	23° 26' 17"	10 m 48 s
24	249° 46' 41"	-0.48"	248° 06' 55"	-21° 54' 52"	0.9860286	16' 13.23"	23° 26' 17"	10 m 47 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	343° 45' 11"	-4° 30' 46"	346° 47' 36"	-10° 33' 08"	0° 58' 24"	15' 54.79"	246° 44' 55"	0.54464
1	344° 19' 34"	-4° 29' 10"	347° 19' 05"	-10° 18' 19"	0° 58' 22"	15' 54.37"	246° 39' 33"	0.54924
2	344° 53' 56"	-4° 27' 31"	347° 50' 29"	-10° 03' 27"	0° 58' 21"	15' 53.96"	246° 34' 20"	0.55383
3	345° 28' 15"	-4° 25' 52"	348° 21' 48"	-9° 48' 34"	0° 58' 19"	15' 53.54"	246° 29' 16"	0.55841
4	346° 02' 33"	-4° 24' 11"	348° 53' 04"	-9° 33' 39"	0° 58' 18"	15' 53.12"	246° 24' 23"	0.56299
5	346° 36' 49"	-4° 22' 28"	349° 24' 15"	-9° 18' 41"	0° 58' 16"	15' 52.71"	246° 19' 38"	0.56755
6	347° 11' 03"	-4° 20' 44"	349° 55' 21"	-9° 03' 42"	0° 58' 15"	15' 52.29"	246° 15' 04"	0.57210
7	347° 45' 14"	-4° 18' 58"	350° 26' 24"	-8° 48' 41"	0° 58' 13"	15' 51.88"	246° 10' 38"	0.57664
8	348° 19' 24"	-4° 17' 11"	350° 57' 22"	-8° 33' 38"	0° 58' 12"	15' 51.46"	246° 6' 22"	0.58118
9	348° 53' 33"	-4° 15' 23"	351° 28' 17"	-8° 18' 33"	0° 58' 10"	15' 51.04"	246° 2' 16"	0.58570
10	349° 27' 39"	-4° 13' 33"	351° 59' 07"	-8° 03' 27"	0° 58' 09"	15' 50.63"	245° 58' 18"	0.59021
11	350° 01' 43"	-4° 11' 42"	352° 29' 54"	-7° 48' 19"	0° 58' 07"	15' 50.21"	245° 54' 31"	0.59470
12	350° 35' 46"	-4° 09' 49"	353° 00' 37"	-7° 33' 09"	0° 58' 06"	15' 49.80"	245° 50' 52"	0.59919
13	351° 09' 46"	-4° 07' 56"	353° 31' 16"	-7° 17' 59"	0° 58' 04"	15' 49.38"	245° 47' 23"	0.60366
14	351° 43' 45"	-4° 06' 00"	354° 01' 51"	-7° 02' 47"	0° 58' 02"	15' 48.97"	245° 44' 03"	0.60812
15	352° 17' 42"	-4° 04' 04"	354° 32' 23"	-6° 47' 34"	0° 58' 01"	15' 48.55"	245° 40' 53"	0.61257
16	352° 51' 37"	-4° 02' 06"	355° 02' 52"	-6° 32' 19"	0° 57' 59"	15' 48.14"	245° 37' 52"	0.61700
17	353° 25' 30"	-4° 00' 06"	355° 33' 17"	-6° 17' 04"	0° 57' 58"	15' 47.73"	245° 34' 60"	0.62142
18	353° 59' 21"	-3° 58' 06"	356° 03' 39"	-6° 01' 47"	0° 57' 56"	15' 47.31"	245° 32' 17"	0.62583
19	354° 33' 10"	-3° 56' 04"	356° 33' 57"	-5° 46' 30"	0° 57' 55"	15' 46.90"	245° 29' 43"	0.63022
20	355° 06' 58"	-3° 54' 01"	357° 04' 13"	-5° 31' 12"	0° 57' 53"	15' 46.49"	245° 27' 19"	0.63459
21	355° 40' 44"	-3° 51' 57"	357° 34' 25"	-5° 15' 53"	0° 57' 52"	15' 46.08"	245° 25' 04"	0.63895
22	356° 14' 27"	-3° 49' 51"	358° 04' 34"	-5° 00' 34"	0° 57' 50"	15' 45.67"	245° 22' 58"	0.64330
23	356° 48' 09"	-3° 47' 44"	358° 34' 41"	-4° 45' 13"	0° 57' 49"	15' 45.26"	245° 21' 01"	0.64763
24	357° 21' 50"	-3° 45' 36"	359° 04' 44"	-4° 29' 53"	0° 57' 47"	15' 44.85"	245° 19' 14"	0.65194

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	249° 46' 41"	-0.48"	248° 06' 55"	-21° 54' 52"	0.9860286	16' 13.23"	23° 26' 17"	10 m 47 s
1	249° 49' 13"	-0.48"	248° 09' 37"	-21° 55' 14"	0.9860217	16' 13.23"	23° 26' 17"	10 m 46 s
2	249° 51' 45"	-0.48"	248° 12' 19"	-21° 55' 37"	0.9860148	16' 13.24"	23° 26' 17"	10 m 45 s
3	249° 54' 17"	-0.47"	248° 15' 01"	-21° 55' 59"	0.9860079	16' 13.25"	23° 26' 17"	10 m 44 s
4	249° 56' 49"	-0.47"	248° 17' 44"	-21° 56' 22"	0.9860010	16' 13.25"	23° 26' 17"	10 m 43 s
5	249° 59' 21"	-0.47"	248° 20' 26"	-21° 56' 44"	0.9859942	16' 13.26"	23° 26' 17"	10 m 42 s
6	250° 01' 53"	-0.46"	248° 23' 08"	-21° 57' 06"	0.9859873	16' 13.27"	23° 26' 17"	10 m 41 s
7	250° 04' 25"	-0.46"	248° 25' 50"	-21° 57' 29"	0.9859805	16' 13.27"	23° 26' 17"	10 m 41 s
8	250° 06' 57"	-0.45"	248° 28' 32"	-21° 57' 51"	0.9859736	16' 13.28"	23° 26' 17"	10 m 40 s
9	250° 09' 29"	-0.45"	248° 31' 14"	-21° 58' 13"	0.9859668	16' 13.29"	23° 26' 17"	10 m 39 s
10	250° 12' 01"	-0.45"	248° 33' 57"	-21° 58' 35"	0.9859600	16' 13.30"	23° 26' 17"	10 m 38 s
11	250° 14' 33"	-0.44"	248° 36' 39"	-21° 58' 57"	0.9859532	16' 13.30"	23° 26' 17"	10 m 37 s
12	250° 17' 05"	-0.44"	248° 39' 21"	-21° 59' 19"	0.9859464	16' 13.31"	23° 26' 17"	10 m 36 s
13	250° 19' 38"	-0.44"	248° 42' 03"	-21° 59' 41"	0.9859396	16' 13.32"	23° 26' 17"	10 m 35 s
14	250° 22' 10"	-0.43"	248° 44' 46"	-22° 00' 03"	0.9859328	16' 13.32"	23° 26' 17"	10 m 34 s
15	250° 24' 42"	-0.43"	248° 47' 28"	-22° 00' 25"	0.9859260	16' 13.33"	23° 26' 17"	10 m 33 s
16	250° 27' 14"	-0.42"	248° 50' 10"	-22° 00' 47"	0.9859192	16' 13.34"	23° 26' 17"	10 m 32 s
17	250° 29' 46"	-0.42"	248° 52' 52"	-22° 01' 09"	0.9859125	16' 13.34"	23° 26' 17"	10 m 31 s
18	250° 32' 18"	-0.42"	248° 55' 35"	-22° 01' 30"	0.9859057	16' 13.35"	23° 26' 17"	10 m 30 s
19	250° 34' 50"	-0.41"	248° 58' 17"	-22° 01' 52"	0.9858990	16' 13.36"	23° 26' 17"	10 m 29 s
20	250° 37' 22"	-0.41"	249° 00' 59"	-22° 02' 14"	0.9858923	16' 13.36"	23° 26' 17"	10 m 28 s
21	250° 39' 54"	-0.40"	249° 03' 42"	-22° 02' 35"	0.9858855	16' 13.37"	23° 26' 17"	10 m 27 s
22	250° 42' 26"	-0.40"	249° 06' 24"	-22° 02' 57"	0.9858788	16' 13.38"	23° 26' 17"	10 m 26 s
23	250° 44' 58"	-0.39"	249° 09' 07"	-22° 03' 19"	0.9858721	16' 13.38"	23° 26' 17"	10 m 25 s
24	250° 47' 30"	-0.39"	249° 11' 49"	-22° 03' 40"	0.9858654	16' 13.39"	23° 26' 17"	10 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	357° 21' 50"	-3° 45' 36"	359° 04' 44"	-4° 29' 53"	0° 57' 47"	15' 44.85"	245° 19' 14"	0.65194
1	357° 55' 28"	-3° 43' 27"	359° 34' 45"	-4° 14' 31"	0° 57' 46"	15' 44.44"	245° 17' 35"	0.65624
2	358° 29' 05"	-3° 41' 17"	0° 04' 44"	-3° 59' 10"	0° 57' 44"	15' 44.03"	245° 16' 06"	0.66052
3	359° 02' 39"	-3° 39' 05"	0° 34' 39"	-3° 43' 48"	0° 57' 43"	15' 43.62"	245° 14' 46"	0.66478
4	359° 36' 12"	-3° 36' 53"	1° 04' 33"	-3° 28' 26"	0° 57' 41"	15' 43.22"	245° 13' 35"	0.66903
5	0° 09' 43"	-3° 34' 39"	1° 34' 23"	-3° 13' 03"	0° 57' 40"	15' 42.81"	245° 12' 33"	0.67326
6	0° 43' 13"	-3° 32' 24"	2° 04' 12"	-2° 57' 41"	0° 57' 38"	15' 42.41"	245° 11' 41"	0.67747
7	1° 16' 40"	-3° 30' 08"	2° 33' 58"	-2° 42' 18"	0° 57' 37"	15' 42.00"	245° 10' 57"	0.68166
8	1° 50' 06"	-3° 27' 51"	3° 03' 42"	-2° 26' 56"	0° 57' 35"	15' 41.60"	245° 10' 22"	0.68583
9	2° 23' 30"	-3° 25' 33"	3° 33' 24"	-2° 11' 33"	0° 57' 34"	15' 41.19"	245° 9' 57"	0.68999
10	2° 56' 53"	-3° 23' 14"	4° 03' 04"	-1° 56' 11"	0° 57' 32"	15' 40.79"	245° 9' 40"	0.69413
11	3° 30' 13"	-3° 20' 54"	4° 32' 41"	-1° 40' 49"	0° 57' 31"	15' 40.39"	245° 9' 33"	0.69824
12	4° 03' 32"	-3° 18' 33"	5° 02' 17"	-1° 25' 27"	0° 57' 30"	15' 39.99"	245° 9' 35"	0.70234
13	4° 36' 49"	-3° 16' 11"	5° 31' 52"	-1° 10' 05"	0° 57' 28"	15' 39.59"	245° 9' 46"	0.70642
14	5° 10' 04"	-3° 13' 47"	6° 01' 24"	0° -54' 44"	0° 57' 27"	15' 39.19"	245° 10' 06"	0.71048
15	5° 43' 18"	-3° 11' 23"	6° 30' 55"	0° -39' 24"	0° 57' 25"	15' 38.79"	245° 10' 35"	0.71451
16	6° 16' 30"	-3° 08' 58"	7° 00' 24"	0° -24' 04"	0° 57' 24"	15' 38.39"	245° 11' 13"	0.71853
17	6° 49' 40"	-3° 06' 32"	7° 29' 52"	0° -8' 44"	0° 57' 22"	15' 38.00"	245° 12' 00"	0.72253
18	7° 22' 49"	-3° 04' 05"	7° 59' 19"	0° 06' 34"	0° 57' 21"	15' 37.60"	245° 12' 56"	0.72650
19	7° 55' 55"	-3° 01' 38"	8° 28' 44"	0° 21' 52"	0° 57' 19"	15' 37.21"	245° 14' 02"	0.73045
20	8° 29' 00"	-2° 59' 09"	8° 58' 07"	0° 37' 09"	0° 57' 18"	15' 36.81"	245° 15' 16"	0.73438
21	9° 02' 04"	-2° 56' 39"	9° 27' 30"	0° 52' 26"	0° 57' 16"	15' 36.42"	245° 16' 40"	0.73829
22	9° 35' 06"	-2° 54' 09"	9° 56' 52"	1° 07' 41"	0° 57' 15"	15' 36.03"	245° 18' 13"	0.74218
23	10° 08' 06"	-2° 51' 38"	10° 26' 12"	1° 22' 55"	0° 57' 14"	15' 35.64"	245° 19' 55"	0.74605
24	10° 41' 04"	-2° 49' 06"	10° 55' 32"	1° 38' 09"	0° 57' 12"	15' 35.25"	245° 21' 46"	0.74989

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	250° 47' 30"	-0.39"	249° 11' 49"	-22° 03' 40"	0.9858654	16' 13.39"	23° 26' 17"	10 m 24 s
1	250° 50' 02"	-0.39"	249° 14' 32"	-22° 04' 01"	0.9858587	16' 13.40"	23° 26' 17"	10 m 23 s
2	250° 52' 34"	-0.38"	249° 17' 14"	-22° 04' 23"	0.9858520	16' 13.40"	23° 26' 17"	10 m 22 s
3	250° 55' 06"	-0.38"	249° 19' 56"	-22° 04' 44"	0.9858453	16' 13.41"	23° 26' 17"	10 m 21 s
4	250° 57' 38"	-0.37"	249° 22' 39"	-22° 05' 06"	0.9858387	16' 13.41"	23° 26' 17"	10 m 20 s
5	251° 00' 10"	-0.37"	249° 25' 21"	-22° 05' 27"	0.9858320	16' 13.42"	23° 26' 17"	10 m 19 s
6	251° 02' 43"	-0.36"	249° 28' 04"	-22° 05' 48"	0.9858254	16' 13.43"	23° 26' 17"	10 m 18 s
7	251° 05' 15"	-0.36"	249° 30' 46"	-22° 06' 09"	0.9858187	16' 13.43"	23° 26' 17"	10 m 17 s
8	251° 07' 47"	-0.35"	249° 33' 29"	-22° 06' 30"	0.9858121	16' 13.44"	23° 26' 17"	10 m 16 s
9	251° 10' 19"	-0.35"	249° 36' 12"	-22° 06' 52"	0.9858055	16' 13.45"	23° 26' 17"	10 m 15 s
10	251° 12' 51"	-0.35"	249° 38' 54"	-22° 07' 13"	0.9857989	16' 13.45"	23° 26' 17"	10 m 14 s
11	251° 15' 23"	-0.34"	249° 41' 37"	-22° 07' 34"	0.9857923	16' 13.46"	23° 26' 17"	10 m 13 s
12	251° 17' 55"	-0.34"	249° 44' 19"	-22° 07' 55"	0.9857857	16' 13.47"	23° 26' 17"	10 m 12 s
13	251° 20' 27"	-0.33"	249° 47' 02"	-22° 08' 15"	0.9857791	16' 13.47"	23° 26' 17"	10 m 11 s
14	251° 22' 59"	-0.33"	249° 49' 45"	-22° 08' 36"	0.9857725	16' 13.48"	23° 26' 17"	10 m 10 s
15	251° 25' 31"	-0.32"	249° 52' 27"	-22° 08' 57"	0.9857659	16' 13.49"	23° 26' 17"	10 m 09 s
16	251° 28' 03"	-0.32"	249° 55' 10"	-22° 09' 18"	0.9857594	16' 13.49"	23° 26' 17"	10 m 08 s
17	251° 30' 35"	-0.31"	249° 57' 53"	-22° 09' 39"	0.9857528	16' 13.50"	23° 26' 17"	10 m 07 s
18	251° 33' 08"	-0.31"	250° 00' 35"	-22° 09' 59"	0.9857463	16' 13.51"	23° 26' 17"	10 m 06 s
19	251° 35' 40"	-0.30"	250° 03' 18"	-22° 10' 20"	0.9857397	16' 13.51"	23° 26' 17"	10 m 05 s
20	251° 38' 12"	-0.30"	250° 06' 01"	-22° 10' 41"	0.9857332	16' 13.52"	23° 26' 17"	10 m 04 s
21	251° 40' 44"	-0.29"	250° 08' 43"	-22° 11' 01"	0.9857267	16' 13.53"	23° 26' 17"	10 m 03 s
22	251° 43' 16"	-0.29"	250° 11' 26"	-22° 11' 22"	0.9857202	16' 13.53"	23° 26' 17"	10 m 02 s
23	251° 45' 48"	-0.28"	250° 14' 09"	-22° 11' 42"	0.9857137	16' 13.54"	23° 26' 17"	10 m 01 s
24	251° 48' 20"	-0.28"	250° 16' 52"	-22° 12' 03"	0.9857072	16' 13.54"	23° 26' 17"	10 m 00 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	10° 41' 04"	-2° 49' 06"	10° 55' 32"	1° 38' 09"	0° 57' 12"	15' 35.25"	245° 21' 46"	0.74989
1	11° 14' 01"	-2° 46' 33"	11° 24' 50"	1° 53' 21"	0° 57' 11"	15' 34.86"	245° 23' 46"	0.75371
2	11° 46' 56"	-2° 43' 59"	11° 54' 08"	2° 08' 32"	0° 57' 09"	15' 34.47"	245° 25' 55"	0.75751
3	12° 19' 50"	-2° 41' 25"	12° 23' 25"	2° 23' 41"	0° 57' 08"	15' 34.09"	245° 28' 14"	0.76128
4	12° 52' 42"	-2° 38' 49"	12° 52' 42"	2° 38' 50"	0° 57' 06"	15' 33.70"	245° 30' 42"	0.76503
5	13° 25' 32"	-2° 36' 13"	13° 21' 57"	2° 53' 57"	0° 57' 05"	15' 33.32"	245° 33' 19"	0.76875
6	13° 58' 21"	-2° 33' 37"	13° 51' 13"	3° 09' 02"	0° 57' 04"	15' 32.93"	245° 36' 05"	0.77246
7	14° 31' 08"	-2° 30' 59"	14° 20' 27"	3° 24' 06"	0° 57' 02"	15' 32.55"	245° 39' 00"	0.77613
8	15° 03' 53"	-2° 28' 21"	14° 49' 42"	3° 39' 09"	0° 57' 01"	15' 32.17"	245° 42' 05"	0.77979
9	15° 36' 37"	-2° 25' 42"	15° 18' 56"	3° 54' 10"	0° 56' 59"	15' 31.79"	245° 45' 19"	0.78341
10	16° 09' 19"	-2° 23' 03"	15° 48' 10"	4° 09' 09"	0° 56' 58"	15' 31.41"	245° 48' 43"	0.78702
11	16° 42' 00"	-2° 20' 23"	16° 17' 24"	4° 24' 06"	0° 56' 57"	15' 31.03"	245° 52' 15"	0.79060
12	17° 14' 39"	-2° 17' 42"	16° 46' 37"	4° 39' 02"	0° 56' 55"	15' 30.65"	245° 55' 58"	0.79415
13	17° 47' 17"	-2° 15' 01"	17° 15' 51"	4° 53' 56"	0° 56' 54"	15' 30.28"	245° 59' 49"	0.79768
14	18° 19' 53"	-2° 12' 19"	17° 45' 04"	5° 08' 48"	0° 56' 52"	15' 29.90"	246° 3' 50"	0.80118
15	18° 52' 28"	-2° 09' 36"	18° 14' 18"	5° 23' 38"	0° 56' 51"	15' 29.53"	246° 8' 01"	0.80465
16	19° 25' 01"	-2° 06' 53"	18° 43' 32"	5° 38' 25"	0° 56' 50"	15' 29.16"	246° 12' 21"	0.80810
17	19° 57' 33"	-2° 04' 09"	19° 12' 46"	5° 53' 11"	0° 56' 48"	15' 28.78"	246° 16' 51"	0.81153
18	20° 30' 03"	-2° 01' 25"	19° 42' 00"	6° 07' 55"	0° 56' 47"	15' 28.41"	246° 21' 30"	0.81492
19	21° 02' 31"	-1° 58' 40"	20° 11' 15"	6° 22' 36"	0° 56' 46"	15' 28.04"	246° 26' 19"	0.81830
20	21° 34' 58"	-1° 55' 55"	20° 40' 30"	6° 37' 15"	0° 56' 44"	15' 27.68"	246° 31' 18"	0.82164
21	22° 07' 24"	-1° 53' 09"	21° 09' 46"	6° 51' 52"	0° 56' 43"	15' 27.31"	246° 36' 27"	0.82495
22	22° 39' 48"	-1° 50' 23"	21° 39' 02"	7° 06' 26"	0° 56' 42"	15' 26.94"	246° 41' 45"	0.82824
23	23° 12' 10"	-1° 47' 37"	22° 08' 19"	7° 20' 58"	0° 56' 40"	15' 26.58"	246° 47' 13"	0.83151
24	23° 44' 32"	-1° 44' 49"	22° 37' 36"	7° 35' 27"	0° 56' 39"	15' 26.21"	246° 52' 51"	0.83474

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	251° 48' 20"	-0.28"	250° 16' 52"	-22° 12' 03"	0.9857072	16' 13.54"	23° 26' 17"	10 m 00 s
1	251° 50' 52"	-0.27"	250° 19' 35"	-22° 12' 23"	0.9857007	16' 13.55"	23° 26' 17"	9 m 59 s
2	251° 53' 24"	-0.27"	250° 22' 17"	-22° 12' 43"	0.9856943	16' 13.56"	23° 26' 17"	9 m 58 s
3	251° 55' 56"	-0.26"	250° 25' 00"	-22° 13' 04"	0.9856878	16' 13.56"	23° 26' 17"	9 m 57 s
4	251° 58' 28"	-0.26"	250° 27' 43"	-22° 13' 24"	0.9856813	16' 13.57"	23° 26' 17"	9 m 56 s
5	252° 01' 01"	-0.25"	250° 30' 26"	-22° 13' 44"	0.9856749	16' 13.58"	23° 26' 17"	9 m 55 s
6	252° 03' 33"	-0.25"	250° 33' 09"	-22° 14' 04"	0.9856685	16' 13.58"	23° 26' 17"	9 m 54 s
7	252° 06' 05"	-0.24"	250° 35' 52"	-22° 14' 24"	0.9856620	16' 13.59"	23° 26' 17"	9 m 53 s
8	252° 08' 37"	-0.24"	250° 38' 35"	-22° 14' 44"	0.9856556	16' 13.60"	23° 26' 17"	9 m 52 s
9	252° 11' 09"	-0.23"	250° 41' 17"	-22° 15' 04"	0.9856492	16' 13.60"	23° 26' 17"	9 m 51 s
10	252° 13' 41"	-0.23"	250° 44' 00"	-22° 15' 24"	0.9856428	16' 13.61"	23° 26' 17"	9 m 50 s
11	252° 16' 13"	-0.22"	250° 46' 43"	-22° 15' 44"	0.9856364	16' 13.61"	23° 26' 17"	9 m 49 s
12	252° 18' 45"	-0.22"	250° 49' 26"	-22° 16' 04"	0.9856301	16' 13.62"	23° 26' 17"	9 m 48 s
13	252° 21' 18"	-0.21"	250° 52' 09"	-22° 16' 24"	0.9856237	16' 13.63"	23° 26' 17"	9 m 47 s
14	252° 23' 50"	-0.21"	250° 54' 52"	-22° 16' 44"	0.9856173	16' 13.63"	23° 26' 17"	9 m 46 s
15	252° 26' 22"	-0.20"	250° 57' 35"	-22° 17' 04"	0.9856110	16' 13.64"	23° 26' 17"	9 m 45 s
16	252° 28' 54"	-0.20"	251° 00' 18"	-22° 17' 23"	0.9856047	16' 13.65"	23° 26' 17"	9 m 44 s
17	252° 31' 26"	-0.19"	251° 03' 01"	-22° 17' 43"	0.9855983	16' 13.65"	23° 26' 17"	9 m 43 s
18	252° 33' 58"	-0.19"	251° 05' 44"	-22° 18' 03"	0.9855920	16' 13.66"	23° 26' 17"	9 m 42 s
19	252° 36' 30"	-0.18"	251° 08' 27"	-22° 18' 22"	0.9855857	16' 13.66"	23° 26' 17"	9 m 41 s
20	252° 39' 02"	-0.18"	251° 11' 11"	-22° 18' 42"	0.9855794	16' 13.67"	23° 26' 17"	9 m 40 s
21	252° 41' 35"	-0.17"	251° 13' 54"	-22° 19' 01"	0.9855731	16' 13.68"	23° 26' 17"	9 m 39 s
22	252° 44' 07"	-0.17"	251° 16' 37"	-22° 19' 21"	0.9855668	16' 13.68"	23° 26' 17"	9 m 38 s
23	252° 46' 39"	-0.16"	251° 19' 20"	-22° 19' 40"	0.9855606	16' 13.69"	23° 26' 17"	9 m 37 s
24	252° 49' 11"	-0.16"	251° 22' 03"	-22° 19' 59"	0.9855543	16' 13.70"	23° 26' 17"	9 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	23° 44' 32"	-1° 44' 49"	22° 37' 36"	7° 35' 27"	0° 56' 39"	15' 26.21"	246° 52' 51"	0.83474
1	24° 16' 51"	-1° 42' 02"	23° 06' 55"	7° 49' 54"	0° 56' 38"	15' 25.85"	246° 58' 39"	0.83795
2	24° 49' 10"	-1° 39' 14"	23° 36' 14"	8° 04' 18"	0° 56' 36"	15' 25.49"	247° 4' 37"	0.84112
3	25° 21' 26"	-1° 36' 26"	24° 05' 34"	8° 18' 40"	0° 56' 35"	15' 25.13"	247° 10' 46"	0.84427
4	25° 53' 42"	-1° 33' 37"	24° 34' 55"	8° 32' 58"	0° 56' 34"	15' 24.77"	247° 17' 04"	0.84740
5	26° 25' 56"	-1° 30' 48"	25° 04' 16"	8° 47' 14"	0° 56' 32"	15' 24.41"	247° 23' 33"	0.85049
6	26° 58' 08"	-1° 27' 58"	25° 33' 39"	9° 01' 27"	0° 56' 31"	15' 24.05"	247° 30' 12"	0.85355
7	27° 30' 19"	-1° 25' 08"	26° 03' 03"	9° 15' 37"	0° 56' 30"	15' 23.70"	247° 37' 01"	0.85659
8	28° 02' 29"	-1° 22' 18"	26° 32' 29"	9° 29' 44"	0° 56' 28"	15' 23.34"	247° 44' 01"	0.85960
9	28° 34' 38"	-1° 19' 28"	27° 01' 55"	9° 43' 48"	0° 56' 27"	15' 22.99"	247° 51' 12"	0.86257
10	29° 06' 45"	-1° 16' 37"	27° 31' 23"	9° 57' 49"	0° 56' 26"	15' 22.64"	247° 58' 33"	0.86552
11	29° 38' 50"	-1° 13' 46"	28° 00' 52"	10° 11' 47"	0° 56' 25"	15' 22.28"	248° 6' 05"	0.86844
12	30° 10' 54"	-1° 10' 55"	28° 30' 22"	10° 25' 42"	0° 56' 23"	15' 21.93"	248° 13' 48"	0.87133
13	30° 42' 57"	-1° 08' 03"	28° 59' 54"	10° 39' 33"	0° 56' 22"	15' 21.59"	248° 21' 42"	0.87419
14	31° 14' 59"	-1° 05' 12"	29° 29' 27"	10° 53' 21"	0° 56' 21"	15' 21.24"	248° 29' 47"	0.87702
15	31° 46' 59"	-1° 02' 20"	29° 59' 02"	11° 07' 05"	0° 56' 19"	15' 20.89"	248° 38' 04"	0.87982
16	32° 18' 58"	0°-59' 28"	30° 28' 39"	11° 20' 46"	0° 56' 18"	15' 20.54"	248° 46' 31"	0.88259
17	32° 50' 55"	0°-56' 35"	30° 58' 17"	11° 34' 24"	0° 56' 17"	15' 20.20"	248° 55' 10"	0.88533
18	33° 22' 51"	0°-53' 43"	31° 27' 57"	11° 47' 58"	0° 56' 16"	15' 19.86"	249° 4' 01"	0.88804
19	33° 54' 46"	0°-50' 50"	31° 57' 38"	12° 01' 28"	0° 56' 14"	15' 19.51"	249° 13' 04"	0.89072
20	34° 26' 40"	0°-47' 57"	32° 27' 22"	12° 14' 55"	0° 56' 13"	15' 19.17"	249° 22' 18"	0.89337
21	34° 58' 32"	0°-45' 04"	32° 57' 07"	12° 28' 18"	0° 56' 12"	15' 18.83"	249° 31' 45"	0.89599
22	35° 30' 23"	0°-42' 11"	33° 26' 54"	12° 41' 37"	0° 56' 11"	15' 18.49"	249° 41' 24"	0.89857
23	36° 02' 13"	0°-39' 18"	33° 56' 44"	12° 54' 52"	0° 56' 09"	15' 18.16"	249° 51' 15"	0.90113
24	36° 34' 01"	0°-36' 25"	34° 26' 35"	13° 08' 04"	0° 56' 08"	15' 17.82"	250° 1' 19"	0.90365

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	252° 49' 11"	-0.16"	251° 22' 03"	-22° 19' 59"	0.9855543	16' 13.70"	23° 26' 17"	9 m 36 s
1	252° 51' 43"	-0.15"	251° 24' 46"	-22° 20' 19"	0.9855480	16' 13.70"	23° 26' 17"	9 m 35 s
2	252° 54' 15"	-0.14"	251° 27' 29"	-22° 20' 38"	0.9855418	16' 13.71"	23° 26' 17"	9 m 34 s
3	252° 56' 47"	-0.14"	251° 30' 12"	-22° 20' 57"	0.9855356	16' 13.71"	23° 26' 17"	9 m 33 s
4	252° 59' 20"	-0.13"	251° 32' 56"	-22° 21' 16"	0.9855293	16' 13.72"	23° 26' 17"	9 m 32 s
5	253° 01' 52"	-0.13"	251° 35' 39"	-22° 21' 36"	0.9855231	16' 13.73"	23° 26' 17"	9 m 31 s
6	253° 04' 24"	-0.12"	251° 38' 22"	-22° 21' 55"	0.9855169	16' 13.73"	23° 26' 17"	9 m 30 s
7	253° 06' 56"	-0.12"	251° 41' 05"	-22° 22' 14"	0.9855107	16' 13.74"	23° 26' 17"	9 m 29 s
8	253° 09' 28"	-0.11"	251° 43' 49"	-22° 22' 33"	0.9855045	16' 13.74"	23° 26' 17"	9 m 28 s
9	253° 12' 00"	-0.11"	251° 46' 32"	-22° 22' 52"	0.9854984	16' 13.75"	23° 26' 17"	9 m 27 s
10	253° 14' 32"	-0.10"	251° 49' 15"	-22° 23' 10"	0.9854922	16' 13.76"	23° 26' 17"	9 m 26 s
11	253° 17' 05"	-0.10"	251° 51' 58"	-22° 23' 29"	0.9854860	16' 13.76"	23° 26' 17"	9 m 25 s
12	253° 19' 37"	-0.09"	251° 54' 42"	-22° 23' 48"	0.9854799	16' 13.77"	23° 26' 17"	9 m 23 s
13	253° 22' 09"	-0.09"	251° 57' 25"	-22° 24' 07"	0.9854737	16' 13.78"	23° 26' 17"	9 m 22 s
14	253° 24' 41"	-0.08"	252° 00' 08"	-22° 24' 26"	0.9854676	16' 13.78"	23° 26' 17"	9 m 21 s
15	253° 27' 13"	-0.07"	252° 02' 52"	-22° 24' 44"	0.9854615	16' 13.79"	23° 26' 17"	9 m 20 s
16	253° 29' 45"	-0.07"	252° 05' 35"	-22° 25' 03"	0.9854554	16' 13.79"	23° 26' 17"	9 m 19 s
17	253° 32' 18"	-0.06"	252° 08' 18"	-22° 25' 21"	0.9854493	16' 13.80"	23° 26' 17"	9 m 18 s
18	253° 34' 50"	-0.06"	252° 11' 02"	-22° 25' 40"	0.9854432	16' 13.81"	23° 26' 17"	9 m 17 s
19	253° 37' 22"	-0.05"	252° 13' 45"	-22° 25' 59"	0.9854371	16' 13.81"	23° 26' 17"	9 m 16 s
20	253° 39' 54"	-0.05"	252° 16' 29"	-22° 26' 17"	0.9854311	16' 13.82"	23° 26' 17"	9 m 15 s
21	253° 42' 26"	-0.04"	252° 19' 12"	-22° 26' 35"	0.9854250	16' 13.82"	23° 26' 17"	9 m 14 s
22	253° 44' 58"	-0.04"	252° 21' 56"	-22° 26' 54"	0.9854189	16' 13.83"	23° 26' 17"	9 m 13 s
23	253° 47' 31"	-0.03"	252° 24' 39"	-22° 27' 12"	0.9854129	16' 13.84"	23° 26' 17"	9 m 12 s
24	253° 50' 03"	-0.03"	252° 27' 23"	-22° 27' 30"	0.9854069	16' 13.84"	23° 26' 17"	9 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	36° 34' 01"	0°-36' 25"	34° 26' 35"	13° 08' 04"	0° 56' 08"	15' 17.82"	250° 1' 19"	0.90365
1	37° 05' 48"	0°-33' 32"	34° 56' 28"	13° 21' 11"	0° 56' 07"	15' 17.49"	250° 11' 36"	0.90615
2	37° 37' 34"	0°-30' 39"	35° 26' 23"	13° 34' 15"	0° 56' 06"	15' 17.15"	250° 22' 06"	0.90861
3	38° 09' 19"	0°-27' 45"	35° 56' 20"	13° 47' 14"	0° 56' 04"	15' 16.82"	250° 32' 49"	0.91104
4	38° 41' 02"	0°-24' 52"	36° 26' 20"	14° 00' 09"	0° 56' 03"	15' 16.49"	250° 43' 46"	0.91344
5	39° 12' 44"	0°-21' 59"	36° 56' 22"	14° 13' 00"	0° 56' 02"	15' 16.16"	250° 54' 57"	0.91581
6	39° 44' 25"	0°-19' 05"	37° 26' 26"	14° 25' 47"	0° 56' 01"	15' 15.83"	251° 6' 22"	0.91814
7	40° 16' 05"	0°-16' 12"	37° 56' 32"	14° 38' 29"	0° 55' 60"	15' 15.50"	251° 18' 01"	0.92045
8	40° 47' 43"	0°-13' 19"	38° 26' 41"	14° 51' 07"	0° 55' 58"	15' 15.17"	251° 29' 54"	0.92272
9	41° 19' 20"	0°-10' 26"	38° 56' 52"	15° 03' 41"	0° 55' 57"	15' 14.84"	251° 42' 03"	0.92496
10	41° 50' 56"	0° -7' 32"	39° 27' 05"	15° 16' 10"	0° 55' 56"	15' 14.52"	251° 54' 27"	0.92717
11	42° 22' 31"	0° -4' 39"	39° 57' 21"	15° 28' 35"	0° 55' 55"	15' 14.19"	252° 7' 06"	0.92934
12	42° 54' 05"	0° -1' 46"	40° 27' 40"	15° 40' 55"	0° 55' 54"	15' 13.87"	252° 20' 02"	0.93149
13	43° 25' 37"	0° 01' 06"	40° 58' 01"	15° 53' 10"	0° 55' 52"	15' 13.55"	252° 33' 14"	0.93360
14	43° 57' 08"	0° 03' 59"	41° 28' 24"	16° 05' 21"	0° 55' 51"	15' 13.23"	252° 46' 43"	0.93568
15	44° 28' 38"	0° 06' 52"	41° 58' 50"	16° 17' 26"	0° 55' 50"	15' 12.91"	253° 0' 29"	0.93772
16	45° 00' 07"	0° 09' 44"	42° 29' 19"	16° 29' 27"	0° 55' 49"	15' 12.59"	253° 14' 33"	0.93974
17	45° 31' 35"	0° 12' 36"	42° 59' 50"	16° 41' 24"	0° 55' 48"	15' 12.28"	253° 28' 56"	0.94172
18	46° 03' 01"	0° 15' 28"	43° 30' 24"	16° 53' 15"	0° 55' 47"	15' 11.96"	253° 43' 37"	0.94367
19	46° 34' 27"	0° 18' 20"	44° 01' 00"	17° 05' 01"	0° 55' 45"	15' 11.65"	253° 58' 38"	0.94558
20	47° 05' 51"	0° 21' 10"	44° 31' 41"	17° 16' 40"	0° 55' 44"	15' 11.33"	254° 13' 55"	0.94746
21	47° 37' 14"	0° 24' 01"	45° 02' 23"	17° 28' 16"	0° 55' 43"	15' 11.02"	254° 29' 37"	0.94931
22	48° 08' 36"	0° 26' 52"	45° 33' 08"	17° 39' 47"	0° 55' 42"	15' 10.71"	254° 45' 40"	0.95113
23	48° 39' 57"	0° 29' 43"	46° 03' 55"	17° 51' 13"	0° 55' 41"	15' 10.40"	255° 2' 06"	0.95291
24	49° 11' 17"	0° 32' 34"	46° 34' 46"	18° 02' 33"	0° 55' 40"	15' 10.09"	255° 18' 56"	0.95466



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	253° 50' 03"	-0.03"	252° 27' 23"	-22° 27' 30"	0.9854069	16' 13.84"	23° 26' 17"	9 m 11 s
1	253° 52' 35"	-0.02"	252° 30' 06"	-22° 27' 48"	0.9854009	16' 13.85"	23° 26' 17"	9 m 10 s
2	253° 55' 07"	-0.02"	252° 32' 49"	-22° 28' 07"	0.9853948	16' 13.85"	23° 26' 17"	9 m 09 s
3	253° 57' 39"	-0.01"	252° 35' 33"	-22° 28' 25"	0.9853888	16' 13.86"	23° 26' 17"	9 m 08 s
4	254° 00' 11"	-0.00"	252° 38' 17"	-22° 28' 43"	0.9853829	16' 13.87"	23° 26' 17"	9 m 07 s
5	254° 02' 44"	0.00"	252° 41' 00"	-22° 29' 01"	0.9853769	16' 13.87"	23° 26' 17"	9 m 06 s
6	254° 05' 16"	0.01"	252° 43' 44"	-22° 29' 19"	0.9853709	16' 13.88"	23° 26' 17"	9 m 05 s
7	254° 07' 48"	0.01"	252° 46' 27"	-22° 29' 37"	0.9853649	16' 13.88"	23° 26' 17"	9 m 04 s
8	254° 10' 20"	0.02"	252° 49' 11"	-22° 29' 55"	0.9853590	16' 13.89"	23° 26' 17"	9 m 03 s
9	254° 12' 52"	0.02"	252° 51' 54"	-22° 30' 13"	0.9853530	16' 13.89"	23° 26' 17"	9 m 01 s
10	254° 15' 25"	0.03"	252° 54' 38"	-22° 30' 30"	0.9853471	16' 13.90"	23° 26' 17"	9 m 00 s
11	254° 17' 57"	0.03"	252° 57' 22"	-22° 30' 48"	0.9853412	16' 13.91"	23° 26' 17"	8 m 59 s
12	254° 20' 29"	0.04"	253° 00' 05"	-22° 31' 06"	0.9853353	16' 13.91"	23° 26' 17"	8 m 58 s
13	254° 23' 01"	0.04"	253° 02' 49"	-22° 31' 24"	0.9853294	16' 13.92"	23° 26' 17"	8 m 57 s
14	254° 25' 33"	0.05"	253° 05' 33"	-22° 31' 41"	0.9853235	16' 13.92"	23° 26' 17"	8 m 56 s
15	254° 28' 06"	0.05"	253° 08' 16"	-22° 31' 59"	0.9853176	16' 13.93"	23° 26' 17"	8 m 55 s
16	254° 30' 38"	0.06"	253° 10' 60"	-22° 32' 16"	0.9853117	16' 13.94"	23° 26' 17"	8 m 54 s
17	254° 33' 10"	0.06"	253° 13' 44"	-22° 32' 34"	0.9853059	16' 13.94"	23° 26' 17"	8 m 53 s
18	254° 35' 42"	0.07"	253° 16' 27"	-22° 32' 51"	0.9853000	16' 13.95"	23° 26' 17"	8 m 52 s
19	254° 38' 14"	0.08"	253° 19' 11"	-22° 33' 09"	0.9852942	16' 13.95"	23° 26' 17"	8 m 51 s
20	254° 40' 47"	0.08"	253° 21' 55"	-22° 33' 26"	0.9852883	16' 13.96"	23° 26' 17"	8 m 50 s
21	254° 43' 19"	0.09"	253° 24' 39"	-22° 33' 43"	0.9852825	16' 13.96"	23° 26' 17"	8 m 49 s
22	254° 45' 51"	0.09"	253° 27' 22"	-22° 34' 00"	0.9852767	16' 13.97"	23° 26' 17"	8 m 48 s
23	254° 48' 23"	0.10"	253° 30' 06"	-22° 34' 18"	0.9852709	16' 13.98"	23° 26' 17"	8 m 47 s
24	254° 50' 55"	0.10"	253° 32' 50"	-22° 34' 35"	0.9852651	16' 13.98"	23° 26' 17"	8 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	49° 11' 17"	0° 32' 34"	46° 34' 46"	18° 02' 33"	0° 55' 40"	15' 10.09"	255° 18' 56"	0.95466
1	49° 42' 35"	0° 35' 24"	47° 05' 39"	18° 13' 48"	0° 55' 39"	15' 09.78"	255° 36' 09"	0.95638
2	50° 13' 53"	0° 38' 14"	47° 36' 35"	18° 24' 58"	0° 55' 38"	15' 09.48"	255° 53' 48"	0.95806
3	50° 45' 09"	0° 41' 04"	48° 07' 34"	18° 36' 02"	0° 55' 36"	15' 09.17"	256° 11' 54"	0.95971
4	51° 16' 24"	0° 43' 54"	48° 38' 36"	18° 47' 01"	0° 55' 35"	15' 08.87"	256° 30' 27"	0.96133
5	51° 47' 39"	0° 46' 43"	49° 09' 41"	18° 57' 54"	0° 55' 34"	15' 08.57"	256° 49' 28"	0.96291
6	52° 18' 52"	0° 49' 31"	49° 40' 49"	19° 08' 42"	0° 55' 33"	15' 08.26"	257° 9' 00"	0.96446
7	52° 50' 04"	0° 52' 20"	50° 11' 60"	19° 19' 24"	0° 55' 32"	15' 07.96"	257° 29' 04"	0.96598
8	53° 21' 15"	0° 55' 08"	50° 43' 13"	19° 30' 00"	0° 55' 31"	15' 07.66"	257° 49' 41"	0.96746
9	53° 52' 25"	0° 57' 56"	51° 14' 30"	19° 40' 31"	0° 55' 30"	15' 07.37"	258° 10' 54"	0.96891
10	54° 23' 33"	1° 00' 43"	51° 45' 49"	19° 50' 56"	0° 55' 29"	15' 07.07"	258° 32' 43"	0.97033
11	54° 54' 41"	1° 03' 30"	52° 17' 12"	20° 01' 15"	0° 55' 28"	15' 06.77"	258° 55' 12"	0.97171
12	55° 25' 48"	1° 06' 16"	52° 48' 38"	20° 11' 28"	0° 55' 27"	15' 06.48"	259° 18' 23"	0.97306
13	55° 56' 53"	1° 09' 02"	53° 20' 06"	20° 21' 35"	0° 55' 25"	15' 06.19"	259° 42' 18"	0.97438
14	56° 27' 58"	1° 11' 48"	53° 51' 38"	20° 31' 36"	0° 55' 24"	15' 05.90"	260° 7' 01"	0.97566
15	56° 59' 01"	1° 14' 33"	54° 23' 12"	20° 41' 31"	0° 55' 23"	15' 05.61"	260° 32' 34"	0.97691
16	57° 30' 04"	1° 17' 17"	54° 54' 50"	20° 51' 19"	0° 55' 22"	15' 05.32"	260° 59' 01"	0.97812
17	58° 01' 05"	1° 20' 02"	55° 26' 30"	21° 01' 02"	0° 55' 21"	15' 05.03"	261° 26' 26"	0.97930
18	58° 32' 06"	1° 22' 45"	55° 58' 14"	21° 10' 38"	0° 55' 20"	15' 04.74"	261° 54' 53"	0.98045
19	59° 03' 05"	1° 25' 28"	56° 30' 00"	21° 20' 09"	0° 55' 19"	15' 04.46"	262° 24' 28"	0.98156
20	59° 34' 04"	1° 28' 11"	57° 01' 50"	21° 29' 32"	0° 55' 18"	15' 04.17"	262° 55' 16"	0.98264
21	60° 05' 01"	1° 30' 53"	57° 33' 42"	21° 38' 50"	0° 55' 17"	15' 03.89"	263° 27' 23"	0.98369
22	60° 35' 58"	1° 33' 34"	58° 05' 38"	21° 48' 01"	0° 55' 16"	15' 03.61"	264° 0' 55"	0.98470
23	61° 06' 53"	1° 36' 15"	58° 37' 36"	21° 57' 05"	0° 55' 15"	15' 03.33"	264° 36' 02"	0.98568
24	61° 37' 47"	1° 38' 56"	59° 09' 38"	22° 06' 03"	0° 55' 14"	15' 03.05"	265° 12' 51"	0.98662

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	254° 50' 55"	0.10"	253° 32' 50"	-22° 34' 35"	0.9852651	16' 13.98"	23° 26' 17"	8 m 46 s
1	254° 53' 28"	0.11"	253° 35' 34"	-22° 34' 52"	0.9852593	16' 13.99"	23° 26' 17"	8 m 44 s
2	254° 55' 60"	0.11"	253° 38' 18"	-22° 35' 09"	0.9852535	16' 13.99"	23° 26' 17"	8 m 43 s
3	254° 58' 32"	0.12"	253° 41' 01"	-22° 35' 26"	0.9852478	16' 14.00"	23° 26' 17"	8 m 42 s
4	255° 01' 04"	0.12"	253° 43' 45"	-22° 35' 43"	0.9852420	16' 14.00"	23° 26' 17"	8 m 41 s
5	255° 03' 37"	0.13"	253° 46' 29"	-22° 35' 60"	0.9852363	16' 14.01"	23° 26' 17"	8 m 40 s
6	255° 06' 09"	0.13"	253° 49' 13"	-22° 36' 17"	0.9852306	16' 14.02"	23° 26' 17"	8 m 39 s
7	255° 08' 41"	0.14"	253° 51' 57"	-22° 36' 34"	0.9852248	16' 14.02"	23° 26' 17"	8 m 38 s
8	255° 11' 13"	0.14"	253° 54' 41"	-22° 36' 51"	0.9852191	16' 14.03"	23° 26' 17"	8 m 37 s
9	255° 13' 45"	0.15"	253° 57' 25"	-22° 37' 07"	0.9852134	16' 14.03"	23° 26' 17"	8 m 36 s
10	255° 16' 18"	0.15"	254° 00' 09"	-22° 37' 24"	0.9852077	16' 14.04"	23° 26' 17"	8 m 35 s
11	255° 18' 50"	0.16"	254° 02' 53"	-22° 37' 41"	0.9852020	16' 14.04"	23° 26' 17"	8 m 34 s
12	255° 21' 22"	0.16"	254° 05' 37"	-22° 37' 57"	0.9851964	16' 14.05"	23° 26' 17"	8 m 33 s
13	255° 23' 54"	0.17"	254° 08' 21"	-22° 38' 14"	0.9851907	16' 14.06"	23° 26' 17"	8 m 32 s
14	255° 26' 27"	0.17"	254° 11' 04"	-22° 38' 30"	0.9851851	16' 14.06"	23° 26' 17"	8 m 30 s
15	255° 28' 59"	0.18"	254° 13' 48"	-22° 38' 47"	0.9851794	16' 14.07"	23° 26' 17"	8 m 29 s
16	255° 31' 31"	0.18"	254° 16' 32"	-22° 39' 03"	0.9851738	16' 14.07"	23° 26' 17"	8 m 28 s
17	255° 34' 03"	0.19"	254° 19' 16"	-22° 39' 20"	0.9851682	16' 14.08"	23° 26' 17"	8 m 27 s
18	255° 36' 36"	0.19"	254° 22' 01"	-22° 39' 36"	0.9851625	16' 14.08"	23° 26' 17"	8 m 26 s
19	255° 39' 08"	0.20"	254° 24' 45"	-22° 39' 52"	0.9851569	16' 14.09"	23° 26' 17"	8 m 25 s
20	255° 41' 40"	0.20"	254° 27' 29"	-22° 40' 08"	0.9851513	16' 14.09"	23° 26' 17"	8 m 24 s
21	255° 44' 12"	0.21"	254° 30' 13"	-22° 40' 25"	0.9851458	16' 14.10"	23° 26' 17"	8 m 23 s
22	255° 46' 45"	0.21"	254° 32' 57"	-22° 40' 41"	0.9851402	16' 14.11"	23° 26' 17"	8 m 22 s
23	255° 49' 17"	0.22"	254° 35' 41"	-22° 40' 57"	0.9851346	16' 14.11"	23° 26' 17"	8 m 21 s
24	255° 51' 49"	0.22"	254° 38' 25"	-22° 41' 13"	0.9851291	16' 14.12"	23° 26' 17"	8 m 20 s

(*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	61° 37' 47"	1° 38' 56"	59° 09' 38"	22° 06' 03"	0° 55' 14"	15' 03.05"	265° 12' 51"	0.98662
1	62° 08' 41"	1° 41' 35"	59° 41' 42"	22° 14' 55"	0° 55' 13"	15' 02.77"	265° 51' 33"	0.98753
2	62° 39' 33"	1° 44' 14"	60° 13' 49"	22° 23' 39"	0° 55' 12"	15' 02.49"	266° 32' 20"	0.98841
3	63° 10' 25"	1° 46' 53"	60° 45' 59"	22° 32' 18"	0° 55' 11"	15' 02.22"	267° 15' 25"	0.98925
4	63° 41' 15"	1° 49' 31"	61° 18' 12"	22° 40' 49"	0° 55' 10"	15' 01.95"	268° 1' 04"	0.99006
5	64° 12' 05"	1° 52' 08"	61° 50' 28"	22° 49' 14"	0° 55' 09"	15' 01.67"	268° 49' 33"	0.99083
6	64° 42' 54"	1° 54' 45"	62° 22' 47"	22° 57' 31"	0° 55' 08"	15' 01.40"	269° 41' 15"	0.99158
7	65° 13' 41"	1° 57' 21"	62° 55' 09"	23° 05' 42"	0° 55' 07"	15' 01.13"	270° 36' 34"	0.99228
8	65° 44' 28"	1° 59' 56"	63° 27' 33"	23° 13' 47"	0° 55' 06"	15' 00.86"	271° 35' 57"	0.99296
9	66° 15' 14"	2° 02' 31"	64° 00' 00"	23° 21' 44"	0° 55' 05"	15' 00.60"	272° 40' 00"	0.99360
10	66° 45' 58"	2° 05' 05"	64° 32' 30"	23° 29' 34"	0° 55' 04"	15' 00.33"	273° 49' 23"	0.99420
11	67° 16' 42"	2° 07' 38"	65° 05' 03"	23° 37' 17"	0° 55' 03"	15' 00.07"	275° 4' 53"	0.99478
12	67° 47' 25"	2° 10' 11"	65° 37' 39"	23° 44' 53"	0° 55' 02"	14' 59.80"	276° 27' 30"	0.99532
13	68° 18' 07"	2° 12' 42"	66° 10' 17"	23° 52' 22"	0° 55' 01"	14' 59.54"	277° 58' 24"	0.99582
14	68° 48' 48"	2° 15' 13"	66° 42' 58"	23° 59' 44"	0° 55' 00"	14' 59.28"	279° 39' 02"	0.99629
15	69° 19' 28"	2° 17' 44"	67° 15' 41"	24° 06' 59"	0° 54' 59"	14' 59.03"	281° 31' 10"	0.99673
16	69° 50' 08"	2° 20' 13"	67° 48' 27"	24° 14' 06"	0° 54' 58"	14' 58.77"	283° 36' 58"	0.99714
17	70° 20' 46"	2° 22' 42"	68° 21' 16"	24° 21' 06"	0° 54' 57"	14' 58.51"	285° 59' 11"	0.99751
18	70° 51' 23"	2° 25' 10"	68° 54' 07"	24° 27' 59"	0° 54' 56"	14' 58.26"	288° 41' 08"	0.99785
19	71° 22' 00"	2° 27' 37"	69° 27' 00"	24° 34' 44"	0° 54' 55"	14' 58.01"	291° 47' 02"	0.99815
20	71° 52' 36"	2° 30' 04"	69° 59' 56"	24° 41' 22"	0° 54' 55"	14' 57.76"	295° 21' 59"	0.99842
21	72° 23' 10"	2° 32' 29"	70° 32' 55"	24° 47' 53"	0° 54' 54"	14' 57.51"	299° 32' 11"	0.99866
22	72° 53' 44"	2° 34' 54"	71° 05' 56"	24° 54' 16"	0° 54' 53"	14' 57.26"	304° 24' 47"	0.99887
23	73° 24' 17"	2° 37' 18"	71° 38' 59"	25° 00' 32"	0° 54' 52"	14' 57.01"	310° 7' 26"	0.99904
24	73° 54' 49"	2° 39' 41"	72° 12' 04"	25° 06' 40"	0° 54' 51"	14' 56.77"	316° 47' 02"	0.99918



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	255° 51' 49"	0.22"	254° 38' 25"	-22° 41' 13"	0.9851291	16' 14.12"	23° 26' 17"	8 m 20 s
1	255° 54' 21"	0.23"	254° 41' 09"	-22° 41' 29"	0.9851235	16' 14.12"	23° 26' 17"	8 m 18 s
2	255° 56' 54"	0.23"	254° 43' 53"	-22° 41' 45"	0.9851180	16' 14.13"	23° 26' 17"	8 m 17 s
3	255° 59' 26"	0.24"	254° 46' 37"	-22° 42' 01"	0.9851125	16' 14.13"	23° 26' 17"	8 m 16 s
4	256° 01' 58"	0.24"	254° 49' 22"	-22° 42' 17"	0.9851070	16' 14.14"	23° 26' 17"	8 m 15 s
5	256° 04' 30"	0.24"	254° 52' 06"	-22° 42' 33"	0.9851015	16' 14.14"	23° 26' 17"	8 m 14 s
6	256° 07' 03"	0.25"	254° 54' 50"	-22° 42' 48"	0.9850960	16' 14.15"	23° 26' 17"	8 m 13 s
7	256° 09' 35"	0.25"	254° 57' 34"	-22° 43' 04"	0.9850905	16' 14.15"	23° 26' 17"	8 m 12 s
8	256° 12' 07"	0.26"	255° 00' 18"	-22° 43' 20"	0.9850850	16' 14.16"	23° 26' 17"	8 m 11 s
9	256° 14' 39"	0.26"	255° 03' 02"	-22° 43' 35"	0.9850796	16' 14.16"	23° 26' 17"	8 m 10 s
10	256° 17' 12"	0.27"	255° 05' 47"	-22° 43' 51"	0.9850741	16' 14.17"	23° 26' 17"	8 m 09 s
11	256° 19' 44"	0.27"	255° 08' 31"	-22° 44' 07"	0.9850687	16' 14.18"	23° 26' 17"	8 m 08 s
12	256° 22' 16"	0.28"	255° 11' 15"	-22° 44' 22"	0.9850632	16' 14.18"	23° 26' 17"	8 m 06 s
13	256° 24' 49"	0.28"	255° 13' 59"	-22° 44' 38"	0.9850578	16' 14.19"	23° 26' 17"	8 m 05 s
14	256° 27' 21"	0.28"	255° 16' 44"	-22° 44' 53"	0.9850524	16' 14.19"	23° 26' 17"	8 m 04 s
15	256° 29' 53"	0.29"	255° 19' 28"	-22° 45' 08"	0.9850470	16' 14.20"	23° 26' 17"	8 m 03 s
16	256° 32' 25"	0.29"	255° 22' 12"	-22° 45' 24"	0.9850416	16' 14.20"	23° 26' 17"	8 m 02 s
17	256° 34' 58"	0.30"	255° 24' 57"	-22° 45' 39"	0.9850362	16' 14.21"	23° 26' 17"	8 m 01 s
18	256° 37' 30"	0.30"	255° 27' 41"	-22° 45' 54"	0.9850308	16' 14.21"	23° 26' 17"	7 m 60 s
19	256° 40' 02"	0.31"	255° 30' 25"	-22° 46' 09"	0.9850255	16' 14.22"	23° 26' 17"	7 m 59 s
20	256° 42' 35"	0.31"	255° 33' 10"	-22° 46' 24"	0.9850201	16' 14.22"	23° 26' 17"	7 m 58 s
21	256° 45' 07"	0.31"	255° 35' 54"	-22° 46' 40"	0.9850148	16' 14.23"	23° 26' 17"	7 m 56 s
22	256° 47' 39"	0.32"	255° 38' 38"	-22° 46' 55"	0.9850095	16' 14.23"	23° 26' 17"	7 m 55 s
23	256° 50' 11"	0.32"	255° 41' 23"	-22° 47' 10"	0.9850041	16' 14.24"	23° 26' 17"	7 m 54 s
24	256° 52' 44"	0.33"	255° 44' 07"	-22° 47' 25"	0.9849988	16' 14.24"	23° 26' 17"	7 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	73° 54' 49"	2° 39' 41"	72° 12' 04"	25° 06' 40"	0° 54' 51"	14' 56.77"	316° 47' 02"	0.99918
1	74° 25' 21"	2° 42' 04"	72° 45' 12"	25° 12' 41"	0° 54' 50"	14' 56.52"	324° 27' 17"	0.99928
2	74° 55' 51"	2° 44' 25"	73° 18' 22"	25° 18' 34"	0° 54' 49"	14' 56.28"	333° 5' 03"	0.99935
3	75° 26' 21"	2° 46' 46"	73° 51' 33"	25° 24' 19"	0° 54' 48"	14' 56.04"	342° 26' 55"	0.99939
4	75° 56' 49"	2° 49' 06"	74° 24' 47"	25° 29' 57"	0° 54' 47"	14' 55.80"	352° 8' 42"	0.99940
5	76° 27' 17"	2° 51' 24"	74° 58' 03"	25° 35' 27"	0° 54' 46"	14' 55.57"	1° 40' 30"	0.99937
6	76° 57' 44"	2° 53' 42"	75° 31' 21"	25° 40' 49"	0° 54' 46"	14' 55.33"	10° 35' 25"	0.99931
7	77° 28' 10"	2° 55' 59"	76° 04' 41"	25° 46' 04"	0° 54' 45"	14' 55.10"	18° 36' 10"	0.99922
8	77° 58' 36"	2° 58' 15"	76° 38' 03"	25° 51' 10"	0° 54' 44"	14' 54.87"	25° 36' 29"	0.99909
9	78° 29' 00"	3° 00' 31"	77° 11' 27"	25° 56' 09"	0° 54' 43"	14' 54.64"	31° 38' 13"	0.99894
10	78° 59' 24"	3° 02' 45"	77° 44' 52"	26° 01' 00"	0° 54' 42"	14' 54.41"	36° 47' 32"	0.99875
11	79° 29' 47"	3° 04' 58"	78° 18' 19"	26° 05' 44"	0° 54' 41"	14' 54.18"	41° 12' 01"	0.99852
12	80° 00' 09"	3° 07' 11"	78° 51' 47"	26° 10' 19"	0° 54' 41"	14' 53.96"	44° 59' 04"	0.99827
13	80° 30' 30"	3° 09' 22"	79° 25' 18"	26° 14' 47"	0° 54' 40"	14' 53.73"	48° 15' 13"	0.99798
14	81° 00' 50"	3° 11' 32"	79° 58' 49"	26° 19' 06"	0° 54' 39"	14' 53.51"	51° 5' 57"	0.99766
15	81° 31' 10"	3° 13' 42"	80° 32' 23"	26° 23' 18"	0° 54' 38"	14' 53.29"	53° 35' 45"	0.99731
16	82° 01' 29"	3° 15' 50"	81° 05' 57"	26° 27' 21"	0° 54' 37"	14' 53.07"	55° 48' 14"	0.99692
17	82° 31' 47"	3° 17' 58"	81° 39' 33"	26° 31' 17"	0° 54' 37"	14' 52.86"	57° 46' 18"	0.99650
18	83° 02' 04"	3° 20' 04"	82° 13' 10"	26° 35' 05"	0° 54' 36"	14' 52.64"	59° 32' 19"	0.99606
19	83° 32' 21"	3° 22' 10"	82° 46' 48"	26° 38' 44"	0° 54' 35"	14' 52.43"	61° 8' 10"	0.99558
20	84° 02' 36"	3° 24' 14"	83° 20' 28"	26° 42' 16"	0° 54' 34"	14' 52.22"	62° 35' 25"	0.99506
21	84° 32' 51"	3° 26' 18"	83° 54' 08"	26° 45' 39"	0° 54' 33"	14' 52.01"	63° 55' 18"	0.99452
22	85° 03' 06"	3° 28' 20"	84° 27' 50"	26° 48' 55"	0° 54' 33"	14' 51.81"	65° 8' 51"	0.99394
23	85° 33' 19"	3° 30' 21"	85° 01' 32"	26° 52' 02"	0° 54' 32"	14' 51.60"	66° 16' 57"	0.99333
24	86° 03' 32"	3° 32' 22"	85° 35' 15"	26° 55' 01"	0° 54' 31"	14' 51.40"	67° 20' 19"	0.99270

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	256° 52' 44"	0.33"	255° 44' 07"	-22° 47' 25"	0.9849988	16' 14.24"	23° 26' 17"	7 m 53 s
1	256° 55' 16"	0.33"	255° 46' 52"	-22° 47' 39"	0.9849935	16' 14.25"	23° 26' 17"	7 m 52 s
2	256° 57' 48"	0.33"	255° 49' 36"	-22° 47' 54"	0.9849882	16' 14.26"	23° 26' 17"	7 m 51 s
3	257° 00' 21"	0.34"	255° 52' 20"	-22° 48' 09"	0.9849829	16' 14.26"	23° 26' 17"	7 m 50 s
4	257° 02' 53"	0.34"	255° 55' 05"	-22° 48' 24"	0.9849777	16' 14.27"	23° 26' 17"	7 m 49 s
5	257° 05' 25"	0.35"	255° 57' 49"	-22° 48' 39"	0.9849724	16' 14.27"	23° 26' 17"	7 m 48 s
6	257° 07' 58"	0.35"	256° 00' 34"	-22° 48' 53"	0.9849672	16' 14.28"	23° 26' 17"	7 m 47 s
7	257° 10' 30"	0.35"	256° 03' 18"	-22° 49' 08"	0.9849619	16' 14.28"	23° 26' 17"	7 m 45 s
8	257° 13' 02"	0.36"	256° 06' 03"	-22° 49' 22"	0.9849567	16' 14.29"	23° 26' 17"	7 m 44 s
9	257° 15' 34"	0.36"	256° 08' 47"	-22° 49' 37"	0.9849515	16' 14.29"	23° 26' 17"	7 m 43 s
10	257° 18' 07"	0.36"	256° 11' 32"	-22° 49' 51"	0.9849463	16' 14.30"	23° 26' 17"	7 m 42 s
11	257° 20' 39"	0.37"	256° 14' 16"	-22° 50' 06"	0.9849411	16' 14.30"	23° 26' 17"	7 m 41 s
12	257° 23' 11"	0.37"	256° 17' 01"	-22° 50' 20"	0.9849359	16' 14.31"	23° 26' 17"	7 m 40 s
13	257° 25' 44"	0.37"	256° 19' 45"	-22° 50' 35"	0.9849307	16' 14.31"	23° 26' 17"	7 m 39 s
14	257° 28' 16"	0.38"	256° 22' 30"	-22° 50' 49"	0.9849255	16' 14.32"	23° 26' 17"	7 m 38 s
15	257° 30' 48"	0.38"	256° 25' 15"	-22° 51' 03"	0.9849203	16' 14.32"	23° 26' 17"	7 m 36 s
16	257° 33' 21"	0.39"	256° 27' 59"	-22° 51' 17"	0.9849152	16' 14.33"	23° 26' 17"	7 m 35 s
17	257° 35' 53"	0.39"	256° 30' 44"	-22° 51' 31"	0.9849101	16' 14.33"	23° 26' 17"	7 m 34 s
18	257° 38' 25"	0.39"	256° 33' 28"	-22° 51' 46"	0.9849049	16' 14.34"	23° 26' 17"	7 m 33 s
19	257° 40' 58"	0.40"	256° 36' 13"	-22° 51' 60"	0.9848998	16' 14.34"	23° 26' 17"	7 m 32 s
20	257° 43' 30"	0.40"	256° 38' 58"	-22° 52' 14"	0.9848947	16' 14.35"	23° 26' 17"	7 m 31 s
21	257° 46' 02"	0.40"	256° 41' 42"	-22° 52' 28"	0.9848896	16' 14.35"	23° 26' 17"	7 m 30 s
22	257° 48' 35"	0.40"	256° 44' 27"	-22° 52' 42"	0.9848845	16' 14.36"	23° 26' 17"	7 m 29 s
23	257° 51' 07"	0.41"	256° 47' 12"	-22° 52' 55"	0.9848794	16' 14.36"	23° 26' 17"	7 m 27 s
24	257° 53' 39"	0.41"	256° 49' 56"	-22° 53' 09"	0.9848743	16' 14.37"	23° 26' 17"	7 m 26 s

(*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	86° 03' 32"	3° 32' 22"	85° 35' 15"	26° 55' 01"	0° 54' 31"	14' 51.40"	67° 20' 19"	0.99270
1	86° 33' 44"	3° 34' 21"	86° 08' 59"	26° 57' 53"	0° 54' 30"	14' 51.20"	68° 19' 31"	0.99202
2	87° 03' 55"	3° 36' 19"	86° 42' 44"	27° 00' 36"	0° 54' 30"	14' 51.00"	69° 15' 05"	0.99132
3	87° 34' 06"	3° 38' 16"	87° 16' 29"	27° 03' 10"	0° 54' 29"	14' 50.80"	70° 7' 26"	0.99059
4	88° 04' 15"	3° 40' 12"	87° 50' 15"	27° 05' 37"	0° 54' 28"	14' 50.61"	70° 56' 56"	0.98983
5	88° 34' 24"	3° 42' 07"	88° 24' 01"	27° 07' 56"	0° 54' 28"	14' 50.42"	71° 43' 54"	0.98903
6	89° 04' 33"	3° 44' 01"	88° 57' 48"	27° 10' 06"	0° 54' 27"	14' 50.23"	72° 28' 36"	0.98820
7	89° 34' 40"	3° 45' 54"	89° 31' 35"	27° 12' 08"	0° 54' 26"	14' 50.04"	73° 11' 16"	0.98735
8	90° 04' 47"	3° 47' 46"	90° 05' 22"	27° 14' 03"	0° 54' 26"	14' 49.85"	73° 52' 06"	0.98646
9	90° 34' 54"	3° 49' 36"	90° 39' 10"	27° 15' 48"	0° 54' 25"	14' 49.67"	74° 31' 16"	0.98554
10	91° 04' 59"	3° 51' 26"	91° 12' 58"	27° 17' 26"	0° 54' 24"	14' 49.48"	75° 8' 57"	0.98459
11	91° 35' 04"	3° 53' 14"	91° 46' 45"	27° 18' 56"	0° 54' 24"	14' 49.31"	75° 45' 16"	0.98361
12	92° 05' 08"	3° 55' 01"	92° 20' 33"	27° 20' 17"	0° 54' 23"	14' 49.13"	76° 20' 20"	0.98260
13	92° 35' 12"	3° 56' 47"	92° 54' 20"	27° 21' 30"	0° 54' 22"	14' 48.95"	76° 54' 16"	0.98156
14	93° 05' 15"	3° 58' 32"	93° 28' 08"	27° 22' 35"	0° 54' 22"	14' 48.78"	77° 27' 09"	0.98049
15	93° 35' 17"	4° 00' 16"	94° 01' 55"	27° 23' 32"	0° 54' 21"	14' 48.61"	77° 59' 04"	0.97939
16	94° 05' 18"	4° 01' 58"	94° 35' 42"	27° 24' 21"	0° 54' 20"	14' 48.44"	78° 30' 07"	0.97826
17	94° 35' 19"	4° 03' 40"	95° 09' 28"	27° 25' 01"	0° 54' 20"	14' 48.27"	79° 0' 20"	0.97710
18	95° 05' 19"	4° 05' 20"	95° 43' 14"	27° 25' 33"	0° 54' 19"	14' 48.11"	79° 29' 48"	0.97591
19	95° 35' 19"	4° 06' 59"	96° 16' 59"	27° 25' 58"	0° 54' 19"	14' 47.95"	79° 58' 34"	0.97469
20	96° 05' 18"	4° 08' 37"	96° 50' 44"	27° 26' 14"	0° 54' 18"	14' 47.79"	80° 26' 41"	0.97344
21	96° 35' 17"	4° 10' 14"	97° 24' 28"	27° 26' 21"	0° 54' 17"	14' 47.63"	80° 54' 11"	0.97216
22	97° 05' 14"	4° 11' 49"	97° 58' 11"	27° 26' 21"	0° 54' 17"	14' 47.48"	81° 21' 07"	0.97085
23	97° 35' 12"	4° 13' 24"	98° 31' 53"	27° 26' 13"	0° 54' 16"	14' 47.32"	81° 47' 30"	0.96952
24	98° 05' 08"	4° 14' 57"	99° 05' 34"	27° 25' 56"	0° 54' 16"	14' 47.17"	82° 13' 24"	0.96815



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	257° 53' 39"	0.41"	256° 49' 56"	-22° 53' 09"	0.9848743	16' 14.37"	23° 26' 17"	7 m 26 s
1	257° 56' 12"	0.41"	256° 52' 41"	-22° 53' 23"	0.9848693	16' 14.37"	23° 26' 17"	7 m 25 s
2	257° 58' 44"	0.42"	256° 55' 26"	-22° 53' 37"	0.9848642	16' 14.38"	23° 26' 17"	7 m 24 s
3	258° 01' 16"	0.42"	256° 58' 10"	-22° 53' 50"	0.9848592	16' 14.38"	23° 26' 17"	7 m 23 s
4	258° 03' 49"	0.42"	257° 00' 55"	-22° 54' 04"	0.9848541	16' 14.39"	23° 26' 17"	7 m 22 s
5	258° 06' 21"	0.43"	257° 03' 40"	-22° 54' 18"	0.9848491	16' 14.39"	23° 26' 17"	7 m 21 s
6	258° 08' 53"	0.43"	257° 06' 25"	-22° 54' 31"	0.9848441	16' 14.40"	23° 26' 17"	7 m 20 s
7	258° 11' 26"	0.43"	257° 09' 09"	-22° 54' 45"	0.9848391	16' 14.40"	23° 26' 17"	7 m 18 s
8	258° 13' 58"	0.43"	257° 11' 54"	-22° 54' 58"	0.9848341	16' 14.41"	23° 26' 17"	7 m 17 s
9	258° 16' 31"	0.44"	257° 14' 39"	-22° 55' 12"	0.9848291	16' 14.41"	23° 26' 17"	7 m 16 s
10	258° 19' 03"	0.44"	257° 17' 24"	-22° 55' 25"	0.9848242	16' 14.42"	23° 26' 17"	7 m 15 s
11	258° 21' 35"	0.44"	257° 20' 08"	-22° 55' 38"	0.9848192	16' 14.42"	23° 26' 17"	7 m 14 s
12	258° 24' 08"	0.44"	257° 22' 53"	-22° 55' 51"	0.9848142	16' 14.43"	23° 26' 17"	7 m 13 s
13	258° 26' 40"	0.45"	257° 25' 38"	-22° 56' 05"	0.9848093	16' 14.43"	23° 26' 17"	7 m 12 s
14	258° 29' 12"	0.45"	257° 28' 23"	-22° 56' 18"	0.9848044	16' 14.44"	23° 26' 17"	7 m 10 s
15	258° 31' 45"	0.45"	257° 31' 08"	-22° 56' 31"	0.9847994	16' 14.44"	23° 26' 17"	7 m 09 s
16	258° 34' 17"	0.45"	257° 33' 53"	-22° 56' 44"	0.9847945	16' 14.45"	23° 26' 17"	7 m 08 s
17	258° 36' 49"	0.46"	257° 36' 38"	-22° 56' 57"	0.9847896	16' 14.45"	23° 26' 17"	7 m 07 s
18	258° 39' 22"	0.46"	257° 39' 22"	-22° 57' 10"	0.9847847	16' 14.46"	23° 26' 17"	7 m 06 s
19	258° 41' 54"	0.46"	257° 42' 07"	-22° 57' 23"	0.9847798	16' 14.46"	23° 26' 17"	7 m 05 s
20	258° 44' 27"	0.46"	257° 44' 52"	-22° 57' 36"	0.9847750	16' 14.47"	23° 26' 17"	7 m 04 s
21	258° 46' 59"	0.46"	257° 47' 37"	-22° 57' 49"	0.9847701	16' 14.47"	23° 26' 17"	7 m 02 s
22	258° 49' 31"	0.47"	257° 50' 22"	-22° 58' 01"	0.9847653	16' 14.48"	23° 26' 17"	7 m 01 s
23	258° 52' 04"	0.47"	257° 53' 07"	-22° 58' 14"	0.9847604	16' 14.48"	23° 26' 17"	7 m 00 s
24	258° 54' 36"	0.47"	257° 55' 52"	-22° 58' 27"	0.9847556	16' 14.49"	23° 26' 17"	6 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	98° 05' 08"	4° 14' 57"	99° 05' 34"	27° 25' 56"	0° 54' 16"	14' 47.17"	82° 13' 24"	0.96815
1	98° 35' 04"	4° 16' 29"	99° 39' 15"	27° 25' 32"	0° 54' 15"	14' 47.03"	82° 38' 50"	0.96676
2	99° 04' 60"	4° 17' 59"	100° 12' 54"	27° 24' 59"	0° 54' 15"	14' 46.88"	83° 3' 48"	0.96533
3	99° 34' 54"	4° 19' 29"	100° 46' 32"	27° 24' 18"	0° 54' 14"	14' 46.74"	83° 28' 22"	0.96388
4	100° 04' 49"	4° 20' 57"	101° 20' 09"	27° 23' 29"	0° 54' 14"	14' 46.60"	83° 52' 32"	0.96240
5	100° 34' 42"	4° 22' 24"	101° 53' 45"	27° 22' 32"	0° 54' 13"	14' 46.46"	84° 16' 19"	0.96089
6	101° 04' 36"	4° 23' 50"	102° 27' 19"	27° 21' 27"	0° 54' 13"	14' 46.33"	84° 39' 46"	0.95935
7	101° 34' 28"	4° 25' 14"	103° 00' 52"	27° 20' 14"	0° 54' 12"	14' 46.20"	85° 2' 51"	0.95779
8	102° 04' 20"	4° 26' 38"	103° 34' 23"	27° 18' 53"	0° 54' 12"	14' 46.07"	85° 25' 38"	0.95619
9	102° 34' 12"	4° 27' 60"	104° 07' 53"	27° 17' 25"	0° 54' 11"	14' 45.94"	85° 48' 06"	0.95457
10	103° 04' 03"	4° 29' 21"	104° 41' 21"	27° 15' 48"	0° 54' 11"	14' 45.82"	86° 10' 16"	0.95292
11	103° 33' 53"	4° 30' 40"	105° 14' 47"	27° 14' 03"	0° 54' 10"	14' 45.70"	86° 32' 10"	0.95125
12	104° 03' 43"	4° 31' 58"	105° 48' 12"	27° 12' 10"	0° 54' 10"	14' 45.58"	86° 53' 47"	0.94954
13	104° 33' 33"	4° 33' 16"	106° 21' 34"	27° 10' 10"	0° 54' 09"	14' 45.46"	87° 15' 09"	0.94781
14	105° 03' 22"	4° 34' 31"	106° 54' 55"	27° 08' 01"	0° 54' 09"	14' 45.35"	87° 36' 16"	0.94605
15	105° 33' 11"	4° 35' 46"	107° 28' 14"	27° 05' 45"	0° 54' 09"	14' 45.24"	87° 57' 08"	0.94426
16	106° 02' 59"	4° 36' 59"	108° 01' 31"	27° 03' 21"	0° 54' 08"	14' 45.13"	88° 17' 47"	0.94245
17	106° 32' 46"	4° 38' 11"	108° 34' 46"	27° 00' 49"	0° 54' 08"	14' 45.03"	88° 38' 12"	0.94061
18	107° 02' 33"	4° 39' 22"	109° 07' 58"	26° 58' 09"	0° 54' 07"	14' 44.93"	88° 58' 24"	0.93874
19	107° 32' 20"	4° 40' 31"	109° 41' 09"	26° 55' 22"	0° 54' 07"	14' 44.83"	89° 18' 24"	0.93685
20	108° 02' 07"	4° 41' 39"	110° 14' 17"	26° 52' 26"	0° 54' 07"	14' 44.73"	89° 38' 12"	0.93492
21	108° 31' 52"	4° 42' 46"	110° 47' 23"	26° 49' 24"	0° 54' 06"	14' 44.64"	89° 57' 47"	0.93298
22	109° 01' 38"	4° 43' 51"	111° 20' 26"	26° 46' 13"	0° 54' 06"	14' 44.55"	90° 17' 11"	0.93100
23	109° 31' 23"	4° 44' 55"	111° 53' 27"	26° 42' 55"	0° 54' 06"	14' 44.46"	90° 36' 24"	0.92900
24	110° 01' 08"	4° 45' 58"	112° 26' 25"	26° 39' 29"	0° 54' 05"	14' 44.38"	90° 55' 26"	0.92698

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	258° 54' 36"	0.47"	257° 55' 52"	-22° 58' 27"	0.9847556	16' 14.49"	23° 26' 17"	6 m 59 s
1	258° 57' 08"	0.47"	257° 58' 37"	-22° 58' 40"	0.9847508	16' 14.49"	23° 26' 17"	6 m 58 s
2	258° 59' 41"	0.47"	258° 01' 22"	-22° 58' 52"	0.9847459	16' 14.50"	23° 26' 17"	6 m 57 s
3	259° 02' 13"	0.48"	258° 04' 07"	-22° 59' 05"	0.9847411	16' 14.50"	23° 26' 17"	6 m 56 s
4	259° 04' 46"	0.48"	258° 06' 52"	-22° 59' 17"	0.9847363	16' 14.50"	23° 26' 17"	6 m 54 s
5	259° 07' 18"	0.48"	258° 09' 37"	-22° 59' 30"	0.9847315	16' 14.51"	23° 26' 17"	6 m 53 s
6	259° 09' 50"	0.48"	258° 12' 22"	-22° 59' 42"	0.9847268	16' 14.51"	23° 26' 17"	6 m 52 s
7	259° 12' 23"	0.48"	258° 15' 07"	-22° 59' 54"	0.9847220	16' 14.52"	23° 26' 17"	6 m 51 s
8	259° 14' 55"	0.48"	258° 17' 52"	-23° 00' 07"	0.9847173	16' 14.52"	23° 26' 17"	6 m 50 s
9	259° 17' 28"	0.49"	258° 20' 37"	-23° 00' 19"	0.9847125	16' 14.53"	23° 26' 17"	6 m 49 s
10	259° 19' 60"	0.49"	258° 23' 22"	-23° 00' 31"	0.9847078	16' 14.53"	23° 26' 17"	6 m 48 s
11	259° 22' 32"	0.49"	258° 26' 07"	-23° 00' 43"	0.9847030	16' 14.54"	23° 26' 17"	6 m 46 s
12	259° 25' 05"	0.49"	258° 28' 52"	-23° 00' 56"	0.9846983	16' 14.54"	23° 26' 17"	6 m 45 s
13	259° 27' 37"	0.49"	258° 31' 37"	-23° 01' 08"	0.9846936	16' 14.55"	23° 26' 17"	6 m 44 s
14	259° 30' 10"	0.49"	258° 34' 22"	-23° 01' 20"	0.9846889	16' 14.55"	23° 26' 17"	6 m 43 s
15	259° 32' 42"	0.49"	258° 37' 07"	-23° 01' 32"	0.9846842	16' 14.56"	23° 26' 17"	6 m 42 s
16	259° 35' 14"	0.49"	258° 39' 52"	-23° 01' 44"	0.9846796	16' 14.56"	23° 26' 17"	6 m 41 s
17	259° 37' 47"	0.49"	258° 42' 37"	-23° 01' 55"	0.9846749	16' 14.57"	23° 26' 17"	6 m 40 s
18	259° 40' 19"	0.50"	258° 45' 22"	-23° 02' 07"	0.9846702	16' 14.57"	23° 26' 17"	6 m 38 s
19	259° 42' 52"	0.50"	258° 48' 08"	-23° 02' 19"	0.9846656	16' 14.57"	23° 26' 17"	6 m 37 s
20	259° 45' 24"	0.50"	258° 50' 53"	-23° 02' 31"	0.9846609	16' 14.58"	23° 26' 17"	6 m 36 s
21	259° 47' 56"	0.50"	258° 53' 38"	-23° 02' 43"	0.9846563	16' 14.58"	23° 26' 17"	6 m 35 s
22	259° 50' 29"	0.50"	258° 56' 23"	-23° 02' 54"	0.9846517	16' 14.59"	23° 26' 17"	6 m 34 s
23	259° 53' 01"	0.50"	258° 59' 08"	-23° 03' 06"	0.9846471	16' 14.59"	23° 26' 17"	6 m 33 s
24	259° 55' 34"	0.50"	259° 01' 53"	-23° 03' 17"	0.9846425	16' 14.60"	23° 26' 17"	6 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	110° 01' 08"	4° 45' 58"	112° 26' 25"	26° 39' 29"	0° 54' 05"	14' 44.38"	90° 55' 26"	0.92698
1	110° 30' 52"	4° 46' 60"	112° 59' 21"	26° 35' 56"	0° 54' 05"	14' 44.30"	91° 14' 18"	0.92493
2	111° 00' 36"	4° 47' 60"	113° 32' 15"	26° 32' 15"	0° 54' 05"	14' 44.22"	91° 32' 58"	0.92285
3	111° 30' 19"	4° 48' 59"	114° 05' 05"	26° 28' 27"	0° 54' 05"	14' 44.15"	91° 51' 29"	0.92075
4	112° 00' 02"	4° 49' 56"	114° 37' 53"	26° 24' 31"	0° 54' 04"	14' 44.08"	92° 9' 49"	0.91862
5	112° 29' 45"	4° 50' 53"	115° 10' 38"	26° 20' 28"	0° 54' 04"	14' 44.01"	92° 28' 00"	0.91647
6	112° 59' 28"	4° 51' 48"	115° 43' 21"	26° 16' 18"	0° 54' 04"	14' 43.94"	92° 46' 01"	0.91429
7	113° 29' 10"	4° 52' 41"	116° 16' 00"	26° 11' 60"	0° 54' 04"	14' 43.88"	93° 3' 53"	0.91208
8	113° 58' 52"	4° 53' 34"	116° 48' 37"	26° 07' 35"	0° 54' 03"	14' 43.82"	93° 21' 35"	0.90985
9	114° 28' 33"	4° 54' 25"	117° 21' 11"	26° 03' 02"	0° 54' 03"	14' 43.77"	93° 39' 08"	0.90760
10	114° 58' 15"	4° 55' 14"	117° 53' 42"	25° 58' 22"	0° 54' 03"	14' 43.72"	93° 56' 32"	0.90532
11	115° 27' 55"	4° 56' 02"	118° 26' 09"	25° 53' 35"	0° 54' 03"	14' 43.67"	94° 13' 47"	0.90302
12	115° 57' 36"	4° 56' 49"	118° 58' 34"	25° 48' 41"	0° 54' 03"	14' 43.62"	94° 30' 54"	0.90069
13	116° 27' 17"	4° 57' 35"	119° 30' 56"	25° 43' 40"	0° 54' 02"	14' 43.58"	94° 47' 51"	0.89834
14	116° 56' 57"	4° 58' 19"	120° 03' 14"	25° 38' 32"	0° 54' 02"	14' 43.54"	95° 4' 40"	0.89597
15	117° 26' 37"	4° 59' 02"	120° 35' 30"	25° 33' 16"	0° 54' 02"	14' 43.51"	95° 21' 21"	0.89357
16	117° 56' 16"	4° 59' 44"	121° 07' 42"	25° 27' 54"	0° 54' 02"	14' 43.47"	95° 37' 53"	0.89114
17	118° 25' 56"	5° 00' 24"	121° 39' 51"	25° 22' 24"	0° 54' 02"	14' 43.45"	95° 54' 16"	0.88870
18	118° 55' 35"	5° 01' 03"	122° 11' 57"	25° 16' 48"	0° 54' 02"	14' 43.42"	96° 10' 32"	0.88623
19	119° 25' 14"	5° 01' 40"	122° 43' 59"	25° 11' 05"	0° 54' 02"	14' 43.40"	96° 26' 39"	0.88373
20	119° 54' 53"	5° 02' 16"	123° 15' 59"	25° 05' 15"	0° 54' 02"	14' 43.38"	96° 42' 38"	0.88122
21	120° 24' 32"	5° 02' 51"	123° 47' 54"	24° 59' 18"	0° 54' 02"	14' 43.37"	96° 58' 29"	0.87868
22	120° 54' 10"	5° 03' 25"	124° 19' 47"	24° 53' 14"	0° 54' 02"	14' 43.36"	97° 14' 13"	0.87611
23	121° 23' 48"	5° 03' 57"	124° 51' 36"	24° 47' 04"	0° 54' 02"	14' 43.35"	97° 29' 48"	0.87353
24	121° 53' 27"	5° 04' 27"	125° 23' 22"	24° 40' 47"	0° 54' 02"	14' 43.35"	97° 45' 15"	0.87092



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	259° 55' 34"	0.50"	259° 01' 53"	-23° 03' 17"	0.9846425	16' 14.60"	23° 26' 17"	6 m 31 s
1	259° 58' 06"	0.50"	259° 04' 39"	-23° 03' 29"	0.9846379	16' 14.60"	23° 26' 17"	6 m 30 s
2	260° 00' 39"	0.50"	259° 07' 24"	-23° 03' 40"	0.9846333	16' 14.61"	23° 26' 17"	6 m 29 s
3	260° 03' 11"	0.50"	259° 10' 09"	-23° 03' 52"	0.9846287	16' 14.61"	23° 26' 17"	6 m 28 s
4	260° 05' 43"	0.50"	259° 12' 54"	-23° 04' 03"	0.9846242	16' 14.62"	23° 26' 17"	6 m 27 s
5	260° 08' 16"	0.50"	259° 15' 39"	-23° 04' 15"	0.9846196	16' 14.62"	23° 26' 17"	6 m 26 s
6	260° 10' 48"	0.50"	259° 18' 25"	-23° 04' 26"	0.9846151	16' 14.62"	23° 26' 17"	6 m 24 s
7	260° 13' 21"	0.50"	259° 21' 10"	-23° 04' 37"	0.9846105	16' 14.63"	23° 26' 17"	6 m 23 s
8	260° 15' 53"	0.50"	259° 23' 55"	-23° 04' 48"	0.9846060	16' 14.63"	23° 26' 17"	6 m 22 s
9	260° 18' 26"	0.50"	259° 26' 40"	-23° 04' 59"	0.9846015	16' 14.64"	23° 26' 17"	6 m 21 s
10	260° 20' 58"	0.50"	259° 29' 26"	-23° 05' 10"	0.9845970	16' 14.64"	23° 26' 17"	6 m 20 s
11	260° 23' 31"	0.50"	259° 32' 11"	-23° 05' 21"	0.9845925	16' 14.65"	23° 26' 17"	6 m 19 s
12	260° 26' 03"	0.50"	259° 34' 56"	-23° 05' 32"	0.9845880	16' 14.65"	23° 26' 17"	6 m 17 s
13	260° 28' 35"	0.50"	259° 37' 42"	-23° 05' 43"	0.9845835	16' 14.66"	23° 26' 17"	6 m 16 s
14	260° 31' 08"	0.50"	259° 40' 27"	-23° 05' 54"	0.9845791	16' 14.66"	23° 26' 17"	6 m 15 s
15	260° 33' 40"	0.50"	259° 43' 12"	-23° 06' 05"	0.9845746	16' 14.66"	23° 26' 17"	6 m 14 s
16	260° 36' 13"	0.50"	259° 45' 58"	-23° 06' 16"	0.9845702	16' 14.67"	23° 26' 17"	6 m 13 s
17	260° 38' 45"	0.50"	259° 48' 43"	-23° 06' 27"	0.9845657	16' 14.67"	23° 26' 17"	6 m 12 s
18	260° 41' 18"	0.50"	259° 51' 28"	-23° 06' 37"	0.9845613	16' 14.68"	23° 26' 17"	6 m 10 s
19	260° 43' 50"	0.50"	259° 54' 14"	-23° 06' 48"	0.9845569	16' 14.68"	23° 26' 17"	6 m 09 s
20	260° 46' 23"	0.50"	259° 56' 59"	-23° 06' 59"	0.9845525	16' 14.69"	23° 26' 17"	6 m 08 s
21	260° 48' 55"	0.50"	259° 59' 44"	-23° 07' 09"	0.9845481	16' 14.69"	23° 26' 17"	6 m 07 s
22	260° 51' 28"	0.50"	260° 02' 30"	-23° 07' 20"	0.9845437	16' 14.70"	23° 26' 17"	6 m 06 s
23	260° 53' 60"	0.50"	260° 05' 15"	-23° 07' 30"	0.9845393	16' 14.70"	23° 26' 17"	6 m 05 s
24	260° 56' 32"	0.50"	260° 08' 01"	-23° 07' 41"	0.9845349	16' 14.70"	23° 26' 17"	6 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	121° 53' 27"	5° 04' 27"	125° 23' 22"	24° 40' 47"	0° 54' 02"	14' 43.35"	97° 45' 15"	0.87092
1	122° 23' 05"	5° 04' 57"	125° 55' 04"	24° 34' 23"	0° 54' 02"	14' 43.35"	98° 0' 34"	0.86829
2	122° 52' 43"	5° 05' 25"	126° 26' 43"	24° 27' 53"	0° 54' 02"	14' 43.35"	98° 15' 46"	0.86564
3	123° 22' 21"	5° 05' 51"	126° 58' 19"	24° 21' 16"	0° 54' 02"	14' 43.36"	98° 30' 50"	0.86296
4	123° 51' 58"	5° 06' 16"	127° 29' 50"	24° 14' 32"	0° 54' 02"	14' 43.37"	98° 45' 46"	0.86026
5	124° 21' 36"	5° 06' 40"	128° 01' 19"	24° 07' 42"	0° 54' 02"	14' 43.38"	99° 0' 34"	0.85754
6	124° 51' 14"	5° 07' 03"	128° 32' 44"	24° 00' 46"	0° 54' 02"	14' 43.40"	99° 15' 15"	0.85480
7	125° 20' 51"	5° 07' 24"	129° 04' 05"	23° 53' 43"	0° 54' 02"	14' 43.42"	99° 29' 48"	0.85204
8	125° 50' 29"	5° 07' 43"	129° 35' 23"	23° 46' 34"	0° 54' 02"	14' 43.45"	99° 44' 14"	0.84925
9	126° 20' 07"	5° 08' 02"	130° 06' 38"	23° 39' 19"	0° 54' 02"	14' 43.48"	99° 58' 32"	0.84645
10	126° 49' 44"	5° 08' 19"	130° 37' 49"	23° 31' 57"	0° 54' 02"	14' 43.51"	100° 12' 42"	0.84362
11	127° 19' 22"	5° 08' 34"	131° 08' 56"	23° 24' 30"	0° 54' 02"	14' 43.55"	100° 26' 45"	0.84077
12	127° 48' 59"	5° 08' 48"	131° 40' 00"	23° 16' 56"	0° 54' 03"	14' 43.59"	100° 40' 41"	0.83790
13	128° 18' 37"	5° 09' 01"	132° 11' 00"	23° 09' 16"	0° 54' 03"	14' 43.64"	100° 54' 28"	0.83501
14	128° 48' 14"	5° 09' 13"	132° 41' 57"	23° 01' 29"	0° 54' 03"	14' 43.69"	101° 8' 09"	0.83210
15	129° 17' 52"	5° 09' 23"	133° 12' 50"	22° 53' 37"	0° 54' 03"	14' 43.74"	101° 21' 42"	0.82917
16	129° 47' 30"	5° 09' 31"	133° 43' 40"	22° 45' 39"	0° 54' 03"	14' 43.80"	101° 35' 07"	0.82622
17	130° 17' 08"	5° 09' 39"	134° 14' 26"	22° 37' 35"	0° 54' 04"	14' 43.86"	101° 48' 26"	0.82325
18	130° 46' 46"	5° 09' 45"	134° 45' 09"	22° 29' 25"	0° 54' 04"	14' 43.92"	102° 1' 36"	0.82026
19	131° 16' 24"	5° 09' 49"	135° 15' 48"	22° 21' 09"	0° 54' 04"	14' 43.99"	102° 14' 40"	0.81725
20	131° 46' 02"	5° 09' 52"	135° 46' 23"	22° 12' 48"	0° 54' 04"	14' 44.06"	102° 27' 36"	0.81422
21	132° 15' 40"	5° 09' 54"	136° 16' 55"	22° 04' 20"	0° 54' 05"	14' 44.14"	102° 40' 24"	0.81117
22	132° 45' 19"	5° 09' 54"	136° 47' 24"	21° 55' 47"	0° 54' 05"	14' 44.22"	102° 53' 06"	0.80810
23	133° 14' 57"	5° 09' 53"	137° 17' 49"	21° 47' 08"	0° 54' 05"	14' 44.31"	103° 5' 39"	0.80501
24	133° 44' 36"	5° 09' 51"	137° 48' 10"	21° 38' 24"	0° 54' 05"	14' 44.40"	103° 18' 06"	0.80190

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	260° 56' 32"	0.50"	260° 08' 01"	-23° 07' 41"	0.9845349	16' 14.70"	23° 26' 17"	6 m 03 s
1	260° 59' 05"	0.50"	260° 10' 46"	-23° 07' 51"	0.9845306	16' 14.71"	23° 26' 17"	6 m 02 s
2	261° 01' 37"	0.50"	260° 13' 31"	-23° 08' 01"	0.9845262	16' 14.71"	23° 26' 17"	6 m 01 s
3	261° 04' 10"	0.50"	260° 16' 17"	-23° 08' 12"	0.9845219	16' 14.72"	23° 26' 17"	5 m 60 s
4	261° 06' 42"	0.50"	260° 19' 02"	-23° 08' 22"	0.9845175	16' 14.72"	23° 26' 17"	5 m 59 s
5	261° 09' 15"	0.50"	260° 21' 48"	-23° 08' 32"	0.9845132	16' 14.73"	23° 26' 17"	5 m 58 s
6	261° 11' 47"	0.50"	260° 24' 33"	-23° 08' 42"	0.9845089	16' 14.73"	23° 26' 17"	5 m 56 s
7	261° 14' 20"	0.50"	260° 27' 19"	-23° 08' 52"	0.9845046	16' 14.73"	23° 26' 17"	5 m 55 s
8	261° 16' 52"	0.49"	260° 30' 04"	-23° 09' 02"	0.9845003	16' 14.74"	23° 26' 17"	5 m 54 s
9	261° 19' 25"	0.49"	260° 32' 50"	-23° 09' 12"	0.9844960	16' 14.74"	23° 26' 17"	5 m 53 s
10	261° 21' 57"	0.49"	260° 35' 35"	-23° 09' 22"	0.9844917	16' 14.75"	23° 26' 17"	5 m 52 s
11	261° 24' 30"	0.49"	260° 38' 21"	-23° 09' 32"	0.9844875	16' 14.75"	23° 26' 17"	5 m 51 s
12	261° 27' 02"	0.49"	260° 41' 06"	-23° 09' 42"	0.9844832	16' 14.76"	23° 26' 17"	5 m 49 s
13	261° 29' 35"	0.49"	260° 43' 52"	-23° 09' 52"	0.9844789	16' 14.76"	23° 26' 17"	5 m 48 s
14	261° 32' 07"	0.49"	260° 46' 37"	-23° 10' 01"	0.9844747	16' 14.76"	23° 26' 17"	5 m 47 s
15	261° 34' 40"	0.49"	260° 49' 23"	-23° 10' 11"	0.9844705	16' 14.77"	23° 26' 17"	5 m 46 s
16	261° 37' 12"	0.48"	260° 52' 08"	-23° 10' 21"	0.9844663	16' 14.77"	23° 26' 17"	5 m 45 s
17	261° 39' 45"	0.48"	260° 54' 54"	-23° 10' 30"	0.9844620	16' 14.78"	23° 26' 17"	5 m 43 s
18	261° 42' 17"	0.48"	260° 57' 39"	-23° 10' 40"	0.9844578	16' 14.78"	23° 26' 17"	5 m 42 s
19	261° 44' 50"	0.48"	261° 00' 25"	-23° 10' 49"	0.9844536	16' 14.78"	23° 26' 17"	5 m 41 s
20	261° 47' 22"	0.48"	261° 03' 11"	-23° 10' 59"	0.9844495	16' 14.79"	23° 26' 17"	5 m 40 s
21	261° 49' 55"	0.48"	261° 05' 56"	-23° 11' 08"	0.9844453	16' 14.79"	23° 26' 17"	5 m 39 s
22	261° 52' 27"	0.48"	261° 08' 42"	-23° 11' 18"	0.9844411	16' 14.80"	23° 26' 17"	5 m 38 s
23	261° 54' 60"	0.47"	261° 11' 27"	-23° 11' 27"	0.9844370	16' 14.80"	23° 26' 17"	5 m 36 s
24	261° 57' 32"	0.47"	261° 14' 13"	-23° 11' 36"	0.9844328	16' 14.80"	23° 26' 17"	5 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	133° 44' 36"	5° 09' 51"	137° 48' 10"	21° 38' 24"	0° 54' 05"	14' 44.40"	103° 18' 06"	0.80190
1	134° 14' 15"	5° 09' 47"	138° 18' 28"	21° 29' 34"	0° 54' 06"	14' 44.49"	103° 30' 25"	0.79877
2	134° 43' 54"	5° 09' 42"	138° 48' 43"	21° 20' 39"	0° 54' 06"	14' 44.59"	103° 42' 37"	0.79562
3	135° 13' 34"	5° 09' 35"	139° 18' 54"	21° 11' 38"	0° 54' 07"	14' 44.69"	103° 54' 42"	0.79246
4	135° 43' 14"	5° 09' 27"	139° 49' 01"	21° 02' 31"	0° 54' 07"	14' 44.80"	104° 6' 39"	0.78928
5	136° 12' 54"	5° 09' 18"	140° 19' 06"	20° 53' 19"	0° 54' 07"	14' 44.91"	104° 18' 30"	0.78607
6	136° 42' 34"	5° 09' 07"	140° 49' 06"	20° 44' 02"	0° 54' 08"	14' 45.02"	104° 30' 12"	0.78285
7	137° 12' 15"	5° 08' 55"	141° 19' 04"	20° 34' 40"	0° 54' 08"	14' 45.14"	104° 41' 48"	0.77962
8	137° 41' 56"	5° 08' 42"	141° 48' 58"	20° 25' 12"	0° 54' 09"	14' 45.27"	104° 53' 16"	0.77636
9	138° 11' 37"	5° 08' 27"	142° 18' 49"	20° 15' 39"	0° 54' 09"	14' 45.39"	105° 4' 37"	0.77309
10	138° 41' 18"	5° 08' 10"	142° 48' 36"	20° 06' 01"	0° 54' 10"	14' 45.53"	105° 15' 51"	0.76979
11	139° 11' 00"	5° 07' 53"	143° 18' 20"	19° 56' 18"	0° 54' 10"	14' 45.66"	105° 26' 58"	0.76649
12	139° 40' 43"	5° 07' 34"	143° 48' 01"	19° 46' 29"	0° 54' 11"	14' 45.80"	105° 37' 57"	0.76316
13	140° 10' 25"	5° 07' 13"	144° 17' 39"	19° 36' 36"	0° 54' 11"	14' 45.95"	105° 48' 49"	0.75982
14	140° 40' 08"	5° 06' 51"	144° 47' 13"	19° 26' 38"	0° 54' 12"	14' 46.10"	105° 59' 34"	0.75646
15	141° 09' 52"	5° 06' 28"	145° 16' 44"	19° 16' 34"	0° 54' 12"	14' 46.25"	106° 10' 12"	0.75308
16	141° 39' 36"	5° 06' 04"	145° 46' 12"	19° 06' 26"	0° 54' 13"	14' 46.41"	106° 20' 42"	0.74968
17	142° 09' 20"	5° 05' 38"	146° 15' 37"	18° 56' 13"	0° 54' 13"	14' 46.57"	106° 31' 06"	0.74627
18	142° 39' 05"	5° 05' 10"	146° 44' 59"	18° 45' 55"	0° 54' 14"	14' 46.74"	106° 41' 22"	0.74285
19	143° 08' 51"	5° 04' 41"	147° 14' 18"	18° 35' 33"	0° 54' 15"	14' 46.91"	106° 51' 30"	0.73940
20	143° 38' 37"	5° 04' 11"	147° 43' 33"	18° 25' 05"	0° 54' 15"	14' 47.09"	107° 1' 32"	0.73594
21	144° 08' 23"	5° 03' 40"	148° 12' 46"	18° 14' 33"	0° 54' 16"	14' 47.27"	107° 11' 27"	0.73247
22	144° 38' 10"	5° 03' 07"	148° 41' 56"	18° 03' 56"	0° 54' 17"	14' 47.45"	107° 21' 14"	0.72898
23	145° 07' 58"	5° 02' 33"	149° 11' 03"	17° 53' 15"	0° 54' 17"	14' 47.64"	107° 30' 54"	0.72547
24	145° 37' 46"	5° 01' 57"	149° 40' 06"	17° 42' 29"	0° 54' 18"	14' 47.83"	107° 40' 27"	0.72195



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	261° 57' 32"	0.47"	261° 14' 13"	-23° 11' 36"	0.9844328	16' 14.80"	23° 26' 17"	5 m 35 s
1	262° 00' 05"	0.47"	261° 16' 59"	-23° 11' 46"	0.9844287	16' 14.81"	23° 26' 17"	5 m 34 s
2	262° 02' 37"	0.47"	261° 19' 44"	-23° 11' 55"	0.9844245	16' 14.81"	23° 26' 17"	5 m 33 s
3	262° 05' 10"	0.47"	261° 22' 30"	-23° 12' 04"	0.9844204	16' 14.82"	23° 26' 17"	5 m 32 s
4	262° 07' 42"	0.46"	261° 25' 15"	-23° 12' 13"	0.9844163	16' 14.82"	23° 26' 17"	5 m 30 s
5	262° 10' 15"	0.46"	261° 28' 01"	-23° 12' 22"	0.9844122	16' 14.83"	23° 26' 17"	5 m 29 s
6	262° 12' 47"	0.46"	261° 30' 47"	-23° 12' 31"	0.9844081	16' 14.83"	23° 26' 17"	5 m 28 s
7	262° 15' 20"	0.46"	261° 33' 32"	-23° 12' 40"	0.9844040	16' 14.83"	23° 26' 17"	5 m 27 s
8	262° 17' 52"	0.45"	261° 36' 18"	-23° 12' 49"	0.9844000	16' 14.84"	23° 26' 17"	5 m 26 s
9	262° 20' 25"	0.45"	261° 39' 04"	-23° 12' 58"	0.9843959	16' 14.84"	23° 26' 17"	5 m 24 s
10	262° 22' 57"	0.45"	261° 41' 49"	-23° 13' 06"	0.9843918	16' 14.85"	23° 26' 17"	5 m 23 s
11	262° 25' 30"	0.45"	261° 44' 35"	-23° 13' 15"	0.9843878	16' 14.85"	23° 26' 17"	5 m 22 s
12	262° 28' 02"	0.45"	261° 47' 21"	-23° 13' 24"	0.9843837	16' 14.85"	23° 26' 17"	5 m 21 s
13	262° 30' 35"	0.44"	261° 50' 07"	-23° 13' 32"	0.9843797	16' 14.86"	23° 26' 17"	5 m 20 s
14	262° 33' 08"	0.44"	261° 52' 52"	-23° 13' 41"	0.9843757	16' 14.86"	23° 26' 17"	5 m 18 s
15	262° 35' 40"	0.44"	261° 55' 38"	-23° 13' 50"	0.9843717	16' 14.87"	23° 26' 17"	5 m 17 s
16	262° 38' 13"	0.44"	261° 58' 24"	-23° 13' 58"	0.9843677	16' 14.87"	23° 26' 17"	5 m 16 s
17	262° 40' 45"	0.43"	262° 01' 10"	-23° 14' 07"	0.9843637	16' 14.87"	23° 26' 17"	5 m 15 s
18	262° 43' 18"	0.43"	262° 03' 55"	-23° 14' 15"	0.9843597	16' 14.88"	23° 26' 17"	5 m 14 s
19	262° 45' 50"	0.43"	262° 06' 41"	-23° 14' 23"	0.9843557	16' 14.88"	23° 26' 17"	5 m 13 s
20	262° 48' 23"	0.42"	262° 09' 27"	-23° 14' 32"	0.9843518	16' 14.89"	23° 26' 17"	5 m 11 s
21	262° 50' 55"	0.42"	262° 12' 13"	-23° 14' 40"	0.9843478	16' 14.89"	23° 26' 17"	5 m 10 s
22	262° 53' 28"	0.42"	262° 14' 58"	-23° 14' 48"	0.9843439	16' 14.89"	23° 26' 17"	5 m 09 s
23	262° 56' 00"	0.42"	262° 17' 44"	-23° 14' 56"	0.9843399	16' 14.90"	23° 26' 17"	5 m 08 s
24	262° 58' 33"	0.41"	262° 20' 30"	-23° 15' 04"	0.9843360	16' 14.90"	23° 26' 17"	5 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	145° 37' 46"	5° 01' 57"	149° 40' 06"	17° 42' 29"	0° 54' 18"	14' 47.83"	107° 40' 27"	0.72195
1	146° 07' 35"	5° 01' 20"	150° 09' 08"	17° 31' 39"	0° 54' 19"	14' 48.03"	107° 49' 52"	0.71841
2	146° 37' 24"	5° 00' 42"	150° 38' 06"	17° 20' 44"	0° 54' 20"	14' 48.24"	107° 59' 11"	0.71486
3	147° 07' 14"	5° 00' 02"	151° 07' 01"	17° 09' 45"	0° 54' 20"	14' 48.44"	108° 8' 22"	0.71129
4	147° 37' 05"	4° 59' 21"	151° 35' 54"	16° 58' 41"	0° 54' 21"	14' 48.66"	108° 17' 27"	0.70771
5	148° 06' 56"	4° 58' 38"	152° 04' 44"	16° 47' 33"	0° 54' 22"	14' 48.87"	108° 26' 24"	0.70411
6	148° 36' 48"	4° 57' 54"	152° 33' 31"	16° 36' 21"	0° 54' 23"	14' 49.09"	108° 35' 14"	0.70050
7	149° 06' 41"	4° 57' 09"	153° 02' 16"	16° 25' 05"	0° 54' 24"	14' 49.32"	108° 43' 56"	0.69688
8	149° 36' 34"	4° 56' 22"	153° 30' 58"	16° 13' 44"	0° 54' 24"	14' 49.55"	108° 52' 32"	0.69324
9	150° 06' 29"	4° 55' 34"	153° 59' 38"	16° 02' 19"	0° 54' 25"	14' 49.78"	109° 1' 00"	0.68958
10	150° 36' 24"	4° 54' 45"	154° 28' 15"	15° 50' 50"	0° 54' 26"	14' 50.02"	109° 9' 21"	0.68592
11	151° 06' 19"	4° 53' 54"	154° 56' 49"	15° 39' 17"	0° 54' 27"	14' 50.27"	109° 17' 35"	0.68224
12	151° 36' 16"	4° 53' 02"	155° 25' 22"	15° 27' 39"	0° 54' 28"	14' 50.52"	109° 25' 42"	0.67854
13	152° 06' 13"	4° 52' 09"	155° 53' 52"	15° 15' 58"	0° 54' 29"	14' 50.77"	109° 33' 42"	0.67483
14	152° 36' 12"	4° 51' 14"	156° 22' 19"	15° 04' 13"	0° 54' 30"	14' 51.03"	109° 41' 35"	0.67111
15	153° 06' 11"	4° 50' 18"	156° 50' 44"	14° 52' 24"	0° 54' 31"	14' 51.29"	109° 49' 20"	0.66738
16	153° 36' 11"	4° 49' 20"	157° 19' 08"	14° 40' 31"	0° 54' 32"	14' 51.56"	109° 56' 59"	0.66363
17	154° 06' 12"	4° 48' 21"	157° 47' 29"	14° 28' 34"	0° 54' 33"	14' 51.83"	110° 4' 30"	0.65987
18	154° 36' 14"	4° 47' 21"	158° 15' 47"	14° 16' 34"	0° 54' 34"	14' 52.11"	110° 11' 54"	0.65610
19	155° 06' 16"	4° 46' 19"	158° 44' 04"	14° 04' 29"	0° 54' 35"	14' 52.39"	110° 19' 11"	0.65232
20	155° 36' 20"	4° 45' 17"	159° 12' 19"	13° 52' 21"	0° 54' 36"	14' 52.68"	110° 26' 20"	0.64852
21	156° 06' 25"	4° 44' 12"	159° 40' 32"	13° 40' 10"	0° 54' 37"	14' 52.97"	110° 33' 23"	0.64471
22	156° 36' 30"	4° 43' 07"	160° 08' 43"	13° 27' 54"	0° 54' 38"	14' 53.26"	110° 40' 18"	0.64089
23	157° 06' 37"	4° 41' 60"	160° 36' 52"	13° 15' 35"	0° 54' 39"	14' 53.56"	110° 47' 06"	0.63706
24	157° 36' 45"	4° 40' 51"	161° 04' 59"	13° 03' 13"	0° 54' 40"	14' 53.87"	110° 53' 47"	0.63321

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	262° 58' 33"	0.41"	262° 20' 30"	-23° 15' 04"	0.9843360	16' 14.90"	23° 26' 17"	5 m 07 s
1	263° 01' 06"	0.41"	262° 23' 16"	-23° 15' 12"	0.9843321	16' 14.90"	23° 26' 17"	5 m 05 s
2	263° 03' 38"	0.41"	262° 26' 02"	-23° 15' 20"	0.9843281	16' 14.91"	23° 26' 17"	5 m 04 s
3	263° 06' 11"	0.40"	262° 28' 47"	-23° 15' 28"	0.9843242	16' 14.91"	23° 26' 17"	5 m 03 s
4	263° 08' 43"	0.40"	262° 31' 33"	-23° 15' 36"	0.9843203	16' 14.92"	23° 26' 17"	5 m 02 s
5	263° 11' 16"	0.40"	262° 34' 19"	-23° 15' 44"	0.9843165	16' 14.92"	23° 26' 17"	5 m 01 s
6	263° 13' 48"	0.39"	262° 37' 05"	-23° 15' 52"	0.9843126	16' 14.92"	23° 26' 17"	4 m 59 s
7	263° 16' 21"	0.39"	262° 39' 51"	-23° 15' 60"	0.9843087	16' 14.93"	23° 26' 17"	4 m 58 s
8	263° 18' 53"	0.39"	262° 42' 37"	-23° 16' 08"	0.9843049	16' 14.93"	23° 26' 17"	4 m 57 s
9	263° 21' 26"	0.38"	262° 45' 23"	-23° 16' 15"	0.9843010	16' 14.94"	23° 26' 17"	4 m 56 s
10	263° 23' 59"	0.38"	262° 48' 08"	-23° 16' 23"	0.9842972	16' 14.94"	23° 26' 17"	4 m 55 s
11	263° 26' 31"	0.38"	262° 50' 54"	-23° 16' 30"	0.9842933	16' 14.94"	23° 26' 17"	4 m 53 s
12	263° 29' 04"	0.37"	262° 53' 40"	-23° 16' 38"	0.9842895	16' 14.95"	23° 26' 17"	4 m 52 s
13	263° 31' 36"	0.37"	262° 56' 26"	-23° 16' 45"	0.9842857	16' 14.95"	23° 26' 17"	4 m 51 s
14	263° 34' 09"	0.37"	262° 59' 12"	-23° 16' 53"	0.9842819	16' 14.95"	23° 26' 17"	4 m 50 s
15	263° 36' 41"	0.36"	263° 01' 58"	-23° 17' 00"	0.9842781	16' 14.96"	23° 26' 17"	4 m 49 s
16	263° 39' 14"	0.36"	263° 04' 44"	-23° 17' 08"	0.9842743	16' 14.96"	23° 26' 17"	4 m 47 s
17	263° 41' 47"	0.35"	263° 07' 30"	-23° 17' 15"	0.9842705	16' 14.97"	23° 26' 17"	4 m 46 s
18	263° 44' 19"	0.35"	263° 10' 16"	-23° 17' 22"	0.9842667	16' 14.97"	23° 26' 17"	4 m 45 s
19	263° 46' 52"	0.35"	263° 13' 02"	-23° 17' 29"	0.9842630	16' 14.97"	23° 26' 17"	4 m 44 s
20	263° 49' 24"	0.34"	263° 15' 47"	-23° 17' 36"	0.9842592	16' 14.98"	23° 26' 17"	4 m 42 s
21	263° 51' 57"	0.34"	263° 18' 33"	-23° 17' 44"	0.9842555	16' 14.98"	23° 26' 17"	4 m 41 s
22	263° 54' 30"	0.34"	263° 21' 19"	-23° 17' 51"	0.9842517	16' 14.98"	23° 26' 17"	4 m 40 s
23	263° 57' 02"	0.33"	263° 24' 05"	-23° 17' 58"	0.9842480	16' 14.99"	23° 26' 17"	4 m 39 s
24	263° 59' 35"	0.33"	263° 26' 51"	-23° 18' 05"	0.9842443	16' 14.99"	23° 26' 17"	4 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	157° 36' 45"	4° 40' 51"	161° 04' 59"	13° 03' 13"	0° 54' 40"	14' 53.87"	110° 53' 47"	0.63321
1	158° 06' 54"	4° 39' 42"	161° 33' 05"	12° 50' 47"	0° 54' 41"	14' 54.18"	111° 0' 21"	0.62936
2	158° 37' 04"	4° 38' 31"	162° 01' 09"	12° 38' 17"	0° 54' 43"	14' 54.49"	111° 6' 48"	0.62549
3	159° 07' 15"	4° 37' 18"	162° 29' 11"	12° 25' 44"	0° 54' 44"	14' 54.81"	111° 13' 07"	0.62162
4	159° 37' 27"	4° 36' 05"	162° 57' 12"	12° 13' 08"	0° 54' 45"	14' 55.14"	111° 19' 20"	0.61773
5	160° 07' 40"	4° 34' 50"	163° 25' 11"	12° 00' 28"	0° 54' 46"	14' 55.46"	111° 25' 25"	0.61383
6	160° 37' 54"	4° 33' 33"	163° 53' 08"	11° 47' 45"	0° 54' 47"	14' 55.80"	111° 31' 23"	0.60992
7	161° 08' 10"	4° 32' 16"	164° 21' 05"	11° 34' 59"	0° 54' 49"	14' 56.14"	111° 37' 14"	0.60601
8	161° 38' 27"	4° 30' 57"	164° 48' 60"	11° 22' 09"	0° 54' 50"	14' 56.48"	111° 42' 57"	0.60208
9	162° 08' 45"	4° 29' 37"	165° 16' 53"	11° 09' 17"	0° 54' 51"	14' 56.83"	111° 48' 34"	0.59814
10	162° 39' 04"	4° 28' 15"	165° 44' 46"	10° 56' 21"	0° 54' 52"	14' 57.18"	111° 54' 03"	0.59419
11	163° 09' 25"	4° 26' 52"	166° 12' 37"	10° 43' 22"	0° 54' 54"	14' 57.53"	111° 59' 25"	0.59023
12	163° 39' 46"	4° 25' 28"	166° 40' 27"	10° 30' 20"	0° 54' 55"	14' 57.90"	112° 4' 40"	0.58627
13	164° 10' 10"	4° 24' 02"	167° 08' 16"	10° 17' 15"	0° 54' 56"	14' 58.26"	112° 9' 47"	0.58229
14	164° 40' 34"	4° 22' 35"	167° 36' 04"	10° 04' 07"	0° 54' 58"	14' 58.63"	112° 14' 47"	0.57831
15	165° 10' 60"	4° 21' 07"	168° 03' 51"	9° 50' 55"	0° 54' 59"	14' 59.01"	112° 19' 40"	0.57431
16	165° 41' 27"	4° 19' 38"	168° 31' 37"	9° 37' 41"	0° 55' 01"	14' 59.39"	112° 24' 26"	0.57031
17	166° 11' 55"	4° 18' 07"	168° 59' 23"	9° 24' 25"	0° 55' 02"	14' 59.77"	112° 29' 05"	0.56630
18	166° 42' 25"	4° 16' 35"	169° 27' 07"	9° 11' 05"	0° 55' 03"	15' 00.16"	112° 33' 36"	0.56229
19	167° 12' 57"	4° 15' 02"	169° 54' 51"	8° 57' 42"	0° 55' 05"	15' 00.56"	112° 37' 60"	0.55826
20	167° 43' 30"	4° 13' 27"	170° 22' 35"	8° 44' 17"	0° 55' 06"	15' 00.95"	112° 42' 16"	0.55423
21	168° 14' 04"	4° 11' 51"	170° 50' 18"	8° 30' 49"	0° 55' 08"	15' 01.36"	112° 46' 26"	0.55018
22	168° 44' 40"	4° 10' 14"	171° 18' 00"	8° 17' 19"	0° 55' 09"	15' 01.76"	112° 50' 28"	0.54614
23	169° 15' 17"	4° 08' 36"	171° 45' 42"	8° 03' 45"	0° 55' 11"	15' 02.18"	112° 54' 22"	0.54208
24	169° 45' 56"	4° 06' 56"	172° 13' 24"	7° 50' 09"	0° 55' 12"	15' 02.59"	112° 58' 10"	0.53802



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	263° 59' 35"	0.33"	263° 26' 51"	-23° 18' 05"	0.9842443	16' 14.99"	23° 26' 17"	4 m 38 s
1	264° 02' 07"	0.32"	263° 29' 37"	-23° 18' 12"	0.9842405	16' 15.00"	23° 26' 17"	4 m 36 s
2	264° 04' 40"	0.32"	263° 32' 23"	-23° 18' 18"	0.9842368	16' 15.00"	23° 26' 17"	4 m 35 s
3	264° 07' 13"	0.32"	263° 35' 09"	-23° 18' 25"	0.9842331	16' 15.00"	23° 26' 17"	4 m 34 s
4	264° 09' 45"	0.31"	263° 37' 55"	-23° 18' 32"	0.9842295	16' 15.01"	23° 26' 17"	4 m 33 s
5	264° 12' 18"	0.31"	263° 40' 41"	-23° 18' 39"	0.9842258	16' 15.01"	23° 26' 17"	4 m 32 s
6	264° 14' 50"	0.30"	263° 43' 27"	-23° 18' 45"	0.9842221	16' 15.01"	23° 26' 17"	4 m 30 s
7	264° 17' 23"	0.30"	263° 46' 13"	-23° 18' 52"	0.9842184	16' 15.02"	23° 26' 17"	4 m 29 s
8	264° 19' 56"	0.29"	263° 48' 59"	-23° 18' 58"	0.9842148	16' 15.02"	23° 26' 17"	4 m 28 s
9	264° 22' 28"	0.29"	263° 51' 45"	-23° 19' 05"	0.9842111	16' 15.02"	23° 26' 17"	4 m 27 s
10	264° 25' 01"	0.29"	263° 54' 31"	-23° 19' 11"	0.9842075	16' 15.03"	23° 26' 17"	4 m 26 s
11	264° 27' 33"	0.28"	263° 57' 17"	-23° 19' 18"	0.9842039	16' 15.03"	23° 26' 17"	4 m 24 s
12	264° 30' 06"	0.28"	264° 00' 03"	-23° 19' 24"	0.9842002	16' 15.04"	23° 26' 17"	4 m 23 s
13	264° 32' 39"	0.27"	264° 02' 50"	-23° 19' 31"	0.9841966	16' 15.04"	23° 26' 17"	4 m 22 s
14	264° 35' 11"	0.27"	264° 05' 36"	-23° 19' 37"	0.9841930	16' 15.04"	23° 26' 17"	4 m 21 s
15	264° 37' 44"	0.26"	264° 08' 22"	-23° 19' 43"	0.9841894	16' 15.05"	23° 26' 17"	4 m 20 s
16	264° 40' 16"	0.26"	264° 11' 08"	-23° 19' 49"	0.9841858	16' 15.05"	23° 26' 17"	4 m 18 s
17	264° 42' 49"	0.25"	264° 13' 54"	-23° 19' 55"	0.9841823	16' 15.05"	23° 26' 17"	4 m 17 s
18	264° 45' 22"	0.25"	264° 16' 40"	-23° 20' 01"	0.9841787	16' 15.06"	23° 26' 17"	4 m 16 s
19	264° 47' 54"	0.24"	264° 19' 26"	-23° 20' 08"	0.9841751	16' 15.06"	23° 26' 17"	4 m 15 s
20	264° 50' 27"	0.24"	264° 22' 12"	-23° 20' 14"	0.9841716	16' 15.06"	23° 26' 17"	4 m 13 s
21	264° 52' 60"	0.24"	264° 24' 58"	-23° 20' 19"	0.9841680	16' 15.07"	23° 26' 17"	4 m 12 s
22	264° 55' 32"	0.23"	264° 27' 44"	-23° 20' 25"	0.9841645	16' 15.07"	23° 26' 17"	4 m 11 s
23	264° 58' 05"	0.23"	264° 30' 30"	-23° 20' 31"	0.9841609	16' 15.07"	23° 26' 17"	4 m 10 s
24	265° 00' 37"	0.22"	264° 33' 17"	-23° 20' 37"	0.9841574	16' 15.08"	23° 26' 17"	4 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	169° 45' 56"	4° 06' 56"	172° 13' 24"	7° 50' 09"	0° 55' 12"	15' 02.59"	112° 58' 10"	0.53802
1	170° 16' 36"	4° 05' 15"	172° 41' 05"	7° 36' 31"	0° 55' 14"	15' 03.01"	113° 1' 50"	0.53395
2	170° 47' 18"	4° 03' 33"	173° 08' 46"	7° 22' 50"	0° 55' 15"	15' 03.44"	113° 5' 22"	0.52988
3	171° 18' 02"	4° 01' 49"	173° 36' 27"	7° 09' 07"	0° 55' 17"	15' 03.87"	113° 8' 47"	0.52579
4	171° 48' 47"	4° 00' 05"	174° 04' 08"	6° 55' 21"	0° 55' 19"	15' 04.30"	113° 12' 05"	0.52171
5	172° 19' 34"	3° 58' 19"	174° 31' 48"	6° 41' 32"	0° 55' 20"	15' 04.74"	113° 15' 15"	0.51761
6	172° 50' 22"	3° 56' 31"	174° 59' 29"	6° 27' 42"	0° 55' 22"	15' 05.19"	113° 18' 18"	0.51351
7	173° 21' 12"	3° 54' 43"	175° 27' 10"	6° 13' 49"	0° 55' 23"	15' 05.64"	113° 21' 14"	0.50941
8	173° 52' 04"	3° 52' 53"	175° 54' 51"	5° 59' 54"	0° 55' 25"	15' 06.09"	113° 24' 02"	0.50530
9	174° 22' 58"	3° 51' 02"	176° 22' 33"	5° 45' 56"	0° 55' 27"	15' 06.55"	113° 26' 42"	0.50119
10	174° 53' 53"	3° 49' 10"	176° 50' 14"	5° 31' 57"	0° 55' 28"	15' 07.01"	113° 29' 15"	0.49707
11	175° 24' 50"	3° 47' 16"	177° 17' 56"	5° 17' 55"	0° 55' 30"	15' 07.47"	113° 31' 40"	0.49295
12	175° 55' 49"	3° 45' 22"	177° 45' 39"	5° 03' 51"	0° 55' 32"	15' 07.94"	113° 33' 58"	0.48882
13	176° 26' 50"	3° 43' 26"	178° 13' 22"	4° 49' 45"	0° 55' 34"	15' 08.42"	113° 36' 08"	0.48469
14	176° 57' 52"	3° 41' 29"	178° 41' 06"	4° 35' 37"	0° 55' 35"	15' 08.90"	113° 38' 11"	0.48055
15	177° 28' 57"	3° 39' 31"	179° 08' 50"	4° 21' 27"	0° 55' 37"	15' 09.38"	113° 40' 06"	0.47641
16	178° 00' 03"	3° 37' 31"	179° 36' 35"	4° 07' 15"	0° 55' 39"	15' 09.87"	113° 41' 53"	0.47227
17	178° 31' 11"	3° 35' 30"	180° 04' 21"	3° 53' 02"	0° 55' 41"	15' 10.36"	113° 43' 33"	0.46813
18	179° 02' 21"	3° 33' 29"	180° 32' 08"	3° 38' 46"	0° 55' 43"	15' 10.85"	113° 45' 04"	0.46398
19	179° 33' 33"	3° 31' 25"	180° 59' 56"	3° 24' 29"	0° 55' 44"	15' 11.35"	113° 46' 29"	0.45983
20	180° 04' 47"	3° 29' 21"	181° 27' 45"	3° 10' 10"	0° 55' 46"	15' 11.86"	113° 47' 45"	0.45567
21	180° 36' 03"	3° 27' 16"	181° 55' 34"	2° 55' 49"	0° 55' 48"	15' 12.36"	113° 48' 53"	0.45152
22	181° 07' 21"	3° 25' 09"	182° 23' 26"	2° 41' 26"	0° 55' 50"	15' 12.88"	113° 49' 54"	0.44736
23	181° 38' 40"	3° 23' 02"	182° 51' 18"	2° 27' 02"	0° 55' 52"	15' 13.39"	113° 50' 47"	0.44321
24	182° 10' 02"	3° 20' 53"	183° 19' 12"	2° 12' 36"	0° 55' 54"	15' 13.91"	113° 51' 32"	0.43905

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DATA MATAHARI

Jam	Ecliptic Longitude)	Ecliptic Latitude)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	265° 00' 37"	0.22"	264° 33' 17"	-23° 20' 37"	0.9841574	16' 15.08"	23° 26' 17"	4 m 09 s
1	265° 03' 10"	0.22"	264° 36' 03"	-23° 20' 43"	0.9841539	16' 15.08"	23° 26' 17"	4 m 07 s
2	265° 05' 43"	0.21"	264° 38' 49"	-23° 20' 48"	0.9841504	16' 15.08"	23° 26' 17"	4 m 06 s
3	265° 08' 15"	0.21"	264° 41' 35"	-23° 20' 54"	0.9841469	16' 15.09"	23° 26' 17"	4 m 05 s
4	265° 10' 48"	0.20"	264° 44' 21"	-23° 20' 60"	0.9841434	16' 15.09"	23° 26' 17"	4 m 04 s
5	265° 13' 21"	0.20"	264° 47' 07"	-23° 21' 05"	0.9841399	16' 15.10"	23° 26' 17"	4 m 03 s
6	265° 15' 53"	0.19"	264° 49' 53"	-23° 21' 11"	0.9841364	16' 15.10"	23° 26' 17"	4 m 01 s
7	265° 18' 26"	0.19"	264° 52' 39"	-23° 21' 16"	0.9841330	16' 15.10"	23° 26' 17"	4 m 00 s
8	265° 20' 59"	0.18"	264° 55' 26"	-23° 21' 22"	0.9841295	16' 15.11"	23° 26' 17"	3 m 59 s
9	265° 23' 31"	0.18"	264° 58' 12"	-23° 21' 27"	0.9841261	16' 15.11"	23° 26' 17"	3 m 58 s
10	265° 26' 04"	0.17"	265° 00' 58"	-23° 21' 32"	0.9841226	16' 15.11"	23° 26' 17"	3 m 56 s
11	265° 28' 37"	0.17"	265° 03' 44"	-23° 21' 37"	0.9841192	16' 15.12"	23° 26' 17"	3 m 55 s
12	265° 31' 09"	0.16"	265° 06' 30"	-23° 21' 43"	0.9841158	16' 15.12"	23° 26' 17"	3 m 54 s
13	265° 33' 42"	0.16"	265° 09' 17"	-23° 21' 48"	0.9841123	16' 15.12"	23° 26' 17"	3 m 53 s
14	265° 36' 15"	0.15"	265° 12' 03"	-23° 21' 53"	0.9841089	16' 15.13"	23° 26' 17"	3 m 52 s
15	265° 38' 47"	0.15"	265° 14' 49"	-23° 21' 58"	0.9841055	16' 15.13"	23° 26' 17"	3 m 50 s
16	265° 41' 20"	0.14"	265° 17' 35"	-23° 22' 03"	0.9841021	16' 15.13"	23° 26' 17"	3 m 49 s
17	265° 43' 53"	0.13"	265° 20' 21"	-23° 22' 08"	0.9840987	16' 15.14"	23° 26' 17"	3 m 48 s
18	265° 46' 25"	0.13"	265° 23' 08"	-23° 22' 13"	0.9840954	16' 15.14"	23° 26' 17"	3 m 47 s
19	265° 48' 58"	0.12"	265° 25' 54"	-23° 22' 18"	0.9840920	16' 15.14"	23° 26' 17"	3 m 45 s
20	265° 51' 31"	0.12"	265° 28' 40"	-23° 22' 23"	0.9840886	16' 15.15"	23° 26' 17"	3 m 44 s
21	265° 54' 03"	0.11"	265° 31' 26"	-23° 22' 27"	0.9840853	16' 15.15"	23° 26' 17"	3 m 43 s
22	265° 56' 36"	0.11"	265° 34' 13"	-23° 22' 32"	0.9840819	16' 15.15"	23° 26' 17"	3 m 42 s
23	265° 59' 09"	0.10"	265° 36' 59"	-23° 22' 37"	0.9840786	16' 15.16"	23° 26' 17"	3 m 41 s
24	266° 01' 41"	0.10"	265° 39' 45"	-23° 22' 41"	0.9840752	16' 15.16"	23° 26' 17"	3 m 39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	182° 10' 02"	3° 20' 53"	183° 19' 12"	2° 12' 36"	0° 55' 54"	15' 13.91"	113° 51' 32"	0.43905
1	182° 41' 26"	3° 18' 43"	183° 47' 07"	1° 58' 09"	0° 55' 56"	15' 14.44"	113° 52' 09"	0.43489
2	183° 12' 52"	3° 16' 31"	184° 15' 03"	1° 43' 40"	0° 55' 58"	15' 14.96"	113° 52' 38"	0.43072
3	183° 44' 21"	3° 14' 19"	184° 43' 01"	1° 29' 10"	0° 55' 60"	15' 15.50"	113° 52' 59"	0.42656
4	184° 15' 51"	3° 12' 06"	185° 11' 01"	1° 14' 39"	0° 56' 02"	15' 16.03"	113° 53' 12"	0.42240
5	184° 47' 23"	3° 09' 51"	185° 39' 03"	1° 00' 06"	0° 56' 04"	15' 16.57"	113° 53' 17"	0.41824
6	185° 18' 58"	3° 07' 35"	186° 07' 06"	0° 45' 32"	0° 56' 06"	15' 17.11"	113° 53' 14"	0.41408
7	185° 50' 35"	3° 05' 18"	186° 35' 11"	0° 30' 56"	0° 56' 08"	15' 17.66"	113° 53' 03"	0.40992
8	186° 22' 13"	3° 03' 01"	187° 03' 18"	0° 16' 20"	0° 56' 10"	15' 18.21"	113° 52' 44"	0.40576
9	186° 53' 55"	3° 00' 42"	187° 31' 27"	0° 01' 42"	0° 56' 12"	15' 18.77"	113° 52' 16"	0.40160
10	187° 25' 38"	2° 58' 21"	187° 59' 38"	0° 12' 57"	0° 56' 14"	15' 19.32"	113° 51' 40"	0.39744
11	187° 57' 24"	2° 56' 00"	188° 27' 52"	0° 27' 37"	0° 56' 16"	15' 19.89"	113° 50' 56"	0.39329
12	188° 29' 11"	2° 53' 38"	188° 56' 07"	0° 42' 18"	0° 56' 18"	15' 20.45"	113° 50' 03"	0.38913
13	189° 01' 02"	2° 51' 15"	189° 24' 25"	0° 56' 60"	0° 56' 20"	15' 21.02"	113° 49' 02"	0.38498
14	189° 32' 54"	2° 48' 50"	189° 52' 46"	-1° 11' 43"	0° 56' 22"	15' 21.59"	113° 47' 53"	0.38083
15	190° 04' 49"	2° 46' 25"	190° 21' 09"	-1° 26' 26"	0° 56' 24"	15' 22.17"	113° 46' 35"	0.37669
16	190° 36' 46"	2° 43' 58"	190° 49' 34"	-1° 41' 11"	0° 56' 26"	15' 22.75"	113° 45' 09"	0.37254
17	191° 08' 46"	2° 41' 31"	191° 18' 02"	-1° 55' 56"	0° 56' 28"	15' 23.33"	113° 43' 34"	0.36840
18	191° 40' 48"	2° 39' 02"	191° 46' 33"	-2° 10' 42"	0° 56' 31"	15' 23.91"	113° 41' 50"	0.36427
19	192° 12' 52"	2° 36' 33"	192° 15' 07"	-2° 25' 28"	0° 56' 33"	15' 24.50"	113° 39' 58"	0.36014
20	192° 44' 59"	2° 34' 02"	192° 43' 43"	-2° 40' 15"	0° 56' 35"	15' 25.09"	113° 37' 57"	0.35601
21	193° 17' 08"	2° 31' 31"	193° 12' 23"	-2° 55' 02"	0° 56' 37"	15' 25.69"	113° 35' 47"	0.35189
22	193° 49' 20"	2° 28' 58"	193° 41' 05"	-3° 09' 50"	0° 56' 39"	15' 26.29"	113° 33' 28"	0.34777
23	194° 21' 34"	2° 26' 24"	194° 09' 51"	-3° 24' 39"	0° 56' 41"	15' 26.89"	113° 31' 01"	0.34366
24	194° 53' 50"	2° 23' 50"	194° 38' 40"	-3° 39' 27"	0° 56' 44"	15' 27.49"	113° 28' 24"	0.33955



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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	266° 01' 41"	0.10"	265° 39' 45"	-23° 22' 41"	0.9840752	16' 15.16"	23° 26' 17"	3 m 39 s
1	266° 04' 14"	0.09"	265° 42' 31"	-23° 22' 46"	0.9840719	16' 15.16"	23° 26' 17"	3 m 38 s
2	266° 06' 47"	0.09"	265° 45' 18"	-23° 22' 50"	0.9840686	16' 15.17"	23° 26' 17"	3 m 37 s
3	266° 09' 19"	0.08"	265° 48' 04"	-23° 22' 55"	0.9840653	16' 15.17"	23° 26' 17"	3 m 36 s
4	266° 11' 52"	0.08"	265° 50' 50"	-23° 22' 59"	0.9840620	16' 15.17"	23° 26' 17"	3 m 34 s
5	266° 14' 25"	0.07"	265° 53' 36"	-23° 23' 04"	0.9840587	16' 15.18"	23° 26' 17"	3 m 33 s
6	266° 16' 57"	0.07"	265° 56' 23"	-23° 23' 08"	0.9840554	16' 15.18"	23° 26' 17"	3 m 32 s
7	266° 19' 30"	0.06"	265° 59' 09"	-23° 23' 12"	0.9840521	16' 15.18"	23° 26' 17"	3 m 31 s
8	266° 22' 03"	0.05"	266° 01' 55"	-23° 23' 17"	0.9840488	16' 15.19"	23° 26' 17"	3 m 30 s
9	266° 24' 35"	0.05"	266° 04' 41"	-23° 23' 21"	0.9840456	16' 15.19"	23° 26' 17"	3 m 28 s
10	266° 27' 08"	0.04"	266° 07' 28"	-23° 23' 25"	0.9840423	16' 15.19"	23° 26' 17"	3 m 27 s
11	266° 29' 41"	0.04"	266° 10' 14"	-23° 23' 29"	0.9840391	16' 15.20"	23° 26' 17"	3 m 26 s
12	266° 32' 13"	0.03"	266° 13' 00"	-23° 23' 33"	0.9840358	16' 15.20"	23° 26' 17"	3 m 25 s
13	266° 34' 46"	0.03"	266° 15' 47"	-23° 23' 37"	0.9840326	16' 15.20"	23° 26' 17"	3 m 23 s
14	266° 37' 19"	0.02"	266° 18' 33"	-23° 23' 41"	0.9840293	16' 15.20"	23° 26' 17"	3 m 22 s
15	266° 39' 51"	0.02"	266° 21' 19"	-23° 23' 45"	0.9840261	16' 15.21"	23° 26' 17"	3 m 21 s
16	266° 42' 24"	0.01"	266° 24' 06"	-23° 23' 49"	0.9840229	16' 15.21"	23° 26' 17"	3 m 20 s
17	266° 44' 57"	0.00"	266° 26' 52"	-23° 23' 52"	0.9840197	16' 15.21"	23° 26' 17"	3 m 18 s
18	266° 47' 30"	-0.00"	266° 29' 38"	-23° 23' 56"	0.9840165	16' 15.22"	23° 26' 17"	3 m 17 s
19	266° 50' 02"	-0.01"	266° 32' 25"	-23° 23' 60"	0.9840133	16' 15.22"	23° 26' 17"	3 m 16 s
20	266° 52' 35"	-0.01"	266° 35' 11"	-23° 24' 04"	0.9840101	16' 15.22"	23° 26' 17"	3 m 15 s
21	266° 55' 08"	-0.02"	266° 37' 57"	-23° 24' 07"	0.9840069	16' 15.23"	23° 26' 17"	3 m 14 s
22	266° 57' 40"	-0.02"	266° 40' 44"	-23° 24' 11"	0.9840038	16' 15.23"	23° 26' 17"	3 m 12 s
23	267° 00' 13"	-0.03"	266° 43' 30"	-23° 24' 14"	0.9840006	16' 15.23"	23° 26' 17"	3 m 11 s
24	267° 02' 46"	-0.03"	266° 46' 16"	-23° 24' 18"	0.9839975	16' 15.24"	23° 26' 17"	3 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	194° 53' 50"	2° 23' 50"	194° 38' 40"	-3° 39' 27"	0° 56' 44"	15' 27.49"	113° 28' 24"	0.33955
1	195° 26' 09"	2° 21' 14"	195° 07' 32"	-3° 54' 16"	0° 56' 46"	15' 28.10"	113° 25' 39"	0.33545
2	195° 58' 31"	2° 18' 38"	195° 36' 28"	-4° 09' 05"	0° 56' 48"	15' 28.71"	113° 22' 44"	0.33136
3	196° 30' 55"	2° 16' 01"	196° 05' 27"	-4° 23' 55"	0° 56' 50"	15' 29.32"	113° 19' 41"	0.32727
4	197° 03' 22"	2° 13' 22"	196° 34' 30"	-4° 38' 44"	0° 56' 53"	15' 29.93"	113° 16' 28"	0.32319
5	197° 35' 51"	2° 10' 43"	197° 03' 36"	-4° 53' 34"	0° 56' 55"	15' 30.55"	113° 13' 05"	0.31912
6	198° 08' 23"	2° 08' 03"	197° 32' 46"	-5° 08' 23"	0° 56' 57"	15' 31.17"	113° 9' 34"	0.31506
7	198° 40' 58"	2° 05' 22"	198° 01' 60"	-5° 23' 12"	0° 56' 59"	15' 31.79"	113° 5' 53"	0.31100
8	199° 13' 35"	2° 02' 40"	198° 31' 18"	-5° 38' 01"	0° 57' 02"	15' 32.42"	113° 2' 03"	0.30695
9	199° 46' 15"	1° 59' 57"	199° 00' 39"	-5° 52' 50"	0° 57' 04"	15' 33.04"	112° 58' 03"	0.30291
10	200° 18' 57"	1° 57' 13"	199° 30' 05"	-6° 07' 39"	0° 57' 06"	15' 33.67"	112° 53' 53"	0.29888
11	200° 51' 42"	1° 54' 29"	199° 59' 35"	-6° 22' 27"	0° 57' 09"	15' 34.31"	112° 49' 34"	0.29486
12	201° 24' 30"	1° 51' 43"	200° 29' 09"	-6° 37' 15"	0° 57' 11"	15' 34.94"	112° 45' 05"	0.29085
13	201° 57' 20"	1° 48' 57"	200° 58' 47"	-6° 52' 02"	0° 57' 13"	15' 35.57"	112° 40' 26"	0.28684
14	202° 30' 14"	1° 46' 10"	201° 28' 30"	-7° 06' 49"	0° 57' 16"	15' 36.21"	112° 35' 37"	0.28285
15	203° 03' 10"	1° 43' 22"	201° 58' 18"	-7° 21' 35"	0° 57' 18"	15' 36.85"	112° 30' 38"	0.27887
16	203° 36' 08"	1° 40' 33"	202° 28' 09"	-7° 36' 21"	0° 57' 20"	15' 37.49"	112° 25' 30"	0.27490
17	204° 09' 10"	1° 37' 44"	202° 58' 06"	-7° 51' 05"	0° 57' 23"	15' 38.14"	112° 20' 11"	0.27095
18	204° 42' 14"	1° 34' 53"	203° 28' 07"	-8° 05' 49"	0° 57' 25"	15' 38.78"	112° 14' 41"	0.26700
19	205° 15' 21"	1° 32' 02"	203° 58' 13"	-8° 20' 32"	0° 57' 27"	15' 39.43"	112° 9' 02"	0.26307
20	205° 48' 30"	1° 29' 11"	204° 28' 24"	-8° 35' 14"	0° 57' 30"	15' 40.08"	112° 3' 12"	0.25915
21	206° 21' 43"	1° 26' 18"	204° 58' 40"	-8° 49' 55"	0° 57' 32"	15' 40.73"	111° 57' 11"	0.25524
22	206° 54' 58"	1° 23' 25"	205° 29' 01"	-9° 04' 34"	0° 57' 35"	15' 41.38"	111° 50' 60"	0.25135
23	207° 28' 17"	1° 20' 31"	205° 59' 27"	-9° 19' 13"	0° 57' 37"	15' 42.03"	111° 44' 38"	0.24747
24	208° 01' 38"	1° 17' 36"	206° 29' 58"	-9° 33' 50"	0° 57' 39"	15' 42.69"	111° 38' 05"	0.24360

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	267° 02' 46"	-0.03"	266° 46' 16"	-23° 24' 18"	0.9839975	16' 15.24"	23° 26' 17"	3 m 10 s
1	267° 05' 19"	-0.04"	266° 49' 03"	-23° 24' 21"	0.9839943	16' 15.24"	23° 26' 17"	3 m 09 s
2	267° 07' 51"	-0.05"	266° 51' 49"	-23° 24' 24"	0.9839912	16' 15.24"	23° 26' 17"	3 m 07 s
3	267° 10' 24"	-0.05"	266° 54' 36"	-23° 24' 28"	0.9839880	16' 15.25"	23° 26' 17"	3 m 06 s
4	267° 12' 57"	-0.06"	266° 57' 22"	-23° 24' 31"	0.9839849	16' 15.25"	23° 26' 17"	3 m 05 s
5	267° 15' 29"	-0.06"	267° 00' 08"	-23° 24' 34"	0.9839818	16' 15.25"	23° 26' 17"	3 m 04 s
6	267° 18' 02"	-0.07"	267° 02' 55"	-23° 24' 37"	0.9839787	16' 15.25"	23° 26' 17"	3 m 02 s
7	267° 20' 35"	-0.07"	267° 05' 41"	-23° 24' 40"	0.9839756	16' 15.26"	23° 26' 17"	3 m 01 s
8	267° 23' 08"	-0.08"	267° 08' 27"	-23° 24' 43"	0.9839725	16' 15.26"	23° 26' 17"	3 m 00 s
9	267° 25' 40"	-0.09"	267° 11' 14"	-23° 24' 46"	0.9839694	16' 15.26"	23° 26' 17"	2 m 59 s
10	267° 28' 13"	-0.09"	267° 14' 00"	-23° 24' 49"	0.9839663	16' 15.27"	23° 26' 17"	2 m 58 s
11	267° 30' 46"	-0.10"	267° 16' 47"	-23° 24' 52"	0.9839632	16' 15.27"	23° 26' 17"	2 m 56 s
12	267° 33' 18"	-0.10"	267° 19' 33"	-23° 24' 55"	0.9839601	16' 15.27"	23° 26' 17"	2 m 55 s
13	267° 35' 51"	-0.11"	267° 22' 19"	-23° 24' 58"	0.9839571	16' 15.28"	23° 26' 17"	2 m 54 s
14	267° 38' 24"	-0.11"	267° 25' 06"	-23° 25' 01"	0.9839540	16' 15.28"	23° 26' 17"	2 m 53 s
15	267° 40' 57"	-0.12"	267° 27' 52"	-23° 25' 03"	0.9839510	16' 15.28"	23° 26' 17"	2 m 51 s
16	267° 43' 29"	-0.13"	267° 30' 39"	-23° 25' 06"	0.9839479	16' 15.29"	23° 26' 17"	2 m 50 s
17	267° 46' 02"	-0.13"	267° 33' 25"	-23° 25' 09"	0.9839449	16' 15.29"	23° 26' 17"	2 m 49 s
18	267° 48' 35"	-0.14"	267° 36' 12"	-23° 25' 11"	0.9839418	16' 15.29"	23° 26' 17"	2 m 48 s
19	267° 51' 08"	-0.14"	267° 38' 58"	-23° 25' 14"	0.9839388	16' 15.29"	23° 26' 17"	2 m 46 s
20	267° 53' 40"	-0.15"	267° 41' 44"	-23° 25' 16"	0.9839358	16' 15.30"	23° 26' 17"	2 m 45 s
21	267° 56' 13"	-0.15"	267° 44' 31"	-23° 25' 19"	0.9839328	16' 15.30"	23° 26' 17"	2 m 44 s
22	267° 58' 46"	-0.16"	267° 47' 17"	-23° 25' 21"	0.9839298	16' 15.30"	23° 26' 17"	2 m 43 s
23	268° 01' 19"	-0.16"	267° 50' 04"	-23° 25' 23"	0.9839268	16' 15.31"	23° 26' 17"	2 m 42 s
24	268° 03' 51"	-0.17"	267° 52' 50"	-23° 25' 26"	0.9839238	16' 15.31"	23° 26' 17"	2 m 40 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	208° 01' 38"	1° 17' 36"	206° 29' 58"	-9° 33' 50"	0° 57' 39"	15' 42.69"	111° 38' 05"	0.24360
1	208° 35' 02"	1° 14' 41"	207° 00' 35"	-9° 48' 25"	0° 57' 42"	15' 43.34"	111° 31' 22"	0.23975
2	209° 08' 28"	1° 11' 45"	207° 31' 17"	-10° 02' 59"	0° 57' 44"	15' 44.00"	111° 24' 27"	0.23592
3	209° 41' 58"	1° 08' 48"	208° 02' 04"	-10° 17' 32"	0° 57' 47"	15' 44.65"	111° 17' 21"	0.23210
4	210° 15' 30"	1° 05' 51"	208° 32' 57"	-10° 32' 03"	0° 57' 49"	15' 45.31"	111° 10' 04"	0.22829
5	210° 49' 06"	1° 02' 53"	209° 03' 56"	-10° 46' 32"	0° 57' 51"	15' 45.97"	111° 2' 36"	0.22451
6	211° 22' 44"	0° 59' 54"	209° 35' 00"	-11° 00' 59"	0° 57' 54"	15' 46.63"	110° 54' 56"	0.22073
7	211° 56' 25"	0° 56' 55"	210° 06' 10"	-11° 15' 25"	0° 57' 56"	15' 47.29"	110° 47' 05"	0.21698
8	212° 30' 09"	0° 53' 55"	210° 37' 26"	-11° 29' 48"	0° 57' 59"	15' 47.95"	110° 39' 02"	0.21324
9	213° 03' 57"	0° 50' 55"	211° 08' 48"	-11° 44' 10"	0° 58' 01"	15' 48.61"	110° 30' 47"	0.20952
10	213° 37' 46"	0° 47' 54"	211° 40' 17"	-11° 58' 29"	0° 58' 04"	15' 49.27"	110° 22' 20"	0.20582
11	214° 11' 39"	0° 44' 53"	212° 11' 51"	-12° 12' 46"	0° 58' 06"	15' 49.94"	110° 13' 41"	0.20214
12	214° 45' 35"	0° 41' 51"	212° 43' 31"	-12° 27' 01"	0° 58' 08"	15' 50.60"	110° 4' 50"	0.19848
13	215° 19' 34"	0° 38' 49"	213° 15' 18"	-12° 41' 13"	0° 58' 11"	15' 51.26"	109° 55' 47"	0.19484
14	215° 53' 36"	0° 35' 46"	213° 47' 11"	-12° 55' 22"	0° 58' 13"	15' 51.92"	109° 46' 31"	0.19122
15	216° 27' 41"	0° 32' 42"	214° 19' 10"	-13° 09' 29"	0° 58' 16"	15' 52.58"	109° 37' 02"	0.18761
16	217° 01' 48"	0° 29' 39"	214° 51' 16"	-13° 23' 33"	0° 58' 18"	15' 53.24"	109° 27' 21"	0.18403
17	217° 35' 59"	0° 26' 34"	215° 23' 29"	-13° 37' 35"	0° 58' 21"	15' 53.91"	109° 17' 26"	0.18047
18	218° 10' 13"	0° 23' 30"	215° 55' 48"	-13° 51' 33"	0° 58' 23"	15' 54.57"	109° 7' 19"	0.17693
19	218° 44' 29"	0° 20' 25"	216° 28' 14"	-14° 05' 29"	0° 58' 25"	15' 55.23"	108° 56' 58"	0.17342
20	219° 18' 49"	0° 17' 19"	217° 00' 47"	-14° 19' 21"	0° 58' 28"	15' 55.89"	108° 46' 24"	0.16993
21	219° 53' 12"	0° 14' 14"	217° 33' 27"	-14° 33' 10"	0° 58' 30"	15' 56.55"	108° 35' 36"	0.16645
22	220° 27' 37"	0° 11' 08"	218° 06' 13"	-14° 46' 55"	0° 58' 33"	15' 57.20"	108° 24' 35"	0.16301
23	221° 02' 06"	0° 08' 01"	218° 39' 07"	-15° 00' 38"	0° 58' 35"	15' 57.86"	108° 13' 19"	0.15959
24	221° 36' 38"	0° 04' 54"	219° 12' 08"	-15° 14' 16"	0° 58' 38"	15' 58.52"	108° 1' 49"	0.15619



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	268° 03' 51"	-0.17"	267° 52' 50"	-23° 25' 26"	0.9839238	16' 15.31"	23° 26' 17"	2 m 40 s
1	268° 06' 24"	-0.18"	267° 55' 37"	-23° 25' 28"	0.9839208	16' 15.31"	23° 26' 17"	2 m 39 s
2	268° 08' 57"	-0.18"	267° 58' 23"	-23° 25' 30"	0.9839179	16' 15.32"	23° 26' 17"	2 m 38 s
3	268° 11' 30"	-0.19"	268° 01' 10"	-23° 25' 32"	0.9839149	16' 15.32"	23° 26' 17"	2 m 37 s
4	268° 14' 02"	-0.19"	268° 03' 56"	-23° 25' 34"	0.9839119	16' 15.32"	23° 26' 17"	2 m 35 s
5	268° 16' 35"	-0.20"	268° 06' 42"	-23° 25' 36"	0.9839090	16' 15.32"	23° 26' 17"	2 m 34 s
6	268° 19' 08"	-0.20"	268° 09' 29"	-23° 25' 38"	0.9839060	16' 15.33"	23° 26' 17"	2 m 33 s
7	268° 21' 41"	-0.21"	268° 12' 15"	-23° 25' 40"	0.9839031	16' 15.33"	23° 26' 17"	2 m 32 s
8	268° 24' 13"	-0.22"	268° 15' 02"	-23° 25' 42"	0.9839001	16' 15.33"	23° 26' 17"	2 m 30 s
9	268° 26' 46"	-0.22"	268° 17' 48"	-23° 25' 44"	0.9838972	16' 15.34"	23° 26' 17"	2 m 29 s
10	268° 29' 19"	-0.23"	268° 20' 35"	-23° 25' 46"	0.9838943	16' 15.34"	23° 26' 17"	2 m 28 s
11	268° 31' 52"	-0.23"	268° 23' 21"	-23° 25' 48"	0.9838914	16' 15.34"	23° 26' 17"	2 m 27 s
12	268° 34' 24"	-0.24"	268° 26' 08"	-23° 25' 49"	0.9838885	16' 15.34"	23° 26' 17"	2 m 25 s
13	268° 36' 57"	-0.24"	268° 28' 54"	-23° 25' 51"	0.9838856	16' 15.35"	23° 26' 17"	2 m 24 s
14	268° 39' 30"	-0.25"	268° 31' 41"	-23° 25' 52"	0.9838827	16' 15.35"	23° 26' 17"	2 m 23 s
15	268° 42' 03"	-0.25"	268° 34' 27"	-23° 25' 54"	0.9838798	16' 15.35"	23° 26' 17"	2 m 22 s
16	268° 44' 35"	-0.26"	268° 37' 14"	-23° 25' 55"	0.9838769	16' 15.36"	23° 26' 17"	2 m 21 s
17	268° 47' 08"	-0.26"	268° 40' 00"	-23° 25' 57"	0.9838740	16' 15.36"	23° 26' 17"	2 m 19 s
18	268° 49' 41"	-0.27"	268° 42' 47"	-23° 25' 58"	0.9838712	16' 15.36"	23° 26' 17"	2 m 18 s
19	268° 52' 14"	-0.28"	268° 45' 33"	-23° 25' 60"	0.9838683	16' 15.36"	23° 26' 17"	2 m 17 s
20	268° 54' 46"	-0.28"	268° 48' 20"	-23° 26' 01"	0.9838654	16' 15.37"	23° 26' 17"	2 m 16 s
21	268° 57' 19"	-0.29"	268° 51' 06"	-23° 26' 02"	0.9838626	16' 15.37"	23° 26' 17"	2 m 14 s
22	268° 59' 52"	-0.29"	268° 53' 53"	-23° 26' 03"	0.9838597	16' 15.37"	23° 26' 17"	2 m 13 s
23	269° 02' 25"	-0.30"	268° 56' 39"	-23° 26' 05"	0.9838569	16' 15.38"	23° 26' 17"	2 m 12 s
24	269° 04' 58"	-0.30"	268° 59' 26"	-23° 26' 06"	0.9838541	16' 15.38"	23° 26' 17"	2 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	221° 36' 38"	0° 04' 54"	219° 12' 08"	-15° 14' 16"	0° 58' 38"	15' 58.52"	108° 1' 49"	0.15619
1	222° 11' 12"	0° 01' 47"	219° 45' 16"	-15° 27' 51"	0° 58' 40"	15' 59.17"	107° 50' 05"	0.15281
2	222° 45' 50"	0° -1' 20"	220° 18' 31"	-15° 41' 22"	0° 58' 42"	15' 59.83"	107° 38' 06"	0.14947
3	223° 20' 30"	0° -4' 27"	220° 51' 53"	-15° 54' 50"	0° 58' 45"	16' 00.48"	107° 25' 53"	0.14614
4	223° 55' 14"	0° -7' 35"	221° 25' 23"	-16° 08' 13"	0° 58' 47"	16' 01.13"	107° 13' 24"	0.14285
5	224° 30' 01"	0° -10' 43"	221° 59' 00"	-16° 21' 32"	0° 58' 49"	16' 01.78"	107° 0' 40"	0.13958
6	225° 04' 50"	0° -13' 51"	222° 32' 45"	-16° 34' 47"	0° 58' 52"	16' 02.43"	106° 47' 41"	0.13633
7	225° 39' 43"	0° -16' 60"	223° 06' 37"	-16° 47' 57"	0° 58' 54"	16' 03.07"	106° 34' 26"	0.13312
8	226° 14' 38"	0° -20' 08"	223° 40' 37"	-17° 01' 03"	0° 58' 57"	16' 03.72"	106° 20' 55"	0.12993
9	226° 49' 37"	0° -23' 17"	224° 14' 45"	-17° 14' 05"	0° 58' 59"	16' 04.36"	106° 7' 07"	0.12677
10	227° 24' 38"	0° -26' 25"	224° 48' 60"	-17° 27' 02"	0° 59' 01"	16' 05.00"	105° 53' 03"	0.12364
11	227° 59' 43"	0° -29' 34"	225° 23' 23"	-17° 39' 54"	0° 59' 04"	16' 05.63"	105° 38' 42"	0.12054
12	228° 34' 51"	0° -32' 43"	225° 57' 53"	-17° 52' 41"	0° 59' 06"	16' 06.27"	105° 24' 04"	0.11747
13	229° 10' 01"	0° -35' 52"	226° 32' 32"	-18° 05' 23"	0° 59' 08"	16' 06.90"	105° 9' 08"	0.11443
14	229° 45' 14"	0° -39' 01"	227° 07' 19"	-18° 17' 60"	0° 59' 11"	16' 07.53"	104° 53' 54"	0.11142
15	230° 20' 31"	0° -42' 10"	227° 42' 13"	-18° 30' 32"	0° 59' 13"	16' 08.16"	104° 38' 22"	0.10844
16	230° 55' 50"	0° -45' 19"	228° 17' 15"	-18° 42' 58"	0° 59' 15"	16' 08.78"	104° 22' 31"	0.10550
17	231° 31' 12"	0° -48' 28"	228° 52' 26"	-18° 55' 18"	0° 59' 17"	16' 09.41"	104° 6' 22"	0.10258
18	232° 06' 38"	0° -51' 36"	229° 27' 44"	-19° 07' 33"	0° 59' 20"	16' 10.02"	103° 49' 52"	0.09970
19	232° 42' 06"	0° -54' 45"	230° 03' 11"	-19° 19' 43"	0° 59' 22"	16' 10.64"	103° 33' 03"	0.09685
20	233° 17' 37"	0° -57' 54"	230° 38' 45"	-19° 31' 46"	0° 59' 24"	16' 11.25"	103° 15' 53"	0.09403
21	233° 53' 11"	-1° 01' 02"	231° 14' 28"	-19° 43' 43"	0° 59' 26"	16' 11.86"	102° 58' 22"	0.09125
22	234° 28' 48"	-1° 04' 10"	231° 50' 19"	-19° 55' 34"	0° 59' 29"	16' 12.47"	102° 40' 30"	0.08850
23	235° 04' 27"	-1° 07' 18"	232° 26' 18"	-20° 07' 19"	0° 59' 31"	16' 13.07"	102° 22' 16"	0.08579
24	235° 40' 10"	-1° 10' 26"	233° 02' 26"	-20° 18' 57"	0° 59' 33"	16' 13.67"	102° 3' 38"	0.08311

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	269° 04' 58"	-0.30"	268° 59' 26"	-23° 26' 06"	0.9838541	16' 15.38"	23° 26' 17"	2 m 11 s
1	269° 07' 30"	-0.31"	269° 02' 12"	-23° 26' 07"	0.9838512	16' 15.38"	23° 26' 17"	2 m 09 s
2	269° 10' 03"	-0.31"	269° 04' 59"	-23° 26' 08"	0.9838484	16' 15.38"	23° 26' 17"	2 m 08 s
3	269° 12' 36"	-0.32"	269° 07' 45"	-23° 26' 09"	0.9838456	16' 15.39"	23° 26' 17"	2 m 07 s
4	269° 15' 09"	-0.32"	269° 10' 32"	-23° 26' 10"	0.9838428	16' 15.39"	23° 26' 17"	2 m 06 s
5	269° 17' 41"	-0.33"	269° 13' 18"	-23° 26' 10"	0.9838400	16' 15.39"	23° 26' 17"	2 m 04 s
6	269° 20' 14"	-0.33"	269° 16' 05"	-23° 26' 11"	0.9838372	16' 15.40"	23° 26' 17"	2 m 03 s
7	269° 22' 47"	-0.34"	269° 18' 51"	-23° 26' 12"	0.9838344	16' 15.40"	23° 26' 17"	2 m 02 s
8	269° 25' 20"	-0.34"	269° 21' 38"	-23° 26' 13"	0.9838316	16' 15.40"	23° 26' 17"	2 m 01 s
9	269° 27' 53"	-0.35"	269° 24' 24"	-23° 26' 13"	0.9838289	16' 15.40"	23° 26' 17"	1 m 59 s
10	269° 30' 25"	-0.35"	269° 27' 11"	-23° 26' 14"	0.9838261	16' 15.41"	23° 26' 17"	1 m 58 s
11	269° 32' 58"	-0.36"	269° 29' 57"	-23° 26' 14"	0.9838233	16' 15.41"	23° 26' 17"	1 m 57 s
12	269° 35' 31"	-0.36"	269° 32' 44"	-23° 26' 15"	0.9838206	16' 15.41"	23° 26' 17"	1 m 56 s
13	269° 38' 04"	-0.37"	269° 35' 31"	-23° 26' 15"	0.9838178	16' 15.41"	23° 26' 17"	1 m 55 s
14	269° 40' 37"	-0.37"	269° 38' 17"	-23° 26' 16"	0.9838151	16' 15.42"	23° 26' 17"	1 m 53 s
15	269° 43' 09"	-0.38"	269° 41' 04"	-23° 26' 16"	0.9838124	16' 15.42"	23° 26' 17"	1 m 52 s
16	269° 45' 42"	-0.38"	269° 43' 50"	-23° 26' 17"	0.9838096	16' 15.42"	23° 26' 17"	1 m 51 s
17	269° 48' 15"	-0.39"	269° 46' 37"	-23° 26' 17"	0.9838069	16' 15.43"	23° 26' 17"	1 m 50 s
18	269° 50' 48"	-0.39"	269° 49' 23"	-23° 26' 17"	0.9838042	16' 15.43"	23° 26' 17"	1 m 48 s
19	269° 53' 21"	-0.40"	269° 52' 10"	-23° 26' 17"	0.9838015	16' 15.43"	23° 26' 17"	1 m 47 s
20	269° 55' 53"	-0.40"	269° 54' 56"	-23° 26' 17"	0.9837988	16' 15.43"	23° 26' 17"	1 m 46 s
21	269° 58' 26"	-0.41"	269° 57' 43"	-23° 26' 17"	0.9837961	16' 15.44"	23° 26' 17"	1 m 45 s
22	270° 00' 59"	-0.41"	270° 00' 29"	-23° 26' 17"	0.9837934	16' 15.44"	23° 26' 17"	1 m 43 s
23	270° 03' 32"	-0.42"	270° 03' 16"	-23° 26' 17"	0.9837907	16' 15.44"	23° 26' 17"	1 m 42 s
24	270° 06' 05"	-0.42"	270° 06' 03"	-23° 26' 17"	0.9837880	16' 15.44"	23° 26' 17"	1 m 41 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	235° 40' 10"	-1° 10' 26"	233° 02' 26"	-20° 18' 57"	0° 59' 33"	16' 13.67"	102° 3' 38"	0.08311
1	236° 15' 56"	-1° 13' 34"	233° 38' 42"	-20° 30' 29"	0° 59' 35"	16' 14.26"	101° 44' 38"	0.08047
2	236° 51' 44"	-1° 16' 41"	234° 15' 06"	-20° 41' 54"	0° 59' 37"	16' 14.85"	101° 25' 13"	0.07786
3	237° 27' 35"	-1° 19' 48"	234° 51' 38"	-20° 53' 12"	0° 59' 40"	16' 15.44"	101° 5' 24"	0.07529
4	238° 03' 29"	-1° 22' 55"	235° 28' 18"	-21° 04' 23"	0° 59' 42"	16' 16.02"	100° 45' 09"	0.07276
5	238° 39' 26"	-1° 26' 02"	236° 05' 07"	-21° 15' 28"	0° 59' 44"	16' 16.60"	100° 24' 27"	0.07026
6	239° 15' 25"	-1° 29' 08"	236° 42' 04"	-21° 26' 25"	0° 59' 46"	16' 17.17"	100° 3' 19"	0.06780
7	239° 51' 28"	-1° 32' 13"	237° 19' 09"	-21° 37' 14"	0° 59' 48"	16' 17.74"	99° 41' 41"	0.06538
8	240° 27' 33"	-1° 35' 19"	237° 56' 23"	-21° 47' 56"	0° 59' 50"	16' 18.30"	99° 19' 34"	0.06300
9	241° 03' 41"	-1° 38' 24"	238° 33' 45"	-21° 58' 31"	0° 59' 52"	16' 18.86"	98° 56' 57"	0.06066
10	241° 39' 51"	-1° 41' 28"	239° 11' 15"	-22° 08' 58"	0° 59' 54"	16' 19.42"	98° 33' 48"	0.05835
11	242° 16' 05"	-1° 44' 32"	239° 48' 53"	-22° 19' 17"	0° 59' 56"	16' 19.97"	98° 10' 05"	0.05609
12	242° 52' 21"	-1° 47' 36"	240° 26' 40"	-22° 29' 28"	0° 59' 58"	16' 20.51"	97° 45' 48"	0.05387
13	243° 28' 39"	-1° 50' 39"	241° 04' 34"	-22° 39' 30"	1° 00' 00"	16' 21.05"	97° 20' 54"	0.05169
14	244° 05' 00"	-1° 53' 41"	241° 42' 37"	-22° 49' 25"	1° 00' 02"	16' 21.59"	96° 55' 23"	0.04954
15	244° 41' 24"	-1° 56' 43"	242° 20' 48"	-22° 59' 11"	1° 00' 04"	16' 22.12"	96° 29' 12"	0.04744
16	245° 17' 51"	-1° 59' 44"	242° 59' 07"	-23° 08' 49"	1° 00' 06"	16' 22.64"	96° 2' 18"	0.04539
17	245° 54' 20"	-2° 02' 45"	243° 37' 34"	-23° 18' 17"	1° 00' 08"	16' 23.16"	95° 34' 41"	0.04337
18	246° 30' 51"	-2° 05' 45"	244° 16' 10"	-23° 27' 37"	1° 00' 10"	16' 23.67"	95° 6' 16"	0.04140
19	247° 07' 26"	-2° 08' 44"	244° 54' 53"	-23° 36' 49"	1° 00' 12"	16' 24.18"	94° 37' 03"	0.03947
20	247° 44' 02"	-2° 11' 43"	245° 33' 44"	-23° 45' 51"	1° 00' 14"	16' 24.68"	94° 6' 57"	0.03758
21	248° 20' 41"	-2° 14' 40"	246° 12' 42"	-23° 54' 43"	1° 00' 15"	16' 25.17"	93° 35' 55"	0.03574
22	248° 57' 23"	-2° 17' 38"	246° 51' 49"	-24° 03' 27"	1° 00' 17"	16' 25.66"	93° 3' 53"	0.03394
23	249° 34' 07"	-2° 20' 34"	247° 31' 03"	-24° 12' 01"	1° 00' 19"	16' 26.14"	92° 30' 49"	0.03219
24	250° 10' 54"	-2° 23' 29"	248° 10' 25"	-24° 20' 26"	1° 00' 21"	16' 26.62"	91° 56' 36"	0.03048

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	270° 06' 05"	-0.42"	270° 06' 03"	-23° 26' 17"	0.9837880	16' 15.44"	23° 26' 17"	1 m 41 s
1	270° 08' 37"	-0.43"	270° 08' 49"	-23° 26' 17"	0.9837853	16' 15.45"	23° 26' 17"	1 m 40 s
2	270° 11' 10"	-0.43"	270° 11' 36"	-23° 26' 17"	0.9837827	16' 15.45"	23° 26' 17"	1 m 38 s
3	270° 13' 43"	-0.44"	270° 14' 22"	-23° 26' 17"	0.9837800	16' 15.45"	23° 26' 17"	1 m 37 s
4	270° 16' 16"	-0.44"	270° 17' 09"	-23° 26' 16"	0.9837774	16' 15.45"	23° 26' 17"	1 m 36 s
5	270° 18' 49"	-0.45"	270° 19' 55"	-23° 26' 16"	0.9837747	16' 15.46"	23° 26' 17"	1 m 35 s
6	270° 21' 21"	-0.45"	270° 22' 42"	-23° 26' 16"	0.9837721	16' 15.46"	23° 26' 17"	1 m 33 s
7	270° 23' 54"	-0.46"	270° 25' 28"	-23° 26' 15"	0.9837694	16' 15.46"	23° 26' 17"	1 m 32 s
8	270° 26' 27"	-0.46"	270° 28' 15"	-23° 26' 15"	0.9837668	16' 15.46"	23° 26' 17"	1 m 31 s
9	270° 28' 60"	-0.46"	270° 31' 02"	-23° 26' 14"	0.9837642	16' 15.47"	23° 26' 17"	1 m 30 s
10	270° 31' 33"	-0.47"	270° 33' 48"	-23° 26' 14"	0.9837615	16' 15.47"	23° 26' 17"	1 m 29 s
11	270° 34' 05"	-0.47"	270° 36' 35"	-23° 26' 13"	0.9837589	16' 15.47"	23° 26' 17"	1 m 27 s
12	270° 36' 38"	-0.48"	270° 39' 21"	-23° 26' 13"	0.9837563	16' 15.48"	23° 26' 17"	1 m 26 s
13	270° 39' 11"	-0.48"	270° 42' 08"	-23° 26' 12"	0.9837537	16' 15.48"	23° 26' 17"	1 m 25 s
14	270° 41' 44"	-0.49"	270° 44' 54"	-23° 26' 11"	0.9837511	16' 15.48"	23° 26' 17"	1 m 24 s
15	270° 44' 17"	-0.49"	270° 47' 41"	-23° 26' 10"	0.9837485	16' 15.48"	23° 26' 17"	1 m 22 s
16	270° 46' 50"	-0.49"	270° 50' 28"	-23° 26' 09"	0.9837460	16' 15.49"	23° 26' 17"	1 m 21 s
17	270° 49' 22"	-0.50"	270° 53' 14"	-23° 26' 08"	0.9837434	16' 15.49"	23° 26' 17"	1 m 20 s
18	270° 51' 55"	-0.50"	270° 56' 01"	-23° 26' 07"	0.9837408	16' 15.49"	23° 26' 17"	1 m 19 s
19	270° 54' 28"	-0.51"	270° 58' 47"	-23° 26' 06"	0.9837382	16' 15.49"	23° 26' 17"	1 m 17 s
20	270° 57' 01"	-0.51"	271° 01' 34"	-23° 26' 05"	0.9837357	16' 15.50"	23° 26' 17"	1 m 16 s
21	270° 59' 34"	-0.51"	271° 04' 20"	-23° 26' 04"	0.9837331	16' 15.50"	23° 26' 17"	1 m 15 s
22	271° 02' 06"	-0.52"	271° 07' 07"	-23° 26' 03"	0.9837306	16' 15.50"	23° 26' 17"	1 m 14 s
23	271° 04' 39"	-0.52"	271° 09' 53"	-23° 26' 02"	0.9837280	16' 15.50"	23° 26' 17"	1 m 12 s
24	271° 07' 12"	-0.53"	271° 12' 40"	-23° 26' 01"	0.9837255	16' 15.51"	23° 26' 17"	1 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	250° 10' 54"	-2° 23' 29"	248° 10' 25"	-24° 20' 26"	1° 00' 21"	16' 26.62"	91° 56' 36"	0.03048
1	250° 47' 42"	-2° 26' 24"	248° 49' 55"	-24° 28' 40"	1° 00' 22"	16' 27.09"	91° 21' 10"	0.02881
2	251° 24' 34"	-2° 29' 18"	249° 29' 32"	-24° 36' 45"	1° 00' 24"	16' 27.55"	90° 44' 25"	0.02719
3	252° 01' 27"	-2° 32' 11"	250° 09' 17"	-24° 44' 40"	1° 00' 26"	16' 28.00"	90° 6' 15"	0.02562
4	252° 38' 23"	-2° 35' 03"	250° 49' 08"	-24° 52' 25"	1° 00' 27"	16' 28.45"	89° 26' 33"	0.02409
5	253° 15' 21"	-2° 37' 54"	251° 29' 07"	-24° 59' 60"	1° 00' 29"	16' 28.90"	88° 45' 11"	0.02261
6	253° 52' 21"	-2° 40' 44"	252° 09' 13"	-25° 07' 24"	1° 00' 31"	16' 29.33"	88° 1' 59"	0.02118
7	254° 29' 24"	-2° 43' 33"	252° 49' 26"	-25° 14' 38"	1° 00' 32"	16' 29.76"	87° 16' 48"	0.01979
8	255° 06' 28"	-2° 46' 22"	253° 29' 47"	-25° 21' 42"	1° 00' 34"	16' 30.18"	86° 29' 25"	0.01846
9	255° 43' 35"	-2° 49' 09"	254° 10' 13"	-25° 28' 34"	1° 00' 35"	16' 30.60"	85° 39' 36"	0.01717
10	256° 20' 44"	-2° 51' 55"	254° 50' 47"	-25° 35' 16"	1° 00' 37"	16' 31.00"	84° 47' 06"	0.01592
11	256° 57' 55"	-2° 54' 40"	255° 31' 27"	-25° 41' 47"	1° 00' 38"	16' 31.40"	83° 51' 38"	0.01473
12	257° 35' 08"	-2° 57' 24"	256° 12' 13"	-25° 48' 07"	1° 00' 40"	16' 31.79"	82° 52' 50"	0.01358
13	258° 12' 23"	-3° 00' 06"	256° 53' 06"	-25° 54' 16"	1° 00' 41"	16' 32.18"	81° 50' 17"	0.01249
14	258° 49' 40"	-3° 02' 48"	257° 34' 05"	-26° 00' 14"	1° 00' 42"	16' 32.55"	80° 43' 32"	0.01144
15	259° 26' 59"	-3° 05' 28"	258° 15' 10"	-26° 06' 00"	1° 00' 44"	16' 32.92"	79° 31' 60"	0.01044
16	260° 04' 20"	-3° 08' 08"	258° 56' 21"	-26° 11' 35"	1° 00' 45"	16' 33.29"	78° 15' 02"	0.00949
17	260° 41' 42"	-3° 10' 46"	259° 37' 38"	-26° 16' 59"	1° 00' 46"	16' 33.64"	76° 51' 51"	0.00859
18	261° 19' 07"	-3° 13' 22"	260° 18' 60"	-26° 22' 10"	1° 00' 48"	16' 33.98"	75° 21' 29"	0.00775
19	261° 56' 33"	-3° 15' 58"	261° 00' 27"	-26° 27' 11"	1° 00' 49"	16' 34.32"	73° 42' 49"	0.00695
20	262° 34' 01"	-3° 18' 32"	261° 42' 00"	-26° 31' 59"	1° 00' 50"	16' 34.65"	71° 54' 30"	0.00620
21	263° 11' 31"	-3° 21' 05"	262° 23' 38"	-26° 36' 35"	1° 00' 51"	16' 34.97"	69° 54' 50"	0.00550
22	263° 49' 02"	-3° 23' 36"	263° 05' 21"	-26° 40' 59"	1° 00' 52"	16' 35.29"	67° 41' 49"	0.00486
23	264° 26' 36"	-3° 26' 06"	263° 47' 09"	-26° 45' 12"	1° 00' 54"	16' 35.59"	65° 12' 59"	0.00426
24	265° 04' 10"	-3° 28' 35"	264° 29' 01"	-26° 49' 12"	1° 00' 55"	16' 35.89"	62° 25' 19"	0.00372

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	271° 07' 12"	-0.53"	271° 12' 40"	-23° 26' 01"	0.9837255	16' 15.51"	23° 26' 17"	1 m 11 s
1	271° 09' 45"	-0.53"	271° 15' 27"	-23° 25' 59"	0.9837230	16' 15.51"	23° 26' 17"	1 m 10 s
2	271° 12' 18"	-0.53"	271° 18' 13"	-23° 25' 58"	0.9837204	16' 15.51"	23° 26' 17"	1 m 09 s
3	271° 14' 51"	-0.54"	271° 20' 60"	-23° 25' 57"	0.9837179	16' 15.51"	23° 26' 17"	1 m 07 s
4	271° 17' 23"	-0.54"	271° 23' 46"	-23° 25' 55"	0.9837154	16' 15.52"	23° 26' 17"	1 m 06 s
5	271° 19' 56"	-0.55"	271° 26' 33"	-23° 25' 54"	0.9837129	16' 15.52"	23° 26' 17"	1 m 05 s
6	271° 22' 29"	-0.55"	271° 29' 19"	-23° 25' 52"	0.9837104	16' 15.52"	23° 26' 17"	1 m 04 s
7	271° 25' 02"	-0.55"	271° 32' 06"	-23° 25' 50"	0.9837079	16' 15.52"	23° 26' 17"	1 m 02 s
8	271° 27' 35"	-0.56"	271° 34' 53"	-23° 25' 49"	0.9837054	16' 15.53"	23° 26' 17"	1 m 01 s
9	271° 30' 08"	-0.56"	271° 37' 39"	-23° 25' 47"	0.9837030	16' 15.53"	23° 26' 17"	0 m 60 s
10	271° 32' 40"	-0.56"	271° 40' 26"	-23° 25' 45"	0.9837005	16' 15.53"	23° 26' 17"	0 m 59 s
11	271° 35' 13"	-0.57"	271° 43' 12"	-23° 25' 44"	0.9836980	16' 15.53"	23° 26' 17"	0 m 58 s
12	271° 37' 46"	-0.57"	271° 45' 59"	-23° 25' 42"	0.9836955	16' 15.54"	23° 26' 17"	0 m 56 s
13	271° 40' 19"	-0.57"	271° 48' 45"	-23° 25' 40"	0.9836931	16' 15.54"	23° 26' 17"	0 m 55 s
14	271° 42' 52"	-0.58"	271° 51' 32"	-23° 25' 38"	0.9836906	16' 15.54"	23° 26' 17"	0 m 54 s
15	271° 45' 25"	-0.58"	271° 54' 19"	-23° 25' 36"	0.9836882	16' 15.54"	23° 26' 17"	0 m 53 s
16	271° 47' 57"	-0.58"	271° 57' 05"	-23° 25' 34"	0.9836858	16' 15.55"	23° 26' 17"	0 m 51 s
17	271° 50' 30"	-0.59"	271° 59' 52"	-23° 25' 32"	0.9836833	16' 15.55"	23° 26' 17"	0 m 50 s
18	271° 53' 03"	-0.59"	272° 02' 38"	-23° 25' 30"	0.9836809	16' 15.55"	23° 26' 17"	0 m 49 s
19	271° 55' 36"	-0.59"	272° 05' 25"	-23° 25' 27"	0.9836785	16' 15.55"	23° 26' 17"	0 m 48 s
20	271° 58' 09"	-0.60"	272° 08' 11"	-23° 25' 25"	0.9836761	16' 15.55"	23° 26' 17"	0 m 46 s
21	272° 00' 42"	-0.60"	272° 10' 58"	-23° 25' 23"	0.9836736	16' 15.56"	23° 26' 17"	0 m 45 s
22	272° 03' 14"	-0.60"	272° 13' 44"	-23° 25' 21"	0.9836712	16' 15.56"	23° 26' 17"	0 m 44 s
23	272° 05' 47"	-0.60"	272° 16' 31"	-23° 25' 18"	0.9836688	16' 15.56"	23° 26' 17"	0 m 43 s
24	272° 08' 20"	-0.61"	272° 19' 18"	-23° 25' 16"	0.9836665	16' 15.56"	23° 26' 17"	0 m 41 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	265° 04' 10"	-3° 28' 35"	264° 29' 01"	-26° 49' 12"	1° 00' 55"	16' 35.89"	62° 25' 19"	0.00372
1	265° 41' 46"	-3° 31' 02"	265° 10' 58"	-26° 52' 60"	1° 00' 56"	16' 36.18"	59° 15' 11"	0.00323
2	266° 19' 24"	-3° 33' 28"	265° 52' 59"	-26° 56' 36"	1° 00' 57"	16' 36.46"	55° 38' 12"	0.00279
3	266° 57' 03"	-3° 35' 52"	266° 35' 04"	-26° 59' 59"	1° 00' 58"	16' 36.73"	51° 29' 15"	0.00240
4	267° 34' 44"	-3° 38' 15"	267° 17' 12"	-27° 03' 10"	1° 00' 59"	16' 36.99"	46° 42' 38"	0.00207
5	268° 12' 26"	-3° 40' 36"	267° 59' 25"	-27° 06' 08"	1° 00' 60"	16' 37.24"	41° 12' 30"	0.00178
6	268° 50' 09"	-3° 42' 56"	268° 41' 40"	-27° 08' 54"	1° 01' 01"	16' 37.49"	34° 53' 49"	0.00155
7	269° 27' 52"	-3° 45' 14"	269° 23' 57"	-27° 11' 27"	1° 01' 01"	16' 37.73"	27° 44' 36"	0.00137
8	270° 05' 38"	-3° 47' 30"	270° 06' 19"	-27° 13' 47"	1° 01' 02"	16' 37.95"	19° 46' 38"	0.00124
9	270° 43' 25"	-3° 49' 45"	270° 48' 44"	-27° 15' 55"	1° 01' 03"	16' 38.17"	11° 10' 10"	0.00117
10	271° 21' 14"	-3° 51' 59"	271° 31' 12"	-27° 17' 50"	1° 01' 04"	16' 38.38"	2° 12' 51"	0.00115
11	271° 59' 03"	-3° 54' 10"	272° 13' 42"	-27° 19' 32"	1° 01' 05"	16' 38.58"	353° 17' 22"	0.00118
12	272° 36' 54"	-3° 56' 21"	272° 56' 14"	-27° 21' 02"	1° 01' 05"	16' 38.78"	344° 45' 54"	0.00126
13	273° 14' 45"	-3° 58' 29"	273° 38' 49"	-27° 22' 18"	1° 01' 06"	16' 38.96"	336° 54' 58"	0.00140
14	273° 52' 38"	-4° 00' 36"	274° 21' 25"	-27° 23' 21"	1° 01' 07"	16' 39.13"	329° 53' 11"	0.00159
15	274° 30' 32"	-4° 02' 40"	275° 04' 03"	-27° 24' 12"	1° 01' 07"	16' 39.30"	323° 42' 10"	0.00183
16	275° 08' 26"	-4° 04' 44"	275° 46' 42"	-27° 24' 50"	1° 01' 08"	16' 39.45"	318° 18' 56"	0.00212
17	275° 46' 21"	-4° 06' 45"	276° 29' 22"	-27° 25' 14"	1° 01' 08"	16' 39.60"	313° 38' 14"	0.00247
18	276° 24' 17"	-4° 08' 45"	277° 12' 03"	-27° 25' 26"	1° 01' 09"	16' 39.74"	309° 34' 12"	0.00287
19	277° 02' 14"	-4° 10' 43"	277° 54' 45"	-27° 25' 24"	1° 01' 09"	16' 39.87"	306° 1' 11"	0.00333
20	277° 40' 12"	-4° 12' 39"	278° 37' 27"	-27° 25' 10"	1° 01' 10"	16' 39.99"	302° 54' 11"	0.00383
21	278° 18' 10"	-4° 14' 33"	279° 20' 10"	-27° 24' 42"	1° 01' 10"	16' 40.10"	300° 8' 58"	0.00439
22	278° 56' 09"	-4° 16' 25"	280° 02' 52"	-27° 24' 02"	1° 01' 10"	16' 40.20"	297° 41' 59"	0.00500
23	279° 34' 09"	-4° 18' 15"	280° 45' 35"	-27° 23' 08"	1° 01' 11"	16' 40.29"	295° 30' 19"	0.00567
24	280° 12' 09"	-4° 20' 04"	281° 28' 17"	-27° 22' 02"	1° 01' 11"	16' 40.37"	293° 31' 36"	0.00639

24 Desember 2022

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	272° 08' 20"	-0.61"	272° 19' 18"	-23° 25' 16"	0.9836665	16' 15.56"	23° 26' 17"	0 m 41 s
1	272° 10' 53"	-0.61"	272° 22' 04"	-23° 25' 13"	0.9836641	16' 15.57"	23° 26' 17"	0 m 40 s
2	272° 13' 26"	-0.61"	272° 24' 51"	-23° 25' 11"	0.9836617	16' 15.57"	23° 26' 17"	0 m 39 s
3	272° 15' 59"	-0.62"	272° 27' 37"	-23° 25' 08"	0.9836593	16' 15.57"	23° 26' 17"	0 m 38 s
4	272° 18' 32"	-0.62"	272° 30' 24"	-23° 25' 06"	0.9836569	16' 15.57"	23° 26' 17"	0 m 36 s
5	272° 21' 04"	-0.62"	272° 33' 10"	-23° 25' 03"	0.9836546	16' 15.58"	23° 26' 17"	0 m 35 s
6	272° 23' 37"	-0.62"	272° 35' 57"	-23° 25' 00"	0.9836522	16' 15.58"	23° 26' 17"	0 m 34 s
7	272° 26' 10"	-0.63"	272° 38' 43"	-23° 24' 57"	0.9836499	16' 15.58"	23° 26' 17"	0 m 33 s
8	272° 28' 43"	-0.63"	272° 41' 30"	-23° 24' 55"	0.9836475	16' 15.58"	23° 26' 17"	0 m 31 s
9	272° 31' 16"	-0.63"	272° 44' 17"	-23° 24' 52"	0.9836452	16' 15.59"	23° 26' 17"	0 m 30 s
10	272° 33' 49"	-0.63"	272° 47' 03"	-23° 24' 49"	0.9836429	16' 15.59"	23° 26' 17"	0 m 29 s
11	272° 36' 22"	-0.64"	272° 49' 50"	-23° 24' 46"	0.9836405	16' 15.59"	23° 26' 17"	0 m 28 s
12	272° 38' 54"	-0.64"	272° 52' 36"	-23° 24' 43"	0.9836382	16' 15.59"	23° 26' 17"	0 m 27 s
13	272° 41' 27"	-0.64"	272° 55' 23"	-23° 24' 40"	0.9836359	16' 15.59"	23° 26' 17"	0 m 25 s
14	272° 44' 00"	-0.64"	272° 58' 09"	-23° 24' 37"	0.9836336	16' 15.60"	23° 26' 17"	0 m 24 s
15	272° 46' 33"	-0.64"	273° 00' 56"	-23° 24' 33"	0.9836313	16' 15.60"	23° 26' 17"	0 m 23 s
16	272° 49' 06"	-0.65"	273° 03' 42"	-23° 24' 30"	0.9836290	16' 15.60"	23° 26' 17"	0 m 22 s
17	272° 51' 39"	-0.65"	273° 06' 29"	-23° 24' 27"	0.9836267	16' 15.60"	23° 26' 17"	0 m 20 s
18	272° 54' 11"	-0.65"	273° 09' 15"	-23° 24' 24"	0.9836244	16' 15.61"	23° 26' 17"	0 m 19 s
19	272° 56' 44"	-0.65"	273° 12' 02"	-23° 24' 20"	0.9836222	16' 15.61"	23° 26' 17"	0 m 18 s
20	272° 59' 17"	-0.65"	273° 14' 48"	-23° 24' 17"	0.9836199	16' 15.61"	23° 26' 17"	0 m 17 s
21	273° 01' 50"	-0.66"	273° 17' 35"	-23° 24' 13"	0.9836176	16' 15.61"	23° 26' 17"	0 m 15 s
22	273° 04' 23"	-0.66"	273° 20' 21"	-23° 24' 10"	0.9836154	16' 15.62"	23° 26' 17"	0 m 14 s
23	273° 06' 56"	-0.66"	273° 23' 08"	-23° 24' 06"	0.9836131	16' 15.62"	23° 26' 17"	0 m 13 s
24	273° 09' 29"	-0.66"	273° 25' 55"	-23° 24' 03"	0.9836109	16' 15.62"	23° 26' 17"	0 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	280° 12' 09"	-4° 20' 04"	281° 28' 17"	-27° 22' 02"	1° 01' 11"	16' 40.37"	293° 31' 36"	0.00639
1	280° 50' 09"	-4° 21' 51"	282° 10' 59"	-27° 20' 42"	1° 01' 11"	16' 40.45"	291° 43' 50"	0.00716
2	281° 28' 10"	-4° 23' 35"	282° 53' 39"	-27° 19' 09"	1° 01' 12"	16' 40.51"	290° 5' 27"	0.00798
3	282° 06' 12"	-4° 25' 18"	283° 36' 19"	-27° 17' 24"	1° 01' 12"	16' 40.57"	288° 35' 06"	0.00886
4	282° 44' 14"	-4° 26' 59"	284° 18' 58"	-27° 15' 25"	1° 01' 12"	16' 40.61"	287° 11' 41"	0.00979
5	283° 22' 16"	-4° 28' 38"	285° 01' 35"	-27° 13' 14"	1° 01' 12"	16' 40.65"	285° 54' 18"	0.01077
6	284° 00' 18"	-4° 30' 15"	285° 44' 10"	-27° 10' 49"	1° 01' 12"	16' 40.68"	284° 42' 10"	0.01180
7	284° 38' 20"	-4° 31' 49"	286° 26' 43"	-27° 08' 12"	1° 01' 12"	16' 40.70"	283° 34' 39"	0.01288
8	285° 16' 23"	-4° 33' 22"	287° 09' 15"	-27° 05' 22"	1° 01' 12"	16' 40.71"	282° 31' 12"	0.01402
9	285° 54' 26"	-4° 34' 53"	287° 51' 44"	-27° 02' 19"	1° 01' 12"	16' 40.71"	281° 31' 21"	0.01521
10	286° 32' 29"	-4° 36' 22"	288° 34' 11"	-26° 59' 03"	1° 01' 12"	16' 40.70"	280° 34' 44"	0.01645
11	287° 10' 31"	-4° 37' 49"	289° 16' 34"	-26° 55' 34"	1° 01' 12"	16' 40.68"	279° 40' 58"	0.01774
12	287° 48' 34"	-4° 39' 13"	289° 58' 55"	-26° 51' 53"	1° 01' 12"	16' 40.65"	278° 49' 48"	0.01908
13	288° 26' 37"	-4° 40' 36"	290° 41' 13"	-26° 47' 59"	1° 01' 12"	16' 40.61"	278° 0' 57"	0.02047
14	289° 04' 40"	-4° 41' 56"	291° 23' 28"	-26° 43' 53"	1° 01' 12"	16' 40.57"	277° 14' 12"	0.02192
15	289° 42' 42"	-4° 43' 15"	292° 05' 39"	-26° 39' 34"	1° 01' 12"	16' 40.51"	276° 29' 23"	0.02341
16	290° 20' 44"	-4° 44' 31"	292° 47' 46"	-26° 35' 03"	1° 01' 11"	16' 40.45"	275° 46' 18"	0.02496
17	290° 58' 46"	-4° 45' 45"	293° 29' 50"	-26° 30' 20"	1° 01' 11"	16' 40.38"	275° 4' 49"	0.02656
18	291° 36' 48"	-4° 46' 57"	294° 11' 50"	-26° 25' 24"	1° 01' 11"	16' 40.29"	274° 24' 48"	0.02820
19	292° 14' 49"	-4° 48' 07"	294° 53' 45"	-26° 20' 16"	1° 01' 11"	16' 40.20"	273° 46' 08"	0.02990
20	292° 52' 50"	-4° 49' 15"	295° 35' 36"	-26° 14' 56"	1° 01' 10"	16' 40.10"	273° 8' 44"	0.03164
21	293° 30' 50"	-4° 50' 21"	296° 17' 22"	-26° 09' 24"	1° 01' 10"	16' 40.00"	272° 32' 29"	0.03344
22	294° 08' 50"	-4° 51' 24"	296° 59' 04"	-26° 03' 40"	1° 01' 09"	16' 39.88"	271° 57' 18"	0.03528
23	294° 46' 49"	-4° 52' 26"	297° 40' 41"	-25° 57' 44"	1° 01' 09"	16' 39.75"	271° 23' 08"	0.03717
24	295° 24' 48"	-4° 53' 25"	298° 22' 13"	-25° 51' 36"	1° 01' 08"	16' 39.62"	270° 49' 55"	0.03911

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DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	273° 09' 29"	-0.66"	273° 25' 55"	-23° 24' 03"	0.9836109	16' 15.62"	23° 26' 17"	0 m 12 s
1	273° 12' 01"	-0.66"	273° 28' 41"	-23° 23' 59"	0.9836086	16' 15.62"	23° 26' 17"	0 m 10 s
2	273° 14' 34"	-0.66"	273° 31' 28"	-23° 23' 55"	0.9836064	16' 15.62"	23° 26' 17"	0 m 09 s
3	273° 17' 07"	-0.67"	273° 34' 14"	-23° 23' 51"	0.9836042	16' 15.63"	23° 26' 17"	0 m 08 s
4	273° 19' 40"	-0.67"	273° 37' 01"	-23° 23' 48"	0.9836020	16' 15.63"	23° 26' 17"	0 m 07 s
5	273° 22' 13"	-0.67"	273° 39' 47"	-23° 23' 44"	0.9835997	16' 15.63"	23° 26' 17"	0 m 05 s
6	273° 24' 46"	-0.67"	273° 42' 34"	-23° 23' 40"	0.9835975	16' 15.63"	23° 26' 17"	0 m 04 s
7	273° 27' 19"	-0.67"	273° 45' 20"	-23° 23' 36"	0.9835953	16' 15.63"	23° 26' 17"	0 m 03 s
8	273° 29' 51"	-0.67"	273° 48' 07"	-23° 23' 32"	0.9835931	16' 15.64"	23° 26' 17"	0 m 02 s
9	273° 32' 24"	-0.67"	273° 50' 53"	-23° 23' 28"	0.9835909	16' 15.64"	23° 26' 17"	0 m 01 s
10	273° 34' 57"	-0.68"	273° 53' 40"	-23° 23' 24"	0.9835888	16' 15.64"	23° 26' 17"	0 m -1 s
11	273° 37' 30"	-0.68"	273° 56' 26"	-23° 23' 20"	0.9835866	16' 15.64"	23° 26' 17"	0 m -2 s
12	273° 40' 03"	-0.68"	273° 59' 13"	-23° 23' 15"	0.9835844	16' 15.65"	23° 26' 17"	0 m -3 s
13	273° 42' 36"	-0.68"	274° 01' 59"	-23° 23' 11"	0.9835823	16' 15.65"	23° 26' 17"	0 m -4 s
14	273° 45' 09"	-0.68"	274° 04' 46"	-23° 23' 07"	0.9835801	16' 15.65"	23° 26' 17"	0 m -6 s
15	273° 47' 42"	-0.68"	274° 07' 32"	-23° 23' 03"	0.9835779	16' 15.65"	23° 26' 17"	0 m -7 s
16	273° 50' 14"	-0.68"	274° 10' 19"	-23° 22' 58"	0.9835758	16' 15.65"	23° 26' 17"	0 m -8 s
17	273° 52' 47"	-0.68"	274° 13' 05"	-23° 22' 54"	0.9835737	16' 15.66"	23° 26' 17"	0 m -9 s
18	273° 55' 20"	-0.68"	274° 15' 51"	-23° 22' 49"	0.9835715	16' 15.66"	23° 26' 17"	0 m -11 s
19	273° 57' 53"	-0.68"	274° 18' 38"	-23° 22' 45"	0.9835694	16' 15.66"	23° 26' 17"	0 m -12 s
20	274° 00' 26"	-0.68"	274° 21' 24"	-23° 22' 40"	0.9835673	16' 15.66"	23° 26' 17"	0 m -13 s
21	274° 02' 59"	-0.69"	274° 24' 11"	-23° 22' 35"	0.9835652	16' 15.66"	23° 26' 17"	0 m -14 s
22	274° 05' 32"	-0.69"	274° 26' 57"	-23° 22' 31"	0.9835631	16' 15.67"	23° 26' 17"	0 m -15 s
23	274° 08' 04"	-0.69"	274° 29' 44"	-23° 22' 26"	0.9835610	16' 15.67"	23° 26' 17"	0 m -17 s
24	274° 10' 37"	-0.69"	274° 32' 30"	-23° 22' 21"	0.9835589	16' 15.67"	23° 26' 17"	0 m -18 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	295° 24' 48"	-4° 53' 25"	298° 22' 13"	-25° 51' 36"	1° 01' 08"	16' 39.62"	270° 49' 55"	0.03911
1	296° 02' 46"	-4° 54' 22"	299° 03' 39"	-25° 45' 17"	1° 01' 08"	16' 39.47"	270° 17' 34"	0.04110
2	296° 40' 44"	-4° 55' 16"	299° 45' 00"	-25° 38' 45"	1° 01' 07"	16' 39.32"	269° 46' 03"	0.04314
3	297° 18' 40"	-4° 56' 09"	300° 26' 16"	-25° 32' 03"	1° 01' 07"	16' 39.16"	269° 15' 19"	0.04522
4	297° 56' 36"	-4° 56' 60"	301° 07' 26"	-25° 25' 09"	1° 01' 06"	16' 38.99"	268° 45' 19"	0.04735
5	298° 34' 31"	-4° 57' 48"	301° 48' 31"	-25° 18' 04"	1° 01' 05"	16' 38.82"	268° 16' 01"	0.04953
6	299° 12' 26"	-4° 58' 34"	302° 29' 29"	-25° 10' 47"	1° 01' 05"	16' 38.63"	267° 47' 23"	0.05175
7	299° 50' 19"	-4° 59' 18"	303° 10' 21"	-25° 03' 20"	1° 01' 04"	16' 38.44"	267° 19' 22"	0.05402
8	300° 28' 08"	-4° 59' 59"	303° 51' 05"	-24° 55' 42"	1° 01' 03"	16' 38.23"	266° 52' 00"	0.05634
9	301° 05' 60"	-5° 00' 38"	304° 31' 45"	-24° 47' 53"	1° 01' 02"	16' 38.02"	266° 25' 10"	0.05870
10	301° 43' 50"	-5° 01' 16"	305° 12' 18"	-24° 39' 53"	1° 01' 02"	16' 37.80"	265° 58' 53"	0.06110
11	302° 21' 39"	-5° 01' 51"	305° 52' 45"	-24° 31' 42"	1° 01' 01"	16' 37.58"	265° 33' 08"	0.06356
12	302° 59' 27"	-5° 02' 23"	306° 33' 06"	-24° 23' 21"	1° 01' 00"	16' 37.34"	265° 7' 53"	0.06605
13	303° 37' 14"	-5° 02' 54"	307° 13' 20"	-24° 14' 49"	1° 00' 59"	16' 37.10"	264° 43' 07"	0.06859
14	304° 15' 00"	-5° 03' 22"	307° 53' 27"	-24° 06' 07"	1° 00' 58"	16' 36.85"	264° 18' 49"	0.07117
15	304° 52' 45"	-5° 03' 48"	308° 33' 27"	-23° 57' 15"	1° 00' 57"	16' 36.59"	263° 54' 59"	0.07380
16	305° 30' 28"	-5° 04' 12"	309° 13' 20"	-23° 48' 13"	1° 00' 56"	16' 36.32"	263° 31' 35"	0.07647
17	306° 08' 10"	-5° 04' 34"	309° 53' 06"	-23° 39' 01"	1° 00' 55"	16' 36.05"	263° 8' 36"	0.07918
18	306° 45' 50"	-5° 04' 53"	310° 32' 45"	-23° 29' 39"	1° 00' 54"	16' 35.77"	262° 46' 02"	0.08193
19	307° 23' 29"	-5° 05' 10"	311° 12' 17"	-23° 20' 08"	1° 00' 53"	16' 35.48"	262° 23' 52"	0.08473
20	308° 01' 07"	-5° 05' 25"	311° 51' 42"	-23° 10' 27"	1° 00' 52"	16' 35.19"	262° 2' 06"	0.08756
21	308° 38' 43"	-5° 05' 38"	312° 30' 59"	-23° 00' 37"	1° 00' 51"	16' 34.88"	261° 40' 42"	0.09044
22	309° 16' 18"	-5° 05' 49"	313° 10' 09"	-22° 50' 37"	1° 00' 50"	16' 34.57"	261° 19' 40"	0.09336
23	309° 53' 51"	-5° 05' 57"	313° 49' 11"	-22° 40' 28"	1° 00' 49"	16' 34.25"	260° 58' 60"	0.09631
24	310° 31' 22"	-5° 06' 03"	314° 28' 06"	-22° 30' 10"	1° 00' 47"	16' 33.93"	260° 38' 41"	0.09931

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	274° 10' 37"	-0.69"	274° 32' 30"	-23° 22' 21"	0.9835589	16' 15.67"	23° 26' 17"	0 m-18 s
1	274° 13' 10"	-0.69"	274° 35' 17"	-23° 22' 16"	0.9835568	16' 15.67"	23° 26' 17"	0 m-19 s
2	274° 15' 43"	-0.69"	274° 38' 03"	-23° 22' 12"	0.9835547	16' 15.68"	23° 26' 17"	0 m-20 s
3	274° 18' 16"	-0.69"	274° 40' 50"	-23° 22' 07"	0.9835526	16' 15.68"	23° 26' 17"	0 m-22 s
4	274° 20' 49"	-0.69"	274° 43' 36"	-23° 22' 02"	0.9835506	16' 15.68"	23° 26' 17"	0 m-23 s
5	274° 23' 22"	-0.69"	274° 46' 22"	-23° 21' 57"	0.9835485	16' 15.68"	23° 26' 17"	0 m-24 s
6	274° 25' 55"	-0.69"	274° 49' 09"	-23° 21' 51"	0.9835464	16' 15.68"	23° 26' 17"	0 m-25 s
7	274° 28' 27"	-0.69"	274° 51' 55"	-23° 21' 46"	0.9835444	16' 15.69"	23° 26' 17"	0 m-27 s
8	274° 31' 00"	-0.69"	274° 54' 42"	-23° 21' 41"	0.9835424	16' 15.69"	23° 26' 17"	0 m-28 s
9	274° 33' 33"	-0.69"	274° 57' 28"	-23° 21' 36"	0.9835403	16' 15.69"	23° 26' 17"	0 m-29 s
10	274° 36' 06"	-0.69"	275° 00' 15"	-23° 21' 31"	0.9835383	16' 15.69"	23° 26' 17"	0 m-30 s
11	274° 38' 39"	-0.69"	275° 03' 01"	-23° 21' 25"	0.9835363	16' 15.69"	23° 26' 17"	0 m-32 s
12	274° 41' 12"	-0.69"	275° 05' 47"	-23° 21' 20"	0.9835343	16' 15.70"	23° 26' 17"	0 m-33 s
13	274° 43' 45"	-0.69"	275° 08' 34"	-23° 21' 15"	0.9835323	16' 15.70"	23° 26' 17"	0 m-34 s
14	274° 46' 17"	-0.69"	275° 11' 20"	-23° 21' 09"	0.9835303	16' 15.70"	23° 26' 17"	0 m-35 s
15	274° 48' 50"	-0.69"	275° 14' 07"	-23° 21' 04"	0.9835283	16' 15.70"	23° 26' 17"	0 m-36 s
16	274° 51' 23"	-0.69"	275° 16' 53"	-23° 20' 58"	0.9835263	16' 15.70"	23° 26' 17"	0 m-38 s
17	274° 53' 56"	-0.69"	275° 19' 39"	-23° 20' 52"	0.9835243	16' 15.71"	23° 26' 17"	0 m-39 s
18	274° 56' 29"	-0.69"	275° 22' 26"	-23° 20' 47"	0.9835223	16' 15.71"	23° 26' 17"	0 m-40 s
19	274° 59' 02"	-0.68"	275° 25' 12"	-23° 20' 41"	0.9835203	16' 15.71"	23° 26' 17"	0 m-41 s
20	275° 01' 35"	-0.68"	275° 27' 59"	-23° 20' 35"	0.9835184	16' 15.71"	23° 26' 17"	0 m-43 s
21	275° 04' 08"	-0.68"	275° 30' 45"	-23° 20' 29"	0.9835164	16' 15.71"	23° 26' 17"	0 m-44 s
22	275° 06' 40"	-0.68"	275° 33' 31"	-23° 20' 24"	0.9835145	16' 15.72"	23° 26' 17"	0 m-45 s
23	275° 09' 13"	-0.68"	275° 36' 18"	-23° 20' 18"	0.9835126	16' 15.72"	23° 26' 17"	0 m-46 s
24	275° 11' 46"	-0.68"	275° 39' 04"	-23° 20' 12"	0.9835106	16' 15.72"	23° 26' 17"	0 m-48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	310° 31' 22"	-5° 06' 03"	314° 28' 06"	-22° 30' 10"	1° 00' 47"	16' 33.93"	260° 38' 41"	0.09931
1	311° 08' 52"	-5° 06' 07"	315° 06' 53"	-22° 19' 44"	1° 00' 46"	16' 33.60"	260° 18' 42"	0.10234
2	311° 46' 20"	-5° 06' 09"	315° 45' 33"	-22° 09' 08"	1° 00' 45"	16' 33.26"	259° 59' 04"	0.10542
3	312° 23' 47"	-5° 06' 08"	316° 24' 05"	-21° 58' 24"	1° 00' 44"	16' 32.91"	259° 39' 45"	0.10853
4	313° 01' 11"	-5° 06' 06"	317° 02' 30"	-21° 47' 32"	1° 00' 42"	16' 32.56"	259° 20' 46"	0.11168
5	313° 38' 34"	-5° 06' 01"	317° 40' 47"	-21° 36' 31"	1° 00' 41"	16' 32.20"	259° 2' 06"	0.11486
6	314° 15' 56"	-5° 05' 54"	318° 18' 56"	-21° 25' 22"	1° 00' 40"	16' 31.84"	258° 43' 45"	0.11808
7	314° 53' 15"	-5° 05' 45"	318° 56' 57"	-21° 14' 05"	1° 00' 38"	16' 31.47"	258° 25' 42"	0.12134
8	315° 30' 32"	-5° 05' 34"	319° 34' 51"	-21° 02' 40"	1° 00' 37"	16' 31.09"	258° 7' 57"	0.12463
9	316° 07' 48"	-5° 05' 20"	320° 12' 37"	-20° 51' 07"	1° 00' 36"	16' 30.71"	257° 50' 30"	0.12796
10	316° 45' 01"	-5° 05' 05"	320° 50' 15"	-20° 39' 26"	1° 00' 34"	16' 30.32"	257° 33' 20"	0.13132
11	317° 22' 13"	-5° 04' 47"	321° 27' 46"	-20° 27' 38"	1° 00' 33"	16' 29.92"	257° 16' 28"	0.13472
12	317° 59' 23"	-5° 04' 27"	322° 05' 08"	-20° 15' 43"	1° 00' 31"	16' 29.52"	256° 59' 53"	0.13815
13	318° 36' 30"	-5° 04' 05"	322° 42' 23"	-20° 03' 40"	1° 00' 30"	16' 29.11"	256° 43' 34"	0.14162
14	319° 13' 36"	-5° 03' 41"	323° 19' 30"	-19° 51' 30"	1° 00' 28"	16' 28.70"	256° 27' 32"	0.14511
15	319° 50' 39"	-5° 03' 15"	323° 56' 30"	-19° 39' 13"	1° 00' 27"	16' 28.28"	256° 11' 46"	0.14864
16	320° 27' 40"	-5° 02' 47"	324° 33' 21"	-19° 26' 49"	1° 00' 25"	16' 27.85"	255° 56' 17"	0.15220
17	321° 04' 40"	-5° 02' 16"	325° 10' 05"	-19° 14' 19"	1° 00' 24"	16' 27.42"	255° 41' 03"	0.15579
18	321° 41' 37"	-5° 01' 44"	325° 46' 42"	-19° 01' 42"	1° 00' 22"	16' 26.99"	255° 26' 05"	0.15941
19	322° 18' 31"	-5° 01' 10"	326° 23' 10"	-18° 48' 58"	1° 00' 20"	16' 26.55"	255° 11' 22"	0.16306
20	322° 55' 24"	-5° 00' 33"	326° 59' 31"	-18° 36' 08"	1° 00' 19"	16' 26.10"	254° 56' 55"	0.16675
21	323° 32' 14"	-4° 59' 54"	327° 35' 44"	-18° 23' 12"	1° 00' 17"	16' 25.65"	254° 42' 43"	0.17046
22	324° 09' 02"	-4° 59' 14"	328° 11' 50"	-18° 10' 10"	1° 00' 15"	16' 25.20"	254° 28' 47"	0.17419
23	324° 45' 48"	-4° 58' 31"	328° 47' 48"	-17° 57' 02"	1° 00' 14"	16' 24.74"	254° 15' 05"	0.17796
24	325° 22' 32"	-4° 57' 47"	329° 23' 38"	-17° 43' 48"	1° 00' 12"	16' 24.27"	254° 1' 37"	0.18176

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	275° 11' 46"	-0.68"	275° 39' 04"	-23° 20' 12"	0.9835106	16' 15.72"	23° 26' 17"	0 m-48 s
1	275° 14' 19"	-0.68"	275° 41' 50"	-23° 20' 06"	0.9835087	16' 15.72"	23° 26' 17"	0 m-49 s
2	275° 16' 52"	-0.68"	275° 44' 37"	-23° 19' 60"	0.9835068	16' 15.72"	23° 26' 17"	0 m-50 s
3	275° 19' 25"	-0.68"	275° 47' 23"	-23° 19' 53"	0.9835049	16' 15.72"	23° 26' 17"	0 m-51 s
4	275° 21' 58"	-0.68"	275° 50' 10"	-23° 19' 47"	0.9835030	16' 15.73"	23° 26' 17"	0 m-52 s
5	275° 24' 31"	-0.68"	275° 52' 56"	-23° 19' 41"	0.9835011	16' 15.73"	23° 26' 17"	0 m-54 s
6	275° 27' 03"	-0.67"	275° 55' 42"	-23° 19' 35"	0.9834992	16' 15.73"	23° 26' 17"	0 m-55 s
7	275° 29' 36"	-0.67"	275° 58' 29"	-23° 19' 29"	0.9834973	16' 15.73"	23° 26' 17"	0 m-56 s
8	275° 32' 09"	-0.67"	276° 01' 15"	-23° 19' 22"	0.9834954	16' 15.73"	23° 26' 17"	0 m-57 s
9	275° 34' 42"	-0.67"	276° 04' 01"	-23° 19' 16"	0.9834935	16' 15.74"	23° 26' 17"	0 m-59 s
10	275° 37' 15"	-0.67"	276° 06' 48"	-23° 19' 09"	0.9834917	16' 15.74"	23° 26' 17"	0 m-60 s
11	275° 39' 48"	-0.67"	276° 09' 34"	-23° 19' 03"	0.9834898	16' 15.74"	23° 26' 17"	-1 m 01 s
12	275° 42' 21"	-0.67"	276° 12' 20"	-23° 18' 56"	0.9834880	16' 15.74"	23° 26' 17"	-1 m 02 s
13	275° 44' 54"	-0.67"	276° 15' 07"	-23° 18' 50"	0.9834861	16' 15.74"	23° 26' 17"	-1 m 03 s
14	275° 47' 26"	-0.66"	276° 17' 53"	-23° 18' 43"	0.9834843	16' 15.75"	23° 26' 17"	-1 m 05 s
15	275° 49' 59"	-0.66"	276° 20' 39"	-23° 18' 36"	0.9834825	16' 15.75"	23° 26' 17"	-1 m 06 s
16	275° 52' 32"	-0.66"	276° 23' 25"	-23° 18' 30"	0.9834807	16' 15.75"	23° 26' 17"	-1 m 07 s
17	275° 55' 05"	-0.66"	276° 26' 12"	-23° 18' 23"	0.9834789	16' 15.75"	23° 26' 17"	-1 m 08 s
18	275° 57' 38"	-0.66"	276° 28' 58"	-23° 18' 16"	0.9834771	16' 15.75"	23° 26' 17"	-1 m 10 s
19	276° 00' 11"	-0.66"	276° 31' 44"	-23° 18' 09"	0.9834753	16' 15.75"	23° 26' 17"	-1 m 11 s
20	276° 02' 44"	-0.65"	276° 34' 31"	-23° 18' 02"	0.9834735	16' 15.76"	23° 26' 17"	-1 m 12 s
21	276° 05' 17"	-0.65"	276° 37' 17"	-23° 17' 55"	0.9834717	16' 15.76"	23° 26' 17"	-1 m 13 s
22	276° 07' 49"	-0.65"	276° 40' 03"	-23° 17' 48"	0.9834699	16' 15.76"	23° 26' 17"	-1 m 14 s
23	276° 10' 22"	-0.65"	276° 42' 49"	-23° 17' 41"	0.9834681	16' 15.76"	23° 26' 17"	-1 m 16 s
24	276° 12' 55"	-0.65"	276° 45' 36"	-23° 17' 34"	0.9834664	16' 15.76"	23° 26' 17"	-1 m 17 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	325° 22' 32"	-4° 57' 47"	329° 23' 38"	-17° 43' 48"	1° 00' 12"	16' 24.27"	254° 1' 37"	0.18176
1	325° 59' 13"	-4° 56' 60"	329° 59' 21"	-17° 30' 28"	1° 00' 10"	16' 23.80"	253° 48' 25"	0.18558
2	326° 35' 51"	-4° 56' 11"	330° 34' 57"	-17° 17' 03"	1° 00' 09"	16' 23.33"	253° 35' 27"	0.18943
3	327° 12' 28"	-4° 55' 21"	331° 10' 25"	-17° 03' 32"	1° 00' 07"	16' 22.85"	253° 22' 43"	0.19330
4	327° 49' 02"	-4° 54' 28"	331° 45' 45"	-16° 49' 57"	1° 00' 05"	16' 22.37"	253° 10' 13"	0.19720
5	328° 25' 33"	-4° 53' 34"	332° 20' 59"	-16° 36' 16"	1° 00' 03"	16' 21.88"	252° 57' 57"	0.20112
6	329° 02' 02"	-4° 52' 37"	332° 56' 05"	-16° 22' 29"	1° 00' 01"	16' 21.39"	252° 45' 56"	0.20507
7	329° 38' 29"	-4° 51' 39"	333° 31' 04"	-16° 08' 38"	0° 59' 60"	16' 20.90"	252° 34' 08"	0.20904
8	330° 14' 53"	-4° 50' 39"	334° 05' 55"	-15° 54' 43"	0° 59' 58"	16' 20.40"	252° 22' 33"	0.21304
9	330° 51' 15"	-4° 49' 37"	334° 40' 40"	-15° 40' 42"	0° 59' 56"	16' 19.89"	252° 11' 13"	0.21706
10	331° 27' 34"	-4° 48' 33"	335° 15' 17"	-15° 26' 37"	0° 59' 54"	16' 19.39"	252° 0' 05"	0.22110
11	332° 03' 51"	-4° 47' 27"	335° 49' 48"	-15° 12' 28"	0° 59' 52"	16' 18.88"	251° 49' 11"	0.22516
12	332° 40' 05"	-4° 46' 19"	336° 24' 11"	-14° 58' 14"	0° 59' 50"	16' 18.37"	251° 38' 31"	0.22925
13	333° 16' 16"	-4° 45' 10"	336° 58' 28"	-14° 43' 56"	0° 59' 48"	16' 17.85"	251° 28' 03"	0.23335
14	333° 52' 25"	-4° 43' 58"	337° 32' 38"	-14° 29' 34"	0° 59' 47"	16' 17.33"	251° 17' 48"	0.23748
15	334° 28' 31"	-4° 42' 45"	338° 06' 41"	-14° 15' 08"	0° 59' 45"	16' 16.81"	251° 7' 47"	0.24162
16	335° 04' 35"	-4° 41' 30"	338° 40' 37"	-14° 00' 38"	0° 59' 43"	16' 16.28"	250° 57' 58"	0.24579
17	335° 40' 36"	-4° 40' 13"	339° 14' 27"	-13° 46' 05"	0° 59' 41"	16' 15.75"	250° 48' 22"	0.24997
18	336° 16' 35"	-4° 38' 55"	339° 48' 10"	-13° 31' 28"	0° 59' 39"	16' 15.22"	250° 38' 58"	0.25417
19	336° 52' 31"	-4° 37' 35"	340° 21' 46"	-13° 16' 47"	0° 59' 37"	16' 14.69"	250° 29' 47"	0.25839
20	337° 28' 24"	-4° 36' 13"	340° 55' 17"	-13° 02' 03"	0° 59' 35"	16' 14.15"	250° 20' 48"	0.26263
21	338° 04' 14"	-4° 34' 49"	341° 28' 40"	-12° 47' 16"	0° 59' 33"	16' 13.61"	250° 12' 02"	0.26688
22	338° 40' 02"	-4° 33' 24"	342° 01' 58"	-12° 32' 26"	0° 59' 31"	16' 13.07"	250° 3' 28"	0.27115
23	339° 15' 47"	-4° 31' 57"	342° 35' 10"	-12° 17' 32"	0° 59' 29"	16' 12.52"	249° 55' 06"	0.27544
24	339° 51' 30"	-4° 30' 28"	343° 08' 15"	-12° 02' 36"	0° 59' 27"	16' 11.98"	249° 46' 56"	0.27974



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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	276° 12' 55"	-0.65"	276° 45' 36"	-23° 17' 34"	0.9834664	16' 15.76"	23° 26' 17"	-1 m 17 s
1	276° 15' 28"	-0.64"	276° 48' 22"	-23° 17' 27"	0.9834646	16' 15.76"	23° 26' 17"	-1 m 18 s
2	276° 18' 01"	-0.64"	276° 51' 08"	-23° 17' 20"	0.9834629	16' 15.77"	23° 26' 17"	-1 m 19 s
3	276° 20' 34"	-0.64"	276° 53' 54"	-23° 17' 12"	0.9834612	16' 15.77"	23° 26' 17"	-1 m 21 s
4	276° 23' 07"	-0.64"	276° 56' 41"	-23° 17' 05"	0.9834594	16' 15.77"	23° 26' 17"	-1 m 22 s
5	276° 25' 39"	-0.63"	276° 59' 27"	-23° 16' 58"	0.9834577	16' 15.77"	23° 26' 17"	-1 m 23 s
6	276° 28' 12"	-0.63"	277° 02' 13"	-23° 16' 50"	0.9834560	16' 15.77"	23° 26' 17"	-1 m 24 s
7	276° 30' 45"	-0.63"	277° 04' 59"	-23° 16' 43"	0.9834543	16' 15.77"	23° 26' 17"	-1 m 25 s
8	276° 33' 18"	-0.63"	277° 07' 46"	-23° 16' 35"	0.9834526	16' 15.78"	23° 26' 17"	-1 m 27 s
9	276° 35' 51"	-0.62"	277° 10' 32"	-23° 16' 28"	0.9834509	16' 15.78"	23° 26' 17"	-1 m 28 s
10	276° 38' 24"	-0.62"	277° 13' 18"	-23° 16' 20"	0.9834492	16' 15.78"	23° 26' 17"	-1 m 29 s
11	276° 40' 57"	-0.62"	277° 16' 04"	-23° 16' 12"	0.9834475	16' 15.78"	23° 26' 17"	-1 m 30 s
12	276° 43' 30"	-0.62"	277° 18' 50"	-23° 16' 05"	0.9834459	16' 15.78"	23° 26' 17"	-1 m 32 s
13	276° 46' 02"	-0.61"	277° 21' 37"	-23° 15' 57"	0.9834442	16' 15.78"	23° 26' 17"	-1 m 33 s
14	276° 48' 35"	-0.61"	277° 24' 23"	-23° 15' 49"	0.9834426	16' 15.79"	23° 26' 17"	-1 m 34 s
15	276° 51' 08"	-0.61"	277° 27' 09"	-23° 15' 41"	0.9834409	16' 15.79"	23° 26' 17"	-1 m 35 s
16	276° 53' 41"	-0.61"	277° 29' 55"	-23° 15' 33"	0.9834393	16' 15.79"	23° 26' 17"	-1 m 36 s
17	276° 56' 14"	-0.60"	277° 32' 41"	-23° 15' 25"	0.9834377	16' 15.79"	23° 26' 17"	-1 m 38 s
18	276° 58' 47"	-0.60"	277° 35' 27"	-23° 15' 17"	0.9834360	16' 15.79"	23° 26' 17"	-1 m 39 s
19	277° 01' 20"	-0.60"	277° 38' 14"	-23° 15' 09"	0.9834344	16' 15.79"	23° 26' 17"	-1 m 40 s
20	277° 03' 53"	-0.59"	277° 40' 60"	-23° 15' 01"	0.9834328	16' 15.80"	23° 26' 17"	-1 m 41 s
21	277° 06' 25"	-0.59"	277° 43' 46"	-23° 14' 53"	0.9834312	16' 15.80"	23° 26' 17"	-1 m 43 s
22	277° 08' 58"	-0.59"	277° 46' 32"	-23° 14' 45"	0.9834296	16' 15.80"	23° 26' 17"	-1 m 44 s
23	277° 11' 31"	-0.58"	277° 49' 18"	-23° 14' 36"	0.9834280	16' 15.80"	23° 26' 17"	-1 m 45 s
24	277° 14' 04"	-0.58"	277° 52' 04"	-23° 14' 28"	0.9834265	16' 15.80"	23° 26' 17"	-1 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	339° 51' 30"	-4° 30' 28"	343° 08' 15"	-12° 02' 36"	0° 59' 27"	16' 11.98"	249° 46' 56"	0.27974
1	340° 27' 10"	-4° 28' 58"	343° 41' 14"	-11° 47' 37"	0° 59' 25"	16' 11.43"	249° 38' 59"	0.28405
2	341° 02' 47"	-4° 27' 26"	344° 14' 07"	-11° 32' 35"	0° 59' 23"	16' 10.88"	249° 31' 13"	0.28838
3	341° 38' 21"	-4° 25' 52"	344° 46' 55"	-11° 17' 30"	0° 59' 21"	16' 10.32"	249° 23' 39"	0.29273
4	342° 13' 53"	-4° 24' 17"	345° 19' 36"	-11° 02' 23"	0° 59' 19"	16' 09.77"	249° 16' 16"	0.29708
5	342° 49' 22"	-4° 22' 40"	345° 52' 12"	-10° 47' 14"	0° 59' 17"	16' 09.21"	249° 9' 06"	0.30145
6	343° 24' 48"	-4° 21' 02"	346° 24' 42"	-10° 32' 02"	0° 59' 15"	16' 08.65"	249° 2' 06"	0.30584
7	344° 00' 12"	-4° 19' 22"	346° 57' 07"	-10° 16' 48"	0° 59' 13"	16' 08.10"	248° 55' 19"	0.31023
8	344° 35' 33"	-4° 17' 41"	347° 29' 26"	-10° 01' 32"	0° 59' 11"	16' 07.53"	248° 48' 43"	0.31463
9	345° 10' 51"	-4° 15' 58"	348° 01' 40"	-9° 46' 14"	0° 59' 09"	16' 06.97"	248° 42' 18"	0.31905
10	345° 46' 06"	-4° 14' 13"	348° 33' 48"	-9° 30' 54"	0° 59' 06"	16' 06.41"	248° 36' 04"	0.32348
11	346° 21' 19"	-4° 12' 27"	349° 05' 52"	-9° 15' 32"	0° 59' 04"	16' 05.84"	248° 30' 02"	0.32791
12	346° 56' 28"	-4° 10' 40"	349° 37' 50"	-9° 00' 09"	0° 59' 02"	16' 05.28"	248° 24' 11"	0.33236
13	347° 31' 35"	-4° 08' 51"	350° 09' 43"	-8° 44' 43"	0° 59' 00"	16' 04.71"	248° 18' 31"	0.33682
14	348° 06' 40"	-4° 07' 01"	350° 41' 31"	-8° 29' 17"	0° 58' 58"	16' 04.14"	248° 13' 01"	0.34128
15	348° 41' 41"	-4° 05' 09"	351° 13' 14"	-8° 13' 49"	0° 58' 56"	16' 03.57"	248° 7' 43"	0.34575
16	349° 16' 40"	-4° 03' 16"	351° 44' 52"	-7° 58' 19"	0° 58' 54"	16' 03.00"	248° 2' 36"	0.35023
17	349° 51' 36"	-4° 01' 22"	352° 16' 25"	-7° 42' 48"	0° 58' 52"	16' 02.43"	247° 57' 39"	0.35472
18	350° 26' 30"	-3° 59' 26"	352° 47' 54"	-7° 27' 16"	0° 58' 50"	16' 01.86"	247° 52' 54"	0.35921
19	351° 01' 20"	-3° 57' 29"	353° 19' 19"	-7° 11' 43"	0° 58' 48"	16' 01.29"	247° 48' 19"	0.36371
20	351° 36' 08"	-3° 55' 31"	353° 50' 38"	-6° 56' 10"	0° 58' 46"	16' 00.71"	247° 43' 54"	0.36822
21	352° 10' 53"	-3° 53' 31"	354° 21' 54"	-6° 40' 35"	0° 58' 43"	16' 00.14"	247° 39' 40"	0.37273
22	352° 45' 36"	-3° 51' 30"	354° 53' 05"	-6° 24' 59"	0° 58' 41"	15' 59.57"	247° 35' 37"	0.37724
23	353° 20' 15"	-3° 49' 28"	355° 24' 12"	-6° 09' 23"	0° 58' 39"	15' 58.99"	247° 31' 44"	0.38177
24	353° 54' 52"	-3° 47' 24"	355° 55' 15"	-5° 53' 46"	0° 58' 37"	15' 58.42"	247° 28' 01"	0.38629

29 Desember 2022

DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	277° 14' 04"	-0.58"	277° 52' 04"	-23° 14' 28"	0.9834265	16' 15.80"	23° 26' 17"	-1 m 46 s
1	277° 16' 37"	-0.58"	277° 54' 50"	-23° 14' 20"	0.9834249	16' 15.80"	23° 26' 17"	-1 m 47 s
2	277° 19' 10"	-0.58"	277° 57' 36"	-23° 14' 11"	0.9834234	16' 15.81"	23° 26' 17"	-1 m 49 s
3	277° 21' 43"	-0.57"	278° 00' 23"	-23° 14' 03"	0.9834218	16' 15.81"	23° 26' 17"	-1 m 50 s
4	277° 24' 16"	-0.57"	278° 03' 09"	-23° 13' 54"	0.9834203	16' 15.81"	23° 26' 17"	-1 m 51 s
5	277° 26' 48"	-0.57"	278° 05' 55"	-23° 13' 46"	0.9834187	16' 15.81"	23° 26' 17"	-1 m 52 s
6	277° 29' 21"	-0.56"	278° 08' 41"	-23° 13' 37"	0.9834172	16' 15.81"	23° 26' 17"	-1 m 53 s
7	277° 31' 54"	-0.56"	278° 11' 27"	-23° 13' 29"	0.9834157	16' 15.81"	23° 26' 17"	-1 m 55 s
8	277° 34' 27"	-0.55"	278° 14' 13"	-23° 13' 20"	0.9834142	16' 15.81"	23° 26' 17"	-1 m 56 s
9	277° 36' 60"	-0.55"	278° 16' 59"	-23° 13' 11"	0.9834127	16' 15.82"	23° 26' 17"	-1 m 57 s
10	277° 39' 33"	-0.55"	278° 19' 45"	-23° 13' 02"	0.9834112	16' 15.82"	23° 26' 17"	-1 m 58 s
11	277° 42' 06"	-0.54"	278° 22' 31"	-23° 12' 54"	0.9834097	16' 15.82"	23° 26' 17"	-1 m 59 s
12	277° 44' 38"	-0.54"	278° 25' 17"	-23° 12' 45"	0.9834083	16' 15.82"	23° 26' 17"	-2 m 01 s
13	277° 47' 11"	-0.54"	278° 28' 03"	-23° 12' 36"	0.9834068	16' 15.82"	23° 26' 17"	-2 m 02 s
14	277° 49' 44"	-0.53"	278° 30' 49"	-23° 12' 27"	0.9834053	16' 15.82"	23° 26' 17"	-2 m 03 s
15	277° 52' 17"	-0.53"	278° 33' 35"	-23° 12' 18"	0.9834039	16' 15.82"	23° 26' 17"	-2 m 04 s
16	277° 54' 50"	-0.53"	278° 36' 21"	-23° 12' 09"	0.9834024	16' 15.83"	23° 26' 17"	-2 m 06 s
17	277° 57' 23"	-0.52"	278° 39' 07"	-23° 11' 60"	0.9834010	16' 15.83"	23° 26' 17"	-2 m 07 s
18	277° 59' 56"	-0.52"	278° 41' 53"	-23° 11' 50"	0.9833996	16' 15.83"	23° 26' 17"	-2 m 08 s
19	278° 02' 29"	-0.51"	278° 44' 39"	-23° 11' 41"	0.9833982	16' 15.83"	23° 26' 17"	-2 m 09 s
20	278° 05' 01"	-0.51"	278° 47' 25"	-23° 11' 32"	0.9833968	16' 15.83"	23° 26' 17"	-2 m 10 s
21	278° 07' 34"	-0.51"	278° 50' 11"	-23° 11' 23"	0.9833954	16' 15.83"	23° 26' 17"	-2 m 12 s
22	278° 10' 07"	-0.50"	278° 52' 57"	-23° 11' 13"	0.9833940	16' 15.83"	23° 26' 17"	-2 m 13 s
23	278° 12' 40"	-0.50"	278° 55' 43"	-23° 11' 04"	0.9833926	16' 15.84"	23° 26' 17"	-2 m 14 s
24	278° 15' 13"	-0.49"	278° 58' 29"	-23° 10' 54"	0.9833912	16' 15.84"	23° 26' 17"	-2 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	353° 54' 52"	-3° 47' 24"	355° 55' 15"	-5° 53' 46"	0° 58' 37"	15' 58.42"	247° 28' 01"	0.38629
1	354° 29' 27"	-3° 45' 20"	356° 26' 14"	-5° 38' 08"	0° 58' 35"	15' 57.85"	247° 24' 29"	0.39082
2	355° 03' 58"	-3° 43' 14"	356° 57' 08"	-5° 22' 30"	0° 58' 33"	15' 57.27"	247° 21' 07"	0.39535
3	355° 38' 27"	-3° 41' 07"	357° 27' 59"	-5° 06' 51"	0° 58' 31"	15' 56.70"	247° 17' 55"	0.39989
4	356° 12' 53"	-3° 38' 58"	357° 58' 46"	-4° 51' 12"	0° 58' 29"	15' 56.12"	247° 14' 53"	0.40442
5	356° 47' 16"	-3° 36' 49"	358° 29' 30"	-4° 35' 33"	0° 58' 27"	15' 55.55"	247° 12' 02"	0.40896
6	357° 21' 37"	-3° 34' 38"	359° 00' 10"	-4° 19' 54"	0° 58' 25"	15' 54.98"	247° 9' 20"	0.41350
7	357° 55' 55"	-3° 32' 27"	359° 30' 46"	-4° 04' 15"	0° 58' 22"	15' 54.41"	247° 6' 49"	0.41805
8	358° 30' 10"	-3° 30' 14"	0° 01' 19"	-3° 48' 36"	0° 58' 20"	15' 53.83"	247° 4' 28"	0.42259
9	359° 04' 23"	-3° 27' 60"	0° 31' 48"	-3° 32' 56"	0° 58' 18"	15' 53.26"	247° 2' 16"	0.42713
10	359° 38' 33"	-3° 25' 45"	1° 02' 15"	-3° 17' 17"	0° 58' 16"	15' 52.69"	247° 0' 14"	0.43168
11	0° 12' 40"	-3° 23' 29"	1° 32' 38"	-3° 01' 38"	0° 58' 14"	15' 52.12"	246° 58' 22"	0.43622
12	0° 46' 44"	-3° 21' 12"	2° 02' 58"	-2° 45' 60"	0° 58' 12"	15' 51.55"	246° 56' 40"	0.44076
13	1° 20' 46"	-3° 18' 54"	2° 33' 15"	-2° 30' 21"	0° 58' 10"	15' 50.98"	246° 55' 08"	0.44530
14	1° 54' 46"	-3° 16' 35"	3° 03' 29"	-2° 14' 44"	0° 58' 08"	15' 50.41"	246° 53' 45"	0.44984
15	2° 28' 42"	-3° 14' 14"	3° 33' 40"	-1° 59' 06"	0° 58' 06"	15' 49.84"	246° 52' 32"	0.45438
16	3° 02' 36"	-3° 11' 53"	4° 03' 48"	-1° 43' 30"	0° 58' 04"	15' 49.28"	246° 51' 29"	0.45892
17	3° 36' 28"	-3° 09' 31"	4° 33' 54"	-1° 27' 54"	0° 58' 02"	15' 48.71"	246° 50' 35"	0.46345
18	4° 10' 17"	-3° 07' 08"	5° 03' 57"	-1° 12' 18"	0° 57' 59"	15' 48.14"	246° 49' 50"	0.46798
19	4° 44' 03"	-3° 04' 45"	5° 33' 58"	0°-56' 44"	0° 57' 57"	15' 47.58"	246° 49' 15"	0.47251
20	5° 17' 47"	-3° 02' 20"	6° 03' 56"	0°-41' 10"	0° 57' 55"	15' 47.02"	246° 48' 50"	0.47703
21	5° 51' 28"	-2° 59' 54"	6° 33' 52"	0°-25' 37"	0° 57' 53"	15' 46.46"	246° 48' 34"	0.48155
22	6° 25' 06"	-2° 57' 28"	7° 03' 45"	0°-10' 06"	0° 57' 51"	15' 45.90"	246° 48' 27"	0.48606
23	6° 58' 42"	-2° 55' 01"	7° 33' 37"	0° 05' 25"	0° 57' 49"	15' 45.34"	246° 48' 30"	0.49057
24	7° 32' 16"	-2° 52' 32"	8° 03' 26"	0° 20' 55"	0° 57' 47"	15' 44.78"	246° 48' 42"	0.49508

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	278° 15' 13"	-0.49"	278° 58' 29"	-23° 10' 54"	0.9833912	16' 15.84"	23° 26' 17"	-2 m 15 s
1	278° 17' 46"	-0.49"	279° 01' 15"	-23° 10' 45"	0.9833899	16' 15.84"	23° 26' 17"	-2 m 16 s
2	278° 20' 19"	-0.49"	279° 04' 01"	-23° 10' 35"	0.9833885	16' 15.84"	23° 26' 17"	-2 m 18 s
3	278° 22' 52"	-0.48"	279° 06' 47"	-23° 10' 26"	0.9833872	16' 15.84"	23° 26' 17"	-2 m 19 s
4	278° 25' 24"	-0.48"	279° 09' 33"	-23° 10' 16"	0.9833858	16' 15.84"	23° 26' 17"	-2 m 20 s
5	278° 27' 57"	-0.47"	279° 12' 19"	-23° 10' 06"	0.9833845	16' 15.84"	23° 26' 17"	-2 m 21 s
6	278° 30' 30"	-0.47"	279° 15' 05"	-23° 09' 57"	0.9833832	16' 15.85"	23° 26' 17"	-2 m 22 s
7	278° 33' 03"	-0.46"	279° 17' 51"	-23° 09' 47"	0.9833819	16' 15.85"	23° 26' 17"	-2 m 24 s
8	278° 35' 36"	-0.46"	279° 20' 37"	-23° 09' 37"	0.9833806	16' 15.85"	23° 26' 17"	-2 m 25 s
9	278° 38' 09"	-0.45"	279° 23' 23"	-23° 09' 27"	0.9833793	16' 15.85"	23° 26' 17"	-2 m 26 s
10	278° 40' 42"	-0.45"	279° 26' 09"	-23° 09' 17"	0.9833780	16' 15.85"	23° 26' 17"	-2 m 27 s
11	278° 43' 14"	-0.45"	279° 28' 55"	-23° 09' 07"	0.9833767	16' 15.85"	23° 26' 17"	-2 m 28 s
12	278° 45' 47"	-0.44"	279° 31' 41"	-23° 08' 57"	0.9833755	16' 15.85"	23° 26' 17"	-2 m 30 s
13	278° 48' 20"	-0.44"	279° 34' 26"	-23° 08' 47"	0.9833742	16' 15.85"	23° 26' 17"	-2 m 31 s
14	278° 50' 53"	-0.43"	279° 37' 12"	-23° 08' 37"	0.9833730	16' 15.86"	23° 26' 17"	-2 m 32 s
15	278° 53' 26"	-0.43"	279° 39' 58"	-23° 08' 27"	0.9833717	16' 15.86"	23° 26' 17"	-2 m 33 s
16	278° 55' 59"	-0.42"	279° 42' 44"	-23° 08' 16"	0.9833705	16' 15.86"	23° 26' 17"	-2 m 34 s
17	278° 58' 32"	-0.42"	279° 45' 30"	-23° 08' 06"	0.9833693	16' 15.86"	23° 26' 17"	-2 m 36 s
18	279° 01' 04"	-0.41"	279° 48' 16"	-23° 07' 56"	0.9833681	16' 15.86"	23° 26' 17"	-2 m 37 s
19	279° 03' 37"	-0.41"	279° 51' 02"	-23° 07' 45"	0.9833669	16' 15.86"	23° 26' 17"	-2 m 38 s
20	279° 06' 10"	-0.40"	279° 53' 47"	-23° 07' 35"	0.9833657	16' 15.86"	23° 26' 17"	-2 m 39 s
21	279° 08' 43"	-0.40"	279° 56' 33"	-23° 07' 24"	0.9833645	16' 15.86"	23° 26' 17"	-2 m 40 s
22	279° 11' 16"	-0.40"	279° 59' 19"	-23° 07' 14"	0.9833633	16' 15.87"	23° 26' 17"	-2 m 42 s
23	279° 13' 49"	-0.39"	280° 02' 05"	-23° 07' 03"	0.9833622	16' 15.87"	23° 26' 17"	-2 m 43 s
24	279° 16' 22"	-0.39"	280° 04' 51"	-23° 06' 53"	0.9833610	16' 15.87"	23° 26' 17"	-2 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	7° 32' 16"	-2° 52' 32"	8° 03' 26"	0° 20' 55"	0° 57' 47"	15' 44.78"	246° 48' 42"	0.49508
1	8° 05' 47"	-2° 50' 03"	8° 33' 13"	0° 36' 23"	0° 57' 45"	15' 44.22"	246° 49' 04"	0.49957
2	8° 39' 15"	-2° 47' 34"	9° 02' 59"	0° 51' 50"	0° 57' 43"	15' 43.67"	246° 49' 34"	0.50407
3	9° 12' 41"	-2° 45' 03"	9° 32' 42"	1° 07' 16"	0° 57' 41"	15' 43.12"	246° 50' 14"	0.50855
4	9° 46' 05"	-2° 42' 32"	10° 02' 24"	1° 22' 40"	0° 57' 39"	15' 42.56"	246° 51' 03"	0.51303
5	10° 19' 26"	-2° 39' 60"	10° 32' 04"	1° 38' 03"	0° 57' 37"	15' 42.01"	246° 52' 01"	0.51751
6	10° 52' 44"	-2° 37' 27"	11° 01' 42"	1° 53' 25"	0° 57' 35"	15' 41.46"	246° 53' 08"	0.52197
7	11° 26' 00"	-2° 34' 54"	11° 31' 19"	2° 08' 45"	0° 57' 33"	15' 40.92"	246° 54' 25"	0.52643
8	11° 59' 14"	-2° 32' 20"	12° 00' 55"	2° 24' 03"	0° 57' 31"	15' 40.37"	246° 55' 50"	0.53089
9	12° 32' 25"	-2° 29' 45"	12° 30' 29"	2° 39' 20"	0° 57' 29"	15' 39.83"	246° 57' 25"	0.53533
10	13° 05' 34"	-2° 27' 09"	13° 00' 02"	2° 54' 34"	0° 57' 27"	15' 39.29"	246° 59' 08"	0.53976
11	13° 38' 41"	-2° 24' 33"	13° 29' 33"	3° 09' 47"	0° 57' 25"	15' 38.75"	247° 1' 01"	0.54419
12	14° 11' 45"	-2° 21' 57"	13° 59' 04"	3° 24' 58"	0° 57' 23"	15' 38.21"	247° 3' 02"	0.54861
13	14° 44' 46"	-2° 19' 19"	14° 28' 33"	3° 40' 08"	0° 57' 21"	15' 37.67"	247° 5' 13"	0.55301
14	15° 17' 46"	-2° 16' 41"	14° 58' 02"	3° 55' 15"	0° 57' 19"	15' 37.14"	247° 7' 32"	0.55741
15	15° 50' 43"	-2° 14' 03"	15° 27' 29"	4° 10' 20"	0° 57' 17"	15' 36.61"	247° 10' 01"	0.56180
16	16° 23' 38"	-2° 11' 24"	15° 56' 56"	4° 25' 23"	0° 57' 15"	15' 36.08"	247° 12' 38"	0.56618
17	16° 56' 30"	-2° 08' 44"	16° 26' 22"	4° 40' 24"	0° 57' 13"	15' 35.55"	247° 15' 24"	0.57054
18	17° 29' 20"	-2° 06' 04"	16° 55' 47"	4° 55' 23"	0° 57' 11"	15' 35.03"	247° 18' 19"	0.57490
19	18° 02' 08"	-2° 03' 23"	17° 25' 11"	5° 10' 19"	0° 57' 09"	15' 34.50"	247° 21' 23"	0.57924
20	18° 34' 54"	-2° 00' 42"	17° 54' 35"	5° 25' 13"	0° 57' 07"	15' 33.98"	247° 24' 36"	0.58358
21	19° 07' 37"	-1° 58' 01"	18° 23' 59"	5° 40' 05"	0° 57' 06"	15' 33.46"	247° 27' 57"	0.58790
22	19° 40' 18"	-1° 55' 19"	18° 53' 22"	5° 54' 54"	0° 57' 04"	15' 32.94"	247° 31' 27"	0.59221
23	20° 12' 57"	-1° 52' 36"	19° 22' 45"	6° 09' 41"	0° 57' 02"	15' 32.43"	247° 35' 07"	0.59651
24	20° 45' 34"	-1° 49' 53"	19° 52' 08"	6° 24' 25"	0° 56' 60"	15' 31.92"	247° 38' 55"	0.60079

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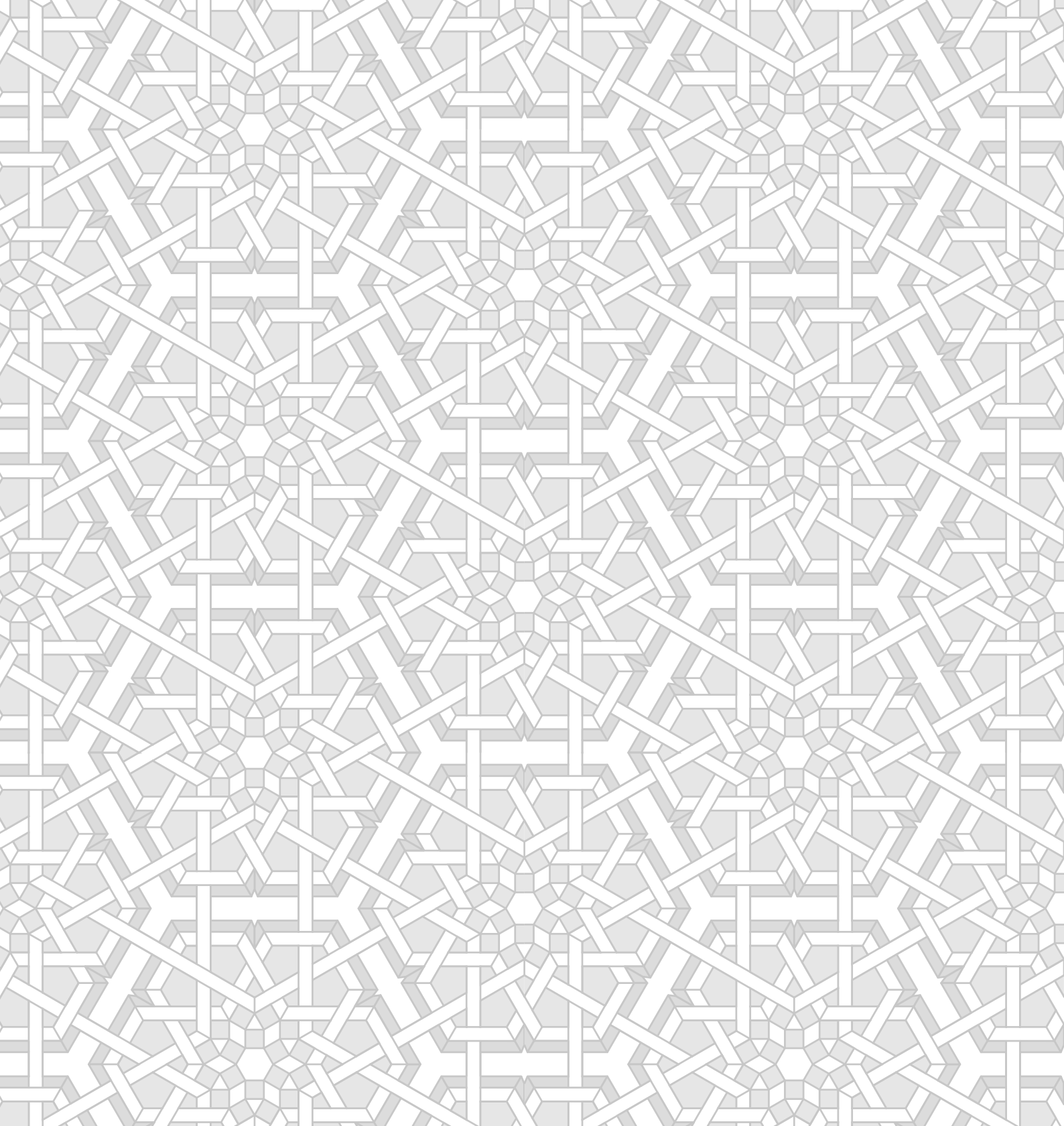
DATA MATAHARI

Jam	Ecliptic Longitude (*)	Ecliptic Latitude (*)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	279° 16' 22"	-0.39"	280° 04' 51"	-23° 06' 53"	0.9833610	16' 15.87"	23° 26' 17"	-2 m 44 s
1	279° 18' 54"	-0.38"	280° 07' 36"	-23° 06' 42"	0.9833599	16' 15.87"	23° 26' 17"	-2 m 45 s
2	279° 21' 27"	-0.38"	280° 10' 22"	-23° 06' 31"	0.9833587	16' 15.87"	23° 26' 17"	-2 m 46 s
3	279° 24' 00"	-0.37"	280° 13' 08"	-23° 06' 21"	0.9833576	16' 15.87"	23° 26' 17"	-2 m 48 s
4	279° 26' 33"	-0.37"	280° 15' 54"	-23° 06' 10"	0.9833565	16' 15.87"	23° 26' 17"	-2 m 49 s
5	279° 29' 06"	-0.36"	280° 18' 40"	-23° 05' 59"	0.9833554	16' 15.87"	23° 26' 17"	-2 m 50 s
6	279° 31' 39"	-0.36"	280° 21' 25"	-23° 05' 48"	0.9833543	16' 15.87"	23° 26' 17"	-2 m 51 s
7	279° 34' 12"	-0.35"	280° 24' 11"	-23° 05' 37"	0.9833532	16' 15.88"	23° 26' 17"	-2 m 52 s
8	279° 36' 45"	-0.35"	280° 26' 57"	-23° 05' 26"	0.9833521	16' 15.88"	23° 26' 17"	-2 m 54 s
9	279° 39' 17"	-0.34"	280° 29' 42"	-23° 05' 15"	0.9833510	16' 15.88"	23° 26' 17"	-2 m 55 s
10	279° 41' 50"	-0.34"	280° 32' 28"	-23° 05' 04"	0.9833500	16' 15.88"	23° 26' 17"	-2 m 56 s
11	279° 44' 23"	-0.33"	280° 35' 14"	-23° 04' 53"	0.9833489	16' 15.88"	23° 26' 17"	-2 m 57 s
12	279° 46' 56"	-0.33"	280° 37' 60"	-23° 04' 41"	0.9833479	16' 15.88"	23° 26' 17"	-2 m 58 s
13	279° 49' 29"	-0.32"	280° 40' 45"	-23° 04' 30"	0.9833469	16' 15.88"	23° 26' 17"	-2 m 59 s
14	279° 52' 02"	-0.32"	280° 43' 31"	-23° 04' 19"	0.9833458	16' 15.88"	23° 26' 17"	-3 m 01 s
15	279° 54' 35"	-0.31"	280° 46' 17"	-23° 04' 08"	0.9833448	16' 15.88"	23° 26' 17"	-3 m 02 s
16	279° 57' 07"	-0.31"	280° 49' 02"	-23° 03' 56"	0.9833438	16' 15.88"	23° 26' 17"	-3 m 03 s
17	279° 59' 40"	-0.30"	280° 51' 48"	-23° 03' 45"	0.9833428	16' 15.89"	23° 26' 17"	-3 m 04 s
18	280° 02' 13"	-0.30"	280° 54' 34"	-23° 03' 33"	0.9833418	16' 15.89"	23° 26' 17"	-3 m 05 s
19	280° 04' 46"	-0.29"	280° 57' 19"	-23° 03' 22"	0.9833409	16' 15.89"	23° 26' 17"	-3 m 07 s
20	280° 07' 19"	-0.28"	281° 00' 05"	-23° 03' 10"	0.9833399	16' 15.89"	23° 26' 17"	-3 m 08 s
21	280° 09' 52"	-0.28"	281° 02' 51"	-23° 02' 58"	0.9833389	16' 15.89"	23° 26' 17"	-3 m 09 s
22	280° 12' 25"	-0.27"	281° 05' 36"	-23° 02' 47"	0.9833380	16' 15.89"	23° 26' 17"	-3 m 10 s
23	280° 14' 57"	-0.27"	281° 08' 22"	-23° 02' 35"	0.9833371	16' 15.89"	23° 26' 17"	-3 m 11 s
24	280° 17' 30"	-0.26"	281° 11' 08"	-23° 02' 23"	0.9833361	16' 15.89"	23° 26' 17"	-3 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	20° 45' 34"	-1° 49' 53"	19° 52' 08"	6° 24' 25"	0° 56' 60"	15' 31.92"	247° 38' 55"	0.60079
1	21° 18' 08"	-1° 47' 10"	20° 21' 30"	6° 39' 06"	0° 56' 58"	15' 31.41"	247° 42' 51"	0.60506
2	21° 50' 41"	-1° 44' 26"	20° 50' 53"	6° 53' 45"	0° 56' 56"	15' 30.90"	247° 46' 57"	0.60932
3	22° 23' 11"	-1° 41' 42"	21° 20' 15"	7° 08' 21"	0° 56' 54"	15' 30.39"	247° 51' 11"	0.61357
4	22° 55' 39"	-1° 38' 58"	21° 49' 37"	7° 22' 55"	0° 56' 52"	15' 29.89"	247° 55' 34"	0.61780
5	23° 28' 05"	-1° 36' 13"	22° 18' 60"	7° 37' 25"	0° 56' 51"	15' 29.39"	248° 0' 06"	0.62202
6	24° 00' 29"	-1° 33' 28"	22° 48' 22"	7° 51' 53"	0° 56' 49"	15' 28.89"	248° 4' 46"	0.62622
7	24° 32' 51"	-1° 30' 42"	23° 17' 45"	8° 06' 18"	0° 56' 47"	15' 28.40"	248° 9' 35"	0.63041
8	25° 05' 11"	-1° 27' 56"	23° 47' 08"	8° 20' 39"	0° 56' 45"	15' 27.90"	248° 14' 33"	0.63459
9	25° 37' 28"	-1° 25' 10"	24° 16' 32"	8° 34' 58"	0° 56' 43"	15' 27.41"	248° 19' 40"	0.63875
10	26° 09' 44"	-1° 22' 24"	24° 45' 56"	8° 49' 14"	0° 56' 42"	15' 26.92"	248° 24' 55"	0.64289
11	26° 41' 58"	-1° 19' 37"	25° 15' 20"	9° 03' 26"	0° 56' 40"	15' 26.44"	248° 30' 19"	0.64702
12	27° 14' 09"	-1° 16' 50"	25° 44' 45"	9° 17' 35"	0° 56' 38"	15' 25.96"	248° 35' 52"	0.65114
13	27° 46' 19"	-1° 14' 03"	26° 14' 11"	9° 31' 41"	0° 56' 36"	15' 25.48"	248° 41' 33"	0.65524
14	28° 18' 27"	-1° 11' 16"	26° 43' 37"	9° 45' 44"	0° 56' 34"	15' 25.00"	248° 47' 23"	0.65932
15	28° 50' 33"	-1° 08' 28"	27° 13' 04"	9° 59' 43"	0° 56' 33"	15' 24.52"	248° 53' 22"	0.66339
16	29° 22' 36"	-1° 05' 41"	27° 42' 32"	10° 13' 39"	0° 56' 31"	15' 24.05"	248° 59' 30"	0.66744
17	29° 54' 38"	-1° 02' 53"	28° 12' 01"	10° 27' 31"	0° 56' 29"	15' 23.58"	249° 5' 46"	0.67147
18	30° 26' 38"	-1° 00' 05"	28° 41' 31"	10° 41' 20"	0° 56' 28"	15' 23.11"	249° 12' 11"	0.67548
19	30° 58' 37"	0°-57' 17"	29° 11' 02"	10° 55' 06"	0° 56' 26"	15' 22.65"	249° 18' 44"	0.67948
20	31° 30' 33"	0°-54' 28"	29° 40' 33"	11° 08' 48"	0° 56' 24"	15' 22.19"	249° 25' 27"	0.68346
21	32° 02' 27"	0°-51' 40"	30° 10' 06"	11° 22' 26"	0° 56' 22"	15' 21.73"	249° 32' 18"	0.68743
22	32° 34' 20"	0°-48' 51"	30° 39' 40"	11° 35' 60"	0° 56' 21"	15' 21.27"	249° 39' 18"	0.69137
23	33° 06' 11"	0°-46' 03"	31° 09' 16"	11° 49' 31"	0° 56' 19"	15' 20.82"	249° 46' 26"	0.69530
24	33° 37' 60"	0°-43' 14"	31° 38' 52"	12° 02' 57"	0° 56' 18"	15' 20.37"	249° 53' 43"	0.69921



LAMPIRAN - LAMPIRAN





PRESIDEN
REPUBLIK INDONESIA

KEPUTUSAN PRESIDEN REPUBLIK INDONESIA
NOMOR 41 TAHUN 1987

TENTANG

PEMBAGIAN WILAYAH REPUBLIK INDONESIA
MENJADI 3 (TIGA) WILAYAH WAKTU
PRESIDEN REPUBLIK INDONESIA

- Menimbang : a. bahwa pembagian waktu mempunyai peranan penting dalam menunjang kelancaran penyelenggaraan pemerintahan dalam arti yang seluas-luasnya dan dalam usaha peningkatan efesiensi kerja di segala bidang;
- b. bahwa pembagian waktu sekarang ini dinilai tidak sesuai lagi dengan kenyataan waktu dan geografis, khususnya di beberapa daerah Propinsi Daerah Tingkat I Kalimantan Barat, Kalimantan Tengah, dan Propinsi Daerah Tingkat I Bali;
- c. bahwa sehubungan dengan hal di atas, dipandang perlu untuk menata kembali pembagian wilayah waktu di Indonesia sebagaimana yang telah ditetapkan dalam Keputusan Presiden nomor 243 tahun 1963.

Mengingat : Pasal 4 ayat (1) Undang-undang Dasar 1945

MEMUTUSKAN :

Menetapkan : KEPUTUSAN PRESIDEN REPUBLIK INDONESIA
TENTANG PEMBAGIAN WILAYAH REPUBLIK
INDONESIA MENJADI 3 (TIGA) WILAYAH WAKTU

Pasal 1

- (1) Wilayah Republik Indonesia dibagi menjadi (tiga) wilayah waktu dengan 3 (tiga) waktu tolok.
- (2) 3 (tiga) wilayah waktu sebagaimana dimaksud dalam ayat (1) adalah :
1. Waktu Indonesia Barat, meliputi :
 - a. Seluruh Propinsi Daerah Tingkat I Sumatera
 - b. Seluruh Propinsi Daerah Tingkat I Jawa dan Madura



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- c. Propinsi Daerah Tingkat I Kalimantan Barat
- d. Propinsi Daerah Tingkat I Kalimantan Tengah
- 2. Waktu Indonesia Tengah, meliputi
 - a. Propinsi Daerah Tingkat I Kalimantan Timur;
 - b. Propinsi Daerah Tingkat I Kalimantan Selatan;
 - c. Propinsi Daerah Tingkat I Bali;
 - d. Propinsi Daerah Tingkat I Nusa Tenggara Barat;
 - e. Propinsi Daerah Tingkat I Nusa Tenggara Timur;
 - f. Propinsi Daerah Tingkat I Timor Timur;
 - g. Propinsi Daerah Tingkat I Sulawesi
- 3. Waktu Indonesia Timur meliputi
 - a. Propinsi Daerah Tingkat I Maluku
 - b. Propinsi Daerah Tingkat I Irian Jaya
- (3) 3 (tiga) wilayah waktu sebagaimana dimaksud dalam ayat (2) tersebut, masing-masing ditetapkan dengan waktu tolok sebagai berikut :
 - a. Waktu Indonesia Barat dengan waktu tolok (GMT + 7 jam) dan derajat tolok 105° Bujur Timur;
 - b. Waktu Indonesia Tengah dengan waktu tolok (GMT + 8 jam) dan derajat tolok 120° Bujur Timur
 - c. Waktu Indonesia Timur dengan waktu tolok (GMT + 9 jam) dan derajat tolok 135° Bujur Timur.

Pasal 2

Pada saat mulai berlakunya Keputusan Presiden Ini, Keputusan Presiden Normor 243 Tahun 1963 tentang Pembagian Wilayah Republik Indonesia menjadi 3 (tiga) Wilayah Waktu Dengan 3 (tiga) Waktu Tolok dinyatakan tidak berlaku.



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Pasal 3

Keputusan Presiden ini mulai berlaku pada tanggal 1 Januari 1988

Ditetapkan di Jakarta

Pada tanggal 26 Nopember 1987

PRESIDEN REPUBLIK INDONESIA

ttd

S O E H A R T O

Salinan sesuai dengan aslinya
SEKRETARIAT KABINET RI
Kepala Biro Hukum
dan Perundang-undangan

Bambang Koesowo, SH, LLM



**KEBIJAKAN PEMERINTAH RI
DALAM MENETAPKAN AWAL BULAN QAMARIYAH
DI INDONESIA**

MUKADIMAH

1. Undang-undang Nomor 3 Tahun 2006 tentang Perubahan Undang-undang Nomor 7 Tahun 1989 tentang Peradilan Agama pasal 52A Pengadilan Agama memberikan Itsbat Kesaksian Rukyat Hilal dalam penentuan awal bulan pada tahun Hijriyah. Sedangkan penetapan awal bulan qomariyah masih menjadi kewenangan Menteri Agama. Berdasarkan Peraturan Menteri Agama nomor 42 tahun 2016 tentang Organisasi dan Tata Kerja Kementerian Agama, Direktorat Urusan Agama Islam dan Pembinaan Syariah mempunyai tugas melaksanakan perumusan dan pelaksanaan kebijakan, standardisasi, bimbingan teknis, dan evaluasi, serta pengawasan di bidang urusan agama islam dan pembinaan syariah sesuai dengan ketentuan peraturan perundang-undangan yang termasuk di dalamnya masalah hisab rukyat, sedangkan pelaksanaan di daerah di tangani oleh Bidang Urusan Agama Islam dan Pembinaan Syariah / Bimas Islam.
2. Menyatukan penentuan awal Ramadan, Syawal dan Zulhijah merupakan salahsatu upaya mewujudkan persatuan umat dalam beribadah sehingga terciptapersatuan umat, baik lahir maupun batin serta adanya kehidupan yang penuhrasa toleransi, selaras, seimbang dan berkesinambungan.
3. Namun dalam kenyataannya penentuan tersebut terdapat perbedaan (Khilaf) di kalangan para ulama dan pemuka agama Islam. Di satu pihak bersikukuh dengan rukyat sedangkan di lain pihak boleh saja dengan hisab.
4. Masalah puasa dan hari raya, disamping merupakan masalah fiqh termasuk juga masalah sosial, masalah yang dikerjakan secara umum bersama-sama, maka perbedaan tersebut dapat berdampak yang kurang baik di kalangan kaum muslimin sendiri maupun masyarakat pada umumnya. Islam adalah Agamarahmatal lil ‘aalamiin dengan membawa konsep ukhuwah telah banyak tercatat dalam sejarah, namun dalam soal puasa dan hari raya, yang seharusnya sama ternyata belum mampu bersatu.

DASAR HUKUM

1. Undang-Undang Nomor 25 Tahun 2004 tentang Sistem Perencanaan Pembangunan Nasional;

2. Undang-Undang Nomor 3 Tahun 2006 tentang Perubahan Atas Undang-Undang Nomor 7 Tahun 1989 tentang Peradilan Agama;
3. Undang-undang Nomor 17 Tahun 2007 tentang Rencana Pembangunan Jangka Panjang Nasional Tahun 2005-2025;
4. Peraturan Presiden Nomor 7 tahun 2015 tentang Organisasi Kementerian Negara;
5. Peraturan Presiden Nomor 83 tahun 2015 tentang Kementerian Agama;
6. Peraturan Menteri Agama Nomor 42 Tahun 2016 tentang Organisasi dan Tata Kerja Kementerian Agama;
7. Peraturan Menteri Agama Nomor 13 Tahun 2012 tentang Organisasi dan Tata Kerja Instansi Vertikal Kementerian Agama.

SASARAN

1. Meningkatnya kualitas pelayanan kehidupan beragama bagi seluruh lapisan masyarakat;
2. Menyamakan persepsi penentuan awal bulan qomariyah;
3. Meningkatnya kerukunan intern dan antar umat beragama dalam rangka terwujudnya kehidupan yang harmonis, toleransi dan saling menghormati.

KEBIJAKAN

1. Umum :
 - a. Menghimpun seluruh pendapat ulama, para ahli dan instansi terkait dalam masalah hisab rukyat
 - b. Mengembangkan ilmu hisab dan rukyat
 - c. Melaksanakan musyawarah / pertemuan
 - d. Melakukan rukyat bersama
 - e. Menyelenggarakan pelatihan bersama
 - f. Menyusun dan menyebarkan buku, almanak dan sebagainya
 - g. Melakukan kerjasama dalam maupun luar negeri.
2. Kebijakan Penetapan Awal Bulan Qomariyah
 - a. Selain Ramadan, Syawal, dan Zulhijah dapat berdasar hisab (tinggi hilal + 2°, elongasi 3° atau umur bulan 8 jam antara saat ijtima' dengan ghurub)

- b. Untuk Ramadan, Syawal, dan Zulhijah berdasar hisab dan rukyat, yaitu:
 - 1) Data hisab dan hasil rukyat sebagai masukan
 - 2) Ditetapkan dalam sidang itsbat
 - 3) Rukyat dilaksanakan oleh Pegawai Kementerian Agama, Kanwil Kementerian Agama, Kantor Kementerian Agama Kabupaten/Kota, instansi terkait, Ormas Islam dan masyarakat luas (Koordinator : Kanwil Kementerian Agama/Kantor Kementerian Agama Kab/Kota)
 - 4) Itsbat rukyat hilal oleh hakim Pengadilan Tinggi Agama / Pengadilan Agama
3. Tim Hisab Rukyat Pusat dikoordinasikan oleh Direktorat Urusan Agama Islam dan Pembinaan Syariah, BHR Daerah dikoordinasikan oleh Kanwil Kementerian Agama Provinsi, sedangkan BHR Kabupaten/Kota dikoordinasikan oleh Kantor Kementerian Agama Kabupaten/Kota. Badan Hisab Rukyat Kementerian Agama dapat terdiri dari unsur :
 - a. Kementerian Agama
 - b. Pengadilan Agama
 - c. Ulama / Majelis Ulama Indonesia
 - d. Ormas Islam
 - e. Perguruan Tinggi
 - f. Badan Meteorologi dan Geofisika/Planetarium
 - g. Pemerintah Daerah/Instansi terkait
 - h. Tokoh/Ahli hisab rukyat.

PROSEDUR PENETAPAN

1. Rukyatul Hilal
 - a. Dirjen Bimbingan Masyarakat Islam Kementerian Agama memeritahkan rukyatul hilal menjelang awal Ramadan, Syawal, dan Zulhijah kepada Kanwil Kementerian Agama dan Kantor Kementerian Agama seluruh Indonesia.
 - b. Kanwil Kementerian Agama dan Kantor Kementerian Agama sebagai koordinator penyelenggaraan pelaksanaan rukyat di daerah masing-masing.
 - c. Rukyat dilakukan bersama-sama dengan instansi terkait, perwakilan ormas Islam, tokoh agama, ahli hisab rukyat, dan masyarakat luas.

Untuk mendukung kelancaran kegiatan di atas, Ditjen Badan Peradilan Agama Mahkamah Agung menugaskan Hakim Agama pada Pengadilan Tinggi

Agama/Mahkamah Syariah Provinsi dan Pengadilan Agama/Mahkamah Syariah seluruh Indonesia sebagai tenaga ahli dan petugas menyumpah saksi rukyatul hilal.

Oleh karena itu, Kanwil Kementerian Agama dan Kantor Kementerian Agama sebagai penanggung jawab dan koordinator pelaksanaan rukyat di daerah masing-masing diharapkan melakukan rukyatul hilal di tempat-tempat strategis dan di tempat-tempat lain yang dimungkinkan hilal dapat terlihat dan selalu mengikut sertakan Hakim Pengadilan Agama/Mahkamah Syariah. Sedangkan masyarakat luas yang ingin melakukan rukyat agar bergabung atau berkoordinasi dengan Panitia Rukyat Kanwil Kementerian Agama dan Kantor Kementerian Agama di daerah masing-masing. Masyarakat diharapkan tidak membuat tempat rukyat sendiri-sendiri tanpa sepengetahuan Kanwil Kementerian Agama dan Kantor Kementerian Agama.

Laporan rukyat dari Panitia Rukyat Daerah dan masyarakat luas sesegera mungkin dilaporkan kepada Panitia Rukyat dan Itsbat Awal Ramadan, Syawal dan Zulhijah di Kementerian Agama RI.

2. Penetapan Pemerintah

Dalam madzhab Syafi'i mensyaratkan bahwa penetapan (itsbat) awal bulan qamariyah khususnya awal Ramadan, Syawal, dan Zulhijah harus dilakukan oleh pemerintah/qadli. Apabila pemerintah telah menetapkannya maka seluruh umat Islam wajib mengikuti dan melaksanakannya. Sedang madzhab Hanafi, Maliki, dan Hanbali tidak mensyaratkan harus ditetapkan oleh pemerintah/qadli. Tetapi jika pemerintah telah menetapkannya maka umat Islam wajib mengikuti dan mentaatinya.

Itsbat (penetapan) Pemerintah diperlukan karena ada beberapa keuntungan, antara lain :

1. Itsbat diperlukan untuk mendapatkan keabsahan
2. Itsbat diperlukan untuk mencegah kerancuan dan keraguan sistem pelaporan.
3. Itsbat diperlukan untuk penyatuan umat dan menghilangkan perbedaan pendapat.

Semuanya wajib mengikuti dan mentaati, serta tidak boleh lagi terjadi adanya silang pendapat demi tegaknya ukhuwah Islamiyah. Sesuai dengan kaidah fiqh :

- a. *Hukm al hakim ilzam wa yarfa'u al khilaf.*
- b. *Tasharruf al imam 'ala raiyatih manuthun bi al mashlahah.*
- c. *Inna ijtihada ulil amr huwa al ashlu al tsalits minas-syari'ah al islamiyah wa innahum idza ajma'u ra'yahum wajaba 'ala al amah wa 'ala hukkamiha al 'amalu bih.*
- d. Fatwa MUI Nomor 2 Tahun 2004 tentang Penentuan Awal Ramadan, Syawal, dan Zulhijah. Menyatakan bahwa "seluruh umat Islam di Indonesia wajib

mentaati ketetapan Pemerintah RI tentang Penetapan Awal Ramadan, Syawal dan Zulhijah”.

Pelaksanaan sidang itsbat selalu menjunjung tinggi musyawarah, menghormati sikap perbedaan pendapat, kebersamaan, dan demokratis, serta menerima saran dan pendapat dari peserta sidang. Setelah saran dan pendapat dibahas dan diterima, dengan suasana bersama-sama berupaya mencari keputusan yang terbaik, lalu mengambil musyawarah mufakat, bulat dan maslahah, maka sidang memutuskan “Penetapan tanggal 1 Ramadan, Syawal dan Zulhijah”.

**KEPUTUSAN FATWA
MAJELIS ULAMA INDONESIA**

Nomor 2 tahun 2004

Tentang

PENETAPAN AWAL RAMADHAN, SYAWAL, DAN DZULHIJAH

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Majelis Ulama Indonesia,

MENIMBANG

- : a. bahwa umat Islam Indonesia dalam melaksanakan puasa Ramadhan, salat Idul Fitri dan Idul Adha, serta ibadah-ibadah lain yang terkait dengan ketiga bulan tersebut terkadang tidak dapat melakukannya pada hari dan tanggal yang sama disebabkan perbedaan dalam penetapan awal bulan-bulan tersebut;
- b. bahwa keadaan sebagaimana tersebut pada huruf a dapat menimbulkan citra dan dampak negative terhadap syi'ar dan dakwah Islam;
- c. bahwa Ijtima' Ulama Komisi Fatwa se-Indonesia pada tanggal 22 Syawwal 1424 H / 16 Desember 2003 telah menfatwakan tentang penetapan awal bulan Ramadhan, Syawwal, dan Dzulhijjah sebagai upaya mengatasi hal diatas;
- d. bahwa oleh karena itu, Majelis Ulama Indonesia memandang perlu menetapkan fatwa tentang penetapan awal bulan Ramadhan, Syawwal dan Dzulhijjah dimaksud untuk dijadikan pedoman.

MENGINGAT

- : 1. Firman Allah SWT, antara lain

هُوَ الَّذِي جَعَلَ الشَّمْسُ ضِيَاءً وَالْقَمَرَ نُورًا وَقَدَرَهُ مَنَازِلَ

لِتَعْلَمُوا عَدَدَ السِّنِينَ وَالْحِسَابَ (يونس [١٠]: ٥)

Dia-lah yang menjadikan matahari bersinar dan bulan bercahaya dan ditetapkan-Nya manzilah-manzilah (tempat-tempat) bagi perjalanan bulan itu, supaya kamu mengetahui bilangan tahun dan perhitungan (waktu). (QS Yunus [10]: 5)

يَا أَيُّهَا الَّذِينَ آمَنُوا أَطِيعُوا اللَّهَ وَأَطِيعُوا الرَّسُولَ وَأُولَى الْأَمْرِ
مِنْكُمْ (النساء [4]: ٥٩)

Hai orang-orang yang beriman, taatlah kepada Allah, taatlah kepada Rasul dan ulil-amri diantara kamu (QS. an-Nisa'[4]:59)

2. Hadits – hadits Nabi s.a.w, antara lain

١) لَا تَصُومُوا حَتَّى تَرَوْا الْهَلَالَ وَلَا تُفْطِرُوا حَتَّى تَرَوْهُ فَإِنْ
غَمَّ عَلَيْكُمْ فَأَقْدِرُوا لَهُ (رواه البخاري ومسلم عن ابن عمر)

“janganlah kamu berpuasa (Ramadhan) sehingga melihat tanggal (satu Ramadhan) dan janganlah berbuka (mengakhiri puasa Ramadhan) sehingga tanggal (satu Syawwal). Jika dihalangi oleh awan/mendung maka kira-kiralah”. (H.R. Bukhari Muslim dari Ibnu Umar).

٢) صُومُوا لِرُؤْيَيْهِ وَأَفْطِرُوا لِرُؤْيَيْهِ فَإِنْ غُيِيَ عَلَيْكُمْ فَأَكْمِلُوا
عِدَّةَ شَعْبَانَ ثَلَاثِينَ

“Berpuasalah (Ramadhan) karena melihat tanggal (satu Ramadhan). Dan berbukalah (mengakhiri puasa Ramadhan) karena melihat tanggal (satu Syawwal). Apabila kamu terhalangi, sehingga tidak dapat melihatnya maka sempurnakanlah bilangan Sya’ban tiga puluh hari”. (Bukhari Muslim dari Abu Hurairah).

٣) عَلَيْكُمْ بِالسَّمْعِ وَالطَّاعَةِ وَإِنْ وَلَّى عَلَيْكُمْ عَبْدٌ حَبَشِيٌّ

“Wajib bagi kalian untuk taat (kepada pemimpin), meskipun yang memimpin kalian itu seorang hamba sahaya Habsyi”. (H.R. Bukhari dari Irbadh bin Sariyah).

3. Qa’idah fiqh:

٤) حُكْمُ الْحَاكِمِ إِذَا زَامَ وَيَرْفَعُ الْخِلَافَ

“Keputusan pemerintah itu mengikat (wajib dipatuhi) dan menghilangkan silang pendapat”.

MEMPERHATIKAN : 1. Pendapat para ulama ahli fiqh; antara lain pendapat Imam al Syarwani dalam Hasyiyah al-Syarwani:

وَمَحَلُّ الْخِلَافِ إِذَا لَمْ يَحْكَمْ بِهِ حَاكِمٌ، فَإِنْ حَكَمَ بِهِ حَاكِمٌ
يَرَاهُ وَجِبَ الصَّوْمُ عَلَى الْكَافَةِ وَلَمْ يُنْقَضِ الْحُكْمُ إِجْمَاعًا.
قَالَهُ النَّوَوِيُّ فِي مَجْمُوعِهِ، وَهُوَ صَرِيحٌ فِي أَنَّ لِلْقَاضِي أَنْ
يَحْكُمَ بِكَوْنِ اللَّيْلَةِ مِنْ رَمَضَانَ. (خَاشِيَةُ الشَّرَوَانِي، جزء ٣ ص ٣٧٦)

2. Keputusan Ijtima Ulama Komisi Fatwa se-Indonesia tentang Fatwa Bunga (interest/fa'idah), tanggal 22 Syawal 1424/16 Desember 2003.
3. Keputusan Rapat Komisi Fatwa MUI, tanggal 05 Dzulhijjah 1424/24 Januari 2004.

Dengan memohon ridha Allah SWT

MEMUTUSKAN

MENETAPKAN : FATWA TENTANG PENETAPAN AWAL RAMADHAN, SYAWAL DAN DZULHIJAH

Pertama : **Fatwa**

1. Penetapan awal Ramadhan, Syawal dan Dzulhijjah dilakukan berdasarkan metode ru'yah dan hisab oleh Pemerintah RI cq Menteri Agama dan berlaku secara nasional.
2. Seluruh umat Islam di Indonesia wajib menaati ketetapan pemerintah RI tentang penetapan awal Ramadhan, Syawal dan Dzulhijjah.
3. Dalam menetapkan awal Ramadhan, Syawal dan Dzulhijjah, Menteri Agama wajib berkonsultasi dengan Majelis Ulama Indonesia, ormas-ormas Islam dan Instansi terkait.
4. Hasil rukyat dari daerah yang memungkinkan hilal dirukyat walaupun di luar wilayah Indonesia yang

mathla'nya sama dengan Indonesia dapat dijadikan pedoman oleh Menteri Agama RI.

Kedua : **Rekomendasi**

Agar Majelis Ulama Indonesia mengusahakan adanya kriteria penentuan awal Ramadhan, Syawal dan Dzulhijjah untuk dijadikan pedoman oleh Menteri Agama dengan membahasnya bersama ormas-ormas Islam dan para ahli terkait.

Jakarta, 05 Dzulhijjah 1424 H
24 Januari 2004 M

**MAJELIS ULAMA INDONESIA
KOMISI FATWA,**

Ketua,

ttd

KH. MA'RUF AMIN

Sekretaris,

ttd

HASANUDIN

FATWA
MAJELIS ULAMA INDONESIA
Nomor : 05 Tahun 2010
Tentang
ARAH KIBLAT

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Komisi Fatwa Majelis Ulama Indonesia

- Menimbang : a. bahwa dalam rangka memberikan pedoman kepada masyarakat tentang arah Kiblat, Majelis Ulama Indonesia menetapkan Fatwa Nomor 3 Tahun 2010 tentang Kiblat, yang pada bagian ketentuan Hukum Nomor 3 disebutkan: "Letak geografis Indonesia yang berada di bagian timur Ka'bah/Mekkah Maka kiblat umat Islam Indonesia adalah menghadap ke arah barat".
- b. bahwa terhadap diktum fatwa tersebut muncul pertanyaan di masyarakat, yang bisa menimbulkan kesimpangsiuran penafsiran serta pertanyaan mengenai keabsahan shalat yang arah kiblatnya menghadap ke barat laut;
- c. bahwa oleh karena itu, Komisi Fatwa Majelis Ulama Indonesia memandang perlu menetapkan fatwa tentang arah kiblat untuk dijadikan pedoman bagi masyarakat.

Mengingat : 1. Firman Allah SWT:

قَدْ نَرَى تَقَلُّبَ وَجْهِكَ فِي السَّمَاءِ ط فَلَنُوَلِّيَنَّكَ قِبْلَةً تَرْضَاهَا ؕ فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ ؕ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ ؕ وَإِنَّ الَّذِينَ أُوتُوا الْكِتَابَ لَيَعْلَمُونَ أَنَّهُ الْحَقُّ مِنْ رَبِّهِمْ ؕ وَمَا

اللَّهُ بِغَفِلٍ عَمَّا يَعْمَلُونَ ﴿١١﴾

Sungguh Kami (sering) melihat mukamu menengadah ke langit, maka sungguh Kami akan memalingkan kamu ke kiblat yang kamu sukai. Palingkanlah mukamu ke arah Masjidil Haram, dan di mana saja kamu berada, palingkanlah mukamu ke arahnua. dan sesunghnua orano-orano (Yahudi dan Nasrani)

yang diberi Al-Kitab (Taurat dan Injil) memang mengetahui bahwa berpaling ke Masjidil Haram itu adalah benar dari Tuhannya; dan Allah sekali-kali tidak lengah dari apa yang mereka kerjakan. (QS. Al-Baqarah [2]:144)

2. Firman Allah SWT:

وَمِنْ حَيْثُ خَرَجْتَ فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ وَإِنَّهُ لَلْحَقُّ مِنْ رَبِّكَ وَمَا اللَّهُ بِغَفِلٍ عَمَّا تَعْمَلُونَ ﴿١٤٩﴾

Dan dari mana saja kamu keluar (datang), maka palingkanlah wajahmu ke arah Masjidil Haram; Sesungguhnya ketentuan itu benar-benar sesuatu yang haq dari Tuhanmu. Dan Allah sekali-kali tidak lengah dari apa yang kamu kerjakan. (QS. Al-Baqarah [2]:149)

3. Firman Allah SWT:

وَمِنْ حَيْثُ خَرَجْتَ فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ لِئَلَّا يَكُونَ لِلنَّاسِ عَلَيْكُمْ حُجَّةٌ إِلَّا الَّذِينَ ظَلَمُوا مِنْهُمْ فَلَا تَخْشَوْهُمْ وَاخْشَوْنِي وَلِأُتِمَّ نِعْمَتِي عَلَيْكُمْ وَلَعَلَّكُمْ تَهْتَدُونَ ﴿١٥٠﴾

Dan dari mana saja kamu (keluar), maka palingkanlah wajahmu ke arah Masjidil Haram. Dan di mana saja kamu (sekalian) berada, maka palingkanlah wajahmu ke arahnya, agar tidak ada hujjah bagi manusia atas kamu, kecuali orang-orang yang zalim di antara mereka. Maka janganlah kamu takut kepada mereka dan takutlah kepada-Ku (saja). Dan agar Ku sempurnakan nikmat-Ku atasmu, dan supaya kamu mendapat petunjuk. (QS. Al-Baqarah [2] : 150)

4. Firman Allah SWT:

وَلِلَّهِ الْمَشْرِقُ وَالْمَغْرِبُ فَأَيْنَمَا تُوَلُّوا فَثَمَّ وَجْهُ اللَّهِ إِنَّ اللَّهَ وَاسِعٌ عَلِيمٌ ﴿١٥١﴾

Dan kepunyaan Allah-lah Timur dan Barat, maka ke manapun kamu menghadap di situlah wajah Allah. Sesungguhnya Allah

Maha Luas (rahmat-Nya) lagi Maha Mengetahui.
(QS. Al-Baqarah [2] : 115)

5. Firman Allah SWT:

وَجَاهِدُوا فِي اللَّهِ حَقَّ جِهَادِهِ ۚ هُوَ اجْتَبَاكُمْ وَمَا جَعَلَ عَلَيْكُمْ فِي
الدِّينِ مِنْ حَرَجٍ ۚ مِلَّةَ أَبِيكُمْ إِبْرَاهِيمَ ۚ هُوَ سَمَّاكُمُ الْمُسْلِمِينَ مِنْ قَبْلُ
وَفِي هَذَا لِيَكُونَ الرَّسُولُ شَهِيدًا عَلَيْكُمْ وَتَكُونُوا شُهَدَاءَ عَلَى النَّاسِ ۚ
فَأَقِمْوَا الصَّلَاةَ وَآتُوا الزَّكَاةَ وَاعْتَصِمُوا بِاللَّهِ هُوَ مَوْلَاكُمْ فَنِعْمَ
الْمَوْلَىٰ وَنِعْمَ النَّصِيرُ ﴿٧٨﴾

*Dan berjihadlah kamu di jalan Allah dengan jihad yang sebenar-
benarnya. Dia telah memilih kamu dan Dia sekali-kali tidak
menjadikan untuk kamu dalam agama suatu kesempitan.
(Ikutilah) agama orang tuamu Ibrahim. Dia (Allah) telah
menamai kamu sekalian orang-orang muslim dari dahulu, dan
(begitu pula) dalam (al-Qur'an) ini, supaya Rasul itu menjadi
saksi atas dirimu dan supaya kamu semua menjadi saksi atas
segenap manusia, maka dirikanlah shalat, tunaikanlah zakat dan
berpeganglah kamu pada tali Allah. Dia adalah Pelindungmu,
maka Dialah sebaik-baik Pelindung dan sebaik-baik Penolong.
(QS. Al-Hajj [22]:78)*

6. Hadits Nabi SAW:

عَنْ عَطَاءٍ قَالَ : سَمِعْتُ ابْنَ عَبَّاسٍ قَالَ لَمَّا دَخَلَ النَّبِيُّ صَلَّى اللَّهُ عَلَيْهِ
وَسَلَّمَ الْبَيْتَ دَعَا فِي نَوَاحِيهِ كُلِّهَا وَلَمْ يُصَلِّ حَتَّى خَرَجَ مِنْهُ فَلَمَّا خَرَجَ
رَكَعَ رَكْعَتَيْنِ فِي قِبَلِ الْكُعْبَةِ وَقَالَ (هَذِهِ الْقِبْلَةُ)

*Dari `Atho, ia berkata: aku mendengar Ibnu `Abbas berkata:
setelah Rasulullah SAW masuk ke Ka`bah beliau berdo`a pada
setiap sudutnya dan beliau tidak shalat (di dalamnya) sampai
beliau keluar Ka`bah. Setelah beliau keluar Ka`bah, beliau lalu
shalat dua raka`at di hadapan Ka`bah. Rasulullah SAW lalu
bersabda : “Inilah kiblat”. (HR. Imam Bukhari dan Imam
Muslim)*

7. Hadits Nabi SAW:

قَالَ أَبُو هُرَيْرَةَ قَالَ النَّبِيُّ - صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ - اسْتَقبلَ الْقِبْلَةَ وَكَبَّرَ
(رواه البخارى)

Abu Hurairah berkata, Rasulullah SAW bersabda: "Menghadaplah kiblat, kemudian bertakbirlah (takbiratul ihram)" (HR. Imam Bukhari)

8. Hadits Nabi SAW:

عَنْ مَالِكٍ عَنْ عَبْدِ اللَّهِ بْنِ دِينَارٍ عَنْ ابْنِ عُمَرَ قَالَ بَيْنَمَا النَّاسُ فِي صَلَاةِ الصُّبْحِ بَقْبَاءَ إِذْ جَاءَهُمْ آتٍ فَقَالَ إِنَّ رَسُولَ اللَّهِ - صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ - قَدْ أُنْزِلَ عَلَيْهِ اللَّيْلَةَ ، وَقَدْ أُمِرَ أَنْ يَسْتَقْبِلَ الْكَعْبَةَ ، فَاسْتَقْبَلُوهَا . وَكَانَتْ وُجُوهُهُمْ إِلَى الشَّامِ فَاسْتَدَارُوا إِلَى الْقِبْلَةِ . أَطْرَافَهُ
(رواه البخارى)

Dari Malik dari Abdullah bin Dinar dari Ibnu Umar berkata: ketika orang-orang sedang shalat Shubuh di Masjid Quba`, tiba-tiba datang seseorang berkata bahwa Rasulullah SAW tadi malam menerima wahyu dan diperintahkan untuk menghadap Ka`bah. Mereka lalu mengubah arah (shalat), yang ketika itu menghadap ke arah Syam (Baitul Maqdis), ke arah kiblat (Masjidil Haram). (HR. Imam Bukhari)

9. Hadits Nabi SAW:

عَنْ سَعِيدِ بْنِ أَبِي سَعِيدٍ الْمَقْبُرِيِّ عَنْ أَبِي هُرَيْرَةَ - رَضِيَ اللَّهُ عَنْهُ أَنَّ رَجُلًا دَخَلَ الْمَسْجِدَ وَرَسُولُ اللَّهِ - صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ - جَالِسٌ فِي نَاحِيَةِ الْمَسْجِدِ فَصَلَّى ، ثُمَّ جَاءَ فَسَلَّمَ عَلَيْهِ فَقَالَ لَهُ رَسُولُ اللَّهِ - صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ - « وَعَلَيْكَ السَّلَامُ ارْجِعْ فَصَلِّ فَإِنَّكَ لَمْ تُصَلِّ » . فَرَجَعَ فَصَلَّى ، ثُمَّ جَاءَ فَسَلَّمَ . فَقَالَ « وَعَلَيْكَ السَّلَامُ فَارْجِعْ فَصَلِّ ، فَإِنَّكَ لَمْ تُصَلِّ » . فَقَالَ فِي الثَّانِيَةِ أَوْ فِي الَّتِي بَعْدَهَا عَلَّمَنِي يَا رَسُولَ اللَّهِ . فَقَالَ « إِذَا قُمْتَ إِلَى الصَّلَاةِ فَأَسْبِغِ الوُضُوءَ ، ثُمَّ اسْتَقْبِلِ الْقِبْلَةَ فَكَبِّرْ ، ثُمَّ اقْرَأْ بِمَا تيسَّرَ مَعَكَ مِنَ الْقُرْآنِ ، ثُمَّ ارْكَعْ حَتَّى تَطْمِئَنَّ رَاكِعًا ، ثُمَّ ارْفَعْ حَتَّى تَسْتَوِيَ قَائِمًا ، ثُمَّ اسْجُدْ حَتَّى تَطْمِئَنَّ سَاجِدًا ،

ثُمَّ ارْفَعْ حَتَّى تَطْمَئِنَّ جَالِسًا ، ثُمَّ اسْجُدْ حَتَّى تَطْمَئِنَّ سَاجِدًا ، ثُمَّ ارْفَعْ
حَتَّى تَطْمَئِنَّ جَالِسًا ، ثُمَّ افْعَلْ ذَلِكَ فِي صَلَاتِكَ كُلِّهَا »

Dari Sa'id ibn Sa'id al-Maqburi dari Abu Hurairah r.a. bahwa ada seorang laki-laki masuk ke masjid kemudian ia shalat dan saat itu ada Rasulullah sedang duduk di salah satu sudut masjid. Setelah shalat orang itu mendatangi Rasul dan memberi salam kepada beliau. Rasul lalu menjawab: "Wa'alaikum al-salam, kembalilah/ulangilah shalatmu karena sesungguhnya kamu belum shalat". Laki-laki itu kemudian mengulangi shalatnya dan kembali mendatangi Rasul serta memberi salam kepada beliau. Rasul menjawab salam dan berkata: "ulangi kembali shalatmu karena kamu belum shalat". Kemudian laki-laki itu berkata di pengulangan shalat yang kedua atau sesudahnya; "Ajarilah aku wahai Rasulullah" Rasulullah menjawab : "Apabila engkau akan menunaikan shalat maka sempurnakanlah wudlu, menghadaplah kiblat lalu bertakbirlah (takbiratul ihram), kemudian bacalah apa yang mudah bagimu dari ayat-ayat al-Qur'an, lalu ruku'lah dengan thuma'ninah, lalu berdiri dengan sempurna, lalu sujud dengan thuma'ninah, lalu duduk dengan thuma'ninah, lalu sujud dengan thuma'ninah, kemudian bangun dan duduk dengan thuma'ninah. Maka lakukanlah seperti itu pada setiap shalat kamu" (HR. Imam Bukhari)

10. Hadits Nabi SAW:

أَبِي هُرَيْرَةَ رَضِيَ اللَّهُ عَنْهُ أَنَّ النَّبِيَّ - صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ - قَالَ : " مَا بَيْنَ الْمَشْرِقِ وَالْمَغْرِبِ قِبْلَةٌ " (رواه الترمذي)

Dari Abu Hurairah r.a. bahwa Nabi SAW bersabda: "Arah antara Timur dan Barat adalah Kiblat". (HR. Imam al-Turmudzi)

11. Hadits Nabi SAW:

عَنْ ابْنِ عَبَّاسٍ أَنَّ رَسُولَ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ : الْبَيْتُ قِبْلَةٌ لِأَهْلِ الْمَسْجِدِ ، وَالْمَسْجِدُ قِبْلَةٌ لِأَهْلِ الْحَرَمِ ، وَالْحَرَمُ قِبْلَةٌ لِأَهْلِ الْأَرْضِ فِي مَشَارِقِهَا وَمَغَارِبِهَا مِنْ أُمَّتِي.

Dari Ibnu `Abbas bahwa Nabi SAW bersabda: Ka`bah adalah kiblat bagi orang yang shalat di masjidil haram, dan masjidil haram adalah kiblat bagi penduduk yang tinggal di tanah haram (Mekkah), dan tanah haram (Mekkah) adalah kiblat bagi penduduk bumi di timurnya dan di baratnya dari umatku".

Memperhatikan : 1. Pendapat Imam `Ala al-Din al-Kasani al-Hanafi dalam kitab *Badai' Shanai' fi Tartib al-Syarai'*:

أَنَّ الْمُصَلِّيَّ لَا يَخْلُو إِمَّا إِنْ كَانَ قَادِرًا عَلَى الْإِسْتِقْبَالِ أَوْ كَانَ عَاجِزًا عَنْهُ فَإِنْ كَانَ قَادِرًا يَجِبُ عَلَيْهِ التَّوَجُّهُ إِلَى الْقِبْلَةِ إِنْ كَانَ فِي حَالِ مُشَاهَدَةِ الْكَعْبَةِ فَإِلَى عَيْنِهَا ، أَيْ : أَيِّ جِهَةٍ كَانَتْ مِنْ جِهَاتِ الْكَعْبَةِ ، حَتَّىٰ لَوْ كَانَ مُنْحَرِفًا عَنْهَا غَيْرَ مُتَوَجِّهِ إِلَى شَيْءٍ مِنْهَا لَمْ يَجِزْ ، لِقَوْلِهِ تَعَالَى :

{وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ} ، وَفِي وَسْعِهِ تَوَلِيَةُ الْوَجْهِ إِلَى عَيْنِهَا فَيَجِبُ ذَلِكَ ، وَإِنْ كَانَ غَائِبًا عَنِ الْكَعْبَةِ يَجِبُ عَلَيْهِ التَّوَجُّهُ إِلَى جِهَتِهَا ، وَهِيَ الْمَحَارِبُ الْمَنْصُوبَةُ بِالْإِمَارَاتِ الدَّالَّةِ عَلَيْهَا لَا إِلَى عَيْنِهَا ، وَتُعْتَبَرُ الْجِهَةُ دُونَ الْعَيْنِ . كَذَا ذَكَرَ الْكَرْخِيُّ وَالرَّازِيُّ ، وَهُوَ قَوْلُ عَامَّةِ مُشَايخِنَا بِمَا وَرَاءَ النَّهْرِ

"Sesungguhnya bagi orang yang shalat tidak boleh kosong/lepas, apakah ia mampu atau tidak, untuk

menghadap kiblat. Apabila ia mampu maka wajib baginya menghadap kiblat, jika ia dapat menyaksikannya (Ka'bah) maka ia harus menghadap kepada 'ainul Ka'bah atau kepada arah dari arah kiblat. Jika ia tidak menghadap salah satunya maka itu tidak diperbolehkan, sebagaimana firman Allah "...dan dimana saja kamu berada, palingkanlah mukamu ke arahnya...". Dan dalam keadaan yang memungkinkan menghadap tepat

ke 'ainul ka'bah maka wajib dilakukan. Namun jika ghaib (tidak dapat melihat ka'bah) maka wajib menghadap ke arah Ka'bah (*jihatul Ka'bah*)..."

2. Pendapat Imam al-Qurtubi dalam Kitab *Jami` al-Ahkam Al-Qur'an* :

واختلفوا هل فرض الغائب استقبال العين أو الجهة؟ فمهم من قال بالأول قال ابن العربي (ت ٥٤٣ هـ) وهو ضعيف لأنه تكليف لما لا يصل إليه . ومنهم من قال بالجهة ، وهو الصحيح لثلاثة أمور: الأول : أنه الممكن الذي يرتبط به التكليف

الثاني : أنه المأمور به في القرآن لقوله تعالى : {فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ وَحَيْثُ مَا كُنْتُمْ} يعني من الأرض من شرق أو غرب {فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ}

الثالث : أن العلماء احتجوا بالصف الطويل الذي يعلم قطعاً أنه أضعاف عرض البيت

"Mereka berbeda pendapat apakah wajib bagi si ghaib (orang yang shalat dan tidak dapat melihat Ka'bah) untuk menghadap tepat ke bangunan Ka'bah (*'ainul Ka'bah*) atau ke arah Ka'bah (*jihatul Ka'bah*)? sebagian berpendapat pertama (yaitu, menghadap *'ainul Ka'bah*) berkata Ibnu 'Arabi (W.534 H) : pendapat ini adalah lemah karena membebani orang yang tidak dapat shalat dengan menghadap tepat *'ainul Ka'bah*. Sebagian lain berpendapat cukup menghadap arah Ka'bah (*Jihatul Ka'bah*). Pendapat terakhir inilah yang benar, dengan tiga alasan: (1) Bahwa hal inilah yang memungkinkan bagi ketentuan sebuah taklif (pembebanan hukum). (2) Bahwa hal inilah yang

diperintahkan oleh al-Qur'an dalam ayat **فَوَلِّ وَجْهَكَ شَطْرَ** (maka palingkanlah wajahmu ke arah Masjidil Haram) yakni belahan bumi di timur dan barat **فَوَلُّوا وُجُوهَكُمْ** (palingkanlah mukamu ke arahnya). (3) Bahwa para ulama berhujjah dengan (kebolehan) shalat dengan shaf yang panjang, yang sangat lemah (kecil kemungkinan) dapat menghadap tepat ke bangunan Ka'bah ('*ainul Ka'bah*)."

3. Pendapat Imam Al-Syirazi dalam kitab al-Muhadzdzab:

وإن لم يكن شيء من ذلك نظرت فإن كان ممن يعرف الدلائل فإن كان غائبا عن مكة اجتهد في طلب القبلة لأن له طريقا إلى معرفتها بالشمس والقمر والجبال والرياح ولهذا قال الله تعالى : { وَعَلَامَاتٍ وَبِالنَّجْمِ هُمْ يَهْتَدُونَ } [النحل : ١٦] فكان له أن يجتهد كالعالم في الحادثة وفي فرضه قولان : قال في الأم : فرضها إصابة العين لأن من لزمه فرض القبلة لزمه إصابة العين المكّي وظاهر ما نقله المزني أن الفرض هو الجهة لأنه لو كان الفرض هو العين لما صحت صلاة الصف الطويل لأن فيهم من يخرج عن العين

"Jika sama sekali ia tidak memiliki petunjuk apapun, maka dilihat maslahatnya. Jika ia termasuk orang yang mengetahui tanda-tanda atau petunjuk kiblat, maka meskipun ia tidak dapat melihat Ka'bah, ia harus tetap berijtihad mengetahui kiblat. Karena ia memiliki cara untuk mengetahuinya melalui keberadaan matahari, bulan, gunung, dan angin karena Allah SWT berfirman:

وَعَلَامَاتٍ وَبِالنَّجْمِ هُمْ يَهْتَدُونَ

"Dan (Dia ciptakan) tanda-tanda (penunjuk jalan). Dan dengan bintang-bintang itulah mereka mendapat petunjuk". (Qs An-Nahl:16).

Dengan begitu ia berhak berijtihad (dalam menentukan letak Ka'bah) seperti orang yang paham tentang fenomena alam mengenai kewajibannya ada dua pendapat. Dalam kitab al-Umm, Imam al-Syafi'i berkata : "Yang wajib dalam berkiblat adalah menghadap secara tepat ke bangunan Ka'bah. Karena orang yang diwajibkan

untuk menghadap kiblat, ia wajib menghadap ke bangunan Ka'bah, seperti halnya orang Mekkah. "Sedangkan teks yang jelas yang dikutip oleh imam al-Muzanni (murid Imam al-Syafi'i) dari Imam al-Syafi'i mengatakan bahwa yang wajib adalah menghadap ke arah Ka'bah (Jihatul Ka'bah) karena seandainya yang wajib itu adalah menghadap ke bangunan Ka'bah secara fisik, maka shalat jama'ah yang shafnya memanjang adalah tidak sah, sebab diantara mereka terdapat orang yang menghadap ke arah di luar dari bangunan Ka'bah."

4. Pendapat Ibnu Qudamah al-Hanbali:

ولنا، قول النبي صلى الله عليه السلام : " ما بين المشرق والمغرب قبلة " رواه الترمذي وقال: حديث حسن صحيح وظاهره أن جميع ما بينهما قبلة . ولأنه لو كان الفرض إصابة العين ، لما صحت صلاة أهل الصف الطويل على خط مستو، ولا صلاة اثنين متباعدين يستقبلان قبلة واحدة . فإنه لا يجوز أن يتوجه إلى الكعبة مع طول الصف إلا بقدرها . فإن قيل : مع البعيد يتسع المحاذي . قلنا : إنما يتسع مع تقوس الصف ، أما مع استوائه فلا . وشطر البيت : نحوه و قبله .

"Dan bagi kita adalah sabda Nabi SAW:" Arah antara timur dan barat adalah kiblat"(HR.Imam At-Tirmidzi), menurut sebuah pendapat hadist ini adalah hasan shahih.yang jelas bahwa arah antara keduanya adalah kiblat karena jika yang diwajibkan adalah menghadap tepat ke bangunan Ka'bah ('ainul Ka'bah) maka tidaklah sah shalat orang dengan shaf yang panjang..."

5. Makalah Drs.KH.A.Ghazaly Masroeri tentang" arah kiblat dari Indonesia" Dan "Posisi Arah Barat Indonesia" dalam rapat komisi Fatwa MUI tanggal 1 Juli 2010;
6. Pandangan dan pendapat rapat Komisi Fatwa MUI pada hari senin tanggal 1 Februari 2010 dan 1 Juli 2010.

MEMUTUSKAN

Menetapkan : FATWA TENTANG ARAH KIBLAT

Pertama : Ketentuan Hukum

1. Kiblat bagi orang yang shalat dan dapat melihat Ka`bah adalah menghadap ke bangunan Ka`bah (*ainul Ka`bah*)
2. Kiblat bagi orang yang shalat dan tidak dapat melihat Ka`bah adalah arah Ka`bah (*Jihat al-Ka`bah*)
3. Kiblat umat Islam Indonesia adalah menghadap ke barat laut dengan posisi bervariasi sesuai dengan letak kawasan masing-masing.

Kedua : **Rekomendasi**

Bangunan masjid/musholla yang tidak tepat arah kiblatnya, perlu ditata ulang shafnya tanpa membongkar bangunannya

Ditetapkan di : Jakarta

Tanggal : 18 Rajab 1431 H
01 Juli 2010 M

KOMISI FATWA MAJELIS ULAMA INDONESIA

Ketua,

ttd

DR. H. M. ANWAR IBRAHIM

Sekretaris,

ttd

DR. H. HASANUDIN, M.Ag.

CONTOH PERHITUNGAN AWAL WAKTU SHALAT UNTUK JAKARTA

Pada tanggal 3 Januari 2022

Data :

1. Lintang Tempat (ϕ) = $-06^{\circ} 10'$ (LS)
2. Bujur Tempat (λ) = $106^{\circ} 49'$ (BT)
3. Deklinasi Matahari (δ_0) jam 5 GMT = $-22^{\circ} 49' 26''$
4. Equation of Time (e) jam 5 GMT = $-00^j 04^m 21^d$
5. $\cotan h_{\text{asar}}$ = $\tan [\phi - \delta] + 1$
 $= \tan [-06^{\circ} 10' - -22^{\circ} 49' 26''] + 1$
 $= \tan 16^{\circ} 39' 26'' + 1$
 $= 0.299200745 + 1$
 $= 1.299200745^{-1}$
 $= 0.769703992$
 $h_{\text{asar}} = \tan^{-1} 0.769703992 = 37^{\circ} 35' 08.24''$
 - a. h_{asar} = $37^{\circ} 35' 08.24''$
 - b. h_{magrib} = -01°
 - c. $h_{\text{isya'}}$ = -18°
 - d. h_{subuh} = -20°
 - e. h_{imsak} = 10 menit sebelum subuh
 - f. h_{terbit} = -01°
 - g. h_{dhuha} = $04^{\circ} 30'$
6. Mer. Pass = $12^j 00^m 00^d - (-00^j 04^m 21^d)$
 $= 12^j 04^m 21.00^d$
7. Interpolasi = $(106^{\circ} 49' - 105^{\circ}) : 15$
 $= 00^j 07^m 16.00^d$

1. Awal Waktu Zuhur :

- Mer. Pass = $12^j 04^m 21.00^d$ (LMT)
- Interpolasi = $\frac{00^j 07^m 16.00^d}{11^j 57^m 05.00^d - 11^j 58^m}$
- Ikhtiyat = $\frac{00^j 03^m}{12^j 01^m}$ (WIB)

2. Awal Waktu Ashar :

$$\cos t = -\tan \phi \tan \delta_0 + \sin h_{\text{as}} : \cos \phi : \cos \delta_0$$

$$\cos t = \frac{-\tan -06^{\circ} 10' \times \tan -22^{\circ} 49' 26'' + \sin 37^{\circ} 35' 08.24''}{\cos -06^{\circ} 10' : \cos -22^{\circ} 49' 26''}$$

$$\begin{aligned}
 &= 0.108046159 \times -0.420851993 + 0.609946327 : \\
 &0.994213627 : 0.9217015 \\
 &= 0.620141283 \\
 t &= 51^\circ 40' 27.44'' \\
 \text{Mer. Pass} &= 12^j 04^m 21.00^d \\
 t : 15 &= \underline{03^j 26^m 41.65^d} + \\
 &15^j 31^m 02.65^d \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^j 07^m 16.00^d} - \\
 &15^j 23^m 46.65^d \\
 &15^j 24^m \\
 \text{Ikhtiyat} &= \underline{00^j 02^m} + \\
 \text{Ashar} &= 15^j 26^m \text{ (WIB)}
 \end{aligned}$$

3. Awal Waktu Maghrib :

$$\cos t = -\tan \phi \tan \delta_o + \sin h_{mg} : \cos \phi : \cos \delta_o$$

$$\begin{aligned}
 \cos t &= -\tan -06^\circ 10' \times \tan -22^\circ 49' 26'' + \sin -01^\circ : \\
 &\cos -06^\circ 10' : \cos -22^\circ 49' 26'' \\
 &= 0.108046159 \times -0.420851993 + -0.017452406 : \\
 &0.994213627 : 0.9217015 \\
 &= -0.064516631 \\
 t &= 93^\circ 41' 56.76'' \\
 \text{Mer. Pass} &= 12^j 04^m 21.00^d \\
 t : 15 &= \underline{06^j 14^m 47.78^d} + \\
 &18^j 19^m 08.78^d \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^j 07^m 16.00^d} - \\
 &18^j 11^m 52.78^d \\
 &18^j 12^m \\
 \text{Ikhtiyat} &= \underline{00^j 02^m} + \\
 \text{Maghrib} &= 18^j 14^m \text{ (WIB)}
 \end{aligned}$$

4. Awal Waktu Isya' :

$$\cos t = -\tan \phi \tan \delta_o + \sin h_{is} : \cos \phi : \cos \delta_o$$

$$\begin{aligned}
 \cos t &= -\tan -06^\circ 10' \times \tan -22^\circ 49' 26'' + \sin -18^\circ : \\
 &\cos -06^\circ 10' : \cos -22^\circ 49' 26'' \\
 &= 0.108046159 \times -0.420851993 + -0.309016994 : \\
 &0.994213627 : 0.9217015 \\
 &= -0.382690691 \\
 t &= 112^\circ 30' 01.62'' \\
 \text{Mer. Pass} &= 12^j 04^m 21.00^d
 \end{aligned}$$

$$\begin{aligned}
 t : 15 &= \underline{07^j 30^m 00.11^d} + \\
 &\quad 19^j 34^m 21.11^d \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^j 07^m 16.00^d} - \\
 &\quad 19^j 27^m 05.11^d \\
 &\quad 19^j 28^m \\
 \text{Ikhtiyat} &= \underline{00^j 02^m} + \\
 \text{Isya'} &= 19^j 30^m \text{ (WIB)}
 \end{aligned}$$

5. Awal Waktu Subuh :

$$\text{Cos } t = -\tan \phi \tan \delta_o + \sin h_{sb} : \cos \phi : \cos \delta_o$$

$$\begin{aligned}
 \text{Cos } t &= -\tan -06^\circ 10' \times \tan -22^\circ 49' 26'' + \sin -20^\circ : \\
 &\quad \cos -06^\circ 10' : \cos -22^\circ 49' 26'' \\
 &= 0.108046159 \times -0.420851993 + -0.342020143 : \\
 &\quad 0.994213627 : 0.9217015 \\
 &= -0.418705853 \\
 t &= 114^\circ 45' 10.40'' \\
 \text{Mer. Pass} &= 12^j 04^m 21.00^d \\
 t : 15 &= \underline{07^j 39^m 00.70^d} - \\
 &\quad 04^j 25^m 20.30^d \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^j 07^m 16.00^d} - \\
 &\quad 04^j 18^m 04.30^d \\
 &\quad 04^j 19^m \\
 \text{Ikhtiyat} &= \underline{00^j 02^m} + \\
 \text{Subuh} &= 04^j 21^m \text{ (WIB)}
 \end{aligned}$$

6. Waktu Imsak :

$$\text{Imsak} = \text{Waktu Subuh} - 10^m$$

$$\begin{aligned}
 \text{Subuh} &= 04^j 21^m \text{ (WIB)} \\
 &= \underline{00^j 10^m} - \\
 \text{Imsak} &= 04^j 11^m \text{ (WIB)}
 \end{aligned}$$

7. Waktu Terbit :

$$\text{Cos } t = -\tan \phi \tan \delta_o + \sin h_{tb} : \cos \phi : \cos \delta_o$$

$$\begin{aligned}
 \text{Cos } t &= -\tan -06^\circ 10' \times \tan -22^\circ 49' 26'' + \sin -01^\circ : \\
 &\quad \cos -06^\circ 10' : \cos -22^\circ 49' 26'' \\
 &= 0.108046159 \times -0.420851993 + -0.017452406 : \\
 &\quad 0.994213627 : 0.9217015 \\
 &= -0.064516631
 \end{aligned}$$

$$\begin{aligned}
 t &= 93^{\circ} 41' 56.76'' \\
 \text{Mer. Pass} &= 12^{\text{j}} 04^{\text{m}} 21.00^{\text{d}} \\
 t : 15 &= \underline{06^{\text{j}} 14^{\text{m}} 47.78^{\text{d}}} - \\
 &\quad 05^{\text{j}} 49^{\text{m}} 33.22^{\text{d}} \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^{\text{j}} 07^{\text{m}} 16.00^{\text{d}}} - \\
 &\quad 05^{\text{j}} 42^{\text{m}} 17.22^{\text{d}} \\
 &\quad 05^{\text{j}} 42^{\text{m}} \\
 \text{Ikhtiyat} &= \underline{00^{\text{j}} 02^{\text{m}}} - \\
 \text{Terbit} &= 05^{\text{j}} 40^{\text{m}} \text{ (WIB)}
 \end{aligned}$$

8. Awal Waktu Duha :

$$\cos t = -\tan \phi \tan \delta_o + \sin h_{\text{dl}} : \cos \phi : \cos \delta_o$$

$$\begin{aligned}
 \cos t &= -\tan -06^{\circ} 10' \times \tan -22^{\circ} 49' 26'' + \sin 04^{\circ} 30' : \\
 &\quad \cos -06^{\circ} 10' : \cos -22^{\circ} 49' 26'' \\
 &= 0.108046159 \times -0.420851993 + 0.078459095 : \\
 &\quad 0.994213627 : 0.9217015 \\
 &= 0.040148177 \\
 t &= 87^{\circ} 41' 56.62'' \\
 \text{Mer. Pass} &= 12^{\text{j}} 04^{\text{m}} 21.00^{\text{d}} \\
 t : 15 &= \underline{05^{\text{j}} 50^{\text{m}} 47.77^{\text{d}}} - \\
 &\quad 06^{\text{j}} 13^{\text{m}} 33.23^{\text{d}} \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^{\text{j}} 07^{\text{m}} 16.00^{\text{d}}} - \\
 &\quad 06^{\text{j}} 06^{\text{m}} 17.23^{\text{d}} \\
 &\quad 06^{\text{j}} 07^{\text{m}} \\
 \text{Ikhtiyat} &= \underline{00^{\text{j}} 02^{\text{m}}} + \\
 \text{Dluha} &= 06^{\text{j}} 09^{\text{m}} \text{ (WIB)}
 \end{aligned}$$

Hasil Perhitungan

Awal waktu-waktu shalat untuk Jakarta pada tanggal 3 Januari 2020

Imsak	Subuh	Terbit	Duha	Zuhur	Asar	Maghrib	Isya
04:11	04:21	05:40	06:09	12:01	15:26	18:14	19:30

CONTOH PERHITUNGAN AWAL BULAN RAMADAN 1442 H

1. Menentukan bulan dan tahun

Sebagai contoh, dihitung waktu ijtima' dan posisi hilal menjelang bulan Ramadan 1443 H.

2. Menentukan Lokasi

Perhitungan untuk lokasi pantai Pelabuhan Ratu, Sukabumi dengan posisi

Lintang Tempat (ϕ) = $-07^{\circ} 01' 44.60''$

Bujur Tempat (λ) = $106^{\circ} 33' 27.80''$

Tinggi tempat = 52.685 meter di atas air laut

3. Konversi Tanggal

29 Sya'ban 1443 H atau tanggal 29-08-1443 H

Waktu yang telah dilalui sebanyak 1442 th, lebih 07 bl, lebih 29 hr.

1442 tahun : 30 tahun = 48 daur lebih 2 tahun

48 daur = 48×10631 hari = 510288 hari

2 tahun = 2×354 = 708 hari

07 bulan = $(30 \times 4) + (29 \times 3)$ = 207 hari

29 hari = 29 hari +

Jumlah = 511232 hari

Selisih kalender Masehi – Hijriyah = 227016 hari

Anggaran baru Gregorius = 13 hari +

JUMLAH = 738261 hari

$511232 : 7$ = 73033 lebih 1 = Jumat (dihitung mulai Jum'at)

$511232 : 5$ = 102246 lebih 2 = Pahing (dihitung mulai Legi)

$738261 : 1461$ = 505 siklus lebih 456 hari

505 siklus = 504×4 = 2020 tahun

456 hari = 1 tahun lebih 91 hari

Waktu yang dilewati = 2021 tahun + 3 bulan + 1 hari

atau 2021 tahun lebih 3 bulan lebih 1 hari

Jadi 29 Sya'ban 1442 H bertepatan 1 April 2022 M (Jumat Pahing).

4. Menyiapkan data astronomi pada tanggal 1 April 2022 M
5. FIB (Fraction Illumination Bulan) terkecil pada tanggal 1 April 2021 M yaitu 0.00089, pada jam 07 (GMT)
6. ELM jam 07 = $11^{\circ} 32' 32.00''$
 ELM jam 08 = $11^{\circ} 34' 60.00'' -$
 Selisih (B_1) = $00^{\circ} 02' 28.00''$
7. ALB jam 07 = $11^{\circ} 49' 04.00''$
 ALB jam 08 = $12^{\circ} 21' 46.00'' -$
 Selisih (B_2) = $00^{\circ} 32' 42.00''$
8. ELM jam 07 = $11^{\circ} 32' 32.00''$
 ALB jam 07 = $11^{\circ} 49' 04.00'' -$
MB = $-00^{\circ} 16' 32.00''$
9. B_2 = $00^{\circ} 32' 42.00''$
 B_1 = $00^{\circ} 02' 28.00'' -$
SB = $00^{\circ} 30' 14.00''$
10. Titik Ijtima' = MB : SB
 = $-00^{\circ} 16' 32.00'' : 00^{\circ} 30' 14.00''$
 = $-00^{\circ} 32' 48.69''$
11. Waktu FIB terkecil = $07^j 00^m 00^d$
 Titik Ijtima' = $-00^{\circ} 32' 48.69'' +$
Ijtima' = $06^j 27^m 11.31^d$
 Koreksi ΔT = $00^j 02^m 09.67^d -$
 Ijtima' dalam GMT = $06^j 25^m 01.64^d$
 Koreksi WIB = $07^j 00^m 00.00^d +$
Ijtima' = $13^j 25^m 01.64^d$
12. Perkiraan matahari terbenam untuk Pelabuhan Ratu, Sukabumi pada tanggal 01 April 2022
 ϕ = $-07^{\circ} 01' 44.60''$
 λ = $106^{\circ} 33' 27.80''$
 T_t = 52.685 m
 δ = $04^{\circ} 37' 31.00''$

$$\begin{aligned}
 e &= -00^{\text{j}} \ 03^{\text{m}} \ 52.00^{\text{d}} \\
 \text{Dip} &= \sqrt{52.685 \times 0.0293} = 00^{\circ} \ 12' \ 45.62'' \\
 h &= -(00^{\circ} \ 16' + 00^{\circ} \ 34' \ 30'' + \text{Dip}) = -00^{\circ} \ 12' \ 45.62'' \\
 \cos t &= -\tan \phi \tan \delta + \sin h : \cos \phi : \cos \delta \\
 &= -\tan -07^{\circ} \ 01' \ 44.6'' \times \tan 04^{\circ} \ 37' \ 31.00'' + \sin -01^{\circ} \ 03' \ 15.62'' \\
 &\quad : \cos -07^{\circ} \ 01' \ 44.6'' : \cos 04^{\circ} \ 37' \ 31.00'' \\
 &= -0.0008625381793 \\
 t &= 90^{\circ} \ 29' \ 39.13'' \\
 12 - e &= 12^{\text{j}} \ 03^{\text{m}} \ 52.00^{\text{d}} \\
 t : 15 &= \underline{06^{\text{j}} \ 01^{\text{m}} \ 58.61^{\text{d}}} + \\
 12 - e + t : 15 &= 18^{\text{j}} \ 05^{\text{m}} \ 50.61^{\text{d}} \\
 \lambda : 15 &= \underline{07^{\text{j}} \ 06^{\text{m}} \ 13.85^{\text{d}}} - \\
 \text{Matahari terbenam} &= \mathbf{10^{\text{j}} \ 59^{\text{m}} \ 36.76^{\text{d}}}
 \end{aligned}$$

13. Data dari Ephemeris pada jam 10:54:24.06 (GMT)

a) Deklinasi matahari ($\delta_{\odot}$)

$$\begin{aligned}
 \delta_{\odot} \text{ jam 10} &= 04^{\circ} \ 36' \ 33.00'' & 04^{\circ} \ 36' \ 33.00'' \\
 \delta_{\odot} \text{ jam 11} &= \underline{04^{\circ} \ 37' \ 31.00''} - \\
 &\quad -00^{\circ} \ 00' \ 58.00'' \\
 &\quad \underline{00^{\circ} \ 59' \ 36.76''} \times \\
 &\quad -00^{\circ} \ 00' \ 57.63'' & \underline{-00^{\circ} \ 00' \ 57.63''} - \\
 \delta_{\odot} \text{ jam 10:59:36.76} &= & \mathbf{04^{\circ} \ 37' \ 30.63''}
 \end{aligned}$$

b) Semi diameter matahari ($SD_{\odot}$)

$$\begin{aligned}
 SD_{\odot} \text{ jam 10} &= 00^{\circ} \ 16' \ 00.37'' & 00^{\circ} \ 16' \ 00.37'' \\
 SD_{\odot} \text{ jam 11} &= \underline{00^{\circ} \ 16' \ 00.36''} - \\
 &\quad 00^{\circ} \ 00' \ 00.01'' \\
 &\quad \underline{00^{\circ} \ 59' \ 36.76''} \times \\
 &\quad 00^{\circ} \ 00' \ 00.01'' & \underline{00^{\circ} \ 00' \ 00.01''} - \\
 SD_{\odot} \text{ jam 10:59:36.76} &= & \mathbf{00^{\circ} \ 16' \ 00.36''}
 \end{aligned}$$

c) Equation of Time (e)

$$\begin{aligned}
 e \text{ jam 10} &= 00^{\text{j}} \ 03^{\text{m}} \ 52.00^{\text{d}} & -00^{\text{j}} \ 03^{\text{m}} \ 52.00^{\text{d}} \\
 e \text{ jam 11} &= \underline{00^{\text{j}} \ 03^{\text{m}} \ 52.00^{\text{d}}} - \\
 &\quad -00^{\circ} \ 00' \ 00.00''
 \end{aligned}$$

$$\begin{aligned}
 & \frac{00^\circ \ 59' \ 36.76''}{-00^\circ \ 00' \ 00.00''} \times \frac{-00^\circ \ 00' \ 00.01''}{-00^\circ \ 00' \ 00.01''} - \\
 \mathbf{e \ jam \ 10:59:36.76} &= \mathbf{-00^j \ 03^m \ 52.00^d} \\
 14. \ h_o &= -(SD_o + 00^\circ \ 34' \ 30'' + Dip) \\
 &= -(00^\circ \ 16' \ 00.36'' + 00^\circ \ 34' \ 30'' + 00^\circ \ 12' \ 45.62'') \\
 &= \mathbf{-01^\circ \ 03' \ 15.98''} \\
 15. \ \cos t_o &= -\tan \phi \tan \delta + \sin h : \cos \phi : \cos \delta \\
 &= -\tan -07^\circ \ 01' \ 44.60'' \times \tan 04^\circ \ 37' \ 30.63'' + \sin -01^\circ \ 03' \ 15.98'' \\
 &\quad : \cos -07^\circ \ 01' \ 44.60'' : \cos 04^\circ \ 37' \ 30.63'' \\
 &= 0.000862736571 \\
 t_o &= \mathbf{90^\circ \ 29' \ 39.54''} \\
 16. \ \text{Ghurub} &= 12 - e + (t_o : 15) - (\lambda : 15) \\
 12 - e &= 12^j \ 03^m \ 52.00^d \\
 t : 15 &= \frac{06^j \ 01^m \ 58.64^d}{+} \\
 12 - e + t : 15 &= 18^j \ 05^m \ 50.64^d \\
 \lambda : 15 &= \frac{07^j \ 06^m \ 13.85^d}{-} \\
 \text{Ghurub} &= 10^j \ 59^m \ 36.79^d \\
 \text{Koreksi WIB} &= \frac{07^j \ 00^m \ 00.00^d}{+} \\
 &\mathbf{17^j \ 59^m \ 36.79^d} \\
 17. \ AR_o \ \text{jam 10} &= 10^\circ \ 43' \ 03.00'' \qquad 10^\circ \ 43' \ 03.00'' \\
 AR_o \ \text{jam 11} &= \frac{10^\circ \ 45' \ 20.00''}{-} \\
 &\quad -00^\circ \ 02' \ 17.00'' \\
 &\quad \frac{00^\circ \ 59' \ 36.79''}{\times} \\
 &\quad -00^\circ \ 02' \ 16.12'' \qquad \frac{-00^\circ \ 02' \ 16.12''}{-} \\
 \mathbf{AR_o \ jam \ 10:59:36.79} &= \mathbf{10^\circ \ 45' \ 19.12''} \\
 18. \ AR_{\zeta} \ \text{jam 10} &= 13^\circ \ 39' \ 23.00'' \qquad 13^\circ \ 39' \ 23.00'' \\
 AR_{\zeta} \ \text{jam 11} &= \frac{14^\circ \ 08' \ 33.00''}{-} \\
 &\quad -00^\circ \ 29' \ 10.00'' \\
 &\quad \frac{00^\circ \ 59' \ 36.79''}{\times} \\
 &\quad -00^\circ \ 28' \ 58.72'' \qquad \frac{-00^\circ \ 28' \ 58.72''}{-} \\
 \mathbf{AR_{\zeta} \ jam \ 10:59:36.79} &= \mathbf{14^\circ \ 08' \ 21.72''} \\
 19. \ \delta_{\zeta} \ \text{jam 10} &= 02^\circ \ 16' \ 32.00'' \qquad 02^\circ \ 16' \ 32.00''
 \end{aligned}$$

$$\begin{aligned}
 \delta_{\text{jam 11}} &= \underline{02^\circ 31' 13.00''} - \\
 &\quad -00^\circ 14' 41.00'' \\
 &\quad \underline{00^\circ 59' 36.79''} \times \\
 &\quad -00^\circ 14' 35.32'' \qquad \underline{-00^\circ 14' 35.32''} - \\
 \delta_{\text{jam 10:59:36.79}} &= \qquad \qquad \qquad \mathbf{02^\circ 31' 07.32''} \\
 20. \text{SD}_{\text{jam 10}} &= 00^\circ 15' 26.88'' \qquad 00^\circ 15' 26.88'' \\
 \text{SD}_{\text{jam 11}} &= \underline{00^\circ 15' 26.50''} - \\
 &\quad -00^\circ 00' 00.38'' \\
 &\quad \underline{00^\circ 59' 36.79''} \times \\
 &\quad -00^\circ 00' 00.38'' \qquad \underline{-00^\circ 00' 00.38''} - \\
 \text{SD}_{\text{jam 10:59:36.79}} &= \qquad \qquad \qquad \mathbf{00^\circ 15' 26.50''} \\
 21. \text{HP}_{\text{jam 10}} &= 00^\circ 56' 41.00'' \qquad 00^\circ 56' 41.00'' \\
 \text{HP}_{\text{jam 11}} &= \underline{00^\circ 56' 40.00''} - \\
 &\quad -00^\circ 00' 01.00'' \\
 &\quad \underline{00^\circ 59' 36.79''} \times \\
 &\quad -00^\circ 00' 00.99'' \qquad \underline{-00^\circ 00' 00.99''} - \\
 \text{HP}_{\text{jam 10:59:36.79}} &= \qquad \qquad \qquad \mathbf{00^\circ 56' 40.01''} \\
 22. t_{\text{c}} &= \text{AR}_0 - \text{AR}_{\text{c}} + t_0 \\
 &= 10^\circ 45' 19.12'' - 14^\circ 08' 21.72'' + 90^\circ 29' 39.54'' \\
 &= \mathbf{87^\circ 06' 36.94''} \\
 23. \sin h_{\text{c}} &= \sin \phi \sin \delta_{\text{c}} + \cos \phi \cos \delta_{\text{c}} \cos t_{\text{c}} \\
 &= \sin -07^\circ 01' 44.60'' \times \sin 02^\circ 31' 07.32'' + \cos -07^\circ 01' 44.60'' \\
 &\quad \times \cos 02^\circ 31' 07.32'' \times \cos 87^\circ 06' 36.94'' \\
 &= 0.044609118 \\
 h_{\text{c}} &= \mathbf{02^\circ 33' 24.35''} \\
 24. P &= \cos h_{\text{c}} \times \text{HP}_{\text{c}} \\
 &= \cos 02^\circ 33' 24.35'' \times 00^\circ 56' 40.01'' \\
 P &= \mathbf{00^\circ 56' 36.63''} \\
 25. h_{\text{c}}^\circ &= h - P + \text{SD}_{\text{c}} \\
 h_{\text{c}} &= 02^\circ 33' 24.35'' \\
 P &= \underline{00^\circ 56' 36.63''} - \\
 &\quad 01^\circ 36' 47.72''
 \end{aligned}$$

$$\begin{aligned}
 SD_{\zeta} &= 00^{\circ} 15' 26.50'' + \\
 h_{\zeta}^{\circ} &= 01^{\circ} 52' 14.22'' \\
 26. \text{ Refr} &= 0,01695: \tan (h_{\zeta}^{\circ} + 10,3:(h_{\zeta}^{\circ} + 5,1255)) \\
 &= 0,01695: \tan (01^{\circ} 52' 14.22'' + 10,3 : (01^{\circ} 52' 14.22'' + \\
 &\quad 5,1255)) \\
 &= 00^{\circ} 17' 24.68'' \\
 27. h_{\zeta}' &= h_{\zeta}^{\circ} + \text{Refr} + \text{Dip} \\
 h_{\zeta}^{\circ} &= 01^{\circ} 52' 14.22'' \\
 \text{Refr} &= 00^{\circ} 17' 24.68'' \\
 \text{Dip} &= 00^{\circ} 12' 45.62'' + \\
 h_{\zeta}' &= 02^{\circ} 22' 24.52'' \\
 28. \sin NF &= (\sin \phi \sin \delta_{\zeta}) : (\cos \phi \cos \delta_{\zeta}) \\
 &= (\sin -07^{\circ} 01' 44.60'' \times \sin 02^{\circ} 31' 07.32'') : (\cos -07^{\circ} 01' 44.60'' \\
 &\quad \times \cos 02^{\circ} 31' 07.32'') \\
 &= -0.0005423685338 \\
 NF &= -00^{\circ} 81' 38.72'' \\
 29. \text{ PNF} &= \cos NF \times HP \\
 &= \cos -00^{\circ} 18' 38.72'' \times 00^{\circ} 56' 40.01'' \\
 \text{PNF} &= 00^{\circ} 56' 39.96'' \\
 30. \text{ SBSH} &= 90 + NF \\
 &= 90 + -00^{\circ} 18' 38.72'' \\
 \text{SBSH} &= 89^{\circ} 41' 21.28'' \\
 31. \text{ SBS} &= 90 + NF + \text{PNF} - (SD_{\zeta} + 0.575 + \text{Dip}) \\
 &= 90 + -00^{\circ} 18' 38.72'' + 00^{\circ} 56' 39.96'' - \\
 &\quad (00^{\circ} 15' 26.50'' + 0.575 + 00^{\circ} 12' 45.62'') \\
 \text{SBS} &= 89^{\circ} 35' 19.12'' \\
 32. Lm_{\zeta} &= (\text{SBS} - t) : 15 \\
 &= (89^{\circ} 35' 19.12'' - 87^{\circ} 06' 36.94'') : 15 \\
 Lm_{\zeta} &= 00^j 09^m 54.81^d \\
 33. \text{ Terb}_{\zeta} &= \text{Ghurub} + Lm \\
 &= 17^j 59^m 36.79^d + 00^j 09^m 54.81^d
 \end{aligned}$$

$$\begin{aligned}
 \text{Terb}_\zeta &= 18^{\text{j}} 09^{\text{m}} 31.60^{\text{d}} \\
 34. \tan A_o &= -\sin \phi : \tan t_o + \cos \phi \tan \delta_o : \sin t_o \\
 &= -\sin -07^\circ 01' 44.60'' : \tan 90^\circ 29' 39.54'' + \\
 &\quad \cos -07^\circ 01' 44.60'' \times \tan 04^\circ 37' 30.63'' : \sin 90^\circ 29' 39.54'' \\
 &= 0.079239504 \\
 A_o &= 04^\circ 31' 50.24'' \\
 35. \tan A_\zeta &= -\sin \phi : \tan t_\zeta + \cos \phi \tan \delta_\zeta : \sin t_\zeta \\
 &= -\sin -07^\circ 01' 44.60'' : \tan 87^\circ 06' 36.94'' + \\
 &\quad \cos -07^\circ 01' 44.60'' \times \tan 02^\circ 31' 07.32'' : \sin 87^\circ 06' 36.94'' \\
 &= 0.049890087 \\
 A_\zeta &= 02^\circ 51' 22.04'' \\
 36. \text{PH} &= A_\zeta - A_o \\
 &= 02^\circ 51' 22.04'' - 04^\circ 31' 50.24'' \\
 \text{PH} &= -01^\circ 40' 28.20'' \\
 37. \tan AT_\zeta &= -\sin \phi : \tan \text{SBS} + \cos \phi \tan \delta_\zeta : \sin \text{SBS} \\
 &= -\sin -07^\circ 01' 44.60'' : \tan 89^\circ 35' 19.12'' + \\
 &\quad \cos -07^\circ 01' 44.60'' \times \tan 02^\circ 31' 07.32'' : \sin 89^\circ 35' 19.12'' \\
 &= 0.044537058 \\
 AT_\zeta &= 02^\circ 33' 00.36'' \\
 38. \text{FI jam 10} &= 0.00107 \qquad 0.00107 \\
 \text{FI jam 11} &= \frac{0.00121}{-0.00014} - \\
 &\quad \frac{00^\circ 56' 36.79'' \times}{-0.0001390973889} \qquad \frac{-0.0001390973889}{0.001209097389} \\
 \text{FI jam 10: 59:36.79} &= 0.001209097389 = 0.12\% \\
 39. \text{NH} &= (\sqrt{[\text{PH}^2 + h_\zeta'^2]}) : 15 \\
 &= (\sqrt{[(-01^\circ 40' 28.20'')^2 + (02^\circ 22' 24.52'')^2]}) : 15 \\
 &= (\sqrt{[02^\circ 48' 14.22'' + 05^\circ 38' 00.23'']}) : 15 \\
 &= (\sqrt{08^\circ 26' 14.45''}) : 15 \\
 &= 02^\circ 54' 16.96'' : 15 \\
 \text{NH} &= 0.193647414 \text{ Jari}
 \end{aligned}$$

$$\begin{aligned}
 40. \tan \text{MRG} &= [\text{PH} : h'] \\
 &= [-01^\circ 40' 28.20'' : 02^\circ 22' 24.52'] \\
 &= -0.705504814
 \end{aligned}$$

$$\text{MRG} = -35^\circ 12' 11.35''$$

$$\begin{aligned}
 41. \cos \text{JB} &= \cos h' \times \cos \text{PH} \\
 &= \cos 02^\circ 22' 24.52'' \times \cos -01^\circ 40' 28.20'' \\
 &= 0.998715438
 \end{aligned}$$

$$\text{JB} = 02^\circ 54' 15.97''$$

Dari perhitungan di atas dapat diketahui bahwa ijtima' menjelang bulan Ramadan 1443 H terjadi pada hari Jumat Pahing tanggal 01 April 2022 M jam 13:25:01.64 WIB.

Untuk lokasi Pelabuhanratu, Sukabumi (Jawa Barat):

Matahari Terbenam	= 17:59:36.79 WIB
Arah Matahari	= 04° 31' 50.24'' (Utara Titik Barat)
Tinggi Hilal	= 02° 22' 54.65'' (di atas ufuk Mar'i)
Arah Hilal	= 02° 51' 22.04'' (Utara Titik Barat)
Posisi Hilal	= -01° 40' 28.20'' (Selatan Matahari)
Jarak Busur	= 02° 54' 15.97''
Keadaan Hilal	= Miring ke Selatan
Lama Hilal	= 00 ^j 09 ^m 54.81 ^d
Hilal Terbenam	= 18:09:31.60 WIB
Arah Terb. Hilal	= 02° 33' 00.36'' (Utara Titik Barat)
Illuminasi Hilal	= 0.001209097389 = (0.12%)
Nurul Hilal	= 0.193647414 (jari)

DAFTAR REFRAKSI

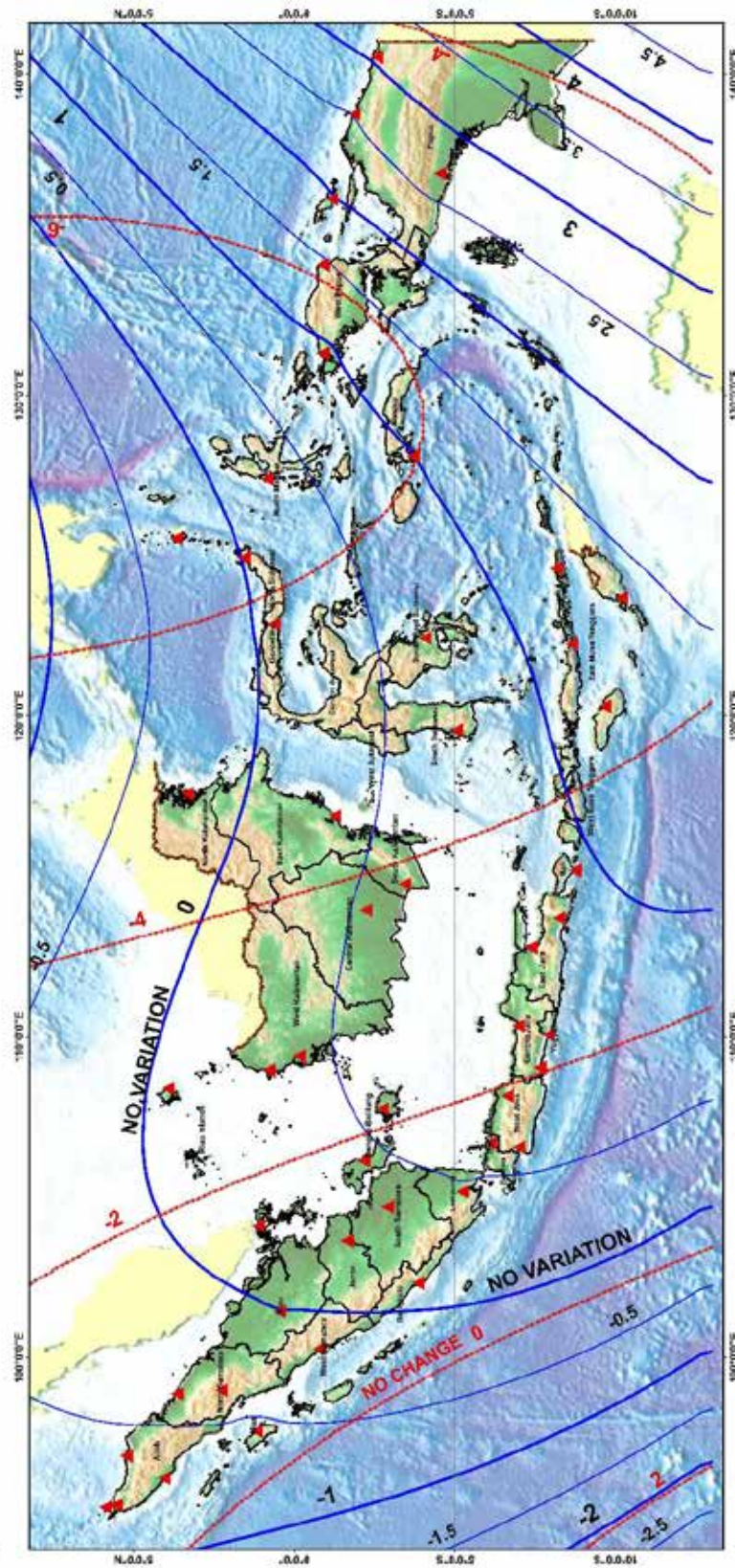
h	Refr	h'	h	Refr	h'	h	Refr	h'	h	Refr	h'
-0° 35'	34.5'	0° 00'	2° 14'	16.1'	2° 30'	5° 51'	08.5'	6° 00'	15° 00'	03.5'	15° 04'
-0° 31'	33.8'	0° 03'	2° 19'	15.8'	2° 35'	6° 02'	08.3'	6° 10'	15° 27'	03.4'	15° 30'
-0° 27'	33.2'	0° 06'	2° 24'	15.5'	2° 40'	6° 12'	08.1'	6° 20'	15° 54'	03.3'	15° 57'
-0° 24'	32.6'	0° 09'	2° 30'	15.2'	2° 45'	6° 22'	07.9'	6° 30'	16° 23'	03.2'	16° 26'
-0° 20'	32.0'	0° 12'	2° 35'	14.9'	2° 50'	6° 32'	07.7'	6° 40'	16° 53'	03.1'	16° 56'
-0° 16'	31.4'	0° 15'	2° 40'	14.7'	2° 55'	6° 42'	07.6'	6° 50'	17° 25'	03.0'	17° 28'
-0° 13'	30.8'	0° 18'	2° 46'	14.4'	3° 00'	6° 53'	07.4'	7° 00'	17° 59'	02.9'	18° 02'
-0° 09'	30.3'	0° 21'	2° 51'	14.1'	3° 05'	7° 03'	07.2'	7° 10'	18° 35'	02.8'	18° 38'
-0° 06'	29.8'	0° 24'	2° 56'	13.9'	3° 10'	7° 13'	07.1'	7° 20'	19° 14'	02.7'	19° 17'
-0° 02'	29.2'	0° 27'	3° 01'	13.7'	3° 15'	7° 23'	07.0'	7° 30'	19° 55'	02.6'	19° 58'
+0 01'	28.7'	0° 30'	3° 07'	13.4'	3° 20'	7° 33'	06.8'	7° 40'	20° 39'	02.5'	20° 42'
+0 05'	28.2'	0° 33'	3° 12'	13.2'	3° 25'	7° 43'	06.7'	7° 50'	21° 26'	02.4'	21° 28'
0° 08'	27.8'	0° 36'	3° 17'	13.0'	3° 30'	7° 53'	06.6'	8° 00'	22° 17'	02.3'	22° 19'
0° 12'	27.3'	0° 39'	3° 22'	12.7'	3° 35'	8° 04'	06.4'	8° 10'	23° 11'	02.2'	23° 13'
0° 15'	26.8'	0° 42'	3° 27'	12.5'	3° 40'	8° 14'	06.3'	8° 20'	24° 09'	02.1'	24° 11'
0° 19'	26.4'	0° 45'	3° 33'	12.3'	3° 45'	8° 24'	06.2'	8° 30'	25° 12'	02.0'	25° 14'
0° 22'	25.9'	0° 48'	3° 38'	12.1'	3° 50'	8° 34'	06.1'	8° 40'	26° 20'	01.9'	26° 22'
0° 26'	25.5'	0° 51'	3° 43'	11.9'	3° 55'	8° 44'	06.0'	8° 50'	27° 34'	01.8'	27° 36'
0° 29'	25.1'	0° 54'	3° 48'	11.8'	4° 00'	8° 54'	05.9'	9° 00'	28° 54'	01.7'	28° 56'
0° 32'	24.7'	0° 57'	3° 53'	11.6'	4° 05'	9° 04'	05.8'	9° 10'	30° 22'	01.6'	30° 24'
0° 36'	24.3'	1° 00'	3° 59'	11.4'	4° 10'	9° 14'	05.7'	9° 20'	31° 58'	01.5'	32° 00'
0° 39'	24.0'	1° 03'	4° 04'	11.2'	4° 15'	9° 24'	05.6'	9° 30'	33° 44'	01.4'	33° 45'
0° 42'	23.6'	1° 06'	4° 09'	11.1'	4° 20'	9° 34'	05.5'	9° 40'	35° 39'	01.3'	35° 40'
0° 46'	23.2'	1° 09'	4° 14'	10.9'	4° 25'	9° 45'	05.4'	9° 50'	37° 47'	01.2'	37° 48'
0° 49'	22.9'	1° 12'	4° 19'	10.7'	4° 30'	9° 51'	05.3'	9° 56'	40° 07'	01.1'	40° 08'
0° 52'	22.5'	1° 15'	4° 24'	10.6'	4° 35'	10° 03'	05.2'	10° 08'	42° 43'	01.0'	42° 44'
0° 56'	22.2'	1° 18'	4° 30'	10.4'	4° 40'	10° 15'	05.1'	10° 20'	45° 35'	00.9'	45° 36'
0° 59'	21.9'	1° 21'	4° 35'	10.3'	4° 45'	10° 28'	05.0'	10° 33'	48° 46'	00.8'	48° 47'
1° 02'	21.6'	1° 24'	4° 40'	10.1'	4° 50'	10° 41'	04.9'	10° 46'	52° 17'	00.7'	52° 18'
1° 06'	21.2'	1° 27'	4° 45'	10.0'	4° 55'	10° 55'	04.8'	11° 00'	56° 10'	00.6'	56° 11'
1° 09'	20.9'	1° 30'	4° 50'	09.9'	5° 00'	11° 09'	04.7'	11° 14'	60° 27'	00.5'	60° 28'
1° 14'	20.5'	1° 35'	4° 55'	09.7'	5° 05'	11° 24'	04.6'	11° 29'	65° 08'	00.4'	65° 08'
1° 20'	20.0'	1° 40'	5° 00'	09.6'	5° 10'	11° 40'	04.5'	11° 45'	70° 11'	00.3'	70° 11'
1° 25'	19.5'	1° 45'	5° 05'	09.5'	5° 15'	11° 57'	04.4'	12° 01'	75° 34'	00.2'	75° 34'
1° 31'	19.1'	1° 50'	5° 11'	09.4'	5° 20'	12° 14'	04.3'	12° 18'	81° 13'	00.1'	81° 13'
1° 36'	18.7'	1° 55'	5° 16'	09.2'	5° 25'	12° 31'	04.2'	12° 35'	87° 03'	00.0'	87° 03'
1° 42'	18.3'	2° 00'	5° 21'	09.1'	5° 30'	12° 50'	04.1'	12° 54'	Keterangan: h = Tinggi Nyata Refr = Refraksi h' = Tinggi Lihat h' = h + Refr		
1° 47'	17.9'	2° 05'	5° 26'	09.0'	5° 35'	13° 09'	04.0'	13° 13'			
1° 52'	17.5'	2° 10'	5° 31'	08.9'	5° 40'	13° 29'	03.9'	13° 33'			
1° 58'	17.2'	2° 15'	5° 36'	08.8'	5° 45'	13° 50'	03.8'	13° 54'			
2° 03'	16.8'	2° 20'	5° 41'	08.7'	5° 50'	14° 12'	03.7'	14° 16'			
2° 08'	16.5'	2° 25'	5° 46'	08.6'	5° 55'	14° 36'	03.6'	14° 40'			

DAFTAR KERENDAHAN UFUK

(Berdasarkan rumus $D' = 1,76\sqrt{m}$)

Tinggi	Rendah Ufuk	Tinggi	Rendah Ufuk	Tinggi	Rendah Ufuk	Tinggi	Rendah Ufuk
Meter	`	Meter	`	Meter	`	Meter	`
1	1.8	34	10.3	160	22.3	475	38.4
2	2.5	36	10.6	170	23.0	500	39.4
3	3.0	38	10.8	180	23.6	525	40.3
4	3.5	40	11.1	190	24.3	550	41.3
5	3.9	45	11.8	200	24.9	575	42.2
6	4.3	50	12.4	210	25.5	600	43.1
7	4.7	55	13.1	220	26.1	625	44.0
8	5.0	60	13.6	230	26.7	650	44.9
9	5.3	65	14.2	240	27.3	675	45.7
10	5.6	70	14.7	250	27.8	700	46.6
12	6.1	75	15.2	260	28.4	725	47.4
14	6.6	80	15.7	270	28.9	750	48.2
16	7.0	85	16.2	280	29.4	775	49.0
18	7.5	90	16.7	290	30.0	800	49.8
20	7.9	95	17.2	300	30.5	825	50.5
22	8.3	100	17.6	325	31.7	850	51.3
24	8.6	110	18.5	350	32.9	875	52.1
26	9.0	120	19.3	375	34.1	900	52.8
28	9.3	130	20.1	400	35.2	925	53.5
30	9.6	140	20.8	425	36.3	950	54.2
32	10.0	150	21.6	450	37.3	975	55.0

1. GEOMAGNETIC DECLINATION COMPONENT MAP FOR EPOCH 2020.0

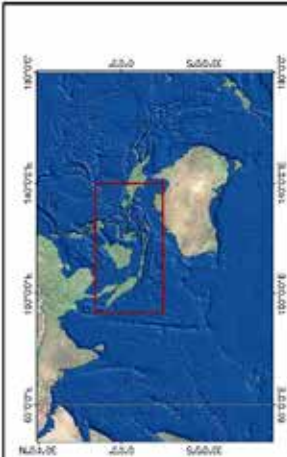


SCALE 1:5,000,000

Legend :

- ▲ Repeat stations
- Contour Annual Change in Minute of Arc
- Contour Declination with Interval 1 Degree
- Contour Declination with Interval 0.5 Degree
- Provincial boundaries
- Country boundaries
- Other Country

*Base map Source : RBI Map and BATNAS from The Geospatial Information Agency





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