The description and use of the longitude scale, or lunar collector, for readily clearing the apparent lunar distances from the effects of parallax and refraction, and for finding the apparent time from the altitude of the sun, or a star

DESCRIPTION AND USE

OF THE

LONGITUDE SCALE;

OR,

LUNAR CORRECTOR.

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LONGITUDE SCALE,

OR

LUNAR CORRECTOR,

FOR READILY

CLEARING THE APPARENT LUNAR DISTANCES

FROM THE

EFFECTS OF PARALLAX AND REFRACTION;

AND

FOR FINDING THE APPARENT TIME

FROM THE ALTITUDE OF THE SUN, OR A STAR.

BY

DAVID THOMSON.

THE SECOND EDITION, GREATLY ENLARGED AND IMPROVED,

CONTAINING ALL

THE TABLES

REQUIRED WITH THE NAUTICAL ALMANAC, AND SCALE,

IN FINDING THE

LONGITUDE

EITHER BY LUNAR OBSERVATIONS, OR CHRONOMETERS.

LONDON:

PRINTED FOR THE AUTHOR,

AND SOLD, WITH THE SCALE, BY MR. BATE, MATHEMATICAL AND PHILOSOPHICAL INSTRUMENT MAKER, 17, POULTRY.

1823.

Entered at Stationers' Hall.

Plummer and Brewis, Printers, Love Lane, East Cheap.

PREFACE.

THE method of finding the Longitude at Sea by means of observations between the Sun and Moon, or between the Moon and a Star, commonly called Lunar Observations, is daily getting into more general practice; and probably, in a very few years, every person will be qualified to determine the Longitude by this method, who undertakes to conduct a Ship from one place to another, where he may be several days without seeing land; for the error in the Longitude by account will frequently be greater in 24 hours, than the error in the Longitude when found by a good Lunar Observation.

The operation of clearing the Apparent Lunar Distances from the effects of Parallax and Refraction, in order to find the True Distance, has generally been considered the only difficult part of the calculations which are necessary in finding the Longitude by the Lunar Observations, and a great variety of methods have been invented with the view of rendering this part of the process as simple as possible. In the year 1816, the Author of this published a pamphlet, containing the description and use of a Sliding Scale invented by him for the purpose of finding the True Lunar Distances, and the Apparent Time from the Sun's Altitude, with the other necessary data. This Scale met with the approbation of the Astronomer Royal, and also with that of several other eminent Mathematicians and Astronomers, some of whose names are given in the pamphlet before-mentioned; and the inventor trusts that the Scale in its present improved state, will be found still more worthy of attention.

The principal object in view in the alterations introduced on the Scale has been to avoid as much as possible the distinction of cases in the correction of the Lunar Distances. This has been so far effected, that it is presumed the Rule now given can hardly be misunderstood by any person who pays

the least attention to it; and the process is so short, that the Apparent Distance may be Reduced in about two minutes, so correctly, as very seldom to differ more than one or two seconds from the True Distance as obtained by the most rigid calculation. The operation of finding the Apparent Time by the Scale is also rendered more simple, and Examples are given of the application of the Scale, in determining the Longitude both by Lunar Observations and Chronometers.

The Tables are also more correct and extensive than in the former Edition, and no other Tables are required in deducing the Longitude either from Lunar Observations or Time-keepers. Table VI., which contains the third correction to be applied to the Apparent Lunar Distances according to the Rule now given, is new. The construction of this Table has been a work of very considerable labour; this will be readily credited, when it is considered that the third correction combines *six* small corrections when applied to a distance between the Sun and Moon, and *five* when the distance is between the Moon and a fixed Star.

For the correctness with which the operations may be performed by the Scales, the Inventor must acknowledge himself much indebted to Mr. BATE, for the great pains taken by him in laying down new lines to divide from. These lines are perhaps more accurate than any of a similar nature hitherto constructed, at least the Author has not met with any that could be compared with them in this respect.

Scales of either Two or Three Feet in length may be had; the operations are performed in the same manner by both. The result will, in general, be more accurate when the Three Feet Scale is used; but the short Scale will not cause any error of material consequence in the practice of Navigation, for this error will very seldom amount to three miles of Longitude.

DESCRIPTION OF THE LINES

ON THE

THREE FEET SCALE.

On the side marked LUNAR SIDE *are the following lines:*

I. ON the upper fixed part is a line marked APP. DIST. This is a line of Logarithmic Tangents, commencing at the right hand at 28°, and increasing towards the left up to 88° 40′; each degree from 28° to 70° is divided into 6 parts, so that each division is equal to 10 minutes of a degree. From 70° to 88° 40′ each degree is divided into 12 parts; each division is therefore equal to 5 minutes.

II. On the fixed part, at the right hand extremity, is the MOON'S HOR. PAR. Each minute is divided into 6 parts, so that each division is equal to 10 seconds.

III. On the upper edge of the slide is a line of Logarithmic Sines, marked APP. DIST. This line commences towards the left hand at 28°, and increases towards the right up to 90°; each degree from 28° to 40° is divided into 6 parts or to 10 minutes of a degree; from 40° to 60° each division is equal to 15 minutes; from 60° to 70° each degree is divided into 2 parts or to 30 minutes; from 70° to 85° each division is a degree; and there is no division between 85° and 90°.

IV. On the slide to the left of the last mentioned line is the MOON'S HOR. PAR. Each minute is divided into 6 parts; hence each part or division is equal to 10 seconds. The hor. par. on this line increases in a contrary direction to that on the fixed part.

V. On the lower edge of the slide is a line of Logarithmic Sines, marked APP. ALT. (for apparent altitude.) This line begins at 5°, and increases towards the right hand up to 90°; each degree from 5° to 20° is divided into 12 parts, so that each division is equal to 5 minutes of a degree; from 20° to 40° each division is 10 minutes; from 40° to 60° each division is 15 minutes; from 60° to 70° each degree is divided into 2 parts or to 30 minutes; from 70° to 85° each division is a degree; and there is no division between 85° and 90°.

VI. On the lower fixed part is a line of numbers, marked CORR. (for Correction.) This line commences at the left hand; the first division is 1 minute, and the last or right hand division is 1° 40′. The minutes are subdivided as fol-

lows : from 1′ to 20′ each minute is divided into 12 parts, so that each division is equal to 5 seconds of correction ; from 20′ to 50′ each minute is divided into 6 parts or to 10 seconds; from 50′ to 1° 20′ each minute is divided into 4 parts or to 15 seconds; and from 1° 20′ to 1° 40′ each minute is divided into 3 parts, hence each part is equal to 20 seconds.

VII. On the fixed part below the line of correction is the complement of the correction to 2°; this line is marked Comp. Corr. The right hand division is 20 minutes, and the left hand one 1° 59′; and all the numbers in this line are respectively equal to what the numbers on the line of correction which are at the same vertical lines want of 2 degrees ; thus, the number on the line of correction being 40 minutes, the number on the complement of correction is 1° 20′ ; or, if the number on the line of correction be 1° 10′, the number on this line is 50 minutes, and so on ; also, if the number on the line of correction be 42′ 30″, the number on this line will be 1° 17′ 30″, the two numbers together being always equal to 2 degrees.

On the side marked Time Side *are the following lines :*

I. On the upper fixed part is a line of Logarithmic Co. Sines, marked Half Sum, beginning at 0° at the right hand, and divided as follows : from 0° to 5° there is no division ; from 5° to 20° each division is a degree ; from 20° to 30° each degree is divided into 2 parts or to 30 minutes ; from 30° to 50° each division is 15 minutes ; from 50° to 70° each degree is divided into 6 parts or to 10 minutes ; and from 70° to the left hand division (viz. 89° 25′) each degree is divided into 12 parts, so that each division is equal to 5 minutes.

II. On the upper edge of the slide is another line of Co. Sines, marked Lat. (for Latitude.) This line is divided and numbered exactly in the same manner as that on the fixed part.

III. On the lower edge of the slide is a line of Logarithmic Sines, marked Diff. (for difference.) This line begins at the left hand at 0° 35′, and increases towards the right up to 90° ; from the beginning of this line up to 20° each degree is divided into 12 parts, so that each part is equal to 5 minutes ; from 20° to 40° each degree is divided into 6 parts or to 10 minutes ; from 40° to 60° each division is equal to 15 minutes ; from 60° to 70° each division is 30 minutes; from 70° to 85° each division is a degree ; and there is no division between 85° and 90°.

IV. On the lower fixed part, adjacent to the slide, is a line marked Time P. M. This is a line of versed sines divided into time; from the left hand up to 4h. each minute of time is divided into 2 parts or to 30 seconds ; from 4h. to 6h. each division is 1 minute of time ; from 6h. to 8h. each division is 2 minutes; from 8h. to 11h. each division is 4 minutes ; and from 11h. to 12h. each division is 20 minutes of time.

V. Below the last mentioned line, is a line marked Time A. M. This line is of the same nature as the last, and the hours, &c. on this are respectively the complements to 24h. of the hours, &c. immediately above them; that is, when the hour on the P. M. line is 4, the hour on this is 20 ; or, if the time on the P. M. line is 2h. 35m. the time on this will be 21h. 25m. and so on. The divisions for the minutes, &c. on the P. M. line answer for this line, observing to reckon from right to left ; thus, if the time pointed out on the line above be

3h. 17m. 30s., the time on this will be 20h. 42m. 30s. The hours, &c. on this line are for astronomical time; if civil or nautical time be wanted, reject 12h. from the time given by this line; the remainder will be the civil or nautical time A. M.

The sliding brass clasp contains the DECLINATION. This is a portion of a line of Co. Sines. The left hand edge of the clasp is 0°; the first division from this towards the right is 5°; from 5° to 15° each division is a degree; from 15 to 32° each division is half a degree or 30 minutes.

DESCRIPTION

OF THE

TWO FEET SCALE.

The lines on this scale are of the same nature as those already described in the three feet scale, and are marked in the same manner. The description begins as before on the LUNAR SIDE.

I. Each degree of the APP. DIST. on the fixed part, from 28° to 80°, is divided into 6 parts, so that each part is 10 minutes of a degree; above 80° each division is 5 minutes.

II. Each minute of MOON'S HOR. PAR. on the fixed part, and also on the slide, is divided into 4 parts or to 15 seconds.

III. The APP. DIST. on the slide. From 28° to 40° each degree is divided into 4 parts, or to 15 minutes of a degree; from 40° to 60° each division is 30 minutes: from 60° to 80 each division is a degree; the division between 80° and 85° is at 82° 30′, and there is no division between 85° and 90°.

IV. The APP ALTS. From 5° to 10° each degree is divided into 12 parts, or to 5 minutes of a degree; from 10° to 20° each division is 10 minutes; from 20° to 40° each is 15 minutes; from 40° to 90° the divisions are the same as those in the line last described.

V. The line of CORR. From 1 to 10 minutes each division is equal to 5 seconds of Correction; from 10′ to 30′ each division is 10 seconds; from 30′ to 50′ each minute is divided into 4 parts, or to 15″; above 50′ each division is 30 seconds of Correction.

VI. The COMP. CORR. This line will be easily understood by referring to the description of the corresponding line on the 3 feet scale.

The TIME SIDE.

I. The HALF SUM. The first division to the left of 0° is at 5°; the division between 5° and 10° is at 7° 30′; from 10° to 30° each division is a degree; from

30° to 50° each degree is divided into 2 parts; from 50° to 70° into 4 parts; and from 70° to 80° into 6 parts, or to 10 minutes; from 80° to the end of the scale each division is 5 minutes of a degree.

II. The LAT. This line is divided and numbered in the same manner as the Half Sums.

III. The DIFF. From the left up to 10° each division is equal to 5 minutes; from 10° to 20° each is equal to 10 minutes; from 20° to 40° each degree is divided into 4 parts, or to 15 minutes; from 40° to 60° each division is 30 minutes; from 60° to 80° each division is a degree; the division between 80° and 85° is at 82° 30′; and the division next to 90° is 85°.

IV. The TIME P.M. From the left up to 3h. each division is 30 seconds of time; from 3h. to 5h. each division is a minute; from 5h. to 8h. each division is 2 minutes; from 8h. to 10h. each is 4 minutes; from 10h. to 12h. each division is 30 minutes.

V. The TIME A.M. This line has the same relation to the TIME P.M. as the corresponding line on the 3 feet scale, that is, the hours on the A.M. line are merely the complements to 24h. of those on the P.M. line, and the minutes, &c. increase in a contrary direction.

VI. The DECLINATION on the brass clasp. The left hand edge of the clasp represents 0°; the first division from this towards the right is 4°; from 4° to 10° each division is 2 degrees; from 10° to 32° each division is a degree.

REMARKS.

I. In the first rule for correcting the Lunar distances by the scale, the line of CORR. is only to be used; the use of the COMP. CORR. is explained afterwards.

II. The apparent time whether before or after noon may always be found by the P.M. line, for the time on that line is the horary distance of the observed object from the meridian; therefore when the Sun is observed in the morning, the time given on the P.M. line being subtracted from 24h. gives the astronomical time, or from 12h. gives the civil or nautical time. The line of time A.M. is only to save the trouble of these subtractions.

III. If any difficulty be found in setting by hand a particular part of the slide exactly to any given place on the fixed part, it may be very easily and accurately done, by striking with any small thing (such as a pen knife) on the end of the slide, or the fixed part, according as you wish the slide to move to the left or right; and in reading off the corrections, &c. it will be found useful to trace the divisions with the point of a pen-knife, or any thing else with a sharp point.

IV. On the lines of Sines and Co-sines, the space that is between 90° or 0°, and the first division towards the left is always equal to 5°; but a degree next to 90° or 0° takes up a much less part of that space than a degree next to 85° or 5° that is, 86° is farther to the right of 85° than 89° is to the left of 90°; and supposing the whole space to be divided into 100 parts, then on the lines of Sines the number of those parts reckoned to the right from 85°, which the higher degrees will occupy respectively, is nearly as follows, 86° = 36, 87° = 63, 88° = 84, and 89° = 96. And on the lines of Co-sines 1° will be 4 of the same parts to the left of 0°, 2° = 16, 3° = 37, and 4° = 64. It will be proper to attend to these remarks on the space between 85° and 90°, when correcting a distance between 85° and 95°; the line of APP. DIST. on the slide being a

line of Sines. And in finding the apparent time when the Latitude of the place of observation is less than 5°, the space between 0° and 5° on the line of LAT. should be estimated in the proportion here given, this being a line of Co-sines. Also the declination, when under 5°, must be thus estimated.

PROBLEM I.

Given the Apparent Distance of the Moon from the Sun or a fixed Star, together with the Apparent Altitudes of the objects, and the Moon's horizontal parallax, to find the true Distance.

RULE.

1. Set the Apparent Distance on the *slide* to the Moon's Hor. Par. on the fixed part, then opposite to the Apparent Altitude of the Sun or Star is the *first correction*, which is always to be *subtracted* from the Apparent Distance.

2. Set the Moon's Hor. Par. on the *slide* to the Apparent Distance on the fixed part, and opposite to the Moon's Apparent Altitude is the *second* correction, which is to be *added* to the Apparent Distance when less than 90°, but to be *subtracted* when the Distance is greater than 90°.

3. Take the *third correction* from Table VI. corresponding to the given Distance and Altitudes, this correction is always to be *added* to the Apparent Distance.

These 3 corrections being applied to the Apparent Distance will give the True Distance.

N. B. When the Apparent Distance is greater than 90°, subtract it from 180°, and work with the supplement on the Scale.

EXAMPLE I.

Suppose the Apparent Distance between the Moon and a Star is 60°, the Apparent Altitude of the Star 24°, and that of the Moon 16°, when the Moon's Hor. Par. is 58′: required the True Distance.

				+			−		
				°	′	″	°	′	″
Moon's Hor. Par.		58′ 00″							
Apparent Distance	-	-	-	60	0	0			
Star's Apparent Altitude	24° 0′	First Correction	−				0	27	15
Moon's Apparent Altitude	16° 0′	Second Correction	+		9	14			
Time Table VI.	- -	Third Correction	+		1	30			
Sum of + Column	-	-	-	60	10	44			
Sum of — Column	-	-	-		27	15			
True Distance	-	-	-	59	43	29			

The apparent distance 60° on the slide being set to 58′ of hor. par. on the fixed part, the first correction will be found, opposite to the Star's apparent altitude 24°, to be 27′ 15″.

Again, 58′ of hor. par. on the slide being set to the apparent distance 60°, on the fixed part, opposite to the apparent altitude of the Moon 16°, is the second correction 9′ 14″.

In Table VI. at apparent distance 60°, under 24°, the apparent altitude of the Star, and opposite to 16°, the apparent altitude of the Moon, is 1′ 30″, which is the third correction.

If the work be arranged as above, it is plain from the Rule, that the first correction is always to be placed in the Minus column, and that the second cor-

rection must be placed in the Plus column when the apparent distance is *less* than 90°, but in the Minus column when the distance is *greater* than 90°; also that the third correction is always to be put in the Plus column. Then the sum of the Minus column being subtracted from that of the Plus column, the remainder will be the true distance.

EXAMPLE II.

Let the apparent distance between the Sun and Moon be 104°; the Sun's apparent altitude 20°, and the Moon's 42°, when the Moon's hor. par. is 55′: required the true distance.

Moon's Hor. Par.		55′ 0″		+			−		
				°	′	″	°	′	″
Apparent Distance				104	0	0			
Sun's Apparent Altitude	20° 0′	First Correction	−					19	23
Moon's Apparent Altitude	42° 0′	Second Correction	−					9	11
From Table VI.		Third Correction	+		2	45			
Sum of + Column				104	2	45		28	34
Sum of − Column			−		28	34			
True Distance				103	34	11			

Here the apparent distance 104° being taken from 180° leaves the supplement 76°; then 76° on the slide being set to the hor. par. 55′ on the fixed part, opposite to the Sun's apparent altitude 20° will be found the first correction = 19′ 23″.

Next, the hor. par. 55′ on the slide being set to the supplement of the distance 76° on the fixed part, the second correction will be found, opposite to 42°, the Moon's apparent altitude, = 9′ 11″.

In Table VI. at apparent distance 104°, under the Sun's altitude 20°, and opposite to the Moon's 42°, is 2′ 52″; but the distance being between the Sun and Moon, the effect of the Sun's parallax on the distance is to be taken from Table *P.* and applied to 2′ 52″, which will give the third correction 2′ 45″; for in Table *P.* under the Sun's altitude 20°, and opposite to the Moon's 40°, is 7″ to be subtracted from 2′ 52″, as directed at the top of the table.

EXAMPLE III.

Suppose the apparent distance between the Moon and a Star is 52° 45′ 30″; the apparent altitude of the Star 18° 20′, that of the Moon 56° 15′ and her hor. par. 56′ 40″: required the true distance.

Moon's Hor. Par.		56′ 40″		+			−		
				°	′	″	°	′	″
Apparent Distance				52	45	30			
Star's Apparent Altitude	18° 20′	First Correction	−					22	23
Moon's Apparent Altitude	56° 15′	Second Correction	+		35	49			
From Table VI.		Third Correction	+		2	14			
Sum of + Column				53	23	33			
Sum of − Column			−		22	23			
True Distance				53	1	10			

The apparent distance 52° 45′ 30″ on the slide being set to the hor. par. 56′ 40″, the first correction 22′ 23″ will be found opposite to 18° 20′, the Star's apparent altitude.

Again, the hor. par. 56′ 40″ on the slide being set to the apparent distance

52° 45′ 30″ on the fixed part, the second correction 35′ 49″ is found opposite to 56° 15′, the Moon's apparent altitude.

In Table VI. at the nearest apparent distance 52°, and under Star's altitude 18°, and opposite to the Moon's 56°, is 2′ 17″ of third correction; but under Star's altitude 20°, and opposite to the Moon's 56°, the third correction is only 2′ 2″; therefore 3″ is taken from 2′ 17″ for the 20′ which the Star's altitude exceeds 18°, which makes the third correction 2′ 14″. No allowance is required for the odd minutes of Moon's altitude, nor for what the given apparent distance exceeds 52°, as both these will not cause an error of more than 1″ in the true distance.

EXAMPLE IV.

Suppose the apparent distance is 77° 44′ 4″ between the Sun and Moon; the Sun's apparent altitude 48° 18′, that of the Moon 22° 43′, and the Moon's hor. par. 55′ 22″: required the true distance.

Moon's Hor. Par.		55′ 22″		+		—	
				° ′ ″		° ′ ″	
Apparent Distance	- - -			77 44 4			
Sun's Apparent Altitude	48° 18′	First Correction	—			42	18
Moon's Apparent Altitude	22° 43′	Second Correction	+	4	39		
From Table VI.	- -	Third Correction	+	1	58		
Sum of + Column	- - -			77	50 41		
Sum of — Column	- - -		—		42 18		
True Distance	- - -			77	8 23		

Here the given apparent distance on the slide being set to the hor. par. 55′ 22″, the first correction 42′ 18″ is found opposite to the Sun's apparent altitude. Again, the hor. par. 55′ 22″ on the slide being set to the apparent distance on the fixed part, the second correction 4′ 39″ is found opposite to the Moon's apparent altitude.

At apparent distance 76° (in Table VI.) the third correction for the given altitudes is 1′ 58″; but at apparent distance 80°, the third correction for the same altitude is 2′ 5″; therefore 2″ is to be added to 1′ 58″ for 1° 44′ which the given distance exceeds 76°, so that 2′ 0″ would be the third correction if the distance were between the Moon and a Star, but the distance being between the Sun and Moon, the effect of the Sun's parallax will be found in Table *P.* = 2″, which is to be subtracted from 2′ 0″, the remainder 1′ 58″ is the third correction to be applied to the apparent distance.

EXAMPLE V.

Let the apparent distance between the Sun and Moon be 114° 50′ 42″, the Sun's apparent altitude 38° 28′, and the Moon's 23° 30′, when the Moon's hor. par. is 58′ 49″: required the true distance.

Moon's Hor. Par.		58′ 49″		+		—	
				° ′ ″		° ′ ″	
Apparent Distance	- - -			114 50 42			
Sun's Apparent Altitude	38° 28′	First Correction	—			40	19
Moon's Apparent Altitude	23° 30′	Second Correction	+			10	47
From Table VI.	- -	Third Correction	+		3 4		
Sum of + Column	- - -			114	53 46	51	6
Sum of — Column	- - -		—		51 6		
True Distance	- - -			114	2 40		

EXAMPLE VI.

Suppose the apparent distance between the Moon and a Star is 45° 3′ 57″, the apparent altitude of the Star 43° 13′, that of the Moon 66° 34′, and the Moon's hor. par. 61′ 13″: required the true distance.

				+			—		
				°	′	″	°	′	″
Apparent Distance	-	-	-	45	3	57			
Star's Apparent Altitude	43° 13′	First Correction	—					59	12
Moon's Apparent Altitude	66° 34′	Second Correction	+		56	2			
From Table VI.	- -	Third Correction	+			59			
Sum of + Column	-	-	-	46	0	58			
Sum of — Column	-	-	-		59	12			
True distance	-	-	-	45	1	46			

In the foregoing Examples, the corrections are all applied to the apparent distance agreeable to the Rule; in these the line of correction has only been used. The following method will be found rather shorter where the line of the COMP. CORR. is used, and by that means all the corrections may be added to the apparent distance.

RULE.

1. When the apparent distance is less than 90°, set the apparent distance on the slide to the Moon's hor. par. as before; then, instead of taking off the correction opposite to the apparent altitude of the Sun or Star, take off the complement of the correction; add this, together with the second and third corrections (found as before) to the apparent distance, the sum, rejecting 2 degrees, will be the true distance.

2. When the apparent distance is greater than 90°, take the complements of both the *first* and *second* corrections from the scale; add these, together with the third correction, to the apparent distance, the sum, rejecting 4 degrees, will be the true distanee.

When the true distance is found in this manner, the number of figures required for reducing the apparent to the true distance is about the same as is necessary for reducing the observed distance between the Sun and Moon to the apparent distance, and the time required to perform the one operation is nearly the same as that required for the other. That this method may be well understood, the foregoing six Examples are worked by it, that the reader may compare them with each other, and see the reason of applying the complements of the corrections from the scale, instead of the corrections, when it is wished to avoid subtractions.

EXAMPLE I.

				°	′	″
Moon's Hor. Par.	58′ 0″					
Apparent Distance of Moon and Star	-			60	0	0
Star's Apparent Altitude	24° 0′	Comp. 1st Corr.	+	1	32	45
Moon's Apparent Altitude	16° 0′	Second Corr.	+		9	14
From Table VI.	- -	Third Corr.	+		1	30
Sum rejecting 2° = True Distance	-	-		59	43	29

By referring to this example, as worked by the former method, it will be seen that the first correction is 27′ 15″ to be subtracted. Now it is plain that the result will be the same if the complement of 27′ 15″ to 2° (that is 1° 32′ 45″) be added to the apparent distance, and 2° rejected on that account. The apparent distance being less than 90°, the second correction is the same as before, and the third correction is always the same in both methods.

EXAMPLE II.

				°	′	″
Moon's Hor. Par.	55′ 0″					
Apparent Distance of Sun and Star	-			104	0	0
Sun's Apparent Altitude	20° 0′	Comp. 1st Corr.	+	1	40	37
Moon's Apparent Altitude	42 0	Comp. 2d Corr.	+	1	50	49
From Table VI. - -		Third Corr.	+		2	45
Sum rejecting 4° = True Distance	- -			103	34	11

Here the apparent distance being greater than 90°, the complement of the second correction, as well as that of the first, is taken from the scale. Now the first correction being 19′ 23″, its complement to 2° is 1° 40′ 37″; and the second correction being 9′ 11″, the complement of it to 2° is 1° 50′ 49″. These complements, together with the third correction, being added to the apparent distance, give the sum 107° 34′ 11″, and 4° being rejected from that, the remainder 103° 34′ 11″ is the true distance.

EXAMPLE III.

				°	′	″
Moon's Hor. Par.	56′ 40″					
Apparent Distance of Moon and Star	-			52	45	30
Sun's Apparent Altitude	18° 20′	Comp. 1st Corr.	+	1	37	37
Moon's Apparent Altitude	56 15	Second Corr.	+		35	49
From Table VI. - -		Third Corr.	+		2	15
Sum — 2° = True Distance	- -			53	1	11

EXAMPLE IV.

				°	′	″
Moon's Hor. Par.	55′ 22″					
Apparent Distance of Sun and Moon	-			77	44	4
Sun's Apparent Altitude	48° 18′	Comp. 1st Corr.	+	1	17	42
Moon's Apparent Altitude	22 43	Second Corr.	+		4	39
From Table VI. - -		Third Corr.	+		1	58
Sum — 2° = True Distance	- -			77	8	23

EXAMPLE V.

				°	′	″
Moon's Hor. Par.	58′ 49″					
Apparent Distance of Sun and Moon	-			114	50	42
Sun's Apparent Altitude	38° 28′	Comp. 1st Corr.	+	1	19	41
Moon's Apparent Altitude	23 20	Comp. 2d Corr.	+	1	49	13
From Table VI. - -			+		3	4
Sum — 4° = True distance	- -			114	2	40

EXAMPLE VI.

				°	′	″
Moon's Hor. Par.		61′ 13″				
Apparent Distance of Moon and Star		-		45	3	57
Star's Apparent Altitude	44° 15′	Comp. 1st Corr.	+	1	0	48
Moon's Apparent Altitude	66 34	Second Corr.	+		56	2
Time Table VI. - -		Third Corr.	+			59
Sum — 2° = True Distance		- -		45	1	46

REMARKS.

I. The scale is not adapted for distances less than 28°, nor for altitudes less than 5°; indeed neither altitude should be less than 6°, on account that the third corrections in Table VI. are not given for lower altitudes, although an allowance might be easily made in the third correction for an altitude between 5 and 6 degrees; but low altitudes should be avoided, if possible, in the practice of the Lunar Observations, as they may cause a considerable error in the distance, from the uncertainty of the refraction near the horizon.

II. If, when the Moon's hor. par. on the slide is set to the apparent distance on the fixed part, the Moon's apparent altitude be found to the left of 1 minute of correction, it shows that the second correction is less than 1 minute. The number of seconds in this correction is to be found as follows:

Make a mark at the point of the slide that is opposite to 1 minute of correction; shift the slide to the right, until that point be opposite to 10 minutes of correction; then take off the correction opposite to the Moon's apparent altitude; divide the correction by 10, the quotient will be the number of seconds contained in the second correction. For example:

Suppose the apparent distance is 88° 50′, the Moon's apparent altitude 15°, and the hor. par. 56′; what would be the second correction?

Here, when 56′ of hor. par. on the slide is set to 88° 30′ on the fixed part, 15° of altitude will be found to the left of 1 minute of correction, and the point of the slide that is opposite to 1 minute is 43° of altitude nearly. Now, 43° being set to 10 minutes of correction, opposite to the Moon's apparent altitude 15°, will be found 3′ 47″, and this, divided by 10, gives 22″.7 (or 23″ nearly) of second correction.

III. When the apparent distance is between 88° 40′ and 91° 20′, the second correction cannot be found by the scale, but must be found by Table V. — See the explanation of that table in the page opposite to it.

PROBLEM II.

Given the Latitude of a Place, together with the Sun's true altitude and declination, to find the Apparent Time of observation.

1. Add together, the Sun's altitude, Polar distance, and the Latitude of the place of observation; find the Half Sum, and the Difference between the Half Sum and the Sun's altitude.

2. Set the left hand edge of the sliding brass plate to the HALF SUM on the fixed part.

3. Set the Latitude on the Slide opposite to the Declination on the brass plate; then opposite to the Difference on the Slide will be found the Apparent Time on the fixed part.

EXAMPLE I.

In Latitude 42° 0′ N. when the Sun's declination is 10° N. and his true altitude 34° 0′: required the apparent time P. M.

	°	′	
Sun's true altitude - -	34	0	
Sun's Polar distance - -	80	0	
Latitude - - - -	42	0	
Sum - - - -	156	0	
Half Sum - - -	78	0	
Difference - - -	44	0	Apparent time, 3h. 31m. 0s. P. M.

Here the Half Sum of the Latitude, the Sun's polar distance, and altitude, is 78° 0′, and the difference between this and the Sun's altitude is 44° 0′. Now, the left hand edge of the brass clasp being set to the Half Sum 78° on the fixed part, and then the Latitude 42° on the slide being set opposite to the Declination 10° on the brass clasp, opposite to the Difference 44° 0′ will be found 3h. 31m. 0s. the apparent time P. M.

EXAMPLE II.

Suppose that in Latitude 29° 30′ S. when the Sun's declination is 19° 30′ N., his true altitude is found to be 22° 0′ east of the meridian: required the apparent time of observation.

	°	′	
Sun's true altitude - -	22	0	
Sun's Polar distance -	109	30	
Latitude - - - -	29	30	
Sum - - - -	161	0	
Half Sum - - -	80	30	
Difference - - -	58	30	Apparent time, 20h. 44m. 16s.

The left hand edge of the brass plate being put to the Half Sum 80° 30′ on the fixed part, and then the Latitude 29° 30′ on the slide being set to the Declination 19° 30′ on the brass slide, opposite to the Difference 58° 30′ on the slide is the apparent time 20h. 44m. 16s. on the A. M. line; this is astronomical time. If civil or nautical time be required, reject 12h., and the remainder, 8h. 44m. 16s. will be the time required.

If the time opposite to the difference 58° 30′ were taken from the upper or P. M. line, it will be 3h. 15m. 44s., and this being subtracted from 24h. the remainder will be 20h. 44m. 16s. as before. The time given by the P. M. line being always the horary distance of the Sun from the nearest noon.

EXAMPLE III.

In the afternoon, in Latitude 34° 53′ N. the Sun's true altitude was 14° 56′, and at the same time his declination was 16° 41′ S.: required the apparent time of observation.

	°	′	
Sun's true altitude - -	14	56	
Sun's Polar distance - -	106	41	
Latitude - - - -	34	53	
Sum - - - -	156	30	
Half Sum - - -	78	15	
Difference - - -	63	19	Apparent time, 3h. 50m. 7s. P. M.

EXAMPLE IV.

To find the apparent time A. M. or P. M. let there be given,

	°	′	
The Sun's true altitude -	28	47	
The Sun's Polar distance -	78	44	
And Latitude - - -	56	34	
Sum - - - -	164	5	
Half Sum - - -	82	2½	
Difference - -	53	15½	App. time A.M. 20h. 24m. 27s. or P.M. 3h. 35m. 33s.

PROBLEM III.

Given the true altitude, together with the right ascension and declination, of a Star, the Latitude of the place of observation, and the right ascension of the Sun, at the time the Star's altitude is observed, to find the Apparent Time of observation.

RULE.

With the Latitude of the place of observation, the Star's true altitude, and declination, find the Star's meridian distance in the same manner that the Sun's meridian distance is found by the last Problem, always taking the meridian distance from the P. M. line when the Star is observed *West* of the meridian, but from the A. M. line when the Star is observed *East* of the meridian.

Then to the complement to 24h. of the Sun's right ascension, add the Star's right ascension, and its meridian distance; the sum (rejecting 24h. or 48h. if necessary) will be the apparent time of observation.

EXAMPLE I.

In Latitude 33° 51′ N. the true altitude of Regulus, observed west of the meridian, was 39° 21′, and at the same time the Star's declination was 12° 50′ N.,

its right ascension 9h. 58m. 51s., and the Sun's right ascension 3h. 22m. 8s.: required the apparent time of observation.

	° ′		h. m. s.
Star's true altitude	39 21		24 0 0
Star's polar distance	77 10		
Latitude	33 51	Sun's R. A. -	— 3 22 8
Sum - - -	150 22	Comp. of Sun's R. A.	20 37 52
Half Sum - -	75 11	Star's R. A. -	+ 9 58 51
Difference - -	35 50	Star's merid. dist.	+ 3 23 44
Sum — 24h. = Apparent time		- - -	10 0 27

The operation for finding the meridian distance of the Star by the Scale, is the same as it would be to find the apparent time P. M. if the Sun's true altitude were found to be 39° 21′ west of the meridian, and his declination, and the latitude of the place, the same as here given. Now, the complement to 24h. of the Sun's right ascension is 20h. 37m. 52s., to which the Star's right ascension 9h. 58m. 51s., and its meridian distance 3h. 23m. 44s. being added, the sum is 34h. 0m. 27s., from which reject 24h., the remainder 10h. 0m. 27s. is the apparent time of observation.

EXAMPLE II.

In latitude 23° 31′ S. the true altitude of Rigel observed east of the meridian was 28° 42′; at the same time the declination of the star was 8° 25′ S.; its right ascension 5h. 5m. 55s.; and the Sun's right ascension 12h. 49m. 31s.: required the apparent time of observation.

	° ′		h. m. s.
Star's true altitude	28 42		24 0 0
Star's polar distance	81 35		
Latitude	23 31	Sun's R. A. -	— 12 49 31
Sum - -	133 48	Comp. of Sun's R. A.	11 10 29
Half Sum - -	66 54	Star's R. A. -	+ 5 5 55
Difference - -	38 12	Star's Merid. Dist.	+ 19 50 51
Sum — 24h. = Apparent time		- - - -	12 7 15

Here because the star is observed to the eastward of the meridian, its meridian distance 19h. 50m. 51s. is taken from the A. M. line; the complement of the Sun's right ascension is 11h. 10m. 29s.; and the sum of this, the star's right ascension and meridian distance is 36h. 7m. 15s.; from which 24h. being subtracted, the remainder 12h. 7m. 15s. is the apparent time of observation.

REMARKS.

I. What is called the star's meridian distance in the foregoing Examples, is always the horary distance of the star reckoned to the westward of the meridian. Hence, when the star is observed in the western hemisphere, its meridian distance will be less than 12h.; but when the observation is made in the eastern hemisphere, the star's horary distance from the meridian, reckoning to the west-

ward, must be greater than 12h.; for it is the complement to 24h. of the horary distance of the star to the eastward of the meridian.

II. It might be of advantage if the Nautical day were made to agree with the Astronomical day, as mistakes sometimes take place, from the former being 24h. in advance, with respect to the latter. If the hours of the Nautical day be continued to 24h. from noon to noon, that is, calling 8 P. M. 8h., and 8 A. M. 20h., and so on; then Nautical time is changed into Astronomical time, by merely altering the date to the preceding day. Thus, Jan. 10, at 9 A. M. Nautical time, will be Jan. 9, at 21h. Astronomical time. When apparent time is mentioned in any part of these directions, the apparent Astronomical time is always to be understood, unless where otherwise expressed.

In the following examples of finding the Longitude by Lunars, a set of distances, with the altitudes of the objects observed at the same time, are supposed to be taken down on a slate, or a piece of paper; the observed distance and altitudes are the means of the observations as given by the instruments, corrected by the index errors, if any.

It is supposed that the reader is acquainted with the usual methods of finding the proportional parts of the variation in the Sun's declination, &c. in 24h. for the given Greenwich time, or the parts of the variation of the Moon's semidiameter or hor. par. in 12h. for any given time at Greenwich, past noon or midnight. These proportional parts may be easily and correctly found on the LUNAR SIDE of the Scale, by attending to the following directions.

The minutes on the line of Correction may be esteemed as hours, and then the seconds of correction become minutes of time; or the minutes of correction may be esteemed as seconds of the circle, and then the seconds of correction are to be reckoned thirds of the circle.

I. To find the Correction of the Sun's declination for a given time past noon.

RULE.

Set 30° of alt. on the slide to 24′ of correction, and esteeming the minutes of correction as hours, make a mark on the slide opposite to the given time past noon. Then set 30° of alt. on the slide to the change of the Sun's declination in 24h., and opposite to the mark that was made on the slide, will be found the proportional part of that change for the given time past noon, which being added to, or subtracted from the Sun's declination for the preceding noon, according as it is increasing or decreasing; the sum or difference will be the declination at the given time.

EXAMPLE.

Suppose the Sun's declination be found on any day in the Nautical Almanac = 14° 10′ 15″, and on the following day it is 14° 28′ 55″, what would be the Sun's declination at 9h. 35m. Greenwich time.

Here the change of the Sun's declination in 24h. is 18′ 40″. And 30° of altitude being set to 24′ of correction, make a mark on the slide opposite to 9′ 35″

(= 9h. 35m.) then set 30° of alt. on the slide to the change of declination in 24h. (= 18′ 40″) and opposite to the mark on the slide will be found 7′ 27″, the proportional part required, which is to be added to 14° 10′ 15″, hence the declination at 9h. 35m. will be 14° 20′ 42″.

In this way the proportional part of the variation of the Sun's declination may be found to the nearest second. And in the same manner the proportional part of the increase of the Sun's right ascension in 24h. may be found to the nearest half second, for any given time past noon.

EXAMPLE.

Suppose the increase of the Sun's right ascension in 24h. is 3m. 55s. what would be the proportional part for 17h. 15m.?

Thirty degrees of altitude on the slide being set to 24′ of correction, and a mark made on the slide opposite to 17′ 15″ (= 17h. 15m. the time past noon), and then 30° of altitude set to 3m. 55s., (the increase of right ascension in 24h.) the mark on the slide will be opposite to 2′ 49″, or 2m. 49s., which is the proportional part required for 17h. 15m.

II. To find the proportional part of the variation of the Moon's semidiameter or horizontal parallax in 12h. for any given time past noon or midnight.

RULE.

Set 10° of altitude on the slide to 12′ of correction, and make a mark on the slide opposite to the given time past noon or midnight, (esteeming the minutes of correction as hours, and the seconds as minutes of time as before), then set 10° of alt. on the slide to the variation of the Moon's semidiameter or hor. par. in 12h., and opposite to the mark on the slide will be found the proportional part required. Here the minutes of correction are to be used as seconds of variation.

EXAMPLE.

Let the variation of the Moon's hor. par. in 12h. be 19″, what would it be in 7h. 40m.?

Here 10° of alt. being set to 12′ of correction, and a mark made on the slide opposite to 7′ 40″ (or 7h. 40m.), and then 10° of alt. set to 19′ (or 19″ of variation) opposite to the mark on the slide is 12′ nearly, which is to be called 12″, the proportional part required.

It may be observed that any other particular division on the line of altitudes may be used in place of 30° or 10°, these being merely used as appearing the most convenient in the foregoing problems for setting to 24′ of correction, this being esteemed 24h., or to 12′ esteemed as 12h. These proportional parts may also be found on the line of correction with a pair of compasses, in a manner which must be obvious to any person acquainted with the use of the line of Numbers on Gunter's Scale.

EXAMPLE I.

Estimated Nautical Time of obs. at Ship.	Latitude.	Lon. per Acct.	Height of the Eye.
1821, July 5th, at 2h. 20m. P. M.	6° 46′ N.	20° 15′ W.	15 Feet.

	h. m.		° ′ ″
Estim. Astron. time at Ship, 4th July	2 20	Sun's Declin. for Greenwich time	22 54 0 N.
Longitude in time, W. - +	1 21	Moon's Semid. for do. do.	15 0
		Moon's Hor. Par. for do. do.	55 3
Estim. time at Greenwich -	3 41		

	° ′ ″		° ′
Obs. dist. Sun and Moon's nearest limbs	59 57 00	Obsd. alt. Moon's up. limb	65 13
Sun's Semidiameter - - -	+ 15 46	Semid. + dip . -	— 19
Moon's Semidiameter - - -	+ 15 0		
Moon's Augmentation of semid. -	+ 14	Moon's Apparent Alt.	64 54
Apparent distance - - - -	60 28 00		° ′
Sun's App. alt. 52° 25′ Comp. 1st corr.	+ 1 9 52	Obsd. alt. Sun's lower limb	52 13
Moon's App. alt. 64 54 Second corr.	+ 28 14	Semid. — dip - -	+ 12
From Table VI. Third corr.	+ 1 1		
		Sun's Apparent Altitude	52 25
Sum — 2° = True distance - -	60 7 7	Sun's Corr. in Altitude	— 1
Dist. in N. A. at III. - - -	59 48 11		
Dist. in N. A. at VI. - - -	61 12 28	Sun's True Altitude	52 24
		Sun's Polar distance	67 6
First difference - - - -	0 18 56 P.L. 9780	Latitude - -	6 46
Second difference - - - -	1 24 17 P.L. 3295		
	h. m. s.	Sum - - -	126 16
App. time at Greenwich - - -	3 40 26 P.L. 6485	Half Sum - -	63 8
App. time at Ship - - - -	2 21 16	Difference - -	10 44
Longitude in time - - - -	1 19 10 = 19° 47′ 30″ W.		

Here the true distance is found in the manner explained at page 8, so as to make all the corrections additive to the apparent distance; As the true distance is greater than the distance in the Nautical Almanac at 3h. and less than the distance at 6h., the apparent time at Greenwich must be greater than 3h. and less than 6h., and the time after 3h. may be found by the Rule of Three: Thus, As the difference of the two distances taken from the Nautical Almanac is to 3h., so is the difference between the true distance and the first distance taken from the Nautical Almanac, to the Proportional part of time. The foregoing example would stand as follows, As 1° 24′ 17″ : 3h. : : 0° 18′ 56″ : 0h. 40m. 26s. But this proportional part is got with much more ease by the exeellent table of Proportional Logarithms which was constructed by Dr. Maskelyne, particularly for that purpose. In this, as well as in the following examples, the time over the first distance taken from the Nautical Almanac is added to the proportional part of 3h. as found by Proportional Logarithms, which gives the apparent time at Greenwich when the observation is made.

The apparent time at the ship is found from the Sun's altitude by Problem II., and this time being less than the time at Greenwich by 1h. 19m. 10s., the Longitude at the place of observation is therefore 19° 47′ 30″ W.

The mode of finding the proportional part of 3h. by Proportional Logarithms is perhaps the best that can be given for the purpose. But this proportional part may be very easily found by the Scale, as follows:

RULE.

Set 90° of altitude on the slide opposite to the *second* difference on the line of correction, and mark the point of the slide that is opposite to the *first* difference; then set 90° of altitude to 1° 30′ of correction, and opposite to the mark on the slide will be found half the proportional part of 3h.

EXAMPLE.

Let the first difference be 0° 18′ 56″, and the second difference 1° 24′ 17″, what would be the proportional part of 3h.?

Set 90° of altitude to the second difference 1° 24′ 17″ on the line of correction, and make a mark at the point of the slide that is opposite to the first difference (18′ 56″); then put 90° of altitude to 1° 30′ of correction, and opposite to the mark on the slide will be found 20′ 13″, the double of which is 40′ 26″ or 40m. 26s. the proportional part required.

When the second difference is greater than 1° 40′, it will be necessary to set 90° of altitude to half the second difference; then the slide being marked opposite to the first difference, set 90° of altitude to 45° of correction, and opposite to the mark on the slide will be half the proportional part of 3h. as before.

EXAMPLE II.

Estimated Nautical Time of Obs. at Ship.	Latitude.	Lon. per Acct.	Height of the Eye.
1821, Dec. 4th, at 5h. 0m. P. M.	34° 4′ S.	47° 30′ E.	14 Feet.

	h m.		° ′ ″
Estim. Astron. time at Ship, 3d Dec.	5 00	Sun's Declin. for Greenwich time	22 8 0 N.
Longitude in time, E. - -	− 3 10	Moon's Semid. for do. do.	16 3
		Moon's Hor. Par. for do. do.	58 53
Estimated time at Greenwich	1 50		

	° ′ ″		° ′
Obs. dist. Sun and Moon's nearest limbs	103 4 00	Obsd. alt. Moon's up. limb	45 54
Sun's Semidiameter - - -	+ 16 16	Semid. + dip - -	− 19
Moon's Semidiameter - - -	+ 16 3	Moon's Apparent Alt.	45 35
Moon's Augmentation of semid. -	+ 12		
Apparent distance - - - -	103 36 31		° ′
Sun's App. alt. 24° 56′ Comp. 1st corr.	+ 1 34 27	Obsd. alt. Sun's lower limb	24 43
Moon's App. alt. 45 35 Comp. 2d corr.	+ 1 49 49	Semid. − dip - -	+ 13
From Table VI. Third corr.	+ 2 34	Sun's Apparent Altitude	24 56
Sum − 4° = True distance - -	103 3 21	Sun's Corr. in Altitude	− 2
Dist. in N. A. at noon - - -	102 6 32	Sun's True Altitude	24 54
Dist. in N. A. at III h. - - -	103 43 30	Sun's Polar distance	67 52
	0 56 49 P.L. 5008	Latitude - -	34 4
First difference - - - -	1 36 58 P.L. 2687		
Second difference - - - -	h. m. s.	Sum - - -	126 50
	1 45 29 P.L. 2321	Half Sum - -	63 25
App. time at Greenwich - -	4 56 29 - - - -	Difference - -	38 31
App. time at Ship - - - -			
Longitude in time - - - -	3 11 0 = 47° 45′ E.		

EXAMPLE III.

Estimated Nautical Time of Obs. at Ship.	Latitude.	Lon. per Acct.	Height of the Eye.
1822, June 6th, at 0h. 30m. A. M.	23° 30′ N.	36° 45′ W.	15 Feet.

	h.	m.			h.	m.	s.
Estim. Astron. time at Ship, 5th June	12	30		Sun's R. A. at noon, 5th June -	4	51	22
Longitude in time, W. - +	2	27		Add for 14h. 57m. - -		2	34
Estimated time at Greenwich	14	57		Sun's R. A. at time of observation	4	53	56

					o	′
Moon's Hor. Par. at Greenw. time	54′ 18″			Obs. alt. Moon's lower limb	37	25
	o	′	″	Semid. — dip - +		11
Obs. dist. of Star from Moon's far. limb	67	39	10			
Moon's Semid. at Greenw. time 14′ 47″ }				Moon's Apparent altitude	37	36
Augmentation - - 9 }	— 14	56				
					o	′
Apparent distance - -	67	24	14	Obs. alt. of Sp. Vir. W of mer.	21	18
Star's App. alt. 21° 14′ Comp. 1st corr. +	1	38	42	Dip - -	—	4
Moon's App. alt. 37 36 Second corr. +		13	47			
From Table VI. Third corr. +		1	42	Star's Apparent altitude	21	14
				Refraction - -	—	2
Sum — 2° = True distance -	67	18	25			
Dist. in N. A. at XII. h. - -	65	52	24	Star's True altitude -	21	12
Dist. in N. A. at XV. h. - -	67	22	13	Star's Polar distance	100	14
				Latitude - -	23	30
First difference - - - -	1	26	1 P.L. 3207			
Second difference - - - -	1	29	49 P.L. 3019	Sum - - -	144	56
				Half Sum - -	72	28
	h.	m.	s.			
App. time at Greenwich -	14	54	22 - - P.L. 0188	Difference - -	51	16
App. time at Ship - -	12	27	24		h.	m. s.
				Star's Meridian distance	4	5 28
Longitude in time - -	2	24	58 = 36° 14½′ W.	Star's Right ascension -	13	15 52
				Comp. (to 24h.) of Sun's R.A.	19	6 4
				Sum — 24h. = App. time	12	27 24

NOTE. Tables of the Distances of the Moon from the Planets Venus, Mars, Jupiter, and Saturn, have been lately published at Copenhagen, under the direction of the celebrated SCHUMACHER, Professor of Astronomy at the University of that place. These Tables are adapted to the meridian of Greenwich, and the directions for their use are in English.

An apparent distance of the Moon from a Planet is reduced to the true distance in the same manner as a distance between the Moon and a fixed Star, except the small correction for the effect of the Planet's parallax on the distance. This correction may be found as follows: With the apparent altitude of the Planet used, as if the distance were between the Sun and Moon, take the effect of the Sun's parallax from Table *P*, multiply this by the horizontal parallax of the Planet, and divide the product by 9, the quotient will be the effect of the parallax of the Planet on the distance, which is to be added to, or substracted from the Third Correction, (or the apparent distance) according as the effect of the Sun's parallax should be applied for the same distance and altitudes. The horizontal parallaxes of the Planets are given in SCHUMACHER's Tables, and also their Right Ascensions and Declinations, so that the Apparent Time may be very correctly ascertained from the altitude of a Planet.

ON FINDING THE

LONGITUDE AT SEA

By Chronometers.

In finding the Longitude by a Time-keeper, it is necessary that its error for mean time at the meridian from which the Longitude is to be reckoned should be known, at the time the Longitude is to be found, which error being applied to the time shown by the Chronometer when an observation is made for the purpose of finding the time at the Ship, will give the mean time at the first meridian at the instant of observation. The difference between this time, and the mean time found at the ship, will be the Longitude in time, which will be East or West according as the time at the Ship is greater or less than the time at the first meridian. Hence, if Time-keepers could be made to go exactly to mean time, or to measure an equal portion of time during every mean day, no other method of finding the Longitude would be required. But it is well known that even the best Chronometers are liable to alter their rate of going; therefore entire dependance should not be placed on any Time-keeper during a long voyage. A Time-keeper is, however, of great utility to the practical Navigator both in long and short voyages; for during a long voyage its error can be often ascertained by Lunar Observations, and then the Longitude may be correctly found by the watch when observations of the Lunar Distances cannot be had for that purpose.

In the following Examples the apparent time is found by Problem II. or III. according as the time is to be inferred from the altitude of the Sun or a Star. The declination of the Sun, and the equation of time, may be taken from the Nautical Almanac for the time at Greenwich, as given by the Chronometer when the observation is made. But when the Sun's right ascension is to be found, the mean time at Greenwich should be reduced to the apparent time, by applying to it the equation of time, with a contrary sign to that which is given in the Nautical Almanac, and then the Sun's right ascension is to be found to the Greenwich apparent time. This may be done by the Scale, as explained at page 15. The necessary correction of the Sun's declination, and also that of the equation of time, may generally be made at sight with sufficient exactness, or the proportional parts of the variation of these in 24 hours may also be found by the Scale.

EXAMPLE I.

Suppose on the 2d September 1821, about 3h. 30m. P. M. nautical time, in Latitude 28° 42′ N., and Longitude by account 38° 30′ W. that the altitude of the Sun's lower limb is 37° 2′, and the time by a Chronometer when the altitude is observed is 4h. 53m. 21s., the error of the Chronometer for mean time at

Greenwich 1h. 8m. 34s. slow; height of the observer's eye 16 feet: required the longitude of the ship.

	h. m. s.		o /
Time of obs. by Chronometer	4 53 21	Obs. alt. of Sun's lower limb	37 2
Chron slow for M. T. at Greenwich	+1 8 34	Sun's Semid. — dip and corr. of alt.	+ 11
M. T. of obs. at Greenw. 1st Sept.	6 1 55	Sun's True altitude	37 13
Sun's declin. at Greenwich time	8° 14′ N.	Sun's Polar distance	81 46
		Latitude	28 42
		Sum	147 41
	h. m. s.	Half Sum	73 50½
Apparent time at Ship	3 27 28	Difference	36 37½
Equation of time	— 12		
Mean time at Ship	3 27 16		
Mean time at Greenwich	6 1 55		
Longitude in time	2 34 39 = 38° 39′ 45″ W.		

Instead of applying the equation of time to the apparent time at Ship, it may be applied with a contrary sign to the mean time at Greenwich, which will give the apparent time at that place; the difference between which, and the apparent time at Ship, will be the Longitude in time.

EXAMPLE II.

On the 9th December 1821, at about 4 P. M. nautical time, in Latitude 36° 6′ S., and Longitude per account 53° E., the observed altitude of the Sun's lower limb was 35° 13′, at the same instant the time by a Chronometer, which was fast for mean time at Greenwich 0h. 1m. 24s., was 0h. 30m. 4s.; height of of the eye 12 feet: required the longitude of the ship at the time of observation.

	o /		o /
Sun's declin. at Greenwich time	22 45 S.	Obs. alt. of Sun's lower limb	35 13
	h. m. s.	Sun's Semid. — dip and corr. of alt.	+ 12
Time of obs. by Chronometer	0 30 4		
Chron. fast for M. T. at Greenwich	— 1 24	Sun's True altitude	35 25
		Sun's Polar distance	67 15
M. T. of obs. at Greenwich 8th Dec.	0 28 40	Latitude	36 6
Equation of time (for sub.) add	7 50		
		Sum	138 46
Appareat time at Greenwich	0 36 30	Half Sum	69 23
Apparent time at Ship	4 7 21	Difference	69 23
Longitude in time	3 30 51 = 52° 42′ 45″ E.		

EXAMPLE III.

July 7, 1822, about 9h. 40m. P. M. nautical time, in Latitude 35° 32′ N. and Longitude by account 10° W. the observed altitude of *Arcturus* west of the meridian was 52° 40′ when the time by a Chronometer was 12h. 11m. 22s., the error of the Chronometer for Greenwich mean time 1h. 46m. 24s. fast, and the height of the observer's eye 17 feet: required the longitude of the ship.

	h.	m.	s.
Time of obs. by Chronometer -	12	11	27
Chron. fast for M. T. at Greenwich	1	46	24
Mean time of obs. at Greenwich -	10	25	3
Equation of time (for add in N. A.) sub.		4	18
Apparent time of obs. at Greenwich	10	20	45

	h.	m.	s.
Comp. of Sun's R.A. (to 24h.)	16	58	24
Star's right ascension	14	7	35
Star's meridian distance	2	35	45

	h.	m.	s.
Sum — 24h. = App. time at Ship - - -	9	41	44
Longitude in time - - -	0	39	1 = 9° 45′ 15″ W.

	h.	m.	s.
Sun's R. A. at noon, 6th July	6	59	50
Correction for 10h. 20m. -	+	1	46
Sun's R. A. at time of obs.	7	1	36

	°	′
Star's observed altitude -	52	40
Dip and refraction - -	—	5
Star's true altitude - -	52	35
Star's Polar distance -	69	53
Latitude - - -	35	32
Sum - - - -	158	00
Half Sum - - -	79	00
Difference - - -	26	25

In this Example the apparent time of observation at the ship is found by Problem III. to be 9h. 41m. 44s.; the difference between this and the apparent time at Greenwich is 0h. 39m. 1s.: hence the Longitude 9° 45′ 15″ W., the time at Greenwich being farther in advance than the time at ship.

It is much to be desired that Navigators would attend more to observations of the Stars, both for finding the time at ship and the latitude. But many, who are in other respects good Navigators, scarcely know a star in the heavens, and are thereby prevented from obtaining the latitude and longitude of the ship during the night, when it may be of the utmost consequence that they should be known.

Captain Thomas Lynn has lately published very extensive and useful Tables of the fixed Stars, which Navigators will find of great service to them in determining both the Latitude and Longitude.

EXPLANATION OF THE TABLES.

TABLE I.

Refraction of the Heavenly Bodies in Altitude.

This Table contains the mean Refraction, which must always be subtracted from the apparent altitude of an object when it is necessary to find the true altitude. For example, if the apparent altitude of a fixed Star be 12°, its true altitude will be 11° 55′ 37″, the refraction for 12° of apparent altitude being 4′ 23″.

TABLE II.

Depression or dip of the Horizon of the Sea.

The dip is to be subtracted from the observed altitude in order to find the apparent altitude of an object, to which the refraction in altitude is to be applied. In the examples in this book, where the apparent altitude is not required, the sum of the dip and refraction is subtracted from the observed altitude of a Star, which gives its true altitude. When the altitude of the Sun's lower limb is observed, the true altitude may be found by applying the difference between the Sun's semidiameter, and the sum of the dip and correction of the Sun's altitude, to the observed altitude. The true altitudes need only be found to the nearest minute when the operation of finding the Time is performed by the Scale.

TABLE III.

The Sun's Parallax in Altitude.

The Sun's Parallax in Altitude being taken from the Refraction in Altitude, leaves the Correction of the Sun in Altitude. Thus, if the Sun's apparent altitude be 12°, the Correction in Altitude will be 4′ 23″ — 9″ = 4′ 14″.

TABLE IV.

Moon's Augmentation.

This Table is to be entered with the Moon's semidiameter, as found by the Nautical Almanac, at the top, and the Moon's apparent altitude in the side column, under the former, and opposite the latter is the Augmentation of the

Moon's semidiameter. For example, When the Moon's semidiameter in the Nautical Almanac is 15′ 40″, and her apparent altitude 57°, the Augmentation is 13″.

TABLE V.

To find the Second Correction when the Apparent Distance is between 88° 40′ and 91° 20′.

The explanation of this Table is given in the page opposite to it.

TABLE VI.

Third Correction.

This correction is always *additive* to the Apparent Distance. The given Apparent Distance is to be found in the Table; then look for the apparent altitude of the Sun or Star at the top, and the Moon's apparent altitude in a side column under the former, and opposite to the latter is the third correction. For example, When the Apparent Distance between the Moon and a Star is 84°, the apparent altitude of the Star 46°, and that of the Moon 32°, the third Correction is 1′ 50″.

The small Table, which is titled Table *P.*, contains the effect of the Sun's parallax on the distance; this never exceeds 9″, and it is to be added to, or subtracted from, the third correction, according to the direction at the top of the Table. Thus, at Apparent Distance 48°, the Sun's altitude 50°. and the Moon's 10°, the effect of the Sun's parallax on the distance is 4″ to be added to the third correction, because it is found above the line in the column. But at the same distance, if the Moon's apparent altitude be 50°, and that of the Sun 10°, the effect of the Sun's parallax on the distance is 8″ to be subtracted from the third correction, because it is found below the line in the column. When the apparent distance is above 82° the effect of the Sun's parallax is always subtractive from the third correction.

In taking out the third correction from this Table, when the given distance or altitudes differ considerably from those in the Table, it is generally necessary to make a proportion in the third correction. For example, Let the Apparent Distance be 45° 50′, the Star's apparent altitude 50°, and the Moon's 30°. Here, at Apparent Distance 44°, the third correction for the given altitudes is 1′ 12″, but at Apparent Distance 48°, for the same altitudes, the third correction is 1′ 16″. Hence the third correction for Apparent Distance 45° 50′, is 1′ 14″.

TABLE VII.

Proportional Logarithms.

This Table is given for the purpose of finding the Apparent Time at Greenwich answering to a given True Distance between the Sun and Moon, or between the

Moon and a Star. For example, Let the given True Distance be 63° 18′ 25″ when the distance of the same objects in the Nautical Almanac at 6h. is 62° 31′ 40″, and at 9h. 64° 6′ 15″, what would be the apparent time at Greenwich?

	°	′	″		
True distance	63	18	25		
Distance at 6h.	62	31	40		
Distance at 9h.	64	6	19		
First difference	0	46	45	P. L.	5855
Second difference	1	34	39	P. L.	2792
	h.	m.	s.		
Time past 6h.	1	28	35	P. L.	3063
	+ 6				
App. time at Greenwich	7	28	55		

This Table is very useful in many other Problems in Nautical Astronomy, which the reader may see exemplified in the different books on that subject, particularly in Mackay's Longitude.

TABLE VIII.

To turn Motion into Time, or Time into Motion.

The principal use of this Table is to turn Longitude into Time, or Time into Longitude. The method of doing this will be obvious from the following examples:

I. What Time answers to Longitude 98° 45′ 30″?

	°	′	″		h.	m.	s.
	98	0	0	=	6	32	0
		45	0	=		3	0
			30	=			2
Time required	-	-	-		6	35	2

II. What Longitude answers to 7h. 42m. 28s.?

	h.	m.	s.		°	′	″
	7	40	0	=	115	0	0
		2	0	=		30	0
			28	=		7	0
Longitude required	-	-			115	37	0

TABLE I.

The Refractions of the Heavenly Bodies on Altitude.

App. Alt.	Refr.	App. Alt.	Refr.	App. Alt.	Refr.
° ′	′ ″	° ′	′ ″	° ′	′ ″
0 0	33 0	6 30	7 51	30 0	1 38
0 5	32 10	6 40	7 40	31 0	1 35
0 10	31 22	6 50	7 30	32 0	1 31
0 15	30 35	7 0	7 20	33 0	1 28
0 20	29 50	7 10	7 11	34 0	1 24
0 25	29 6	7 20	7 2	35 0	1 21
0 30	28 22	7 30	6 53	36 0	1 18
0 35	27 41	7 40	6 45	37 0	1 16
0 40	27 0	7 50	6 37	38 0	1 13
0 45	26 20	8 0	6 29	39 0	1 10
0 50	25 42	8 10	6 22	40 0	1 8
0 55	25 5	8 20	6 15	41 0	1 5
1 0	24 29	8 30	6 8	42 0	1 3
1 5	23 54	8 40	6 1	43 0	1 1
1 10	23 20	8 50	5 55	44 0	0 59
1 15	22 47	9 0	5 48	45 0	0 57
1 20	22 15	9 10	5 42	46 0	0 55
1 25	21 44	9 20	5 36	47 0	0 53
1 30	21 15	9 30	5 31	48 0	0 51
1 53	20 46	9 40	5 25	49 0	0 49
1 40	20 18	9 50	5 20	50 0	0 48
1 45	19 51	10 0	5 15	51 0	0 46
1 50	19 25	10 15	5 7	52 0	0 44
1 55	19 0	10 30	5 0	53 0	0 43
2 0	18 35	10 45	4 53	54 0	0 41
2 5	18 11	11 0	4 47	55 0	0 40
2 10	17 48	11 15	4 40	56 0	0 38
2 15	17 26	11 30	4 34	57 0	0 37
2 20	17 4	11 45	4 29	58 0	0 35
2 25	16 44	12 0	4 23	59 0	0 34
2 30	16 24	12 20	4 16	60 0	0 33
2 35	16 4	12 40	4 9	61 0	0 32
2 40	15 45	13 0	4 3	62 0	0 30
2 45	15 27	13 20	3 57	63 0	0 29
2 50	15 9	13 40	3 51	64 0	0 28
2 55	14 52	14 0	3 45	65 0	0 26
3 0	14 36	14 20	3 40	66 0	0 25
3 5	14 20	14 40	3 35	67 0	0 24
3 10	14 4	15 0	3 30	68 0	0 23
3 15	13 49	15 30	3 24	69 0	0 22
3 20	13 34	16 0	3 17	70 0	0 21
3 25	13 20	16 30	3 10	71 0	0 19
3 30	13 6	17 0	3 4	72 0	0 18
3 40	12 40	17 30	2 59	73 0	0 17
3 50	12 15	18 0	2 54	74 0	0 16
4 0	11 51	18 30	2 49	75 0	0 15
4 10	11 29	19 0	2 44	76 0	0 14
4 20	11 3	19 30	2 39	77 0	0 13
4 30	10 48	20 0	2 35	78 0	0 12
4 40	10 29	20 30	2 31	79 0	0 11
4 50	10 11	21 0	2 27	80 0	0 10
5 0	9 54	21 30	2 24	81 0	0 9
5 10	9 38	22 0	2 20	82 0	0 8
5 20	9 23	23 0	2 14	83 0	0 7
5 30	9 8	24 0	2 8	84 0	0 6
5 40	8 54	25 0	2 2	85 0	0 5
5 50	8 41	26 0	1 56	86 0	0 4
6 0	8 28	27 0	1 51	87 0	0 3
6 10	8 15	28 0	1 47	88 0	0 2
6 20	8 3	29 0	1 42	89 0	0 1

TABLE II.

Depression or Dip of the Hor. of the Sea.

Height of the Eye.	Dip of the Horizon.
Feet.	′ ″
1	0 57
2	1 21
3	1 39
4	1 55
5	2 8
6	2 20
7	2 31
8	2 42
9	2 52
10	3 1
11	3 10
12	3 18
13	3 26
14	3 34
15	3 42
16	3 49
17	3 56
18	4 3
19	4 10
20	4 16
21	4 22
22	4 28
23	4 34
24	4 40
26	4 52
28	5 3
30	5 14
35	5 39
40	6 2
45	6 24
50	6 44
60	7 23
70	7 59
80	8 32
90	9 3
100	9 33

TABLE III.

The Sun's Parallax in Altitude.

Sun's Alt.	Sun's Parallax.
0°	9″
4	9
8	9
12	9
16	9
20	8
22	8
24	8
26	8
28	8
30	8
32	8
34	7
36	7
38	7
40	7
42	7
44	6
46	6
48	6
50	6
52	5
54	5
56	5
58	5
60	4
62	4
64	4
66	4
68	3
70	3
74	2
78	2
82	1
86	1
90	0

TABLE IV. Moon's Augmentation.

☽'s App Alt.	☽'s Horizontal Semidiameter.						
	14′ 40″	15′ 0″	15′ 20″	15′ 40″	16′ 0″	16′ 20″	16′ 40″
0°	0″	0″	0″	0″	0″	0″	0″
3	1	1	1	1	1	1	1
6	2	2	2	2	2	2	2
9	2	2	3	3	3	3	3
12	3	3	3	3	4	4	4
15	4	4	4	4	4	5	5
18	4	5	5	5	5	5	6
21	5	5	6	6	6	6	7
24	6	6	6	7	7	7	7
27	6	7	7	7	8	8	8
30	7	7	8	8	8	9	9
33	8	8	8	8	9	9	10
36	8	8	9	9	10	10	11
39	9	9	10	10	11	11	11
42	9	10	10	11	11	12	12
45	10	10	11	11	12	12	13
48	10	11	11	12	12	13	13
51	11	12	12	12	13	13	14
54	11	12	12	13	13	14	14
57	12	13	13	13	14	14	15
60	12	13	13	14	14	15	16
65	13	14	14	15	15	16	16
70	13	14	14	15	16	16	17
75	14	14	15	15	16	16	17
80	14	14	15	16	16	17	18
90	14	15	15	16	17	17	18

EXPLANATION AND USE OF TABLE V.

WHEN the Apparent Distance between the Sun and Moon, or between the Moon and a Star, falls between 88° 45′ and 91° 15′, the second correction cannot be found by the scale, but must be found by Table V, which is very easily done to the nearest half second as follows :

RULE. To the Log. of the Moon's hor. par. add the Log. of the Moon's apparent altitude, and the Log. of the apparent distance ; the sum will be the Log. of the second correction.

EXAMPLES.

I. Suppose the Moon's hor. par. is 56′ 40″, and her apparent altitude 37° 30′, when the apparent distance is 89° 5′ : required the second correction.

Moon's hor. par.	56′ 40″	-	Log. 0.042
Moon's app. alt.	37° 30′	-	Log. 0.676
Apparent distance	89 5	-	Log. 2.796
Second correction	0′ 33″	-	Log. 3.514

II. Let it be required to find the second correction when the Moon's hor. par. is 60′ 25″, apparent altitude 57° 38′, and the apparent distance 90° 55′.

Moon's hor. par.	60′ 25″	-	Log. 0.014
Moon's app. alt.	57° 38′	-	Log. 0.534
Apparent distance	90 53	-	Log. 2.812
Second correction	0′ 47″	-	Log. 3.360

Or the complement of the second correction, will be 1° 59′ 13″.

TABLE V.

To find the Second Correction, when the Apparent Distance is between 88° 40′ and 91° 20′.

Logs. of ☽'s hor. par.		Logs. of ☽'s Apparent Altitude.				Logs. of App. Dist.				Logs. of 2nd Correction.			
Hor. Par.	Log.	Alt.	Log.	Alt.	Log.	M	88°	89°	M	S	0′	1′	
′ ″		° ′		° ′									
53. 0	0.071	5 0	1.520	35 0	0.701	0	2.457	2.758	60	0		3.255	60
10	070	5 30	478	35 30	696	1	466	765	59	1	5.033	248	59
20	068	6 0	441	36 0	691	2	464	773	58	2	4.732	241	58
30	067	6 30	406	36 30	686	3	468	780	57	3	556	234	57
40	065	7 0	374	37 0	681	4	472	788	56	4	431	227	56
50	064	7 30	344	37 30	676	5	475	796	55	5	334	220	55
54. 0	0 063	8 0	1.316	38 0	0.671	6	2.479	2.804	54	6	4.255	3.214	54
10	061	8 30	290	38 30	666	7	483	812	53	7	188	207	53
20	060	9 0	266	39 0	661	8	487	820	52	8	130	201	52
30	059	9 30	242	39 30	656	9	491	829	51	9	079	195	51
40	057	10 0	220	40 0	652	10	495	837	50	10	033	188	50
50	056	10 30	199	40 30	647	11	499	846	49	11	3.992	182	49
55. 0	0.055	11 0	1.179	41 0	0.643	12	2.503	2.855	48	12	3.954	3.176	48
10	054	11 30	160	42 0	634	13	507	864	47	13	919	170	47
20	052	12 0	142	43 0	626	14	511	873	46	14	887	164	46
30	051	12 30	125	44 0	618	15	515	883	45	15	857	158	45
40	050	13 0	108	45 0	610	16	519	893	44	16	829	153	44
50	048	13 30	092	46 0	603	17	523	903	43	17	803	147	43
56. 0	0.047	14 0	1.076	47 0	0.596	18	2.527	2.913	42	18	3.778	3.141	42
10	046	14 30	061	48 0	589	19	532	923	41	19	755	136	41
20	044	15 0	047	49 0	582	20	536	934	40	20	732	130	40
30	043	15 30	033	50 0	576	21	540	945	39	21	711	125	39
40	042	16 0	020	51 0	569	22	545	956	38	22	691	120	38
50	041	16 30	008	52 0	563	23	549	968	37	23	672	114	37
57. 0	0.039	17 0	0.995	53 0	0.558	24	2.554	2.980	36	24	3.653	3.109	36
10	038	17 30	982	54 0	552	25	558	992	35	25	635	104	35
20	037	18 0	970	55 0	547	26	563	3.005	34	26	618	099	34
30	036	18 30	958	56 0	541	27	568	018	33	27	602	094	33
40	034	19 0	947	57 0	536	28	572	031	32	28	586	089	32
50	033	19 30	936	58 0	532	29	577	045	31	29	571	084	31
58. 0	0.032	20 0	0.926	59 0	0.527	30	2.582	3.059	30	30	3.556	3.079	30
10	031	20 30	916	60 0	522	31	587	074	29	31	542	074	29
20	029	21 0	906	61 0	518	32	592	089	28	32	528	070	28
30	028	21 30	896	62 0	514	33	597	105	27	33	515	065	27
40	027	22 0	886	63 0	510	34	602	121	26	34	502	060	26
50	026	22 30	877	64 0	506	35	607	138	25	35	489	056	25
59. 0	0.024	23 0	0.868	65 0	0.503	36	2.612	3.156	24	36	3.477	3.051	24
10	023	23 30	859	66 0	499	37	617	175	23	37	465	047	23
20	022	24 0	851	67 0	496	38	622	194	22	38	454	042	22
30	021	24 30	842	68 0	493	39	628	214	21	39	442	038	21
40	019	25 0	834	69 0	490	40	633	235	20	40	431	033	20
50	018	25 30	826	70 0	487	41	639	257	19	41	421	029	19
60. 0	0.017	26 0	0.818	71 0	0.484	42	2.644	3.281	18	42	3.410	3.025	18
10	016	26 30	810	72 0	482	43	650	306	17	43	400	021	17
20	015	27 0	803	73 0	479	44	655	332	16	44	390	016	16
30	013	27 30	796	74 0	477	45	661	360	15	45	380	012	15
40	012	28 0	788	75 0	475	46	667	390	14	46	371	008	14
50	011	28 30	781	76 0	473	47	673	422	13	47	361	004	13
61. 0	0.010	29 0	0.774	77 0	0.471	48	2.679	3.457	12	48	3.352	3.000	12
10	009	29 30	768	78 0	470	49	685	495	11	49	343	2.996	11
20	008	30 0	761	79 0	468	50	691	536	10	50	334	992	10
30	006	30 30	754	80 0	467	51	697	582	9	51	326	988	9
40	005	31 0	748	81 0	465	52	704	633	8	52	317	984	8
50	004	31 30	742	82 0	464	53	710	691	7	53	309	980	7
		32 0	0.736	83 0	0.463	54	2.717	3.758	6	54	3.301	2.976	6
		32 30	730	84 0	462	55	723	837	5	55	293	973	5
		33 0	724	85 0	462	56	730	934	4	56	285	969	4
		33 30	718	86 0	461	57	737	4.059	3	57	277	965	3
		34 0	712	87 0	461	58	744	235	2	58	270	961	2
		34 30	707	88 0	460	59	751	536	1	59	263	958	1
						60	758		0	60	255	954	0
							91°	90°	M		1° 59′	1° 58′	S
							App. Dist.				Comp. of 2nd Cor.		

TABLE VI.

Third Correction, to Apparent Distance 28°.

D's App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															D's App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 20	1 23	1 27	1 33	1 40	1 49	2 00	2 28	2 56	3 24	3 53	4 21	4 48	5 15	5 42	6 9	6
7	1 25	1 20	1 23	1 27	1 32	1 38	1 45	2 4	2 26	2 49	3 13	3 36	3 58	4 20	4 43	5 6	7
8	1 32	1 24	1 20	1 22	1 25	1 29	1 35	1 50	2 7	2 26	2 46	3 4	3 23	3 42	4 1	4 20	8
9	1 41	1 29	1 23	1 20	1 22	1 24	1 28	1 39	1 52	2 7	2 22	2 37	2 53	3 9	3 25	3 41	9
10	1 53	1 37	1 28	1 23	1 20	1 21	1 23	1 30	1 49	1 52	2 5	2 18	2 31	2 44	2 58	3 11	10
11	2 6	1 46	1 34	1 27	1 23	1 20	1 21	1 24	1 31	1 41	1 52	2 4	2 15	2 26	2 37	2 48	11
12	2 19	1 56	1 41	1 32	1 26	1 22	1 19	1 21	1 26	1 33	1 42	1 52	2 1	2 10	2 20	2 30	12
13	2 32	2 6	1 49	1 38	1 30	1 25	1 21	1 20	1 23	1 28	1 34	1 42	1 49	1 57	2 6	2 15	13
14	2 46	2 17	1 58	1 44	1 34	1 28	1 23	1 19	1 21	1 24	1 28	1 34	1 40	1 47	1 54	2 3	14
15	3 00	2 28	2 7	1 51	1 39	1 32	1 25	1 20	1 19	1 21	1 24	1 28	1 33	1 39	1 45	1 52	15
16	3 14	2 39	2 16	1 58	1 45	1 36	1 28	1 21	1 18	1 19	1 21	1 24	1 28	1 33	1 38	1 44	16
17	3 28	2 51	2 25	2 5	1 51	1 41	1 32	1 23	1 19	1 18	1 19	1 21	1 24	1 28	1 33	1 38	17
18	3 41	3 2	2 35	2 13	1 58	1 46	1 36	1 25	1 20	1 17	1 18	1 19	1 21	1 24	1 28	1 33	18
19	3 55	3 13	2 45	2 21	2 5	1 52	1 41	1 27	1 21	1 18	1 16	1 17	1 18	1 20	1 24	1 28	19
20	4 9	3 24	2 55	2 29	2 11	1 57	1 46	1 30	1 23	1 18	1 16	1 15	1 16	1 18	1 21	1 24	20
21	4 23	3 35	3 4	2 37	2 17	2 3	1 51	1 33	1 25	1 19	1 16	1 14	1 15	1 16	1 18	1 20	21
22	4 36	3 46	3 13	2 45	2 24	2 9	1 56	1 36	1 27	1 20	1 16	1 13	1 14	1 15	1 16	1 17	22
23	4 49	3 57	3 22	2 53	2 31	2 14	2 1	1 40	1 29	1 22	1 17	1 13	1 13	1 13	1 14	1 15	23
24	5 2	4 8	3 31	3 0	2 37	2 20	2 6	1 43	1 31	1 24	1 18	1 14	1 12	1 12	1 12	1 13	24
25	5 16	4 19	3 40	3 8	2 43	2 26	2 11	1 47	1 34	1 26	1 19	1 15	1 13	1 11	1 11	1 12	25
26	5 29	4 30	3 49	3 15	2 50	2 32	2 16	1 51	1 36	1 28	1 20	1 15	1 13	1 11	1 11	1 11	26
27	5 42	4 41	3 58	3 23	2 57	2 38	2 21	1 55	1 39	1 30	1 21	1 16	1 13	1 11	1 10	1 10	27
28	5 55	4 52	4 7	3 30	3 4	2 44	2 26	1 59	1 42	1 32	1 22	1 17	1 14	1 11	1 10	1 10	28
29	6 7	5 3	4 16	3 38	3 11	2 50	2 31	2 3	1 45	1 34	1 24	1 18	1 14	1 12	1 10	1 10	29
30	6 19	5 13	4 25	3 45	3 18	2 55	2 36	2 7	1 47	1 36	1 26	1 19	1 15	1 12	1 10	1 9	30
31	6 31	5 23	4 34	3 52	3 25	3 1	2 41	2 10	1 50	1 38	1 27	1 20	1 15	1 12	1 10	1 9	31
32	6 42	5 32	4 43	3 59	3 31	3 7	2 46	2 13	1 53	1 40	1 29	1 21	1 16	1 12	1 10	1 9	32
33	6 53	5 41	4 51	4 6	3 37	3 12	2 51	2 17	1 56	1 42	1 31	1 22	1 16	1 12	1 10	1 9	33
34	7 4	5 50	4 58	4 13	3 43	3 17	2 55	2 20	1 58	1 44	1 32	1 23	1 17	1 12	1 10	1 9	34
35		5 59	5 5	4 20	3 48	3 21	2 59	2 23	2 00	1 46	1 33	1 23	1 17	1 13	1 10	1 8	35
36			5 11	4 26	3 53	3 25	3 3	2 26	2 3	1 47	1 34	1 24	1 18	1 13	1 10	1 8	36
37				4 32	3 58	3 29	3 7	2 29	2 5	1 49	1 35	1 25	1 18	1 13	1 10	1 8	37
38					4 2	3 33	3 10	2 32	2 7	1 51	1 36	1 26	1 19	1 14	1 10	1 8	38
39						3 37	3 12	2 34	2 9	1 52	1 37	1 27	1 19	1 14	1 11	1 8	39
40							3 15	2 37	2 11	1 53	1 38	1 24	1 20	1 15	1 11	1 8	40
41								2 40	2 13	1 54	1 39	1 28	1 20	1 15	1 11	1 8	41
42								2 42	2 15	1 55	1 40	1 29	1 21	1 15	1 10	1 7	42
43									2 17	1 56	1 40	1 29	1 21	1 15	1 10	1 7	43
44									2 18	1 57	1 41	1 30	1 21	1 15	1 10	1 7	44
46										1 59	1 42	1 30	1 22	1 15	1 10	1 7	46
48											1 43	1 31	1 22	1 15	1 10	1 6	48
50												1 32	1 23	1 15	1 10	1 6	50
52													1 24	1 15	1 9	1 5	52
54														1 15	1 9	1 5	54
56															1 9	1 4	56
58																1 3	58
60																	60
62																	62
64																	64
66																	66
68																	68
70																	70
72																	72
74																	74
76																	76
78																	78
80																	80
82																	82
84																	84
86																	86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 28°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																☽'s App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	6 37	7 4															6
7	5 28	5 49															7
8	4 40	4 57	5 11														8
9	3 56	4 11	4 25														9
10	3 26	3 38	3 50	4 2													10
11	3 0	3 12	3 23	3 33													11
12	2 40	2 50	2 59	3 7													12
13	2 24	2 33	2 41	2 48													13
14	2 11	2 18	2 25	2 31	2 42												14
15	1 59	2 6	2 12	2 17	2 27												15
16	1 50	1 56	2 1	2 6	2 14												16
17	1 43	1 48	1 52	1 56	2 3												17
18	1 37	1 41	1 45	1 48	1 54	1 59											18
19	1 31	1 35	1 38	1 41	1 46	1 50											19
20	1 26	1 29	1 32	1 34	1 38	1 42											20
21	1 22	1 25	1 27	1 29	1 32	1 36											21
22	1 19	1 21	1 23	1 25	1 27	1 30	1 32										22
23	1 17	1 18	1 20	1 22	1 24	1 26	1 27										23
24	1 15	1 16	1 17	1 18	1 20	1 22	1 23										24
25	1 13	1 14	1 14	1 15	1 16	1 18	1 19										25
26	1 11	1 12	1 12	1 13	1 13	1 14	1 15	1 15									26
27	1 10	1 11	1 11	1 11	1 11	1 11	1 12	1 12									27
28	1 10	1 10	1 10	1 10	1 10	1 9	1 9	1 9									28
29	1 10	1 10	1 10	1 9	1 9	1 8	1 7	1 6									29
30	1 9	1 9	1 9	1 8	1 8	1 7	1 6	1 4	1 3								30
31	1 8	1 8	1 7	1 7	1 6	1 5	1 4	1 2	1 1								31
32	1 8	1 7	1 6	1 6	1 5	1 4	1 3	1 1	1 0								32
33	1 7	1 6	1 5	1 5	1 4	1 3	1 2	1 0	58								33
34	1 7	1 5	1 4	1 4	1 3	1 2	1 1	59	57	54							34
35	1 7	1 5	1 4	1 3	1 2	1 1	1 0	58	55	53							35
36	1 6	1 5	1 4	1 3	1 1	1 0	58	56	54	52							36
37	1 6	1 4	1 3	1 2	1 0	59	57	55	53	51							37
38	1 6	1 4	1 2	1 1	59	58	56	54	52	50	49						38
39	1 6	1 4	1 2	1 0	59	57	55	53	51	49	47						39
40	1 6	1 4	1 2	1 0	58	57	55	52	50	48	46						40
41	1 6	1 4	1 2	1 0	58	56	54	51	49	47	45						41
42	1 5	1 4	1 2	59	57	55	53	50	48	46	44	42					42
43	1 5	1 3	1 1	59	57	55	53	50	48	46	44	42					43
44	1 5	1 3	1 1	59	56	54	52	50	47	45	43	41					44
46	1 4	1 2	1 0	58	55	53	51	49	47	44	42	40	39				46
48	1 3	1 1	59	57	54	52	50	48	46	43	42	39	38				48
50	1 3	1 1	58	56	53	51	49	47	45	42	40	38	37	36			50
52	1 2	1 0	57	55	52	50	48	46	44	42	40	38	56	35			52
54	1 2	59	56	54	51	49	47	45	43	41	39	37	35	34	33		54
56	1 1	58	55	53	50	48	46	44	42	40	38	36	35	34	33		56
58	1 0	57	54	52	49	47	45	43	41	39	37	36	35	34	32	31	58
60	58	55	53	51	48	46	44	42	40	38	37	36	35	34	32	31	60
62		54	52	50	47	45	43	41	39	38	37	36	35	34	32	31	62
64			50	49	46	44	32	40	38	37	36	35	34	33	32	30	64
66				48	45	43	41	39	38	37	36	35	34	33	31	29	66
68					43	41	40	38	37	36	35	34	33	32	30		68
70					42	40	39	38	37	36	35	34	33	31	29		70
72						39	38	37	36	35	34	33	32	30			72
74						39	37	36	35	34	33	32	30	28			74
76							36	35	34	34	33	31	29				76
78							36	34	34	33	32	30	28				78
80								34	33	32	31	30					80
82								33	32	31	30	29					82
84									32	31	30						84
86									31	30	29						86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	

TABLE VI.

Third Correction, to Apparent Distance 32°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 18	1 21	1 25	1 30	1 37	1 47	1 59	2 23	2 48	3 13	3 39	4 5	4 30	4 55	5 20	5 45	6
7	1 23	1 18	1 21	1 24	1 27	1 33	1 42	2 0	2 18	2 37	2 58	3 20	3 42	4 4	4 25	4 46	7
8	1 30	1 22	1 18	1 20	1 22	1 25	1 29	1 42	1 57	2 14	2 32	2 50	3 8	3 26	3 44	4 2	8
9	1 38	1 27	1 20	1 18	1 19	1 21	1 23	1 31	1 44	1 58	2 12	2 26	2 41	2 56	3 11	3 26	9
10	1 47	1 33	1 23	1 20	1 18	1 19	1 20	1 24	1 34	1 45	1 57	2 9	2 21	2 34	2 46	2 59	10
11	1 57	1 41	1 28	1 23	1 19	1 17	1 18	1 21	1 27	1 36	1 46	1 56	2 6	2 17	2 28	2 39	11
12	2 9	1 50	1 34	1 27	1 22	1 19	1 17	1 19	1 23	1 29	1 37	1 46	1 55	2 4	2 13	2 23	12
13	2 21	1 59	1 41	1 32	1 26	1 21	1 18	1 17	1 20	1 24	1 30	1 37	1 45	1 53	2 1	2 9	13
14	2 34	2 8	1 50	1 38	1 30	1 24	1 20	1 16	1 18	1 21	1 25	1 30	1 36	1 43	1 51	1 58	14
15	2 47	2 18	1 59	1 45	1 35	1 28	1 22	1 17	1 16	1 18	1 21	1 25	1 30	1 35	1 42	1 49	15
16	2 59	2 28	2 7	1 52	1 41	1 32	1 25	1 19	1 15	1 16	1 18	1 21	1 25	1 29	1 35	1 41	16
17	3 12	2 38	2 16	1 59	1 47	1 36	1 28	1 21	1 16	1 15	1 16	1 18	1 21	1 25	1 30	1 35	17
18	3 25	2 48	2 25	2 6	1 52	1 41	1 32	1 23	1 17	1 14	1 15	1 17	1 19	1 22	1 25	1 29	18
19	3 38	2 58	2 34	2 13	1 58	1 46	1 36	1 25	1 18	1 15	1 14	1 15	1 17	1 19	1 21	1 25	19
20	3 50	3 9	2 43	2 20	2 4	1 51	1 40	1 27	1 20	1 16	1 13	1 14	1 15	1 17	1 19	1 21	20
21	4 3	3 19	2 52	2 27	2 10	1 56	1 45	1 30	1 22	1 17	1 14	1 13	1 14	1 15	1 16	1 18	21
22	4 15	3 30	3 0	2 35	2 17	2 2	1 50	1 33	1 24	1 18	1 14	1 11	1 12	1 13	1 14	1 16	22
23	4 28	3 40	3 9	2 42	2 24	2 7	1 55	1 36	1 26	1 19	1 15	1 12	1 11	1 12	1 13	1 14	23
24	4 40	3 51	3 17	2 50	2 30	2 13	1 59	1 39	1 28	1 21	1 16	1 12	1 10	1 11	1 11	1 12	24
25	4 52	4 1	3 26	2 57	2 36	2 18	2 4	1 42	1 30	1 22	1 17	1 13	1 11	1 9	1 9	1 10	25
26	5 4	4 12	3 34	3 5	2 43	2 24	2 8	1 46	1 32	1 24	1 18	1 13	1 11	1 8	1 8	1 9	26
27	5 16	4 22	3 43	3 12	2 50	2 30	2 13	1 50	1 34	1 26	1 19	1 14	1 11	1 9	1 8	1 8	27
28	5 28	4 33	3 52	3 20	2 57	2 35	2 17	1 53	1 37	1 27	1 20	1 15	1 11	1 9	1 7	1 8	28
29	5 41	4 44	4 1	3 28	3 3	2 41	2 21	1 57	1 40	1 29	1 21	1 16	1 12	1 10	1 8	1 7	29
30	5 53	4 54	4 10	3 35	3 0	2 46	2 26	2 0	1 43	1 31	1 23	1 17	1 13	1 10	1 8	1 6	30
31	6 5	5 4	4 19	3 42	3 15	2 52	2 31	2 4	1 46	1 33	1 24	1 18	1 13	1 10	1 8	1 6	31
32	6 17	5 14	4 27	3 49	3 21	2 57	2 36	2 8	1 49	1 36	1 26	1 19	1 14	1 11	1 9	1 7	32
33	6 29	5 23	4 35	3 56	3 27	3 2	2 41	2 12	1 52	1 38	1 27	1 20	1 15	1 11	1 9	1 7	33
34	6 40	5 32	4 43	4 3	3 32	3 7	2 46	2 15	1 55	1 40	1 29	1 21	1 16	1 12	1 9	1 7	34
35	6 50	5 40	4 50	4 9	3 38	3 12	2 50	2 19	1 58	1 43	1 31	1 22	1 17	1 13	1 9	1 7	35
36	6 59	5 48	4 57	4 15	3 43	3 16	2 54	2 22	2 1	1 45	1 32	1 23	1 18	1 13	1 10	1 7	36
37	7 7	5 56	5 4	4 21	3 49	3 21	2 59	2 25	2 4	1 47	1 34	1 24	1 19	1 14	1 10	1 7	37
38	7 15	6 3	5 10	4 29	3 54	3 25	3 3	2 28	2 6	1 49	1 35	1 25	1 19	1 14	1 10	1 7	38
39		6 10	5 16	4 33	3 59	3 30	3 7	2 31	2 8	1 51	1 36	1 26	1 20	1 15	1 10	1 7	39
40			5 21	4 38	4 4	3 34	3 11	2 34	2 10	1 52	1 38	1 27	1 20	1 15	1 11	1 8	40
41				4 43	4 8	3 38	3 15	2 36	2 13	1 54	1 39	1 28	1 21	1 16	1 12	1 8	41
42					4 12	3 42	3 18	2 39	2 16	1 56	1 41	1 29	1 22	1 16	1 12	1 8	42
43						3 46	3 21	2 42	2 18	1 58	1 42	1 30	1 22	1 16	1 12	1 8	43
44							3 24	2 45	2 20	2 0	1 43	1 31	1 23	1 17	1 12	1 8	44
46								1 50	2 23	2 2	1 45	1 32	1 24	1 17	1 12	1 8	46
48									2 26	2 4	1 47	1 34	1 25	1 18	1 12	1 8	48
50										2 6	1 49	1 36	1 26	1 19	1 13	1 8	50
52											1 51	1 38	1 28	1 19	1 13	1 8	52
54												1 39	1 29	1 20	1 14	1 8	54
56													1 30	1 21	1 14	1 8	56
58														1 21	1 14	1 8	58
60															1 14	1 8	60
62																1 8	62
64																	64
66																	66
68																	68
70																	70
72																	72
74																	74
76																	76
78																	78
80																	80
82																	82
84																	84
86																	86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 32°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	6 10	6 33	6 55	7 15													6
7	5 7	5 26	5 44	6 2													7
8	4 20	4 37	4 52	5 7													8
9	3 41	3 56	4 10	4 24													9
10	3 12	3 25	3 38	3 50	4 12												10
11	2 51	3 2	3 13	3 23	3 42												11
12	2 33	2 43	2 51	3 00	3 17												12
13	2 18	2 26	2 34	2 42	2 56												13
14	2 5	2 12	2 19	2 26	2 38	2 50											14
15	1 55	2 2	2 8	2 14	2 25	2 35											15
16	1 47	1 53	1 58	2 3	2 14	2 22											16
17	1 40	1 45	1 50	1 54	2 3	2 11											17
18	1 34	1 38	1 42	1 46	1 53	2 0	2 6										18
19	1 29	1 33	1 36	1 39	1 45	1 51	1 57										19
20	1 25	1 28	1 31	1 33	1 38	1 43	1 49										20
21	1 21	1 24	1 26	1 28	1 32	1 37	1 42										21
22	1 18	1 20	1 22	1 24	1 27	1 31	1 35	1 39									22
23	1 15	1 17	1 19	1 20	1 23	1 27	1 30	1 34									23
24	1 13	1 14	1 16	1 17	1 20	1 23	1 26	1 29									24
25	1 11	1 12	1 13	1 15	1 17	1 19	1 22	1 24									25
26	1 9	1 10	1 11	1 12	1 14	1 16	1 17	1 19	1 21								26
27	1 8	1 9	1 9	1 10	1 12	1 13	1 14	1 16	1 17								27
28	1 8	1 8	1 8	1 9	1 10	1 11	1 12	1 13	1 14								28
29	1 7	1 7	1 7	1 7	1 8	1 9	1 9	1 10	1 11								29
30	1 6	1 6	1 6	1 6	1 6	1 7	1 7	1 7	1 8	1 8							30
31	1 6	1 6	1 6	1 5	1 5	1 5	1 5	1 5	1 5	1 5							31
32	1 6	1 5	1 5	1 4	1 4	1 4	1 4	1 4	1 3	1 3							32
33	1 5	1 4	1 4	1 3	1 3	1 2	1 2	1 2	1 1	1 1							33
34	1 5	1 4	1 3	1 2	1 2	1 1	1 0	1 0	59	59	59						34
35	1 5	1 3	1 3	1 2	1 1	1 0	59	58	57	57	57						35
36	1 5	1 3	1 2	1 1	1 1	1 0	58	57	56	56	55						36
37	1 5	1 3	1 1	1 0	1 0	59	57	56	55	55	54						37
38	1 5	1 3	1 1	1 0	59	58	56	55	54	54	53	52					38
39	1 5	1 3	1 1	59	58	57	56	54	53	52	51	50					39
40	1 5	1 2	1 0	59	58	56	55	53	52	51	50	49					40
41	1 5	1 2	1 0	59	58	56	54	52	51	50	49	48					41
42	1 5	1 2	1 0	59	57	55	53	51	50	49	48	47	47				42
43	1 5	1 2	1 0	58	56	54	52	51	49	48	47	47	46				43
44	1 5	1 2	1 0	58	55	53	51	50	49	48	47	46	45				44
46	1 5	1 2	1 0	58	55	52	51	50	48	47	46	45	44	43			46
48	1 5	1 2	59	57	55	52	50	49	47	46	45	44	43	42			48
50	1 5	1 2	59	57	54	51	49	48	47	46	44	43	42	41	40		50
52	1 4	1 1	58	56	53	51	49	47	46	45	43	42	41	40	39		52
54	1 4	1 1	58	56	53	50	48	46	45	44	43	41	40	39	38	37	54
56	1 4	1 1	58	56	52	49	47	45	44	42	41	40	39	38	37	36	56
58	1 4	1 1	58	56	52	49	47	45	43	41	40	39	38	37	36	35	58
60	1 4	1 0	57	55	51	48	46	44	42	40	39	38	37	36	35	35	60
62	1 3	59	56	54	51	48	45	43	41	39	38	37	36	35	34	34	62
64	1 3	59	56	54	50	47	45	43	41	38	38	37	36	35	34		64
66		59	56	54	50	47	44	42	40	38	37	36	35	34	33		66
68				55	53	48	46	44	42	40	38	37	36	35	34		68
70					52	48	45	43	41	39	37	36	35	34	33		70
72						47	44	42	40	38	37	36	35	33			72
74						47	44	42	40	38	36	35	34	32			74
76							43	41	39	38	36	35	34				76
78							43	41	39	37	35	34	33				78
80								41	39	37	35	34					80
82								40	38	36	34	33					82
84									38	36	34						84
86									37	35	34						86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	

TABLE VI.

Third Correction, to Apparent Distance 36°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																		☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°			
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 17	1 19	1 22	1 27	1 33	1 42	1 52	2 13	2 34	2 56	3 19	3 43	4 7	4 32	4 55	5 18			6
7	1 20	1 17	1 19	1 22	1 26	1 31	1 37	1 52	2 9	2 28	2 48	3 8	3 27	3 46	4 6	4 25			7
8	1 25	1 20	1 17	1 19	1 21	1 23	1 27	1 39	1 53	2 8	2 24	2 40	2 57	3 14	3 30	3 46			8
9	1 32	1 24	1 19	1 17	1 18	1 19	1 21	1 29	1 40	1 52	2 5	2 19	2 33	2 47	3 2	3 16			9
10	1 42	1 30	1 23	1 19	1 16	1 17	1 18	1 23	1 31	1 40	1 51	2 2	2 14	2 27	2 40	2 52			10
11	1 52	1 37	1 28	1 22	1 18	1 16	1 17	1 19	1 25	1 33	1 42	1 51	2 1	2 12	2 23	2 33			11
12	2 3	1 45	1 34	1 26	1 20	1 17	1 15	1 17	1 21	1 27	1 34	1 41	1 50	1 59	2 8	2 17			12
13	2 14	1 53	1 40	1 30	1 23	1 19	1 16	1 15	1 18	1 23	1 28	1 34	1 41	1 49	1 57	2 5			13
14	2 25	2 1	1 47	1 35	1 26	1 21	1 18	1 14	1 16	1 19	1 24	1 29	1 35	1 41	1 49	1 55			14
15	2 36	2 10	1 54	1 41	1 30	1 25	1 21	1 16	1 15	1 17	1 21	1 25	1 30	1 35	1 41	1 46			15
16	2 48	2 20	2 2	1 47	1 35	1 29	1 24	1 18	1 13	1 15	1 18	1 21	1 25	1 29	1 34	1 39			16
17	3 0	2 30	2 10	1 53	1 40	1 33	1 28	1 20	1 15	1 14	1 16	1 18	1 21	1 24	1 28	1 33			17
18	3 12	2 40	2 18	2 0	1 46	1 38	1 32	1 22	1 16	1 13	1 15	1 16	1 18	1 20	1 23	1 27			18
19	3 24	2 49	2 27	2 7	1 51	1 43	1 36	1 25	1 18	1 15	1 14	1 15	1 16	1 18	1 20	1 23			19
20	3 35	2 59	2 35	2 14	1 57	1 48	1 40	1 29	1 21	1 16	1 12	1 13	1 14	1 16	1 18	1 20			20
21	3 46	3 9	2 43	2 21	2 3	1 53	1 44	1 31	1 23	1 17	1 13	1 12	1 13	1 14	1 16	1 18			21
22	3 57	3 18	2 51	2 28	2 9	1 58	1 48	1 34	1 25	1 18	1 14	1 11	1 12	1 13	1 14	1 15			22
23	4 9	3 28	2 59	2 35	2 16	2 3	1 52	1 36	1 26	1 19	1 14	1 11	1 10	1 11	1 12	1 13			23
24	4 20	3 37	3 7	2 42	2 22	2 8	1 56	1 39	1 28	1 20	1 15	1 11	1 9	1 9	1 10	1 11			24
25	4 32	3 47	3 15	2 49	2 28	2 13	2 0	1 41	1 30	1 22	1 15	1 11	1 9	1 8	1 8	1 9			25
26	4 43	3 56	3 23	2 56	2 34	2 18	2 4	1 45	1 32	1 23	1 16	1 12	1 9	1 7	1 7	1 7			26
27	4 55	4 6	3 31	3 3	2 40	2 23	2 9	1 48	1 35	1 25	1 17	1 12	1 9	1 7	1 6	1 6			27
28	5 6	4 15	3 39	3 10	2 46	2 28	2 13	1 52	1 38	1 27	1 19	1 13	1 9	1 7	1 6	1 6			28
29	5 17	4 25	3 47	3 17	2 52	2 34	2 18	1 56	1 40	1 29	1 20	1 13	1 9	1 7	1 6	1 5			29
30	5 28	4 34	3 54	3 24	2 58	2 39	2 23	2 0	1 43	1 31	1 21	1 14	1 10	1 8	1 6	1 5			30
31	5 39	4 43	4 2	3 31	3 4	2 44	2 28	2 4	1 46	1 33	1 23	1 16	1 11	1 8	1 6	1 5			31
32	5 49	4 52	4 10	3 37	3 10	2 49	2 33	2 7	1 49	1 35	1 25	1 17	1 12	1 9	1 7	1 5			32
33	5 59	5 0	4 18	3 44	3 16	2 54	2 37	2 10	1 51	1 37	1 27	1 19	1 14	1 10	1 7	1 5			33
34	6 9	5 8	4 25	3 50	3 22	2 59	2 41	2 13	1 53	1 39	1 29	1 21	1 15	1 11	1 8	1 6			34
35	6 19	5 16	4 32	3 56	3 28	3 4	2 46	2 16	1 56	1 41	1 30	1 22	1 16	1 11	1 8	1 6			35
36	6 28	5 24	4 38	4 2	3 33	3 9	2 50	2 19	1 58	1 43	1 32	1 23	1 17	1 12	1 9	1 6			36
37	6 38	5 32	4 45	4 8	3 39	3 14	2 54	2 22	2 1	1 45	1 33	1 24	1 18	1 13	1 9	1 6			37
38	6 47	5 40	4 52	4 14	3 44	3 18	2 58	2 25	2 4	1 47	1 35	1 26	1 19	1 14	1 10	1 6			38
39	6 57	5 48	4 59	4 20	3 49	3 23	3 2	2 28	2 6	1 49	1 36	1 27	1 20	1 14	1 10	1 7			39
40	7 6	5 56	5 5	4 25	3 54	3 27	3 6	2 31	2 8	1 51	1 38	1 28	1 21	1 15	1 11	1 7			40
41	7 16	6 4	5 12	4 31	3 59	3 31	3 10	2 33	2 11	1 53	1 40	1 30	1 22	1 15	1 11	1 8			41
42	7 25	6 12	5 18	4 36	4 3	3 35	3 13	2 36	2 14	1 55	1 42	1 31	1 22	1 16	1 11	1 8			42
43		6 19	5 24	4 41	4 8	3 39	3 17	2 39	2 16	1 57	1 43	1 32	1 23	1 16	1 11	1 8			43
44			5 30	4 46	4 12	3 43	3 20	2 42	2 18	1 59	1 45	1 33	1 24	1 17	1 12	1 9			44
46					4 20	3 50	3 26	2 47	2 22	2 2	1 47	1 35	1 25	1 18	1 13	1 9			46
48							3 32	2 52	2 26	2 5	1 49	1 37	1 27	1 20	1 14	1 10			48
50								2 57	2 30	2 8	1 51	1 39	1 29	1 21	1 15	1 10			50
52									2 33	2 11	1 53	1 41	1 31	1 22	1 16	1 11			52
54										2 13	1 55	1 43	1 32	1 23	1 16	1 11			54
56											1 57	1 44	1 33	1 24	1 17	1 11			56
58												1 45	1 34	1 25	1 18	1 12			58
60													1 35	1 26	1 18	1 12			60
62														1 26	1 18	1 12			62
64															1 19	1 12			64
66																1 13			66
68																			68
70																			70
72																			72
74																			74
76																			76
78																			78
80																			80
82																			82
84																			84
86																			86
						11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°			

TABLE P. EFFECT OF SUN'S PAR.
Add the Numbers above the black lines to 3rd Correction, subtract the others.

☽'s App. Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	0	1	3	5	7					
10	1	0	2	4	5					
20	4	3	1	1	3	4				
30	6	5	3	1	0	2	3			
40	9	8	5	3	2	0	1	2		
50			7	5	4	2	1	0	1	
60				7	5	4	3	2	1	0
70					6	5	4	3	2	
80						6	4			

TABLE VI.

Third Correction, to Apparent Distance 36°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																		☽'s App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°			
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	5 40	6 1	6 22	6 43	7 24														6
7	4 43	5 1	5 19	5 36	6 11														7
8	4 1	4 18	4 31	4 46	5 16														8
9	3 29	3 42	3 55	4 8	4 33														9
10	3 4	3 16	3 27	3 38	3 59	4 20													10
11	2 43	2 54	3 4	3 13	3 32	3 50													11
12	2 27	2 36	2 45	2 53	3 10	3 25													12
13	2 13	2 21	2 29	2 37	2 51	3 4													13
14	2 2	2 9	2 16	2 23	2 36	2 47	2 57												14
15	1 53	1 59	2 5	2 11	2 23	2 33	2 42												15
16	1 45	1 50	1 56	2 1	2 12	2 21	2 29												16
17	1 38	1 42	1 47	1 53	2 2	2 10	2 17												17
18	1 32	1 36	1 40	1 45	1 53	2 1	2 7	2 13											18
19	1 27	1 30	1 34	1 38	1 45	1 52	1 58	2 3											19
20	1 23	1 26	1 29	1 33	1 38	1 44	1 49	1 54											20
21	1 20	1 22	1 25	1 28	1 33	1 38	1 43	1 47											21
22	1 17	1 18	1 20	1 23	1 28	1 33	1 37	1 41	1 45										22
23	1 14	1 15	1 17	1 19	1 24	1 28	1 32	1 36	1 39										23
24	1 11	1 12	1 14	1 16	1 20	1 23	1 27	1 31	1 34										24
25	1 9	1 10	1 11	1 13	1 16	1 19	1 22	1 26	1 29										25
26	1 8	1 8	1 9	1 11	1 13	1 15	1 18	1 21	1 24	1 26									26
27	1 7	1 7	1 8	1 9	1 11	1 13	1 15	1 17	1 20	1 22									27
28	1 6	1 6	1 7	1 8	1 9	1 11	1 12	1 14	1 16	1 18									28
29	1 6	1 6	1 6	1 7	1 8	1 9	1 10	1 11	1 13	1 14									29
30	1 5	1 5	1 5	1 6	1 7	1 7	1 8	1 9	1 10	1 11	1 13								30
31	1 5	1 5	1 5	1 5	1 6	1 6	1 6	1 7	1 8	1 9	1 10								31
32	1 4	1 4	1 5	1 5	1 5	1 5	1 5	1 5	1 6	1 7	1 8								32
33	1 4	1 4	1 4	1 4	1 4	1 4	1 4	1 4	1 4	1 5	1 5								33
34	1 4	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3						34
35	1 4	1 3	1 3	1 3	1 2	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1						35
36	1 4	1 3	1 2	1 2	1 1	1 0	1 0	1 0	1 0	1 0	1 0	1 0	1 0						36
37	1 4	1 3	1 2	1 1	59	59	59	59	59	59	59	59							37
38	1 4	1 3	1 1	1 0	58	58	58	58	58	58	58	58	57						38
39	1 5	1 3	1 1	1 0	58	58	58	58	57	57	57	56	56						39
40	1 5	1 3	1 1	1 0	58	57	57	57	57	56	56	55	54						40
41	1 6	1 3	1 1	59	57	56	56	56	56	55	54	53	52						41
42	1 6	1 3	1 1	59	57	56	55	55	55	54	53	52	51	51					42
43	1 6	1 3	1 1	59	56	55	54	54	54	53	52	51	50	50					43
44	1 6	1 3	1 1	59	56	54	53	53	53	52	51	50	49	49					44
46	1 6	1 3	1 1	59	56	54	53	52	51	50	49	48	48	47	47				46
48	1 7	1 3	1 1	59	56	54	52	51	49	48	47	46	46	45	45				48
50	1 7	1 3	1 1	59	56	53	51	50	48	47	46	45	45	44	44	44			50
52	1 7	1 3	1 1	59	55	52	50	49	48	47	46	45	44	43	42	42			52
54	1 7	1 3	1 1	59	55	52	50	48	47	46	45	44	43	42	41	41			54
56	1 7	1 3	1 1	58	55	52	49	48	47	46	45	44	43	42	41	40			56
58	1 7	1 3	1 1	0	58	55	52	49	47	46	45	44	43	42	41	40	39		58
60	1 7	1 3	1 1	0	58	55	51	48	46	45	44	43	42	41	40	39			60
62	1 7	1 3	1 1	0	58	54	51	48	46	44	43	42	41	40	39	38			62
64	1 7	1 3	1 1	0	58	54	51	48	46	44	43	42	40	39	38				64
66	1 8	1 3	1 1	0	57	54	50	47	45	43	42	41	39	38	37				66
68	1 8	1 3	1 1	0	57	54	50	47	45	43	42	40	39	38					68
70		1 3	1 1	0	57	53	50	47	44	42	41	40	39	38					70
72			1 1	0	57	53	50	46	43	41	40	39	38						72
74					57	52	49	46	43	41	40	39	38						74
76						52	48	45	43	41	39	38							76
78						51	48	45	42	40	39	37							78
80							47	44	42	40	39								80
82							47	44	41	40	38								82
84								44	41	39									84
86								44	41	39									86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°			

TABLE VI.

Third Correction, to Apparent Distance 40°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 16	1 18	1 21	1 25	1 31	1 39	1 47	2 5	2 26	2 48	3 10	3 32	3 54	4 16	4 38	4 59	6
7	1 19	1 16	1 18	1 21	1 24	1 28	1 34	1 48	2 4	2 22	2 40	2 58	3 16	3 34	3 52	4 10	7
8	1 24	1 19	1 16	1 18	1 20	1 22	1 26	1 36	1 50	2 4	2 18	2 33	2 48	3 4	3 20	3 36	8
9	1 31	1 23	1 19	1 16	1 18	1 19	1 21	1 27	1 38	1 49	2 1	2 12	2 25	2 38	2 52	3 5	9
10	1 40	1 29	1 23	1 19	1 16	1 17	1 18	1 21	1 29	1 38	1 48	1 58	2 9	2 20	2 32	2 44	10
11	1 50	1 36	1 28	1 22	1 18	1 15	1 16	1 18	1 23	1 31	1 39	1 48	1 57	2 7	2 17	2 27	11
12	2 1	1 44	1 34	1 26	1 20	1 17	1 15	1 17	1 20	1 26	1 33	1 40	1 48	1 57	2 5	2 13	12
13	2 11	1 52	1 40	1 30	1 23	1 19	1 16	1 16	1 18	1 22	1 28	1 34	1 41	1 48	1 55	2 2	13
14	2 21	2 0	1 46	1 34	1 26	1 21	1 17	1 15	1 17	1 19	1 23	1 28	1 34	1 40	1 46	1 53	14
15	2 31	2 8	1 52	1 39	1 30	1 23	1 19	1 16	1 15	1 17	1 20	1 23	1 27	1 32	1 38	1 44	15
16	2 41	2 16	1 58	1 44	1 34	1 26	1 21	1 17	1 14	1 15	1 17	1 19	1 22	1 26	1 31	1 37	16
17	2 52	2 24	2 4	1 49	1 38	1 30	1 24	1 19	1 15	1 14	1 15	1 17	1 19	1 22	1 26	1 31	17
18	3 3	2 32	2 11	1 54	1 43	1 34	1 28	1 21	1 16	1 13	1 14	1 15	1 17	1 19	1 22	1 26	18
19	3 14	2 41	2 18	2 0	1 48	1 39	1 32	1 23	1 17	1 14	1 13	1 14	1 15	1 17	1 19	1 22	19
20	3 25	2 50	2 25	2 6	1 53	1 43	1 36	1 25	1 19	1 15	1 12	1 12	1 13	1 15	1 16	1 19	20
21	3 36	2 59	2 32	2 12	1 58	1 47	1 39	1 27	1 20	1 16	1 13	1 11	1 12	1 13	1 14	1 14	21
22	3 47	3 8	2 40	2 18	2 4	1 52	1 43	1 30	1 22	1 17	1 13	1 11	1 11	1 12	1 13	1 14	22
23	3 58	3 17	2 48	2 25	2 10	1 57	1 47	1 33	1 24	1 18	1 14	1 12	1 10	1 10	1 11	1 12	23
24	4 9	3 26	2 56	2 32	2 15	2 2	1 51	1 37	1 26	1 19	1 15	1 12	1 9	1 9	1 9	1 10	24
25	4 20	3 35	3 4	2 39	2 21	2 7	1 56	1 40	1 28	1 21	1 16	1 13	1 10	1 8	1 8	1 9	25
26	4 30	3 44	3 12	2 45	2 27	2 12	2 0	1 43	1 30	1 22	1 17	1 13	1 10	1 8	1 8	1 9	26
27	4 41	3 53	3 20	2 52	2 33	2 17	2 4	1 47	1 33	1 24	1 18	1 14	1 11	1 8	1 7	1 8	27
28	4 51	4 2	3 28	2 59	2 39	2 23	2 8	1 50	1 35	1 25	1 19	1 14	1 11	1 8	1 7	1 7	28
29	5 1	4 11	3 36	3 6	2 45	2 28	2 12	1 53	1 38	1 27	1 20	1 15	1 12	1 9	1 7	1 7	29
30	5 12	4 20	3 44	3 13	2 50	2 33	2 17	1 56	1 40	1 29	1 21	1 15	1 12	1 9	1 7	1 6	30
31	5 23	4 29	3 52	3 20	2 56	2 38	2 21	2 0	1 43	1 30	1 22	1 16	1 12	1 9	1 7	1 6	31
32	5 33	4 38	3 59	3 27	3 1	2 43	2 26	2 3	1 45	1 32	1 23	1 17	1 13	1 10	1 7	1 6	32
33	5 43	4 46	4 6	3 33	3 7	2 48	2 30	2 6	1 47	1 34	1 24	1 18	1 14	1 10	1 8	1 6	33
34	5 52	4 54	4 13	3 39	3 13	2 53	2 34	2 9	1 49	1 36	1 26	1 19	1 15	1 11	1 8	1 6	34
35	6 1	5 2	4 20	3 45	3 19	2 58	2 38	2 12	1 51	1 38	1 27	1 20	1 15	1 11	1 8	1 6	35
36	6 10	5 10	4 26	3 51	3 24	3 2	2 42	2 15	1 54	1 40	1 29	1 22	1 16	1 12	1 8	1 6	36
37	6 18	5 17	4 32	3 57	3 29	3 7	2 46	2 18	1 57	1 42	1 31	1 23	1 17	1 12	1 9	1 7	37
38	6 26	5 24	4 38	4 3	3 33	3 11	2 50	2 21	2 0	1 44	1 33	1 25	1 18	1 13	1 9	1 7	38
39	6 34	5 31	4 44	4 8	3 38	3 15	2 54	2 24	2 2	1 46	1 35	1 26	1 19	1 14	1 10	1 7	39
40	6 42	5 38	4 50	4 13	3 42	3 19	2 58	2 27	2 5	1 48	1 37	1 28	1 20	1 14	1 10	1 7	40
41	6 50	5 45	4 56	4 19	3 47	3 24	3 2	2 30	2 8	1 51	1 39	1 29	1 21	1 15	1 11	1 8	41
42	6 58	5 52	5 2	4 24	3 51	3 28	3 6	2 33	2 10	1 53	1 41	1 30	1 22	1 16	1 11	1 8	42
43	7 7	5 59	5 8	4 29	3 56	3 32	3 10	2 36	2 13	1 55	1 43	1 32	1 23	1 17	1 12	1 9	43
44	7 15	6 6	5 14	4 34	4 0	3 36	3 13	2 39	2 15	1 57	1 44	1 33	1 24	1 18	1 13	1 9	44
46	7 33	6 21	5 26	4 44	4 9	3 44	3 20	2 44	2 19	2 1	1 47	1 35	1 27	1 20	1 14	1 10	46
48			5 38	4 54	4 18	3 51	3 27	2 49	2 23	2 5	1 50	1 37	1 29	1 22	1 15	1 11	48
50					4 27	3 58	3 33	2 54	2 27	2 8	1 52	1 39	1 31	1 23	1 17	1 12	50
52							3 39	2 59	2 31	2 11	1 54	1 42	1 32	1 24	1 18	1 13	52
54								3 4	2 35	2 14	1 56	1 44	1 34	1 26	1 19	1 14	54
56									2 39	2 17	1 58	1 46	1 36	1 28	1 20	1 14	56
										2 19	2 0	1 48	1 37	1 29	1 21	1 15	58
											2 2	1 49	1 38	1 30	1 22	1 15	60
												1 50	1 39	1 30	1 22	1 16	62
													1 40	1 31	1 23	1 16	64
														1 31	1 24	1 17	66
															1 24	1 17	68
																1 17	70
																	72
																	74
																	76
																	78
																	80
																	82
																	84
																	86
	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°						

TABLE *P*. EFFECT OF SUN'S PAR.
Add the Numbers above the black lines to 3rd Correction, subtract the others.

☽'s App. Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	0	1	2	4	6					
10	1	0	1	3	4	6				
20	4	3	1	1	2	3	4			
30	6	5	3	2	0	1	2	3		
40	8	7	5	4	2	1	0	1	2	
50		9	7	5	4	2	1	0	0	0
60			9	7	5	4	3	2	2	
70				8	6	5	4	3		
80					7	6	4			
90						6				

TABLE VI.

Third Correction, to Apparent Distance 40°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	5 19	5 39	5 59	6 19	6 57	7 33											6
7	4 27	4 44	5 1	5 18	5 51	6 20											7
8	3 51	4 6	4 20	4 34	5 1	5 26											8
9	3 18	3 32	3 45	3 58	4 22	4 44											9
10	2 56	3 8	3 19	3 30	3 50	4 9	4 27										10
11	2 37	2 47	2 57	3 6	3 25	3 42	3 58										11
12	2 22	2 30	2 39	2 48	3 5	3 20	3 33										12
13	2 10	2 17	2 25	2 32	2 47	3 1	3 13										13
14	2 0	2 6	2 12	2 18	2 32	2 45	2 56	3 4									14
15	1 50	1 56	2 1	2 7	2 19	2 30	2 40	2 48									15
16	1 42	1 47	1 52	1 58	2 8	2 18	2 27	2 35									16
17	1 36	1 40	1 45	1 50	1 59	2 8	2 16	2 23									17
18	1 31	1 34	1 38	1 43	1 51	1 59	2 6	2 12	2 19								18
19	1 26	1 29	1 33	1 36	1 44	1 51	1 58	2 3	2 9								19
20	1 22	1 24	1 27	1 30	1 37	1 44	1 50	1 55	2 0								20
21	1 18	1 20	1 23	1 26	1 32	1 38	1 44	1 49	1 53								21
22	1 15	1 17	1 19	1 22	1 28	1 33	1 38	1 43	1 47	1 50							22
23	1 13	1 14	1 16	1 19	1 24	1 29	1 33	1 38	1 42	1 45							23
24	1 11	1 12	1 14	1 16	1 21	1 25	1 29	1 33	1 37	1 40							24
25	1 10	1 11	1 12	1 14	1 18	1 21	1 25	1 29	1 32	1 35							25
26	1 9	1 10	1 11	1 12	1 15	1 18	1 21	1 25	1 28	1 30	1 31						26
27	1 8	1 9	1 9	1 10	1 13	1 15	1 18	1 21	1 24	1 26	1 27						27
28	1 7	1 8	1 8	1 9	1 11	1 13	1 16	1 18	1 20	1 22	1 23						28
29	1 7	1 7	1 7	1 8	1 9	1 11	1 13	1 15	1 16	1 18	1 19						29
30	1 6	1 6	1 6	1 7	1 8	1 9	1 11	1 12	1 13	1 15	1 16	1 17					30
31	1 6	1 6	1 6	1 7	1 7	1 8	1 9	1 10	1 11	1 13	1 14	1 15					31
32	1 6	1 6	1 6	1 6	1 6	1 6	1 7	1 8	1 9	1 10	1 11	1 12					32
33	1 5	1 5	1 5	1 5	1 5	1 5	1 6	1 6	1 7	1 8	1 9	1 10					33
34	1 5	1 4	1 4	1 4	1 4	1 4	1 5	1 5	1 6	1 7	1 7	1 8	1 8				34
35	1 5	1 4	1 4	1 4	1 4	1 4	1 4	1 4	1 4	1 5	1 5	1 6	1 6				35
36	1 5	1 4	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 4	1 4	1 4	1 4				36
37	1 5	1 4	1 3	1 2	1 2	1 2	1 2	1 1	1 1	1 2	1 2	1 2	1 2				37
38	1 5	1 4	1 2	1 1	1 1	1 1	1 1	1 0	1 0	1 0	1 0	1 1	1 1	1 1			38
39	1 5	1 4	1 2	1 1	1 0	1 0	1 0	59	59	59	59	59	59	59			39
40	1 5	1 4	1 2	1 1	1 0	59	59	58	58	57	57	57	57	57			40
41	1 6	1 4	1 2	1 1	59	58	58	57	57	56	56	56	56	56			41
42	1 6	1 4	1 2	1 0	58	57	57	56	56	55	55	55	55	55	55		42
43	1 6	1 4	1 2	1 0	58	57	56	55	55	54	54	54	54	54	54		43
44	1 6	1 4	1 2	1 0	58	56	55	54	54	53	53	53	53	53	53		44
46	1 7	1 4	1 2	1 0	58	56	54	53	53	52	52	51	51	51	51	51	46
48	1 8	1 5	1 2	1 0	58	55	53	52	52	51	51	50	49	49	49	49	48
50	1 8	1 5	1 2	1 0	57	54	52	51	51	50	49	48	48	48	48	48	50
52	1 9	1 5	1 2	1 0	57	54	52	50	50	49	48	47	46	46	46	46	52
54	1 9	1 5	1 2	1 0	57	54	51	49	49	48	47	46	45	45	45	45	54
56	1 10	1 6	1 3	1 0	56	53	51	49	48	47	46	45	45	44	44		56
58	1 10	1 6	1 3	1 0	56	53	50	48	47	46	45	45	44	43	43		58
60	1 10	1 7	1 4	1 1	56	52	50	48	47	45	44	44	43	42			60
62	1 11	1 7	1 4	1 1	56	52	50	48	46	45	44	43	42	42			62
64	1 11	1 7	1 4	1 1	56	52	49	47	45	44	43	42	41				64
66	1 12	1 7	1 4	1 1	56	52	49	47	45	43	42	42	41				66
68	1 12	1 8	1 4	1 1	56	52	49	47	45	43	42	42					68
70	1 12	1 8	1 4	1 1	55	51	48	46	44	43	42	42					70
72	1 13	1 8	1 4	1 1	55	51	48	46	44	43	42						72
74		1 8	1 4	1 1	55	51	48	46	44	43	42						74
76			1 4	1 1	55	51	48	46	44	42							76
78				1 1	55	51	48	46	43	42							78
80					55	51	48	46	43								80
82					55	51	48	46	43								82
84						51	48	46									84
86						51	48	45									86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	

TABLE VI.

Third Correction, to Apparent Distance 44°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																		☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°			
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 16	1 18	1 21	1 25	1 31	1 37	1 45	2 3	2 23	2 44	3 5	3 25	3 45	4 5	4 25	1 44			6
7	1 20	1 16	1 18	1 20	1 24	1 28	1 33	1 46	2 1	2 17	2 34	2 51	3 8	3 25	3 42	3 59			7
8	1 25	1 19	1 16	1 17	1 19	1 22	1 25	1 35	1 47	2 0	2 14	2 29	2 43	2 58	3 12	3 27			8
9	1 31	1 23	1 18	1 15	1 16	1 18	1 21	1 27	1 36	1 47	1 59	2 12	2 24	2 36	2 48	3 0			9
10	1 39	1 28	1 21	1 17	1 15	1 16	1 18	1 22	1 29	1 38	1 48	1 58	2 8	2 18	2 29	2 39			10
11	1 48	1 34	1 25	1 20	1 17	1 15	1 16	1 19	1 24	1 31	1 39	1 47	1 56	2 5	2 14	2 24			11
12	1 58	1 41	1 30	1 23	1 19	1 16	1 15	1 17	1 20	1 25	1 32	1 38	1 46	1 54	2 2	2 11			12
13	2 8	1 48	1 35	1 27	1 22	1 18	1 16	1 15	1 17	1 21	1 26	1 32	1 38	1 45	1 52	1 59			13
14	2 18	1 56	1 41	1 31	1 25	1 20	1 17	1 14	1 15	1 18	1 22	1 27	1 32	1 37	1 44	1 49			14
15	2 28	2 4	1 47	1 36	1 29	1 23	1 19	1 15	1 14	1 16	1 19	1 23	1 27	1 32	1 37	1 42			15
16	2 38	2 12	1 53	1 41	1 33	1 26	1 21	1 17	1 14	1 15	1 17	1 20	1 23	1 27	1 32	1 36			16
17	2 48	2 20	2 0	1 47	1 37	1 30	1 24	1 19	1 15	1 15	1 16	1 18	1 20	1 23	1 26	1 30			17
18	2 58	2 28	2 8	1 53	1 42	1 34	1 27	1 20	1 16	1 14	1 15	1 16	1 18	1 20	1 22	1 25			18
19	3 8	2 37	2 15	1 59	1 47	1 38	1 30	1 22	1 17	1 14	1 14	1 15	1 16	1 17	1 19	1 22			19
20	3 18	2 45	2 22	2 5	1 52	1 42	1 34	1 25	1 19	1 15	1 13	1 14	1 14	1 15	1 17	1 19			20
21	3 29	2 54	2 30	2 12	1 57	1 46	1 37	1 27	1 21	1 17	1 14	1 12	1 13	1 14	1 15	1 17			21
22	3 39	3 2	2 37	2 18	2 3	1 51	1 41	1 30	1 23	1 18	1 14	1 11	1 12	1 13	1 14	1 16			22
23	3 49	3 11	2 45	2 24	2 8	1 55	1 45	1 33	1 25	1 19	1 15	1 12	1 11	1 12	1 13	1 14			23
24	4 0	3 19	2 52	2 31	2 14	2 0	1 49	1 36	1 27	1 20	1 16	1 12	1 10	1 10	1 11	1 13			24
25	4 10	3 28	2 59	2 37	2 20	2 5	1 53	1 39	1 29	1 21	1 17	1 13	1 10	1 9	1 10	1 11			25
26	4 20	3 36	3 6	2 43	2 25	2 10	1 57	1 42	1 31	1 22	1 17	1 13	1 10	1 8	1 9	1 9			26
27	4 30	3 45	3 13	2 49	2 31	2 15	2 1	1 45	1 32	1 23	1 18	1 14	1 11	1 9	1 8	1 8			27
28	4 39	3 53	3 20	2 55	2 36	2 20	2 5	1 47	1 34	1 25	1 19	1 15	1 12	1 9	1 7	1 7			28
29	4 48	4 1	3 27	3 1	2 41	2 24	2 9	1 49	1 36	1 27	1 20	1 15	1 12	1 9	1 7	1 6			29
30	4 57	4 9	3 34	3 7	2 46	2 29	2 14	1 52	1 38	1 28	1 21	1 16	1 13	1 9	1 7	1 6			30
31	5 7	4 17	3 41	3 13	2 51	2 34	2 19	1 55	1 40	1 30	1 22	1 17	1 13	1 10	1 8	1 6			31
32	5 16	4 25	3 48	3 19	2 56	2 38	2 23	1 58	1 42	1 31	1 23	1 18	1 14	1 10	1 8	1 6			32
33	5 25	4 33	3 54	3 25	3 1	2 43	2 27	2 1	1 44	1 33	1 24	1 19	1 15	1 11	1 9	1 7			33
34	5 34	4 40	4 1	3 30	3 6	2 47	2 31	2 4	1 47	1 35	1 26	1 20	1 15	1 11	1 9	1 7			34
35	5 43	4 48	4 8	3 36	3 11	2 52	2 35	2 7	1 50	1 37	1 27	1 21	1 16	1 12	1 9	1 7			35
36	5 51	4 55	4 14	3 42	3 15	2 56	2 39	2 11	1 53	1 39	1 28	1 22	1 17	1 13	1 10	1 7			36
37	6 0	5 3	4 21	3 47	3 20	3 0	2 43	2 15	1 56	1 41	1 30	1 23	1 17	1 13	1 10	1 8			37
38	6 9	5 10	4 27	3 52	3 24	3 4	2 47	2 18	1 58	1 43	1 32	1 24	1 18	1 14	1 11	1 8			38
39	6 18	5 18	4 33	3 58	3 29	3 8	2 51	2 21	2 1	1 45	1 33	1 25	1 19	1 14	1 11	1 8			39
40	6 27	5 25	4 39	4 3	3 33	3 12	2 54	2 24	2 3	1 46	1 35	1 26	1 20	1 15	1 11	1 8			40
41	6 36	5 32	4 45	4 8	3 38	3 16	2 58	2 27	2 6	1 48	1 37	1 27	1 21	1 16	1 12	1 9			41
42	6 45	5 39	4 51	4 13	3 42	3 20	3 1	2 30	2 8	1 50	1 39	1 29	1 22	1 16	1 12	1 9			42
43	6 53	5 46	4 57	4 18	3 47	3 24	3 4	2 33	2 10	1 52	1 40	1 30	1 23	1 17	1 13	1 9			43
44	7 0	5 53	5 5	4 23	3 51	3 28	3 7	2 35	2 12	1 54	1 42	1 32	1 24	1 18	1 13	1 10			44
46	7 14	6 6	5 14	4 33	4 0	3 35	3 14	2 40	2 17	1 58	1 45	1 35	1 26	1 20	1 14	1 10			46
48	7 27	6 18	5 25	4 43	4 9	3 43	3 21	2 45	2 21	2 2	1 48	1 37	1 28	1 21	1 15	1 11			48
50	7 40	6 29	5 35	4 52	4 18	3 50	3 27	2 50	2 25	2 6	1 52	1 40	1 31	1 23	1 16	1 11			50
52			5 45	5 1	4 26	3 57	3 33	2 55	2 29	2 10	1 56	1 43	1 33	1 25	1 18	1 12			52
54					4 34	4 4	3 39	3 0	2 33	2 14	1 59	1 46	1 35	1 26	1 19	1 13			54
56							3 45	3 5	2 37	2 17	2 2	1 49	1 37	1 27	1 20	1 14			56
								3 10	2 41	2 20	2 4	1 51	1 39	1 29	1 21	1 15			58
									2 44	2 22	2 5	1 52	1 40	1 30	1 22	1 16			60
										2 24	2 6	1 53	1 42	1 31	1 23	1 17			62
											2 7	1 54	1 43	1 32	1 24	1 18			64
												1 55	1 44	1 33	1 25	1 19			66
													1 45	1 34	1 26	1 20			68
														1 35	1 27	1 21			70
															1 29	1 21			72
																1 22			74
																			76
																			78
																			80
																			82
																			84
																			86
	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°								

TABLE P. EFFECT OF SUN'S PAR. Add the Numbers above the black lines to 3rd Correction, subtract the others.

☽'s App. Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	0	1	2	4	5	6				
10	1	0	1	2	4	5				
20	3	3	1	0	2	3	4			
30	5	5	3	2	0	1	2	2		
40	7	7	5	4	2	1	0	0	1	
50	9	8	7	5	4	3	2	1	1	
60			8	7	5	4	3	2	2	
70				8	6	5	4	3		
80					7	6				

TABLE VI.

Third Correction, to Apparent Distance 44°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	5 3	5 22	5 41	5 59	6 36	7 10	7 40										6
7	4 15	4 31	4 47	5 2	5 33	6 1	6 29										7
8	3 40	3 53	4 6	4 20	4 46	5 11	5 35										8
9	3 12	3 24	3 35	3 47	4 10	4 31	4 51										9
10	2 50	3 0	3 10	3 20	3 39	3 58	4 17	4 34									10
11	2 33	2 42	2 52	3 0	3 17	3 33	3 48	4 3									11
12	2 19	2 27	2 36	2 44	2 59	3 13	3 26	3 39									12
13	2 6	2 13	2 21	2 29	2 43	2 56	3 9	3 20									13
14	1 55	2 2	2 9	2 16	2 29	2 41	2 53	3 2	3 10								14
15	1 47	1 53	1 59	2 5	2 17	2 28	2 38	2 47	2 54								15
16	1 40	1 45	1 50	1 56	2 7	2 17	2 26	2 34	2 41								16
17	1 34	1 38	1 43	1 48	1 58	2 7	2 15	2 22	2 29								17
18	1 29	1 33	1 37	1 42	1 51	1 59	2 6	2 12	2 18	2 24							18
19	1 25	1 28	1 32	1 36	1 44	1 52	1 59	2 4	2 9	2 14							19
20	1 22	1 25	1 28	1 31	1 38	1 46	1 52	1 57	2 1	2 6							20
21	1 19	1 22	1 25	1 27	1 33	1 40	1 46	1 51	1 55	1 59							21
22	1 17	1 19	1 22	1 24	1 29	1 35	1 40	1 45	1 49	1 53	1 55						22
23	1 15	1 17	1 19	1 21	1 25	1 30	1 35	1 40	1 44	1 47	1 49						23
24	1 14	1 15	1 16	1 18	1 22	1 26	1 30	1 35	1 39	1 42	1 44						24
25	1 12	1 13	1 14	1 16	1 19	1 22	1 26	1 30	1 34	1 37	1 39						25
26	1 10	1 11	1 12	1 14	1 16	1 19	1 22	1 26	1 30	1 32	1 34	1 35					26
27	1 9	1 10	1 11	1 12	1 14	1 19	1 19	1 23	1 26	1 28	1 30	1 31					27
28	1 8	1 9	1 10	1 11	1 12	1 14	1 17	1 20	1 22	1 24	1 26	1 27					28
29	1 7	1 8	1 8	1 9	1 10	1 12	1 15	1 17	1 19	1 21	1 22	1 23					29
30	1 6	1 7	1 7	1 8	1 9	1 10	1 12	1 14	1 16	1 18	1 19	1 20	1 22				30
31	1 6	1 6	1 6	1 7	1 8	1 8	1 10	1 12	1 14	1 15	1 17	1 18	1 19				31
32	1 5	1 6	1 6	1 6	1 7	1 7	1 8	1 10	1 12	1 13	1 14	1 15	1 16				32
33	1 5	1 5	1 5	1 5	1 6	1 6	1 7	1 8	1 9	1 10	1 11	1 12	1 13				33
34	1 5	1 4	1 4	1 4	1 5	1 5	1 6	1 6	1 7	1 8	1 9	1 10	1 11	1 12			34
35	1 5	1 4	1 4	1 4	1 4	1 4	1 5	1 5	1 5	1 6	1 7	1 8	1 9	1 10			35
36	1 5	1 4	1 3	1 3	1 3	1 3	1 4	1 4	1 4	1 5	1 5	1 6	1 7	1 8			36
37	1 6	1 4	1 3	1 2	1 2	1 2	1 3	1 3	1 3	1 4	1 4	1 5	1 5	1 6			37
38	1 6	1 4	1 2	1 1	1 1	1 1	1 2	1 2	1 2	1 3	1 3	1 4	1 4	1 4	1 5		38
39	1 6	1 4	1 2	1 1	1 0	1 0	1 1	1 1	1 1	1 2	1 2	1 3	1 3	1 3	1 4		39
40	1 6	1 4	1 2	1 1	1 0	1 0	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 2		40
41	1 7	1 5	1 3	1 1	1 0	1 0	1 0	1 0	1 0	1 0	1 0	1 0	1 0	1 0	1 0		41
42	1 7	1 5	1 3	1 1	59	59	59	59	59	59	59	59	59	59	59	59	42
43	1 7	1 5	1 3	1 1	59	59	58	58	58	58	58	58	58	58	58	58	43
44	1 7	1 5	1 3	1 1	59	58	57	57	57	57	57	57	57	57	57	57	44
46	1 7	1 5	1 3	1 1	59	57	56	56	56	56	55	55	55	55	55	55	46
48	1 8	1 6	1 4	1 2	59	57	55	55	55	54	54	54	53	53	53	53	48
50	1 8	1 6	1 4	1 2	59	57	55	54	54	53	53	53	52	52	52	52	50
52	1 9	1 6	1 4	1 2	59	56	54	53	53	52	52	51	51	51	50		52
54	1 10	1 7	1 4	1 2	59	56	54	53	52	51	51	50	50	49	49		54
56	1 10	1 7	1 5	1 2	59	56	54	52	51	50	50	49	49	48			56
58	1 11	1 8	1 5	1 3	59	56	53	51	50	49	49	48	48	47			58
60	1 11	1 8	1 5	1 3	59	56	53	51	50	49	48	47	47				60
62	1 12	1 9	1 6	1 3	59	56	53	51	49	48	47	47	46				62
64	1 13	1 9	1 6	1 3	59	56	53	51	49	48	47	46					64
66	1 14	1 10	1 7	1 4	59	56	53	51	49	48	47	46					66
68	1 15	1 11	1 7	1 4	59	56	53	51	49	47	46						68
70	1 16	1 11	1 7	1 4	59	55	53	51	49	47	46						70
72	1 16	1 12	1 8	1 4	59	55	52	50	48	46							72
74	1 16	1 12	1 8	1 4	59	55	52	50	48	46							74
76	1 17	1 12	1 8	1 5	59	55	52	49	47								76
78		1 12	1 8	1 5	59	55	52	49	47								78
80			1 8	1 5	59	55	52	49									80
82				1 5	59	55	52	49									82
84					59	55	52										84
86					59	55	52										86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	

TABLE VI.

Third Correction, to Apparent Distance 48°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																				☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°					
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″					°
6	1 16	1 17	1 19	1 23	1 29	1 36	1 43	2 1	2 20	2 39	2 58	3 16	3 35	3 54	4 13	4 32					6
7	1 19	1 16	1 17	1 19	1 23	1 28	1 33	1 46	2 0	2 16	2 32	2 47	3 2	3 18	3 34	3 50					7
8	1 24	1 19	1 16	1 17	1 19	1 22	1 26	1 35	1 47	1 59	2 12	2 25	2 39	2 52	3 7	3 21					8
9	1 30	1 23	1 18	1 16	1 17	1 19	1 21	1 28	1 37	1 47	1 58	2 9	2 20	2 32	2 44	2 55					9
10	1 37	1 27	1 21	1 18	1 16	1 17	1 18	1 23	1 30	1 38	1 47	1 56	2 6	2 16	2 26	2 36					10
11	1 45	1 33	1 25	1 21	1 18	1 16	1 17	1 20	1 25	1 32	1 39	1 47	1 55	2 4	2 13	2 22					11
12	1 53	1 39	1 30	1 24	1 21	1 18	1 16	1 19	1 22	1 27	1 33	1 40	1 47	1 54	2 2	2 10					12
13	2 2	1 46	1 36	1 28	1 24	1 20	1 18	1 17	1 19	1 23	1 28	1 34	1 40	1 46	1 53	2 0					13
14	2 11	1 54	1 42	1 33	1 27	1 23	1 20	1 16	1 17	1 20	1 24	1 29	1 34	1 39	1 45	1 51					14
15	2 20	2 1	1 48	1 37	1 30	1 26	1 22	1 17	1 16	1 18	1 21	1 24	1 29	1 33	1 38	1 43					15
16	2 30	2 9	1 54	1 42	1 34	1 29	1 24	1 18	1 16	1 17	1 18	1 20	1 24	1 28	1 32	1 37					16
17	2 40	2 17	2 0	1 47	1 38	1 32	1 27	1 20	1 17	1 16	1 17	1 18	1 21	1 25	1 28	1 32					17
18	2 50	2 25	2 7	1 52	1 42	1 35	1 30	1 22	1 18	1 15	1 16	1 17	1 19	1 22	1 25	1 28					18
19	3 0	2 32	2 14	1 58	1 46	1 39	1 33	1 24	1 19	1 16	1 15	1 16	1 17	1 19	1 22	1 24					19
20	3 9	2 40	2 20	2 3	1 51	1 43	1 36	1 27	1 21	1 17	1 14	1 15	1 16	1 17	1 19	1 21					20
21	3 18	2 48	2 26	2 9	1 56	1 47	1 40	1 30	1 23	1 18	1 15	1 14	1 15	1 16	1 17	1 19					21
22	3 27	2 56	2 33	2 15	2 2	1 52	1 43	1 32	1 24	1 19	1 16	1 13	1 14	1 15	1 16	1 18					22
23	3 37	3 3	2 40	2 21	2 7	1 56	1 46	1 35	1 26	1 20	1 16	1 14	1 13	1 14	1 15	1 16					23
24	3 46	3 11	2 47	2 26	2 12	2 0	1 50	1 37	1 27	1 21	1 17	1 14	1 12	1 13	1 13	1 14					24
25	3 56	3 19	2 54	2 32	2 17	2 5	1 54	1 40	1 29	1 22	1 18	1 15	1 13	1 12	1 12	1 13					25
26	4 5	3 27	3 1	2 38	2 22	2 9	1 58	1 42	1 31	1 24	1 19	1 16	1 13	1 11	1 11	1 12					26
27	4 15	3 34	3 8	2 44	2 27	2 14	2 2	1 44	1 33	1 25	1 20	1 16	1 13	1 11	1 10	1 11					27
28	4 24	3 42	3 15	2 50	2 32	2 18	2 6	1 47	1 35	1 27	1 21	1 17	1 14	1 12	1 10	1 10					28
29	4 33	3 50	3 21	2 56	2 37	2 23	2 10	1 50	1 37	1 28	1 22	1 18	1 15	1 12	1 10	1 9					29
30	4 42	3 58	3 28	3 2	2 42	2 27	2 13	1 53	1 40	1 30	1 23	1 19	1 15	1 12	1 10	1 9					30
31	4 51	4 6	3 35	3 8	2 47	2 31	2 17	1 57	1 42	1 32	1 25	1 20	1 16	1 13	1 11	1 9					31
32	5 0	4 13	3 42	3 14	2 52	2 35	2 20	2 0	1 44	1 33	1 26	1 21	1 16	1 13	1 11	1 9					32
33	5 9	4 21	3 49	3 20	2 57	2 39	2 23	2 3	1 46	1 35	1 27	1 22	1 17	1 14	1 12	1 10					33
34	5 18	4 28	3 55	3 25	3 2	2 44	2 27	2 6	1 49	1 37	1 28	1 23	1 18	1 14	1 12	1 10					34
35	5 27	4 36	4 1	3 31	3 7	2 48	2 31	2 9	1 52	1 39	1 30	1 24	1 19	1 15	1 12	1 10					35
36	5 35	4 43	4 8	3 37	3 12	2 52	2 35	2 12	1 54	1 41	1 31	1 25	1 19	1 15	1 12	1 10					36
37	5 44	4 50	4 14	3 42	3 17	2 57	2 39	2 16	1 56	1 43	1 33	1 26	1 20	1 16	1 13	1 11					37
38	5 52	4 57	4 20	3 47	3 22	3 1	2 43	2 19	1 59	1 45	1 34	1 27	1 21	1 17	1 14	1 11					38
39	6 0	5 4	4 26	3 53	3 26	3 5	2 47	2 22	2 2	1 47	1 35	1 28	1 22	1 17	1 14	1 12					39
40	6 8	5 11	4 32	3 58	3 30	3 10	2 51	2 25	2 5	1 49	1 37	1 29	1 23	1 18	1 15	1 11					40
41	6 16	5 18	4 38	4 3	3 35	3 14	2 55	2 28	2 7	1 51	1 39	1 31	1 24	1 19	1 16	1 13					41
42	6 24	5 24	4 44	4 8	3 40	3 18	2 58	2 31	2 10	1 53	1 41	1 33	1 26	1 20	1 16	1 13					42
43	6 32	5 31	4 50	4 13	3 44	3 22	3 2	2 33	2 12	1 55	1 43	1 34	1 27	1 21	1 17	1 14					43
44	6 39	5 37	4 55	4 18	3 48	3 26	3 5	2 36	2 14	1 57	1 45	1 36	1 28	1 22	1 18	1 15					44
46	6 53	5 49	5 5	4 28	3 56	3 34	3 12	2 41	2 18	2 1	1 48	1 38	1 30	1 23	1 18	1 15					46
48	7 7	6 1	5 15	4 37	4 4	3 41	3 18	2 46	2 22	2 5	1 51	1 40	1 31	1 24	1 19	1 16					48
50	7 21	6 13	5 25	4 46	4 12	3 47	3 24	2 51	2 26	2 8	1 53	1 42	1 33	1 25	1 20	1 16					50
52	7 34	6 24	5 34	4 54	4 20	3 53	3 30	2 56	2 30	2 12	1 56	1 44	1 35	1 27	1 22	1 17					52
54	7 47	6 35	5 43	5 1	4 27	3 59	3 36	3 1	2 34	2 15	1 59	1 46	1 37	1 29	1 23	1 19					54
56			5 51	5 8	4 34	4 5	3 41	3 6	2 38	2 18	2 2	1 49	1 39	1 31	1 25	1 20					56
					4 40	4 11	3 46	3 10	2 42	2 21	2 4	1 51	1 41	1 32	1 26	1 21					58
							3 50	3 13	2 45	2 23	2 6	1 53	1 42	1 33	1 27	1 21					60
								3 15	2 47	2 25	2 8	1 54	1 43	1 34	1 28	1 22					62
									2 49	2 27	2 10	1 56	1 45	1 35	1 28	1 22					64
										2 29	2 11	1 57	1 46	1 36	1 29	1 23					66
											2 12	1 58	1 47	1 37	1 30	1 24					68
												1 59	1 48	1 38	1 30	1 24					70
													1 49	1 39	1 31	1 24					72
														1 40	1 32	1 25					74
															1 33	1 25					76
																1 26					78
																					80
																					82
																					84
																					86
						11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°					

TABLE P. EFFECT OF SUN'S PAR.
Add the Numbers above the black lines to 3rd Correction, subtract the others.

☽'s App. Alt.	Sun's Apparent Altitude.								
	5	10	20	30	40	50	60	70	80	90
5	0	1	2	3	4	5				
10	1	1	1	2	3	4	5			
20	3	3	1	0	1	2	3	3		
30	5	5	3	2	1	0	1	2		
40	7	6	5	4	3	2	1	0	0	0
50	9	8	6	5	4	3	2	2	1	
60		9	8	6	5	4	3	3		
70			9	7	6	5	4			
80				8	7	6				
90					7					

TABLE VI.

Third Correction, to Apparent Distance 48°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	4 51	5 10	5 28	5 46	6 18	6 49	7 19	7 47									6
7	4 6	4 21	4 36	4 51	5 19	5 45	6 11	6 35									7
8	3 34	3 48	4 1	4 14	4 38	5 1	5 22	5 42									8
9	3 7	3 19	3 30	3 41	4 3	4 24	4 43	5 0									9
10	2 47	2 57	3 7	3 17	3 36	3 54	4 11	4 26	4 40								10
11	2 31	2 40	2 49	2 57	3 14	3 30	3 44	3 57	4 10								11
12	2 17	2 25	2 33	2 40	2 55	3 9	3 22	3 34	3 45								12
13	2 6	2 33	2 20	2 27	2 40	2 52	3 4	3 15	3 25								13
14	1 57	2 4	2 10	2 16	2 27	2 38	2 49	2 59	3 8	3 15							14
15	1 49	1 55	2 1	2 6	2 16	2 26	2 35	2 44	2 53	3 0							15
16	1 42	1 47	1 52	1 57	2 7	2 15	2 23	2 32	2 40	2 46							16
17	1 36	1 41	1 45	1 50	1 59	2 6	2 14	2 22	2 29	2 34							17
18	1 31	1 35	1 39	1 43	1 51	1 59	2 4	2 13	2 19	2 24	2 29						18
19	1 27	1 31	1 34	1 38	1 45	1 52	1 58	2 4	2 10	2 15	2 19						19
20	1 24	1 27	1 30	1 33	1 39	1 45	1 51	1 57	2 2	2 7	2 11						20
21	1 22	1 24	1 27	1 29	1 34	1 40	1 45	1 51	1 56	2 0	2 4						21
22	1 20	1 22	1 24	1 26	1 30	1 35	1 40	1 45	1 50	1 54	1 57	1 59					22
23	1 18	1 19	1 21	1 23	1 27	1 31	1 36	1 40	1 45	1 49	1 51	1 53					23
24	1 16	1 17	1 19	1 21	1 25	1 28	1 32	1 36	1 40	1 44	1 46	1 48					24
25	1 14	1 15	1 16	1 18	1 22	1 25	1 29	1 32	1 36	1 39	1 41	1 43					25
26	1 12	1 13	1 14	1 16	1 19	1 23	1 26	1 29	1 32	1 34	1 36	1 38	1 40				26
27	1 11	1 12	1 13	1 14	1 17	1 20	1 23	1 26	1 28	1 30	1 32	1 34	1 36				27
28	1 10	1 11	1 12	1 13	1 15	1 18	1 20	1 23	1 25	1 27	1 27	1 30	1 32				28
29	1 9	1 10	1 11	1 12	1 14	1 16	1 18	1 20	1 22	1 24	1 25	1 27	1 28				29
30	1 9	1 10	1 10	1 11	1 12	1 14	1 16	1 18	1 19	1 21	1 22	1 24	1 25	1 26			30
31	1 9	1 9	1 9	1 10	1 11	1 12	1 14	1 16	1 17	1 19	1 20	1 21	1 22	1 23			31
32	1 8	1 8	1 8	1 9	1 10	1 11	1 13	1 14	1 15	1 17	1 18	1 19	1 19	1 20			32
33	1 8	1 7	1 7	1 8	1 9	1 10	1 11	1 12	1 13	1 15	1 16	1 17	1 17	1 17			33
34	1 8	1 6	1 6	1 7	1 8	1 9	1 10	1 11	1 12	1 13	1 14	1 14	1 15	1 15	1 16		34
35	1 8	1 6	1 5	1 6	1 7	1 8	1 9	1 9	1 10	1 11	1 12	1 12	1 13	1 13	1 14		35
36	1 8	1 6	1 5	1 5	1 6	1 7	1 8	1 9	1 10	1 10	1 11	1 11	1 11	1 12			36
37	1 9	1 7	1 5	1 4	1 4	1 5	1 6	1 6	1 7	1 7	1 8	1 8	1 9	1 9	1 10		37
38	1 9	1 7	1 5	1 3	1 3	1 4	1 5	1 5	1 6	1 6	1 7	1 7	1 8	1 8	1 8	1 9	38
39	1 9	1 7	1 5	1 3	1 3	1 3	1 4	1 4	1 5	1 5	1 6	1 6	1 6	1 7	1 7	1 7	39
40	1 9	1 7	1 5	1 3	1 2	1 2	1 3	1 3	1 4	1 4	1 5	1 5	1 5	1 6	1 6	1 6	40
41	1 10	1 8	1 5	1 3	1 1	1 1	1 2	1 2	1 3	1 3	1 4	1 4	1 4	1 5	1 5	1 5	41
42	1 10	1 8	1 5	1 3	1 1	1 1	1 1	1 2	1 2	1 2	1 3	1 3	1 3	1 4	1 4	1 4	42
43	1 11	1 8	1 6	1 4	1 1	1 0	1 0	1 1	1 1	1 1	1 2	1 2	1 2	1 3	1 3	1 3	43
44	1 12	1 9	1 6	1 4	1 1	1 0	1 0	1 0	1 0	1 1	1 1	1 1	1 1	1 1	1 1	1 1	44
46	1 12	1 9	1 6	1 4	1 1	59	59	59	59	59	59	59	59	59	59	59	46
48	1 13	1 10	1 7	1 4	1 1	59	58	58	58	58	57	57	57	57	57		48
50	1 13	1 10	1 7	1 5	1 1	59	57	57	57	57	56	56	56	56	56		50
52	1 14	1 11	1 8	1 5	1 1	59	57	56	56	56	55	55	54	54			52
54	1 15	1 11	1 8	1 6	1 2	59	57	56	55	55	54	54	53	53			54
56	1 15	1 11	1 8	1 6	1 2	59	57	55	54	54	53	53	52				56
58	1 16	1 12	1 9	1 6	1 2	59	57	55	54	53	52	52	51				58
60	1 16	1 12	1 9	1 6	1 2	59	57	55	53	52	52	51					60
62	1 17	1 13	1 10	1 7	1 2	59	57	55	53	52	51	51					62
64	1 17	1 13	1 10	1 7	1 2	59	57	55	53	52	51						64
66	1 18	1 14	1 10	1 7	1 3	59	57	54	52	51	50						66
68	1 18	1 14	1 10	1 7	1 3	59	56	54	52	51							68
70	1 19	1 15	1 11	1 8	1 3	59	56	54	52	51							70
72	1 19	1 15	1 11	1 8	1 3	59	56	54	52								72
74	1 20	1 15	1 11	1 8	1 3	59	56	53	51								74
76	1 20	1 16	1 12	1 8	1 3	59	56	53									76
78	1 21	1 16	1 12	1 9	1 4	59	56	53									78
80	1 21	1 16	1 12	1 9	1 4	59	56										80
82		1 16	1 12	1 9	1 4	59	56										82
84			1 12	1 9	1 4	59											84
86				1 9	1 4	59											86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	

TABLE VI.

Third Correction, to Apparent Distance 52°.

D's App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																D's App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 18	1 19	1 21	1 24	1 30	1 37	1 44	2 0	2 17	2 34	2 51	3 10	3 28	3 47	4 6	4 24	6
7	1 21	1 18	1 19	1 21	1 24	1 29	1 34	1 46	2 0	2 14	2 28	2 42	2 57	3 12	3 27	3 43	7
8	1 25	1 21	1 18	1 19	1 21	1 24	1 27	1 36	1 47	1 58	2 11	2 23	2 36	2 50	3 3	3 16	8
9	1 30	1 24	1 20	1 18	1 19	1 21	1 23	1 29	1 37	1 47	1 57	2 8	2 19	2 31	2 42	2 53	9
10	1 37	1 28	1 23	1 20	1 18	1 19	1 21	1 25	1 30	1 38	1 46	1 56	2 6	2 16	2 26	2 36	10
11	1 45	1 34	1 28	1 23	1 20	1 18	1 19	1 22	1 26	1 32	1 39	1 47	1 56	2 4	2 13	2 22	11
12	1 54	1 41	1 33	1 27	1 22	1 20	1 18	1 20	1 23	1 27	1 33	1 40	1 47	1 54	2 2	2 10	12
13	2 2	1 48	1 38	1 31	1 25	1 22	1 19	1 19	1 21	1 24	1 29	1 35	1 41	1 47	1 54	2 1	13
14	2 11	1 55	1 44	1 35	1 28	1 24	1 21	1 18	1 19	1 22	1 26	1 30	1 35	1 41	1 47	1 52	14
15	2 19	2 2	1 50	1 39	1 32	1 27	1 23	1 19	1 18	1 20	1 23	1 26	1 30	1 35	1 40	1 44	15
16	2 28	2 9	1 55	1 44	1 35	1 30	1 25	1 20	1 17	1 18	1 20	1 23	1 26	1 30	1 34	1 38	16
17	2 37	2 16	2 0	1 48	1 39	1 33	1 27	1 21	1 18	1 17	1 18	1 20	1 23	1 26	1 30	1 33	17
18	2 46	2 23	2 6	1 53	1 43	1 36	1 30	1 23	1 19	1 16	1 17	1 18	1 20	1 23	1 26	1 29	18
19	2 56	2 30	2 12	1 59	1 48	1 40	1 33	1 25	1 20	1 17	1 16	1 17	1 18	1 20	1 23	1 26	19
20	3 5	2 37	2 18	2 4	1 52	1 44	1 37	1 27	1 22	1 18	1 15	1 16	1 17	1 18	1 20	1 23	20
21	3 14	2 44	2 24	2 9	1 57	1 48	1 40	1 29	1 23	1 19	1 16	1 16	1 16	1 17	1 18	1 20	21
22	3 23	2 52	2 31	2 15	2 1	1 52	1 44	1 32	1 25	1 20	1 16	1 15	1 15	1 16	1 17	1 18	22
23	3 32	2 59	2 38	2 20	2 6	1 56	1 47	1 34	1 26	1 21	1 17	1 15	1 14	1 15	1 16	1 17	23
24	3 41	3 7	2 44	2 26	2 11	2 0	1 51	1 37	1 28	1 22	1 18	1 15	1 14	1 14	1 15	1 16	24
25	3 50	3 14	2 51	2 31	2 16	2 4	1 54	1 40	1 30	1 23	1 19	1 16	1 14	1 13	1 14	1 15	25
26	3 59	3 22	2 58	2 37	2 21	2 8	1 58	1 42	1 32	1 25	1 20	1 16	1 14	1 13	1 13	1 14	26
27	4 8	3 30	3 5	2 42	2 26	2 12	2 2	1 45	1 33	1 26	1 21	1 17	1 15	1 14	1 13	1 13	27
28	4 17	3 38	3 12	2 48	2 31	2 16	2 6	1 48	1 35	1 28	1 22	1 18	1 15	1 14	1 13	1 13	28
29	4 26	3 45	3 19	2 53	2 36	2 21	2 10	1 51	1 37	1 29	1 23	1 19	1 16	1 14	1 13	1 12	29
30	4 34	3 53	3 25	2 59	2 41	2 25	2 13	1 54	1 39	1 31	1 24	1 19	1 16	1 14	1 13	1 12	30
31	4 43	4 0	3 32	3 5	2 45	2 29	2 17	1 57	1 41	1 32	1 25	1 20	1 17	1 15	1 13	1 12	31
32	4 52	4 8	3 38	3 10	2 50	2 34	2 20	1 59	1 43	1 34	1 27	1 21	1 17	1 15	1 13	1 12	32
33	5 0	4 15	2 44	3 16	2 55	2 38	2 24	2 2	1 45	1 36	1 29	1 23	1 18	1 15	1 13	1 12	33
34	5 9	4 22	3 50	3 21	2 59	2 42	2 27	2 5	1 48	1 38	1 30	1 24	1 19	1 16	1 14	1 12	34
35	5 17	4 29	3 56	3 27	3 4	2 46	2 31	2 7	1 51	1 40	1 32	1 25	1 20	1 17	1 14	1 12	35
36	5 26	4 36	4 2	3 32	3 9	2 50	2 34	2 10	1 53	1 42	1 33	1 26	1 21	1 17	1 14	1 12	36
37	5 34	4 42	4 8	3 37	3 14	2 54	2 38	2 13	1 56	1 44	1 34	1 27	1 22	1 18	1 15	1 13	37
38	5 42	4 49	4 13	3 42	3 18	2 58	2 42	2 16	1 58	1 46	1 36	1 28	1 22	1 18	1 15	1 13	38
39	5 50	4 56	4 19	3 47	3 23	3 2	2 46	2 19	2 1	1 48	1 38	1 30	1 23	1 18	1 15	1 13	39
40	5 58	5 3	4 24	3 52	3 27	3 6	2 49	2 22	2 3	1 50	1 39	1 31	1 25	1 19	1 16	1 14	40
41	6 6	5 9	4 30	3 57	3 32	3 10	2 53	2 25	2 6	1 52	1 41	1 32	1 26	1 20	1 16	1 14	41
42	6 14	5 15	4 35	4 2	3 36	3 14	2 56	2 28	2 8	1 54	1 42	1 34	1 27	1 21	1 17	1 15	42
43	6 21	5 21	4 41	4 7	3 40	3 18	3 0	2 31	2 11	1 56	1 44	1 35	1 28	1 22	1 18	1 15	43
44	6 28	5 27	4 46	4 12	3 44	3 22	3 3	2 34	2 13	1 58	1 45	1 37	1 29	1 23	1 19	1 16	44
46	6 42	5 39	4 56	4 21	3 52	3 29	3 10	2 39	2 18	2 1	1 48	1 39	1 31	1 24	1 20	1 17	46
48	6 55	5 51	5 6	4 30	3 59	3 36	3 16	2 44	2 22	2 5	1 51	1 41	1 33	1 26	1 21	1 18	48
50	7 8	6 2	5 16	4 38	4 7	3 43	3 23	2 49	2 26	2 8	1 54	1 43	1 35	1 27	1 22	1 19	50
52	7 21	6 13	5 25	4 46	4 15	3 50	3 29	2 54	2 30	2 11	1 57	1 45	1 36	1 29	1 24	1 20	52
54	7 33	6 23	5 34	4 53	4 22	3 56	3 35	2 59	2 34	2 14	2 0	1 48	1 38	1 31	1 25	1 21	54
56	7 44	6 33	5 43	4 59	4 29	4 2	3 40	3 4	2 38	2 17	2 2	1 50	1 40	1 32	1 26	1 22	56
58	7 53	6 42	5 50	5 6	4 35	4 7	3 45	3 8	2 42	2 20	2 5	1 53	1 42	1 33	1 27	1 23	58
60			5 56	5 12	4 40	4 12	3 50	3 12	2 46	2 23	2 7	1 55	1 44	1 35	1 29	1 24	60
62					4 45	4 16	3 54	3 15	2 49	2 26	2 9	1 57	1 46	1 36	1 30	1 25	62
64							3 58	3 18	2 51	2 28	2 11	1 59	1 48	1 37	1 31	1 26	64
66								3 20	2 53	2 30	2 13	2 0	1 49	1 39	1 32	1 26	66
68									2 54	2 32	2 15	2 1	1 50	1 40	1 33	1 27	68
70										2 33	2 16	2 2	1 51	1 41	1 34	1 28	70
72											2 17	2 3	1 52	1 42	1 34	1 28	72
74												2 4	1 53	1 43	1 35	1 29	74
76													1 54	1 44	1 36	1 29	76
78														1 44	1 36	1 30	78
80															1 37	1 30	80
82																1 30	82
84																	84
86																	86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

Third Correction, to Apparent Distance 52°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	4 43	5 1	5 18	5 34	6 6	6 36	7 4	7 29	7 53								6
7	3 59	4 14	4 29	4 43	5 9	5 34	5 58	6 20	6 42								7
8	3 30	3 43	3 55	4 8	4 30	4 52	5 13	5 32	5 50								8
9	3 4	3 15	3 26	3 37	3 58	4 17	4 36	4 51	5 5								9
10	2 45	2 54	3 4	3 14	3 32	3 48	4 4	4 20	4 33	4 45							10
11	2 30	2 38	2 47	2 55	3 11	3 26	3 40	3 54	4 6	4 16							11
12	2 17	2 25	2 32	2 40	2 54	3 7	3 20	3 32	3 43	3 52							12
13	2 7	2 13	2 20	2 26	2 39	2 51	3 3	3 14	3 24	3 32							13
14	1 58	2 3	2 9	2 14	2 26	2 37	2 48	2 58	3 7	3 14	3 20						14
15	1 49	1 54	1 59	2 4	2 15	2 26	2 35	2 44	2 52	2 59	3 5						15
16	1 42	1 47	1 51	1 56	2 7	2 16	2 24	2 32	2 40	2 46	2 52						16
17	1 37	1 41	1 45	1 50	2 0	2 8	2 15	2 22	2 29	2 35	2 40						17
18	1 32	1 36	1 40	1 45	1 53	2 0	2 7	2 13	2 19	2 25	2 30	2 33					18
19	1 29	1 32	1 36	1 40	1 47	1 53	2 0	2 6	2 11	2 16	2 21	2 24					19
20	1 26	1 29	1 32	1 35	1 41	1 47	1 53	1 59	2 4	2 9	2 13	2 16					20
21	1 23	1 26	1 28	1 31	1 37	1 42	1 47	1 53	1 58	2 2	2 6	2 9					21
22	1 21	1 23	1 25	1 28	1 33	1 37	1 42	1 47	1 52	1 56	1 59	2 2	2 4				22
23	1 19	1 21	1 23	1 25	1 29	1 33	1 38	1 42	1 47	1 51	1 54	1 56	1 58				23
24	1 17	1 19	1 21	1 23	1 26	1 30	1 34	1 38	1 42	1 46	1 49	1 51	1 53				24
25	1 16	1 17	1 19	1 20	1 23	1 27	1 30	1 34	1 37	1 41	1 44	1 46	1 48				25
26	1 15	1 16	1 17	1 18	1 21	1 24	1 27	1 30	1 33	1 36	1 39	1 41	1 43	1 44			26
27	1 14	1 15	1 16	1 17	1 19	1 22	1 24	1 27	1 30	1 32	1 35	1 37	1 39	1 40			27
28	1 13	1 14	1 15	1 16	1 17	1 20	1 22	1 24	1 27	1 29	1 31	1 33	1 35	1 36			28
29	1 12	1 13	1 14	1 15	1 16	1 18	1 20	1 22	1 24	1 26	1 28	1 30	1 31	1 32			29
30	1 12	1 12	1 13	1 13	1 14	1 16	1 18	1 20	1 22	1 24	1 25	1 27	1 28	1 29	1 30		30
31	1 11	1 11	1 12	1 12	1 13	1 15	1 16	1 18	1 20	1 22	1 23	1 24	1 25	1 26	1 27		31
32	1 11	1 11	1 11	1 11	1 12	1 14	1 15	1 16	1 18	1 20	1 21	1 22	1 23	1 23	1 24		32
33	1 11	1 10	1 10	1 10	1 11	1 13	1 14	1 15	1 17	1 18	1 19	1 20	1 21	1 21	1 22		33
34	1 11	1 10	1 10	1 10	1 11	1 12	1 13	1 14	1 16	1 17	1 17	1 18	1 19	1 19	1 20	1 20	34
35	1 11	1 10	1 10	1 10	1 10	1 11	1 12	1 13	1 14	1 15	1 15	1 16	1 17	1 17	1 18	1 18	35
36	1 11	1 10	1 9	1 9	1 9	1 10	1 11	1 11	1 12	1 13	1 13	1 14	1 15	1 15	1 16	1 16	36
37	1 11	1 10	1 9	1 9	1 9	1 9	1 10	1 10	1 11	1 11	1 12	1 12	1 13	1 13	1 14	1 14	37
38	1 11	1 10	1 9	1 8	1 8	1 9	1 9	1 9	1 10	1 10	1 11	1 11	1 11	1 11	1 12	1 12	38
39	1 11	1 10	1 9	1 8	1 8	1 8	1 8	1 9	1 9	1 10	1 10	1 10	1 10	1 10	1 10	1 10	39
40	1 12	1 10	1 9	1 8	1 7	1 7	1 7	1 7	1 8	1 8	1 9	1 9	1 9	1 9	1 9	1 9	40
41	1 12	1 11	1 9	1 8	1 7	1 7	1 7	1 7	1 7	1 7	1 8	1 8	1 8	1 8	1 8	1 8	41
42	1 13	1 11	1 9	1 8	1 6	1 6	1 6	1 6	1 6	1 6	1 7	1 7	1 7	1 7	1 7	1 7	42
43	1 13	1 11	1 9	1 8	1 6	1 6	1 6	1 6	1 6	1 6	1 6	1 6	1 6	1 6	1 6		43
44	1 14	1 11	1 9	1 8	1 6	1 5	1 5	1 5	1 5	1 5	1 5	1 5	1 5	1 5			44
46	1 14	1 12	1 10	1 9	1 6	1 4	1 4	1 4	1 4	1 4	1 4	1 3	1 3	1 3	1 3		46
48	1 15	1 13	1 11	1 9	1 6	1 4	1 3	1 3	1 3	1 2	1 2	1 1	1 1	1 1			48
50	1 16	1 14	1 11	1 9	1 6	1 4	1 2	1 2	1 2	1 1	1 0	1 0	1 0	1 0			50
52	1 17	1 15	1 12	1 9	1 6	1 4	1 2	1 1	1 1	1 0	1 0	59	58				52
54	1 18	1 15	1 12	1 9	1 6	1 4	1 2	1 1	1 0	59	59	58	57				54
56	1 18	1 15	1 12	1 10	1 6	1 4	1 2	1 0	59	58	58	57					56
58	1 19	1 16	1 13	1 10	1 6	1 4	1 2	1 0	59	58	57	56					58
60	1 20	1 16	1 13	1 10	1 7	1 4	1 2	1 0	58	57	56						60
62	1 21	1 17	1 13	1 10	1 7	1 4	1 1	59	58	56	55						62
64	1 22	1 18	1 14	1 11	1 7	1 4	1 1	59	57	56							64
66	1 22	1 18	1 14	1 11	1 7	1 4	1 1	59	57	55							66
68	1 22	1 18	1 14	1 11	1 7	1 3	1 0	58	56								68
70	1 23	1 18	1 14	1 11	1 7	1 3	1 0	58	56								70
72	1 23	1 19	1 15	1 11	1 7	1 3	1 0	57									72
74	1 24	1 19	1 15	1 11	1 7	1 3	1 0	57									74
76	1 24	1 19	1 15	1 12	1 7	1 3	1 0										76
78	1 24	1 19	1 15	1 12	1 7	1 3	1 0										78
80	1 24	1 19	1 15	1 12	1 7	1 3											80
82	1 25	1 20	1 16	1 12	1 7	1 3											82
84	1 25	1 20	1 16	1 12	1 7												84
86		1 21	1 16	1 12	1 7												86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°						

TABLE *P*. EFFECT OF SUN'S PAR. Add the Numbers above the black lines to 3rd Correction, subtract the others.

☽'s App. Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	0	1	2	3	4	4				
10	1	1	1	2	3	3	4			
20	3	3	1	0	1	2	2	3		
30	5	4	3	2	1	0	0	1		
40	7	6	5	4	3	2	1	1	0	0
50	8	8	6	5	4	3	3	2	2	
60		9	7	6	5	4	4	3		
70			8	7	6	5	5			
80				8	7	6				
90					7					

TABLE VI.

Third Correction, to Apparent Distance 56°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 20	1 22	1 25	1 29	1 35	1 41	1 48	2 2	2 18	2 35	2 52	3 10	3 27	3 45	4 3	4 20	6
7	1 23	1 20	1 22	1 24	1 27	1 32	1 37	1 48	2 1	2 15	2 29	2 43	2 58	3 12	3 27	3 42	7
8	1 28	1 23	1 20	1 21	1 23	1 26	1 29	1 38	1 48	2 0	2 12	2 23	2 35	2 48	3 1	3 14	8
9	1 34	1 27	1 22	1 20	1 21	1 23	1 25	1 31	1 39	1 48	1 58	2 8	2 18	2 29	2 40	2 50	9
10	1 40	1 31	1 25	1 22	1 20	1 21	1 22	1 26	1 32	1 39	1 48	1 56	2 5	2 15	2 24	2 33	10
11	1 47	1 36	1 29	1 25	1 22	1 20	1 21	1 23	1 27	1 33	1 40	1 47	1 55	2 4	2 12	2 20	11
12	1 54	1 42	1 33	1 28	1 24	1 21	1 20	1 21	1 24	1 28	1 34	1 40	1 47	1 55	2 2	2 9	12
13	2 2	1 48	1 38	1 31	1 26	1 23	1 21	1 20	1 22	1 25	1 30	1 35	1 41	1 47	1 54	2 0	13
14	2 10	1 54	1 43	1 35	1 29	1 25	1 22	1 19	1 20	1 23	1 27	1 31	1 36	1 41	1 47	1 52	14
15	2 18	2 1	1 48	1 39	1 33	1 28	1 24	1 21	1 19	1 21	1 24	1 27	1 32	1 36	1 41	1 46	15
16	2 27	2 8	1 53	1 43	1 36	1 31	1 26	1 22	1 19	1 19	1 21	1 24	1 28	1 32	1 36	1 40	16
17	2 35	2 15	1 59	1 47	1 40	1 34	1 29	1 23	1 20	1 18	1 19	1 22	1 25	1 28	1 32	1 35	17
18	2 44	2 22	2 4	1 52	1 43	1 37	1 31	1 25	1 20	1 17	1 18	1 20	1 22	1 25	1 28	1 31	18
19	2 53	2 29	2 10	1 57	1 47	1 40	1 34	1 26	1 21	1 18	1 17	1 19	1 20	1 23	1 25	1 28	19
20	3 2	2 36	2 16	2 1	1 51	1 44	1 37	1 28	1 22	1 19	1 17	1 18	1 19	1 21	1 23	1 25	20
21	3 11	2 44	2 22	2 8	1 55	1 47	1 40	1 30	1 24	1 20	1 18	1 17	1 18	1 19	1 21	1 23	21
22	3 20	2 51	2 29	2 13	2 0	1 51	1 43	1 32	1 25	1 21	1 18	1 16	1 17	1 18	1 19	1 21	22
23	3 29	2 58	2 35	2 18	2 5	1 55	1 46	1 35	1 27	1 22	1 19	1 17	1 16	1 17	1 18	1 19	23
24	3 38	3 5	2 42	2 23	2 9	1 59	1 50	1 37	1 29	1 24	1 20	1 17	1 16	1 16	1 17	1 18	24
25	3 47	3 13	2 49	2 29	2 14	2 3	1 53	1 39	1 31	1 25	1 21	1 18	1 16	1 16	1 16	1 17	25
26	3 55	3 20	2 55	2 34	2 19	2 7	1 57	1 42	1 33	1 27	1 22	1 19	1 17	1 16	1 16	1 16	26
27	4 4	3 27	3 1	2 39	2 24	2 12	2 1	1 45	1 35	1 28	1 23	1 19	1 17	1 16	1 16	1 16	27
28	4 12	3 34	3 8	2 45	2 29	2 16	2 5	1 48	1 37	1 30	1 24	1 20	1 18	1 16	1 15	1 16	28
29	4 21	3 41	3 14	2 50	2 33	2 20	2 8	1 51	1 39	1 31	1 25	1 21	1 18	1 16	1 15	1 15	29
30	4 29	3 48	3 20	2 55	2 38	2 24	2 12	1 54	1 41	1 33	1 26	1 21	1 18	1 16	1 15	1 15	30
31	4 38	3 55	3 26	3 0	2 43	2 28	2 16	1 57	1 44	1 34	1 28	1 22	1 18	1 16	1 16	1 15	31
32	4 46	4 2	3 32	3 6	2 48	2 32	2 19	2 0	1 46	1 36	1 29	1 23	1 19	1 17	1 16	1 15	32
33	4 54	4 9	2 39	3 11	2 53	2 36	2 23	2 3	1 49	1 38	1 31	1 25	1 20	1 17	1 16	1 15	33
34	5 2	4 16	3 45	3 16	2 57	2 40	2 26	2 6	1 51	1 40	1 32	1 26	1 21	1 18	1 16	1 15	34
35	5 10	4 23	3 51	3 22	3 2	2 44	2 30	2 9	1 53	1 42	1 34	1 27	1 22	1 18	1 16	1 15	35
36	5 18	4 30	3 57	3 27	3 6	2 48	2 33	2 12	1 55	1 44	1 35	1 28	1 23	1 19	1 17	1 16	36
37	5 26	4 37	4 3	3 32	3 10	2 52	2 37	2 15	1 58	1 46	1 37	1 29	1 24	1 20	1 18	1 16	37
38	5 33	4 43	4 8	3 37	3 14	2 56	2 41	2 17	2 0	1 48	1 38	1 30	1 25	1 21	1 18	1 16	38
39	5 41	4 50	4 14	3 42	3 19	3 0	2 45	2 20	2 2	1 50	1 39	1 31	1 25	1 21	1 18	1 16	39
40	5 48	4 56	4 19	3 47	3 23	3 4	2 48	2 23	2 4	1 51	1 40	1 32	1 26	1 22	1 19	1 16	40
41	5 55	5 2	4 25	3 52	3 28	3 8	2 51	2 25	2 6	1 53	1 42	1 33	1 27	1 23	1 20	1 17	41
42	6 2	5 8	4 30	3 57	3 32	3 11	2 54	2 28	2 9	1 55	1 43	1 34	1 28	1 24	1 20	1 17	42
43	6 9	5 14	4 35	4 2	3 36	3 15	2 58	2 31	2 12	1 57	1 44	1 35	1 29	1 25	1 21	1 17	43
44	6 16	5 20	4 40	4 7	3 40	3 19	3 1	2 34	2 14	1 59	1 46	1 37	1 31	1 26	1 22	1 18	44
46	6 29	5 32	4 50	4 16	3 48	3 26	3 8	2 40	2 18	2 2	1 49	1 40	1 33	1 28	1 23	1 19	46
48	6 42	5 43	4 59	4 24	3 56	3 33	3 14	2 45	2 22	2 6	1 52	1 43	1 36	1 30	1 25	1 20	48
50	6 54	5 54	5 8	4 32	4 3	3 40	3 19	2 50	2 26	2 9	1 55	1 45	1 38	1 32	1 26	1 21	50
52	7 6	6 4	5 17	4 39	4 10	3 46	3 24	2 55	2 30	2 12	1 58	1 48	1 40	1 33	1 27	1 22	52
54	7 18	6 14	5 25	4 46	4 16	3 52	3 29	2 59	2 34	2 15	2 0	1 50	1 42	1 35	1 29	1 24	54
56	7 29	6 24	5 33	4 53	4 22	3 57	3 34	3 3	2 37	2 19	2 3	1 52	1 43	1 36	1 30	1 25	56
58	7 40	6 33	5 41	5 0	4 28	4 2	3 39	3 7	2 41	2 22	2 6	1 54	1 45	1 37	1 31	1 26	58
60	7 50	6 41	5 48	5 7	4 34	4 7	3 43	3 11	2 44	2 25	2 8	1 56	1 47	1 39	1 32	1 27	60
62	7 58	6 48	5 55	5 13	4 40	4 12	3 48	3 15	2 47	2 28	2 11	1 58	1 48	1 40	1 33	1 28	62
64			6 1	5 19	4 45	4 17	3 52	3 18	2 50	2 30	2 13	2 0	1 50	1 41	1 34	1 29	64
66					4 50	4 21	3 56	3 20	2 53	2 32	2 15	2 2	1 51	1 42	1 35	1 29	66
68							4 0	3 22	2 55	2 34	2 17	2 4	1 52	1 43	1 36	1 30	68
70								3 24	2 57	2 36	2 18	2 5	1 53	1 44	1 37	1 31	70
72									2 59	2 37	2 19	2 6	1 54	1 45	1 38	1 32	72
74										2 38	2 20	2 7	1 55	1 46	1 39	1 32	74
76											2 21	2 8	1 56	1 47	1 39	1 33	76
78												2 8	1 57	1 48	1 40	1 33	78
80													1 58	1 48	1 40	1 34	80
82														1 48	1 40	1 34	82
84															1 41	1 34	84
86																1 34	86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 56°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																		☽'s App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°			
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	4 37	4 54	5 10	5 26	5 56	6 25	6 52	7 15	7 37	7 58									6
7	3 57	4 11	4 25	4 38	5 3	5 29	5 52	6 12	6 31	6 48									7
8	3 26	3 38	3 51	4 3	4 26	4 47	5 5	5 23	5 40	5 55									8
9	3 1	3 12	3 23	3 33	3 53	4 12	4 30	4 46	5 0	5 13									9
10	2 43	2 53	3 2	3 11	3 28	3 45	4 1	4 15	4 27	4 39	4 50								10
11	2 29	2 37	2 45	2 53	3 9	3 24	3 38	3 50	4 1	4 12	4 21								11
12	2 16	2 23	2 30	2 38	2 52	3 6	3 18	3 28	3 38	3 47	3 56								12
13	2 6	2 12	2 18	2 25	2 37	2 50	3 1	3 10	3 19	3 28	3 36								13
14	1 57	2 3	2 8	2 14	2 25	2 36	2 47	2 56	3 4	3 12	3 19	3 24							14
15	1 50	1 55	1 59	2 5	2 15	2 25	2 35	2 44	2 51	2 58	3 4	3 10							15
16	1 44	1 48	1 53	1 58	2 7	2 16	2 25	2 33	2 39	2 45	2 51	2 57							16
17	1 39	1 43	1 48	1 52	2 0	2 8	2 16	2 24	2 30	2 35	2 40	2 45							17
18	1 35	1 39	1 43	1 47	1 54	2 1	2 8	2 15	2 21	2 26	2 31	2 35	2 38						18
19	1 31	1 35	1 38	1 42	1 48	1 55	2 1	2 7	2 13	2 18	2 23	2 27	2 30						19
20	1 28	1 31	1 34	1 37	1 43	1 49	1 55	2 0	2 6	2 10	2 15	2 19	2 22						20
21	1 25	1 27	1 30	1 33	1 38	1 44	1 49	1 54	1 58	2 3	2 7	2 11	2 14						21
22	1 22	1 24	1 27	1 30	1 34	1 39	1 44	1 48	1 52	1 56	2 0	2 4	2 6	2 8					22
23	1 20	1 22	1 24	1 27	1 31	1 35	1 40	1 44	1 47	1 51	1 54	1 57	2 0	2 2					23
24	1 19	1 20	1 22	1 25	1 28	1 32	1 36	1 40	1 43	1 46	1 49	1 52	1 54	1 56					24
25	1 18	1 19	1 21	1 23	1 26	1 29	1 33	1 36	1 39	1 42	1 44	1 47	1 49	1 51					25
26	1 17	1 18	1 19	1 21	1 24	1 27	1 30	1 33	1 35	1 38	1 40	1 42	1 44	1 46	1 48				26
27	1 16	1 17	1 18	1 19	1 22	1 25	1 27	1 30	1 32	1 35	1 37	1 39	1 40	1 42	1 44				27
28	1 16	1 16	1 17	1 18	1 20	1 23	1 25	1 27	1 29	1 32	1 34	1 36	1 37	1 39	1 40				28
29	1 15	1 15	1 16	1 17	1 19	1 21	1 23	1 25	1 27	1 29	1 31	1 33	1 34	1 35	1 36				29
30	1 15	1 15	1 16	1 16	1 17	1 19	1 21	1 23	1 25	1 27	1 29	1 30	1 31	1 32	1 33	1 34			30
31	1 14	1 14	1 15	1 15	1 16	1 18	1 19	1 21	1 23	1 25	1 27	1 28	1 29	1 29	1 30	1 31			31
32	1 14	1 14	1 14	1 14	1 15	1 17	1 18	1 19	1 21	1 23	1 25	1 26	1 27	1 27	1 27	1 28			32
33	1 14	1 13	1 13	1 13	1 14	1 16	1 17	1 18	1 20	1 21	1 23	1 24	1 25	1 25	1 25	1 26			33
34	1 14	1 13	1 13	1 13	1 14	1 15	1 16	1 17	1 19	1 20	1 21	1 22	1 23	1 23	1 23	1 24			34
35	1 14	1 13	1 13	1 13	1 13	1 14	1 15	1 16	1 17	1.18	1 19	1 20	1 21	1 21	1 21	1 22			35
36	1 14	1 13	1 12	1 12	1 12	1 13	1 14	1 15	1 16	1 16	1 17	1 18	1 19	1 19	1 19	1 20			36
37	1 14	1 13	1 12	1 12	1 12	1 13	1 14	1 15	1 15	1 16	1 16	1 16	1 17	1 17	1 17	1 18			37
38	1 14	1 13	1 12	1 11	1 11	1 12	1 13	1 13	1 14	1 14	1 15	1 15	1 16	1 16	1 16	1 17			38
39	1 14	1 13	1 12	1 11	1 11	1 11	1 12	1 12	1 13	1 13	1 13	1 13	1 14	1 14	1 15				39
40	1 14	1 13	1 12	1 11	1 10	1 10	1 11	1 11	1 12	1 12	1 12	1 12	1 12	1 13	1 13				40
41	1 15	1 14	1 12	1 11	1 10	1 10	1 10	1 10	1 11	1 11	1 11	1 12	1 12	1 12					41
42	1 15	1 14	1 12	1 11	1 9	1 9	1 9	1 10	1 10	1 10	1 10	1 11	1 11	1 11					42
43	1 15	1 14	1 12	1 11	1 9	1 9	1 9	1 9	1 9	1 9	1 9	1 10	1 10						43
44	1 16	1 14	1 12	1 11	1 9	1 8	1 8	1 8	1 8	1 8	1 8	1 9							44
46	1 17	1 15	1 13	1 12	1 9	1 7	1 7	1 7	1 6	1 6	1 6	1 7	1 7						46
48	1 17	1 15	1 13	1 12	1 9	1 7	1 6	1 6	1 5	1 5	1 5	1 5							48
50	1 18	1 16	1 14	1 12	1 9	1 6	1 5	1 5	1 4	1 4	1 4	1 4							50
52	1 19	1 17	1 15	1 13	1 9	1 6	1 4	1 4	1 3	1 3	1 3								52
54	1 20	1 17	1 15	1 13	1 9	1 6	1 4	1 3	1 3	1 2	1 2								54
56	1 21	1 18	1 16	1 14	1 10	1 6	1 4	1 2	1 2	1 1	1 1								56
58	1 22	1 19	1 16	1 14	1 10	1 6	1 4	1 2	1 1	1 0	1 0								58
60	1 23	1 19	1 16	1 14	1 10	1 6	1 4	1 2	1 1	1 0									60
62	1 24	1 20	1 17	1 14	1 10	1 6	1 4	1 2	1 1	1 0									62
64	1 24	1 20	1 17	1 14	1 11	1 7	1 4	1 2	1 0										64
66	1 25	1 21	1 18	1 15	1 11	1 7	1 4	1 2	1 0										66
68	1 25	1 21	1 18	1 15	1 11	1 7	1 4	1 2											68
70	1 26	1 22	1 19	1 16	1 11	1 7	1 4	1 2											70
72	1 27	1 23	1 19	1 16	1 11	1 7	1 4												72
74	1 27	1 23	1 19	1 16	1 11	1 7	1 4												74
76	1 28	1 23	1 19	1 16	1 11	1 7													76
78	1 28	1 23	1 20	1 17	1 11	1 7													78
80	1 29	1 24	1 20	1 17	1 11														80
82	1 29	1 24	1 20	1 17	1 11														82
84	1 29	1 24	1 20	1 17															84
86	1 29	1 24	1 20	1 17															86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°								

TABLE *P*. EFFECT OF SUN'S PAR. Add the Numbers above the black lines to 3rd Correction, subtract the others.

☽'s App Alt.	Sun's Apparent Altitude.								
	5	10	20	30	40	50	60	70	80	90
5	0	0	1	2	3	4	4			
10	1	1	0	1	2	3	3			
20	3	3	2	1	0	1	2	2		
30	5	4	3	2	1	1	0	0	1	1
40	6	6	5	4	3	2	2	1	1	
50	8	7	6	5	4	4	3	3		
60	9	8	7	6	5	5	4			
70		9	8	7	6	6				
80			9	8	7					
90				8						

TABLE VI.

Third Correction, to Apparent Distance 60°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 22	1 23	1 25	1 28	1 33	1 40	1 47	2 1	2 16	2 33	3 50	3 8	3 25	3 41	3 58	4 15	6
7	1 24	1 22	1 23	1 25	1 28	1 33	1 37	1 47	1 59	2 13	2 27	2 41	2 55	3 9	3 23	3 37	7
8	1 28	1 24	1 22	1 23	1 25	1 28	1 31	1 39	1 48	1 59	2 14	2 23	2 35	2 48	3 0	3 12	8
9	1 33	1 28	1 24	1 22	1 24	1 25	1 27	1 33	1 40	1 49	1 58	2 8	2 18	2 29	2 39	2 50	9
10	1 40	1 33	1 27	1 24	1 23	1 24	1 25	1 29	1 34	1 41	1 49	1 57	2 6	2 15	2 25	2 34	10
11	1 47	1 38	1 31	1 27	1 24	1 23	1 24	1 26	1 30	1 36	1 42	1 49	1 57	2 5	2 13	2 21	11
12	1 55	1 43	1 36	1 30	1 26	1 24	1 23	1 25	1 28	1 32	1 37	1 43	1 49	1 56	2 3	2 11	12
13	2 3	1 49	1 40	1 34	1 29	1 26	1 24	1 24	1 26	1 29	1 33	1 38	1 43	1 49	1 55	2 2	13
14	2 10	1 55	1 45	1 38	1 32	1 28	1 25	1 23	1 25	1 27	1 30	1 34	1 38	1 43	1 49	1 54	14
15	2 18	2 1	1 50	1 42	1 36	1 31	1 27	1 24	1 23	1 25	1 27	1 30	1 34	1 38	1 43	1 48	15
16	2 26	2 7	1 55	1 46	1 39	1 34	1 29	1 25	1 22	1 23	1 25	1 27	1 30	1 34	1 38	1 43	16
17	2 34	2 13	2 0	1 50	1 43	1 37	1 31	1 26	1 22	1 22	1 23	1 25	1 28	1 31	1 34	1 38	17
18	2 42	2 20	2 5	1 54	1 46	1 40	1 34	1 27	1 23	1 21	1 22	1 23	1 25	1 28	1 31	1 34	18
19	2 50	2 27	2 11	1 59	1 50	1 43	1 36	1 29	1 24	1 22	1 21	1 22	1 23	1 26	1 28	1 31	19
20	2 59	2 34	2 17	2 4	1 54	1 46	1 39	1 31	1 25	1 22	1 20	1 21	1 22	1 24	1 26	1 28	20
21	3 7	2 41	2 23	2 9	1 58	1 50	1 42	1 33	1 26	1 23	1 21	1 20	1 21	1 22	1 24	1 25	21
22	3 15	2 48	2 29	2 14	2 2	1 53	1 45	1 35	1 28	1 24	1 21	1 20	1 20	1 21	1 22	1 23	22
23	3 24	2 55	2 35	2 19	2 7	1 57	1 48	1 37	1 30	1 25	1 22	1 20	1 20	1 20	1 21	1 22	23
24	3 32	3 2	2 41	2 24	2 10	2 1	1 52	1 40	1 31	1 26	1 23	1 21	1 20	1 20	1 20	1 21	24
25	3 41	3 9	2 47	2 29	2 15	2 4	1 55	1 42	1 33	1 27	1 24	1 22	1 20	1 19	1 19	1 20	25
26	3 49	3 16	2 53	2 34	2 20	2 8	1 59	1 45	1 35	1 29	1 25	1 22	1 20	1 19	1 19	1 19	26
27	3 58	3 23	2 59	2 39	2 25	2 12	2 3	1 48	1 38	1 31	1 26	1 23	1 21	1 19	1 19	1 19	27
28	4 6	3 30	3 5	2 44	2 29	2 16	2 7	1 51	1 40	1 32	1 27	1 23	1 21	1 19	1 18	1 18	28
29	4 15	3 37	3 11	2 49	2 33	2 20	2 11	1 53	1 42	1 34	1 28	1 24	1 21	1 19	1 18	1 18	29
30	4 23	3 44	3 17	2 54	2 38	2 24	2 14	1 56	1 44	1 35	1 29	1 24	1 21	1 19	1 18	1 18	30
31	4 31	3 51	3 23	2 59	2 42	2 28	2 18	1 59	1 46	1 37	1 30	1 25	1 22	1 20	1 18	1 18	31
32	4 39	3 58	3 29	3 4	2 47	2 32	2 21	2 2	1 48	1 38	1 31	1 26	1 22	1 20	1 19	1 18	32
33	4 47	4 5	3 34	3 9	2 52	2 36	2 25	2 5	1 51	1 40	1 33	1 27	1 23	1 20	1 19	1 18	33
34	4 55	4 12	3 40	3 14	3 56	2 40	2 28	2 8	1 53	1 41	1 34	1 28	1 24	1 21	1 19	1 18	34
35	5 3	4 18	3 46	3 19	3 0	2 44	2 32	2 11	1 55	1 43	1 35	1 29	1 25	1 22	1 20	1 18	35
36	5 10	4 24	3 52	3 24	3 4	2 48	2 35	2 14	1 57	1 45	1 37	1 31	1 26	1 22	1 20	1 18	36
37	5 18	4 31	3 58	3 29	3 8	2 52	2 39	2 17	1 59	1 47	1 38	1 32	1 27	1 23	1 21	1 19	37
38	5 25	4 38	4 4	3 34	3 12	2 55	2 42	2 20	2 2	1 49	1 40	1 33	1 28	1 24	1 21	1 19	38
39	5 32	4 45	4 10	3 39	3 17	2 59	2 46	2 22	2 4	1 51	1 42	1 35	1 29	1 25	1 22	1 20	39
40	5 39	4 51	4 15	3 44	3 21	3 3	2 49	2 25	2 6	1 53	1 43	1 36	1 30	1 26	1 22	1 20	40
41	5 46	4 57	4 21	3 49	3 26	3 7	2 52	2 27	2 8	1 55	1 45	1 37	1 31	1 27	1 23	1 20	41
42	5 53	5 3	4 26	3 53	3 30	3 11	2 55	2 30	2 10	1 56	1 46	1 38	1 32	1 28	1 24	1 21	42
43	6 0	5 9	4 31	3 58	3 35	3 15	2 58	2 32	2 13	1 58	1 48	1 40	1 34	1 29	1 25	1 22	43
44	6 7	5 15	4 36	4 3	3 39	3 19	3 1	2 35	2 15	2 0	1 49	1 41	1 35	1 30	1 26	1 22	44
46	6 21	5 26	4 46	4 12	3 47	3 26	3 7	2 40	2 19	2 4	1 52	1 43	1 36	1 31	1 27	1 23	46
48	6 34	5 37	4 55	4 20	3 54	3 32	3 13	2 45	2 23	2 8	1 56	1 46	1 39	1 33	1 28	1 24	48
50	6 47	5 48	5 4	4 28	4 1	3 37	3 19	2 50	2 27	2 11	1 59	1 48	1 41	1 35	1 29	1 25	50
52	6 59	5 58	5 13	4 36	4 8	3 43	3 25	2 55	2 31	2 14	2 2	1 51	1 43	1 36	1 31	1 27	52
54	7 11	6 8	5 22	4 44	4 15	3 49	3 30	2 59	2 35	2 18	2 4	1 53	1 45	1 38	1 33	1 28	54
56	7 22	6 17	5 30	4 51	4 21	3 55	3 35	3 4	2 38	2 21	2 7	1 56	1 47	1 40	1 34	1 29	56
58	7 31	6 25	5 37	4 58	4 27	4 1	3 40	3 8	2 41	2 24	2 10	1 58	1 49	1 41	1 35	1 30	58
60	7 40	6 32	5 45	5 4	4 32	4 6	3 45	3 12	2 44	2 27	2 12	2 0	1 50	1 42	1 36	1 31	60
62	7 48	6 39	5 52	5 10	4 38	4 11	3 50	3 16	2 48	2 29	2 14	2 2	1 52	1 44	1 37	1 32	62
64	7 56	6 46	5 58	5 15	4 43	4 15	3 55	3 19	2 51	2 31	2 16	2 4	1 53	1 45	1 38	1 33	64
66	8 3	6 53	6 2	5 20	4 47	4 19	3 59	3 22	2 54	2 33	2 18	2 5	1 55	1 46	1 39	1 34	66
68			6 6	5 24	4 51	4 23	4 2	3 25	2 56	2 35	2 19	2 6	1 56	1 47	1 40	1 34	68
70					4 54	4 26	4 4	3 27	2 58	2 36	2 20	2 7	1 57	1 48	1 41	1 35	70
72							4 6	3 28	3 0	2 38	2 21	2 8	1 58	1 49	1 41	1 35	72
74								3 29	3 2	2 39	2 22	2 9	1 59	1 50	1 42	1 36	74
76									3 3	2 41	2 23	2 10	1 59	1 50	1 42	1 36	76
78										1 42	2 24	2 13	2 0	1 51	1 43	1 37	78
80											2 25	2 12	2 1	1 51	1 43	1 37	80
82												2 12	2 1	1 52	1 44	1 38	82
84													2 2	1 52	1 44	1 38	84
86														1 52	1 44	1 38	86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 60°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																						☽'s App Alt.
	32°		34°		36°		38°		42°		46°		50°		54°		58°		62°		66°		70°		74°		78°		82°		86°		
°	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	°
6	4	32	4	48	5	3	5	19	5	49	6	17	6	44	7	7	7	28	7	47	8	3											6
7	3	51	4	5	4	19	4	32	4	58	5	22	5	44	6	4	6	22	6	38	6	53											7
8	3	23	3	35	3	47	3	59	4	22	4	42	5	1	5	19	5	35	5	50	6	2											8
9	3	0	3	10	3	20	3	30	3	49	4	8	4	25	4	41	4	55	5	8	5	19											9
10	2	43	2	51	3	0	3	9	3	26	3	42	3	58	4	12	4	24	4	35	4	45	4	54									10
11	2	29	2	37	2	44	2	52	2	7	3	21	3	35	3	48	3	59	4	9	4	18	4	26									11
12	2	18	2	25	2	32	2	39	2	52	3	5	3	17	3	29	3	39	3	48	3	57	4	3									12
13	2	8	2	15	2	21	2	28	2	39	2	51	3	2	3	12	3	21	3	30	3	38	3	44									13
14	2	0	2	6	2	12	2	18	2	28	2	38	2	48	2	57	3	6	3	14	3	21	3	26	3	29							14
15	1	53	1	58	2	3	2	8	2	18	2	27	2	36	2	45	2	53	3	0	3	6	3	11	3	15							15
16	1	47	1	51	1	55	2	0	2	9	2	18	2	26	2	34	2	41	2	48	2	53	2	58	3	2							16
17	1	42	1	45	1	49	1	53	2	1	2	9	2	17	2	24	2	31	2	37	2	42	2	46	2	50							17
18	1	37	1	40	1	44	1	47	1	54	2	1	2	9	2	16	2	22	2	27	2	32	2	36	2	40	2	42					18
19	1	33	1	36	1	39	1	42	1	48	1	55	2	2	2	9	2	15	2	19	2	24	2	28	2	31	2	33					19
20	1	30	1	32	1	35	1	38	1	44	1	50	1	56	2	2	2	8	2	12	2	17	2	20	2	23	2	25					20
21	1	27	1	29	1	32	1	35	1	40	1	46	1	51	1	56	2	1	2	6	2	10	2	13	2	15	2	17					21
22	1	25	1	27	1	29	1	32	1	37	1	42	1	47	1	51	1	56	2	0	2	4	2	6	2	8	2	10	2	12			22
23	1	23	1	25	1	27	1	30	1	34	1	38	1	43	1	47	1	51	1	55	1	59	2	1	2	3	2	4	2	6			23
24	1	22	1	23	1	25	1	27	1	31	1	35	1	40	1	44	1	47	1	51	1	54	1	56	1	58	1	59	2	1			24
25	1	21	1	22	1	23	1	25	1	29	1	32	1	36	1	40	1	43	1	47	1	49	1	51	1	53	1	54	1	56			25
26	1	20	1	21	1	22	1	23	1	26	1	29	1	33	1	37	1	40	1	43	1	45	1	47	1	49	1	50	1	51	1	52	26
27	1	19	1	20	1	21	1	22	1	24	1	27	1	30	1	34	1	37	1	40	1	42	1	43	1	45	1	46	1	47	1	48	27
28	1	19	1	19	1	20	1	21	1	23	1	25	1	28	1	31	1	34	1	37	1	39	1	40	1	41	1	42	1	43	1	44	28
29	1	18	1	18	1	19	1	20	1	22	1	23	1	26	1	29	1	31	1	34	1	36	1	37	1	38	1	39	1	40	1	41	29
30	1	18	1	18	1	18	1	19	1	20	1	22	1	24	1	27	1	29	1	31	1	33	1	34	1	35	1	36	1	37	1	38	30
31	1	18	1	18	1	18	1	18	1	19	1	20	1	22	1	25	1	27	1	29	1	30	1	31	1	32	1	33	1	34	1	35	31
32	1	17	1	17	1	17	1	17	1	18	1	19	1	21	1	23	1	25	1	27	1	28	1	29	1	30	1	31	1	21	1	32	32
33	1	17	1	16	1	16	1	16	1	17	1	18	1	19	1	21	1	23	1	25	1	26	1	27	1	28	1	29	1	29	1	30	33
34	1	17	1	16	1	16	1	16	1	16	1	17	1	18	1	20	1	22	1	23	1	24	1	25	1	26	1	27	1	27	1	28	34
35	1	17	1	16	1	16	1	16	1	16	1	16	1	17	1	18	1	20	1	21	1	22	1	23	1	24	1	25	1	25			35
36	1	17	1	16	1	15	1	16	1	16	1	16	1	16	1	17	1	18	1	19	1	20	1	21	1	22	1	23	1	23			36
37	1	17	1	16	1	15	1	15	1	15	1	15	1	15	1	16	1	17	1	18	1	19	1	20	1	21	1	21	1	22			37
38	1	17	1	16	1	15	1	14	1	14	1	14	1	14	1	15	1	16	1	17	1	18	1	19	1	20	1	20	1	21			38
39	1	18	1	16	1	15	1	14	1	13	1	13	1	13	1	14	1	15	1	16	1	17	1	17	1	18	1	18					39
40	1	18	1	16	1	15	1	14	1	13	1	13	1	13	1	14	1	14	1	15	1	16	1	16	1	17	1	17					40
41	1	18	1	16	1	15	1	14	1	12	1	12	1	12	1	13	1	13	1	14	1	15	1	15	1	16	1	16					41
42	1	18	1	16	1	15	1	14	1	12	1	12	1	12	1	12	1	12	1	13	1	14	1	14	1	15	1	15					42
43	1	19	1	17	1	16	1	14	1	12	1	11	1	11	1	11	1	11	1	12	1	13	1	13	1	14							43
44	1	19	1	17	1	16	1	14	1	12	1	11	1	11	1	11	1	11	1	11	1	12	1	12	1	13							44
46	1	20	1	18	1	16	1	14	1	12	1	11	1	10	1	10	1	10	1	10	1	11	1	11	1	11							46
48	1	21	1	19	1	17	1	15	1	12	1	10	1	9	1	9	1	9	1	9	1	10	1	10									48
50	1	22	1	19	1	17	1	15	1	12	1	10	1	9	1	8	1	8	1	8	1	8	1	8									50
52	1	23	1	20	1	17	1	15	1	12	1	10	1	8	1	8	1	8	1	7	1	7											52
54	1	24	1	21	1	18	1	16	1	13	1	10	1	8	1	7	1	7	1	6	1	6											54
56	1	25	1	22	1	19	1	16	1	13	1	10	1	8	1	7	1	7	1	6													56
58	1	26	1	23	1	20	1	17	1	13	1	10	1	8	1	7	1	6	1	5													58
60	1	27	1	24	1	21	1	18	1	14	1	10	1	8	1	7	1	6															60
62	1	28	1	24	1	21	1	18	1	14	1	10	1	8	1	6	1	5															62
64	1	29	1	25	1	21	1	18	1	14	1	10	1	8	1	6																	64
66	1	29	1	25	1	21	1	18	1	14	1	11	1	8	1	6																	66
68	1	29	1	25	1	22	1	19	1	15	1	11	1	8																			68
70	1	30	1	26	1	22	1	19	1	15	1	11	1	8																			70
72	1	30	1	26	1	23	1	20	1	15	1	11																					72
74	1	31	1	27	1	23	1	20	1	15	1	11																					74
76	1	31	1	27	1	23	1	20	1	15																							76
78	1	32	1	28	1	24	1	20	1	15																							78
80	1	32	1	28	1	24	1	21																									80
82	1	33	1	28	1	24	1	21																									82
84	1	33	1	28	1	24																											84
86	1	33	1	28																													86
	32°		34°		36°		38°		42°		46°		50°		54°		58°		62°		66°												

TABLE *P*. EFFECT OF SUN's PAR.
Add the Numbers above the black lines to the 3rd Correction, and subtract the others.

☽'s App Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	0	0	1	2	3	3	4			
10	1	1	0	1	2	2	3	3		
20	3	3	2	1	0	0	1	1	2	
30	5	4	3	3	2	2	1	1	0	2
40	6	6	5	4	3	3	2	2		
50	7	7	6	5	5	4	3	3		
60	9	8	7	6	6	5	4			
70		9	8	7	6	6				
80			8	8	7					
90				8						

TABLE VI.

Third Correction, to Apparent Distance 64°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 26	1 27	1 29	1 32	1 36	1 42	1 49	2 3	2 19	2 35	2 51	3 8	3 24	3 40	3 56	4 12	6
7	1 28	1 26	1 27	1 29	1 32	1 35	1 40	1 51	2 3	2 15	2 28	2 42	2 56	3 9	3 22	3 36	7
8	1 32	1 28	1 26	1 27	1 29	1 31	1 34	1 42	1 51	2 2	2 13	2 24	2 36	2 48	3 0	3 11	8
9	1 37	1 31	1 28	1 26	1 27	1 28	1 30	1 36	1 43	1 52	2 1	2 10	2 20	2 31	2 41	2 51	9
10	1 43	1 35	1 30	1 27	1 26	1 27	1 28	1 32	1 37	1 44	1 51	1 59	2 8	2 17	2 26	2 35	10
11	1 50	1 40	1 33	1 29	1 27	1 26	1 27	1 29	1 33	1 38	1 44	1 51	1 59	2 7	2 14	2 22	11
12	1 57	1 45	1 37	1 32	1 29	1 27	1 26	1 28	1 30	1 34	1 38	1 44	1 51	1 58	2 5	2 12	12
13	2 4	1 50	1 41	1 35	1 31	1 29	1 27	1 27	1 28	1 31	1 34	1 38	1 44	1 50	1 57	2 3	13
14	2 12	1 56	1 46	1 39	1 34	1 31	1 29	1 26	1 27	1 29	1 31	1 34	1 39	1 44	1 50	1 55	14
15	2 20	2 2	1 51	1 43	1 37	1 33	1 30	1 27	1 26	1 27	1 29	1 31	1 35	1 40	1 44	1 49	15
16	2 27	2 8	1 56	1 47	1 41	1 36	1 32	1 28	1 25	1 26	1 27	1 29	1 32	1 36	1 40	1 44	16
17	2 35	2 14	2 1	1 51	1 45	1 39	1 34	1 29	1 26	1 25	1 26	1 28	1 30	1 33	1 36	1 40	17
18	2 43	2 21	2 6	1 56	1 48	1 42	1 37	1 31	1 27	1 25	1 25	1 26	1 28	1 30	1 33	1 36	18
19	2 51	2 27	2 12	2 0	1 52	1 45	1 39	1 32	1 28	1 25	1 25	1 25	1 27	1 28	1 30	1 33	19
20	2 59	2 34	2 17	2 5	1 56	1 49	1 42	1 34	1 29	1 26	1 24	1 24	1 25	1 26	1 28	1 30	20
21	3 7	2 41	2 23	2 10	2 0	1 52	1 45	1 36	1 30	1 26	1 24	1 23	1 24	1 25	1 26	1 28	21
22	3 15	2 48	2 29	2 15	2 4	1 55	1 48	1 38	1 31	1 27	1 25	1 23	1 23	1 24	1 25	1 26	22
23	3 23	2 55	2 35	2 20	2 8	1 59	1 51	1 40	1 33	1 28	1 25	1 23	1 23	1 24	1 24	1 25	23
24	3 31	3 2	2 41	2 25	2 12	2 2	1 54	1 42	1 34	1 29	1 26	1 24	1 23	1 23	1 24	1 25	24
25	3 39	3 8	2 47	2 30	2 17	2 6	1 57	1 44	1 36	1 30	1 26	1 24	1 23	1 23	1 23	1 24	25
26	3 47	3 15	2 53	2 35	2 21	2 10	2 0	1 47	1 38	1 32	1 27	1 25	1 23	1 23	1 23	1 23	26
27	3 56	3 22	2 59	2 40	2 26	2 14	2 4	1 50	1 40	1 33	1 28	1 25	1 23	1 23	1 22	1 23	27
28	4 4	3 29	3 5	2 45	2 30	2 18	2 7	1 53	1 42	1 35	1 29	1 26	1 24	1 23	1 22	1 22	28
29	4 12	3 36	3 11	2 50	2 35	2 22	2 11	1 55	1 44	1 36	1 30	1 27	1 25	1 23	1 22	1 22	29
30	4 20	3 42	3 17	2 55	2 39	2 26	2 15	1 58	1 46	1 38	1 32	1 28	1 25	1 24	1 23	1 22	30
31	4 28	3 49	3 23	3 0	2 43	2 30	2 18	2 0	1 48	1 40	1 33	1 29	1 26	1 24	1 23	1 22	31
32	4 36	3 55	3 28	3 5	2 48	2 34	2 22	2 3	1 50	1 41	1 34	1 30	1 26	1 24	1 23	1 22	32
33	4 44	4 2	3 34	3 10	2 52	2 38	2 26	2 6	1 53	1 43	1 36	1 30	1 27	1 24	1 23	1 22	33
34	4 52	4 8	3 39	3 15	2 56	2 41	2 29	2 8	1 55	1 44	1 37	1 31	1 28	1 25	1 23	1 22	34
35	5 0	4 15	3 45	3 20	3 1	2 45	2 33	2 11	1 57	1 46	1 38	1 32	1 28	1 25	1 23	1 22	35
36	5 7	4 21	3 51	3 25	3 5	2 49	2 36	2 14	1 59	1 47	1 39	1 33	1 29	1 26	1 24	1 23	36
37	5 14	4 28	3 57	3 30	3 9	2 53	2 40	2 17	2 2	1 49	1 41	1 34	1 30	1 27	1 25	1 23	37
38	5 21	4 34	4 2	3 35	3 14	2 57	2 43	2 20	2 4	1 52	1 43	1 36	1 31	1 27	1 25	1 23	38
39	5 28	4 41	4 7	3 39	3 18	3 1	2 46	2 23	2 6	1 54	1 45	1 37	1 32	1 28	1 25	1 23	39
40	5 35	4 47	4 12	3 44	3 22	3 4	2 49	2 26	2 9	1 56	1 46	1 38	1 33	1 29	1 26	1 24	40
41	5 42	4 53	4 17	3 49	3 26	3 8	2 52	2 29	2 11	1 58	1 48	1 40	1 34	1 29	1 26	1 24	41
42	5 49	4 59	4 22	3 53	3 30	3 11	2 55	2 31	2 13	2 0	1 49	1 41	1 35	1 30	1 27	1 24	42
43	5 56	5 4	4 27	3 58	3 34	3 15	2 59	2 34	2 15	2 2	1 51	1 42	1 36	1 31	1 28	1 25	43
44	6 2	5 11	4 32	4 3	3 38	3 19	3 2	2 36	2 17	2 3	1 52	1 44	1 38	1 32	1 29	1 26	44
46	6 15	5 21	4 42	4 11	3 45	3 26	3 8	2 41	2 22	2 6	1 55	1 47	1 40	1 34	1 30	1 27	46
48	6 28	5 32	4 52	4 19	3 53	3 32	3 14	2 45	2 26	2 10	1 58	1 49	1 42	1 36	1 32	1 28	48
50	6 40	5 42	5 1	4 27	4 0	3 38	3 20	2 50	2 29	2 14	2 1	1 51	1 44	1 37	1 33	1 29	50
52	6 52	5 52	5 10	4 35	4 7	3 44	3 25	2 55	2 33	2 17	2 4	1 54	1 46	1 39	1 34	1 30	52
54	7 3	6 1	5 18	4 42	4 14	3 50	3 30	2 59	2 37	2 20	2 7	1 56	1 48	1 41	1 35	1 31	54
56	7 14	6 10	5 26	4 49	4 20	3 55	3 35	3 3	2 41	2 23	2 9	1 58	1 49	1 43	1 37	1 32	56
58	7 21	6 18	5 34	4 56	4 25	4 0	3 39	3 7	2 44	2 26	2 11	2 0	1 52	1 45	1 38	1 33	58
60	7 32	6 26	5 41	5 2	4 30	4 5	3 44	3 11	2 47	2 29	2 14	2 2	1 54	1 47	1 40	1 35	60
62	7 40	6 33	5 47	5 7	4 35	4 10	3 49	3 15	2 50	2 31	2 16	2 4	1 55	1 48	1 41	1 36	62
64	7 48	6 40	5 53	5 12	4 40	4 15	3 53	3 19	2 52	2 34	2 49	2 6	1 56	1 49	1 42	1 37	64
66	7 55	6 47	5 59	5 17	4 45	4 19	3 57	3 22	2 54	2 36	2 21	2 8	1 57	1 50	1 43	1 38	66
68	8 1	6 53	6 4	5 22	4 49	4 23	4 1	3 24	2 56	2 38	2 22	2 9	1 59	1 51	1 44	1 38	68
70	8 7	6 59	6 8	5 26	4 53	4 26	4 4	3 26	2 58	2 40	2 23	2 10	2 0	1 52	1 45	1 39	70
72			6 11	5 30	4 56	4 29	4 6	3 28	3 0	2 41	2 24	2 11	2 1	1 53	1 46	1 39	72
74					4 59	4 31	4 8	3 30	3 2	2 42	2 25	2 12	2 2	1 54	1 47	1 40	74
76							4 9	3 32	3 4	2 43	2 26	2 13	2 3	1 54	1 47	1 40	76
78								3 33	3 6	2 44	2 27	2 14	2 3	1 54	1 47	1 41	78
80									3 7	2 45	2 28	2 15	2 4	1 55	1 47	1 41	80
82										2 46	2 29	2 16	2 4	1 55	1 48	1 42	82
84											2 29	2 16	2 5	1 56	1 49	1 42	84
86												2 16	2 6	1 56	1 49	1 42	86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

Schuifschaal ter berekening der geografische lengte met behulp van maansafstanden,met beschrijving.

Bate 1823.

RECTOR E

E NODIGEN TOT BIJ
RECHT TOT VIERIN

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ZAL AL

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AN INGESLOTEN KA
ZO JA,

ZONDER TOEGANGSKAAR

TABLE VI.

Third Correction, to Apparent Distance 64°.

D's App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																						D's App Alt.
	32°		34°		36°		38°		42°		46°		50°		54°		58°		62°		66°		70°		74°		78°		82°		86°		
°	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	°
6	4	29	4	45	5	0	5	15	5	43	6	10	6	36	6	59	7	20	7	39	7	54	8	7									6
7	3	49	4	2	4	15	4	28	4	53	5	16	5	37	5	57	6	15	6	32	6	46	6	59									7
8	3	22	3	34	3	45	3	56	4	18	4	38	4	57	5	15	5	31	5	46	5	58	6	7									8
9	3	0	3	10	3	20	3	30	3	49	4	7	4	23	4	38	4	52	5	5	5	16	5	26									9
10	2	43	2	52	3	1	3	10	3	27	3	42	3	56	4	9	4	21	4	32	4	42	4	51	4	59							10
11	2	30	2	37	2	45	2	54	3	9	3	22	3	35	3	47	3	57	4	7	4	16	4	24	4	31							11
12	2	19	2	25	2	33	2	40	2	53	3	5	3	17	3	27	3	37	3	47	3	56	4	3	4	8							12
13	2	9	2	15	2	22	2	28	2	40	2	51	3	1	3	11	3	20	3	29	3	37	3	43	3	47							13
14	2	1	2	7	2	13	2	18	2	29	2	39	2	48	2	57	3	6	3	14	3	20	3	25	3	29	3	33					14
15	1	54	2	0	2	5	2	10	2	19	2	29	2	37	2	45	2	53	3	0	3	5	3	10	3	14	3	18					15
16	1	48	1	53	1	58	2	3	2	11	2	20	2	28	2	35	2	42	2	48	2	53	2	57	3	1	3	5					16
17	1	43	1	47	1	52	1	56	2	4	2	12	2	20	2	26	2	32	2	38	2	43	2	47	2	51	2	54					17
18	1	39	1	43	1	47	1	50	1	58	2	5	2	12	2	18	2	24	2	30	2	35	2	39	2	42	2	44	2	46			18
19	1	36	1	39	1	42	1	46	1	52	1	59	2	5	2	11	2	17	2	22	2	27	2	31	2	34	2	36	2	38			19
20	1	33	1	36	1	38	1	42	1	48	1	54	1	59	2	5	2	11	2	15	2	20	2	23	2	26	2	28	2	30			20
21	1	30	1	33	1	35	1	38	1	44	1	49	1	54	2	0	2	5	2	9	2	13	2	16	2	18	2	20	2	22			21
22	1	28	1	30	1	32	1	35	1	40	1	45	1	50	1	55	1	59	2	3	2	6	2	9	2	11	2	13	2	15	2	16	22
23	1	27	1	28	1	30	1	32	1	37	1	41	1	46	1	51	1	54	1	58	2	1	2	3	2	5	2	7	2	9	2	10	23
24	1	26	1	27	1	28	1	30	1	34	1	38	1	42	1	47	1	50	1	54	1	57	1	59	2	0	2	2	2	4	2	5	24
25	1	25	1	26	1	27	1	28	1	32	1	35	1	39	1	43	1	47	1	50	1	53	1	55	1	56	1	58	1	59	2	0	25
26	1	24	1	25	1	26	1	27	1	30	1	33	1	36	1	40	1	44	1	47	1	49	1	51	1	52	1	54	1	55	1	56	26
27	1	23	1	24	1	25	1	26	1	28	1	31	1	34	1	37	1	41	1	44	1	46	1	47	1	49	1	50	1	51	1	52	27
28	1	23	1	23	1	24	1	25	1	26	1	29	1	32	1	35	1	38	1	41	1	43	1	44	1	45	1	46	1	47	1	48	28
29	1	22	1	22	1	23	1	24	1	25	1	27	1	30	1	32	1	35	1	38	1	40	1	41	1	42	1	43	1	44	1	45	29
30	1	22	1	22	1	23	1	23	1	24	1	26	1	28	1	30	1	33	1	35	1	37	1	38	1	39	1	40	1	41	1	42	30
31	1	22	1	22	1	22	1	22	1	23	1	24	1	26	1	28	1	31	1	33	1	34	1	35	1	36	1	37	1	38			31
32	1	21	1	21	1	21	1	21	1	22	1	23	1	25	1	27	1	29	1	31	1	32	1	33	1	34	1	35	1	36			32
33	1	21	1	21	1	21	1	21	1	21	1	22	1	24	1	26	1	27	1	29	1	30	1	31	1	32	1	33	1	34			33
34	1	21	1	20	1	20	1	20	1	20	1	21	1	23	1	25	1	26	1	27	1	28	1	29	1	30	1	31	1	32			34
35	1	21	1	20	1	20	1	20	1	20	1	21	1	22	1	23	1	24	1	25	1	26	1	27	1	28	1	29					35
36	1	21	1	20	1	19	1	19	1	19	1	20	1	21	1	22	1	23	1	24	1	25	1	26	1	26	1	27					36
37	1	21	1	20	1	19	1	19	1	19	1	19	1	20	1	21	1	22	1	23	1	24	1	25	1	25	1	26					37
38	1	21	1	20	1	19	1	18	1	18	1	18	1	19	1	20	1	21	1	22	1	23	1	24	1	24	1	25					38
39	1	21	1	20	1	19	1	18	1	18	1	18	1	18	1	19	1	20	1	21	1	21	1	22	1	22							39
40	1	22	1	20	1	19	1	18	1	17	1	17	1	18	1	18	1	19	1	20	1	20	1	21	1	21							40
41	1	22	1	20	1	19	1	18	1	17	1	17	1	17	1	17	1	18	1	19	1	19	1	20	1	20							41
42	1	22	1	20	1	19	1	18	1	16	1	16	1	16	1	17	1	17	1	18	1	18	1	19	1	19							42
43	1	23	1	21	1	19	1	18	1	16	1	16	1	16	1	16	1	16	1	17	1	17	1	18									43
44	1	23	1	21	1	19	1	18	1	16	1	16	1	16	1	16	1	16	1	16	1	16	1	17									44
46	1	24	1	22	1	20	1	18	1	16	1	15	1	15	1	15	1	15	1	15	1	15	1	16									46
48	1	25	1	22	1	20	1	19	1	16	1	15	1	15	1	14	1	14	1	14	1	14											48
50	1	26	1	23	1	21	1	19	1	16	1	15	1	14	1	13	1	13	1	13	1	13											50
52	1	27	1	24	1	22	1	20	1	17	1	15	1	13	1	12	1	12	1	12													52
54	1	28	1	25	1	22	1	20	1	17	1	15	1	13	1	12	1	11	1	11													54
56	1	29	1	26	1	23	1	21	1	17	1	15	1	13	1	12	1	11															56
58	1	29	1	26	1	23	1	21	1	18	1	15	1	13	1	11	1	10															58
60	1	30	1	27	1	24	1	22	1	18	1	15	1	13	1	11																	60
62	1	31	1	28	1	25	1	22	1	18	1	15	1	13	1	11																	62
64	1	32	1	28	1	25	1	22	1	18	1	15	1	13																			64
66	1	33	1	29	1	26	1	23	1	18	1	16	1	13																			66
68	1	33	1	29	1	26	1	23	1	19	1	16																					68
70	1	34	1	30	1	27	1	24	1	19	1	16																					70
72	1	34	1	30	1	27	1	24	1	19																							72
74	1	35	1	31	1	28	1	24	1	19																							74
76	1	35	1	31	1	28	1	25																									76
78	1	36	1	32	1	28	1	25																									78
80	1	36	1	32	1	28																											80
82	1	37	1	32																													82
84	1	37																															84
86																																	86
	32°		34°		36°		38°		42°		46°		50°		54°		58°		62°		66°												

TABLE P. EFFECT OF SUN'S PAR.
Add the Numbers above the black lines to 3rd Correction, subtract the others.

D's App. Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	0	0	1	1	2	3	3	3		
10	1	1	0	0	1	2	2	2		
20	3	3	2	1	1	0	0	1	1	
30	5	4	3	3	2	2	1	1	1	0
40	6	6	5	4	4	3	3	2	2	
50	7	7	6	5	5	4	4	4		
60	8	8	7	6	6	5	5			
70	9	9	8	7	7	6				
80			8	8	7					
90				8						

TABLE VI.

Third Correction, to Apparent Distance 68°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 29	1 31	1 34	1 37	1 41	1 46	1 52	2 6	2 21	2 36	2 52	3 8	3 24	3 39	3 54	4 10	6
7	1 32	1 29	1 31	1 33	1 36	1 39	1 43	1 54	2 5	2 17	2 30	2 43	2 56	3 9	3 22	3 36	7
8	1 36	1 31	1 29	1 30	1 32	1 34	1 37	1 45	1 54	2 4	2 14	2 25	2 37	2 48	2 59	3 11	8
9	1 41	1 34	1 31	1 29	1 30	1 31	1 33	1 38	1 46	1 54	2 3	2 12	2 22	2 32	2 42	2 52	9
10	1 46	1 38	1 33	1 30	1 29	1 30	1 31	1 34	1 40	1 47	1 54	2 2	2 10	2 19	2 28	2 36	10
11	1 52	1 43	1 36	1 32	1 30	1 29	1 30	1 32	1 36	1 41	1 47	1 54	2 1	2 9	2 16	2 24	11
12	1 59	1 48	1 40	1 35	1 32	1 30	1 29	1 30	1 33	1 37	1 42	1 48	1 54	2 0	2 7	2 14	12
13	2 6	1 53	1 44	1 38	1 34	1 32	1 30	1 29	1 31	1 34	1 38	1 43	1 48	1 53	1 59	2 5	13
14	2 14	1 59	1 49	1 42	1 37	1 34	1 31	1 29	1 30	1 32	1 35	1 39	1 44	1 48	1 53	1 58	14
15	2 21	2 5	1 54	1 46	1 40	1 36	1 33	1 30	1 30	1 31	1 33	1 36	1 40	1 44	1 48	1 53	15
16	2 28	2 11	1 59	1 50	1 44	1 39	1 35	1 31	1 29	1 30	1 32	1 34	1 37	1 40	1 44	1 48	16
17	2 36	2 17	2 4	1 54	1 47	1 42	1 38	1 32	1 29	1 29	1 30	1 32	1 34	1 37	1 40	1 44	17
18	2 44	2 24	2 10	1 59	1 51	1 45	1 40	1 34	1 30	1 28	1 29	1 30	1 32	1 35	1 37	1 40	18
19	2 52	2 30	2 15	2 4	1 55	1 48	1 43	1 35	1 31	1 28	1 28	1 29	1 31	1 33	1 35	1 37	19
20	3 0	2 36	2 21	2 8	1 59	1 52	1 46	1 37	1 32	1 29	1 28	1 29	1 30	1 31	1 33	1 35	20
21	3 8	2 43	2 26	2 13	2 3	1 55	1 48	1 39	1 33	1 30	1 28	1 28	1 29	1 30	1 31	1 33	21
22	3 15	2 49	2 32	2 17	2 7	1 58	1 51	1 41	1 35	1 31	1 29	1 27	1 28	1 29	1 30	1 31	22
23	3 23	2 56	2 37	2 22	2 11	2 2	1 54	1 43	1 37	1 32	1 29	1 27	1 27	1 28	1 29	1 30	23
24	3 31	3 3	2 43	2 27	2 15	2 5	1 57	1 46	1 39	1 34	1 30	1 28	1 27	1 28	1 28	1 29	24
25	3 39	3 9	2 48	2 32	2 19	2 9	2 0	1 48	1 41	1 35	1 31	1 29	1 27	1 27	1 27	1 28	25
26	3 47	3 16	2 54	2 37	2 23	2 12	2 4	1 51	1 43	1 36	1 32	1 30	1 28	1 27	1 27	1 27	26
27	3 55	3 23	3 0	2 42	2 27	2 16	2 7	1 54	1 44	1 37	1 33	1 30	1 28	1 27	1 26	1 27	27
28	4 2	3 29	3 5	2 47	2 31	2 19	2 10	1 56	1 46	1 39	1 34	1 31	1 29	1 27	1 26	1 26	28
29	4 10	3 36	3 11	2 52	2 35	2 23	2 14	1 59	1 48	1 41	1 35	1 32	1 29	1 27	1 26	1 26	29
30	4 17	3 42	3 16	2 57	2 40	2 27	2 17	2 1	1 50	1 42	1 36	1 32	1 29	1 27	1 26	1 26	30
31	4 25	3 49	3 22	3 2	2 44	2 31	2 20	2 3	1 52	1 43	1 37	1 33	1 30	1 28	1 27	1 26	31
32	4 32	3 55	3 27	3 7	2 49	2 34	2 23	2 6	1 54	1 45	1 38	1 33	1 30	1 28	1 27	1 26	32
33	4 40	4 2	3 33	3 12	2 53	2 38	2 26	2 9	1 56	1 47	1 39	1 34	1 31	1 29	1 27	1 26	33
34	4 48	4 8	3 39	3 16	2 57	2 42	2 30	2 12	1 58	1 48	1 41	1 35	1 32	1 30	1 28	1 26	34
35	4 55	4 15	3 45	3 21	3 2	2 46	2 34	2 15	2 0	1 50	1 43	1 37	1 33	1 30	1 28	1 26	35
36	5 2	4 21	3 50	3 26	3 6	2 50	2 37	2 17	2 3	1 52	1 44	1 38	1 34	1 31	1 28	1 26	36
37	5 10	4 27	3 56	3 30	3 10	2 53	2 41	2 20	2 5	1 54	1 46	1 39	1 35	1 31	1 28	1 26	37
38	5 17	4 33	4 1	3 35	3 14	2 57	2 44	2 22	2 7	1 56	1 48	1 41	1 36	1 32	1 29	1 27	38
39	5 24	4 39	4 6	3 40	3 18	3 1	2 47	2 25	2 9	1 58	1 50	1 43	1 37	1 33	1 30	1 27	39
40	5 31	4 45	4 11	3 45	3 22	3 5	2 50	2 27	2 11	2 0	1 51	1 44	1 38	1 34	1 31	1 28	40
41	5 38	4 51	4 16	3 49	3 26	3 9	2 53	2 30	2 14	2 2	1 53	1 45	1 39	1 35	1 31	1 28	41
42	5 44	4 57	4 21	3 53	3 30	3 12	2 56	2 32	2 16	2 4	1 54	1 46	1 40	1 36	1 32	1 29	42
43	5 50	5 2	4 26	3 58	3 34	3 16	2 59	2 34	2 19	2 6	1 56	1 48	1 41	1 37	1 33	1 30	43
44	5 57	5 8	4 31	4 2	3 38	3 19	3 3	2 37	2 21	2 8	1 57	1 49	1 43	1 38	1 34	1 31	44
46	6 10	5 19	4 41	4 10	3 46	3 26	3 9	2 42	2 25	2 11	1 59	1 51	1 45	1 40	1 35	1 31	46
48	6 22	5 29	4 50	4 18	3 53	3 32	3 15	2 47	2 29	2 14	2 2	1 54	1 47	1 41	1 36	1 32	48
50	6 34	5 39	4 59	4 26	3 59	3 38	3 21	2 52	2 33	2 18	2 5	1 56	1 49	1 43	1 38	1 33	50
52	6 45	5 48	5 7	4 33	4 6	3 44	3 26	2 56	2 36	2 21	2 8	1 58	1 51	1 45	1 39	1 35	52
54	6 56	5 57	5 14	4 40	4 12	3 50	3 31	3 0	2 39	2 24	2 11	2 0	1 52	1 46	1 40	1 36	54
56	7 6	6 6	5 21	4 46	4 18	3 55	3 36	3 4	2 42	2 27	2 14	2 2	1 54	1 47	1 41	1 37	56
58	7 15	6 14	5 28	4 52	4 24	4 0	3 41	3 8	2 45	2 29	2 16	2 4	1 56	1 49	1 43	1 38	58
60	7 24	6 22	5 35	4 58	4 29	4 5	3 45	3 12	2 48	2 32	2 18	2 6	1 58	1 51	1 45	1 39	60
62	7 33	6 29	5 42	5 3	4 34	4 10	3 49	3 15	2 51	2 34	2 20	2 8	1 59	1 52	1 46	1 40	62
64	7 41	6 35	5 48	5 8	4 39	4 14	3 53	3 18	2 54	2 36	2 22	2 10	2 1	1 53	1 47	1 41	64
66	7 48	6 41	5 53	5 13	4 43	4 18	3 57	3 21	2 56	2 38	2 24	2 12	2 2	1 54	1 48	1 42	66
68	7 55	6 47	5 58	5 17	4 47	4 22	4 0	3 24	2 59	2 40	2 26	2 14	2 3	1 55	1 49	1 43	68
70	8 1	6 52	6 3	5 21	4 51	4 25	4 3	3 27	3 1	2 42	2 27	2 15	2 4	1 56	1 50	1 44	70
72	8 7	6 57	6 8	5 25	4 55	4 28	4 6	3 30	3 3	2 44	2 28	2 15	2 5	1 57	1 51	1 45	72
74	8 12	7 1	6 12	5 29	4 58	4 30	4 8	3 32	3 5	2 45	2 29	2 16	2 5	1 57	1 51	1 45	74
76			6 15	5 32	5 1	4 32	4 10	3 34	3 7	2 46	2 30	2 17	2 6	1 58	1 51	1 45	76
78					5 3	4 34	4 12	3 35	3 9	2 47	2 31	2 18	2 7	1 58	1 52	1 46	78
80							4 13	3 36	3 10	2 48	2 32	2 18	2 7	1 59	1 52	1 46	80
82								3 37	3 11	2 49	2 32	2 19	2 8	1 59	1 52	1 46	82
84									3 11	2 50	2 33	2 20	2 9	2 0	1 53		84
86										2 50	2 33	2 20	2 9	2 0			86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 68°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																		☽'s App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°			
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	4 25	4 40	4 55	5 11	5 40	6 5	6 29	6 51	7 11	7 29	7 45	8 0	8 14						6
7	3 49	4 1	4 14	4 27	4 52	5 15	5 35	5 53	6 10	6 25	6 38	6 50	7 1						7
8	3 22	3 33	3 44	3 55	4 17	4 37	4 55	5 11	5 25	5 38	5 51	6 2	6 10						8
9	3 1	3 11	3 21	3 30	3 48	4 6	4 22	4 37	4 49	5 0	5 10	5 19	5 28						9
10	2 44	2 53	3 2	3 10	3 25	3 41	3 55	4 9	4 21	4 31	4 40	4 49	4 57	5 3					10
11	2 31	2 39	2 47	2 54	3 8	3 22	3 35	3 47	3 58	4 8	4 16	4 23	4 29	4 34					11
12	2 20	2 27	2 34	2 41	2 53	3 6	3 18	3 29	3 39	3 48	3 55	4 2	4 7	4 11					12
13	2 11	2 17	2 23	2 29	2 41	2 52	3 2	3 12	3 22	3 30	3 37	3 43	3 48	3 52					13
14	2 3	2 9	2 14	2 19	2 30	2 40	2 49	2 58	3 6	3 14	3 20	3 26	3 31	3 35	3 38				14
15	1 57	2 2	2 6	2 11	2 21	2 30	2 38	2 46	2 54	3 1	3 7	3 12	3 16	3 20	3 23				15
16	1 52	1 56	2 0	2 4	2 13	2 22	2 29	2 37	2 44	2 50	2 55	3 0	3 4	3 8	3 10				16
17	1 47	1 51	1 55	1 58	2 6	2 14	2 21	2 29	2 35	2 40	2 45	2 49	2 53	2 57	2 59				17
18	1 43	1 47	1 50	1 54	2 1	2 8	2 14	2 22	2 27	2 32	2 36	2 40	2 44	2 47	2 49	2 50			18
19	1 40	1 43	1 46	1 50	1 56	2 2	2 8	2 15	2 20	2 25	2 29	2 32	2 36	2 39	2 41	2 42			19
20	1 37	1 40	1 43	1 46	1 52	1 57	2 3	2 9	2 14	2 18	2 22	2 25	2 28	2 31	2 33	2 34			20
21	1 35	1 37	1 40	1 43	1 48	1 53	1 58	2 3	2 8	2 12	2 16	2 19	2 21	2 23	2 25	2 26			21
22	1 33	1 35	1 37	1 40	1 44	1 49	1 54	1 58	2 2	2 6	2 10	2 13	2 15	2 17	2 19	2 20			22
23	1 31	1 33	1 35	1 37	1 41	1 46	1 50	1 54	1 57	2 1	2 5	2 8	2 10	2 12	2 14	2 15			23
24	1 30	1 31	1 33	1 35	1 39	1 43	1 47	1 50	1 53	1 57	2 0	2 3	2 5	2 7	2 9	2 10			24
25	1 29	1 30	1 31	1 33	1 37	1 40	1 44	1 47	1 50	1 53	1 56	1 59	2 1	2 2	2 4	2 5			25
26	1 28	1 29	1 31	1 32	1 35	1 38	1 41	1 44	1 47	1 50	1 53	1 55	1 57	1 58	1 59	2 0			26
27	1 27	1 28	1 29	1 30	1 33	1 36	1 38	1 41	1 44	1 47	1 50	1 52	1 53	1 54	1 55				27
28	1 27	1 27	1 28	1 29	1 31	1 34	1 36	1 39	1 41	1 44	1 47	1 49	1 50	1 51	1 52				28
29	1 26	1 26	1 27	1 27	1 29	1 32	1 34	1 37	1 39	1 41	1 44	1 46	1 47	1 48	1 49				29
30	1 26	1 26	1 26	1 26	1 28	1 30	1 32	1 35	1 37	1 39	1 41	1 43	1 44	1 45	1 46				30
31	1 25	1 25	1 26	1 26	1 27	1 29	1 31	1 33	1 35	1 37	1 39	1 40	1 41	1 42					31
32	1 25	1 25	1 25	1 25	1 26	1 28	1 29	1 31	1 33	1 35	1 37	1 38	1 39	1 40					32
33	1 25	1 24	1 25	1 25	1 26	1 27	1 28	1 30	1 31	1 33	1 35	1 36	1 37	1 38					33
34	1 25	1 24	1 24	1 24	1 25	1 26	1 27	1 29	1 30	1 31	1 33	1 34	1 35	1 36					34
35	1 25	1 24	1 24	1 24	1 24	1 25	1 26	1 28	1 29	1 30	1 31	1 32	1 33						35
36	1 25	1 24	1 23	1 23	1 23	1 24	1 25	1 27	1 28	1 29	1 30	1 30	1 31						36
37	1 25	1 24	1 23	1 23	1 23	1 23	1 24	1 26	1 27	1 28	1 29	1 29	1 30						37
38	1 25	1 24	1 23	1 22	1 22	1 23	1 24	1 25	1 26	1 27	1 28	1 28	1 29						38
39	1 25	1 24	1 23	1 22	1 22	1 23	1 23	1 24	1 25	1 26	1 27	1 27							39
40	1 26	1 25	1 24	1 23	1 22	1 22	1 23	1 23	1 24	1 25	1 26	1 26							40
41	1 26	1 25	1 24	1 23	1 21	1 21	1 22	1 22	1 23	1 24	1 25	1 25							41
42	1 27	1 25	1 24	1 23	1 21	1 21	1 21	1 22	1 23	1 23	1 24	1 24							42
43	1 27	1 25	1 24	1 23	1 21	1 21	1 21	1 21	1 22	1 22	1 23								43
44	1 28	1 26	1 24	1 23	1 21	1 20	1 20	1 20	1 21	1 21	1 22								44
46	1 28	1 26	1 25	1 24	1 21	1 19	1 19	1 19	1 20	1 20	1 20								46
48	1 29	1 27	1 25	1 24	1 22	1 19	1 18	1 18	1 19	1 19									48
50	1 30	1 28	1 26	1 25	1 22	1 20	1 18	1 18	1 18	1 18									50
52	1 31	1 29	1 27	1 25	1 22	1 20	1 18	1 17	1 17										52
54	1 32	1 29	1 27	1 26	1 23	1 20	1 18	1 17	1 16										54
56	1 33	1 30	1 28	1 26	1 23	1 20	1 18	1 16											56
58	1 34	1 31	1 29	1 27	1 23	1 20	1 18	1 16											58
60	1 35	1 32	1 29	1 27	1 23	1 20	1 18												60
62	1 36	1 33	1 30	1 28	1 23	1 20	1 18												62
64	1 37	1 33	1 30	1 28	1 24	1 20													64
66	1 38	1 34	1 31	1 28	1 24	1 20													66
68	1 38	1 34	1 31	1 28	1 24														68
70	1 39	1 35	1 32	1 29	1 24														70
72	1 39	1 35	1 32	1 29															72
74	1 40	1 36	1 32	1 29															74
76	1 40	1 36	1 32																76
78	1 41	1 36																	78
80	1 41																		80
82																			82
84																			84
86																			86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°								

TABLE *P*. EFFECT OF SUN'S PAR. Add the Numbers above the black lines to 3rd Correction, subtract the others.

☽'s app alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	1	0	0	1	1	2	2	3		
10	2	1	0	0	1	1	1	2	2	
20	3	3	2	1	1	0	0	0	0	0
30	4	4	4	3	2	2	2	1	1	
40	5	6	5	4	4	3	3	2		
50	6	7	6	6	5	5	4			
60	8	8	7	7	6	6				
70	9	8	8	7	7					
80		9	8	8						
90				8						

TABLE VI.

Third Correction, to Apparent Distance 72°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 33	1 35	1 37	1 40	1 44	1 50	1 56	2 9	2 23	2 38	2 53	3 9	3 24	3 40	3 56	4 12	6
7	1 35	1 33	1 34	1 36	1 39	1 43	1 47	1 56	2 8	2 21	2 34	2 47	3 0	3 12	3 26	3 38	7
8	1 39	1 35	1 33	1 34	1 36	1 38	1 41	1 48	1 58	2 8	2 19	2 30	2 41	2 52	3 3	3 14	8
9	1 44	1 38	1 35	1 33	1 34	1 35	1 37	1 42	1 50	1 58	2 7	2 17	2 26	2 35	2 44	2 54	9
10	1 50	1 42	1 37	1 34	1 33	1 34	1 35	1 38	1 44	1 50	1 58	2 6	2 14	2 22	2 30	2 39	10
11	1 56	1 46	1 40	1 36	1 34	1 33	1 34	1 36	1 40	1 45	1 51	1 58	2 5	2 12	2 20	2 27	11
12	2 2	1 51	1 44	1 39	1 36	1 34	1 33	1 35	1 37	1 41	1 46	1 52	1 58	2 4	2 11	2 17	12
13	2 9	1 56	1 48	1 42	1 39	1 36	1 34	1 34	1 35	1 38	1 42	1 47	1 52	1 58	2 4	2 9	13
14	2 16	2 2	1 53	1 46	1 42	1 39	1 36	1 33	1 34	1 36	1 39	1 43	1 47	1 52	1 57	2 2	14
15	2 23	2 8	1 58	1 50	1 45	1 41	1 38	1 34	1 33	1 34	1 36	1 39	1 43	1 47	1 51	1 56	15
16	2 30	2 14	2 3	1 54	1 48	1 43	1 40	1 35	1 33	1 33	1 34	1 36	1 39	1 43	1 47	1 52	16
17	2 37	2 20	2 8	1 58	1 51	1 46	1 42	1 36	1 34	1 33	1 34	1 35	1 37	1 40	1 44	1 48	17
18	2 45	2 27	2 13	2 2	1 54	1 48	1 44	1 37	1 34	1 33	1 33	1 34	1 36	1 38	1 41	1 44	18
19	2 53	2 33	2 18	2 7	1 58	1 51	1 46	1 39	1 35	1 33	1 33	1 34	1 35	1 37	1 39	1 41	19
20	3 1	2 40	2 24	2 11	2 2	1 54	1 49	1 41	1 36	1 34	1 33	1 33	1 34	1 35	1 37	1 39	20
21	3 9	2 46	2 29	2 16	2 6	1 58	1 52	1 43	1 37	1 34	1 33	1 33	1 33	1 34	1 35	1 37	21
22	3 17	2 53	2 35	2 20	2 10	2 2	1 55	1 45	1 39	1 35	1 33	1 32	1 33	1 33	1 34	1 35	22
23	3 25	2 59	2 40	2 25	2 14	2 5	1 58	1 47	1 40	1 36	1 34	1 32	1 32	1 33	1 33	1 34	23
24	3 33	3 6	2 46	2 30	2 18	2 8	2 1	1 50	1 42	1 37	1 34	1 32	1 32	1 32	1 33	1 34	24
25	3 41	3 12	2 51	2 35	2 23	2 12	2 4	1 52	1 44	1 38	1 35	1 33	1 32	1 32	1 32	1 33	25
26	3 48	3 18	2 57	2 40	2 27	2 16	2 8	1 55	1 46	1 40	1 36	1 33	1 32	1 31	1 31	1 32	26
27	3 56	3 25	3 2	2 45	2 31	2 20	2 12	1 57	1 48	1 41	1 37	1 34	1 32	1 31	1 31	1 31	27
28	4 3	3 31	3 7	2 49	2 35	2 24	2 15	2 0	1 50	1 43	1 38	1 34	1 32	1 31	1 30	1 31	28
29	4 11	3 37	3 13	2 54	2 39	2 27	2 18	2 2	1 52	1 45	1 39	1 35	1 35	1 32	1 31	1 30	29
30	4 18	3 44	3 19	2 59	2 43	2 31	2 21	2 5	1 54	1 46	1 40	1 36	1 34	1 32	1 31	1 30	30
31	4 26	3 50	3 24	3 4	2 47	2 34	2 24	2 8	1 56	1 48	1 41	1 37	1 34	1 32	1 31	1 30	31
32	4 33	3 56	3 29	3 9	2 51	2 38	2 27	2 11	1 58	1 50	1 43	1 38	1 35	1 33	1 32	1 31	32
33	4 40	4 2	3 35	3 14	2 56	2 42	2 30	2 14	2 0	1 51	1 44	1 39	1 35	1 33	1 32	1 31	33
34	4 47	4 9	3 41	3 18	3 0	2 45	2 33	2 16	2 2	1 53	1 46	1 40	1 36	1 34	1 32	1 31	34
35	4 54	4 15	3 46	3 23	3 4	2 49	2 37	2 18	2 4	1 54	1 47	1 41	1 37	1 34	1 32	1 31	35
36	5 1	4 21	3 51	3 27	3 8	2 53	2 40	2 20	2 7	1 56	1 48	1 42	1 38	1 35	1 33	1 32	36
37	5 9	4 27	3 56	3 32	3 12	2 57	2 43	2 23	2 9	1 58	1 50	1 44	1 39	1 36	1 33	1 32	37
38	5 16	4 33	4 1	3 37	3 16	3 0	2 47	2 26	2 11	2 0	1 52	1 45	1 40	1 37	1 34	1 32	38
39	5 23	4 39	4 6	3 41	3 20	3 4	2 50	2 28	2 13	2 2	1 53	1 46	1 41	1 38	1 34	1 32	39
40	5 30	4 45	4 11	3 46	3 24	3 7	2 54	2 30	2 15	2 4	1 54	1 48	1 43	1 39	1 35	1 33	40
41	5 37	4 51	4 16	3 50	3 28	3 11	2 57	2 32	2 18	2 6	1 56	1 49	1 44	1 40	1 36	1 33	41
42	5 44	4 57	4 21	3 54	3 32	3 15	3 0	2 35	2 20	2 8	1 58	1 50	1 45	1 41	1 37	1 34	42
43	5 51	5 2	4 26	3 59	3 36	3 18	3 3	2 37	2 22	2 10	1 59	1 51	1 46	1 42	1 38	1 34	43
44	5 57	5 7	4 30	4 3	3 40	3 22	3 6	2 41	2 24	2 12	2 1	1 53	1 47	1 43	1 39	1 35	44
46	6 9	5 17	4 39	4 11	3 47	3 29	3 12	2 45	2 28	2 15	2 4	1 55	1 49	1 44	1 40	1 36	46
48	6 21	5 27	4 48	4 19	3 54	3 35	3 18	2 50	2 32	2 18	2 7	1 58	1 51	1 45	1 41	1 38	48
50	6 32	5 37	4 57	4 26	4 1	3 41	3 23	2 55	2 35	2 21	2 10	2 0	1 53	1 47	1 43	1 39	50
52	6 43	5 46	5 6	4 33	4 7	3 46	3 28	2 59	2 39	2 24	2 12	2 2	1 55	1 49	1 44	1 40	52
54	6 54	5 55	5 14	4 40	4 13	3 52	3 33	3 3	2 43	2 27	2 15	2 5	1 57	1 50	1 45	1 41	54
56	7 4	6 4	5 22	4 47	4 19	3 57	3 38	3 7	2 47	2 31	2 18	2 7	1 59	1 52	1 46	1 42	56
58	7 13	6 12	5 29	4 53	4 25	4 2	3 43	3 11	2 50	2 34	2 21	2 9	2 0	1 53	1 47	1 43	58
60	7 22	6 20	5 35	4 58	4 30	4 7	3 47	3 15	2 53	2 37	2 23	2 11	2 1	1 54	1 49	1 44	60
62	7 31	6 27	5 41	5 3	4 35	4 11	3 51	3 19	2 56	2 39	2 25	2 13	2 4	1 56	1 50	1 45	62
64	7 39	6 33	5 47	5 8	4 40	4 15	3 55	3 22	2 59	2 41	2 27	2 15	2 5	1 57	1 51	1 46	64
66	7 46	6 39	5 53	5 13	4 44	4 19	3 59	3 25	3 1	2 43	2 29	2 16	2 6	1 58	1 52	1 47	66
68	7 52	6 45	5 58	5 18	4 48	4 23	4 2	3 28	3 3	2 45	2 30	2 18	2 7	1 59	1 52	1 47	68
70	7 58	6 50	6 3	5 22	4 52	4 26	4 4	3 30	3 5	2 47	2 31	2 19	2 8	2 0	1 53	1 48	70
72	8 4	6 55	6 7	5 26	4 55	4 29	4 7	3 32	3 7	2 48	2 33	2 20	2 9	2 1	1 54	1 48	72
74	8 9	7 0	6 10	5 30	4 58	4 31	4 9	3 34	3 9	2 49	2 34	2 21	2 10	2 2	1 55	1 49	74
76	8 13	7 4	6 14	5 33	5 1	4 33	4 11	3 35	3 11	2 50	2 35	2 22	2 11	2 1	1 56	1 49	76
78	8 16	7 7	6 17	5 36	5 3	4 35	4 12	3 37	3 12	2 51	2 36	2 23	2 12	2 3	1 56	1 50	78
80			6 19	5 38	5 5	4 37	4 14	3 38	3 13	2 52	2 37	2 24	2 13	2 4	1 57		80
82					5 7	4 39	4 16	3 39	3 13	2 53	2 38	2 24	2 13	2 4			82
84							4 17	3 40	3 14	2 54	2 38	2 24	2 14				84
86								3 41	3 15	2 54	2 38	2 24					86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 72°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																		☽'s App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°			
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	4 27	4 41	4 56	5 11	5 38	6 3	6 27	6 48	7 8	7 27	7 42	7 55	8 6	8 16					6
7	3 51	4 3	4 16	4 28	4 51	5 12	5 32	5 51	6 8	6 23	6 36	6 48	6 58	7 7					7
8	3 25	3 36	3 47	3 58	4 18	4 36	4 54	5 11	5 26	5 39	5 51	6 1	6 9	6 16					8
9	3 4	3 14	3 24	3 33	3 51	4 8	4 23	4 37	4 50	5 1	5 11	5 20	5 28	5 35					9
10	2 48	2 57	3 6	3 14	3 29	3 44	3 58	4 10	4 22	4 33	4 42	4 51	4 57	5 3	5 7				10
11	2 35	2 43	2 51	2 58	3 11	3 25	3 37	3 48	3 59	4 9	4 17	4 24	4 30	4 35	4 39				11
12	2 24	2 31	2 38	2 45	2 57	3 9	3 20	3 31	3 41	3 49	3 57	4 3	4 8	4 12	4 16				12
13	2 15	2 21	2 27	2 33	2 45	2 56	3 6	3 16	3 24	3 32	3 39	3 45	3 49	3 53	3 56				13
14	2 7	2 13	2 18	2 24	2 34	2 44	2 54	3 2	3 10	3 18	3 24	3 29	3 33	3 36	3 39	3 41			14
15	2 1	2 6	2 11	2 16	2 25	2 34	2 43	2 51	2 58	3 5	3 11	3 16	3 20	3 23	3 25	3 27			15
16	1 56	2 1	2 5	2 9	2 18	2 26	2 33	2 41	2 48	2 54	2 59	3 4	3 8	3 11	3 13	3 15			16
17	1 52	1 56	1 59	2 3	2 11	2 19	2 25	2 32	2 39	2 45	2 50	2 54	2 57	3 0	3 2	3 4			17
18	1 48	1 51	1 54	1 58	2 6	2 13	2 19	2 25	2 31	2 37	2 42	2 46	2 48	2 50	2 52	2 54			18
19	1 44	1 47	1 50	1 54	2 1	2 7	2 13	2 19	2 25	2 30	2 35	2 38	2 40	2 42	2 44	2 45			19
20	1 41	1 44	1 47	1 50	1 56	2 2	2 7	2 13	2 19	2 23	2 28	2 31	2 33	2 35	2 36	2 37			20
21	1 39	1 41	1 44	1 46	1 52	1 57	2 2	2 8	2 13	2 17	2 21	2 24	2 26	2 28	2 29	2 30			21
22	1 37	1 39	1 41	1 43	1 48	1 53	1 58	2 3	2 7	2 11	2 15	2 18	2 20	2 22	2 23	2 24			22
23	1 36	1 37	1 39	1 41	1 45	1 50	1 54	1 59	2 2	2 6	2 10	2 13	2 15	2 16	2 17				23
24	1 35	1 36	1 37	1 39	1 43	1 47	1 51	1 55	1 58	2 2	2 5	2 8	2 10	2 11	2 12				24
25	1 34	1 35	1 36	1 38	1 41	1 44	1 48	1 51	1 54	1 58	2 1	2 3	2 5	2 6	2 8				25
26	1 33	1 34	1 35	1 36	1 39	1 42	1 45	1 48	1 51	1 54	1 57	1 59	2 1	2 2	2 4				26
27	1 32	1 33	1 34	1 35	1 37	1 40	1 43	1 45	1 48	1 51	1 54	1 56	1 57	1 58					27
28	1 32	1 32	1 33	1 34	1 35	1 38	1 41	1 43	1 46	1 48	1 51	1 53	1 54	1 55					28
29	1 31	1 32	1 32	1 33	1 34	1 36	1 39	1 41	1 44	1 46	1 48	1 50	1 52	1 53					29
30	1 31	1 31	1 32	1 32	1 33	1 35	1 37	1 39	1 42	1 44	1 46	1 47	1 49	1 50					30
31	1 30	1 31	1 31	1 31	1 32	1 34	1 36	1 38	1 40	1 42	1 44	1 45	1 46						31
32	1 29	1 30	1 30	1 30	1 31	1 33	1 35	1 36	1 38	1 40	1 42	1 43	1 44						32
33	1 29	1 29	1 29	1 30	1 31	1 32	1 33	1 34	1 36	1 38	1 40	1 41	1 42						33
34	1 30	1 29	1 29	1 29	1 30	1 31	1 32	1 33	1 34	1 36	1 38	1 39	1 34						34
35	1 30	1 29	1 29	1 29	1 30	1 30	1 31	1 32	1 33	1 35	1 36	1 37							35
36	1 31	1 29	1 28	1 28	1 29	1 30	1 31	1 32	1 33	1 34	1 35	1 36							36
37	1 31	1 30	1 28	1 28	1 29	1 29	1 30	1 31	1 32	1 33	1 34	1 35							37
38	1 31	1 30	1 28	1 27	1 28	1 29	1 30	1 31	1 32	1 33	1 33	1 34							38
39	1 31	1 30	1 29	1 28	1 28	1 28	1 29	1 30	1 31	1 32	1 32								39
40	1 31	1 30	1 29	1 28	1 27	1 28	1 28	1 29	1 30	1 30	1 30								40
41	1 31	1 30	1 29	1 28	1 27	1 27	1 27	1 28	1 28	1 29	1 29								41
42	1 32	1 31	1 29	1 28	1 26	1 26	1 26	1 27	1 27	1 28	1 28								42
43	1 32	1 31	1 29	1 28	1 26	1 26	1 26	1 26	1 26	1 27									43
44	1 33	1 31	1 30	1 28	1 26	1 26	1 25	1 25	1 25	1 26									44
45	1 34	1 32	1 30	1 29	1 27	1 25	1 25	1 25	1 25	1 25									46
48	1 35	1 32	1 30	1 29	1 27	1 25	1 24	1 24	1 24										48
50	1 36	1 33	1 31	1 30	1 27	1 25	1 24	1 23	1 23										50
52	1 37	1 34	1 31	1 30	1 27	1 25	1 23	1 22											52
54	1 37	1 34	1 32	1 31	1 28	1 25	1 23	1 22											54
56	1 38	1 35	1 33	1 31	1 28	1 25	1 23												56
58	1 39	1 36	1 34	1 32	1 28	1 25	1 23												58
60	1 39	1 36	1 34	1 32	1 28	1 25													60
62	1 40	1 37	1 35	1 32	1 28	1 25													62
64	1 41	1 38	1 36	1 33	1 28														64
66	1 42	1 38	1 36	1 33	1 28														66
68	1 43	1 39	1 36	1 34															68
70	1 43	1 39	1 36	1 34															70
72	1 44	1 40	1 36																72
74	1 44	1 40																	74
76	1 45																		76
78																			78
80																			80
82																			82
84																			84
86																			86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°								

TABLE *P*. EFFECT OF SUN's PAR. Add the Numbers above the black lines to 3rd Correction, subtract the others.

☽'s App. Alt.	Sun's Apparent Altitude.									
	0	10	20	30	40	50	60	70	80	90
5	1	0	0	1	1	2	2	2		
10	2	1	1	0	0	1	1	1	1	
20	3	3	2	2	1	1	1	1	0	0
30	4	4	4	3	3	2	2	2		
40	6	6	5	5	4	4	4	3		
50	7	7	6	6	5	5	5			
60	8	8	7	7	6	6				
70	9	8	8	7	7					
80		9	8	8						
90			9							

TABLE VI.

Third Correction, to Apparent Distance 76°.

D's App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															D's App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ′	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 37	1 39	1 41	1 44	1 48	1 54	2 0	2 13	2 27	2 42	2 57	3 13	3 28	3 43	3 58	4 13	6
7	1 40	1 37	1 38	1 40	1 43	1 47	1 51	2 1	2 12	2 24	2 37	2 50	3 3	3 15	3 28	3 40	7
8	1 44	1 40	1 37	1 38	1 40	1 42	1 45	1 52	2 2	2 12	2 22	2 33	2 44	2 54	3 5	3 16	8
9	1 49	1 43	1 39	1 37	1 38	1 39	1 41	1 46	1 54	2 2	2 11	2 20	2 30	2 39	2 48	2 58	9
10	1 54	1 46	1 41	1 39	1 37	1 38	1 39	1 42	1 48	1 55	2 2	2 10	2 18	2 26	2 34	2 43	10
11	2 0	1 50	1 44	1 41	1 39	1 37	1 38	1 40	1 44	1 49	1 55	2 2	2 9	2 16	2 23	2 31	11
12	2 6	1 55	1 48	1 44	1 41	1 38	1 37	1 38	1 41	1 45	1 50	1 56	2 2	2 8	2 15	2 21	12
13	2 12	2 0	1 52	1 47	1 43	1 40	1 38	1 37	1 39	1 42	1 46	1 51	1 56	2 2	2 8	2 13	13
14	2 19	2 6	1 56	1 50	1 45	1 42	1 40	1 37	1 38	1 40	1 43	1 47	1 52	1 57	2 2	2 7	14
15	2 26	2 12	2 1	1 54	1 48	1 44	1 42	1 38	1 37	1 39	1 41	1 45	1 49	1 53	1 57	2 1	15
16	2 34	2 18	2 6	1 58	1 51	1 47	1 44	1 39	1 37	1 38	1 39	1 43	1 46	1 49	1 53	1 56	16
17	2 41	2 24	2 11	2 2	1 54	1 49	1 46	1 40	1 38	1 37	1 39	1 41	1 43	1 46	1 49	1 52	17
18	2 49	2 30	2 17	2 6	1 58	1 52	1 48	1 42	1 39	1 36	1 37	1 39	1 41	1 43	1 46	1 49	18
19	2 57	2 36	2 22	2 10	2 2	1 55	1 50	1 43	1 40	1 37	1 36	1 38	1 39	1 41	1 43	1 46	19
20	2 5	2 43	2 27	2 15	2 6	1 58	1 52	1 45	1 41	1 38	1 36	1 37	1 38	1 39	1 41	1 43	20
21	3 12	2 49	2 33	2 20	2 10	2 2	1 55	1 47	1 42	1 39	1 37	1 36	1 37	1 38	1 39	1 41	21
22	3 20	2 56	2 38	2 24	2 14	2 5	1 58	1 49	1 44	1 40	1 38	1 36	1 36	1 37	1 38	1 39	22
23	3 28	3 3	2 44	2 29	2 18	2 9	2 1	1 51	1 45	1 41	1 38	1 36	1 35	1 36	1 37	1 38	23
24	3 36	3 9	2 49	2 34	2 22	2 12	2 4	1 54	1 47	1 42	1 39	1 37	1 35	1 36	1 36	1 37	24
25	3 44	3 15	2 54	2 39	2 26	2 16	2 7	1 56	1 49	1 44	1 40	1 37	1 36	1 36	1 36	1 37	25
26	3 51	3 21	3 0	2 44	2 30	2 20	2 11	1 59	1 51	1 45	1 41	1 38	1 36	1 35	1 35	1 36	26
27	3 59	3 28	3 5	2 49	2 34	2 23	2 14	2 1	1 53	1 47	1 42	1 39	1 37	1 36	1 35	1 35	27
28	4 6	3 34	3 10	2 54	2 38	2 27	2 17	2 4	1 54	1 48	1 43	1 39	1 37	1 36	1 35	1 35	28
29	4 13	3 40	3 15	2 58	2 42	2 31	2 21	2 7	1 56	1 49	1 44	1 40	1 38	1 36	1 35	1 34	29
30	4 20	3 46	3 21	3 2	2 47	2 34	2 24	2 9	1 58	1 51	1 45	1 41	1 39	1 37	1 35	1 34	30
31	4 27	3 52	3 26	3 7	2 51	2 38	2 28	2 12	2 0	1 52	1 46	1 42	1 39	1 37	1 35	1 34	31
32	4 34	3 58	3 31	3 12	2 55	2 42	2 31	2 14	2 1	1 54	1 48	1 43	1 40	1 38	1 36	1 35	32
33	4 41	4 4	3 37	3 16	2 59	2 45	2 34	2 17	2 4	1 55	1 49	1 44	1 41	1 38	1 36	1 35	33
34	4 48	4 10	3 42	3 20	3 3	2 49	2 37	2 19	2 6	1 57	1 50	1 45	1 42	1 39	1 37	1 35	34
35	4 55	4 16	3 47	3 25	3 7	2 52	2 41	2 22	2 8	1 59	1 52	1 46	1 42	1 39	1 37	1 35	35
36	5 2	4 22	3 53	3 29	3 11	2 56	2 44	2 24	2 11	2 1	1 53	1 47	1 43	1 40	1 38	1 36	36
37	5 9	4 27	3 58	3 34	3 15	3 0	2 47	2 27	2 13	2 3	1 55	1 48	1 44	1 41	1 38	1 36	37
38	5 16	4 33	4 3	3 38	3 19	3 3	2 50	2 29	2 15	2 4	1 56	1 49	1 45	1 42	1 39	1 37	38
39	5 23	4 38	4 8	3 43	3 23	3 7	2 53	2 31	2 17	2 6	1 58	1 51	1 46	1 42	1 39	1 37	39
40	5 30	4 44	4 13	3 47	3 27	3 10	2 56	2 34	2 19	2 8	1 59	1 52	1 47	1 43	1 40	1 38	40
41	5 37	4 50	4 18	3 51	3 31	3 14	2 59	2 36	2 22	2 10	2 0	1 53	1 48	1 44	1 41	1 38	41
42	5 43	4 55	4 23	3 55	3 34	3 17	3 2	2 39	2 24	2 12	2 1	1 54	1 49	1 45	1 42	1 39	42
43	5 49	5 1	4 28	3 59	3 38	3 20	3 5	2 41	2 26	2 14	2 3	1 56	1 50	1 46	1 43	1 40	43
44	5 55	5 6	4 33	4 3	3 41	3 24	3 8	2 44	2 28	2 15	2 4	1 57	1 51	1 47	1 43	1 40	44
46	6 7	5 16	4 42	4 11	3 49	3 31	3 14	2 49	2 32	2 18	2 7	1 59	1 53	1 48	1 44	1 41	46
48	6 19	5 26	4 51	4 19	3 56	3 37	3 20	2 54	2 35	2 21	2 10	2 2	1 55	1 50	1 46	1 43	48
50	6 30	5 36	4 59	4 27	4 3	3 43	3 25	2 58	2 39	2 25	2 13	2 4	1 57	1 51	1 47	1 44	50
52	6 41	5 46	5 7	4 34	4 10	3 49	3 30	3 3	2 43	2 28	2 16	2 6	1 59	1 53	1 49	1 45	52
54	6 51	5 55	5 15	4 41	4 17	3 55	3 35	3 7	2 47	2 31	2 19	2 9	2 1	1 55	1 50	1 46	54
56	7 1	6 4	5 22	4 48	4 23	4 0	3 40	3 11	2 50	2 34	2 22	2 12	2 3	1 56	1 51	1 47	56
58	7 11	6 12	5 29	4 54	4 28	4 5	3 45	3 15	2 53	2 37	2 25	2 14	2 5	1 57	1 52	1 48	58
60	7 20	6 20	5 36	5 0	4 33	4 9	3 49	3 19	2 56	2 40	2 27	2 16	2 6	1 59	1 53	1 49	60
62	7 28	6 27	5 42	5 5	4 37	4 14	3 53	3 22	2 59	2 43	2 29	2 18	2 8	2 0	1 54	1 50	62
64	7 36	6 34	5 48	5 10	4 41	4 18	3 57	3 25	3 2	2 45	2 31	2 20	2 10	2 2	1 56	1 51	64
66	7 43	6 40	5 54	5 15	4 45	4 22	4 1	3 28	3 5	2 47	2 33	2 21	2 11	2 3	1 57	1 52	66
68	7 49	6 45	5 59	5 19	4 49	4 26	4 5	3 31	3 8	2 49	2 35	2 23	2 13	2 4	1 58	1 53	68
70	7 55	6 50	6 3	5 23	4 53	4 29	4 8	3 34	3 10	2 51	2 36	2 24	2 14	2 5	1 58	1 53	70
72	8 1	6 54	6 7	5 27	4 57	4 32	4 11	3 37	3 12	2 52	2 37	2 25	2 15	2 6	1 59	1 54	72
74	8 6	6 58	6 10	5 30	5 0	4 34	4 13	3 39	3 13	2 53	2 38	2 26	2 16	2 7	2 0	1 54	74
76	8 11	7 2	6 13	5 33	5 3	4 36	4 15	3 41	3 14	2 54	2 39	2 26	2 16	2 7	2 1		76
78	8 15	7 6	6 16	5 36	5 5	4 38	4 17	3 42	3 15	2 55	2 40	2 27	2 17	2 8			78
80	8 18	7 9	6 19	5 38	5 7	4 40	4 19	3 43	3 16	2 56	2 40	2 28	2 18				80
82	8 20	7 11	6 21	5 40	5 9	4 42	4 20	3 44	3 17	2 57	2 41	2 28					82
84			6 23	5 42	5 10	4 43	4 21	3 45	3 18	2 58	2 41						84
86					5 11	4 44	4 22	3 45	3 18	2 58							86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 76°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																						☽'s App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°							
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″							°
6	4 28	4 42	4 57	5 11	5 37	6 2	6 27	6 47	7 6	7 24	7 40	7 54	8 5	8 13	8 20								6
7	3 53	4 5	4 17	4 29	4 52	5 13	5 33	5 52	6 9	6 24	6 37	6 48	6 57	7 5	7 12								7
8	3 27	3 38	3 49	3 59	4 19	4 38	4 56	5 12	5 26	5 39	5 51	6 1	6 9	6 16	6 21								8
9	3 8	3 17	3 26	3 35	3 52	4 8	4 24	4 38	4 51	5 3	5 13	5 22	5 29	5 35	5 40								9
10	2 52	3 0	3 8	3 16	3 31	3 46	4 1	4 14	4 25	4 35	4 44	4 52	4 59	5 4	5 8	5 11							10
11	2 39	2 46	2 53	3 0	3 14	3 27	3 40	3 51	4 2	4 12	4 20	4 27	4 33	4 38	4 42	4 45							11
12	2 28	2 34	2 41	2 47	3 0	3 12	3 23	3 34	3 43	3 52	4 0	4 6	4 11	4 15	4 19	4 22							12
13	2 19	2 25	2 30	2 36	2 48	2 59	3 9	3 19	3 28	3 36	3 43	3 48	3 53	3 57	4 0	4 2							13
14	2 12	2 17	2 22	2 27	2 38	2 48	2 58	3 6	3 14	3 22	3 28	3 33	3 37	3 41	3 43	3 45							14
15	2 5	2 10	2 15	2 19	2 29	2 38	2 47	2 55	3 3	3 9	3 15	3 20	3 24	3 27	3 29	3 31							15
16	2 0	2 4	2 9	2 13	2 21	2 29	2 37	2 45	2 52	2 58	3 4	3 8	3 12	3 15	3 17	3 19							16
17	1 56	1 59	2 3	2 7	2 14	2 22	2 29	2 36	2 43	2 49	2 54	2 58	3 2	3 4	3 6	3 8							17
18	1 52	1 55	1 58	2 2	2 9	2 16	2 23	2 30	2 36	2 42	2 46	2 50	2 53	2 55	2 57	2 58							18
19	1 49	1 51	1 54	1 58	2 4	2 11	2 17	2 24	2 30	2 35	2 39	2 42	2 45	2 47	2 49								19
20	1 46	1 48	1 51	1 54	2 0	2 6	2 12	2 18	2 24	2 28	2 32	2 35	2 37	2 39	2 41								20
21	1 43	1 45	1 48	1 51	1 56	2 2	2 7	2 13	2 18	2 22	2 26	2 29	2 31	2 33	2 34								21
22	1 41	1 43	1 46	1 48	1 53	1 58	2 3	2 8	2 13	2 17	2 20	2 23	2 25	2 27	2 28								22
23	1 40	1 42	1 44	1 46	1 50	1 55	1 59	2 3	2 8	2 12	2 15	2 17	2 19	2 21									23
24	1 39	1 40	1 42	1 44	1 48	1 52	1 56	1 59	2 4	2 7	2 10	2 12	2 14	2 16									24
25	1 38	1 39	1 40	1 42	1 46	1 49	1 53	1 56	2 0	2 3	2 6	2 8	2 10	2 12									25
26	1 37	1 38	1 39	1 41	1 44	1 47	1 50	1 53	1 56	1 59	2 2	2 4	2 6	2 8									26
27	1 36	1 37	1 38	1 40	1 42	1 45	1 48	1 50	1 53	1 56	1 59	2 1	2 3										27
28	1 36	1 37	1 38	1 39	1 41	1 43	1 46	1 48	1 50	1 53	1 56	1 58	2 0										28
29	1 35	1 36	1 37	1 38	1 40	1 42	1 44	1 46	1 48	1 50	1 53	1 55	1 57										29
30	1 35	1 35	1 36	1 37	1 38	1 40	1 42	1 44	1 46	1 48	1 50	1 52	1 54										30
31	1 34	1 34	1 35	1 36	1 37	1 39	1 40	1 42	1 44	1 46	1 48	1 50											31
32	1 34	1 34	1 34	1 35	1 36	1 38	1 39	1 41	1 43	1 44	1 46	1 48											32
33	1 34	1 33	1 34	1 35	1 35	1 37	1 38	1 40	1 42	1 43	1 45	1 46											33
34	1 34	1 33	1 33	1 34	1 35	1 36	1 37	1 39	1 41	1 42	1 44	1 45											34
35	1 34	1 33	1 33	1 33	1 34	1 35	1 36	1 38	1 39	1 40	1 42												35
36	1 35	1 34	1 33	1 33	1 33	1 34	1 35	1 37	1 38	1 39	1 40												36
37	1 35	1 34	1 33	1 32	1 33	1 33	1 34	1 36	1 37	1 38	1 39												37
38	1 35	1 34	1 33	1 32	1 32	1 33	1 34	1 35	1 36	1 37	1 38												38
39	1 36	1 34	1 33	1 32	1 32	1 33	1 33	1 34	1 35	1 36													39
40	1 36	1 35	1 34	1 33	1 32	1 32	1 33	1 34	1 34	1 35													40
41	1 37	1 35	1 34	1 33	1 32	1 32	1 32	1 33	1 33	1 34													41
42	1 37	1 35	1 34	1 33	1 31	1 31	1 32	1 32	1 33	1 33													42
43	1 37	1 35	1 34	1 33	1 31	1 30	1 31	1 31	1 32														43
44	1 38	1 36	1 34	1 33	1 31	1 30	1 30	1 31	1 31														44
46	1 39	1 37	1 35	1 34	1 31	1 29	1 29	1 30	1 30														46
48	1 40	1 38	1 36	1 34	1 31	1 29	1 29	1 29															48
50	1 41	1 38	1 37	1 35	1 32	1 30	1 29	1 29															50
52	1 42	1 39	1 37	1 35	1 32	1 30	1 29																52
54	1 43	1 40	1 38	1 36	1 33	1 30	1 29																54
56	1 44	1 41	1 38	1 36	1 33	1 30																	56
58	1 45	1 42	1 39	1 37	1 33	1 30																	58
60	1 46	1 43	1 40	1 37	1 33																		60
62	1 46	1 43	1 40	1 37	1 33																		62
64	1 47	1 44	1 41	1 38																			64
66	1 48	1 44	1 41	1 38																			66
68	1 49	1 45	1 41																				68
70	1 49	1 45																					70
72	1 49																						72
74																							74
76																							76
78																							78
80																							80
82																							82
84																							84
86																							86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°												

TABLE P. EFFECT OF SUN'S PAR.

Add the Numbers above the black lines to 3rd Correction, subtract the others.

☽'s App. Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	1	1	0	0	1	1	1	1	1	
10	1	1	1	0	0	1	0	0	1	0
15	2	2	1	1	1	2	0	0	1	
20	3	3	2	1	1	2	1	0	1	
25	4	4	2	2	1	2	1	0	1	
30	4	4	3	2	2	2	1	0	1	
35	5	5	3	2	2	3	1	0	1	
40	6	6	4	3	2	3	2	0	1	
45	6	6	4	3	3	3	2	0	1	
50	7	7	5	3	3	4	2	0	1	
55	7	7	5	4	3	4	2	0	1	
60	8	8	5	4	4	4	2	0	1	
65	8	8	6	4	4	5	2	0	1	
70	9	9	6	5	4	5	3	0	1	
75	9	9	7	5	5	5	3	0	1	
80	9	9	7	6	5	6	3	0	1	
90			8	6	6	6	3	0	1	

TABLE VI.

Third Correction, to Apparent Distance 80°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 41	1 43	1 46	1 50	1 54	1 59	2 4	2 17	2 32	2 47	3 2	3 17	3 32	3 47	4 2	4 16	6
7	1 44	1 41	1 43	1 45	1 48	1 51	1 55	2 5	2 17	2 29	2 41	2 54	3 6	3 19	3 31	3 44	7
8	1 48	1 43	1 41	1 42	1 44	1 46	1 49	1 56	2 6	2 16	2 26	2 37	2 48	2 59	3 10	3 20	8
9	1 52	1 46	1 43	1 41	1 42	1 44	1 46	1 51	1 58	2 6	2 15	2 25	2 34	2 43	2 52	3 1	9
10	1 57	1 50	1 46	1 43	1 41	1 42	1 44	1 47	1 53	1 59	2 6	2 14	2 22	2 30	2 38	2 46	10
11	2 3	1 54	1 49	1 45	1 43	1 41	1 42	1 45	1 49	1 54	1 59	2 6	2 13	2 20	2 27	2 34	11
12	2 9	1 59	1 52	1 48	1 45	1 43	1 41	1 43	1 46	1 50	1 54	2 0	2 6	2 12	2 19	2 25	12
13	2 16	2 4	1 56	1 51	1 48	1 45	1 42	1 42	1 44	1 47	1 51	1 56	2 1	2 6	2 12	2 18	13
14	2 23	2 10	2 0	1 54	1 50	1 47	1 44	1 41	1 43	1 45	1 48	1 52	1 57	2 2	2 7	2 12	14
15	2 30	2 16	2 5	1 58	1 53	1 49	1 46	1 42	1 42	1 44	1 46	1 49	1 53	1 58	2 2	2 7	15
16	2 37	2 22	2 10	2 2	1 56	1 52	1 48	1 43	1 41	1 43	1 45	1 47	1 50	1 54	1 58	2 2	16
17	2 45	2 28	2 15	2 6	1 59	1 54	1 50	1 45	1 42	1 42	1 43	1 45	1 48	1 51	1 54	1 58	17
18	2 53	2 34	2 21	2 11	2 3	1 57	1 52	1 47	1 43	1 41	1 42	1 44	1 46	1 48	1 51	1 54	18
19	3 0	2 41	2 26	2 15	2 7	2 0	1 54	1 48	1 44	1 42	1 41	1 43	1 44	1 46	1 49	1 51	19
20	3 8	2 47	2 31	2 20	2 10	2 3	1 57	1 50	1 46	1 43	1 41	1 42	1 43	1 45	1 47	1 49	20
21	3 16	2 54	2 37	2 24	2 14	2 6	1 59	1 52	1 47	1 44	1 42	1 41	1 42	1 43	1 45	1 47	21
22	3 23	3 0	2 43	2 29	2 18	2 9	2 2	1 54	1 49	1 45	1 42	1 40	1 41	1 42	1 43	1 45	22
23	3 31	3 6	2 47	2 33	2 22	2 13	2 5	1 57	1 51	1 47	1 43	1 41	1 40	1 41	1 42	1 44	23
24	3 38	3 12	2 53	2 38	2 25	2 16	2 8	1 58	1 52	1 48	1 44	1 41	1 40	1 41	1 42	1 43	24
25	3 46	3 18	2 58	2 42	2 29	2 19	2 12	2 1	1 54	1 49	1 45	1 42	1 40	1 40	1 41	1 42	25
26	3 53	3 24	3 4	2 47	2 33	2 23	2 15	2 3	1 55	1 50	1 46	1 43	1 41	1 40	1 41	1 42	26
27	4 1	3 31	3 10	2 52	2 37	2 26	2 19	2 6	1 57	1 51	1 47	1 43	1 41	1 40	1 40	1 41	27
28	4 8	3 37	3 15	2 56	2 41	2 30	2 22	2 8	1 59	1 53	1 48	1 44	1 42	1 41	1 40	1 40	28
29	4 15	3 43	3 20	3 1	2 46	2 34	2 26	2 11	2 1	1 55	1 49	1 45	1 43	1 41	1 40	1 39	29
30	4 22	3 49	3 25	3 5	2 50	2 38	2 29	2 14	2 3	1 56	1 50	1 46	1 44	1 42	1 40	1 39	30
31	4 29	3 55	3 30	3 10	2 54	2 41	2 32	2 17	2 5	1 58	1 52	1 47	1 44	1 42	1 40	1 39	31
32	4 36	4 1	3 35	3 14	2 58	2 45	2 35	2 19	2 7	1 59	1 53	1 48	1 45	1 43	1 41	1 39	32
33	4 43	4 7	3 40	3 19	3 2	2 49	2 38	2 22	2 9	2 1	1 54	1 49	1 46	1 44	1 42	1 40	33
34	4 50	4 12	3 45	3 23	3 6	2 52	2 41	2 24	2 11	2 2	1 56	1 50	1 47	1 44	1 42	1 40	34
35	4 57	4 18	3 50	3 28	3 10	2 56	2 44	2 27	2 14	2 4	1 57	1 51	1 47	1 44	1 42	1 40	35
36	5 4	4 24	3 55	3 32	3 14	3 0	2 47	2 29	2 16	2 6	1 58	1 52	1 48	1 45	1 43	1 41	36
37	5 11	4 29	4 0	3 37	3 19	3 3	2 50	2 32	2 18	2 8	2 0	1 53	1 49	1 46	1 44	1 42	37
38	5 18	4 35	4 5	3 42	3 23	3 7	2 54	2 34	2 20	2 9	2 1	1 54	1 49	1 46	1 44	1 42	38
39	5 25	4 41	4 10	3 46	3 27	3 11	2 58	2 36	2 22	2 10	2 2	1 55	1 50	1 47	1 45	1 43	39
40	5 31	4 47	4 15	3 50	3 31	3 14	3 1	2 38	2 24	2 12	2 4	1 57	1 51	1 47	1 45	1 43	40
41	5 38	4 52	4 20	3 54	3 35	3 18	3 4	2 41	2 26	2 14	2 5	1 58	1 52	1 48	1 46	1 44	41
42	5 44	4 57	4 25	3 58	3 38	3 21	3 7	2 44	2 28	2 16	2 7	1 59	1 53	1 49	1 46	1 44	42
43	5 51	5 3	4 30	4 2	3 42	3 25	3 10	2 46	2 30	2 17	2 8	2 1	1 55	1 50	1 47	1 45	43
44	5 57	5 8	4 35	4 6	3 46	3 28	3 13	2 48	2 32	2 19	2 10	2 2	1 56	1 51	1 48	1 45	44
46	6 9	5 18	4 44	4 14	3 53	3 35	3 19	2 53	2 36	2 23	2 13	2 4	1 58	1 53	1 49	1 46	46
48	6 20	5 28	4 53	4 22	4 0	3 41	3 25	2 58	2 39	2 26	2 15	2 7	2 0	1 55	1 51	1 48	48
50	6 31	5 38	5 1	4 30	4 6	3 47	3 30	3 3	2 43	2 29	2 18	2 9	2 2	1 56	1 52	1 49	50
52	6 41	5 47	5 9	4 37	4 12	3 53	3 35	3 7	2 47	2 32	2 21	2 12	2 4	1 58	1 54	1 50	52
54	6 51	5 56	5 17	4 44	4 18	3 58	3 39	3 11	2 51	2 35	2 24	2 14	2 6	1 59	1 55	1 52	54
56	7 1	6 5	5 24	4 50	4 24	4 3	3 44	3 15	2 54	2 38	2 26	2 17	2 8	2 1	1 57	1 53	56
58	7 11	6 14	5 31	4 56	4 30	4 8	3 49	3 19	2 57	2 41	2 29	2 19	2 10	2 3	1 58	1 54	58
60	7 20	6 22	5 38	5 2	4 35	4 13	3 54	3 23	3 0	2 44	2 31	2 21	2 12	2 5	1 59	1 55	60
62	7 28	6 29	5 44	5 7	4 40	4 18	3 58	3 27	3 3	2 47	2 33	2 22	2 13	2 6	2 0	1 56	62
64	7 36	6 35	5 50	5 12	4 44	4 22	4 2	3 31	3 6	2 49	2 35	2 24	2 15	2 7	2 1	1 56	64
66	7 43	6 41	5 55	5 17	4 49	4 26	4 6	3 34	3 9	2 51	2 37	2 26	2 16	2 8	2 2	1 57	66
68	7 49	6 46	6 0	5 21	4 53	4 30	4 9	3 37	3 12	2 53	1 39	2 27	2 17	2 9	2 3	1 58	68
70	7 55	6 51	6 5	5 25	4 57	4 33	4 12	3 39	3 14	2 55	1 41	2 29	2 19	2 10	2 4	1 59	70
72	8 0	6 55	6 9	5 29	5 0	4 36	4 14	3 41	3 16	2 57	1 42	2 30	2 20	2 11	2 5		72
74	8 5	6 59	6 13	5 32	5 3	4 38	4 16	3 43	3 18	2 58	1 43	2 31	2 21	2 12			74
76	8 9	7 3	6 16	5 35	5 6	4 40	4 18	3 44	3 19	2 59	1 44	2 32	2 22				76
78	8 13	7 6	6 19	5 37	5 8	4 42	4 19	3 45	3 20	3 0	2 45	2 32					78
80	8 16	7 9	6 21	5 40	5 10	4 44	4 21	3 46	3 21	3 1	2 45						80
82	8 19	7 12	6 23	5 42	5 12	4 45	4 22	3 47	3 22	3 2							82
84	8 22	7 14	6 25	5 44	5 13	4 46	4 23	3 48	3 23								84
86	8 24	7 16	6 27	5 46	5 14	4 47	4 24	3 49									86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 80°.

D's App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.													D's App Alt.
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	86°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	4 30	4 44	4 58	5 12	5 39	6 4	6 28	6 49	7 8	7 26	7 41	7 54	8 5	8 13	8 19	8 24	6
7	3 56	4 8	4 19	4 30	4 52	5 14	5 35	5 54	6 11	6 26	6 39	6 50	6 59	7 6	7 12	7 16	7
8	3 31	3 41	3 52	4 2	4 23	4 42	4 59	5 15	5 29	5 42	5 54	6 4	6 12	6 18	6 23	6 27	8
9	3 11	3 21	3 30	3 39	3 56	4 12	4 28	4 42	4 54	5 5	5 15	5 24	5 32	5 38	5 43	5 46	9
10	2 54	3 3	3 12	3 20	3 35	3 50	4 4	4 16	4 28	4 39	4 48	4 56	5 2	5 7	5 11	5 14	10
11	2 42	2 49	2 57	3 5	3 19	3 32	3 44	3 56	4 7	4 16	4 24	4 31	4 36	4 41	4 45	4 47	11
12	2 32	2 38	2 45	2 52	3 5	3 17	3 28	3 38	3 48	3 57	4 5	4 11	4 15	4 19	4 22	4 25	12
13	2 24	2 30	2 36	2 42	2 53	3 4	3 14	3 23	3 32	3 40	3 47	3 53	3 57	4 1	4 4	4 6	13
14	2 18	2 23	2 28	2 33	2 43	2 53	3 2	3 11	3 19	3 26	3 32	3 38	3 42	3 46	3 48	3 49	14
15	2 12	2 16	2 21	2 25	2 34	2 43	2 52	3 0	3 7	3 13	3 19	3 25	3 29	3 32	3 34		15
16	2 6	2 10	2 14	2 18	2 26	2 34	2 42	2 50	2 56	3 2	3 8	2 13	3 17	3 20	3 22		16
17	2 1	2 4	2 8	2 12	2 20	2 27	2 34	2 41	2 47	2 53	2 58	3 3	3 6	3 9	3 11		17
18	1 57	2 0	2 3	2 7	2 14	2 21	2 28	2 34	2 40	2 46	2 50	2 54	2 57	3 0	3 2		18
19	1 54	1 56	1 59	2 2	2 9	2 16	2 22	2 28	2 34	2 39	2 43	2 47	2 50	3 52			19
20	1 51	1 53	1 56	1 58	2 5	2 11	2 17	2 22	2 28	2 33	2 37	2 40	2 43	3 45			20
21	1 49	1 51	1 53	1 55	2 1	2 7	2 12	2 17	2 22	2 27	2 31	2 34	2 37	2 38			21
22	1 47	1 49	1 51	1 53	1 58	2 3	2 8	2 13	2 17	2 21	2 25	2 28	2 31	2 32			22
23	1 46	1 47	1 49	1 51	1 55	2 0	2 4	2 9	2 13	2 17	2 20	2 23	2 26				23
24	1 45	1 46	1 47	1 49	1 53	1 57	2 1	2 5	2 9	2 13	2 16	2 19	2 21				24
25	1 44	1 45	1 46	1 48	1 51	1 54	1 58	2 1	2 5	2 9	2 12	2 14	2 16				25
26	1 43	1 44	1 45	1 46	1 49	1 52	1 55	1 58	2 2	2 5	2 8	2 10	2 12				26
27	1 42	1 43	1 44	1 45	1 47	1 50	1 53	1 56	1 59	2 2	2 5	2 7					27
28	1 41	1 42	1 43	1 44	1 46	1 48	1 51	1 54	1 57	1 59	2 2	2 4					28
29	1 40	1 41	1 41	1 42	1 44	1 46	1 49	1 52	1 55	1 57	1 59	2 1					29
30	1 39	1 40	1 40	1 41	1 43	1 45	1 48	1 51	1 53	1 55	1 57	1 59					30
31	1 39	1 40	1 40	1 41	1 42	1 44	1 46	1 49	1 51	1 53	1 55						31
32	1 39	1 39	1 39	1 40	1 41	1 43	1 45	1 47	1 49	1 51	1 53						32
33	1 39	1 39	1 39	1 40	1 41	1 42	1 44	1 46	1 48	1 49	1 51						33
34	1 39	1 39	1 39	1 40	1 41	1 42	1 43	1 45	1 47	1 48	1 49						34
35	1 39	1 39	1 39	1 39	1 40	1 41	1 42	1 44	1 45	1 46							35
36	1 40	1 39	1 39	1 39	1 40	1 41	1 42	1 43	1 44	1 45							36
37	1 41	1 40	1 39	1 38	1 39	1 40	1 41	1 42	1 43	1 44							37
38	1 41	1 40	1 39	1 38	1 39	1 40	1 41	1 42	1 42	1 43							38
39	1 41	1 40	1 39	1 38	1 39	1 39	1 40	1 41	1 41								39
40	1 41	1 40	1 39	1 38	1 38	1 38	1 39	1 40	1 40								40
41	1 42	1 41	1 40	1 39	1 38	1 38	1 38	1 39	1 39								41
42	1 42	1 41	1 40	1 39	1 37	1 37	1 37	1 38	1 38								42
43	1 43	1 41	1 40	1 39	1 37	1 37	1 37	1 37									43
44	1 43	1 42	1 40	1 39	1 37	1 37	1 36	1 37									44
46	1 44	1 42	1 41	1 40	1 38	1 37	1 36	1 36									46
48	1 45	1 43	1 41	1 40	1 38	1 37	1 36										48
50	1 46	1 44	1 42	1 41	1 38	1 36	1 36										50
52	1 47	1 45	1 43	1 41	1 38	1 36											52
54	1 48	1 46	1 44	1 42	1 38	1 36											54
56	1 49	1 47	1 44	1 42	1 38												56
58	1 50	1 47	1 45	1 42	1 38												58
60	1 51	1 48	1 45	1 43													60
62	1 52	1 49	1 46	1 43													62
64	1 52	1 49	1 46														64
66	1 53	1 49															66
68	1 54																68
70																	70
72																	72
74																	74
76																	76
78																	78
80																	80
82																	82
84																	84
86																	86
	32°	34°	36°	38°	42°	46°	50°	54°	58°	62°	66°						

TABLE P. EFFECT OF SUN'S PAR

Add the Numbers above the black lines to the 3rd Correction, and subtract the others.

D's App Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	1	1	1	0	0	1	1	1	1	
10	1	1	1	1	1	0	1	0	0	
15	2	2	2	2	1	1	1	1	1	0
20	3	3	3	2	2	2	2	2	1	
25	4	4	3	3	3	3	2	2		
30	4	4	4	4	4	3	3	3		
35	5	5	5	5	4	4	4			
40	6	6	6	5	5	5	4			
45	6	6	6	6	6	5	5			
50	7	7	7	6	6	6	5			
55	7	8	7	7	7	6	6			
60	8	8	8	8	7	7				
65	8	8	8	8	8	7				
70	8	9	9	8	8	8				
75	9	9	9	9	8					
80	9	9	9	9						
90										

TABLE VI.

Third Correction, to Apparent Distance 84°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 47	1 49	1 51	1 54	1 59	2 4	2 10	2 22	2 36	2 50	3 5	3 20	3 35	3 50	4 5	4 20	6
7	1 50	1 47	1 48	1 50	1 53	1 56	2 0	2 10	2 21	2 33	2 45	2 57	3 10	3 23	3 35	3 48	7
8	1 53	1 49	1 47	1 48	1 50	1 52	1 55	2 2	2 11	2 21	2 31	2 42	2 53	3 3	3 14	3 25	8
9	1 57	1 52	1 49	1 47	1 48	1 50	1 52	1 57	2 4	2 12	2 21	2 30	2 39	2 48	2 58	3 7	9
10	2 2	1 55	1 51	1 49	1 47	1 48	1 50	1 53	1 59	2 5	2 12	2 20	2 27	2 35	2 44	2 52	10
11	2 8	1 59	1 54	1 51	1 49	1 47	1 48	1 51	1 55	1 59	2 5	2 12	2 18	2 26	2 33	2 41	11
12	2 14	2 4	1 57	1 53	1 51	1 48	1 47	1 49	1 52	1 55	1 59	2 5	2 11	2 18	2 25	2 31	12
13	2 20	2 9	2 1	1 56	1 53	1 50	1 48	1 48	1 50	1 52	1 55	2 0	2 6	2 11	2 17	2 23	13
14	2 27	2 14	2 5	1 59	1 55	1 52	1 50	1 47	1 48	1 50	1 53	1 57	2 2	2 6	2 11	2 16	14
15	2 34	2 20	2 10	2 3	1 58	1 54	1 51	1 48	1 47	1 49	1 51	1 54	1 58	2 2	2 7	2 11	15
16	2 42	2 26	2 15	2 7	2 1	1 56	1 53	1 49	1 47	1 48	1 50	1 52	1 55	1 59	2 3	2 7	16
17	2 49	2 32	2 20	2 11	2 4	1 59	1 55	1 50	1 48	1 47	1 48	1 50	1 53	1 56	2 0	2 3	17
18	2 57	2 38	2 25	2 16	2 8	2 2	1 57	1 52	1 49	1 46	1 47	1 49	1 51	1 54	1 57	2 0	18
19	3 4	2 44	2 31	2 20	2 12	2 5	1 59	1 53	1 50	1 47	1 46	1 48	1 49	1 52	1 55	1 57	19
20	3 12	2 50	2 36	2 25	2 15	2 8	2 2	1 55	1 51	1 48	1 46	1 47	1 48	1 50	1 53	1 55	20
21	3 20	2 57	2 42	2 29	2 19	2 11	2 5	1 57	1 52	1 49	1 47	1 46	1 47	1 48	1 50	1 52	21
22	3 27	3 3	2 47	2 34	2 23	2 14	2 8	1 59	1 54	1 50	1 47	1 46	1 46	1 47	1 48	1 50	22
23	3 35	3 9	2 52	2 38	2 27	2 18	2 11	2 1	1 56	1 52	1 48	1 46	1 46	1 47	1 48	1 49	23
24	3 42	3 15	2 57	2 42	2 30	2 21	2 14	2 3	1 57	1 53	1 49	1 46	1 46	1 46	1 47	1 48	24
25	3 49	3 21	3 3	2 47	2 34	2 25	2 17	2 6	1 59	1 54	1 50	1 47	1 46	1 46	1 46	1 47	25
26	3 56	3 27	3 8	2 52	2 38	2 28	2 20	2 8	2 0	1 55	1 51	1 48	1 47	1 46	1 46	1 46	26
27	4 4	3 34	3 13	2 56	2 42	2 32	2 24	2 11	2 2	1 56	1 52	1 49	1 47	1 46	1 45	1 46	27
28	4 11	3 40	3 18	3 1	2 46	2 35	2 27	2 13	2 4	1 58	1 53	1 49	1 47	1 46	1 45	1 45	28
29	4 19	3 47	3 24	3 5	2 51	2 39	2 30	2 16	2 6	1 59	1 54	1 50	1 48	1 46	1 45	1 45	29
30	4 26	3 53	3 29	3 10	2 55	2 43	2 33	2 18	2 8	2 1	1 55	1 51	1 49	1 47	1 46	1 45	30
31	4 33	3 59	3 35	3 14	2 59	2 46	2 36	2 21	2 10	2 3	1 57	1 52	1 49	1 47	1 46	1 45	31
32	4 40	4 5	3 40	3 19	3 3	2 50	2 39	2 24	2 12	2 4	1 58	1 53	1 50	1 48	1 46	1 45	32
33	4 47	4 11	3 45	3 24	3 7	2 54	2 42	2 27	2 14	2 5	1 59	1 54	1 50	1 48	1 46	1 45	33
34	4 54	4 16	3 50	3 28	3 11	2 57	2 45	2 29	2 16	2 7	2 0	1 55	1 51	1 48	1 47	1 46	34
35	5 1	4 22	3 55	3 33	3 15	3 1	2 49	2 32	2 19	2 9	2 2	1 56	1 52	1 49	1 47	1 46	35
36	5 8	4 28	4 0	3 37	3 19	3 5	2 52	2 34	2 21	2 10	2 3	1 58	1 53	1 49	1 47	1 45	36
37	5 15	4 34	4 5	3 42	3 23	3 8	2 56	2 37	2 23	2 12	2 4	1 59	1 54	1 50	1 48	1 47	37
38	5 21	4 40	4 10	3 46	3 27	3 12	2 59	2 39	2 25	2 14	2 6	2 0	1 55	1 51	1 49	1 47	38
39	5 28	4 45	4 15	3 51	3 31	3 15	3 2	2 42	2 29	2 16	2 7	2 1	1 56	1 52	1 49	1 47	39
40	5 34	4 51	4 20	3 55	3 35	3 19	3 5	2 44	2 29	2 18	2 9	2 3	1 57	1 52	1 49	1 47	40
41	5 41	4 56	4 25	3 59	3 39	3 23	3 8	2 47	2 31	2 20	2 11	2 4	1 58	1 53	1 50	1 48	41
42	5 47	5 1	4 30	4 3	3 43	3 26	3 11	2 49	2 33	2 21	2 12	2 5	1 55	1 54	1 51	1 49	42
43	5 53	5 7	4 35	4 7	3 47	3 30	3 14	2 52	2 35	2 23	2 13	2 7	2 0	1 55	1 52	1 50	43
44	6 0	5 12	4 40	4 11	3 50	3 34	3 17	2 54	2 37	2 25	2 15	2 8	2 1	1 56	1 53	1 51	44
46	6 12	5 22	4 49	4 19	3 57	3 40	3 23	2 59	2 41	2 29	2 18	2 10	2 3	1 58	1 55	1 52	46
48	6 24	5 32	4 58	4 27	4 4	3 46	3 29	3 4	2 45	2 32	2 21	2 12	2 5	2 0	1 56	1 53	48
50	6 35	5 42	5 6	4 35	4 11	3 52	3 35	3 9	2 49	2 35	2 24	2 15	2 8	2 2	1 58	1 55	50
52	6 45	5 51	5 14	4 42	4 17	3 58	3 40	3 13	2 53	2 38	2 27	2 18	2 10	2 4	2 0	1 57	52
54	6 55	6 0	5 22	4 49	4 23	4 3	3 45	3 17	2 57	2 41	2 30	2 20	2 12	2 6	2 2	1 58	54
56	7 5	6 9	5 29	4 55	4 29	4 9	3 50	3 21	3 1	2 44	2 32	2 22	2 14	2 8	2 3	1 59	56
58	7 14	6 17	5 36	5 1	4 34	4 14	3 55	3 25	3 4	2 47	2 35	2 24	2 16	2 9	2 4	2 0	58
60	7 22	6 25	5 42	5 6	4 39	4 19	3 59	3 29	3 7	2 50	2 37	2 26	2 17	2 10	2 5	2 1	60
62	7 30	6 32	5 48	5 11	4 44	4 23	4 3	3 33	3 10	2 53	2 39	2 28	2 19	2 12	2 7	2 2	62
64	7 38	6 39	5 54	5 16	4 49	4 27	4 5	3 36	3 13	2 56	2 41	2 29	2 20	2 13	2 8	2 3	64
66	7 45	6 45	6 0	5 21	4 54	4 31	4 11	3 39	3 16	2 58	2 43	2 31	2 22	2 15	2 9	2 3	66
68	7 51	6 50	6 5	5 25	4 58	4 35	4 15	3 41	3 19	3 0	2 45	2 33	2 24	2 16	2 10		68
70	7 57	6 54	6 9	5 29	5 2	4 39	4 18	3 44	3 21	3 2	2 46	2 34	2 25	2 17			70
72	8 2	6 58	6 13	5 33	5 6	4 42	4 21	3 46	3 23	3 3	2 47	2 35	2 26				72
74	8 6	7 2	6 17	5 36	5 9	4 44	4 23	3 48	3 24	3 4	2 48	2 36					74
76	8 10	7 5	6 20	5 38	5 11	4 46	4 25	3 50	3 25	3 5	2 49						76
78	8 14	7 8	6 23	5 42	5 13	4 48	4 26	8 51	3 26	3 6							78
80	8 18	7 11	6 26	5 45	5 15	4 50	4 27	3 52	3 27								80
82	8 21	7 14	6 28	5 47	5 17	4 51	4 28	3 53									82
84	8 24	7 17	6 30	5 49	5 18	4 52	4 29										84
86	8 26	7 19	6 31	5 50	5 19												86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 84°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																				☽'s App Alt.
	32°		34°		36°		38°		42°		46°		50°		54°		58°		62°		66°		70°		74°		78°		82°		86°		
°	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	°
6	4	34	4	48	5	2	5	15	5	41	6	6	6	29	6	51	7	10	7	27	7	42	7	55	8	6	8	14	8	21	8	27	6
7	4	0	4	12	4	24	4	36	4	58	5	19	5	39	5	58	6	15	6	30	6	42	6	53	7	2	7	9	7	15	7	19	7
8	3	36	3	47	3	57	4	7	4	27	4	46	5	4	5	20	5	34	5	46	5	58	6	9	6	17	6	23	6	28	6	31	8
9	3	16	3	25	3	34	3	43	4	0	4	17	4	33	4	47	4	59	5	10	5	20	5	29	5	36	5	42	5	47	5	50	9
10	3	1	3	9	3	17	3	25	3	41	3	55	4	9	4	21	4	33	4	43	4	53	5	1	5	7	5	13	5	17	5	19	10
11	2	48	2	55	3	3	3	10	3	24	3	37	3	50	4	2	4	12	4	21	4	30	4	37	4	43	4	48	4	51			11
12	2	38	2	44	2	51	2	58	3	10	3	22	3	34	3	45	3	54	4	2	4	10	4	16	4	22	4	26	4	28			12
13	2	29	2	35	2	41	2	47	2	58	3	9	3	20	3	29	3	38	3	45	3	52	3	58	4	3	4	7	4	9			13
14	2	22	2	27	2	33	2	38	2	48	2	58	3	8	3	16	3	24	3	31	3	37	3	43	3	47	3	51	3	53			14
15	2	16	2	21	2	26	2	30	2	39	2	48	2	57	3	5	3	12	3	19	3	25	3	30	3	34	3	37					15
16	2	11	2	15	2	20	2	24	2	32	2	40	2	48	2	56	3	2	3	9	3	15	3	19	3	23	3	26					16
17	2	7	2	10	2	14	2	18	2	26	2	34	2	41	2	48	2	54	3	0	3	5	3	9	3	13	3	15					17
18	2	3	2	6	2	10	2	13	2	21	2	28	2	34	2	40	2	46	2	52	2	57	3	1	3	4	3	6					18
19	2	0	2	3	2	6	2	9	2	16	2	23	2	29	2	34	2	40	2	45	2	49	2	53	2	56							19
20	1	57	2	0	2	2	2	5	2	12	2	18	2	24	2	29	2	34	2	38	2	42	2	45	2	48							20
21	1	54	1	57	1	59	2	2	2	8	2	13	2	19	2	24	2	29	2	33	2	36	2	39	2	41							21
22	1	52	1	54	1	56	1	59	2	4	2	9	2	14	2	19	2	24	2	28	2	31	2	34	2	36							22
23	1	50	1	52	1	54	1	56	2	1	2	5	2	10	2	15	2	19	2	23	2	26	2	29									23
24	1	49	1	50	1	52	1	54	1	58	2	2	2	7	2	11	2	15	2	19	2	22	2	25									24
25	1	48	1	49	1	50	1	52	1	56	2	0	2	4	2	8	2	12	2	15	2	18	2	21									25
26	1	47	1	48	1	49	1	51	1	54	1	58	2	2	2	5	2	9	2	12	2	15	2	17									26
27	1	47	1	48	1	49	1	50	1	53	1	56	2	0	2	3	2	6	2	9	2	12											27
28	1	46	1	47	1	48	1	49	1	51	1	54	1	58	2	1	2	3	2	6	2	9											28
29	1	46	1	47	1	47	1	48	1	50	1	53	1	56	1	59	2	1	2	4	2	6											29
30	1	45	1	46	1	46	1	47	1	49	1	52	1	55	1	57	2	0	2	2	2	3											30
31	1	45	1	45	1	46	1	47	1	49	1	51	1	54	1	56	1	58	2	0													31
32	1	45	1	45	1	45	1	46	1	48	1	50	1	52	1	54	1	56	1	58													32
33	1	45	1	45	1	45	1	46	1	47	1	49	1	51	1	53	1	54	1	56													33
34	1	45	1	44	1	44	1	45	1	46	1	48	1	50	1	52	1	53	1	54													34
35	1	45	1	44	1	44	1	45	1	46	1	47	1	49	1	50	1	51															35
36	1	46	1	45	1	44	1	44	1	45	1	46	1	48	1	49	1	50															36
37	1	46	1	45	1	44	1	44	1	45	1	45	1	47	1	48	1	49															37
38	1	46	1	45	1	44	1	44	1	44	1	45	1	46	1	47	1	48															38
39	1	46	1	45	1	44	1	44	1	44	1	44	1	45	1	46																	39
40	1	46	1	45	1	45	1	45	1	44	1	44	1	45	1	45																	40
41	1	47	1	46	1	45	1	45	1	44	1	44	1	44	1	44																	41
42	1	48	1	47	1	46	1	45	1	43	1	43	1	44	1	44																	42
43	1	49	1	48	1	46	1	45	1	43	1	43	1	44																			43
44	1	49	1	48	1	47	1	45	1	43	1	43	1	43																			44
46	1	50	1	49	1	47	1	45	1	43	1	43	1	43																			46
48	1	51	1	50	1	48	1	46	1	44	1	43																					48
50	1	53	1	51	1	49	1	47	1	44	1	43																					50
52	1	54	1	51	1	49	1	47	1	44																							52
54	1	55	1	52	1	49	1	47	1	44																							54
56	1	56	1	53	1	50	1	48																									56
58	1	56	1	53	1	50	1	48																									58
60	1	57	1	54	1	51																											60
62	1	58	1	54																													62
64	1	59																															64
66																																	66
68																																	68
70																																	70
72																																	72
74																																	74
76																																	76
78																																	78
80																																	80
82																																	82
84																																	84
86																																	86
	32°		34°		36°		38°		42°		46°		50°		54°		58°		62°		66°												

TABLE P. EFFECT OF SUN'S PAR.

To be subtracted from the third Correction.

☽'s App Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	1	1	1	0	0	0	0	0	0	
10	1	1	1	1	1	1	1	1	1	0
15	2	2	2	2	2	2	2	2		
20	3	3	3	3	2	2	2	2		
25	4	4	3	3	3	3	3	3		
30	4	4	4	4	4	4	4	4		
35	5	5	5	5	5	5	4			
40	6	6	5	5	5	5	5			
45	6	6	6	6	6	6				
50	7	7	7	6	6	6				
55	7	7	7	7	7	7				
60	8	8	7	7	7					
65	8	8	8	8	8					
70	8	8	8	8						
75	9	9	9	8						
80	9	9	9							
90	9									

TABLE VI.

Third Correction, to Apparent Distance 88°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 53	1 54	1 56	1 59	2 4	2 10	2 16	2 28	2 42	2 56	3 11	3 26	3 41	3 56	4 11	4 25	6
7	1 55	1 53	1 54	1 56	1 59	2 3	2 7	2 16	2 27	2 39	2 51	3 4	3 16	3 28	3 40	3 52	7
8	1 58	1 55	1 53	1 54	1 56	1 59	2 2	2 8	3 17	2 27	2 37	2 48	2 59	3 9	3 19	3 30	8
9	2 2	1 58	1 55	1 53	1 54	1 56	1 58	2 3	2 10	2 18	2 26	2 35	2 45	2 54	3 3	3 12	9
10	2 7	2 1	1 57	1 55	1 53	1 54	1 56	2 0	2 5	2 11	2 18	2 25	2 34	2 43	2 50	2 58	10
11	2 13	2 5	2 0	1 57	1 55	1 53	1 54	1 57	2 1	2 6	2 12	2 18	2 25	2 32	2 39	2 47	11
12	2 19	2 10	2 4	2 0	1 57	1 54	1 53	1 55	1 58	2 2	2 7	2 12	2 18	2 24	2 30	2 37	12
13	2 27	2 15	2 8	2 3	1 59	1 56	1 54	1 54	1 56	1 59	2 3	2 7	2 12	2 18	2 23	2 29	13
14	2 33	2 21	2 12	2 6	2 1	1 58	1 56	1 53	1 55	1 57	2 0	2 3	2 7	2 12	2 17	2 22	14
15	2 40	2 26	2 16	2 9	2 4	2 0	1 57	1 54	1 54	1 55	1 58	2 0	2 4	2 8	2 13	2 17	15
16	2 47	2 32	2 20	2 13	2 7	2 2	1 59	1 55	1 53	1 54	1 56	1 58	2 1	2 5	2 9	2 13	16
17	2 54	2 37	2 25	2 17	2 10	2 5	2 1	1 56	1 53	1 53	1 55	1 57	1 59	2 2	2 5	2 9	17
18	3 2	2 43	2 30	2 21	2 13	2 7	2 3	1 58	1 54	1 52	1 54	1 56	1 58	2 0	2 2	2 5	18
19	3 10	2 49	2 35	2 25	2 16	2 10	2 5	1 59	1 55	1 53	1 53	1 54	1 56	1 58	2 0	2 3	19
20	3 17	2 55	2 41	2 29	2 20	2 13	2 8	2 1	1 56	1 54	1 52	1 53	1 54	1 56	1 58	2 1	20
21	3 25	3 2	2 46	2 34	2 24	2 17	2 11	2 3	1 58	1 55	1 53	1 52	1 53	1 55	1 57	1 59	21
22	3 32	3 8	2 52	2 39	2 28	2 20	2 14	2 5	1 59	1 56	1 53	1 52	1 53	1 54	1 55	1 59	22
23	3 40	3 15	2 57	2 43	2 32	2 24	2 17	2 7	2 1	1 57	1 54	1 52	1 52	1 53	1 54	1 55	23
24	3 47	3 21	3 2	2 48	2 36	2 27	2 20	2 9	2 2	1 58	1 55	1 53	1 52	1 52	1 53	1 54	24
25	3 55	3 27	3 8	2 52	2 40	2 31	2 23	2 11	2 4	2 0	1 56	1 53	1 52	1 52	1 53	1 54	25
26	4 2	3 33	3 13	2 57	2 44	2 35	2 27	2 14	2 6	2 1	1 57	1 54	1 53	1 52	1 52	1 53	26
27	4 10	3 39	3 18	3 2	2 48	2 38	2 30	2 17	2 8	2 2	1 58	1 55	1 53	1 52	1 52	1 52	27
28	4 17	3 45	3 23	3 6	2 52	2 42	2 33	2 19	2 10	2 4	1 59	1 55	1 53	1 52	1 52	1 52	28
29	4 24	3 51	3 28	3 11	2 56	2 46	2 37	2 22	2 12	2 5	2 0	1 56	1 53	1 52	1 52	1 52	29
30	4 31	3 57	3 34	3 15	3 0	2 49	2 40	2 24	2 14	2 6	2 1	1 57	1 54	1 53	1 52	1 52	30
31	4 39	4 3	3 40	3 20	3 4	2 53	2 43	2 27	2 16	2 8	2 2	1 58	1 55	1 53	1 52	1 52	31
32	4 46	4 9	3 45	3 25	3 8	2 56	2 46	2 29	2 18	2 9	2 3	1 59	1 56	1 54	1 53	1 52	32
33	4 53	4 15	3 51	3 29	3 12	3 0	2 50	2 31	2 20	2 11	2 5	2 0	1 56	1 54	1 53	1 53	33
34	5 0	4 21	3 56	3 34	3 17	3 4	2 53	2 34	2 22	2 13	2 7	2 1	1 57	1 55	1 54	1 53	34
35	5 7	4 27	4 1	3 38	3 21	3 7	2 56	2 37	2 24	2 15	2 8	2 2	1 58	1 56	1 54	1 53	35
36	5 13	4 33	4 6	3 43	3 25	3 11	2 59	2 40	2 28	2 17	2 10	2 4	1 59	1 56	1 54	1 53	36
37	5 20	4 39	4 11	3 48	3 29	3 15	3 2	2 43	2 28	2 19	2 11	2 5	2 0	1 57	1 55	1 54	37
38	5 27	4 45	4 16	3 52	3 33	3 18	3 5	2 46	2 31	2 21	2 13	2 6	2 1	1 58	1 56	1 54	38
39	5 34	4 51	4 21	3 57	3 37	3 22	3 8	2 49	2 33	2 22	2 14	2 7	2 2	1 58	1 56	1 55	39
40	5 40	4 56	4 26	4 1	3 41	3 25	3 11	2 51	2 35	2 24	2 16	2 9	2 3	1 59	1 57	1 55	40
41	5 47	5 2	4 31	4 5	3 45	3 29	3 14	2 54	2 38	2 26	2 17	2 10	2 4	2 0	1 57	1 55	41
42	5 53	5 7	4 36	4 9	3 49	3 32	3 17	2 56	2 40	2 28	2 19	2 11	2 5	2 1	1 58	1 56	42
43	6 0	5 13	4 41	4 14	3 53	3 36	3 20	2 59	2 42	2 30	2 20	2 12	2 6	2 1	1 59	1 57	43
44	6 6	5 19	4 46	4 18	3 57	3 39	3 23	3 1	2 44	2 32	2 22	2 13	2 7	1 3	2 0	1 58	44
46	6 18	5 29	4 55	4 26	4 4	3 46	3 29	3 6	2 48	2 35	2 25	2 16	2 9	2 5	2 1	1 59	46
48	6 29	5 39	5 4	4 34	4 11	3 52	3 35	3 11	2 52	2 39	2 28	2 18	2 11	2 7	2 3	2 0	48
50	6 40	5 48	5 12	4 41	4 17	3 58	3 41	3 15	2 56	2 42	2 31	2 21	2 13	2 9	2 5	2 2	50
52	6 51	5 57	5 20	4 48	4 23	4 2	3 47	3 19	2 59	2 45	2 34	2 24	2 16	2 10	2 6	2 3	52
54	7 1	6 6	5 28	4 55	4 29	4 8	3 52	3 23	3 2	2 48	2 36	2 27	2 18	2 12	2 8	2 4	54
56	7 10	6 15	5 35	5 1	4 35	4 14	3 57	3 27	3 7	2 51	2 39	2 29	2 20	2 14	2 9	2 5	56
58	7 19	6 23	5 42	5 7	4 40	4 19	4 2	3 31	3 10	2 54	2 42	2 31	2 22	2 16	2 11	2 6	58
60	7 28	6 31	5 48	5 12	4 45	4 24	4 6	3 35	3 13	2 57	2 44	2 33	2 24	2 17	2 12	2 7	60
62	7 36	6 38	5 54	5 17	4 50	4 29	4 10	3 38	3 16	2 59	2 46	2 35	2 26	2 19	2 13	2 8	62
64	7 44	6 45	6 0	5 22	4 55	4 33	4 14	3 42	3 19	3 2	2 48	2 37	2 28	2 20	2 14		64
66	7 51	6 51	6 5	5 27	5 0	4 37	4 18	3 45	3 22	3 4	2 50	2 39	2 30	2 21			66
68	7 58	6 56	6 10	5 32	5 4	4 41	4 21	3 48	3 25	3 6	2 51	2 40	2 31				68
70	8 4	7 1	6 15	5 36	5 8	4 44	4 23	3 50	3 27	3 8	2 53	2 41					70
72	8 10	7 5	6 19	5 40	5 11	4 47	4 25	3 52	3 29	3 9	2 53						72
74	8 15	7 9	6 23	5 43	5 14	4 49	4 27	3 54	3 30	3 10							74
76	8 19	7 13	6 26	5 46	5 17	4 51	4 29	3 56	3 31								76
78	8 22	7 16	6 29	5 49	5 19	4 53	4 31	3 57									78
80	8 25	7 19	6 31	5 52	5 21	4 55	4 33										80
82	8 28	7 22	6 33	5 54	5 23												82
84	8 30	7 24	6 35														84
86	8 32																86
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 88°.

D's App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																								D's App Alt.
	32°		34°		36°		38°		42°		46°		50°		54°		58°		62°		66°		70°		74°		78°		82°		86°		
°	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	°
6	4	40	4	54	5	8	5	22	5	48	6	13	6	36	6	57	7	16	7	34	7	49	8	2	8	13	8	21	8	27	8	32	6
7	4	4	4	16	4	28	4	40	5	3	5	25	5	45	6	4	6	21	6	36	6	49	7	0	7	9	7	16	7	22			7
8	3	41	3	52	4	3	4	13	4	33	4	52	5	10	5	26	5	40	5	53	6	5	6	15	6	23	6	29	6	34			8
9	3	22	3	31	3	41	3	50	4	8	4	24	4	39	4	53	5	5	5	16	5	26	5	35	5	43	5	49	5	54			9
10	3	6	3	14	3	22	3	30	3	46	4	1	4	15	4	27	4	38	4	49	4	58	5	7	5	14	5	19	5	23			10
11	2	54	3	2	3	9	3	16	3	30	3	43	3	56	4	7	4	17	4	27	4	36	4	43	4	49	4	53					11
12	2	44	2	51	2	58	3	4	3	16	3	28	3	40	3	50	4	0	4	8	4	16	2	23	4	28	4	32					12
13	2	35	2	41	2	47	2	53	3	4	3	15	3	26	3	35	3	44	3	52	3	59	4	5	4	10	4	13					13
14	2	27	2	33	2	38	2	44	2	54	3	4	3	14	3	22	3	30	3	37	3	44	3	50	3	54	3	57					14
15	2	22	2	27	2	32	2	36	2	46	2	55	3	4	3	11	3	18	3	25	3	31	3	37	3	41							15
16	2	17	2	21	2	26	2	30	2	39	2	47	2	55	3	2	3	9	3	15	3	21	3	26	3	30							16
17	2	12	2	16	2	21	2	25	2	33	2	40	2	47	3	54	3	0	3	6	3	12	3	16	3	19							17
18	2	8	2	12	2	16	2	20	2	27	2	34	2	41	2	47	2	53	2	58	3	3	3	7	3	10							18
19	2	5	2	8	2	12	2	16	2	22	2	29	2	35	2	41	2	47	2	52	2	56	2	59									19
20	2	3	2	6	2	9	2	12	2	18	2	24	2	30	2	35	2	41	2	46	2	49	2	52									20
21	2	1	2	3	2	6	2	8	2	14	2	19	2	25	2	30	2	35	2	40	2	43	2	46									21
22	1	59	2	1	2	3	2	5	2	10	2	15	2	20	2	25	2	30	2	35	2	38	2	41									22
23	1	57	1	59	2	1	2	3	2	7	2	12	2	16	2	21	2	26	2	30	2	33											23
24	1	56	1	57	1	59	2	1	2	5	2	9	2	13	2	17	2	22	2	26	2	29											24
25	1	55	1	56	1	57	1	59	2	3	2	6	2	10	2	14	2	18	2	22	2	25											25
26	1	54	1	55	1	56	1	58	2	1	2	4	2	8	2	12	2	15	2	18	2	21											26
27	1	53	1	54	1	55	1	57	2	0	2	3	2	6	2	10	2	13	2	15													27
28	1	53	1	54	1	55	1	56	1	58	2	1	2	4	2	8	2	11	2	13													28
29	1	52	1	53	1	54	1	55	1	57	2	0	2	3	2	6	2	8	2	10													29
30	1	52	1	53	1	53	1	54	1	56	1	59	2	2	2	4	2	6	2	8													30
31	1	52	1	52	1	52	1	53	1	55	1	58	2	0	2	2	2	4															31
32	1	51	1	52	1	52	1	53	1	55	1	57	1	59	2	1	2	2															32
33	1	52	1	51	1	51	1	52	1	54	1	56	1	58	1	59	2	0															33
34	1	52	1	51	1	51	1	52	1	53	1	55	1	57	1	58	1	59															34
35	1	52	1	51	1	51	1	51	1	52	1	54	1	56	1	57																	35
36	1	53	1	52	1	51	1	51	1	52	1	53	1	55	1	56																	36
37	1	53	1	52	1	51	1	51	1	51	1	52	1	54	1	55																	37
38	1	53	1	52	1	51	1	50	1	51	1	52	1	53	1	54																	38
39	1	54	1	52	1	51	1	50	1	51	1	52	1	52																			39
40	1	54	1	53	1	52	1	51	1	50	1	51	1	52																			40
41	1	54	1	53	1	52	1	51	1	50	1	51	1	51																			41
42	1	54	1	53	1	52	1	51	1	50	1	51	1	51																			42
43	1	55	1	54	1	53	1	52	1	51	1	51																					43
44	1	56	1	54	1	53	1	52	1	51	1	50																					44
46	1	57	1	55	1	53	1	52	1	51	1	50																					46
48	1	58	1	56	1	54	1	53	1	51																							48
50	1	59	1	57	1	55	1	53	1	51																							50
52	2	0	1	58	1	55	1	53																									52
54	2	1	1	58	1	56	1	54																									54
56	2	2	1	59	1	56																											56
58	2	3	1	59																													58
60	2	3																															60
62																																	62
64																																	64
66																																	66
68																																	68
70																																	70
72																																	72
74																																	74
76																																	76
78																																	78
80																																	80
82																																	82
84																																	84
86																																	86
	32°		34°		36°		38°		42°		46°		50°		54°		58°		62°		66°												

TABLE P. EFFECT OF SUN'S PAR.

To be subtracted from the third Correction.

D's App Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	1	1	1	1	1	1	1	0	0	0
10	2	1	1	1	1	1	1	1	1	
15	2	2	2	2	2	2	2	2	2	
20	3	3	3	3	3	3	3	3		
25	4	4	4	4	4	4	4	4		
30	4	4	4	4	4	4	4			
35	5	5	5	5	5	5	5			
40	6	6	6	6	6	6				
45	6	6	6	6	6	6				
50	7	7	7	7	7	7				
55	7	7	7	7	7					
60	8	8	8	8	8					
65	8	8	8	8	8					
70	8	8	8	8						
75	9	9	9							
80	9	9	9							
90°	9									

TABLE VI.

Third Correction, to Apparent Distance 92°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	1 59	2 1	2 3	2 6	2 10	2 15	2 21	2 34	2 48	3 3	2 18	3 33	3 48	4 3	4 18	4 33	6
7	2 1	1 59	2 1	2 3	2 5	2 9	2 13	2 22	2 33	2 45	2 58	3 11	3 24	3 36	3 48	4 0	7
8	2 4	2 1	1 59	2 0	2 2	2 4	2 7	2 14	2 23	2 33	2 44	2 55	3 5	3 16	3 26	3 37	8
9	2 8	2 4	2 1	1 59	2 0	2 2	2 4	2 9	2 16	2 24	2 33	2 42	2 51	3 1	3 10	3 19	9
10	2 13	2 7	2 3	2 1	1 59	2 0	2 2	2 6	2 11	2 17	2 24	2 32	2 40	2 48	2 57	3 5	10
11	2 19	2 11	2 6	2 3	2 1	1 59	2 0	2 3	2 7	2 12	2 18	2 24	2 31	2 39	2 46	2 54	11
12	2 25	2 16	2 10	2 6	2 3	2 1	1 59	2 1	2 4	2 8	2 13	2 18	2 24	2 31	2 37	2 44	12
13	2 32	2 21	2 14	2 9	2 5	2 2	2 0	2 0	2 2	2 5	2 9	2 14	2 19	2 24	2 30	2 36	13
14	2 39	2 27	2 18	2 12	2 7	2 4	2 1	1 59	2 1	2 3	2 6	2 10	2 14	2 19	2 24	2 29	14
15	2 46	2 32	2 22	2 15	2 10	2 6	2 3	2 0	2 0	2 1	2 4	2 7	2 10	2 15	2 19	2 24	15
16	2 53	2 38	2 27	2 19	2 13	2 8	2 5	2 1	1 59	2 0	2 2	2 4	2 7	2 11	2 15	2 19	16
17	3 0	2 44	2 32	2 23	2 16	2 11	2 7	2 3	2 0	1 59	2 1	2 3	2 5	2 8	2 12	2 15	17
18	3 8	2 50	2 37	2 27	2 19	2 14	2 9	2 4	2 1	1 59	2 0	2 2	2 4	2 6	2 9	2 12	18
19	3 16	2 56	2 42	2 31	2 22	2 16	2 11	2 6	2 2	2 0	2 0	2 1	2 2	2 4	2 7	2 10	19
20	3 23	3 2	2 48	2 36	2 26	2 19	2 14	2 8	2 3	2 0	1 59	2 0	2 1	2 3	2 5	2 8	20
21	3 31	3 9	2 54	2 41	2 30	2 23	2 17	2 10	2 5	2 1	1 59	1 59	2 0	2 2	2 4	2 6	21
22	3 38	3 15	2 59	2 45	2 34	2 26	2 20	2 12	2 6	2 2	2 0	1 59	2 0	2 1	2 2	2 4	22
23	3 46	3 22	3 4	2 50	2 38	2 30	2 23	2 14	2 8	2 3	2 0	1 59	1 59	2 0	2 1	2 2	23
24	3 53	3 28	3 9	2 54	2 42	2 34	2 27	2 16	2 9	2 4	2 1	2 0	1 59	1 59	2 0	2 1	24
25	4 1	3 34	3 15	2 59	2 46	2 37	2 30	2 19	2 11	2 5	2 2	2 0	1 59	1 59	2 0	2 0	25
26	4 9	3 40	3 20	3 3	2 50	2 41	2 33	2 22	2 13	2 7	2 4	2 1	1 59	1 59	1 59	2 0	26
27	4 17	3 46	3 26	3 8	2 55	2 45	2 36	2 24	2 15	2 9	2 5	2 2	2 0	1 59	1 59	2 0	27
28	4 24	3 52	3 31	3 13	2 59	2 48	2 39	2 27	2 17	2 11	2 6	2 2	2 0	1 59	1 59	1 59	28
29	4 31	3 58	3 36	3 18	3 2	2 52	2 43	2 29	2 19	2 12	2 7	2 3	2 1	2 0	1 59	1 59	29
30	4 38	4 4	3 41	3 22	3 7	2 56	2 46	2 32	2 21	2 13	2 8	2 4	2 1	2 0	1 59	1 59	30
31	4 46	4 10	3 47	3 27	3 12	3 0	2 50	2 35	2 23	2 15	2 9	2 5	2 2	2 0	1 59	1 59	31
32	4 53	4 16	3 52	3 32	3 16	3 4	2 53	2 37	2 25	2 16	2 11	2 7	2 3	2 1	2 0	1 59	32
33	5 0	4 22	3 58	3 37	3 20	3 8	2 57	2 40	2 27	2 18	2 12	2 8	2 4	2 1	2 0	1 59	33
34	5 7	4 28	4 3	3 41	3 24	3 11	3 0	2 42	2 29	2 20	2 14	2 9	2 5	2 2	2 1	2 0	34
35	5 14	4 34	4 8	3 46	3 28	3 15	3 3	2 45	2 31	2 22	2 15	2 10	2 6	2 3	2 1	2 0	35
36	5 21	4 40	4 13	3 50	3 32	3 18	3 6	2 47	2 33	2 24	2 17	2 11	2 7	2 4	2 2	2 1	36
37	5 28	4 46	4 18	3 55	3 36	3 22	3 9	2 50	2 36	2 25	2 18	2 12	2 8	2 5	2 3	2 1	37
38	5 34	4 52	4 23	4 0	3 40	3 25	3 12	2 53	2 33	2 27	2 20	2 14	2 9	2 6	2 4	2 2	38
39	5 41	4 58	4 28	4 3	3 44	3 29	3 15	2 55	2 40	2 29	2 21	2 15	2 10	2 7	2 4	2 2	39
40	5 47	5 3	4 33	4 8	3 48	3 32	3 18	2 58	2 42	2 31	2 22	2 16	2 11	2 7	2 5	2 3	40
41	5 54	5 9	4 38	4 12	3 52	3 35	3 21	3 0	2 45	2 33	2 24	2 17	2 12	2 8	2 5	2 3	41
42	6 0	5 14	4 43	4 16	3 55	3 39	3 24	3 2	2 47	2 34	2 25	2 18	2 13	2 9	2 6	2 4	42
43	6 7	5 20	4 48	4 21	3 59	3 42	3 27	3 5	2 49	2 36	2 27	2 20	2 14	2 10	2 7	2 4	43
44	6 13	5 25	4 53	4 25	4 3	3 46	3 30	3 8	2 51	2 38	2 28	2 21	2 15	2 11	2 8	2 5	44
45	6 19	5 31	4 58	4 29	4 7	3 49	3 33	3 11	2 53	2 40	2 30	2 22	2 16	2 12	2 8	2 5	45
46	6 25	5 36	5 2	4 33	4 10	3 52	3 36	3 13	2 55	2 42	2 31	2 24	2 18	2 13	2 9	2 6	46
47	6 31	5 41	5 7	4 37	4 13	3 55	3 39	3 16	2 57	2 44	2 33	2 25	2 19	2 14	2 10	2 7	47
48	6 37	5 46	5 11	4 41	4 17	3 59	3 42	3 18	2 59	2 46	2 35	2 27	2 20	2 15	2 11	2 8	48
50	6 47	5 56	5 19	4 48	4 24	4 5	3 48	3 22	3 4	2 49	2 37	2 29	2 22	2 16	2 12	2 9	50
52	6 57	6 5	5 27	4 55	4 30	4 11	3 53	3 26	3 8	2 53	2 41	2 32	2 24	2 18	2 13	2 10	52
54	7 7	6 14	5 35	5 2	4 36	4 16	3 58	3 30	3 11	2 56	2 44	2 34	2 26	2 20	2 15	2 11	54
56	7 17	6 23	5 42	5 9	4 42	4 21	4 3	3 34	3 14	2 59	2 47	2 37	2 29	2 22	2 16	2 12	56
58	7 27	6 31	5 49	5 15	4 47	4 26	4 8	3 38	3 17	3 2	2 49	2 39	2 31	2 24	2 18	2 13	58
60	7 36	6 39	5 56	5 21	4 53	4 31	4 13	3 42	3 20	3 5	2 52	2 41	2 32	2 25	2 20		60
62	7 45	6 46	6 2	5 26	4 58	4 36	4 17	3 46	3 23	3 8	2 54	2 43	2 34	2 26			62
64	7 53	6 53	6 8	5 31	5 3	4 41	4 21	3 50	3 26	3 10	2 56	2 44	2 36				64
66	8 1	6 59	6 13	5 36	5 8	4 45	4 25	3 53	3 29	3 12	2 57	2 45					66
68	8 8	7 5	6 18	5 41	5 12	4 49	4 28	3 56	3 32	3 14	2 58						68
70	8 14	7 10	6 23	5 45	5 16	4 52	4 31	3 58	3 34	3 15							70
72	8 20	7 15	6 28	5 49	5 19	4 55	4 33	4 0	3 35								72
74	8 25	7 19	6 31	5 53	5 22	4 57	4 35	4 1									74
76	8 29	7 23	6 34	5 56	5 25	4 59	4 37										76
78	8 32	7 26	6 37	5 58	5 27												78
80	8 34	7 28	6 39														80
82	8 36																82
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 92°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																☽'s App Alt.
	32°	34°	36°	38°	40°	42°	46°	50°	54°	58°	62°	66°	70°	74°	78°	82°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	4 47	5 2	5 16	5 30	5 44	5 57	6 21	6 44	7 4	7 24	7 42	7 59	8 12	8 22	8 30	8 36	6
7	4 12	4 24	4 36	4 48	5 0	5 11	5 33	5 53	6 12	6 29	6 44	6 58	7 10	7 18	7 25		7
8	3 48	3 59	4 10	4 20	4 30	4 40	4 59	5 17	5 33	5 48	6 1	6 13	6 23	6 31	6 37		8
9	3 29	3 38	3 48	3 57	4 6	4 14	4 30	4 45	5 0	5 13	5 25	5 35	5 44	5 52	5 58		9
10	3 13	3 21	3 30	3 38	3 45	3 52	4 8	4 22	4 34	4 46	4 57	5 7	5 15	5 22	5 27		10
11	3 1	3 8	3 16	3 22	3 29	3 36	3 50	4 3	4 14	4 24	4 34	4 43	4 51	4 57			11
12	2 51	2 57	3 4	3 10	3 17	3 23	3 35	3 47	3 57	4 6	4 15	4 23	4 30	4 36			12
13	2 42	2 47	2 53	2 59	3 6	3 12	3 23	3 33	3 42	3 51	4 0	4 7	4 13	4 17			13
14	2 34	2 39	2 44	2 50	2 56	3 2	3 12	3 21	3 30	3 38	3 46	3 52	3 57	4 1			14
15	2 28	2 33	2 38	2 43	2 48	2 53	3 2	3 11	3 19	3 26	3 33	3 39	3 44				15
16	2 23	2 28	2 32	2 37	2 42	2 46	2 54	3 2	3 9	3 16	3 22	3 28	3 33				16
17	2 19	2 23	2 27	2 32	2 36	2 40	2 47	2 54	3 1	3 7	3 13	3 19	3 24				17
18	2 16	2 19	2 23	2 27	2 31	2 34	2 41	2 48	2 54	3 0	3 6	3 11	3 15				18
19	2 13	2 16	2 19	2 23	2 26	2 29	2 36	2 42	2 48	2 54	2 59	3 4					19
20	2 10	2 13	2 16	2 19	2 22	2 25	2 31	2 37	2 43	2 48	2 53	2 57					20
21	2 8	2 10	2 13	2 16	2 18	2 21	2 26	2 32	2 38	2 43	2 47	2 51					21
22	2 6	2 8	2 10	2 13	2 15	2 17	2 22	2 28	2 33	2 38	2 42	2 45					22
23	2 4	2 6	2 8	2 10	2 12	2 14	2 19	2 24	2 29	2 34	2 38						23
24	2 2	2 4	2 6	2 8	2 10	2 12	2 16	2 21	2 26	2 30	2 34						24
25	2 1	2 3	2 4	2 6	2 8	2 10	2 14	2 18	2 22	2 26	2 30						25
26	2 1	2 2	2 3	2 5	2 6	2 8	2 12	2 15	2 19	2 23	2 26						26
27	2 0	2 1	2 2	2 4	2 5	2 7	2 10	2 13	2 16	2 20							27
28	1 59	2 0	2 1	2 3	2 4	2 6	2 8	2 11	2 14	2 17							28
29	1 59	1 59	2 0	2 2	2 3	2 5	2 7	2 10	2 12	2 15							29
30	1 59	1 59	2 0	2 1	2 2	2 4	2 6	2 9	2 11	2 13							30
31	1 59	1 59	1 59	2 0	2 1	2 3	2 5	2 7	2 9								31
32	1 59	1 59	1 59	2 0	2 1	2 2	2 4	2 6	2 7								32
33	1 59	1 59	1 59	1 59	2 0	2 1	2 3	2 5	2 5								33
34	1 59	1 58	1 59	1 59	2 0	2 1	2 2	2 4	2 5								34
35	1 59	1 58	1 59	1 59	2 0	2 0	2 1	2 3									35
36	2 0	1 59	1 59	1 59	2 0	2 0	2 0	2 1	2 2								36
37	2 0	1 59	1 59	1 58	1 59	1 59	2 0	2 0	2 1								37
38	2 0	1 59	1 59	1 58	1 59	1 59	1 59	2 0	2 1								38
39	2 1	2 0	1 59	1 58	1 58	1 59	1 59	1 59									39
40	2 1	2 0	1 59	1 58	1 58	1 58	1 58	1 59									40
41	2 1	2 0	1 59	1 59	1 58	1 58	1 58										41
42	2 2	2 0	1 59	1 59	1 58	1 58	1 58										42
43	2 2	2 1	2 0	1 59	1 58	1 58											43
44	2 3	2 1	2 0	1 59	1 58	1 58											44
45	2 3	2 2	2 1	2 0	1 59	1 58											45
46	2 4	2 2	2 1	2 0	1 59	1 58											46
47	2 4	2 2	2 1	2 0	1 59												47
48	2 5	2 3	2 2	2 1	1 59												48
50	2 6	2 4	2 2	2 1													50
52	2 7	2 5	2 3														52
54	2 8	2 5															54
56	2 9																56
58																	58
60																	60
62																	62
64																	64
66																	66
68																	68
70																	70
72																	72
74																	74
76																	76
78																	78
80																	80
82																	82
	32°	34°	36°	38°	40°	42°	46°	50°	54°	58°	62°						

TABLE P. EFFECT OF SUN'S PAR.

To be subtracted from the third Correction.

☽'s App. Alt.	Sun's Apparent Altitude.								
	5	10	20	30	40	50	60	70	80	90
5	1	1	1	1	1	1	1	1	1	
10	2	2	2	2	2	2	2	2	2	0
15	2	2	2	2	3	3	3	3		
20	3	3	3	3	3	3	3			
25	4	4	4	4	4	4	4			
30	4	4	4	5	5	5	5			
35	5	5	5	5	5	5	6			
40	6	6	6	6	6	6	6			
45	6	6	6	6	7	7				
50	7	7	7	7	7	7				
55	7	7	7	7	8					
60	8	8	8	8	8					
65	8	8	8	8						
70	9	9	8	8						
75	9	9	9							
80	9	9								
90										

TABLE VI.

Third Correction, to Apparent Distance 96°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	2 6	2 8	2 10	2 13	2 17	2 22	2 28	2 41	2 55	3 10	3 26	3 41	3 56	4 11	4 26	4 41	6
7	2 9	2 6	2 8	2 10	2 12	2 16	2 20	2 29	2 40	2 52	3 5	3 18	3 31	3 43	3 56	4 8	7
8	2 12	2 8	2 6	2 7	2 9	2 12	2 15	2 22	2 31	2 40	2 51	3 2	3 13	3 24	3 35	3 45	8
9	2 16	2 11	2 8	2 6	2 7	2 9	2 12	2 17	2 24	2 31	2 40	2 49	2 59	3 8	3 18	3 27	9
10	2 20	2 14	2 10	2 8	2 6	2 7	2 9	2 13	2 18	2 24	2 32	2 40	2 47	2 56	3 4	3 12	10
11	2 26	2 18	2 13	2 10	2 7	2 6	2 7	2 10	2 14	2 19	2 25	2 32	2 39	2 46	2 53	3 1	11
12	2 32	2 13	2 17	2 13	2 9	2 7	2 6	2 8	2 11	2 15	2 20	2 26	2 32	2 38	2 45	2 52	12
13	2 39	2 28	2 21	2 16	2 12	2 9	2 7	2 7	2 9	2 12	2 16	2 21	2 26	2 32	2 38	2 44	13
14	2 46	2 23	2 25	2 19	2 14	2 11	2 9	2 6	2 8	2 10	2 13	2 18	2 22	2 27	2 32	2 37	14
15	2 53	2 29	2 29	2 22	2 17	2 14	2 11	2 7	2 7	2 9	2 11	2 15	2 19	2 23	2 28	2 32	15
16	3 1	2 45	2 34	2 26	2 20	2 16	2 13	2 8	2 5	2 8	2 10	2 13	2 16	2 20	2 24	2 28	16
17	3 8	2 51	2 39	2 30	2 23	2 19	2 15	2 9	2 7	2 7	2 9	2 11	2 14	2 17	2 21	2 24	17
18	3 15	2 57	2 44	2 34	2 26	2 21	2 17	2 11	2 8	2 6	2 8	2 10	2 12	2 15	2 18	2 21	18
19	3 23	3 3	2 49	2 38	2 30	2 24	2 19	2 13	2 9	2 7	2 7	2 8	2 10	2 13	2 15	2 18	19
20	3 30	3 9	2 54	2 43	2 34	2 27	2 22	2 15	2 11	2 8	2 6	2 7	2 9	2 11	2 13	2 15	20
21	3 38	3 16	3 0	2 48	2 37	2 30	2 25	2 17	2 12	2 9	2 7	2 7	2 8	2 9	2 11	2 13	21
22	3 46	3 22	3 5	2 52	2 41	2 33	2 28	2 19	2 14	2 10	2 8	2 6	2 7	2 8	2 10	2 12	22
23	3 54	3 28	3 11	2 57	2 45	2 37	2 31	2 21	2 15	2 11	2 8	2 6	2 6	2 7	2 9	2 11	23
24	4 1	3 34	3 16	3 1	2 49	2 41	2 35	2 23	2 17	2 12	2 9	2 7	2 6	2 7	2 8	2 10	24
25	4 9	3 41	3 22	3 6	2 53	2 45	2 38	2 26	2 19	2 14	2 11	2 8	2 6	2 7	2 8	2 9	25
26	4 16	3 47	3 27	3 11	2 57	2 48	2 41	2 29	2 21	2 16	2 12	2 9	2 7	2 6	2 7	2 8	26
27	4 24	3 53	3 33	3 15	3 1	2 52	2 44	2 31	2 23	2 17	2 13	2 10	2 8	2 6	2 6	2 7	27
28	4 31	4 0	3 38	3 20	3 6	2 55	2 47	2 34	2 24	2 18	2 14	2 11	2 9	2 7	2 6	2 7	28
29	4 39	4 6	3 44	3 25	3 10	2 59	2 50	2 36	2 26	2 20	2 15	2 12	2 10	2 8	2 7	2 6	29
30	4 46	4 12	3 49	3 29	3 14	3 2	2 53	2 38	2 28	2 21	2 16	2 13	2 10	2 8	2 7	2 6	30
31	4 53	4 18	3 55	3 34	3 18	3 7	2 57	2 41	2 30	2 23	2 18	2 14	2 11	2 9	2 8	2 7	31
32	5 0	4 24	4 0	3 39	3 23	3 11	3 1	2 44	2 32	2 25	2 19	2 15	2 12	2 9	2 8	2 7	32
33	5 7	4 30	4 5	3 44	3 27	3 15	3 4	2 46	2 34	2 26	2 20	2 16	2 13	2 10	2 8	2 7	33
34	5 14	4 36	4 11	3 49	3 32	3 19	3 7	2 48	2 36	2 28	2 21	2 17	2 14	2 11	2 9	2 8	34
35	5 21	4 42	4 16	3 54	3 36	3 23	3 11	2 51	2 38	2 30	2 23	2 18	2 15	2 12	2 10	2 8	35
36	5 28	4 48	4 21	3 59	3 40	3 26	3 14	2 54	2 40	2 32	2 25	2 20	2 16	2 13	2 11	2 9	36
37	5 35	4 54	4 26	4 3	3 44	3 29	3 17	2 57	2 43	2 33	2 26	2 21	2 17	2 14	2 11	2 9	37
38	5 42	5 0	4 31	4 8	3 48	3 33	3 20	2 59	2 45	2 35	2 27	2 22	2 18	2 15	2 12	2 10	38
39	5 49	5 6	4 36	4 12	3 52	3 36	3 23	3 2	2 47	2 37	2 29	2 23	2 19	2 16	2 18	2 11	39
40	5 55	5 12	4 41	4 16	3 56	3 40	3 26	3 5	2 50	2 39	2 30	2 24	2 20	2 16	2 13	2 11	40
41	6 2	5 18	4 46	4 20	4 0	3 44	3 30	3 7	2 52	2 41	2 32	2 25	2 21	2 17	2 14	2 12	41
42	6 8	5 23	4 51	4 24	4 4	3 47	3 33	3 10	2 54	2 43	2 34	2 27	2 22	2 18	2 15	2 13	42
43	6 14	5 29	4 56	4 29	4 8	3 51	3 36	3 13	2 57	2 45	2 35	2 28	2 23	2 19	2 16	2 13	43
44	6 20	5 34	5 1	4 33	4 11	3 54	3 39	3 16	2 59	2 47	2 37	2 29	2 24	2 20	2 17	2 14	44
45	6 26	5 39	5 6	4 37	4 14	3 57	3 42	3 19	3 1	2 48	2 38	2 30	2 25	2 21	2 17	2 14	45
46	6 32	5 44	5 10	4 41	4 18	4 0	3 45	3 21	3 3	2 50	2 39	2 31	2 26	2 22	2 18	2 15	46
47	6 38	5 49	5 15	4 45	4 22	4 3	3 48	3 24	3 5	2 52	2 41	2 33	2 27	2 23	2 19	2 16	47
48	6 44	5 54	5 19	4 49	4 25	4 7	3 51	3 26	3 7	2 53	2 42	2 34	2 28	2 24	2 20	2 16	48
49	6 50	5 59	5 23	4 53	4 29	4 10	3 54	2 28	3 9	2 55	2 44	2 36	2 29	2 25	2 21	2 17	49
50	6 55	6 4	5 27	4 57	4 32	4 13	3 57	3 30	3 11	2 56	2 45	2 37	2 31	2 26	2 21	2 17	50
51	7 0	6 9	5 31	5 1	4 36	4 16	4 0	3 32	3 13	2 58	2 47	2 38	2 32	2 27	2 22	2 18	51
52	7 5	6 14	5 35	5 4	4 39	4 19	4 3	3 34	3 15	3 0	2 48	2 39	2 33	2 28	2 23	2 18	52
54	7 15	6 23	5 43	5 11	4 45	4 25	4 8	3 38	3 19	3 2	2 51	2 42	2 35	2 29	2 24	2 19	54
56	7 25	6 31	5 51	5 18	4 51	4 30	4 13	3 42	3 22	3 6	2 54	2 45	2 37	2 30	2 25		56
58	7 35	6 39	5 58	5 24	4 56	4 35	4 17	3 46	3 26	3 9	2 57	2 47	2 39	2 31			58
60	7 45	6 46	6 4	5 30	5 1	4 39	4 21	3 50	3 29	3 12	2 59	2 49	2 41				60
62	7 54	6 53	6 10	5 35	5 6	4 44	4 25	3 54	3 32	3 15	3 1	2 50					62
64	8 2	7 0	6 16	5 40	5 11	4 48	4 29	3 58	3 35	3 17	3 3						64
66	8 10	7 7	6 21	5 45	5 16	4 52	4 33	4 1	3 38	3 19							66
68	8 17	7 13	6 26	5 50	5 21	4 56	4 36	4 4	3 40								68
70	8 24	7 18	6 31	5 54	5 25	5 0	4 39	4 5									70
72	8 29	7 23	6 36	5 58	5 28	5 3	4 41										72
74	8 33	7 27	6 40	6 1	5 31												74
76	8 37	7 31	6 43														76
78	8 40																78
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 96°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																								☽'s App Alt.
	32°		34°		36°		38°		40°		42°		44°		46°		50°		54°		58°		62°		66°		70°		74°		78°		
°	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	°
6	4	56	5	10	5	24	5	38	5	51	6	4	6	17	6	29	6	52	7	14	7	34	7	52	8	9	8	23	8	33	8	40	6
7	4	20	4	32	4	44	4	56	5	8	5	20	5	31	5	42	6	2	6	20	6	37	6	52	7	6	7	18	7	28			7
8	3	56	4	7	4	18	4	29	4	39	4	49	4	59	5	8	5	26	5	42	5	56	6	9	6	21	6	31	6	40			8
9	3	37	3	46	3	55	4	4	4	13	4	23	4	32	4	40	4	56	5	10	5	23	5	34	5	44	5	53	6	1			9
10	3	22	3	30	3	37	3	45	3	53	4	2	4	10	4	17	4	31	4	43	4	55	5	6	5	16	5	24	5	31			10
11	3	9	3	17	3	24	3	31	3	38	3	45	3	52	3	59	4	11	4	22	4	33	4	43	4	52	5	0					11
12	2	59	3	6	3	12	3	19	3	25	3	32	3	38	3	45	3	55	4	5	4	15	4	24	4	32	4	39					12
13	2	50	2	56	3	2	3	8	3	14	3	20	3	26	3	32	3	42	3	51	4	0	4	8	4	15	4	21					13
14	2	42	2	48	2	53	2	58	3	4	3	9	3	15	3	20	3	30	3	39	3	48	3	55	4	1	4	6					14
15	2	36	2	41	2	46	2	50	2	55	3	0	3	5	3	10	3	19	3	28	3	36	3	43	3	49							15
16	2	32	2	36	2	40	2	44	2	48	2	53	2	57	3	2	3	10	3	18	3	25	3	32	3	38							16
17	2	28	2	31	2	35	2	39	2	43	2	47	2	51	2	55	3	3	3	10	3	16	3	22	3	28							17
18	2	24	2	27	2	31	2	35	2	38	2	42	2	45	2	49	2	56	3	2	3	8	3	14	3	19							18
19	2	21	2	24	2	27	2	31	2	34	2	37	2	40	2	44	2	50	2	56	3	2	3	7									19
20	2	18	2	21	2	24	2	27	2	30	2	33	2	36	2	39	2	45	2	51	2	56	3	1									20
21	2	16	2	19	2	21	2	24	2	26	2	29	2	32	2	35	2	41	2	46	2	51	2	55									21
22	2	14	2	17	2	19	2	21	2	23	2	26	2	28	2	31	2	37	2	42	2	46	2	50									22
23	2	13	2	15	2	17	2	19	2	21	2	23	2	25	2	28	2	33	2	38	2	42											23
24	2	11	2	13	2	15	2	17	2	19	2	21	2	23	2	25	2	30	2	35	2	38											24
25	2	10	2	11	2	13	2	15	2	17	2	19	2	21	2	23	2	27	2	31	2	35											25
26	2	9	2	10	2	12	2	13	2	15	2	17	2	19	2	21	2	25	2	28	2	31											26
27	2	8	2	9	2	11	2	12	2	14	2	16	2	18	2	20	2	23	2	25													27
28	2	8	2	9	2	10	2	11	2	13	2	15	2	17	2	18	2	21	2	23													28
29	2	7	2	8	2	9	2	10	2	12	2	13	2	15	2	17	2	19	2	21													29
30	2	7	2	8	2	9	2	10	2	11	2	12	2	14	2	15	2	17	2	19													30
31	2	6	2	7	2	8	2	9	2	10	2	11	2	12	2	14	2	16															31
32	2	6	2	7	2	7	2	8	2	9	2	10	2	11	2	12	2	14															32
33	2	6	2	6	2	7	2	7	2	8	2	9	2	10	2	11	2	13															33
34	2	7	2	6	2	7	2	7	2	8	2	9	2	10	2	11	2	12															34
35	2	7	2	6	2	6	2	7	2	7	2	8	2	9	2	10																	35
36	2	8	2	7	2	6	2	6	2	7	2	8	2	9	2	9																	36
37	2	8	2	7	2	6	2	6	2	7	2	7	2	8	2	8																	37
38	2	9	2	8	3	7	2	6	2	6	2	7	2	8	2	8																	38
39	2	9	2	8	2	7	2	6	2	6	2	7	2	7																			39
40	2	10	2	8	2	7	2	6	2	6	2	6	2	7																			40
41	2	10	2	9	2	8	2	7	2	7	2	7	2	6																			41
42	2	11	2	9	2	8	2	7	2	7	2	7	2	6																			42
43	2	11	2	10	2	8	2	7	2	7																							43
44	2	12	2	10	2	8	2	7	2	7																							44
45	2	12	2	10	2	9	2	8																									45
46	2	13	2	11	2	9	2	8																									46
47	2	13	2	11	2	9																											47
48	2	13	2	11	2	9																											48
49	2	14	2	12																													49
50	2	14	2	12																													50
51	2	14																															51
52	2	15																															52
54																																	54
56																																	56
58																																	58
60																																	60
62																																	62
64																																	64
66																																	66
68																																	68
70																																	70
72																																	72
74																																	74
76																																	76
78																																	78
	32°		34°		36°		38°		40°		42°		44°		46°		50°		54°		58°												

TABLE P. EFFECT OF SUN'S PAR.

To be subtracted from the third Correction.

☽'s App. Alt.	Sun's Apparent Altitude.										
	5	10	20	30	40	50	60	70	80	90	90
5	1	1	1	1	1	1	2	3	2	0	
10	2	2	2	2	2	2	3	3			
15	2	3	3	3	3	3	3				
20	3	3	3	4	4	4					
25	4	4	4	4	4	4					
30	5	5	5	5	5	5					
35	5	5	5	5	5	6					
40	6	6	6	6	6	6					
45	6	6	7	7	7	7					
50	7	7	7	7	7						
55	7	8	8	8	8						
60	8	8	8	8							
65	8	8	8	8							
70	9	9	9								
75	9	9	9								
80	9	9									
90											

TABLE VI.

Third Correction, to Apparent Distance 100°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	2 13	2 15	2 18	2 21	2 25	2 31	2 37	2 49	3 3	3 18	3 33	3 48	4 4	4 19	4 34	4 49	6
7	2 16	2 13	2 15	2 17	2 20	2 24	2 29	2 38	2 49	3 1	3 13	3 25	3 38	3 50	4 3	4 16	7
8	2 19	2 15	2 13	2 14	2 16	2 19	2 23	2 31	2 39	2 49	2 59	3 10	3 21	3 32	3 43	3 54	8
9	2 23	2 18	2 15	2 13	2 14	2 16	2 19	2 25	2 32	2 40	2 48	2 58	3 7	3 16	3 26	3 35	9
10	2 28	2 22	2 18	2 15	2 13	2 14	2 16	2 21	2 26	2 33	2 40	2 48	2 56	3 4	3 13	3 21	10
11	2 33	2 26	2 21	2 17	2 15	2 13	2 14	2 18	2 22	2 27	2 33	2 40	2 47	2 54	3 2	3 10	11
12	2 40	2 30	2 24	2 20	2 17	2 14	2 13	2 16	2 19	2 23	2 28	2 34	2 40	2 46	2 53	3 0	12
13	2 47	2 35	2 28	2 23	2 19	2 16	2 14	2 14	2 17	2 20	2 24	2 29	2 34	2 40	2 45	2 51	13
14	2 54	2 40	2 32	2 26	2 21	2 18	2 16	2 13	2 15	2 18	2 21	2 25	2 30	2 35	2 39	2 44	14
15	3 1	2 46	2 36	2 29	2 24	2 21	2 18	2 14	2 14	2 16	2 19	2 22	2 26	2 30	2 34	2 39	15
16	3 8	2 52	2 41	2 33	2 27	2 23	2 20	2 16	2 13	2 15	2 17	2 20	2 23	2 26	2 30	2 35	16
17	3 15	2 58	2 46	2 37	2 30	2 25	2 22	2 17	2 14	2 14	2 16	2 18	2 21	2 24	2 27	2 31	17
18	3 23	3 4	2 51	2 41	2 33	2 28	2 24	2 19	2 15	2 13	2 15	2 17	2 19	2 22	2 25	2 28	18
19	3 30	3 11	2 56	2 45	2 37	2 31	2 26	2 20	2 16	2 14	2 14	2 16	2 17	2 20	2 22	2 25	19
20	3 38	3 17	3 2	2 50	2 41	2 34	2 29	2 22	2 18	2 15	2 13	2 15	2 16	2 18	2 20	2 23	20
21	3 45	3 24	3 8	2 54	2 45	2 38	2 32	2 24	2 19	2 16	2 14	2 14	2 15	2 17	2 19	2 21	21
22	3 53	3 30	3 13	2 59	2 49	2 41	2 35	2 26	2 21	2 18	2 15	2 13	2 14	2 16	2 18	2 20	22
23	4 1	3 36	3 19	3 4	2 53	2 45	2 38	2 28	2 23	2 19	2 16	2 13	2 13	2 15	2 17	2 19	23
24	4 9	3 42	3 24	3 9	2 58	2 49	2 42	2 31	2 24	2 20	2 17	2 14	2 13	2 14	2 16	2 18	24
25	4 16	3 49	3 30	3 14	3 2	2 53	2 45	2 33	2 26	2 21	2 18	2 15	2 14	2 14	2 15	2 17	25
26	4 24	3 55	3 35	3 19	3 6	2 56	2 48	2 36	2 28	2 23	2 19	2 16	2 14	2 14	2 15	2 16	26
27	4 31	4 2	3 41	3 24	3 11	3 0	2 51	2 38	2 30	2 24	2 20	2 17	2 15	2 14	2 14	2 15	27
28	4 39	4 8	3 46	3 28	3 15	3 4	2 54	2 40	2 32	2 25	2 21	2 18	2 16	2 15	2 14	2 15	28
29	4 46	4 14	3 52	3 33	3 19	3 7	2 58	2 43	2 34	2 26	2 22	2 19	2 17	2 15	2 14	2 14	29
30	4 54	4 20	3 57	3 38	3 23	3 11	3 1	2 45	2 36	2 28	2 24	2 21	2 18	2 16	2 15	2 14	30
31	5 1	4 26	4 3	3 42	3 27	3 15	3 5	2 48	2 38	2 30	2 25	2 22	2 19	2 17	2 15	2 14	31
32	5 8	4 33	4 8	3 47	3 31	3 18	3 8	2 51	2 40	2 32	2 27	2 23	2 20	2 17	2 16	2 15	32
33	5 16	4 39	4 14	3 52	3 36	3 22	3 11	2 54	2 42	2 33	2 28	2 24	2 21	2 18	2 16	2 15	33
34	5 23	4 45	4 19	3 57	3 40	3 26	3 15	2 56	2 44	2 35	2 29	2 25	2 22	2 19	2 17	2 16	34
35	5 30	4 51	4 24	4 2	3 44	3 30	3 18	2 59	2 46	2 37	2 31	2 26	2 23	2 20	2 18	2 16	35
36	5 37	4 57	4 29	4 7	3 48	3 34	3 22	3 2	2 49	2 39	2 32	2 28	2 24	2 20	2 18	2 17	36
37	5 44	5 3	4 35	4 12	3 52	3 38	3 25	3 6	2 51	2 41	2 34	2 29	2 25	2 21	2 19	2 18	37
38	5 51	5 9	4 40	4 16	3 56	3 41	3 28	3 8	2 54	2 43	2 36	2 30	2 26	2 22	2 20	2 18	38
39	5 58	5 15	4 45	4 21	4 0	3 45	3 31	3 11	2 56	2 45	2 37	2 31	2 27	2 23	2 21	2 19	39
40	6 4	5 21	4 50	4 25	4 4	3 48	3 34	3 14	2 58	2 47	2 38	2 32	2 28	2 24	2 22	2 20	40
41	6 11	5 27	4 55	4 29	4 8	3 52	3 38	3 17	3 1	2 49	2 40	2 34	2 29	2 25	2 22	2 20	41
42	6 18	5 33	5 0	4 33	4 12	3 55	3 41	3 19	3 3	2 51	2 41	2 35	2 30	2 26	2 23	2 21	42
43	6 24	5 38	5 5	4 38	4 16	3 59	3 44	3 22	3 6	2 53	2 43	2 36	2 31	2 27	2 24	2 22	43
44	6 30	5 44	5 9	4 42	4 20	4 2	3 47	3 24	3 8	2 55	2 45	2 38	2 32	2 28	2 25	2 22	44
45	6 36	5 49	5 14	4 46	4 24	4 6	3 50	3 27	3 10	2 57	2 47	2 39	2 33	2 29	2 26	2 23	45
46	6 42	5 54	5 18	4 50	4 27	4 9	3 53	3 29	3 12	2 59	2 48	2 41	2 35	2 30	2 27	2 24	46
47	6 48	5 59	5 23	4 54	4 31	4 12	3 56	3 32	3 14	3 0	2 50	2 42	2 36	2 31	2 28	2 25	47
48	6 54	6 4	5 27	4 58	4 34	4 15	3 59	3 34	3 16	3 2	2 51	2 43	2 37	2 32	2 28	2 25	48
49	7 0	6 9	5 32	5 2	4 38	4 18	4 2	3 37	3 18	3 4	2 53	2 45	2 38	2 33	2 29	2 26	49
50	7 5	6 14	5 36	5 6	4 41	4 21	4 5	3 39	3 20	3 5	2 54	2 46	2 39	2 34	2 30	2 26	50
51	7 11	6 19	5 41	5 10	4 45	4 24	4 8	3 42	3 22	3 7	2 55	2 47	2 40	2 35	2 31		51
52	7 16	6 24	5 45	5 14	4 48	4 27	4 11	3 44	3 24	3 9	2 57	2 49	2 42	2 36	3 31		52
53	7 21	6 29	5 49	5 17	4 52	4 30	4 14	3 46	3 26	3 11	2 59	2 50	2 43	2 37			53
54	7 26	6 34	5 53	5 21	4 55	4 33	4 16	3 48	3 28	3 12	3 0	2 51	2 44	2 37			54
55	7 31	6 39	5 57	5 24	4 58	4 36	4 19	3 50	3 30	3 14	3 1	2 52	2 45				55
56	7 36	6 43	6 0	5 27	5 1	4 39	4 22	3 52	3 32	3 16	3 2	2 53	2 46				56
58	7 46	6 51	6 7	5 33	5 7	4 44	4 26	3 56	3 36	3 19	3 5	2 55					58
60	7 56	6 58	6 14	5 39	5 12	4 49	4 31	4 0	3 39	3 22	3 8						60
62	8 5	7 5	6 20	5 45	5 17	4 54	4 36	4 4	3 42	3 24							62
64	8 13	7 12	6 26	5 51	5 22	4 59	4 40	4 7	3 45								64
66	8 21	7 19	6 32	5 57	5 27	5 3	4 43	4 10									66
68	8 28	7 25	6 38	6 2	5 32	5 7	4 45										68
70	8 35	7 30	6 43	6 7	5 36												70
72	8 40	7 35	6 47														72
74	8 44																74
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 100°.

D's App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																		D's App Alt.
	32°	34°	36°	38°	40°	42°	44°	46°	48°	50°	54°	58°	62°	66°	70°	74°			
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	5 45	5 19	5 34	5 48	6 2	6 15	6 28	6 41	6 53	7 47	7 25	7 46	8 5	8 20	8 33	8 44			6
7	4 29	4 41	4 54	5 6	5 18	5 30	5 41	5 52	6 3	6 13	6 32	6 50	7 6	7 19	7 30				7
8	4 5	4 16	4 27	4 38	4 48	4 58	5 8	5 17	5 26	5 35	5 52	6 7	6 20	6 32	6 44				8
9	3 45	3 55	4 5	4 15	4 24	4 32	4 41	4 49	4 57	5 4	5 19	5 33	5 45	5 56	6 7				9
10	3 30	3 39	3 47	3 55	4 3	4 11	4 19	4 26	4 33	4 40	4 54	5 6	5 16	5 26	5 36				10
11	3 18	3 26	3 33	3 40	3 47	3 54	4 1	4 8	4 15	4 21	4 33	4 44	4 54	5 3					11
12	3 7	3 14	3 21	3 27	3 34	3 40	3 47	3 53	3 59	4 4	4 15	4 25	4 34	4 43					12
13	2 58	3 4	3 10	3 16	3 22	3 28	3 34	3 40	3 46	3 51	4 0	4 9	4 17	4 25					13
14	2 50	2 56	3 1	3 7	3 12	3 18	3 23	3 29	3 34	3 39	3 48	3 56	4 4	4 10					14
15	2 41	2 49	2 54	2 59	3 4	3 9	3 14	3 19	3 24	3 28	3 37	3 45	3 53						15
16	2 39	2 44	2 48	2 52	2 57	3 2	3 7	3 11	3 15	3 19	3 27	3 35	3 42						16
17	2 35	2 39	2 43	2 47	2 51	2 56	3 0	3 4	3 8	3 12	3 19	3 26	3 33						17
18	2 31	2 35	2 38	2 42	2 46	2 50	2 54	2 58	3 1	3 5	3 12	3 18	3 24						18
19	2 28	2 31	2 34	2 38	2 42	2 45	2 49	2 52	2 55	2 59	3 5	3 11							19
20	2 25	2 28	2 31	2 35	2 38	2 41	2 44	2 47	2 50	2 54	3 0	3 5							20
21	2 23	2 26	2 29	2 32	2 35	2 38	2 40	2 43	2 46	2 49	2 55	3 0							21
22	2 22	2 24	2 27	2 29	2 32	2 35	2 37	2 40	2 43	2 45	2 50	2 55							22
23	2 21	2 23	2 25	2 27	2 29	2 32	2 34	2 37	2 40	2 42	2 46								23
24	2 20	2 22	2 23	2 25	2 27	2 29	2 32	2 35	2 37	2 39	2 43								24
25	2 19	2 20	2 21	2 23	2 25	2 27	2 30	2 32	2 34	2 36	2 40								25
26	2 18	2 19	2 20	2 21	2 23	2 25	2 28	2 30	2 32	2 34	2 37								26
27	2 17	2 18	2 19	2 20	2 22	2 24	2 26	2 28	2 30	2 32									27
28	2 16	2 17	2 18	2 19	2 21	2 23	2 24	2 26	2 28	2 30									28
29	2 15	2 16	2 17	2 18	2 20	2 22	2 23	2 25	2 26	2 28									29
30	2 15	2 16	2 17	2 18	2 19	2 21	2 22	2 24	2 25	2 26									30
31	2 14	2 15	2 16	2 17	2 18	2 20	2 21	2 22	2 23										31
32	2 14	2 15	2 16	2 17	2 18	2 19	2 20	2 21	2 22										32
33	2 15	2 15	2 15	2 16	2 17	2 18	2 19	2 20											33
34	2 15	2 15	2 15	2 16	2 17	2 18	2 19	2 19											34
35	2 15	2 15	2 15	2 15	2 16	2 17	2 18												35
36	2 16	2 15	2 15	2 15	2 16	2 17	2 17												36
37	2 17	2 16	2 15	2 15	2 16	2 16													37
38	2 17	2 16	3 15	2 15	2 16	2 16													38
39	2 18	2 17	2 16	2 16	2 16														39
40	2 18	2 17	2 16	2 16	2 16														40
41	2 19	2 18	2 17	2 16															41
42	2 19	2 18	2 17	2 16															42
43	2 20	2 18	2 17																43
44	2 20	2 19	2 17																44
45	2 21	2 19																	45
46	2 21	2 19																	46
47	2 22																		47
48	2 22																		48
49																			49
50																			50
51																			51
52																			52
53																			53
54																			54
55																			55
56																			56
58																			58
60																			60
62																			62
64																			64
66																			66
68																			68
70																			70
72																			72
74																			74
	32°	34°	36°	38°	40°	42°	44°	46°	48°	50°	54°								

TABLE *P*. EFFECT OF SUN's PAR.

To be subtracted from the third Correction.

D's App. Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	75	80
5	1	1	1	2	2	2	2	2	2	
10	2	2	2	2	3	3	3	3		
15	2	3	3	3	3	4	4	4		
20	3	3	4	4	4	4	4			
25	4	4	4	5	5	5	5			
30	5	5	5	5	5	6	6			
35	5	5	6	6	6	6				
40	6	6	6	7	7	7				
45	7	7	7	7	7					
50	7	7	7	8	8					
55	8	8	8	8						
60	8	8	8							
65	8	8	9							
70	9	9								
75	9									

TABLE VI.

Third Correction, to Apparent Distance 104°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	2 20	2 22	2 25	2 29	2 33	2 39	2 45	2 58	3 13	3 28	3 43	3 59	4 15	4 30	4 46	5 1	6
7	2 23	2 20	2 22	2 25	2 28	2 32	2 36	2 46	2 57	3 10	3 23	3 36	3 48	4 1	4 14	4 27	7
8	2 26	2 22	2 20	2 22	2 24	2 27	2 30	2 38	2 47	2 57	3 8	3 20	3 31	3 42	3 53	4 4	8
9	2 30	2 25	2 22	2 21	2 22	2 24	2 26	2 32	2 39	2 48	2 57	3 7	3 17	3 26	3 36	3 46	9
10	2 36	2 29	2 25	2 22	2 21	2 22	2 24	2 28	2 34	2 41	2 48	2 56	3 5	3 14	3 23	3 31	10
11	2 42	2 34	2 28	2 24	2 22	2 21	2 22	2 25	2 30	2 35	2 41	2 48	2 55	3 4	3 11	3 19	11
12	2 48	2 39	2 32	2 27	2 24	2 22	2 21	2 23	2 27	2 31	2 36	2 42	2 48	2 56	3 2	3 9	12
13	2 55	2 44	2 36	2 30	2 26	2 24	2 22	2 22	2 25	2 28	2 32	2 38	2 43	2 49	2 55	3 1	13
14	3 2	2 49	2 40	2 33	2 29	2 26	2 24	2 22	2 23	2 26	2 30	2 34	2 39	2 43	2 48	2 54	14
15	3 9	2 54	2 45	2 37	2 32	2 28	2 26	2 23	2 22	2 25	2 28	2 31	2 35	2 39	2 43	2 48	15
16	3 16	3 0	2 50	2 41	2 35	2 31	2 28	2 24	2 22	2 24	2 26	2 29	2 32	2 35	2 39	2 44	16
17	3 23	3 6	2 55	2 45	2 38	2 33	2 30	2 26	2 23	2 23	2 25	2 27	2 30	2 33	2 36	2 40	17
18	3 31	3 13	3 0	2 49	2 41	2 36	2 33	2 27	2 24	2 22	2 24	2 26	2 28	2 31	2 34	2 37	18
19	3 38	3 19	3 5	2 53	2 45	2 39	2 35	2 29	2 25	2 23	2 23	2 24	2 26	2 29	2 31	2 34	19
20	3 46	3 25	3 11	2 58	2 49	2 43	2 38	2 31	2 27	2 24	2 22	2 23	2 25	2 27	2 29	2 32	20
21	3 54	3 32	3 16	3 3	2 53	2 46	2 41	2 33	2 28	2 25	2 23	2 22	2 24	2 26	2 28	2 30	21
22	4 2	3 38	3 22	3 8	2 57	2 50	2 44	2 35	2 30	2 26	2 24	2 22	2 23	2 25	2 27	2 29	22
23	4 10	3 45	3 27	3 13	3 2	2 54	2 47	2 38	2 32	2 28	2 25	2 23	2 22	2 24	2 26	2 28	23
24	4 18	3 51	3 33	3 18	3 6	2 57	2 50	2 40	2 33	2 29	2 26	2 24	2 22	2 23	2 25	2 27	24
25	4 26	3 58	3 39	3 22	3 10	3 1	2 54	2 42	2 35	2 30	2 27	2 24	2 23	2 23	2 24	2 26	25
26	4 33	4 4	3 44	3 27	3 15	3 5	2 57	2 44	2 36	2 31	2 28	2 25	2 24	2 23	2 24	2 26	26
27	4 41	4 11	3 50	3 32	3 19	3 9	3 0	2 47	2 38	2 32	2 29	2 26	2 24	2 23	2 24	2 25	27
28	4 49	4 18	3 56	3 37	3 23	3 12	3 3	2 49	2 40	2 34	2 30	2 27	2 25	2 24	2 24	2 25	28
29	4 57	4 24	4 1	3 42	3 28	3 16	3 7	2 52	2 42	2 35	2 31	2 28	2 26	2 25	2 24	2 25	29
30	5 4	4 30	4 7	3 47	3 32	3 20	3 10	2 55	2 44	2 37	2 33	2 30	2 27	2 25	2 24	2 24	30
31	5 12	4 37	4 13	3 52	3 36	3 24	3 14	2 58	2 46	2 39	2 34	2 31	2 28	2 26	2 25	2 24	31
32	5 19	4 44	4 19	3 57	3 41	3 28	3 17	3 0	2 49	2 41	2 36	2 32	2 29	2 27	2 26	2 25	32
33	5 27	4 51	4 25	4 2	3 46	3 32	3 21	3 3	2 51	2 43	2 37	2 33	2 30	2 28	2 26	2 25	33
34	5 34	4 58	4 30	4 7	3 50	3 36	3 24	3 5	2 54	2 45	2 39	2 34	2 31	2 29	2 27	2 26	34
35	5 42	5 4	4 36	4 12	3 55	3 40	3 27	3 8	2 56	2 47	2 40	2 35	2 32	2 30	2 28	2 27	35
36	5 49	5 10	4 41	4 17	3 59	3 44	3 31	3 11	2 58	2 49	2 42	2 37	2 33	2 30	2 28	2 27	36
37	5 56	5 16	4 46	4 21	4 3	3 47	3 35	3 14	3 1	2 51	2 43	2 38	2 34	2 31	2 29	2 27	37
38	6 3	5 22	4 51	4 26	4 7	3 51	3 38	3 17	3 4	2 53	2 45	2 39	2 35	2 32	2 30	2 28	38
39	6 10	5 28	4 56	4 31	4 11	3 55	3 41	3 20	3 6	2 55	2 47	2 41	2 36	2 33	2 31	2 29	39
40	6 16	5 33	5 1	4 36	4 15	3 59	3 45	3 23	3 9	2 57	2 49	2 42	2 37	2 34	3 32	2 30	40
41	6 23	5 39	5 6	4 40	4 19	4 3	3 49	3 26	3 11	2 59	2 51	2 44	2 39	2 35	2 32	2 30	41
42	6 30	5 44	5 11	4 44	4 23	4 6	3 53	3 29	3 13	3 1	2 52	2 45	2 40	2 36	2 33	2 31	42
43	6 37	5 50	5 16	4 49	4 27	4 10	3 56	3 32	3 15	3 3	2 54	2 47	2 41	2 37	2 34	2 31	43
44	6 43	5 55	5 21	4 53	4 31	4 13	3 59	3 35	3 18	3 5	2 55	2 48	2 42	2 38	2 35	2 32	44
45	6 50	6 1	5 26	4 58	4 35	4 17	4 2	3 38	3 20	3 6	2 57	2 50	2 44	2 39	2 35	2 32	45
46	6 56	6 6	5 31	5 2	4 39	4 20	4 5	3 40	3 22	3 8	2 58	2 51	2 45	2 40	2 36	2 33	46
47	7 2	6 12	5 36	5 6	4 43	4 24	4 8	3 43	3 24	3 10	3 0	2 52	2 46	2 41	2 37		47
48	7 8	6 17	5 40	5 10	4 46	4 27	4 11	3 45	3 26	3 12	3 1	2 53	2 48	2 42	2 38		48
49	7 14	6 23	5 45	5 14	4 50	4 30	4 14	3 47	3 28	3 14	3 3	2 55	2 49	2 43			49
50	7 20	6 28	5 49	5 18	4 53	4 33	4 17	3 50	3 30	3 16	3 4	2 56	2 50	2 44			50
51	7 26	6 33	5 53	5 22	4 57	4 36	4 20	3 52	3 32	3 18	3 6	2 58	2 51				51
52	7 32	6 38	5 57	5 26	5 0	4 39	4 23	3 54	3 34	3 20	3 8	2 59	2 52				52
53	7 37	6 43	6 2	5 29	5 4	4 42	4 26	3 56	3 36	3 22	3 9	3 0					53
54	7 42	6 48	6 6	5 33	5 7	4 45	4 29	3 58	3 38	3 23	3 10	3 1					54
55	7 47	6 53	6 10	5 36	5 10	4 48	4 32	4 0	3 40	3 25	3 12						55
56	7 52	6 57	6 14	5 40	5 13	4 51	4 34	4 3	3 42	3 26	3 13						56
57	7 57	7 1	6 18	5 44	5 16	4 54	4 37	4 5	3 44	3 28							57
58	8 2	7 5	6 22	5 47	5 19	4 57	4 39	4 7	3 46	3 29							58
59	8 6	7 9	6 26	5 50	5 22	5 0	4 41	4 9	3 48								59
60	8 10	7 13	6 30	5 53	5 25	5 2	4 43	4 11	3 50								60
62	8 19	7 19	6 36	5 59	5 30	5 6	4 47	4 15									62
64	8 27	7 26	6 42	6 4	5 35	5 10	4 51										64
66	8 35	7 33	6 47	6 9	5 40												66
68	8 43	7 39	6 52														68
70	8 49																70
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

Third Correction, to Apparent Distance 104°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																☽'s App Alt.
	32°	34°	36°	38°	40°	42°	44°	46°	48°	50°	52°	54°	58°	62°	66°	70°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	5 16	5 31	5 45	6 0	6 14	6 28	6 41	6 54	7 6	7 18	7 29	7 40	8 0	8 19	8 36	8 49	6
7	4 42	4 56	5 8	5 20	5 31	5 42	5 53	6 4	6 15	6 26	6 37	6 47	7 4	7 19	7 33		7
8	4 16	4 28	4 39	4 49	4 59	5 9	5 19	5 28	5 38	5 47	5 57	6 6	6 21	6 34	6 46		8
9	3 55	4 5	4 15	4 25	4 34	4 43	4 52	5 0	5 8	5 16	5 24	5 32	5 46	5 58	6 9		9
10	3 40	3 49	3 58	4 7	4 15	4 23	4 31	4 38	4 45	4 52	4 59	5 6	5 18	5 30	5 40		10
11	3 27	3 35	3 43	3 51	3 58	4 5	4 12	4 19	4 26	4 32	4 38	4 44	4 55	5 6			11
12	3 16	3 23	3 30	3 37	3 44	3 51	3 58	4 4	4 10	4 17	4 23	4 28	4 38	4 47			12
13	3 7	3 13	3 20	3 26	3 33	3 39	3 45	3 51	3 56	4 2	4 7	4 12	4 22	4 30			13
14	2 59	3 5	3 11	3 17	3 23	3 29	3 34	3 39	3 44	3 49	3 54	3 59	4 8	4 15			14
15	2 53	2 58	3 4	3 9	3 15	3 20	3 25	3 29	3 34	3 38	3 43	3 47	3 56				15
16	2 48	2 53	2 58	3 3	3 8	3 12	3 17	3 21	3 25	3 29	3 33	3 37	3 45				16
17	2 44	2 49	2 53	2 58	3 2	3 6	3 10	3 14	3 17	3 21	3 25	3 29	3 36				17
18	2 41	2 45	2 49	2 53	2 57	3 1	3 4	3 8	3 11	3 15	3 18	3 22	3 29				18
19	2 38	2 41	2 45	2 49	2 53	2 56	2 59	3 3	3 6	3 9	3 12	3 16					19
20	2 35	2 38	2 42	2 45	2 49	2 52	2 55	2 58	3 1	3 4	3 7	3 10					20
21	2 33	2 36	2 39	2 42	2 45	2 48	2 51	2 54	2 57	3 0	3 3	3 5					21
22	2 31	2 34	2 36	2 39	2 42	2 45	2 47	2 50	2 53	2 56	2 59	3 1					22
23	2 30	2 32	2 34	2 37	2 39	2 42	2 44	2 47	2 50	2 53	2 55						23
24	2 29	2 31	2 33	2 35	2 37	2 40	2 42	2 44	2 47	2 50	2 52						24
25	2 28	2 29	2 31	2 33	2 35	2 38	2 40	2 42	2 44	2 47							25
26	2 27	2 28	2 30	2 32	2 34	2 36	2 38	2 40	2 42	2 44							26
27	2 26	2 27	2 29	2 31	2 32	2 34	2 36	2 38	2 40								27
28	2 26	2 27	2 28	2 30	2 31	2 33	2 35	2 36	2 38								28
29	2 25	2 26	2 27	2 29	2 30	2 32	2 33	2 34									29
30	2 25	2 26	2 27	2 28	2 29	2 31	2 32	2 33									30
31	2 24	2 25	2 26	2 27	2 28	2 30	2 31										31
32	2 24	2 25	2 26	2 27	2 28	2 29	2 30										32
33	2 24	2 24	2 25	2 26	2 27	2 28											33
34	2 25	2 24	2 25	2 26	2 27	2 27											34
35	2 26	2 25	2 25	2 26	2 26												35
36	2 26	2 25	2 25	2 26	2 26												36
37	2 26	2 25	2 25	2 26													37
38	2 27	2 26	2 26	2 26													38
39	2 27	2 26	2 26														39
40	2 28	2 27	2 26														40
41	2 28	2 27															41
42	2 29	2 27															42
43	2 29																43
44	2 30																44
45																	45
46																	46
47																	47
48																	48
49																	49
50																	50
51																	51
52																	52
53																	53
54																	54
55																	55
56																	56
57																	57
58																	58
59																	59
60																	60
62																	62
64																	64
66																	66
68																	68
70																	70
	32°	34°	36°	38°	40°	42°	44°	46°	48°	50°	52°						

TABLE P. EFFECT OF SUN'S PAR.

To be subtracted from the third Correction.

☽'s App. Alt.	Sun's Apparent Altitude.								
	5	10	20	30	40	50	60	70	80	90
5	1	1	2	2	2	2	3	3		
10	2	2	2	3	3	3	4	4		
15	3	3	3	3	4	4	4	4		
20	3	4	4	4	5	5	5			
25	4	4	5	5	5	6				
30	5	5	5	6	6	6				
35	6	6	6	6	6	7				
40	6	6	7	7	7					
45	7	7	7	8						
50	7	8	8							
55	8	8	8							
60	8	8								
65	9	9								
70	9									

TABLE VI.

Third Correction, to Apparent Distance 108°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	2 30	2 32	2 35	2 39	2 44	2 50	2 56	3 9	3 24	3 39	3 55	4 11	4 27	4 43	4 59	5 15	6
7	2 33	2 30	2 32	2 35	2 39	2 43	2 48	2 58	3 10	3 22	3 35	3 48	4 2	4 15	4 28	4 41	7
8	2 36	2 32	2 30	2 32	2 35	2 38	2 42	2 49	2 58	3 9	3 20	3 31	3 42	3 54	4 6	4 17	8
9	2 40	2 35	2 32	2 31	2 33	2 35	2 38	2 43	2 50	2 58	3 8	3 17	3 27	3 38	3 48	3 58	9
10	2 46	2 39	2 35	2 33	2 31	2 33	2 35	2 39	2 44	2 51	2 59	3 7	3 16	3 25	3 34	3 43	10
11	2 52	2 44	2 38	2 35	2 33	2 32	2 33	2 37	2 41	2 46	2 53	3 0	3 7	3 15	3 23	3 30	11
12	2 59	2 49	2 42	2 38	2 35	2 33	2 32	2 35	2 39	2 43	2 48	2 54	3 0	3 7	3 14	3 20	12
13	3 6	2 54	2 46	2 41	2 37	2 35	2 35	2 34	2 37	2 40	2 44	2 49	2 44	3 0	3 6	3 12	13
14	3 13	2 59	2 51	2 44	2 40	2 37	2 35	2 33	2 35	2 38	2 41	2 45	2 49	2 54	2 59	3 5	14
15	3 20	3 5	2 56	2 48	2 43	2 39	2 37	2 34	2 34	2 36	2 39	2 42	2 46	2 50	2 54	2 59	15
16	3 28	3 11	3 1	2 52	2 46	2 42	2 39	2 35	2 33	2 35	2 37	2 40	2 43	2 46	2 50	2 54	16
17	3 35	3 17	3 6	2 56	2 49	2 45	2 42	2 37	2 34	2 34	2 35	2 38	2 40	2 43	2 47	2 50	17
18	3 43	3 24	3 11	3 0	2 53	2 48	2 44	2 39	2 35	2 33	2 34	2 36	2 38	2 41	2 44	2 47	18
19	3 50	3 31	3 17	3 5	2 57	2 51	2 46	2 40	2 36	2 34	2 33	2 35	2 37	2 39	2 42	2 45	19
20	3 58	3 37	3 22	3 10	3 1	2 54	2 49	2 42	2 38	2 35	2 33	2 34	2 36	2 38	2 40	2 43	20
21	4 6	3 44	3 28	3 14	3 4	2 57	2 52	2 44	2 39	2 36	2 34	2 34	2 35	2 37	2 39	2 41	21
22	4 14	3 51	3 34	3 19	3 8	3 0	2 55	2 46	2 41	2 37	2 35	2 34	2 35	2 36	2 38	2 40	22
23	4 22	3 58	3 40	3 24	3 12	3 4	2 58	2 48	2 42	2 38	2 36	2 34	2 34	2 35	2 37	2 39	23
24	4 30	4 4	3 46	3 29	3 17	3 8	3 1	2 50	2 44	2 40	2 37	2 35	2 34	2 35	2 36	2 38	24
25	4 38	4 11	3 51	3 34	3 22	3 12	3 4	2 53	2 46	2 41	2 38	2 36	2 34	2 34	2 35	2 37	25
26	4 46	4 18	3 57	3 39	3 26	3 16	3 8	2 55	2 48	2 43	2 39	2 37	2 35	2 34	2 35	2 36	26
27	4 54	4 25	4 3	3 44	3 31	3 20	3 11	2 58	2 50	2 44	2 40	2 38	2 36	2 35	2 34	2 35	27
28	5 2	4 31	4 9	3 49	3 35	3 24	3 15	3 0	2 52	2 46	2 42	2 39	2 37	2 35	2 34	2 35	28
29	5 10	4 37	4 15	3 54	3 40	3 28	3 18	3 3	2 54	2 47	2 43	2 40	2 38	2 36	2 35	2 35	29
30	5 18	4 44	4 21	3 59	3 44	3 32	3 22	3 6	2 56	2 49	2 45	2 41	2 38	2 36	2 35	2 35	30
31	5 26	4 51	4 27	4 4	3 48	3 36	3 25	3 9	2 58	2 50	2 46	2 42	2 39	2 37	2 36	2 35	31
32	5 33	4 58	4 33	4 9	3 52	3 40	3 28	3 11	3 0	2 52	2 47	2 43	2 40	2 38	2 37	2 36	32
33	5 41	5 5	4 38	4 14	3 57	3 44	3 32	3 14	3 2	2 54	2 48	2 44	2 41	2 39	2 37	2 36	33
34	5 48	5 11	4 43	4 19	4 1	3 47	3 36	3 17	3 5	2 56	2 50	2 45	2 42	2 40	2 38	2 37	34
35	5 56	5 18	4 49	4 24	4 5	3 51	3 39	3 20	3 7	2 58	2 51	2 46	2 43	2 41	2 39	2 37	35
36	6 3	5 24	4 55	4 29	4 10	3 55	3 42	3 23	3 9	3 0	2 53	2 48	2 44	2 42	2 40	2 38	36
37	6 10	5 30	5 0	4 34	4 14	3 59	3 46	3 26	3 12	3 2	2 55	2 49	2 45	2 42	2 40	2 38	37
38	6 17	5 36	5 5	4 39	4 19	4 3	3 50	2 29	3 15	3 4	2 57	2 51	2 46	2 43	2 41	2 39	38
39	6 24	5 42	5 10	4 44	4 24	4 7	3 54	3 32	3 17	3 6	2 58	2 52	2 47	2 44	2 42	2 40	39
40	6 31	5 48	5 15	4 49	4 28	4 11	3 57	3 35	3 20	3 8	3 0	2 54	2 49	2 45	2 43	2 40	40
41	6 38	5 54	5 20	4 54	4 33	4 15	4 1	3 38	3 22	3 10	3 1	2 55	2 50	2 46	2 43	2 41	41
42	6 45	5 59	5 25	4 58	4 37	4 18	4 5	3 41	3 24	3 12	3 3	2 56	2 51	2 47	2 44	2 41	42
43	6 52	6 5	5 30	5 3	4 41	4 22	4 9	3 44	3 27	3 14	2 5	2 58	2 52	2 48	2 45		43
44	6 59	6 11	5 36	5 7	4 45	4 26	4 12	3 47	3 29	3 16	2 6	2 59	2 53	2 49	2 46		44
45	7 6	6 17	5 41	5 12	4 49	4 30	4 16	3 50	3 31	3 18	2 8	3 1	2 55	2 50			45
46	7 12	6 22	5 46	5 16	4 53	4 34	4 19	3 52	3 33	3 20	3 10	3 2	2 56	2 51			46
47	7 18	6 27	5 51	5 20	4 57	4 37	4 22	3 55	3 36	3 22	3 12	3 4	2 58				47
48	7 24	6 32	5 56	5 24	5 0	4 41	4 25	3 57	3 38	3 24	3 13	3 5	2 59				48
49	7 30	6 37	6 1	5 28	5 4	4 44	4 28	4 0	3 41	3 26	3 15	3 7					49
50	7 36	6 42	6 5	5 32	5 7	4 47	4 31	4 2	3 43	3 28	3 17	3 8					50
51	7 42	6 47	6 10	5 36	5 11	4 50	4 34	4 5	3 45	3 30	3 18						51
52	7 47	6 52	6 14	5 40	5 14	4 53	4 37	4 7	3 47	3 32	3 19						52
53	7 53	6 57	6 18	5 43	5 18	4 56	4 39	4 10	3 49	3 34							53
54	7 58	7 2	6 22	5 47	5 21	4 59	4 42	4 12	3 51	3 35							54
55	8 4	7 7	6 26	5 51	5 24	5 2	4 45	4 14	3 53								55
56	8 9	7 11	6 30	5 54	5 27	5 5	4 47	4 16	3 55								56
57	8 14	7 16	6 34	5 58	5 30	5 8	4 50	4 18									57
58	8 19	7 20	6 38	6 1	5 33	5 11	4 52	4 20									58
59	8 24	7 25	6 42	6 4	5 36	5 14	4 54										59
60	8 28	7 29	6 45	6 8	5 39	5 16	4 56										60
61	8 33	7 33	6 48	6 11	5 42	5 19											61
62	8 37	7 37	6 51	6 14	5 45												62
63	8 41	7 40	6 54	6 17													63
64	8 45	7 43	6 57														64
66	8 53																66
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 108°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																					☽'s App Alt.
	32°	34°	36°	38°	40°	42°	44°	46°	48°	50°	52°	54°	56°	58°	62°	66°						
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″						°
6	5 30	5 45	6 0	6 15	6 29	6 44	6 58	7 11	7 23	7 34	7 45	7 56	8 6	8 16	8 35	8 53						6
7	4 55	5 8	5 21	5 34	5 46	5 58	6 10	6 22	6 33	6 43	6 53	7 2	7 11	7 20	7 36							7
8	4 29	4 41	4 52	5 3	5 13	5 23	5 34	5 44	5 54	6 4	6 13	6 22	6 30	6 38	6 51							8
9	4 8	4 18	4 28	4 38	4 48	4 57	5 6	5 15	5 23	5 31	5 38	5 45	5 53	6 1	6 14							9
10	3 52	4 0	4 9	4 18	4 27	4 36	4 44	4 52	4 59	5 6	5 13	5 20	5 27	5 33	6 45							10
11	3 38	3 46	3 54	4 2	4 10	4 18	4 25	4 33	4 40	4 47	4 53	4 59	5 5	5 11								11
12	3 27	3 34	3 41	3 48	3 56	4 4	4 11	4 18	4 24	4 30	4 36	4 42	4 47	4 52								12
13	3 18	3 24	3 30	3 37	3 44	3 51	3 58	4 4	4 10	4 15	4 21	4 26	4 30	4 34								13
14	3 10	3 16	3 22	3 28	3 34	3 40	3 46	3 52	3 58	4 3	4 8	4 12	4 16	4 20								14
15	3 4	3 9	3 14	3 20	3 25	3 31	3 36	3 42	3 47	3 52	3 56	4 1	4 5									15
16	2 59	3 3	3 8	3 13	3 18	3 23	3 28	3 33	3 38	3 43	3 47	3 51	3 55									16
17	2 54	2 58	3 3	3 7	3 12	3 17	3 21	3 26	3 30	3 35	3 39	3 43										17
18	2 51	2 54	2 59	3 3	3 7	3 11	3 15	3 20	3 24	3 28	3 32	3 35										18
19	2 48	2 51	2 55	2 59	3 3	3 6	3 10	3 14	3 18	3 22	3 25											19
20	2 46	2 49	2 52	2 56	2 59	3 2	3 6	3 9	3 13	3 16	3 19											20
21	2 44	2 47	2 50	2 53	2 56	2 59	3 2	3 5	3 9	3 12												21
22	2 42	2 45	2 48	2 50	2 53	2 56	2 59	3 2	3 5	3 8												22
23	2 41	2 43	2 46	2 48	2 50	2 53	2 56	2 59	3 2													23
24	2 40	2 42	2 44	2 46	2 48	2 51	2 53	2 56	2 59													24
25	2 39	2 40	2 42	2 44	2 46	2 49	2 51	2 53														25
26	2 38	2 39	2 41	2 43	2 45	2 47	2 49	2 51														26
27	2 37	2 38	2 40	2 42	2 44	2 45	2 47															27
28	2 36	2 38	2 39	2 41	2 42	2 44	2 46															28
29	2 36	2 37	2 38	2 40	2 41	2 42																29
30	2 35	2 36	2 37	2 39	2 40	2 41																30
31	2 35	2 36	2 37	2 38	2 39																	31
32	2 35	2 36	2 37	2 38	2 39																	32
33	2 36	2 36	2 36	2 37																		33
34	2 36	2 36	2 36	2 37																		34
35	2 36	2 36	2 36																			35
36	2 37	2 36	2 36																			36
37	2 38	2 37																				37
38	2 38	2 37																				38
39	2 39																					39
40	2 39																					40
41																						41
42																						42
43																						43
44																						44
45																						45
46																						46
47																						47
48																						48
49																						49
50																						50
51																						51
52																						52
53																						53
54																						54
55																						55
56																						56
57																						57
58																						58
59																						59
60																						60
61																						61
62																						62
63																						63
64																						64
66																						66
	32°	34°	36°	38°	40°	42°	44°	46°	48°	50°	52°											

TABLE D. EFFECT OF SUN'S PAR.

To be subtracted from the third Correction.

☽'s App. Alt.	Sun's Apparent Altitude.								
	5	10	20	30	40	50	60	65	80	90
5	1	1	2	2	3	3	3	3		
10	2	2	3	3	4	4	5	5		
15	3	3	4	4	5	5	6			
20	4	4	5	5	6	6				
25	4	4	5	6	6	7				
30	5	5	6	6	7	7				
35	6	6	6	7	8					
40	6	7	7	8	8					
45	7	7	8	8	9					
50	8	8	8	9						
55	8	8	9							
60	8	9								
65	9									
70										

TABLE VI.

Third Correction, to Apparent Distance 112°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	2 40	2 42	2 45	2 49	2 54	3 0	3 7	3 21	3 36	3 52	4 8	4 24	4 40	4 56	5 12	5 28	6
7	2 42	2 40	2 42	2 45	2 49	2 53	2 58	3 8	3 20	3 33	3 46	3 59	4 13	4 26	4 40	4 54	7
8	2 46	2 42	2 41	2 43	2 45	2 48	2 52	3 0	3 9	3 19	3 31	3 42	3 54	4 6	4 18	4 30	8
9	2 51	2 45	2 43	2 41	2 43	2 45	2 48	2 54	3 1	3 9	3 19	3 29	3 40	3 50	4 0	4 11	9
10	2 57	2 49	2 45	2 43	2 42	2 43	2 45	2 49	2 55	3 2	3 10	3 19	3 28	3 37	3 46	3 56	10
11	3 3	2 54	2 48	2 45	2 43	2 42	2 43	2 46	2 50	2 56	3 3	3 11	3 19	3 27	3 35	3 44	11
12	3 9	2 59	2 52	2 48	2 45	2 43	2 42	2 44	2 47	2 52	2 58	3 5	3 12	3 19	3 26	3 34	12
13	3 16	3 4	2 56	2 51	2 47	2 45	2 43	2 43	2 45	2 49	2 54	3 0	3 6	3 12	3 18	3 25	13
14	3 23	3 10	3 0	2 54	2 50	2 47	2 45	2 43	2 44	2 47	2 51	2 56	3 1	3 6	3 12	3 17	14
15	3 31	3 16	3 5	2 58	2 53	2 49	2 47	2 44	2 44	2 46	2 49	2 53	2 57	3 1	3 6	3 11	15
16	3 37	3 22	3 10	3 2	2 56	2 51	2 48	2 45	2 43	2 45	2 47	2 50	2 54	2 57	3 2	3 6	16
17	3 47	3 29	3 15	3 6	2 59	2 54	2 50	2 46	2 44	2 44	2 46	2 48	2 51	2 54	2 58	3 2	17
18	3 55	3 35	3 20	3 10	3 2	2 57	2 53	2 48	2 45	2 44	2 45	2 47	2 49	2 52	2 55	2 59	18
19	4 3	3 41	3 26	3 15	3 6	3 0	2 56	2 50	2 46	2 45	2 44	2 46	2 48	2 50	2 53	2 56	19
20	4 11	3 48	3 32	3 20	3 10	3 2	2 58	2 52	2 48	2 45	2 44	2 45	2 47	2 49	2 51	2 54	20
21	4 19	3 54	3 38	3 25	3 15	3 7	3 1	2 54	2 49	2 46	2 44	2 44	2 46	2 48	2 50	2 52	21
22	4 27	4 1	3 44	3 30	3 20	3 13	3 5	2 56	2 51	2 47	2 45	2 44	2 45	2 47	2 49	2 51	22
23	4 35	4 8	3 50	3 35	3 24	3 15	3 8	2 58	2 52	2 48	2 46	2 45	2 44	2 46	2 48	2 50	23
24	4 43	4 15	3 56	3 40	3 28	3 19	3 11	3 1	2 54	2 49	2 47	2 45	2 44	2 45	2 47	2 49	24
25	4 52	4 22	4 3	3 46	3 33	3 23	3 15	3 3	2 55	2 51	2 48	2 46	2 45	2 44	2 46	2 48	25
26	5 0	4 29	4 9	3 51	3 38	3 27	3 18	3 5	2 57	2 52	2 49	2 47	2 44	2 44	2 45	2 47	26
27	5 8	4 37	4 15	3 56	3 42	3 31	3 22	3 8	2 59	2 54	2 51	2 48	2 45	2 45	2 45	2 46	27
28	5 16	4 44	4 21	4 2	3 47	3 36	3 26	3 11	3 2	2 56	2 52	2 49	2 46	2 46	2 45	2 46	28
29	5 24	4 51	4 27	4 7	3 52	3 40	3 31	3 14	3 5	2 58	2 53	2 50	2 46	2 46	2 45	2 46	29
30	5 32	4 57	4 33	4 12	3 57	3 45	3 35	3 17	3 7	3 0	2 55	2 52	2 47	2 47	2 46	2 46	30
31	5 40	5 4	4 39	4 17	4 2	3 49	3 39	3 20	3 9	3 2	2 57	2 53	2 50	2 48	2 47	2 46	31
32	5 48	5 10	4 45	4 22	4 7	3 54	3 43	3 23	3 12	3 4	2 58	2 54	2 51	2 49	2 47	2 46	32
33	5 56	5 17	4 51	4 28	4 12	3 58	3 46	3 26	3 14	3 6	3 0	2 55	2 52	2 50	2 48	2 47	33
34	6 4	5 24	4 56	4 33	4 16	4 2	3 50	3 29	3 17	3 8	3 2	2 57	2 53	2 51	2 49	2 48	34
35	6 11	5 31	5 2	4 38	4 21	4 6	3 53	3 32	3 19	3 10	3 4	2 59	2 55	2 52	2 50	2 49	35
36	6 19	5 37	5 7	4 43	4 25	4 10	3 57	3 35	3 21	3 12	3 5	3 0	2 56	2 53	2 51	2 49	36
37	6 26	5 44	5 13	4 48	4 29	4 14	4 1	3 38	3 24	3 14	3 7	3 1	2 57	2 54	2 52	2 50	37
38	6 33	5 50	5 18	4 53	4 33	4 17	4 4	3 41	3 26	3 16	3 9	3 3	2 58	2 55	2 53	2 51	38
39	6 41	5 56	5 24	4 58	4 37	4 21	4 8	3 44	3 29	3 18	3 10	3 4	2 59	2 56	2 54		39
40	6 48	6 2	5 29	5 3	4 41	4 25	4 11	3 47	3 32	3 20	3 12	3 6	3 1	2 57	2 55		40
41	6 55	6 8	5 35	5 8	4 45	4 28	4 15	3 50	3 35	3 22	3 13	3 7	3 2	2 58			41
42	7 2	6 14	5 40	5 13	4 49	4 32	4 18	3 53	3 38	3 25	3 15	3 8	3 3	2 59			42
43	7 8	6 20	5 46	5 18	4 53	4 36	4 22	3 56	3 40	3 27	3 17	3 10	3 5				43
44	7 15	6 26	5 51	5 23	4 58	4 40	4 25	3 59	3 42	3 29	3 19	3 12	3 7				44
45	7 22	6 32	5 56	5 28	5 3	4 44	4 28	4 2	3 45	3 31	3 21	3 14					45
46	7 28	6 38	6 2	5 33	5 8	4 47	4 31	4 5	3 47	3 33	3 23	3 15					46
47	7 35	6 44	6 7	5 37	5 12	4 51	4 34	4 8	3 50	3 36	3 25						47
48	7 42	6 49	6 12	5 41	5 16	4 55	4 38	4 11	3 52	3 38	3 26						48
49	7 48	6 54	6 16	5 45	5 20	4 58	4 41	4 14	3 55	3 40							49
50	7 55	6 59	6 21	5 49	5 23	5 2	4 44	4 17	3 57	3 42							50
51	8 1	7 4	6 25	5 53	5 27	5 5	4 47	4 19	3 59								51
52	8 7	7 9	6 29	5 57	5 30	5 8	4 50	4 22	4 1								52
53	8 13	7 14	6 34	6 1	5 34	5 12	4 53	4 24									53
54	8 19	7 19	6 38	6 5	5 37	5 15	4 56	4 26									54
55	8 25	7 23	6 42	6 8	5 41	5 18	4 59										55
56	8 30	7 28	6 47	6 12	5 44	5 21	5 1										56
57	8 35	7 33	6 51	6 15	5 47	5 24											57
58	8 40	7 38	6 55	6 19	5 50												58
59	8 45	7 43	6 59	6 22													59
60	8 50	7 48	7 2														60
61	8 54	7 52															61
62	8 58																62
63																	63
64																	64
65																	65
	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	

TABLE VI.

Third Correction, to Apparent Distance 112°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																	☽'s App Alt.
	32°	34°	36°	38°	40°	42°	44°	46°	48°	50°	52°	54°	56°	58°	60°	62°		
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″		°
6	5 44	6 0	6 16	6 31	6 46	7 0	7 14	7 27	7 40	7 53	8 5	8 18	8 30	8 41	8 50	8 58		6
7	5 7	5 21	5 34	5 47	6 0	6 13	6 25	6 37	6 49	7 0	7 10	7 20	7 30	7 39	7 47			7
8	4 42	4 54	5 5	5 16	5 27	5 38	5 49	6 0	6 10	6 20	6 29	6 38	6 47	6 55	7 2			8
9	4 21	4 32	4 42	4 52	5 1	5 11	5 21	5 31	5 40	5 48	5 56	6 4	6 11	6 18				9
10	4 5	4 14	4 23	4 32	4 40	4 49	4 58	5 7	5 15	5 23	5 31	5 38	5 44	5 50				10
11	3 52	4 0	4 8	4 16	4 23	4 31	4 39	4 47	4 55	5 2	5 8	5 14	5 19					11
12	3 41	3 48	3 55	4 2	4 9	4 16	4 24	4 31	4 38	4 44	4 50	4 56	5 1					12
13	3 31	3 38	3 44	3 50	3 59	4 4	4 10	4 17	4 23	4 29	4 35	4 40						13
14	3 23	3 29	3 35	3 41	3 47	3 53	3 59	4 6	4 12	4 17	4 22	4 26						14
15	3 16	3 21	3 27	3 33	3 38	3 44	3 50	3 56	4 1	4 6	4 10							15
16	3 10	3 15	3 21	3 26	3 31	3 37	3 42	3 47	3 52	3 57	4 1							16
17	3 6	3 11	3 16	3 20	3 25	3 30	3 35	3 40	3 45	3 49								17
18	3 3	3 7	3 12	3 16	3 20	3 25	3 29	3 34	3 38	3 42								18
19	3 0	3 4	3 8	3 12	3 16	3 20	3 24	3 28	3 32									19
20	2 57	3 1	3 5	3 8	3 12	3 16	3 20	3 23	3 26									20
21	2 55	2 58	3 2	3 5	3 9	3 12	3 16	3 19										21
22	2 53	2 56	3 0	3 3	3 6	3 9	3 12	3 15										22
23	2 52	2 55	2 58	3 1	3 3	3 6	3 9											23
24	2 51	2 53	2 56	2 59	3 1	3 4	3 7											24
25	2 50	2 52	2 54	2 57	2 59	3 1												25
26	2 49	2 51	2 53	2 55	2 57	2 59												26
27	2 48	2 50	2 53	2 54	2 56													27
28	2 47	2 49	2 51	2 53	2 55													28
29	2 47	2 48	2 50	2 52														29
30	2 47	2 48	2 49	2 51														30
31	2 47	2 48	2 49															31
32	2 47	2 48	2 49															32
33	2 47	2 48																33
34	2 47	2 48																34
35	2 48																	35
36	2 49																	36
37																		37
38																		38
39																		39
40																		40
41																		41
42																		42
43																		43
44																		44
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47																		47
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53																		53
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57																		57
58																		58
59																		59
60																		60
61																		61
62																		62
63																		63
64																		64
65																		65
	32°	34°	36°	38°	40°	42°	44°	46°	48°	50°	52°							

TABLE P. EFFECT OF SUN'S PAR.

To be subtracted from the third Correction.

☽'s App Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	65	80	90
5	1	2	2	3	3	4	4	4		
10	2	2	3	4	4	5	5			
15	3	3	4	4	5	5	6			
20	4	4	4	5	6	6				
25	4	4	5	5	6	7				
30	5	5	5	6	7					
35	5	6	6	7	7					
40	6	7	7	7	8					
45	7	7	7	8						
50	8	8	8	8						
55	8	9	9							
60	9	9								
65	9									

TABLE VI.

Third Correction, to Apparent Distance 116°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	18°	20°	22°	24°	26°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	2 50	2 52	2 55	2 59	3 4	3 10	3 17	3 25	3 33	3 41	3 49	4 5	4 22	4 39	4 56	5 13	6
7	2 52	2 50	2 52	2 55	2 58	3 2	3 8	3 13	3 19	3 25	3 32	3 46	4 0	4 14	4 28	4 42	7
8	2 56	2 52	2 50	2 52	2 54	2 57	3 1	3 5	3 10	3 15	3 21	3 32	3 44	3 56	4 8	4 20	8
9	3 1	2 55	2 52	2 50	2 52	2 54	2 57	3 0	3 4	3 8	3 13	3 21	3 31	3 42	3 53	4 4	9
10	3 7	2 59	2 55	2 52	2 51	2 52	2 54	2 57	3 0	3 3	3 7	3 14	3 22	3 31	3 41	3 50	10
11	3 13	3 4	2 58	2 54	2 52	2 51	2 53	2 55	2 57	3 0	3 3	3 9	3 16	3 23	3 31	3 39	11
12	3 20	3 9	3 2	2 57	2 54	2 53	2 52	2 53	2 55	2 57	3 0	3 5	3 10	3 16	3 23	3 30	12
13	3 27	3 15	3 6	3 1	2 57	2 55	2 53	2 52	2 53	2 55	2 58	3 2	3 6	3 11	3 17	3 23	13
14	3 35	3 21	3 11	3 5	3 0	2 57	2 55	2 53	2 52	2 54	2 56	2 59	3 3	3 7	3 12	3 18	14
15	3 43	3 27	3 16	3 9	3 4	3 0	2 57	2 55	2 53	2 53	2 54	2 57	3 0	3 4	3 8	3 14	15
16	3 51	3 33	3 21	3 13	3 7	3 3	3 0	2 57	2 55	2 54	2 53	2 55	2 58	3 1	3 5	3 10	16
17	3 59	3 40	3 27	3 17	3 11	3 6	3 2	2 59	2 57	2 55	2 54	2 56	2 57	2 59	3 3	3 7	17
18	4 7	3 47	3 33	3 22	3 14	3 9	3 5	3 1	2 59	2 56	2 55	2 54	2 56	2 58	3 1	3 5	18
19	4 16	3 54	3 39	3 27	3 18	3 12	3 8	3 4	3 1	2 58	2 56	2 55	2 55	2 57	3 0	3 3	19
20	4 24	4 1	3 45	3 32	3 22	3 16	3 11	3 7	3 3	3 0	2 58	2 56	2 55	2 57	2 59	3 2	20
21	4 33	4 8	3 51	3 37	3 27	3 20	3 14	3 9	3 5	3 2	3 0	2 57	2 56	2 57	2 59	3 1	21
22	4 41	4 15	3 57	3 43	3 32	3 24	3 17	3 12	3 7	3 4	3 2	2 59	2 57	2 56	2 58	3 0	22
23	4 49	4 22	4 4	3 49	3 37	3 28	3 21	3 15	3 10	3 7	3 4	3 0	2 58	2 57	2 58	3 0	23
24	4 58	4 29	4 10	3 54	3 42	3 32	3 24	3 18	3 13	3 10	3 7	3 2	2 59	2 58	2 57	2 59	24
25	5 6	4 36	4 16	4 0	3 47	3 37	3 28	3 21	3 16	3 12	3 9	3 4	3 1	2 59	2 58	2 59	25
26	5 15	4 43	4 22	4 5	3 52	3 41	3 32	3 24	3 18	3 14	3 11	3 6	3 2	3 0	2 59	2 58	26
27	5 23	4 50	4 28	4 11	3 57	3 45	3 35	3 27	3 21	3 16	3 13	3 8	3 4	3 2	3 0	2 59	27
28	5 31	4 57	4 34	4 16	4 1	3 49	3 39	3 31	3 24	3 19	3 15	3 9	3 5	3 3	3 1	2 59	28
29	5 39	5 4	4 40	4 21	4 6	3 54	3 43	3 34	3 27	3 21	3 17	3 11	3 7	3 4	3 2	3 0	29
30	5 47	5 11	4 46	4 26	4 10	3 58	3 47	3 38	3 30	3 24	3 19	3 13	3 8	3 5	3 3	3 1	30
31	5 55	5 18	4 42	4 32	4 15	4 2	3 51	3 42	3 34	3 27	3 22	3 15	3 10	3 6	3 4	3 2	31
32	6 3	5 26	4 58	4 37	4 20	4 6	3 55	3 45	3 37	3 30	3 25	3 17	3 12	3 8	3 5	3 3	32
33	6 12	5 33	5 5	4 42	4 25	4 11	3 59	3 48	3 40	3 33	3 27	3 19	3 13	3 9	3 6	3 4	33
34	6 20	5 40	5 11	4 47	4 30	4 15	4 2	3 52	3 43	3 36	3 30	3 21	3 15	3 10	3 7	3 5	34
35	6 29	5 47	5 17	4 53	4 35	4 20	4 6	3 55	3 47	3 40	3 33	3 24	3 17	3 12	3 9	3 6	35
36	6 37	5 55	5 23	4 58	4 40	4 24	4 10	3 59	3 50	3 43	3 36	3 26	3 19	3 14	3 10	3 7	36
37	6 45	6 2	5 29	5 4	4 45	4 29	4 14	4 2	3 53	3 46	3 39	3 29	3 21	3 15	3 11	3 8	37
38	6 53	6 9	5 35	5 9	4 50	4 33	4 18	4 6	3 57	3 49	3 42	3 31	3 23	3 17	3 13	3 9	38
39	7 1	6 16	5 41	5 15	4 54	4 37	4 22	4 10	4 0	3 52	3 45	3 33	3 25	3 19	3 15		39
40	7 8	6 23	5 47	5 20	4 58	4 41	4 26	4 13	4 3	3 54	3 47	3 36	3 27	3 20	3 16		40
41	7 15	6 29	5 53	5 25	5 3	4 45	4 30	4 17	4 6	3 57	3 50	3 39	3 29	3 21			41
42	7 22	6 35	5 58	5 30	5 7	4 49	4 33	4 20	4 9	4 0	3 53	3 41	3 31	3 23			42
43	7 30	6 41	6 4	5 35	5 12	4 53	4 37	4 23	4 12	4 3	3 55	3 43	3 33				43
44	7 37	6 47	6 9	5 40	5 16	4 57	4 41	4 27	4 15	4 6	3 58	3 45	3 34				44
45	7 45	6 53	6 15	5 45	5 21	5 1	4 44	4 30	4 18	4 9	4 1	3 47					45
46	7 52	6 59	6 20	5 49	5 25	5 5	4 48	4 33	4 21	4 11	4 3	3 49					46
47	7 59	7 5	6 25	5 54	5 29	5 9	4 52	4 37	4 24	4 14	4 6						47
48	8 6	7 10	6 30	5 59	5 33	5 13	4 55	4 40	4 27	4 17	4 8						48
49	8 12	7 15	6 35	6 4	5 37	5 16	4 58	4 43	4 30	4 19							49
50	8 18	7 20	6 40	6 8	5 41	5 20	5 1	4 46	4 33								50
51	8 24	7 26	6 45	6 12	5 45	5 23	5 4	4 49									51
52	8 30	7 31	6 50	6 16	5 49	5 27	5 7										52
53	8 36	7 37	6 55	6 20	5 53	5 30											53
54	8 42	7 42	6 59	6 24	5 56												54
55	8 48	7 47	7 3	6 28													55
56	8 54	7 52	7 7														56
57	8 59	7 57															57
58	9 3																58
59																	59
60																	60
61																	61
62																	62
63																	63
64																	64
65																	65
	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	18°	20°	22°	24°	26°	

Third Correction, to Apparent Distance 116°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																	☽'s App Alt.
	28°	30°	32°	34°	36°	38°	40°	42°	44°	46°	48°	50°	52°	54°	56°	58°		
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″		°
6	5 30	6 46	6 3	6 19	6 36	6 52	7 7	7 22	7 36	7 51	8 5	8 18	8 30	8 42	8 53	9 3		6
7	4 56	5 10	5 25	5 40	5 55	6 9	6 22	6 34	6 46	6 58	7 9	7 20	7 31	7 42	7 52			7
8	4 33	4 45	4 58	5 11	5 24	5 36	5 47	5 58	6 8	6 18	6 28	6 38	6 48	6 58	7 8			8
9	4 15	4 26	4 37	4 47	4 58	5 8	5 19	5 29	5 39	5 49	5 59	6 8	6 16	6 24				9
10	4 0	4 10	4 20	4 29	4 39	4 48	4 58	5 7	5 16	5 25	5 33	5 41	5 49	5 56				10
11	3 48	3 57	4 6	4 15	4 23	4 32	4 41	4 49	4 57	5 5	5 12	5 19	5 25					11
12	3 38	3 46	3 54	4 2	4 10	4 18	4 26	4 34	4 41	4 48	4 54	5 1	5 7					12
13	3 30	3 37	3 44	3 52	4 0	4 7	4 14	4 21	4 27	4 33	4 39	4 45						13
14	3 24	3 30	3 37	3 44	3 51	3 57	4 4	4 10	4 16	4 21	4 27	4 33						14
15	3 19	3 25	3 31	3 37	3 43	3 49	3 55	4 1	4 7	4 11	4 17							15
16	3 15	3 20	3 26	3 31	3 37	3 42	3 47	3 53	3 58	4 2	4 8							16
17	3 12	3 16	3 21	3 26	3 31	3 36	3 41	3 46	3 51	3 55								17
18	3 9	3 13	3 17	3 22	3 26	3 31	3 36	3 40	3 45	3 49								18
19	3 7	3 10	3 14	3 18	3 22	3 27	3 31	3 35	3 39									19
20	3 5	3 8	3 11	3 15	3 19	3 23	3 27	3 31	3 34									20
21	3 4	3 6	3 9	3 12	3 16	3 20	3 23	3 27										21
22	3 3	3 5	3 7	3 10	3 14	3 17	3 20	3 23										22
23	3 2	3 4	3 6	3 9	3 12	3 15	3 18											23
24	3 1	3 3	3 5	3 8	3 10	3 13	3 16											24
25	3 0	3 2	3 4	3 7	3 9	3 11												25
26	3 0	3 2	3 4	3 6	3 7	3 9												26
27	3 0	3 1	3 3	3 5	3 6													27
28	2 59	3 0	3 2	3 4	3 5													28
29	2 59	3 0	3 1	3 3														29
30	3 0	3 0	3 1	3 3														30
31	3 1	3 0	3 1															31
32	3 2	3 1	3 2															32
33	3 2	3 1																33
34	3 3	3 2																34
35	3 4																	35
36	3 5																	36
37																		37
38																		38
39																		39
40																		40
41																		41
42																		42
43																		43
44																		44
45																		45
46																		46
47																		47
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59																		59
60																		60
61																		61
62																		62
63																		63
64																		64
65																		65
	28°	30°	32°	34°	36°	38°	40°	42°	44°	46°	48°							

TABLE P. EFFECT OF SUN'S PAR. To be subtracted from the third Correction.

☽'s App. Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	60	70	80	90
5	2	2	3	3	4	4	5			
10	2	3	3	4	5	5	6			
15	3	3	4	5	5	6				
20	4	4	5	6	6	7				
25	5	5	6	6	7					
30	5	6	6	7	8					
35	6	6	7	8						
40	7	7	8	8						
45	7	8	8							
50	8	8	9							
55	9	9								
60	9									

TABLE VI.

Third Correction, to Apparent Distance 120°.

D's App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.																D's App Alt.
	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°	20°	22°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	3 1	3 3	3 6	3 11	3 17	3 24	3 32	3 39	3 47	3 55	4 4	4 12	4 21	4 30	4 39	4 57	6
7	3 3	3 2	3 4	3 7	3 11	3 16	3 22	3 28	3 34	3 40	3 47	3 54	4 1	4 8	4 15	4 30	7
8	3 7	3 4	3 3	3 5	3 8	3 11	3 15	3 20	3 25	3 29	3 35	3 40	3 46	3 52	3 59	4 12	8
9	3 12	3 8	3 5	3 4	3 6	3 8	3 11	3 14	3 18	3 22	3 26	3 31	3 36	3 41	3 47	3 58	9
10	3 18	3 12	3 8	3 6	3 5	3 6	3 8	3 10	3 14	3 17	3 20	3 24	3 28	3 33	3 38	3 47	10
11	3 25	3 17	3 12	3 8	3 6	3 5	3 6	3 8	3 11	3 13	3 16	3 19	3 22	3 26	3 30	3 38	11
12	3 33	3 23	3 16	3 11	3 8	3 6	3 5	3 7	3 9	3 11	3 13	3 15	3 18	3 21	3 24	3 31	12
13	3 41	3 28	3 20	3 15	3 11	3 8	3 6	3 6	3 8	3 9	3 11	3 13	3 15	3 17	3 20	3 26	13
14	3 49	3 34	3 25	3 19	3 14	3 11	3 8	3 7	3 7	3 8	3 9	3 11	3 12	3 14	3 17	3 22	14
15	3 57	3 41	3 30	3 23	3 18	3 14	3 11	3 9	3 8	3 7	3 8	3 9	3 11	3 12	3 14	3 18	15
16	4 6	3 48	3 36	3 28	3 22	3 17	3 13	3 11	3 9	3 8	3 8	3 9	3 10	3 11	3 12	3 16	16
17	4 14	3 55	3 42	3 32	3 25	3 20	3 15	3 12	3 10	3 9	3 9	3 9	3 9	3 10	3 11	3 14	17
18	4 23	4 3	3 48	3 37	3 29	3 23	3 18	3 14	3 12	3 11	3 10	3 9	3 9	3 10	3 11	3 13	18
19	4 32	4 10	3 54	3 42	3 33	3 26	3 21	3 17	3 15	3 13	3 11	3 10	3 10	3 9	3 10	3 12	19
20	4 40	4 17	4 1	3 48	3 38	3 30	3 24	3 20	3 17	3 15	3 13	3 12	3 11	3 10	3 10	3 12	20
21	4 49	4 24	4 7	3 53	3 42	3 34	3 28	3 23	3 19	3 17	3 15	3 13	3 12	3 11	3 10	3 11	21
22	4 58	4 31	4 14	3 58	3 47	3 39	3 32	3 26	3 22	3 19	3 16	3 14	3 13	3 12	3 11	3 11	22
23	5 7	4 39	4 21	4 4	3 52	3 43	3 36	3 30	3 25	3 21	3 18	3 16	3 14	3 13	3 12	3 12	23
24	5 16	4 46	4 27	4 10	3 57	3 47	3 39	3 33	3 28	3 23	3 20	3 18	3 16	3 15	3 14	3 13	24
25	5 25	4 53	4 33	4 15	4 2	3 51	3 43	3 36	3 31	3 26	3 23	3 20	3 18	3 17	3 15	3 14	25
26	5 34	5 1	4 40	4 20	4 7	3 56	3 47	3 39	3 34	3 29	3 25	3 22	3 20	3 18	3 16	3 15	26
27	5 42	5 8	4 47	4 25	4 12	4 1	3 51	3 43	3 37	3 32	3 28	3 25	3 22	3 20	3 18	3 16	27
28	5 51	5 16	4 53	4 31	4 17	4 5	3 55	3 47	3 40	3 35	3 30	3 27	3 24	3 22	3 20	3 17	28
29	6 0	5 24	5 0	4 37	4 22	4 10	3 59	3 50	3 43	3 37	3 33	3 29	3 26	3 23	3 21	3 18	29
30	6 8	5 31	5 6	4 43	4 27	4 15	4 3	3 54	3 46	3 40	3 36	3 32	3 28	3 25	3 23	3 19	30
31	6 17	5 39	5 12	4 48	4 32	4 19	4 7	3 57	3 49	3 43	3 38	3 34	3 30	3 27	3 25	3 20	31
32	6 25	5 46	5 18	4 54	4 37	4 23	4 11	4 1	3 52	3 46	3 41	3 36	3 32	3 29	3 27	3 22	32
33	6 34	5 54	5 25	5 0	4 42	4 27	4 15	4 5	3 56	3 49	3 44	3 39	3 35	3 32	3 29	3 24	33
34	6 43	6 2	5 31	5 6	4 47	4 32	4 19	4 9	3 59	3 52	3 47	3 42	3 37	3 34	3 31	3 26	34
35	6 51	6 9	5 38	5 12	4 52	4 37	4 24	4 12	4 2	3 55	3 50	3 45	3 40	3 36	3 33	3 28	35
36	6 59	6 16	5 44	5 18	4 57	4 42	4 28	4 15	4 5	3 58	3 53	3 47	3 42	3 38	3 35	3 30	36
37	7 8	6 23	5 50	5 23	5 2	4 46	4 32	4 19	4 9	4 2	3 56	3 50	3 45	3 41	3 37	3 31	37
38	7 16	6 30	5 56	5 28	5 7	4 50	4 36	4 23	4 13	4 5	3 59	3 53	3 47	3 43	3 39	3 33	38
39	7 24	6 37	6 2	5 34	5 12	4 55	4 40	4 27	4 16	4 8	4 1	3 55	3 50	3 45	3 41		39
40	7 32	6 44	6 8	5 39	5 17	4 59	4 44	4 31	4 20	4 11	4 4	3 58	3 52	3 47	3 43		40
41	7 40	6 50	6 14	5 44	5 22	5 4	4 48	4 35	4 24	4 15	4 7	4 1	3 55	3 49			41
42	7 47	6 56	6 19	5 50	5 27	5 8	4 52	4 39	4 28	4 18	4 10	4 3	3 57				42
43	7 55	7 2	6 25	5 55	5 32	5 13	4 56	4 42	4 31	4 21	4 13	4 6					43
44	8 3	7 9	6 31	6 0	5 37	5 17	5 0	4 46	4 34	4 24	4 16						44
45	8 11	7 15	6 36	6 5	5 42	5 22	5 4	4 49	4 37	4 27							45
46	8 18	7 21	6 41	6 10	5 46	5 26	5 8	4 53	4 40								46
47	8 25	7 27	6 46	6 15	5 51	5 30	5 11	4 56									47
48	8 32	7 33	6 52	6 20	5 55	5 34	5 14										48
49	8 39	7 39	6 57	6 25	5 59	5 37											49
50	8 45	7 45	7 2	6 30	6 3												50
51	8 51	7 51	7 8	6 34													51
52	8 57	7 57	7 13														52
53	9 3	8 3															53
54	9 9																54
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61																	61
62																	62
63																	63
64																	64
65																	65
	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°						

TABLE P. EFFECT OF SUN'S PAR.
To be subtracted from the third Correction.

D's App. Alt.	Sun's Apparent Altitude.									
	5	10	20	30	40	50	55	70	80	90
5	2	2	3	3	4	5	5			
10	2	3	3	4	5	6				
15	3	4	4	5	6	7				
20	4	4	5	6	7					
25	5	5	6	7	8					
30	5	6	7	8						
35	6	7	8	8						
40	7	8	8							
45	8	8	9							
50	8	9								
55	9									

TABLE VI.

Third Correction, to Apparent Distance 120°.

☽'s App Alt.	APPARENT ALTITUDES OF THE SUN, OR STAR.															☽'s App Alt.
	24°	26°	28°	30°	32°	34°	36°	38°	40°	42°	44°	46°	48°	50°	52°	54°	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
6	5 15	5 32	5 49	6 6	6 23	6 41	6 58	7 14	7 30	7 46	8 2	8 17	8 31	8 44	8 57	9 9	6
7	4 45	5 0	5 15	5 30	5 45	6 0	6 15	6 29	6 43	6 56	7 8	7 21	7 33	7 45	7 57		7
8	4 25	4 38	4 51	5 4	5 17	5 30	5 43	5 56	6 8	6 20	6 31	6 42	6 53	7 3	7 13		8
9	4 9	4 20	4 31	4 43	4 55	5 7	5 18	5 28	5 38	5 49	6 0	6 10	6 20	6 29			9
10	3 57	4 7	4 17	4 27	4 37	4 47	4 57	5 7	5 17	5 27	5 37	5 46	5 55	6 3			10
11	3 47	3 56	4 5	4 14	4 23	4 32	4 42	4 51	4 59	5 8	5 17	5 25	5 33				11
12	3 39	3 47	3 55	4 3	4 11	4 19	4 28	4 37	4 44	4 52	5 0	5 7	5 14				12
13	3 32	3 39	3 46	3 53	4 0	4 8	4 16	4 24	4 31	4 38	4 46	4 53					13
14	3 27	3 33	3 39	3 46	3 52	3 59	4 6	4 13	4 20	4 27	4 34	4 40					14
15	3 23	3 29	3 34	3 40	3 46	3 52	3 58	4 4	4 11	4 18	4 24						15
16	3 20	3 25	3 30	3 36	3 41	3 46	3 52	3 58	4 4	4 10	4 16						16
17	3 18	3 22	3 27	3 32	3 36	3 41	3 47	3 52	3 58	4 3							17
18	3 16	3 20	3 24	3 28	3 32	3 37	3 42	3 47	3 52	3 57							18
19	3 15	3 18	3 21	3 25	3 29	3 33	3 38	3 43	3 47								19
20	3 14	3 16	3 19	3 23	3 27	3 31	3 35	3 39	3 43								20
21	3 13	3 15	3 17	3 21	3 24	3 28	3 32	3 36									21
22	3 12	3 14	3 16	3 19	3 22	3 26	3 29	3 33									22
23	3 12	3 13	3 15	3 18	3 21	3 24	3 27										23
24	3 12	3 13	3 15	3 17	3 26	3 23	3 26										24
25	3 12	3 13	3 15	3 17	3 19	3 21											25
26	3 13	3 14	3 15	3 16	3 18	3 20											26
27	3 14	3 14	3 15	3 16	3 18												27
28	3 15	3 14	3 15	3 16	3 18												28
29	3 16	3 15	3 15	3 16													29
30	3 17	3 16	3 16	3 16													30
31	3 18	3 17	3 17														31
32	3 19	3 18	3 18														32
33	3 21	3 19															33
34	3 22	3 20															34
35	3 24																35
36	3 26																36
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64																	64
65																	65
	24°	26°	28°	30°	32°	36°	36°	38°	40°	42°	44°	46°	48°	50°	52°	54°	

TABLE VII.

PROPORTIONAL LOGARITHMS.

" s.	° ′ h. m. 0 0	° ′ h. m. 0 1	° ′ h. m. 0 2	° ′ h. m. 0 3	° ′ h. m. 0 4	° ′ h. m. 0 5	° ′ h. m. 0 6	° ′ h. m. 0 7	° ′ h. m. 0 8	° ′ h. m. 0 9	" s.
0		2.2553	1.9542	1.7782	1.6532	1.5563	1.4771	1.4102	1.3522	1.3010	0
1	4.0334	2.2481	1.9506	1.7757	1.6514	1.5549	1.4759	1.4091	1.3513	1.3002	1
2	3.7324	2.2410	1.9471	1.7734	1.6496	1.5534	1.4747	1.4081	1.3504	1.2994	2
3	3.5563	2.2341	1.9435	1.7710	1.6478	1.5520	1.4735	1.4071	1.3495	1.2986	3
4	3.4314	2.2272	1.9400	1.7686	1.6460	1.5506	1.4723	1.4061	1.3486	1.2978	4
5	3.3345	2.2205	1.9365	1.7663	1.6443	1.5491	1.4711	1.4050	1.3477	1.2970	5
6	3.2553	2.2139	1.9331	1.7639	1.6425	1.5477	1.4699	1.4040	1.3468	1.2962	6
7	3.1883	2.2073	1.9296	1.7616	1.6407	1.5463	1.4688	1.4030	1.3459	1.2954	7
8	3.1303	2.2009	1.9262	1.7593	1.6390	1.5449	1.4676	1.4020	1.3450	1.2946	8
9	3.0792	2.1946	1.9228	1.7570	1.6372	1.5435	1.4664	1.4010	1.3441	1.2939	9
10	3.0334	2.1883	1.9195	1.7547	1.6355	1.5421	1.4652	1.4000	1.3432	1.2931	10
11	2.9920	2.1822	1.9162	1.7524	1.6338	1.5407	1.4640	1.3989	1.3423	1.2923	11
12	2.9542	2.1761	1.9128	1.7501	1.6320	1.5393	1.4629	1.3979	1.3415	1.2915	12
13	2.9195	2.1701	1.9096	1.7479	1.6303	1.5379	1.4617	1.3969	1.3406	1.2907	13
14	2.8873	2.1642	1.9063	1.7456	1.6286	1.5365	1.4606	1.3959	1.3397	1.2899	14
15	2.8573	2.1584	1.9031	1.7434	1.6269	1.5351	1.4594	1.3949	1.3388	1.2891	15
16	2.8293	2.1526	1.8999	1.7412	1.6252	1.5337	1.4582	1.3939	1.3379	1.2883	16
17	2.8030	2.1469	1.8967	1.7390	1.6235	1.5324	1.4571	1.3929	1.3371	1.2876	17
18	2.7782	2.1413	1.8935	1.7368	1.6218	1.5310	1.4559	1.3919	1.3362	1.2868	18
19	2.7547	2.1358	1.8904	1.7346	1.6201	1.5296	1.4548	1.3910	1.3353	1.2860	19
20	2.7324	2.1303	1 8873	1.7324	1.6185	1.5283	1.4536	1.3900	1.3345	1.2852	20
21	2.7112	2.1249	1.8842	1.7302	1.6168	1.5269	1.4525	1.3890	1.3336	1.2845	21
22	2.6910	2.1196	1.8811	1.7281	1.6151	1.5256	1.4514	1.3880	1.3327	1.2837	22
23	2.6717	2.1143	1.8781	1.7259	1.6135	1.5242	1.4502	1.3870	1.3319	1.2829	23
24	2.6532	2.1091	1.8751	1.7238	1.6118	1.5229	1.4491	1.3860	1.3310	1.2821	24
25	2.6355	2.1040	1.8721	1.7217	1.6102	1.5215	1.4480	1.3851	1.3301	1.2814	25
26	2.6185	2.0989	1.8691	1.7196	1.6085	1.5202	1.4468	1.3841	1.3293	1.2806	26
27	2.6021	2.0939	1.8661	1.7175	1.6069	1.5189	1.4457	1.3831	1.3284	1.2798	27
28	2.5863	2.0889	1.8632	1.7154	1.6053	1.5175	1.4446	1.3821	1.3276	1.2791	28
29	2.5710	2.0840	1.8602	1.7133	1.6037	1.5162	1.4435	1.3812	1.3267	1.2783	29
30	2.5563	2.0792	1.8573	1.7112	1.6021	1.5149	1.4424	1.3802	1.3259	1.2775	30
31	2.5421	2.0744	1.8544	1.7091	1.6005	1.5136	1.4412	1.3792	1.3250	1.2768	31
32	2.5283	2.0696	1.8516	1.7071	1.5989	1.5123	1.4401	1.3783	1.3242	1.2760	32
33	2.5149	2.0649	1.8487	1.7050	1.5973	1.5110	1.4390	1.3773	1.3233	1.2753	33
34	2.5019	2.0603	1.8459	1.7030	1.5957	1.5097	1.4379	1.3764	1.3225	1.2745	34
35	2.4894	2.0557	1.8431	1.7010	1.5941	1.5084	1.4368	1.3754	1.3216	1.2738	35
36	2.4771	2.0512	1.8403	1.6990	1.5925	1.5071	1.4357	1.3745	1.3208	1.2730	36
37	2.4652	2.0467	1.8375	1.6970	1.5909	1.5058	1.4346	1.3735	1.3199	1.2722	37
38	2.4536	2.0422	1.8348	1.6950	1.5894	1.5045	1.4335	1.3726	1.3191	1.2715	38
39	2.4424	2.0378	1.8320	1.6930	1.5878	1.5032	1.4325	1.3716	1.3183	1.2707	39
40	2.4314	2 0334	1.8293	1.6910	1.5863	1.5019	1.4314	1.3707	1.3174	1.2700	40
41	2.4206	2.0291	1.8266	1.6890	1.5847	1.5007	1.4303	1.3697	1.3166	1.2692	41
42	2.4102	2.0248	1.8239	1.6871	1.5832	1.4994	1.4292	1.3688	1.3158	1.2685	42
43	2.4000	2.0206	1.8212	1.6851	1.5816	1.4981	1.4281	1.3678	1.3149	1.2678	43
44	2.3900	2.0164	1.8186	1.6832	1.5801	1.4969	1.4270	1.3669	1.3141	1.2670	44
45	2.3802	2.0122	1.8159	1.6812	1.5786	1.4956	1.4260	1.3660	1.3133	1.2663	45
46	2.3707	2.0081	1.8133	1.6793	1.5771	1.4943	1.4249	1.3650	1.3124	1.2655	46
47	2.3613	2.0040	1.8107	1.6774	1.5755	1.4931	1.4238	1.3641	1.3116	1.2648	47
48	2.3522	2.0000	1.8081	1.6755	1.5740	1.4918	1.4228	1.3632	1.3108	1.2640	48
49	2.3432	1.9960	1.8055	1.6736	1.5725	1.4906	1.4217	1.3623	1.3100	1.2633	49
50	2.3345	1.9920	1.8030	1.6717	1.5710	1.4894	1.4206	1.3613	1.3091	1.2626	50
51	2.3259	1.9881	1.8004	1.6698	1.5695	1.4881	1.4196	1.3604	1.3083	1.2618	51
52	2.3174	1.9842	1 7979	1.6679	1.5680	1.4869	1.4185	1.3595	1.3075	1.2611	52
53	2.3091	1.9803	1.7954	1.6661	1.5666	1.4856	1.4175	1.3586	1.3067	1.2604	53
54	2.3010	1.9765	1.7929	1.6642	1.5651	1.4844	1.4164	1.3576	1.3059	1.2596	54
55	2.2931	1.9727	1.7904	1.6624	1.5636	1.4832	1.4154	1.3567	1.3051	1.2589	55
56	2.2852	1.9690	1.7879	1.6605	1.5621	1.4820	1.4143	1.3558	1.3043	1.2582	56
57	2.2775	1.9652	1.7855	1.6587	1.5607	1.4808	1.4133	1.3549	1.3034	1.2574	57
58	2.2700	1.9615	1.7830	1.6568	1.5592	1.4795	1.4122	1.3540	1.3026	1.2567	58
59	2.2626	1.9579	1.7806	1.6550	1.5578	1.4783	1.4112	1.3531	1.3018	1.2560	59
	0 0	0 1	0 2	0 3	0 4	0 5	0 6	0 7	0 8	0 9	

PROPORTIONAL LOGARITHMS.

// s.	° ′ h. m. 0 10	° ′ h. m. 0 11	° ′ h. m. 0 12	° ′ h. m. 0 13	° ′ h. m. 0 14	° ′ h. m. 0 15	° ′ h. m. 0 16	° ′ h. m. 0 17	° ′ h. m. 0 18	° ′ h. m. 0 19	// s.
0	1.2553	1.2139	1.1761	1.1413	1.1091	1.0792	1.0512	1.0248	1.0000	0.9765	0
1	1.2545	1.2132	1.1755	1.1408	1.1086	1.0787	1.0507	1.0244	0.9996	0.9761	1
2	1.2538	1.2126	1.1749	1.1402	1.1081	1.0782	1.0502	1.0240	0.9992	0.9758	2
3	1.2531	1.2119	1.1743	1.1397	1.1076	1.0777	1.0498	1.0235	0.9988	0.9754	3
4	1.2524	1.2113	1.1737	1.1391	1.1071	1.0773	1.0493	1.0231	0.9984	0.9750	4
5	1.2517	1.2106	1.1731	1.1386	1.1066	1.0768	1.0489	1.0227	0.9980	0.9746	5
6	1.2510	1.2099	1.1725	1.1380	1.1061	1.0763	1.0484	1.0223	0.9976	0.9742	6
7	1.2502	1.2093	1.1719	1.1374	1.1055	1.0758	1.0480	1.0219	0.9972	0.9739	7
8	1.2495	1.2086	1.1713	1.1369	1.1050	1.0753	1.0475	1.0214	0.9968	0.9735	8
9	1.2488	1.2080	1.1707	1.1363	1.1045	1.0749	1.0471	1.0210	0.9964	0.9731	9
10	1.2481	1.2073	1.1701	1.1358	1.1040	1.0744	1.0467	1.0206	0.9960	0.9727	10
11	1.2474	1.2067	1.1695	1.1352	1.1035	1.0739	1.0462	1.0202	0.9956	0.9723	11
12	1.2467	1.2061	1.1689	1.1347	1.1030	1.0734	1.0458	1.0197	0.9952	0.9720	12
13	1.2460	1.2054	1.1683	1.1342	1.1025	1.0730	1.0453	1.0193	0.9948	0.9716	13
14	1.2453	1.2048	1.1677	1.1336	1.1020	1.0725	1.0449	1.0189	0.9944	0.9712	14
15	1.2445	1.2041	1.1671	1.1331	1.1015	1.0720	1.0444	1.0185	0.9940	0.9708	15
16	1.2438	1.2035	1.1665	1.1325	1.1009	1.0715	1.0440	1.0181	0.9936	0.9705	16
17	1.2431	1.2028	1.1660	1.1320	1.1004	1.0711	1.0435	1.0176	0.9932	0.9701	17
18	1.2424	1.2022	1.1654	1.1314	1.0999	1.0706	1.0431	1.0172	0.9928	0.9697	18
19	1.2417	1.2016	1.1648	1.1309	1.0994	1.0701	1.0426	1.0168	0.9924	0.9693	19
20	1.2410	1.2009	1.1642	1.1303	1.0989	1.0696	1.0422	1.0164	0.9920	0.9690	20
21	1.2403	1.2003	1.1636	1.1298	1.0984	1.0692	1.0418	1.0160	0.9916	0.9686	21
22	1.2396	1.1996	1.1630	1.1292	1.0979	1.0687	1.0413	1.0156	0.9912	0.9682	22
23	1.2389	1.1990	1.1624	1.1287	1.0974	1.0682	1.0409	1.0151	0.9908	0.9678	23
24	1.2382	1.1984	1.1619	1.1282	1.0969	1.0678	1.0404	1.0147	0.9905	0.9675	24
25	1.2375	1.1977	1.1613	1.1276	1.0964	1.0673	1.0400	1.0143	0.9901	0.9671	25
26	1.2368	1.1971	1.1607	1.1271	1.0959	1.0668	1.0395	1.0139	0.9897	0.9667	26
27	1.2362	1.1965	1.1601	1.1266	1.0954	1.0663	1.0391	1.0135	0.9893	0.9664	27
28	1.2355	1.1958	1.1595	1.1260	1.0949	1.0659	1.0387	1.0131	0.9889	0.9660	28
29	1.2348	1.1952	1.1589	1.1255	1.0944	1.0654	1.0382	1.0126	0.9885	0.9656	29
30	1.2341	1.1946	1.1584	1.1249	1.0939	1.0649	1.0378	1.0122	0.9881	0.9652	30
31	1.2334	1.1939	1.1578	1.1244	1.0934	1.0645	1.0374	1.0118	0.9877	0.9649	31
32	1.2327	1.1933	1.1572	1.1239	1.0929	1.0640	1.0369	1.0114	0.9873	0.9645	32
33	1.2320	1.1927	1.1566	1.1233	1.0924	1.0635	1.0365	1.0110	0.9869	0.9641	33
34	1.2313	1.1921	1.1561	1.1228	1.0919	1.0631	1.0360	1.0106	0.9865	0.9638	34
35	1.2307	1.1914	1.1555	1.1223	1.0914	1.0626	1.0356	1.0102	0.9861	0.9634	35
36	1.2300	1.1908	1.1549	1.1217	1.0909	1.0621	1.0352	1.0098	0.9858	0.9630	36
37	1.2293	1.1902	1.1543	1.1212	1.0904	1.0617	1.0347	1.0093	0.9854	0.9626	37
38	1.2286	1.1896	1.1538	1.1207	1.0899	1.0612	1.0343	1.0089	0.9850	0.9623	38
39	1.2279	1.1889	1.1532	1.1201	1.0894	1.0608	1.0339	1.0085	0.9846	0.9619	39
40	1.2272	1.1883	1.1526	1.1196	1.0889	1.0603	1.0334	1.0081	0.9842	0.9615	40
41	1.2266	1.1877	1.1520	1.1191	1.0884	1.0598	1.0330	1.0077	0.9838	0.9612	41
42	1.2259	1.1871	1.1515	1.1186	1.0880	1.0594	1.0326	1.0073	0.9834	0.9608	42
43	1.2252	1.1865	1.1509	1.1180	1.0875	1.0589	1.0321	1.0069	0.9830	0.9604	43
44	1.2245	1.1859	1.1503	1.1175	1.0870	1.0585	1.0317	1.0065	0.9827	0.9601	44
45	1.2239	1.1852	1.1498	1.1170	1.0865	1.0580	1.0313	1.0061	0.9823	0.9597	45
46	1.2232	1.1846	1.1492	1.1164	1.0860	1.0575	1.0308	1.0057	0.9819	0.9593	46
47	1.2225	1.1840	1.1486	1.1159	1.0855	1.0571	1.0304	1.0053	0.9815	0.9590	47
48	1.2218	1.1834	1.1481	1.1154	1.0850	1.0566	1.0300	1.0049	0.9811	0.9586	48
49	1.2212	1.1828	1.1475	1.1149	1.0845	1.0562	1.0295	1.0044	0.9807	0.9582	49
50	1.2205	1.1822	1.1469	1.1143	1.0840	1.0557	1.0291	1.0040	0.9803	0.9597	50
51	1.2198	1.1816	1.1464	1.1138	1.0835	1.0552	1.0287	1.0036	0.9800	0.9575	51
52	1.2192	1.1809	1.1458	1.1133	1.0831	1.0548	1.0282	1.0032	0.9796	0.9571	52
53	1.2185	1 1803	1.1452	1.1128	1.0826	1.0543	1.0278	1.0028	0.9792	0.9568	53
54	1.2178	1.1797	1.1447	1.1123	1.0821	1.0539	1.0274	1.0024	0.9788	0.9564	54
55	1.2172	1.1791	1.1441	1.1117	1.0816	1.0534	1.0270	1.0020	0.9784	0.9561	55
56	1.2165	1.1785	1.1436	1.1112	1.0811	1.0530	1.0265	1.0016	0.9780	0.9557	56
57	1.2159	1.1779	1.1430	1.1107	1.0806	1.0525	1.0261	1.0012	0.9777	0.9553	57
58	1.2152	1.1773	1.1424	1.1102	1.0801	1.0521	1.0257	1.0008	0.9773	0.9550	58
59	1.2145	1.1767	1.1419	1.1097	1.0797	1.0516	1.0252	1.0004	0.9769	0.9546	59
	0 10	0 11	0 12	0 13	0 14	0 15	0 16	0 17	0 18	0 19	

TABLE VII.

PROPORTIONAL LOGARITHMS.

" s.	° ′ h. m. 0 20	° ′ h. m. 0 21	° ′ h. m. 0 22	° ′ h. m. 0 23	° ′ h. m. 0 24	° ′ h. m. 0 25	° ′ h. m. 0 26	° ′ h. m. 0 27	° ′ h. m. 0 28	° ′ h. m. 0 29	° ′ h. m. 0 30	° ′ h. m. 0 31	° ′ h. m. 0 32	° ′ h. m. 0 33	° ′ h. m. 0 34	° ′ h. m. 0 35	" s.
0	9542	9331	9128	8935	8751	8573	8403	8239	8081	7929	7782	7639	7501	7368	7238	7112	0
1	9539	9327	9125	8932	8748	8570	8400	8236	8079	7926	7779	7637	7499	7365	7236	7110	1
2	9535	9324	9122	8929	8745	8568	8397	8234	8076	7924	7777	7634	7497	7363	7234	7108	2
3	9532	9320	9119	8926	8742	8565	8395	8231	8073	7921	7774	7632	7494	7361	7232	7106	3
4	9528	9317	9115	8923	8739	8562	8392	8228	8071	7919	7772	7630	7492	7359	7229	7104	4
5	9524	9313	9112	8920	8736	8559	8389	8226	8068	7916	7769	7627	7490	7357	7227	7102	5
6	9521	9310	9109	8917	8733	8556	8386	8223	8066	7914	7767	7625	7488	7354	7225	7100	6
7	9517	9306	9106	8913	8730	8553	8384	8220	8063	7911	7765	7623	7485	7352	7223	7098	7
8	9514	9303	9102	8910	8727	8550	8381	8218	8061	7909	7762	7620	7483	7350	7221	7096	8
9	9510	9300	9099	8907	8724	8547	8378	8215	8058	7906	7760	7618	7481	7348	7219	7093	9
10	9506	9296	9096	8904	8721	8544	8375	8212	8055	7904	7757	7616	7479	7346	7217	7091	10
11	9503	9293	9092	8901	8718	8542	8372	8210	8053	7901	7755	7613	7476	7344	7215	7089	11
12	9499	9289	9089	8898	8715	8539	8370	8207	8050	7899	7753	7611	7474	7341	7212	7087	12
13	9496	9286	9086	8895	8712	8536	8367	8204	8048	7896	7750	7609	7472	7339	7210	7085	13
14	9492	9283	9083	8892	8709	8533	8364	8202	8045	7894	7748	7607	7470	7337	7208	7083	14
15	9488	9279	9079	8888	8706	8530	8361	8199	8043	7891	7745	7604	7467	7335	7206	7081	15
16	9485	9276	9076	8885	8703	8527	8359	8196	8040	7889	7743	7602	7465	7333	7204	7079	16
17	9481	9272	9073	8882	8700	8524	8356	8194	8037	7887	7741	7600	7463	7330	7202	7077	17
18	9478	9269	9070	8879	8697	8522	8353	8191	8035	7884	7738	7597	7461	7328	7200	7075	18
19	9474	9266	9066	8876	8694	8519	8350	8188	8032	7882	7736	7595	7458	7326	7198	7073	19
20	9471	9262	9063	8873	8691	8516	8348	8186	8030	7879	7734	7593	7456	7324	7196	7071	20
21	9467	9259	9060	8870	8688	8513	8345	8183	8027	7877	7731	7590	7454	7322	7193	7069	21
22	9464	9255	9057	8867	8685	8510	8342	8181	8025	7874	7729	7588	7452	7320	7191	7067	22
23	9460	9252	9053	8864	8682	8507	8339	8178	8022	7872	7726	7586	7450	7317	7189	7065	23
24	9456	9249	9050	8861	8679	8504	8337	8175	8020	7869	7724	7583	7447	7315	7187	7063	24
25	9453	9245	9047	8857	8676	8502	8334	8173	8017	7867	7722	7581	7445	7313	7185	7061	25
26	9449	9242	9044	8854	8673	8499	8331	8170	8014	3864	7719	7579	7443	7311	7183	7059	26
27	9446	9238	9041	8851	8670	8496	8328	8167	8012	7862	7717	7577	7441	7309	7181	7057	27
28	9442	9235	9037	8848	8667	8493	8326	8165	8009	7859	7714	7574	7438	7307	7179	7055	28
29	9439	9232	9034	8845	8664	8490	8323	8162	8007	7857	7712	7572	7436	7304	7177	7052	29
30	9435	9228	9031	8842	8661	8487	8320	8159	8004	7855	7710	7570	7434	7302	7175	7050	30
31	9432	9225	9028	8839	8658	3484	8318	8157	8002	7852	7707	7567	7432	7300	7172	7048	31
32	9428	9222	9024	8836	8655	8482	8315	8154	7999	7850	7705	7565	7429	7298	7170	7046	32
33	9425	9218	9021	8833	8652	8479	8312	8152	7997	7847	7703	7563	7427	7296	7168	7044	33
34	9421	9215	9018	8830	8649	8476	8309	8149	7994	7845	7700	7560	7425	7294	7166	7042	34
35	9418	9212	9015	8827	8646	8473	8307	8146	7992	7842	7698	7558	7423	7291	7164	7040	35
36	9414	9208	9012	8824	8643	8470	8304	8144	7989	7340	7696	7556	7421	7289	7162	7038	36
37	9411	9205	9008	8821	8640	8467	8301	8141	7987	7837	7693	7554	7418	7287	7160	7036	37
38	9407	9201	9005	8817	8637	8465	8298	8138	7984	7835	7691	7551	7416	7285	7158	7034	38
39	9404	9198	9002	8814	8635	8462	8296	8136	7981	7832	7688	7549	7414	7283	7156	7032	39
40	9400	9195	8999	8811	8632	8459	8293	8133	7979	7830	7686	7547	7412	7281	7154	7030	40
41	9397	9191	8996	8808	8629	8456	8290	8131	7976	7828	7684	7544	7409	7279	7152	7028	41
42	9393	9188	8992	8805	8626	8453	8288	8128	7974	7825	7681	7542	7407	7276	7149	7026	42
43	9390	9185	8989	8802	8623	8451	8285	8125	7971	7823	7679	7540	7405	7274	7147	7024	43
44	9386	9181	8986	8799	8620	8448	8282	8123	7969	7820	7677	7538	7403	7272	7145	7022	44
45	9383	9178	8983	8796	8617	8445	8279	8120	7966	7818	7674	7535	7401	7270	7143	7020	45
46	9379	9175	8980	8793	8614	8442	8277	8117	7964	7815	7672	7533	7398	7268	7141	7018	46
47	9376	9172	8977	8790	8612	8439	8274	8115	7961	7813	7670	7531	7396	7266	7139	7016	47
48	9372	9168	8973	8787	8608	8437	8271	8112	7959	7811	7667	7528	7394	7264	7137	7014	48
49	9369	9165	8970	8784	8605	8434	8269	8110	7956	7808	7665	7526	7392	7261	7135	7012	49
50	9365	9162	8967	8781	8602	8431	8266	8107	7954	7806	7663	7524	7390	7259	7133	7010	50
51	9362	9158	8964	8778	8599	8428	8263	8104	7951	7803	7660	7522	7387	7257	7131	7008	51
52	9358	9155	8961	8775	8597	8425	8261	8102	7949	7801	7658	7519	7385	7255	7129	7006	52
53	9355	9152	8958	8772	8594	8423	8258	8099	7946	7798	7655	7517	7383	7253	7127	7004	53
54	9351	9148	8954	8769	8591	8420	8255	8097	7944	7796	7653	7515	7381	7251	7124	7002	54
55	9348	9145	8951	8766	8588	8417	8253	8094	7941	7794	7651	7513	7379	7249	7122	7000	55
56	9344	9142	8948	8763	8585	8414	8250	8091	7939	7791	7648	7510	7376	7246	7120	6998	56
57	9341	9138	8945	8760	8582	8411	8247	8089	7936	7789	7646	7508	7374	7244	7118	6996	57
58	9337	9135	8942	8757	8579	8409	8244	8086	7934	7786	7644	7506	7372	7242	7116	6994	58
59	9334	9132	8939	8754	8576	8406	8242	8084	7931	7784	7641	7503	7370	7240	7114	6992	59
	0 20	0 21	0 22	0 23	0 24	0 25	0 26	0 27	0 28	0 29	0 30	0 31	0 32	0 33	0 34	0 35	

TABLE VII.

PROPORTIONAL LOGARITHMS.

# s.	° ′ h. m. 0 36	° ′ h. m. 0 37	° ′ h. m. 0 38	° ′ h. m. 0 39	° ′ h. m. 0 40	° ′ h. m. 0 41	° ′ h. m. 0 42	° ′ h. m. 0 43	° ′ h. m. 0 44	° ′ h. m. 0 45	° ′ h. m. 0 46	° ′ h. m. 0 47	° ′ h. m. 0 48	° ′ h. m. 0 49	° ′ h. m. 0 50	° ′ h. m. 0 51	# s.
0	6990	6871	6755	6642	6532	6425	6320	6218	6118	6021	5925	5832	5740	5651	5563	5477	0
1	6988	6869	6753	6640	6530	6423	6319	6216	6117	6019	5924	5830	5739	5649	5562	5476	1
2	5986	6867	6751	6638	6529	6421	6317	6215	6115	6017	5922	5829	5737	5648	5560	5474	2
3	6984	6865	6749	6637	6527	6420	6315	6213	6113	6016	5920	5827	5736	5646	5559	5473	3
4	6982	6863	6747	6635	6525	6418	6313	6211	6112	6014	5919	5826	5734	5645	5557	5471	4
5	6980	6861	6745	6633	6523	6416	9312	6210	6110	6013	5917	5824	5733	5643	5556	5470	5
6	6978	6859	6743	6631	6521	6414	6310	6208	6108	6011	5916	5823	5731	5642	5554	5469	6
7	6976	6857	6742	6629	6519	6413	6308	6206	6107	6009	5914	5821	5730	5640	5553	5467	7
8	6974	6855	6740	6627	6518	6411	6306	6205	6105	6008	5913	5819	5728	5639	5551	5466	8
9	6972	6853	6738	6625	6516	6409	6305	6203	6103	6006	5911	5818	5727	5637	5550	5464	9
10	6970	6851	6736	6621	6514	6407	6303	6201	6102	6005	5909	5816	5725	5636	5549	5463	10
11	6968	6849	6734	6622	6512	6406	6301	6200	6100	6003	5908	5815	5724	5635	5547	5461	11
12	6966	6847	6732	6620	6510	6404	6300	6198	6099	6001	5906	5813	5722	5633	5546	5460	12
13	6964	6845	6730	6618	6509	6402	6298	6196	6097	6000	5905	5812	5721	5632	5544	5459	13
14	6962	6843	6728	6616	6507	6400	6296	6195	6095	5998	5903	5810	5719	5630	5543	5457	14
15	6960	6841	6726	6614	6505	6398	6294	6193	6094	5997	5902	5809	5718	5629	5541	5456	15
16	6958	6840	6725	6612	6503	6397	6293	6191	6092	5995	5900	5807	5716	5627	5540	5454	16
17	6956	6838	6723	6611	6501	6395	6291	6190	6090	5993	5898	5806	5715	5626	5538	5453	17
18	6954	6836	6721	6609	6500	6393	6289	6188	6089	5992	5897	5804	5713	5624	5537	5452	18
19	6952	6834	6719	6607	6498	6391	6288	6186	6087	5990	5895	5803	5712	5623	5536	5450	19
20	6950	6832	6717	6605	6496	6390	6286	6185	6085	5989	5894	5801	5710	5621	5534	5449	20
21	6948	6830	6715	6603	6494	6388	6284	6183	6084	5987	5892	5800	5709	5620	5533	5447	21
22	6946	6828	6713	6601	6492	6386	6282	6181	6082	5985	5891	5798	5707	5618	5531	5446	22
23	6944	6826	6711	6600	6491	6384	6281	6179	6081	5984	5889	5796	5706	5617	5530	5445	23
24	6942	6824	6709	6598	6489	6383	6279	6178	6079	5982	5888	5795	5704	5615	5528	5443	24
25	6940	6822	6708	6596	6487	6381	6277	6176	6077	5981	5886	5793	5703	5614	5527	5442	25
26	6938	6820	6706	6594	6485	6379	6276	6174	6076	5979	5884	5792	5701	5613	5526	5440	26
27	6936	6818	6704	6592	6484	6377	6274	6173	6074	5977	5883	5790	5700	5611	5524	5439	27
28	6934	6816	6702	6590	6482	6376	6272	6171	6072	5976	5881	5789	5698	5610	5522	5437	28
29	6932	6814	6700	6589	6480	6374	6271	6169	6071	5974	5880	5787	5697	5608	5521	5436	29
30	6930	6812	6698	6587	6478	6372	6269	6168	6069	5973	5878	5786	5695	5607	5520	5435	30
31	6928	6810	6696	6585	6476	6371	6267	6166	6067	5971	5877	5784	5694	5605	5518	5433	31
32	6926	6809	6694	6583	6475	6369	6265	6165	6066	5969	5875	5783	5692	5604	5517	5432	32
33	6924	6807	6692	6581	6473	6367	6264	6163	6064	5968	5874	5781	5691	5602	5516	5430	33
34	6923	6805	6691	6579	6471	6365	6262	6161	6063	5966	5872	5780	5689	5601	5514	5429	34
35	6920	6803	6689	6578	6469	6364	6260	6160	6061	5965	5870	5778	5688	5599	5513	5428	35
36	6918	6801	6687	6576	6467	6362	6259	6158	6059	5963	5869	5777	5686	5598	5511	5426	36
37	6916	6799	6685	6574	6466	6360	6257	6156	6058	5961	5867	5775	5685	5596	5510	5425	37
38	6914	6797	6683	6572	6464	6358	6255	6155	6056	5960	5866	5774	5683	5595	5508	5423	38
39	6912	6795	6681	6570	6462	6357	6254	6153	6055	5958	5864	5772	5682	5594	5507	5422	39
40	6910	6793	6679	6568	6460	6355	6252	6151	6053	5957	5863	5771	5680	5592	5506	5421	40
41	6908	6791	6677	6567	6459	6353	6250	6150	6051	5955	5861	5769	5679	5591	5504	5419	41
42	6906	6789	6676	6565	6457	6351	6248	6148	6050	5954	5860	5768	5677	5589	5503	5418	42
43	6904	6787	6674	6563	6455	6350	6247	6146	6048	5952	5858	5766	5676	5588	5501	5416	43
44	6902	6785	6672	6561	6453	6348	6245	6145	6046	5950	5856	5765	5674	5586	5500	5415	44
45	6900	6784	6670	6559	6451	6346	6243	6143	6045	5949	5855	5763	5673	5585	5498	5414	45
46	6898	6782	6668	6558	6450	6344	6242	6141	6043	5947	5853	5761	5671	5583	5497	5412	46
47	6896	6780	6666	6556	6448	6343	6240	6140	6042	5946	5852	5760	5670	5582	5496	5411	47
48	6894	6778	6664	6554	6446	6341	6238	6138	6040	5944	5850	5758	5669	5580	5494	5409	48
49	6892	6776	6663	6552	6444	6339	6237	6136	6038	5942	5849	5757	5667	5579	5493	5408	49
50	6890	6774	6661	6550	6443	6338	6235	6135	6037	5941	5847	5755	5666	5578	5491	5407	50
51	6888	6772	6659	6548	6441	6336	6233	6133	6035	5939	5846	5754	5664	5576	5490	5405	51
52	6886	6770	6657	6547	6439	6334	6232	6131	6033	5938	5844	5752	5663	5575	5488	5404	52
53	6884	6768	6655	6545	6437	6332	6230	6130	6032	5936	5843	8751	5661	5573	5487	5402	53
54	6882	6766	6653	6543	6435	6331	6228	6128	6030	5935	5841	5749	5660	5572	5486	5401	54
55	6881	6764	6651	6541	6434	6329	6226	6126	6029	5933	5839	5748	5658	5570	5484	5400	55
56	6879	6763	6650	6539	6432	6327	6225	6125	6027	5931	5838	5746	5657	5569	5483	5398	56
57	6877	6761	6648	6538	6430	6325	6223	6123	6025	5930	5836	5745	5655	5567	5481	5397	57
58	6875	6759	6646	6536	6428	6324	6221	6121	6024	5928	5835	5743	5654	5566	5480	5395	58
59	6873	6757	6644	6534	6427	6322	6220	6120	6022	5927	5833	5742	5652	5564	5478	5394	59
	0 36	0 37	0 38	0 39	0 40	0 41	0 42	0 43	0 44	0 45	0 46	0 47	0 48	0 49	0 50	0 51	

TABLE VII.

PROPORTIONAL LOGARITHMS.

// s.	° ′ h. m. 0 52	° ′ h. m. 0 53	° ′ h. m. 0 54	° ′ h. m. 0 55	° ′ h. m. 0 56	° ′ h. m. 0 57	° ′ h. m. 0 58	° ′ h. m. 0 59	° ′ h. m. 1 0	° ′ h. m. 1 1	° ′ h. m. 1 2	° ′ h. m. 1 3	° ′ h. m. 1 4	° ′ h. m. 1 5	° ′ h. m. 1 6	° ′ h. m. 1 7	// s.
0	5393	5310	5229	5149	5071	4994	1918	4841	4771	4699	4629	4559	1491	4424	1357	4292	0
1	5391	5309	5227	5148	5070	4993	1917	4843	4770	4698	4628	4558	4490	4422	1356	4291	1
2	5390	5307	5226	5146	5068	4991	1916	4842	4769	4697	4626	4557	4489	4421	1355	4290	2
3	5389	5306	5225	5145	5067	4990	1915	4841	4768	4696	4625	4556	4488	4420	1354	4289	3
4	5387	5305	5223	5144	5066	4989	1913	4839	4766	4695	4624	4555	4486	4419	1353	4288	4
5	5386	5303	5222	5143	5064	4988	1912	4838	4765	4693	4623	4554	4485	4418	1352	4287	5
6	5384	5302	5221	5141	5063	4986	1911	4837	4764	4692	4622	4552	4484	4417	1351	4285	6
7	5383	5300	5219	5140	5062	4985	1910	4836	4763	4691	4621	4551	4483	4416	1350	4284	7
8	5382	5299	5218	5139	5061	4984	1908	4834	4762	4690	4619	4550	4482	4415	1349	4283	8
9	5380	5298	5217	5137	5059	4983	1907	4833	4760	4689	4618	4549	4481	4414	1347	4282	9
10	5379	5296	5215	5136	5058	4981	1906	4832	4759	4688	4617	4548	4480	4412	1346	4281	10
11	5377	5295	5214	5135	5057	4980	1905	4831	4758	4686	4616	4547	4479	4411	1345	4280	11
12	5376	5294	5213	5133	5055	4979	1903	4830	4757	4685	4615	4546	4477	4410	1344	4279	12
13	5375	5292	5211	5132	5054	4977	1902	4828	4756	4684	4614	4544	4476	4409	1343	4278	13
14	5373	5291	5210	5131	5053	4976	1901	4827	4754	4683	4612	4543	4475	4408	1342	4277	14
15	5372	5290	5209	5129	5051	4975	1900	1826	4753	4682	4611	4542	4474	4407	1341	4276	15
16	5370	5288	5207	5128	5050	4974	1899	1825	4752	4680	4610	4541	4473	4406	1340	4275	16
17	5369	5287	5206	5127	5049	4972	1897	1823	4751	4679	4609	4540	4472	4405	1339	4274	17
18	5368	5285	5205	5125	5048	4971	1896	1822	4750	4678	4608	4539	4471	4404	1338	4273	18
19	5366	5284	5203	5124	5046	1970	1895	4821	4748	4677	4607	4538	4469	4402	1336	4271	19
20	5365	5283	5202	5123	5045	4969	1894	1820	4747	4676	4606	4536	4468	4401	1335	4270	20
21	5364	5281	5201	5122	5044	4967	1892	4819	4746	4675	4604	4535	4467	4400	1334	4269	21
22	5362	5280	5199	5120	5043	4966	1891	4817	4745	4673	4603	4534	4466	4399	1333	4268	22
23	5361	5279	5198	5119	5041	4965	1890	4816	4744	4672	4602	4533	4465	4398	1332	4267	23
24	5359	5277	5197	5118	5040	4964	1889	4815	4742	4671	4601	4532	4464	4397	1331	1266	24
25	5358	5276	5195	5116	5039	1962	1887	4814	4741	4670	4600	4531	4463	4396	1330	4265	25
26	5357	5275	5194	5115	5037	4961	1886	4812	4740	4669	4599	4530	4462	4395	1329	1264	26
27	5355	5273	5193	5114	5036	1960	1885	4811	4739	4668	4597	1528	4460	4394	1328	1263	27
28	5354	5272	5191	5112	5035	1959	1884	4810	4738	4666	4596	4527	4459	4393	1327	1262	28
29	5353	5271	5190	5111	5034	1957	1882	1809	4736	4665	4595	4526	4458	4391	1326	1261	29
30	5351	5269	5189	5110	5032	1956	1881	1808	4735	4664	4594	4525	4157	1390	1325	1260	30
31	5350	5268	5187	5108	5031	4955	1880	1806	4734	4663	4593	4524	4156	4389	1323	4259	31
32	5348	5266	5186	5107	5030	1954	1879	1805	4733	4662	4592	4523	4455	4388	1322	1258	32
33	5347	5265	5135	5106	5028	1952	1877	1804	4732	1660	4590	4522	4454	4387	1321	1256	33
34	5346	5264	5182	5105	5027	1951	1876	1803	4730	4659	4589	4520	4453	4386	1320	4255	34
35	5344	5262	5182	5103	5026	1950	1875	1801	4729	1658	4588	1519	4452	4385	1319	1254	35
36	5343	5261	5181	5102	5025	1949	1874	1800	4728	4657	1587	1518	4450	4384	1318	4253	36
37	5341	5260	5179	5101	5023	1947	1873	1799	4727	1656	4586	4517	4149	4383	1317	1252	37
38	5340	5258	5178	5099	5022	1946	1871	1798	4726	4655	1585	1516	4448	4381	1316	4251	38
39	5339	5257	5177	5098	5021	1945	1870	1797	4724	1653	4584	4515	4447	1380	4315	1250	39
40	5337	5256	5175	5097	5019	4943	4869	1795	4723	1652	4582	1514	1446	4379	1314	4249	40
41	5336	5254	5174	5095	5018	1942	1868	1794	4722	4651	4581	4512	4445	4378	1313	4248	41
42	5335	5253	5173	5094	5017	4941	1866	4793	4721	4650	4580	4511	4444	4377	1311	1247	42
43	5333	5252	5172	5093	5016	4940	4865	4792	4720	4649	4579	4510	4443	4376	4310	4246	43
44	5332	5250	5170	5092	5014	4938	4864	4791	4718	4648	4578	4509	4441	4375	4309	4245	44
45	5331	5249	5169	5090	5013	1937	4863	1789	4717	4647	4577	4508	4440	4374	4308	4214	45
46	5329	5248	5168	5089	5012	1936	4861	1788	4716	4645	4575	4507	4439	4373	4307	4243	46
47	5328	5246	5166	5088	5011	1935	4860	4787	4715	4644	4574	4506	4438	4372	4306	4241	47
48	5326	5245	5165	5086	5009	1933	4859	4786	4714	4643	4573	4505	4437	4370	4305	4240	48
49	5325	5244	5164	5085	5008	4932	4858	4785	4712	1642	4572	4503	4436	4369	4304	4239	49
50	5324	5242	5162	5084	5007	4931	4856	4783	4711	4640	4571	4502	4435	4368	4303	4238	50
51	5322	5241	5161	5082	5005	4930	4855	4782	4710	4639	4570	4501	4434	4367	4302	4237	51
52	5321	5240	5160	5081	5004	4928	4854	4781	4709	4638	1569	4500	4433	4366	4301	1236	52
53	5320	5238	5158	5080	5003	4927	4853	4780	4708	4637	1567	4499	4431	4365	4300	4235	53
54	5318	5237	5157	5079	5002	1926	4852	4778	4707	4636	1566	4498	4430	1364	1298	4234	54
55	5317	5235	5156	5077	5000	4925	4850	1777	4705	4635	4565	4497	4429	4363	4297	4233	55
56	5315	5234	5154	5076	4999	4923	4849	1776	4704	4633	4564	4495	4428	4362	1296	4232	56
57	5314	5233	5153	5075	4998	4922	4848	1775	4703	4632	4563	4494	4427	4361	1295	1231	57
58	5313	5231	5152	5073	4997	4921	1847	4774	4702	4631	4562	4493	4426	4359	1294	4230	58
59	5311	5230	5150	5072	4995	4920	1845	1772	4701	4630	4560	4492	4425	4358	1293	4229	59
	0 52	0 53	0 54	0 55	0 56	0 57	0 58	0 59	1 0	1 1	1 2	1 3	1 4	1 5	1 6	1 7	

TABLE VII.

PROPORTIONAL LOGARITHMS.

# s.	° ′ h. m 1 8	° ′ h. m. 1 9	° ′ h. m. 1 10	° ′ h. m. 1 11	° ′ h. m. 1 12	° ′ h. m. 1 13	° ′ h. m 1 14	° ′ h. m. 1 15	° ′ h. m. 1 16	° ′ h. m. 1 17	° ′ h. m. 1 18	° ′ h. m. 1 19	° ′ h. m. 1 20	° ′ h. m. 1 21	° ′ h. m. 1 22	° ′ h. m. 1 23	# s.
0	4228	4164	4102	4040	3979	3919	3860	3802	3745	3688	3632	3576	3522	3468	3415	3362	0
1	4227	4163	4101	4039	3978	3919	3859	3801	3741	3687	3631	3576	3521	3467	3414	3361	1
2	4226	4162	4100	4038	3977	3918	3858	3800	3743	3686	3630	3575	3520	3466	3413	3360	2
3	4224	4161	4099	4037	3976	3917	3857	3799	3742	3685	3629	3574	3519	3465	3412	3359	3
4	4223	4160	4098	4036	3975	3916	3856	3798	3741	3684	3628	3573	3518	3464	3411	3358	4
5	4222	4159	4097	4035	3974	3915	3856	3797	3740	3683	3627	3572	3517	3463	3410	3358	5
6	4221	4158	4096	4034	3973	3914	3855	3796	3739	3682	3626	3571	3516	3463	3409	3357	6
7	4220	4157	4095	4033	3972	3913	3854	3795	3738	3681	3625	3570	3515	3462	3408	3356	7
8	4219	4156	4093	4032	3971	3912	3853	3794	3737	3680	3624	3569	3514	3461	3408	3355	8
9	4218	4155	4092	4031	3970	3911	3852	3793	3736	3679	3623	3568	3514	3460	3407	3354	9
10	4217	4154	4091	4030	3969	3910	3851	3792	3735	3678	3623	3567	3513	3459	3406	3353	10
11	4216	4153	4090	4029	3968	3909	3850	3792	3734	3677	3622	3566	3512	3458	3405	3352	11
12	4215	4152	4089	4028	3967	3908	3849	3791	3733	3677	3621	3565	3511	3457	3404	3351	12
13	4214	4151	4088	4027	3962	3907	3848	3790	3732	3676	3620	3565	3510	3456	3403	3351	13
14	4213	4150	4087	4026	3965	3906	3847	3789	3731	3675	3619	3564	3509	3455	3402	3350	14
15	4212	4149	4086	4025	3964	3905	3846	3788	3730	3674	3618	3563	3508	3454	3401	3349	15
16	4211	4147	4085	4024	3963	3904	3845	3787	3729	3673	3617	3562	3507	3454	3400	3348	16
17	4210	4146	4084	4023	3962	3903	3844	3786	3728	3672	3616	3561	3506	3453	3400	3347	17
18	4209	4145	4083	4022	3961	3902	3843	3785	3727	3671	3615	3560	3506	3452	3399	3346	18
19	4207	4144	4082	4021	3960	3901	3842	3784	3727	3670	3614	3559	3505	3451	3398	3345	19
20	4206	4143	4081	4020	3959	3900	3841	3783	3726	3669	3613	3558	3504	3450	3397	3345	20
21	4205	4142	4080	4019	3958	3899	3840	3782	3725	3668	3612	3557	3503	3449	3396	3344	21
22	4204	4141	4079	4018	3957	3898	3839	3781	3724	3667	3611	3556	3502	3448	3395	3343	22
23	4203	4140	4078	4017	3956	3897	3838	3780	3723	3666	3610	3555	3501	3447	3394	3342	23
24	4202	4139	4077	4016	3955	3896	3837	3779	3722	3665	3610	3555	3500	3446	3393	3341	24
25	4201	4138	4076	4015	3954	3895	3836	3778	3721	3664	3609	3554	3499	3446	3393	3340	25
26	4200	4137	4075	4014	3953	3894	3835	3777	3720	3663	3608	3553	3498	3445	3392	3339	26
27	4199	4136	4074	4013	3952	3893	3834	3776	3719	3663	3607	3552	3497	3444	3391	3338	27
28	4198	4135	4073	4012	3951	3892	3833	3775	3718	3662	3606	3551	3497	3443	3390	3338	28
29	4197	4134	4072	4011	3950	3891	3832	3774	3717	3661	3605	3550	3496	3442	3387	3337	29
30	4196	4133	4071	4010	3949	3890	3831	3773	3716	3660	3604	3549	3495	3441	3388	3336	30
31	4195	4132	4070	4009	3948	3889	3830	3772	3715	3659	3603	3548	3494	3440	3387	3335	31
32	4194	4131	4069	4008	3947	3888	3829	3771	3714	3658	3602	3547	3493	3439	3386	3334	32
33	4193	4130	4068	4007	3946	3887	3828	3770	3713	3657	3601	3546	3492	3438	3386	3333	33
34	4492	4129	4067	4006	3945	3886	3827	3769	3712	3656	3600	3545	3491	3438	3385	3332	34
35	4191	4128	4066	4005	3944	3885	3826	3768	3711	3655	3599	3545	3490	3437	3384	3332	35
36	4189	4127	4065	4004	3943	3884	3825	3768	3710	3654	3598	3544	3489	3436	3383	3331	36
37	4188	4126	4064	4003	3942	3883	3824	3767	3709	3653	3598	3543	3488	3435	3382	3330	37
38	4187	4125	4063	4002	3941	3882	3823	3766	3709	3652	3597	3542	3488	3434	3381	3329	38
39	4186	4124	4062	4001	3940	3881	3822	3765	3708	3651	3596	3541	3487	3433	3380	3328	39
40	4185	4122	4061	4000	3939	3880	3821	3764	3707	3650	3595	3540	3486	3432	3379	3327	40
41	4184	4121	4060	3999	3938	3879	3820	3763	3706	3649	3594	3539	3485	3431	3379	3326	41
42	4183	4120	4059	3998	3937	3878	3820	3762	3705	3649	3593	3538	3484	3431	3378	3325	42
43	4182	4119	4058	3997	3936	3877	3819	3761	3704	3648	3592	3537	3483	3430	3377	3325	43
44	4181	4118	4056	3996	3935	3876	3818	3760	3703	3647	3591	3536	3482	3429	3376	3324	44
45	4180	4117	4055	3995	3934	3875	3817	3759	3702	3646	3590	3535	3481	3428	3375	3323	45
46	4179	4116	4054	3993	3933	3874	3816	3758	3701	3645	3589	3535	3480	3427	3374	3322	46
47	4178	4115	4053	3992	3932	3873	3815	3757	3700	3644	3588	3534	3480	3426	3373	3321	47
48	4177	4114	4052	3991	3931	3872	3814	3756	3699	3643	3587	3533	3479	3425	3372	3320	48
49	4176	4113	4051	3990	3930	3871	3813	3755	3698	3642	3587	3532	3478	3424	3372	3319	49
50	4175	4112	4050	3989	3929	3870	3812	3754	3697	3641	3586	3531	3477	3423	3371	3319	50
51	4174	4111	4049	3988	3928	3869	3811	3753	3696	3640	3585	3530	3476	3423	3370	3318	51
52	4173	4110	4048	3987	3927	3868	3810	3752	3695	3639	3584	3529	3475	3422	3369	3317	52
53	4172	4109	4047	3986	3926	3867	3809	3751	3694	3638	3583	3528	3474	3421	3368	3316	53
54	4171	4108	4046	3985	3925	3866	3808	3750	3693	3637	3582	3527	3473	3420	3367	3315	54
55	4169	4107	4045	3984	3924	3865	3807	3749	3693	3636	3581	3526	3472	3419	3366	3314	55
56	4168	4106	4044	3983	3923	3864	3806	3748	3692	3635	3580	3525	3471	3418	3365	3313	56
57	4167	4105	4043	3982	3922	3863	3805	3747	3691	3635	3579	3525	3471	3417	3365	3313	57
58	4166	4104	4042	3981	3921	3862	3804	3746	3690	3634	3578	3524	3470	3416	3364	3312	58
59	4165	4103	4041	3980	3920	3861	3803	3746	3689	3633	3577	3523	3469	3415	3363	3311	59
	1 8	1 9	1 10	1 11	1 12	1 13	1 14	1 15	1 16	1 17	1 18	1 19	1 20	1 21	1 22	1 23	

TABLE VII.

PROPORTIONAL LOGARITHMS.

" s.	° ′ h. m. 1 24	° ′ h. m. 1 25	° ′ h. m. 1 26	° ′ h. m. 1 27	° ′ h. m. 1 28	° ′ h. m. 1 29	° ′ h. m. 1 30	° ′ h. m. 1 31	° ′ h. m. 1 32	° ′ h. m. 1 33	° ′ h. m. 1 34	° ′ h. m. 1 35	° ′ h. m. 1 36	° ′ h. m. 1 37	° ′ h. m. 1 38	° ′ h. m. 1 39	" s.
0	3310	3259	3208	3158	3108	3059	3010	2962	2915	2868	2821	2775	2730	2685	2640	2596	0
1	3309	3258	3207	3157	3107	3058	3009	2962	2914	2867	2821	2775	2729	2684	2640	2596	1
2	3308	3257	3206	3156	3106	3057	3009	2961	2913	2866	2820	2774	2729	2684	2639	2595	2
3	3307	3256	3205	3155	3105	3056	3008	2960	2912	2866	2819	2773	2728	2683	2638	2594	3
4	3306	3255	3204	3154	3105	3056	3007	2959	2912	2865	2818	2772	2727	2682	2638	2593	4
5	3306	3254	3204	3153	3104	3055	3006	2958	2911	2864	2818	2772	2726	2681	2637	2593	5
6	3305	3253	3203	3153	3103	3054	3005	2958	2910	2863	2817	2771	2725	2681	2636	2592	6
7	3304	3253	3202	3152	3102	3053	3005	2957	2909	2862	2816	2770	2725	2680	2635	2591	7
8	3303	3252	3201	3151	3101	3052	3004	2956	2909	2862	2815	2769	2724	2679	2635	2591	8
9	3302	3251	3200	3150	3101	3052	3003	2955	2908	2861	2815	2769	2723	2678	2634	2590	9
10	3301	3250	3199	3149	3100	3051	3002	2954	2907	2860	2814	2768	2722	2678	2633	2589	10
11	3300	3249	3198	3148	3099	3050	3001	2954	2906	2859	2813	2767	2722	2677	2632	2588	11
12	3300	3248	3198	3148	3098	3049	3001	2953	2905	2859	2812	2766	2721	2676	2632	2588	12
13	3299	3247	3197	3147	3097	3048	3000	2952	2905	2858	2811	2766	2720	2675	2631	2587	13
14	3298	3247	3196	3146	3096	3047	2999	2951	2904	2857	2811	2765	2719	2675	2630	2586	14
15	3297	3246	3195	3145	3096	3047	2998	2950	2903	2856	2810	2764	2719	2674	2629	2585	15
16	3296	3245	3194	3144	3095	3046	2997	2950	2902	2855	2809	2763	2718	2673	2629	2585	16
17	3295	3244	3193	3143	3094	3045	2997	2949	2901	2855	2808	2763	2717	2672	2628	2584	17
18	3294	3243	3193	3143	3093	3044	2996	2948	2901	2854	2808	2762	2716	2672	2627	2583	18
19	3294	3242	3192	3142	3092	3043	2995	2947	2900	2853	2807	2761	2716	2671	2626	2583	19
20	3293	3242	3191	3141	3091	3043	2994	2946	2899	2852	2806	2760	2715	2670	2626	2582	20
21	3292	3241	3190	3140	3091	3042	2993	2946	2898	2852	2805	2760	2714	2669	2625	2581	21
22	3291	3240	3189	3139	3090	3041	2993	2945	2898	2851	2805	2759	2713	2669	2624	2580	22
23	3290	3239	3188	3138	3089	3040	2992	2944	2897	2850	2804	2758	2713	2668	2624	2580	23
24	3289	3238	3188	3138	3088	3039	2991	2943	2896	2849	2803	2757	2712	2667	2623	2579	24
25	3288	3237	3187	3137	3087	3039	2990	2942	2895	2848	2802	2756	2711	2666	2622	2578	25
26	3288	3236	3186	3136	3087	3038	2989	2942	2894	2848	2801	2756	2710	2666	2621	2577	26
27	3287	3236	3185	3135	3086	3037	2989	2941	2894	2847	2801	2755	2710	2665	2621	2577	27
28	3286	3235	3184	3134	3085	3036	2988	2940	2893	2846	2800	2754	2709	2664	2620	2576	28
29	3285	3234	3183	3133	3084	3035	2987	2939	2892	2845	2799	2753	2708	2663	2619	2575	29
30	3284	3233	3183	3133	3083	3034	2986	2939	2891	2845	2798	2753	2707	2663	2618	2574	30
31	3283	3232	3182	3132	3082	3034	2985	2938	2891	2844	2798	2752	2707	2662	2618	2574	31
32	3282	3231	3181	3131	3082	3033	2985	2937	2890	2843	2797	2751	2706	2661	2617	2573	32
33	3282	3231	3180	3130	3081	3032	2984	2936	2889	2842	2796	2750	2705	2660	2616	2572	33
34	3281	3230	3179	3129	3080	3031	2983	2935	2888	2842	2795	2750	2704	2660	2615	2572	34
35	3280	3229	3178	3129	3079	3030	2982	2935	2887	2841	2795	2749	2704	2659	2615	2571	35
36	3279	3228	3178	3128	3078	3030	2981	2934	2887	2840	2794	2748	2703	2658	2614	2570	36
37	3278	3227	3177	3127	3078	3029	2981	2933	2886	2839	2793	2747	2702	2657	2613	2569	37
38	3277	3226	3176	3126	3077	3028	2980	2932	2885	2838	2792	2747	2701	2657	2612	2569	38
39	3276	3225	3175	3125	3076	3027	2979	2931	2884	2838	2792	2746	2701	2656	2612	2568	39
40	3276	3225	3174	3124	3075	3026	2978	2931	2883	2837	2791	2745	2700	2655	2611	2567	40
41	3275	3224	3173	3124	3074	3026	2977	2930	2883	2836	2790	2744	2699	2655	2610	2566	41
42	3274	3223	3173	3123	3073	3025	2977	2929	2882	2835	2789	2744	2698	2654	2610	2566	42
43	3273	3222	3172	3122	3073	3024	2976	2928	2881	2835	2788	2743	2698	2653	2609	2565	43
44	3272	3221	3171	3121	3072	3023	2975	2927	2880	2834	2788	2742	2697	2652	2608	2564	44
45	3271	3220	3170	3120	3071	3022	2974	2927	2880	2833	2787	2741	2696	2652	2607	2564	45
46	3270	3220	3169	3119	3070	3022	2973	2926	2879	2832	2786	2741	2695	2651	2607	2563	46
47	3270	3219	3168	3119	3069	3021	2973	2925	2878	2831	2785	2740	2695	2650	2606	2562	47
48	3269	3218	3168	3118	3069	3020	2972	2924	2877	2831	2785	2739	2694	2649	2605	2561	48
49	3268	3217	3167	3117	3068	3019	2971	2924	2876	2830	2784	2738	2693	2649	2604	2561	49
50	3267	3216	3166	3116	3067	3018	2970	2923	2876	2829	2783	2738	2692	2648	2604	2560	50
51	3266	3215	3165	3115	3066	3018	2969	2922	2875	2828	2782	2737	2692	2647	2603	2559	51
52	3265	3214	3164	3114	3065	3017	2969	2921	2874	2828	2782	2736	2691	2646	2602	2559	52
53	3265	3214	3163	3114	3065	3016	2968	2920	2873	2827	2781	2735	2690	2646	2601	2558	53
54	3264	3213	3163	3113	3064	3015	2967	2920	2873	2826	2780	2735	2689	2645	2601	2557	54
55	3263	3212	3162	3112	3063	3014	2966	2919	2872	2825	2779	2734	2689	2644	2600	2556	55
56	3262	3211	3161	3111	3062	3014	2965	2918	2871	2825	2779	2733	2688	2643	2599	2556	56
57	3261	3210	3160	3110	3061	3013	2965	2917	2870	2824	2778	2732	2687	2643	2599	2555	57
58	3260	3209	3159	3110	3060	3012	2964	2916	2869	2823	2777	2732	2687	2642	2598	2554	58
59	3259	3209	3158	3109	3060	3011	2963	2916	2869	2822	2776	2731	2686	2641	2597	2553	59
	1 24	1 25	1 26	1 27	1 28	1 29	1 30	1 31	1 32	1 33	1 34	1 35	1 36	1 37	1 38	1 39	

TABLE VII.

PROPORTIONAL LOGARITHMS.

// s.	° ′ h. m. 1 40	° ′ h. m. 1 41	° ′ h. m. 1 42	° ′ h. m. 1 43	° ′ h. m. 1 44	° ′ h. m. 1 45	° ′ h. m. 1 46	° ′ h. m. 1 47	° ′ h. m. 1 48	° ′ h. m. 1 49	° ′ h. m. 1 50	° ′ h. m. 1 51	° ′ h. m. 1 52	° ′ h. m. 1 53	° ′ h. m. 1 54	° ′ h. m. 1 55	// s.
0	2553	2510	2467	2424	2382	2341	2300	2259	2218	2178	2139	2099	2061	2022	1984	1946	0
1	2552	2509	2466	2424	2382	2340	2299	2258	2218	2178	2138	2099	2060	2021	1983	1945	1
2	2551	2508	2465	2423	2381	2339	2298	2258	2217	2177	2137	2098	2059	2021	1982	1944	2
3	2551	2507	2465	2422	2380	2339	2298	2257	2216	2176	2137	2098	2059	2020	1982	1944	3
4	2550	2507	2464	2422	2380	2338	2297	2256	2216	2176	2136	2097	2058	2019	1981	1943	4
5	2549	2506	2463	2421	2379	2337	2296	2256	2215	2175	2136	2096	2057	2019	1981	1943	5
6	2548	2505	2462	2420	2378	2337	2296	2255	2214	2174	2135	2096	2057	2018	1980	1942	6
7	2548	2504	2462	2419	2378	2336	2295	2254	2214	2174	2134	2095	2056	2017	1979	1941	7
8	2547	2504	2461	2419	2377	2335	2294	2253	2213	2173	2134	2094	2055	2017	1979	1941	8
9	2546	2503	2460	2418	2376	2335	2294	2253	2212	2172	2133	2094	2055	2016	1978	1940	9
10	2545	2502	2460	2417	2375	2334	2293	2252	2212	3172	2132	2093	2054	2016	1977	1939	10
11	2545	2502	2459	2417	2375	2333	2292	2251	2211	2171	2132	2092	2053	2015	1977	1939	11
12	2544	2501	2458	2416	2374	2333	2291	2251	2210	2170	2131	2092	2053	2014	1976	1938	12
13	2543	2500	2458	2415	2373	2332	2291	2250	2210	2170	2130	2091	2052	2014	1975	1938	13
14	2543	2499	2457	2415	2373	2331	2290	2249	2209	2169	2130	2090	2052	2013	1975	1937	14
15	2542	2499	2456	2414	2372	2331	2289	2249	2208	2169	2129	2090	2051	2012	1974	1936	15
16	2541	2498	2455	2413	2371	2330	2289	2248	2208	2168	2128	2089	2050	2012	1974	1936	16
17	2540	2497	2455	2412	2371	2329	2288	2247	2207	2167	2128	2088	2050	2011	1973	1935	17
18	2540	2497	2454	2412	2370	2328	2287	2247	2206	2166	2127	2088	2049	2010	1972	1934	18
19	2539	2496	2453	2411	2369	2328	2287	2246	2206	2166	2126	2087	2048	2010	1972	1934	19
20	2538	2495	2453	2410	2368	2327	2286	2245	2205	2165	2126	2086	2048	2009	1971	1933	20
21	2538	2494	2452	2410	2368	2326	2285	2245	2204	2165	2125	2086	2047	2009	1970	1933	21
22	2537	2494	2451	2409	2367	2326	2285	2244	2204	2164	2124	2085	2046	2008	1970	1932	22
23	2536	2493	2450	2408	2366	2325	2284	2243	2203	2163	2124	2085	2046	2007	1969	1931	23
24	2535	2492	2450	2408	2366	2324	2283	2243	2202	2163	2123	2084	2045	2007	1968	1931	24
25	2535	2492	2449	2407	2365	2324	2283	2242	2202	2162	2122	2083	2044	2006	1968	1930	25
26	2534	2491	2448	2406	2364	2323	2282	2241	2201	2161	2122	2083	2044	2005	1967	1929	26
27	2533	2490	2448	2405	2364	2322	2281	2241	2200	2161	2121	2082	2043	2005	1967	1929	27
28	2533	2489	2447	2405	2363	2322	2281	2240	2200	2160	2120	2081	2042	2004	1966	1928	28
29	2532	2489	2446	2404	2362	2321	2280	2239	2199	2159	2120	2081	2042	2003	1965	1928	29
30	2531	2488	2445	2403	2362	2320	2279	2239	2198	2159	2119	2080	2041	2003	1965	1927	30
31	2530	2487	2445	2403	2361	2320	2279	2238	2198	2158	2118	2079	2041	2002	1964	1926	31
32	2530	2487	2444	2402	2360	2319	2278	2237	2197	2157	2118	2079	2040	2001	1963	1926	32
33	2529	2486	2443	2401	2359	2318	2277	2237	2196	2157	2117	2078	2039	2001	1963	1925	33
34	2528	2485	2443	2401	2359	2317	2277	2236	2196	2156	2116	2077	2039	2000	1962	1924	34
35	2527	2485	2442	2400	2358	2317	2276	2235	2195	2155	2116	2077	2038	2000	1962	1924	35
36	2527	2484	2441	2399	2357	2316	2275	2235	2194	2155	2115	2076	2037	1999	1961	1923	36
37	2526	2483	2441	2398	2357	2315	2274	2234	2194	2154	2115	2075	2037	1998	1960	1923	37
38	2525	2482	2440	2398	2356	2315	2274	2233	2193	2153	2114	2075	2036	1998	1960	1922	38
39	2525	2482	2439	2397	2355	2314	2273	2233	2192	2153	2113	2074	2035	1997	1959	1921	39
40	2524	2481	2438	2396	2355	2313	2272	2232	2192	2152	2113	2073	2035	1996	1958	1921	40
41	2523	2480	2438	2396	2354	2313	2272	2231	2191	2151	2112	2073	2034	1996	1958	1920	41
42	2522	2480	2437	2395	2353	2312	2271	2231	2190	2151	2111	2072	2033	1995	1957	1919	42
43	2522	2479	2436	2394	2353	2311	2270	2230	2190	2150	2111	2072	2033	1994	1956	1919	43
44	2521	2478	2436	2394	2352	2311	2270	2229	2189	2149	2110	2071	2032	1994	1956	1918	44
45	2520	2477	2435	2393	2351	2310	2269	2229	2188	2149	2109	2070	2032	1993	1955	1918	45
46	2520	2477	2434	2392	2350	2309	2268	2228	2188	2148	2109	2070	2031	1993	1955	1917	46
47	2519	2476	2433	2391	2350	2309	2268	2227	2187	2147	2108	2069	2030	1992	1954	1916	47
48	2518	2475	2433	2391	2349	2308	2267	2227	2186	2147	2107	2068	2030	1991	1953	1916	48
49	2517	2475	2432	2390	2348	2307	2266	2226	6186	2146	2107	2068	2029	1991	1953	1915	49
50	2517	2474	2431	2389	2348	2307	2266	2225	2185	2145	2106	2067	2028	1990	1952	1914	50
51	2516	2473	2431	2389	2347	2306	2265	2225	2184	2145	2105	2066	2028	1989	1951	1914	51
52	2515	2472	2430	2388	2346	2305	2264	2224	2184	2144	2105	2066	2027	1989	1951	1913	52
53	2515	2472	2429	2387	2346	2304	2264	2223	2183	2143	2104	2065	2026	1988	1950	1913	53
54	2514	2471	2429	2387	2345	2304	2263	2223	2182	2143	2103	2064	2026	1987	1950	1912	54
55	2513	2470	2428	2386	2344	2303	2262	2222	2182	2142	2103	2064	2025	1987	1949	1911	55
56	2512	2470	2427	2385	2344	2302	2262	2221	2181	2141	2102	2063	2025	1986	1948	1911	56
57	2512	2469	2426	2384	2343	2302	2261	2220	2180	2141	2101	2062	2024	1986	1948	1910	57
58	2511	2468	2426	2384	2342	2301	2260	2220	2180	2140	2101	2062	2023	1985	1947	1909	58
59	2510	2467	2425	2383	2342	2300	2260	2219	2179	2139	2100	2061	2023	1984	1946	1909	59
	1 40	1 41	1 42	1 43	1 44	1 45	1 46	1 47	1 48	1 49	1 50	1 51	1 52	1 53	1 54	1 55	

TABLE VII.

PROPORTIONAL LOGARITHMS.

" / s.	° ′ h. m. 1 56	° ′ h. m. 1 57	° ′ h. m. 1 58	° ′ h. m. 1 59	° ′ h. m. 2 0	° ′ h. m. 2 1	° ′ h. m. 2 2	° ′ h. m. 2 3	° ′ h. m. 2 4	° ′ h. m. 2 5	° ′ h. m. 2 6	° ′ h. m. 2 7	° ′ h. m. 2 8	° ′ h. m. 2 9	° ′ h. m. 2 10	° ′ h. m. 2 11	" s.
0	1908	1871	1834	1797	1761	1725	1689	1654	1619	1584	1549	1515	1481	1447	1413	1380	0
1	1908	1870	1833	1797	1760	1724	1689	1653	1618	1583	1548	1514	1480	1446	1413	1379	1
2	1907	1870	1833	1796	1760	1724	1688	1652	1617	1582	1548	1514	1479	1446	1412	1379	2
3	1906	1869	1832	1795	1759	1723	1687	1652	1617	1582	1547	1513	1479	1445	1412	1378	3
4	1906	1868	1831	1795	1759	1722	1687	1651	1616	1581	1547	1512	1478	1445	1411	1378	4
5	1905	1868	1831	1794	1758	1722	1686	1651	1616	1581	1546	1512	1478	1444	1411	1377	5
6	1904	1867	1830	1794	1757	1721	1686	1650	1615	1580	1546	1511	1477	1443	1410	1377	6
7	1904	1867	1830	1793	1757	1721	1685	1650	1614	1580	1545	1511	1477	1443	1409	1376	7
8	1903	1866	1829	1792	1756	1720	1684	1649	1614	1579	1544	1510	1476	1442	1409	1376	8
9	1903	1865	1828	1792	1755	1719	1684	1648	1613	1578	1544	1510	1476	1442	1408	1375	9
10	1902	1865	1828	1791	1755	1719	1683	1648	1613	1578	1543	1509	1475	1441	1408	1374	10
11	1901	1864	1827	1791	1754	1718	1683	1647	1612	1577	1543	1508	1474	1441	1407	1374	11
12	1901	1863	1827	1790	1754	1718	1682	1647	1612	1577	1542	1508	1474	1440	1407	1373	12
13	1900	1863	1826	1789	1753	1717	1681	1646	1611	1576	1542	1507	1473	1440	1406	1373	13
14	1899	1862	1825	1789	1752	1717	1681	1645	1610	1576	1541	1507	1473	1439	1406	1372	14
15	1899	1862	1825	1788	1752	1716	1680	1645	1610	1575	1540	1506	1472	1438	1405	1372	15
16	1898	1861	1824	1788	1751	1715	1680	1644	1609	1574	1540	1506	1472	1438	1404	1371	16
17	1898	1860	1823	1787	1751	1715	1679	1644	1609	1574	1539	1505	1471	1437	1404	1371	17
18	1897	1860	1823	1786	1750	1714	1678	1643	1608	1573	1539	1504	1470	1437	1403	1370	18
19	1896	1859	1822	1786	1749	1714	1678	1643	1607	1573	1538	1504	1470	1436	1403	1370	19
20	1896	1859	1822	1785	1749	1713	1677	1642	1607	1572	1538	1503	1469	1436	1402	1369	20
21	1895	1858	1821	1785	1748	1712	1677	1641	1606	1571	1537	1503	1469	1435	1402	1368	21
22	1894	1857	1820	1784	1748	1712	1676	1641	1606	1571	1536	1502	1468	1435	1401	1368	22
23	1894	1857	1820	1783	1747	1711	1676	1640	1605	1570	1536	1502	1468	1434	1401	1367	23
24	1893	1856	1819	1783	1746	1711	1675	1640	1605	1570	1535	1501	1467	1433	1400	1367	24
25	1893	1855	1819	1782	1746	1710	1675	1639	1604	1569	1535	1500	1467	1433	1399	1366	25
26	1892	1855	1818	1781	1745	1709	1674	1638	1603	1569	1534	1500	1466	1432	1399	1366	26
27	1891	1854	1817	1781	1745	1709	1673	1638	1603	1568	1534	1499	1465	1432	1398	1365	27
28	1891	1854	1817	1780	1744	1708	1673	1637	1602	1567	1533	1499	1465	1431	1398	1365	28
29	1890	1853	1816	1780	1743	1708	1672	1637	1602	1567	1532	1498	1464	1431	1397	1364	29
30	1889	1852	1816	1779	1743	1707	1671	1636	1601	1566	1532	1498	1464	1430	1397	1363	30
31	1889	1852	1815	1778	1742	1706	1671	1635	1600	1566	1531	1497	1463	1429	1396	1363	31
32	1888	1851	1814	1778	1742	1706	1670	1635	1600	1565	1531	1496	1463	1429	1396	1362	32
33	1888	1850	1814	1777	1741	1705	1670	1634	1599	1565	1530	1496	1462	1428	1395	1362	33
34	1887	1850	1813	1777	1740	1705	1669	1634	1599	1564	1530	1495	1461	1428	1394	1361	34
35	1886	1849	1812	1776	1740	1704	1668	1633	1598	1563	1529	1495	1461	1427	1394	1361	35
36	1886	1849	1812	1775	1739	1703	1668	1633	1598	1563	1528	1494	1460	1427	1333	1360	36
37	1885	1848	1811	1775	1739	1703	1667	1632	1597	1562	1528	1494	1460	1426	1393	1360	37
38	1884	1847	1811	1774	1738	1702	1667	1631	1596	1562	1527	1493	1459	1426	1392	1359	38
39	1884	1847	1810	1774	1737	1702	1666	1631	1596	1561	1527	1493	1459	1425	1392	1359	39
40	1883	1846	1809	1773	1737	1701	1665	1630	1595	1561	1526	1492	1458	1424	1391	1358	40
41	1883	1846	1809	1772	1736	1700	1665	1630	1595	1560	1526	1491	1458	1424	1391	1357	41
42	1882	1845	1808	1772	1736	1700	1664	1629	1594	1559	1525	1491	1457	1423	1390	1357	42
43	1881	1844	1808	1771	1735	1699	1664	1628	1593	1559	1524	1490	1456	1423	1389	1356	43
44	1881	1844	1807	1771	1734	1699	1663	1628	1593	1558	1524	1490	1456	1422	1389	1356	44
45	1880	1843	1806	1770	1734	1698	1663	1627	1592	1558	1523	1489	1455	1422	1388	1355	45
46	1880	1843	1806	1769	1733	1697	1662	1627	1592	1557	1523	1489	1455	1421	1388	1355	46
47	1879	1842	1805	1769	1733	1697	1661	1626	1591	1556	1522	1488	1454	1421	1387	1354	47
48	1878	1841	1805	1768	1732	1696	1661	1626	1591	1556	1522	1487	1454	1420	1387	1354	48
49	1878	1841	1804	1768	1731	1696	1660	1625	1590	1555	1521	1487	1453	1419	1386	1353	49
50	1877	1840	1803	1767	1731	1695	1660	1624	1589	1555	1520	1486	1452	1419	1386	1352	50
51	1876	1839	1803	1766	1730	1694	1659	1624	1589	1554	1520	1486	1452	1418	1385	1352	51
52	1876	1839	1802	1766	1730	1694	1658	1623	1588	1554	1519	1485	1451	1418	1384	1351	52
53	1875	1838	1802	1765	1729	1693	1658	1623	1588	1553	1519	1485	1451	1417	1384	1351	53
54	1875	1838	1801	1765	1728	1693	1657	1622	1587	1552	1518	1484	1450	1417	1383	1350	54
55	1874	1837	1800	1764	1728	1692	1657	1621	1587	1552	1518	1483	1450	1416	1383	1350	55
56	1873	1836	1800	1763	1727	1692	1656	1621	1586	1551	1517	1483	1449	1416	1382	1349	56
57	1873	1836	1799	1763	1727	1691	1655	1620	1585	1551	1516	1482	1449	1415	1382	1349	57
58	1872	1835	1798	1762	1726	1690	1655	1620	1585	1550	1516	1482	1448	1414	1381	1348	58
59	1871	1835	1798	1762	1725	1690	1654	1619	1584	1550	1515	1481	1447	1414	1381	1348	59
	1 56	1 57	1 58	1 59	2 0	2 1	2 2	2 3	2 4	2 5	2 6	2 7	2 8	2 9	2 10	2 11	

PROPORTIONAL LOGARITHMS.

" s.	° ′ h. m. 2 12	° ′ h. m. 2 13	° ′ h. m. 2 14	° ′ h. m. 2 15	° ′ h. m. 2 16	° ′ h. m. 2 17	° ′ h. m. 2 18	° ′ h. m. 2 19	° ′ h. m. 2 20	° ′ h. m. 2 21	° ′ h. m. 2 22	° ′ h. m. 2 23	° ′ h. m. 2 24	° ′ h. m. 2 25	° ′ h. m. 2 26	° ′ h. m. 2 27	" s.
0	1347	1314	1282	1249	1217	1186	1154	1123	1091	1061	1030	0999	0969	0939	0909	0880	0
1	1346	1314	1281	1249	1217	1185	1153	1122	1091	1060	1029	0999	0969	0939	0909	0879	1
2	1346	1313	1281	1248	1216	1184	1153	1122	1090	1060	1029	0998	0968	0938	0908	0879	2
3	1345	1313	1280	1248	1216	1184	1152	1121	1090	1059	1028	0998	0968	0938	0908	0878	3
4	1345	1312	1280	1247	1215	1183	1152	1120	1089	1058	1028	0997	0967	0937	0907	0878	4
5	1344	1311	1279	1247	1215	1183	1151	1120	1089	1058	1027	0997	0967	0937	0907	0877	5
6	1344	1311	1278	1246	1214	1182	1151	1119	1088	1057	1027	0996	0966	0936	0006	0877	6
7	1343	1310	1278	1246	1214	1182	1150	1119	1088	1057	1026	0996	0966	0936	0906	0876	7
8	1343	1310	1277	1245	1213	1181	1150	1118	1087	1056	1026	0995	0965	0935	0905	0876	8
9	1342	1309	1277	1245	1213	1181	1149	1118	1087	1056	1025	0995	0965	0935	0905	0875	9
10	1342	1309	1276	1244	1212	1180	1149	1117	1086	1055	1025	0994	0964	0934	0904	0875	10
11	1341	1308	1276	1243	1211	1180	1148	1117	1086	1055	1024	0994	0964	0934	0904	0874	11
12	1340	1308	1275	1243	1211	1179	1148	1116	1085	1054	1024	0993	0963	0933	0903	0874	12
13	1340	1307	1275	1242	1210	1179	1147	1116	1085	1054	1023	0993	0963	0933	0903	0873	13
14	1339	1307	1274	1242	1210	1178	1147	1115	1084	1053	1023	0992	0962	0932	0902	0873	14
15	1339	1306	1274	1241	1209	1178	1146	1115	1084	1053	1022	0992	0962	0932	0902	0872	15
16	1338	1306	1273	1241	1209	1177	1146	1114	1083	1052	1022	0991	0961	0931	0901	0872	16
17	1338	1305	1273	1240	1208	1177	1145	1114	1083	1052	1021	0991	0961	0931	0901	0871	17
18	1337	1304	1272	1240	1208	1176	1145	1113	1082	1051	1021	0990	0960	0930	0900	0871	18
19	1337	1304	1271	1239	1207	1175	1144	1113	1082	1051	1020	0990	0960	0930	0900	0870	19
20	1336	1303	1271	1239	1207	1175	1143	1112	1081	1050	1020	0989	0959	0929	0899	0870	20
21	1335	1303	1270	1238	1206	1174	1143	1112	1081	1050	1019	0989	0959	0929	0899	0869	21
22	1335	1302	1270	1238	1206	1174	1142	1111	1080	1049	1019	0988	0958	0928	0898	0869	22
23	1334	1302	1269	1237	1205	1173	1142	1111	1080	4049	1018	0988	0958	0928	0898	0868	23
24	1334	1301	1269	1237	1205	1173	1141	1110	1079	1048	1018	0987	0957	0927	0897	0868	24
25	1333	1301	1268	1236	1204	1172	1141	1110	1079	1048	1017	0987	0957	0927	0897	0867	25
26	1333	1300	1268	1235	1204	1172	1140	1109	1078	1047	1017	0986	0956	0926	0896	0867	26
27	1332	1300	1267	1235	1203	1171	1140	1109	1078	1047	1016	0986	0956	0926	0896	0866	27
28	1332	1299	1267	1234	1202	1171	1139	1108	1077	1046	1016	0985	0955	0925	0895	0866	28
29	1331	1298	1266	1234	1202	1170	1139	1108	1076	1046	1015	0985	0955	0925	0895	0865	29
30	1331	1298	1266	1233	1201	1170	1138	1107	1076	1045	1015	0984	0954	0924	0894	0865	30
31	1330	1297	1265	1233	1201	1169	1138	1106	1075	1045	1014	0984	0954	0924	0894	0864	31
32	1329	1297	1264	1232	1200	1169	1137	1106	1075	1044	1014	0983	0953	0923	0893	0864	32
33	1329	1296	1264	1232	1200	1168	1137	1105	1074	1044	1013	0983	0953	0923	0893	0863	33
34	1328	1296	1263	1231	1199	1168	1136	1105	1074	1043	1013	0982	0952	0922	0892	0863	34
35	1328	1295	1263	1231	1199	1167	1136	1104	1073	1043	1012	0982	0952	0922	0892	0862	35
36	1327	1295	1262	1230	1198	1167	1135	1104	1073	1042	1012	0981	0951	0921	0891	0862	36
37	1327	1294	1262	1230	1198	1166	1135	1103	1072	1042	1011	0981	0951	0921	0891	0861	37
38	1326	1294	1261	1229	1197	1165	1134	1103	1072	1041	1011	0980	0950	0920	0890	0861	38
39	1326	1293	1261	1229	1197	1165	1134	1102	1071	1041	1010	0980	0950	0920	0890	0860	39
40	1325	1292	1260	1228	1196	1164	1133	1102	1071	1040	1009	0979	0949	0919	0889	0860	40
41	1325	1292	1260	1227	1196	1164	1132	1101	1070	1040	1009	0979	0949	0919	0889	0859	41
42	1324	1291	1259	1227	1195	1163	1132	1101	1070	1039	1008	0978	0948	0918	0888	0859	42
43	1323	1291	1259	1226	1195	1163	1131	1100	1069	1039	1008	0978	0948	0918	0888	0858	43
44	1323	1290	1258	1226	1494	1162	1131	1100	1069	1038	1007	0977	0947	0917	0887	0858	44
45	1322	1290	1257	1225	1193	1162	1130	1099	1068	1037	1007	0977	0947	0917	0887	0857	45
46	1322	1289	1257	1225	1193	1161	1130	1099	1068	1037	1006	0976	0946	0916	0886	0857	46
47	1321	1289	1256	1224	1192	1161	1129	1098	1067	1036	1006	0976	0946	0916	0886	0856	47
48	1321	1288	1256	1224	1192	1160	1129	1098	1067	1036	1005	0975	0945	0915	0885	0856	48
49	1320	1288	1255	1223	1191	1160	1128	1097	1066	1035	1005	0975	0945	0915	0885	0855	49
50	1320	1287	1255	1223	1191	1159	1128	1097	1066	1035	1004	0974	0944	0914	0884	0855	50
51	1319	1287	1254	1222	1190	1159	1127	1096	1065	1034	1004	0974	0944	0914	0884	0855	51
52	1319	1286	1254	1222	1190	1158	1127	1096	1065	1034	1003	0973	0943	0913	0883	0854	52
53	1318	1285	1253	1221	1189	1158	1126	1095	1064	1033	1003	0973	0943	0913	0883	0854	53
54	1317	1285	1253	1221	1189	1157	1126	1095	1064	1033	1002	0972	0942	0912	0883	0853	54
55	1317	1284	1252	1220	1188	1157	1125	1094	1063	1032	1002	0972	0942	0912	0882	0853	55
56	1316	1284	1252	1219	1188	1156	1125	1094	1063	1032	1001	0971	0941	0911	0882	0852	56
57	1316	1283	1251	1219	1187	1156	1124	1093	1062	1031	1001	0971	0941	0911	0881	0852	57
58	1315	1283	1250	1218	1187	1155	1124	1092	1062	1031	1000	0970	0940	0910	0881	0851	58
59	1315	1282	1250	1218	1186	1154	1123	1092	1061	1030	1000	0970	0940	0910	0880	0851	59
	2 12	2 13	2 14	2 15	2 16	2 17	2 18	2 19	2 20	2 21	2 22	2 23	2 24	2 25	2 26	2 27	

TABLE VII.

PROPORTIONAL LOGARITHMS.

" s.	° ′ h. m. 2 28	° ′ h. m. 2 29	° ′ h. m. 2 30	° ′ h. m. 2 31	° ′ h. m. 2 32	° ′ h. m. 2 33	° ′ h. m. 2 34	° ′ h. m. 2 35	° ′ h. m. 2 36	° ′ h. m. 2 37	° ′ h. m. 2 38	° ′ h. m. 2 39	° ′ h. m. 2 40	° ′ h. m. 2 41	° ′ h. m. 2 42	° ′ h. m. 2 43	" s.
0	0850	0821	0792	0763	0734	0706	0678	0649	0621	0594	0566	0539	0512	0484	0458	0431	0
1	0850	0820	0791	0762	0734	0705	0677	0649	0621	0593	0566	0538	0511	0484	0457	0430	1
2	0849	0820	0791	0762	0733	0705	0677	0648	0621	0593	0565	0538	0511	0484	0457	0430	2
3	0849	0819	0790	0762	0733	0704	0676	0648	0620	0592	0565	0537	0510	0483	0456	0430	3
4	0848	0819	0790	0761	0732	0704	0676	0648	0620	0592	0564	0537	0510	0483	0456	0429	4
5	0848	0818	0789	0761	0732	0703	0675	0647	0619	0591	0564	0536	0509	0482	0455	0429	5
6	0847	0818	0789	0760	0731	0703	0675	0647	0619	0591	0563	0536	0509	0482	0455	0428	6
7	0847	0817	0788	0760	0731	0703	0674	0646	0618	0591	0563	0536	0508	0481	0454	0428	7
8	0846	0817	0788	0759	0730	0702	0674	0646	0618	0590	0562	0535	0508	0481	0454	0427	8
9	0846	0816	0787	0759	0730	0702	0673	0645	0617	0590	0562	0535	0507	0480	0454	0427	9
10	0845	0816	0787	0758	0730	0701	0673	0645	0617	0589	0562	0534	0507	0480	0453	0426	10
11	0845	0816	0787	0758	0729	0701	0672	0644	0616	0589	0561	0534	0507	0480	0453	0426	11
12	0844	0815	0786	0757	0729	0700	0672	0644	0616	0588	0561	0533	0506	0479	0452	0426	12
13	0844	0815	0786	0757	0728	0700	0671	0643	0615	0588	0560	0533	0506	0479	0452	0425	13
14	0843	0814	0785	0756	0728	0699	0671	0643	0615	0587	0560	0532	0505	0478	0451	0425	14
15	0843	0814	0785	0756	0727	0699	0670	0642	0615	0587	0559	0532	0505	0478	0451	0424	15
16	0842	0813	0784	0755	0727	0698	0670	0642	0614	0586	0559	0531	0504	0477	0450	0424	16
17	0842	0813	0784	0755	0726	0698	0670	0641	0614	0586	0558	0531	0504	0477	0450	0423	17
18	0841	0812	0783	0754	0726	0697	0669	0641	0613	0585	0558	0531	0503	0476	0450	0423	18
19	0841	0812	0783	0754	0725	0697	0669	0641	0613	0585	0557	0530	0503	0476	0449	0422	19
20	0840	0811	0782	0753	0725	0696	0668	0640	0612	0585	0557	0530	0502	0475	0449	0422	20
21	0840	0811	0782	0753	0724	0696	0668	0640	0612	0584	0557	0529	0502	0475	0448	0422	21
22	0839	0810	0781	0752	0724	0695	0667	0639	0611	0584	0556	0529	0502	0475	0448	0421	22
23	0839	0810	0781	0752	0723	0695	0667	0639	0611	0583	0556	0528	0501	0474	0447	0421	23
24	0838	0809	0780	0751	0723	0694	0666	0638	0610	0583	0555	0528	0501	0474	0447	0420	24
25	0838	0809	0780	0751	0722	0694	0666	0638	0610	0582	0555	0527	0500	0473	0446	0420	25
26	0837	0808	0779	0751	0722	0694	0665	0637	0609	0582	0554	0527	0500	0473	0446	0419	26
27	0837	0808	0779	0750	0721	0693	0665	0637	0609	0581	0554	0526	0499	0472	0446	0419	27
28	0836	0807	0778	0750	0721	0693	0664	0636	0609	0581	0553	0526	0499	0472	0445	0418	28
29	0836	0807	0778	0749	0721	0692	0664	0636	0608	0580	0553	0526	0498	0471	0445	0418	29
30	0835	0806	0777	0749	0720	0692	0663	0635	0608	0580	0552	0525	0498	0471	0444	0418	30
31	0835	0806	0777	0748	0720	0691	0663	0635	0607	0579	0552	0525	0498	0471	0444	0417	31
32	0834	0805	0776	0748	0719	0691	0663	0634	0607	0579	0552	0524	0497	0470	0443	0417	32
33	0834	0805	0776	0747	0719	0690	0662	0634	0606	0579	0551	0524	0497	0470	0443	0416	33
34	0833	0804	0775	0747	0718	0690	0662	0634	0606	0578	0551	0523	0496	0469	0442	0416	34
35	0833	0804	0775	0746	0718	0689	0661	0633	0605	0578	0550	0523	0496	0469	0442	0415	35
36	0833	0803	0774	0746	0717	0689	0661	0633	0605	0577	0550	0522	0495	0468	0442	0415	36
37	0832	0803	0774	0745	0717	0688	0660	0632	0604	0577	0549	0522	0495	0468	0441	0414	37
38	0832	0802	0774	0745	0716	0688	0660	0632	0604	0576	0549	0521	0494	0467	0441	0414	38
39	0831	0802	0773	0744	0716	0687	0659	0631	0603	0576	0548	0521	0494	0467	0440	0414	39
40	0831	0801	0773	0744	0715	0686	0659	0631	0603	0575	0548	0521	0493	0466	0440	0413	40
41	0830	0801	0772	0743	0715	0686	0658	0630	0602	0575	0547	0520	0493	0466	0439	0413	41
42	0830	0801	0772	0743	0714	0686	0658	0630	0602	0574	0547	0520	0493	0466	0439	0412	42
43	0829	0800	0771	0742	0714	0686	0657	0629	0602	0578	0546	0519	0492	0465	0438	0412	43
44	0829	0800	0771	0742	0713	0685	0657	0629	0601	0573	0546	0519	0492	0465	0438	0411	44
45	0828	0799	0770	0741	0713	0685	0656	0628	0601	0573	0546	0518	0491	0464	0438	0411	45
46	0828	0799	0770	0741	0712	0684	0656	0628	0600	0573	0545	0518	0491	0464	0437	0410	46
47	0827	0798	0769	0740	0712	0684	0655	0628	0600	0572	0545	0517	0490	0463	0437	0410	47
48	0827	0798	0769	0740	0711	0683	0655	0627	0599	0572	0544	0517	0490	0463	0436	0410	48
49	0826	0797	0768	0740	0711	0683	0655	0627	0599	0571	0544	0517	0489	0462	0436	0409	49
50	0826	0797	0768	0739	0711	0682	0654	0626	0598	0571	0543	0516	0489	0462	0435	0409	50
51	0825	0796	0767	0739	0710	0682	0654	0626	0598	0570	0543	0516	0489	0462	0435	0408	51
52	0825	0796	0767	0738	0710	0681	0653	0625	0597	0570	0542	0515	0488	0461	0434	0408	52
53	0824	0795	0766	0738	0709	0681	0653	0625	0597	0569	0542	0515	0488	0461	0434	0407	53
54	0824	0795	0766	0737	0709	0680	0652	0624	0596	0569	0541	0514	0487	0460	0434	0407	54
55	0823	0794	0765	0737	0708	0680	0652	0624	0596	0568	0541	0514	0487	0460	0433	0406	55
56	0823	0794	0765	0736	0708	0679	0651	0623	0596	0568	0541	0513	0486	0459	0433	0406	56
57	0822	0793	0764	0736	0707	0679	0651	0623	0595	0568	0540	0513	0486	0459	0432	0406	57
58	0822	0793	0764	0735	0707	0678	0650	0622	0595	0567	0540	0512	0485	0458	0432	0405	58
59	0821	0792	0763	0735	0706	0678	0650	0622	0594	0567	0539	0512	0485	0458	0431	0405	59
	2 28	2 29	2 30	2 31	2 32	2 33	2 34	2 35	2 36	2 37	2 38	2 39	2 40	2 41	2 42	2 43	

PROPORTIONAL LOGARITHMS.

" s.	° ′ h. m. 2 44	° ′ h. m. 2 45	° ′ h. m. 2 46	° ′ h. m. 2 47	° ′ h. m. 2 48	° ′ h. m. 2 49	° ′ h. m. 2 50	° ′ h. m. 2 51	° ′ h. m. 2 52	° ′ h. m. 2 53	° ′ h. m. 2 54	° ′ h. m. 2 55	° ′ h. m. 2 56	° ′ h. m. 2 57	° ′ h. m. 2 58	° ′ h. m. 2 59	" s.
0	0404	0378	0352	0326	0300	0274	0248	0223	0197	0172	0147	0122	0098	0073	0049	0024	0
1	0404	0377	0351	0325	0299	0273	0248	0222	0197	0172	0147	0122	0097	0073	0048	0024	1
2	9403	0377	0351	0325	0299	0273	0247	0222	0197	0171	0146	0122	0097	0072	0048	0023	2
3	0403	0377	0350	0324	0298	0273	0247	0221	0196	0171	0146	0121	0096	0072	0047	0023	3
4	0403	0376	0350	0324	0298	0272	0247	0221	0196	0171	0146	0121	0096	0071	0047	0023	4
5	0402	0376	0349	0323	0297	0272	0246	0221	0195	0170	0145	0120	0096	0071	0046	0022	5
6	0402	0375	0349	0323	0297	0271	0246	0220	0195	0170	0145	0120	0095	0071	0046	0022	6
7	0401	0375	0349	0323	0297	0271	0245	0220	0194	0169	0144	0119	0095	0070	0046	0021	7
8	0401	0374	0348	0322	0296	0270	0245	0219	0194	0169	0144	0119	0094	0070	0045	0021	8
9	0400	0374	0348	0322	0296	0270	0244	0219	0194	0169	0143	0119	0094	0069	0045	0021	9
10	0400	0374	0347	0321	0295	0270	0244	0219	0193	0168	0143	0118	0093	0069	0044	0020	10
11	0399	0373	0347	0321	0295	0269	0244	0218	0193	0168	0143	0118	0093	0068	0044	0020	11
12	0399	0373	0346	0320	0294	0269	0243	0218	0192	0167	0142	0117	0093	0068	0044	0019	12
13	0399	0372	0346	0320	0294	0268	0243	0217	0192	0167	0142	0117	0092	0068	0043	0019	13
14	0398	0372	0346	0319	0294	0268	0242	0217	0192	0166	0141	0117	0092	0067	0043	0019	14
15	0398	0371	0345	0319	0293	0267	0242	0216	0191	0166	0141	0116	0091	0067	0042	0018	15
16	0397	0371	0345	0319	0293	0267	0241	0216	0191	0166	0141	0116	0091	0066	0042	0018	16
17	0397	0370	0344	0318	0292	0267	0241	0216	0190	0165	0140	0115	0091	0066	0042	0017	17
18	0396	0370	0344	0318	0292	0266	0241	0215	0190	0165	0140	0115	0090	0066	0041	0017	18
19	0396	0370	0343	0317	0291	0266	0240	0215	0189	0164	0139	0114	0090	0065	0041	0017	19
20	0395	0369	0343	0317	0291	0265	0240	0214	0189	0164	0139	0114	0089	0065	0040	0016	20
21	0395	0369	0342	0316	0291	0265	0239	0214	0189	0163	0139	0114	0089	0064	0040	0016	21
22	0395	0368	0342	0316	0290	0264	0239	0213	0188	0163	0138	0113	0089	0064	0040	0015	22
23	0394	0368	0342	0316	0290	0264	0238	0213	0188	0163	0138	0113	0088	0064	0039	0015	23
24	0394	0367	0341	0315	0289	0264	0238	0213	0187	0162	0137	0112	0088	0063	0039	0015	24
25	0393	0367	0341	0315	0289	0263	0238	0212	0187	0162	0137	0112	0087	0063	0038	0014	25
26	0393	0366	0340	0314	0288	0263	0237	0212	0187	0161	0136	0112	0087	0062	0038	0014	26
27	0392	0366	0340	0314	0288	0262	0237	0211	0186	0161	0136	0111	0087	0062	0038	0013	27
28	0392	0366	0339	0313	0288	0262	0232	0211	0186	0161	0136	0111	0086	0062	0037	0013	28
29	0392	0365	0339	0313	0287	0261	0232	0211	0185	0160	0135	0110	0086	0061	0037	0012	29
30	0391	0365	0339	0313	0287	0261	0235	0210	0185	0160	0135	0110	0085	0061	0036	0012	30
31	0391	0364	0338	0312	0286	0261	0235	0210	0184	0159	0134	0110	0085	0060	0036	0012	31
32	0390	0364	0338	0312	0286	0260	0235	0209	0184	0159	0134	0109	0084	0060	0036	0011	32
33	0390	0363	0337	0311	0285	0260	0234	0209	0184	0158	0134	0109	0084	0060	0035	0011	33
34	0389	0363	0337	0311	0285	0259	0234	0208	0183	0158	0133	0108	0084	0059	0035	0010	34
35	9389	0363	0336	0310	0285	0259	0233	0208	0183	0158	0133	0108	0083	0059	0034	0010	35
36	0388	0362	0336	0310	0284	0258	0233	0208	0182	0157	0132	0107	0083	0058	0034	0010	36
37	0388	0362	0336	0310	0284	0258	0233	0207	0182	0157	0132	0107	0082	0058	0034	0009	37
38	0388	0361	0335	0309	0283	0258	0232	0207	0181	0156	0131	0107	0082	0057	0033	0009	38
39	0387	0361	0335	0309	0283	0257	0232	0206	0181	0156	0131	0106	0082	0057	0033	0008	39
40	0387	0360	0334	0308	0282	0257	0231	0206	0181	0156	0131	0106	0081	0057	0032	0008	40
41	0386	0360	0334	0308	0282	0256	0231	0205	0180	0155	0130	0105	0081	0056	0032	0008	41
42	0386	0359	0333	0307	0282	0256	0230	0205	0180	0155	0130	0105	0080	0056	0031	0007	42
43	0385	0359	0333	0307	0281	0255	0230	0205	0179	0154	0129	0105	0080	0055	0031	0007	43
44	0385	0359	0333	0307	0281	0255	0230	0204	0179	0154	0129	0104	0080	0055	0031	0006	44
45	0384	0358	0332	0306	0280	0255	0229	0204	0179	0153	0129	0104	0079	0055	0030	0006	45
46	0384	0358	0332	0306	0280	0254	0229	0203	0178	0153	0128	0103	0079	0054	0030	0006	46
47	0384	0357	0331	0305	0279	0254	0228	0203	0178	0153	0128	0103	0078	0054	0029	0005	47
48	0383	0357	0331	0305	0279	0253	0228	0202	0177	0152	0127	0103	0078	0053	0029	0005	48
49	0383	0356	0330	0304	0279	0253	0227	0202	0177	0152	0127	0102	0077	0053	0029	0004	49
50	0382	0356	0330	0304	0278	0252	0227	0202	0176	0151	0126	0102	0077	0053	0028	0004	50
51	0382	0356	0329	0304	0278	0252	0227	0201	0176	0151	0126	0101	0077	0052	0028	0004	51
52	0381	0355	0329	0303	0277	0252	0226	0201	0176	0151	0126	0101	0076	0052	0027	0003	52
53	0381	0355	0329	0303	0277	0251	0226	0200	0175	0150	0125	0100	0076	0051	0027	0003	53
54	0381	0354	0328	0302	0276	0251	0225	0200	0175	0150	0125	0100	0075	0051	0027	0002	54
55	0380	0354	0328	0302	0276	0250	0225	0200	0174	0149	0124	0100	0075	0051	0026	0002	55
56	0380	0353	0327	0301	0276	0250	0224	0199	0174	0149	0124	0099	0075	0050	0026	0002	56
57	0379	0353	0327	0301	0275	0250	0224	0199	0174	0148	0124	0099	0074	0050	0025	0001	57
58	0379	0353	0326	0300	0275	0249	0224	0198	0173	0148	0123	0098	0074	0049	0025	0001	58
59	0378	0352	0326	0300	0274	0249	0223	0198	0173	0148	0123	0098	0073	0049	0025	0000	59
	2 44	2 45	2 46	2 47	2 48	2 49	2 50	2 51	2 52	2 53	2 54	2 55	2 56	2 57	2 58	2 59	

TABLE VIII.

TO TURN MOTION INTO TIME, OR TIME INTO MOTION.

Degrees	Time. H.	M.	Degrees	Time. H.	M.	Degrees	Time. H.	M.	Minutes of Degrees	Time. M.	S.	Seconds of Degrees	Time. S.	T.
1	0	4	61	4	4	121	8	4	1	0	4	1	0	4
2	0	8	62	4	8	122	8	8	2	0	8	2	0	8
3	0	12	63	4	12	123	8	12	3	0	12	3	0	12
4	0	16	64	4	16	124	8	16	4	0	16	4	0	16
5	0	20	65	4	20	125	8	20	5	0	20	5	0	20
6	0	24	66	4	24	126	8	24	6	0	24	6	0	24
7	0	28	67	4	28	127	8	28	7	0	28	7	0	28
8	0	32	68	4	32	128	8	32	8	0	32	8	0	32
9	0	36	69	4	36	129	8	36	9	0	36	9	0	36
10	0	40	70	4	40	130	8	40	10	0	40	10	0	40
11	0	44	71	4	44	131	8	44	11	0	44	11	0	44
12	0	48	72	4	48	132	8	48	12	0	48	12	0	48
13	0	52	73	4	52	133	8	52	13	0	52	13	0	52
14	0	56	74	4	56	134	8	56	14	0	56	14	0	56
15	1	0	75	5	0	135	9	0	15	1	0	15	1	0
16	1	4	76	5	4	136	9	4	16	1	4	16	1	4
17	1	8	77	5	8	137	9	8	17	1	8	17	1	8
18	1	12	78	5	12	138	9	12	18	1	12	18	1	12
19	1	16	79	5	16	139	9	16	19	1	16	19	1	16
20	1	20	80	5	20	140	9	20	20	1	20	20	1	20
21	1	24	81	5	24	141	9	24	21	1	24	21	1	24
22	1	28	82	5	28	142	9	28	22	1	28	22	1	28
23	1	32	83	5	32	143	9	32	23	1	32	23	1	32
24	1	36	84	5	36	144	9	36	24	1	36	24	1	36
25	1	40	85	5	40	145	9	40	25	1	40	25	1	40
26	1	44	86	5	44	146	9	44	26	1	44	26	1	44
27	1	48	87	5	48	147	9	48	27	1	48	27	1	48
28	1	52	88	5	52	148	9	52	28	1	52	28	1	52
29	1	56	89	5	56	149	9	56	29	1	56	29	1	56
30	2	0	90	6	0	150	10	0	30	2	0	30	2	0
31	2	4	91	6	4	151	10	4	31	2	4	31	2	4
32	2	8	92	6	8	152	10	8	32	2	8	32	2	8
33	2	12	93	6	12	153	10	12	33	2	12	33	2	12
34	2	16	94	6	16	154	10	16	34	2	16	34	2	16
35	2	20	95	6	20	155	10	20	35	2	20	35	2	20
36	2	24	96	6	24	156	10	24	36	2	24	36	2	24
37	2	28	97	6	28	157	10	28	37	2	28	37	2	28
38	2	32	98	6	32	158	10	32	38	2	32	38	2	32
39	2	36	99	6	36	159	10	36	39	2	36	39	2	36
40	2	40	100	6	40	160	10	40	40	2	40	40	2	40
41	2	44	101	6	44	161	10	44	41	2	44	41	2	44
42	2	48	102	6	48	162	10	48	42	2	48	42	2	48
43	2	52	103	6	52	163	10	52	43	2	52	43	2	52
44	2	56	104	6	56	164	10	56	44	2	56	44	2	56
45	3	0	105	7	0	165	11	0	45	3	0	45	3	0
46	3	4	106	7	4	166	11	4	46	3	4	46	3	4
47	3	8	107	7	8	167	11	8	47	3	8	47	3	8
48	3	12	108	7	12	168	11	12	48	3	12	48	3	12
49	3	16	109	7	16	169	11	16	49	3	16	49	3	16
50	3	20	110	7	20	170	11	20	50	3	20	50	3	20
51	3	24	111	7	24	171	11	24	51	3	24	51	3	24
52	3	28	112	7	28	172	11	28	52	3	28	52	3	28
53	3	32	113	7	32	173	11	32	53	3	32	53	3	32
54	3	36	114	7	36	174	11	36	54	3	36	54	3	36
55	3	40	115	7	40	175	11	40	55	3	40	55	3	40
56	3	44	116	7	44	176	11	44	56	3	44	56	3	44
57	3	48	117	7	48	177	11	48	57	3	48	57	3	48
58	3	52	118	7	52	178	11	52	58	3	52	58	3	52
59	3	56	119	7	56	179	11	56	59	3	56	59	3	56
60	4	0	120	8	0	180	12	0	60	4	0	60	4	0