

**THE  
ASTRONOMICAL SOCIETY  
OF  
SOUTHERN AFRICA**

---

**HANDBOOK FOR**

**1960**

# THE ASTRONOMICAL SOCIETY OF SOUTHERN AFRICA

## 1959 — 1960

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The Astronomical Society of South Africa was formed in July 1922, by the amalgamation of the Cape and Johannesburg Astronomical Associations which had been in active existence for several years. Its name was changed to the Astronomical Society of Southern Africa in 1956. The declared objects of the Society are:—

- (1) The encouragement and stimulation of the study of Astronomy in Southern Africa;
- (2) The association of observers and their organisation in the work of astronomical observation and research;
- (3) The dissemination throughout Southern Africa of such current astronomical information as may be helpful to observers;
- (4) The publication from time to time of the results of the work accomplished by the Society.

Membership is open to all who are interested in Astronomy. The Society issues, usually, eleven numbers of "The Monthly Notes of the Astronomical Society of Southern Africa" (M.N.A.S.S.A.) each year, and distributes to each member copies of "Sky and Telescope", an illustrated monthly astronomical magazine published in the United States.

Candidates for election as members of the Society must be proposed and seconded by two members (not associate or student members). The annual subscription is £2 2s., with an entrance fee of £1 1s. The annual subscription to M.N.A.S.S.A. for non-members is £1 1s.

Subscriptions and enquiries concerning M.N.A.S.S.A. only should be addressed to the Circulation Manager, Mr. H. E. Krumm, 3, Leeuwendal Crescent, Cape Town.

All other communications for the Society should be addressed to the Hon. Secretary, Astronomical Society of Southern Africa, c/o The Royal Observatory, Observatory, Cape Province.

### SOCIETY'S CALENDAR FOR 1960

Material and Notes for M.N.A.S.S.A. by 20th of the month.

Nominations for Gill Medal by April 8.

Essay Competition closes May 31.

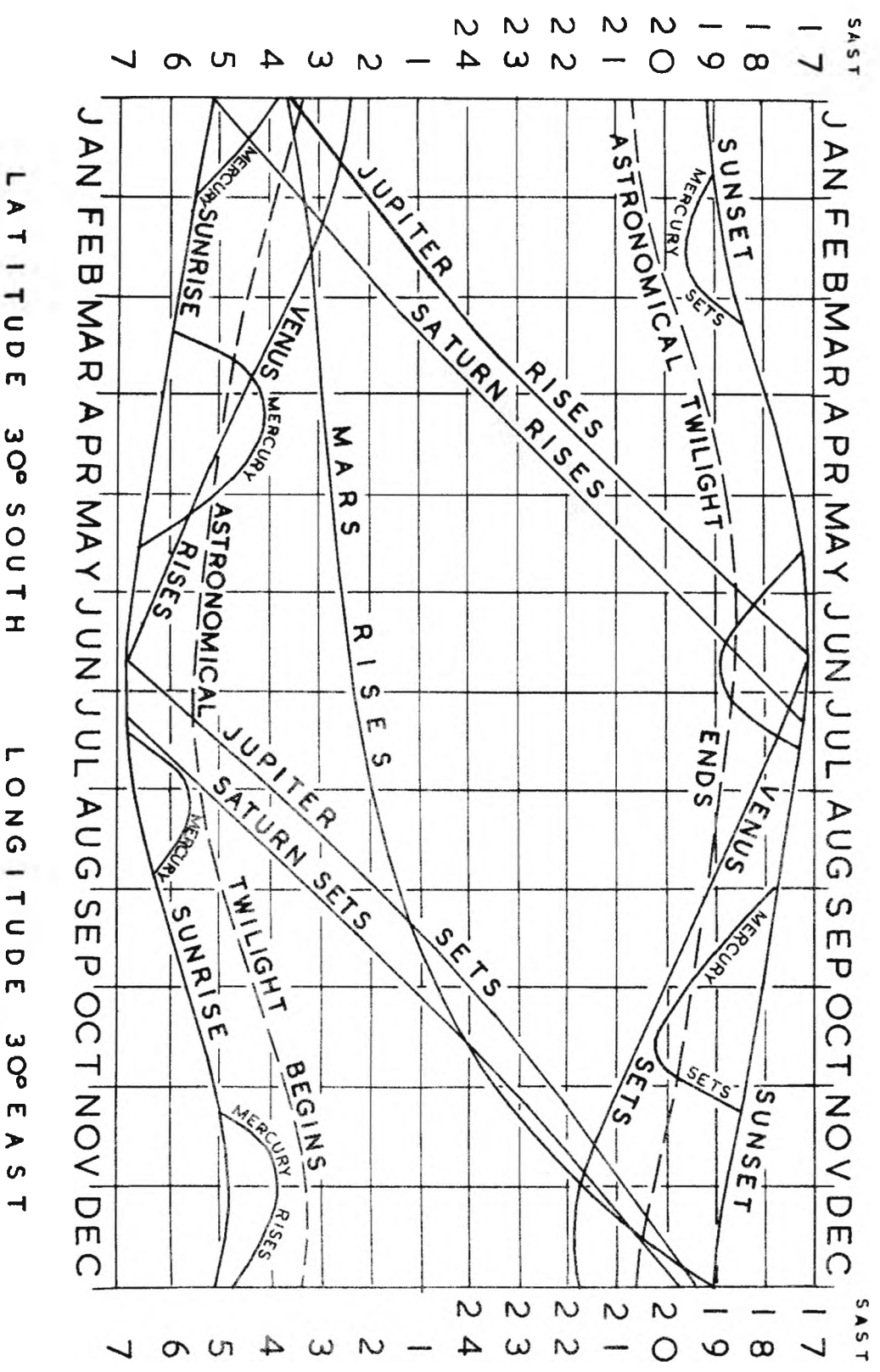
Nominations for Officers and Council by June 15.

Subscriptions due July 1.

Annual General Meeting at all Centres 4th Wednesday in July.

# THE PLANETS AS SEEN FROM SOUTH AFRICA

## 1960



THE  
HANDBOOK  
OF THE  
ASTRONOMICAL SOCIETY OF SOUTHERN AFRICA

1960

Computed and Prepared  
by  
The Computing Section of the Transvaal Centre  
and the Editorial Board of MNASSA

Cape Town 1960

Price to Non-Members: Two shillings

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Grateful acknowledgement is made to H.M. Nautical Almanac Office for the data included in the table of Occultations of Bright Stars.

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## INTRODUCTION

All the times given in this booklet are South African Standard Time, that is, mean solar time for a meridian  $30^{\circ}$ , or two hours, east of Greenwich. This is also the Standard Time in use in the Central African Federation, the Protectorates, Mozambique and the eastern part of the Belgian Congo.

To obtain the local mean time at other places the longitude differences shown in Table I must be applied to the ordinary S.A.S.T.

TABLE I  
CORRECTION FOR LONGITUDE

Bloemfontein	-15 <sup>m</sup>	Grahamstown	-14 <sup>m</sup>
Cape Town	-46	Johannesburg	-08
Durban	+02	Port Elizabeth	-18
East London	-08	Pretoria	-07
Salisbury	+04	Bulawayo	-06

Conversely, to obtain the S.A.S.T. from the local mean time these longitude corrections must be applied with the sign reversed. Thus the S.A.S.T. of local mean noon (i.e. 12h 00m local mean time) at Port Elizabeth is 12h 18m.

Owing to the fact that the Earth does not go round the Sun with uniform circular motion in the plane of the Earth's equator, the local apparent solar time (i.e. the time shown by a sundial) differs from the local mean solar time by a quantity which is usually referred to as the "Equation of Time". The Equation of Time must be added to the mean solar time to give the apparent solar time. Its effect is shown in the third column of Table II which gives the S.A.S.T. of apparent noon, that is, of the Sun's transit over the meridian.

For example, the S.A.S.T. of apparent noon at Port Elizabeth on 1960 November 12 is 12.02 S.A.S.T., found by applying the longitude correction of +18m to the tabulated value for  $30^{\circ}$  E,  $30^{\circ}$  S.

For many purposes sidereal time, that is, local time as measured by the stars, is extremely useful. The sidereal time can be found by applying the S.A.S.T. (on a 24 hour basis) to the corresponding "Sidereal Time at 0 hours S.A.S.T." which is given in the fourth column of Table II and correcting for longitude by means of Table I. A further small correction is needed to allow for the four-minute difference in length between the solar and sidereal days.

The correction is +1m for times between 03.00 and 09.00 S.A.S.T., +2m between 09.00 and 15.00, +3m between 15.00 and 21.00 and +4m between 21.00 and 23.59.

Example: Find the sidereal time at 8.15 p.m. on October 13 at Port Elizabeth.

	h. m.
Sid. Time at 00 <sup>h</sup> .00 <sup>m</sup> S.A.S.T. on October 13	01 26
S.A.S.T. elapsed	20 15
	21 41
Correction for longitude	-18
Interval correction	+ 3
	21 26

For recording the time of variable star observations, the Julian Day Calendar is usually used. This numbers the days consecutively from the beginning of the Julian Era in 4713 B.C. The Julian Day begins at Greenwich mean noon, that is, at 14.00 (2 p.m.) S.A.S.T.

The position of a star in the sky is fixed by its right ascension and declination, much as the position of a point on the earth is fixed by its longitude and latitude. In fact the right ascension and declination of any star are the longitude and latitude of the point on the earth directly beneath it at zero hours sidereal time at Greenwich. Latitude and declination are always measured in degrees north or south of the equator. Longitude and right ascension are measured either in degrees or in time, 360° being equal to 24 hours (1° equals 4 minutes; 15' equals 1 minute). Right ascension is always measured eastwards from the zero celestial meridian, and thus is the equivalent of the longitude measured eastwards from the Greenwich Meridian.

For considering the motions of the Sun, Moon and Planets, the system of co-ordinates known as celestial latitude and longitude is very convenient. These co-ordinates define the position of a celestial body with reference to the ecliptic in exactly the same way as right ascension and declination define its position with reference to the celestial equator. The (celestial) latitude is the angular distance of the body north or south of the ecliptic, while the longitude is the distance from the Vernal Equinox as measured eastwards along the Ecliptic. Celestial latitude and longitude are usually measured in degrees. For example, the co-ordinates of the radiants in the Meteor Calendar are expressed in this way.

The ecliptic is defined by the apparent path of the Sun about the Earth. The latitude of the Sun is therefore always (approximately) zero, whilst its longitude increases by approximately 1° per day.

TABLE II

Date 1960	Julian Date at 14 hours	S. A. S. T. of Sun's transit Longitude 30°E			Sidereal Time for Longitude 30° E				
		h.	m.	s.	S.A.S.T. C hours	S.A.S.T. 18 hours			
January	7	2,436,941.0	12	05	46	7	02	1	05
"	17	951.0	12	09	43	7	41	1	44
"	27	961.0	12	12	34	8	21	2	24
February	6	971.0	12	14	05	9	00	3	03
"	16	981.0	12	14	15	9	39	3	42
"	26	2,436,991.0	12	13	14	10	19	4	22
March	7	2,437,001.0	12	11	14	10	53	5	01
"	17	011.0	12	08	34	11	38	5	41
"	27	021.0	12	05	35	12	17	6	20
April	6	2,437,031.0	12	02	36	12	57	7	00
"	16	041.0	11	59	55	13	36	7	39
"	26	051.0	11	57	52	14	16	8	19
May	6	061.0	11	56	37	14	55	8	58
"	16	071.0	11	56	17	15	35	9	38
"	26	081.0	11	56	53	16	14	10	17
June	5	091.0	11	58	18	16	53	10	56
"	15	101.0	12	00	15	17	33	11	36
"	25	111.0	12	02	24	18	12	12	15
July	5	2,437,121.0	12	04	23	18	52	12	55
"	15	131.0	12	05	48	19	31	13	34
"	25	141.0	12	06	24	20	10	14	13
August	4	151.0	12	06	03	20	50	14	53
"	14	161.0	12	04	40	21	29	15	32
"	24	171.0	12	02	26	22	09	16	12
September	3	181.0	11	59	58	22	48	16	51
"	13	191.0	11	56	03	23	28	17	31
"	23	201.0	11	52	31	0	07	18	10
October	3	2,437,211.0	11	49	11	0	46	18	49
"	13	221.0	11	46	22	1	26	19	29
"	23	231.0	11	44	25	2	05	20	08
November	2	241.0	11	43	37	2	45	20	48
"	12	251.0	11	44	07	3	24	21	27
"	22	261.0	11	46	03	4	04	22	07
December	2	271.0	11	49	17	4	43	22	46
"	12	281.0	11	53	33	5	22	23	25
"	22	291.0	11	58	25	6	02	24	05



THE MOON 1960

PERIGEE			APOGEE		
Date	S.D.	H.P.	Date	S.D.	H.P.
Jan 26 <sup>d</sup> 12 <sup>h</sup>	16' 30"	60' 36"	Jan 10 <sup>d</sup> 15 <sup>h</sup>	14' 43"	54' 01"
Feb 23 05	16 15	59 41	Feb 7 08	14 45	54 08
Mar 19 09	16 09	59 17	Mar 6 04	14 46	54 13
Apr 14 21	16 21	60 01	Apr 3 00	14 46	54 13
May 12 20	16 35	60 50	Apr 30 18	14 45	54 06
Jun 10 04	16 43	61 21	May 28 06	14 43	53 59
Jul 8 13	16 44	61 23	Jun 24 12	14 42	53 56
Aug 5 22	16 37	60 58	Jul 21 16	14 42	53 58
Sep 2 23	16 24	60 12	Aug 18 03	14 44	54 05
Sep 30 00	16 11	59 24	Sep 14 20	14 46	54 12
Oct 24 22	16 13	59 30	Oct 12 15	14 47	54 14
Nov 21 06	16 27	60 23	Nov 9 11	14 46	54 10
Dec 19 13	16 40	61 10	Dec 7 05	14 44	54 03

S.D. = Semi-diameter

H.P. = Horizontal Parallax

The distance of the moon from the earth in miles may be found by dividing 817,500,000 by the H.P. in seconds of arc.

MAXIMUM LIBRATION

Longitude		Latitude	
+ West Limb exposed		+ North Limb exposed	
- East Limb exposed		- South Limb exposed	
Jan 4 +7.6	Jul 14 +7.6	Jan 12 +6.6	Jul 20 +6.7
20 -6.3	30 -6.9	25 -6.6	Aug 3 -6.7
Feb 1 +6.6	Aug 12 +7.1	Feb 8 +6.8	16 +6.8
15 -5.2	27 -5.7	22 -6.7	30 -6.7
29 +5.3	Sep 9 +6.1	Mar 6 +6.8	Sep 13 +6.8
Mar 13 -5.2	22 -4.9	20 -6.8	27 -6.7
27 +4.7	Oct 6 +5.2	Apr 3 +6.8	Oct 10 +6.8
Apr 9 -6.1	19 -5.3	16 -6.7	24 -6.6
22 +5.3	Nov 2 +5.0	30 +6.7	Nov 6 +6.6
May 7 -7.1	16 -6.4	May 13 -6.5	20 -6.5
19 +6.6	28 +5.9	27 +6.6	Dec 3 +6.6
Jun 4 -7.8	Dec 14 -7.5	Jun 10 -6.5	17 -6.5
16 +7.5	26 +7.0	23 +6.6	30 +6.6
Jul 2 -7.7		Jul 7 -6.6	

MOONRISE AND MOONSET

1960 JANUARY

DAY	At 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 2436000+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
F 1	934.4	2.1	8 <sup>h</sup> 03 <sup>m</sup>	21 <sup>h</sup> 21 <sup>m</sup>	8 <sup>h</sup> 33 <sup>m</sup>	22 <sup>h</sup> 09 <sup>m</sup>
S 2	935.4	3.1	9 05	22 05	9 38	22 50
S 3	936.4	4.1	10 05	22 46	10 41	23 28
M 4	937.4	5.1	11 01	23 24	11 40	.....
T 5	938.4	6.1	11 55	.....	12 38	0 03
W 6	939.4	7.1	12 48	0 01	13 33	0 37
T 7	940.4	8.1	13 40	0 38	14 28	1 11
F 8	941.4	9.1	14 32	1 16	15 22	1 47
S 9	942.4	10.1	15 23	1 55	16 15	2 24
S 10	943.4	11.1	16 13	2 36	17 06	3 03
M 11	944.4	12.1	17 01	3 20	17 56	3 46
T 12	945.4	13.1	17 50	4 07	18 44	4 32
W 13	946.4	14.1	18 36	4 55	19 29	5 21
T 14	947.4	15.1	19 20	5 46	20 11	6 13
F 15	948.4	16.1	20 02	6 39	20 51	7 07
S 16	949.4	17.1	20 42	7 32	21 29	8 03
S 17	950.4	18.1	21 21	8 26	22 05	8 59
M 18	951.4	19.1	21 59	9 21	22 40	9 58
T 19	952.4	20.1	22 38	10 16	23 16	10 56
W 20	953.4	21.1	23 19	11 13	23 53	11 56
T 21	954.4	22.1	.....	12 11	.....	12 58
F 22	955.4	23.1	0 01	13 12	0 33	14 01
S 23	956.4	24.1	0 47	14 15	1 16	15 06
S 24	957.4	25.1	1 37	15 17	2 05	16 11
M 25	958.4	26.1	2 33	16 19	2 59	17 14
T 26	959.4	27.1	3 33	17 20	3 59	18 14
W 27	960.4	28.1	4 37	18 16	5 03	19 08
T 28	961.4	29.1	5 41	19 08	6 09	19 57
F 29	962.4	0.7	6 45	19 55	7 16	20 42
S 30	963.4	1.7	7 47	20 38	8 21	21 22
S 31	964.4	2.7	8 46	21 19	9 23	21 59

PHASES OF THE MOON

First Quarter	Jan 5 <sup>d</sup>	20 <sup>h</sup>	53 <sup>m</sup>
Full Moon	14	01	51
Last Quarter	21	17	01
New Moon	28	08	16

MOONRISE AND MOONSET

1960 FEBRUARY

DAY	At 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 2436000+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
M 1	965.4	3.7	9 <sup>h</sup> 43 <sup>m</sup>	21 <sup>h</sup> 58 <sup>m</sup>	10 <sup>h</sup> 24 <sup>m</sup>	22 <sup>h</sup> 35 <sup>m</sup>
T 2	966.4	4.7	10 39	22 36	11 22	23 10
W 3	967.4	5.7	11 32	23 14	12 18	23 45
T 4	968.4	6.7	12 24	23 52	13 13	.....
F 5	969.4	7.7	13 15	.....	14 07	0 23
S 6	970.4	8.7	14 04	0 33	14 59	1 01
S 7	971.4	9.7	14 55	1 16	15 49	1 42
M 8	972.4	10.7	15 44	2 02	16 38	2 27
T 9	973.4	11.7	16 31	2 50	17 24	3 15
W 10	974.4	12.7	17 16	3 39	18 08	4 05
T 11	975.4	13.7	17 59	4 31	18 49	4 59
F 12	976.4	14.7	18 41	5 25	19 28	5 55
S 13	977.4	15.7	19 20	6 20	20 05	6 52
S 14	978.4	16.7	20 00	7 15	20 42	7 51
M 15	979.4	17.7	20 39	8 11	21 18	8 50
T 16	980.4	18.7	21 19	9 08	21 56	9 50
W 17	981.4	19.7	22 02	10 07	22 34	10 51
T 18	982.4	20.7	22 46	11 06	23 16	11 54
F 19	983.4	21.7	23 33	12 06	.....	12 57
S 20	984.4	22.7	.....	13 08	0 01	14 01
S 21	985.4	23.7	0 26	14 09	0 52	15 03
M 22	986.4	24.7	1 22	15 08	1 47	16 01
T 23	987.4	25.7	2 22	16 03	2 48	16 56
W 24	988.4	26.7	3 24	16 56	3 51	17 47
T 25	989.4	27.7	4 26	17 44	4 56	18 33
F 26	990.4	28.7	5 28	18 29	6 01	19 14
S 27	991.4	0.2	6 29	19 11	7 05	19 53
S 28	992.4	1.2	7 28	19 51	8 06	20 30
M 29	993.4	2.2	8 24	20 31	9 07	21 06

PHASES OF THE MOON

First Quarter	Feb 4 <sup>d</sup>	16 <sup>h</sup>	27 <sup>m</sup>
Full Moon		12	19 24
Last Quarter		20	01 48
New Moon		26	20 24

MOONRISE AND MOONSET

1960 MARCH

DAY	At 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 2436000+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
T 1	994.4	3.2	9 <sup>h</sup> 19 <sup>m</sup>	21 <sup>h</sup> 09 <sup>m</sup>	10 <sup>h</sup> 04 <sup>m</sup>	21 <sup>h</sup> 42 <sup>m</sup>
W 2	995.4	4.2	10 13	21 48	11 01	22 19
T 3	996.4	5.2	11 06	22 29	11 56	22 57
F 4	997.4	6.2	11 57	23 11	12 50	23 38
S 5	998.4	7.2	12 48	23 55	13 41	.....
S 6	999.4	8.2	13 53	.....	14 31	0 21
M 7	7000.4	9.2	14 24	0 42	15 17	1 08
T 8	001.4	10.2	15 09	1 30	16 02	1 57
W 9	002.4	11.2	15 53	2 21	16 44	2 48
T 10	003.4	12.2	16 35	3 14	17 24	3 43
F 11	004.4	13.2	17 16	4 08	18 02	4 40
S 12	005.4	14.2	17 56	5 04	18 40	5 38
S 13	006.4	15.2	18 36	6 01	19 17	6 38
M 14	007.4	16.2	19 17	6 59	19 54	7 40
T 15	008.4	17.2	19 59	7 58	20 33	8 42
W 16	009.4	18.2	20 44	8 59	21 15	9 46
T 17	010.4	19.2	21 32	10 00	22 00	10 50
F 18	011.4	20.2	22 22	11 02	22 50	11 54
S 19	012.4	21.2	23 17	12 03	23 43	12 57
S 20	013.4	22.2	.....	13 02	.....	13 56
M 21	014.4	23.2	0 15	13 58	0 41	14 51
T 22	015.4	24.2	1 15	14 50	1 42	15 42
W 23	016.4	25.2	2 16	15 39	2 45	16 28
T 24	017.4	26.2	3 16	16 23	3 47	17 10
F 25	018.4	27.2	4 17	17 06	4 50	17 49
S 26	019.4	28.2	5 14	17 46	5 51	18 26
S 27	020.4	29.2	6 11	18 26	6 52	19 02
M 28	021.4	0.6	7 07	19 04	7 51	19 38
T 29	022.4	1.6	8 01	19 43	8 48	20 15
W 30	023.4	2.6	8 55	20 24	9 44	20 53
T 31	024.4	3.6	9 47	21 05	10 40	21 33

PHASES OF THE MOON

First Quarter	Mar 5 <sup>d</sup>	13 <sup>h</sup>	06 <sup>m</sup>
Full Moon	13	10	26
Last Quarter	20	08	41
New Moon	27	09	38

MOONRISE AND MOONSET

1960 APRIL

DAY	At 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 2437000+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
F 1	025.4	4.6	10 <sup>h</sup> 39 <sup>m</sup>	21 <sup>h</sup> 48 <sup>m</sup>	11 <sup>h</sup> 32 <sup>m</sup>	22 <sup>h</sup> 14 <sup>m</sup>
S 2	026.4	5.6	11 28	22 35	12 22	23 00
S 3	027.4	6.6	12 17	23 22	13 11	23 48
M 4	028.4	7.6	13 02	.....	13 56	.....
T 5	029.4	8.6	13 47	0 12	14 38	0 38
W 6	030.4	9.6	14 29	1 03	15 19	1 31
T 7	031.4	10.6	15 10	1 56	15 57	2 27
F 8	032.4	11.6	15 50	2 51	16 35	3 23
S 9	033.4	12.6	16 30	3 46	17 12	4 23
S 10	034.4	13.6	17 10	4 44	17 49	5 23
M 11	035.4	14.6	17 52	5 44	18 28	6 26
T 12	036.4	15.6	18 36	6 45	19 09	7 31
W 13	037.4	16.6	19 25	7 48	19 54	8 37
T 14	038.4	17.6	20 16	8 51	20 44	9 43
F 15	039.4	18.6	21 11	9 55	21 37	10 49
S 16	040.4	19.6	22 09	10 56	22 35	11 51
S 17	041.4	20.6	23 09	11 54	23 36	12 48
M 18	042.4	21.6	.....	12 48	.....	13 41
T 19	043.4	22.6	0 09	13 37	0 38	14 27
W 20	044.4	23.6	1 10	14 23	1 40	15 10
T 21	045.4	24.6	2 09	15 05	2 43	15 49
F 22	046.4	25.6	3 07	15 45	3 43	16 26
S 23	047.4	26.6	4 03	16 23	4 42	17 02
S 24	048.4	27.6	4 58	17 01	5 41	17 36
M 25	049.4	28.6	5 53	17 40	6 38	18 12
T 26	050.4	0.0	6 46	18 19	7 35	18 50
W 27	051.4	1.0	7 39	19 01	8 30	19 28
T 28	052.4	2.0	8 31	19 43	9 24	20 10
F 29	053.4	3.0	9 22	20 28	10 15	20 54
S 30	054.4	4.0	10 10	21 15	11 05	21 41

PHASES OF THE MOON

First Quarter	Apr 4 <sup>d</sup>	09 <sup>h</sup>	05 <sup>m</sup>
Full Moon	11	22	28
Last Quarter	18	14	57
New Moon	25	23	45

MOONRISE AND MOONSET

1960 MAY

DAY	at 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 2437000+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
S 1	055.4	5.0	10 <sup>h</sup> 57 <sup>m</sup>	22 <sup>h</sup> 04 <sup>m</sup>	11 <sup>h</sup> 51 <sup>m</sup>	22 <sup>h</sup> 30 <sup>m</sup>
M 2	056.4	6.0	11 42	22 54	12 34	23 21
T 3	057.4	7.0	12 24	23 46	13 15	.....
W 4	058.4	8.0	13 04	.....	13 54	0 15
T 5	059.4	9.0	13 45	0 38	14 30	1 10
F 6	060.4	10.0	14 23	1 33	15 07	2 07
S 7	061.4	11.0	15 03	2 28	15 43	3 06
S 8	062.4	12.0	15 44	3 26	16 21	4 07
M 9	063.4	13.0	16 26	4 26	17 00	5 10
T 10	064.4	14.0	17 13	5 28	17 44	6 16
W 11	065.4	15.0	18 03	6 33	18 31	7 23
T 12	066.4	16.0	18 58	7 39	19 25	8 32
F 13	067.4	17.0	19 58	8 43	20 23	9 38
S 14	068.4	18.0	20 59	9 45	21 25	10 39
S 15	069.4	19.0	22 02	10 42	22 29	11 35
M 16	070.4	20.0	23 09	11 35	23 33	12 26
T 17	071.4	21.0	.....	12 22	.....	13 11
W 18	072.4	22.0	0 03	13 05	0 36	13 51
T 19	073.4	23.0	1 02	13 46	1 38	14 28
F 20	074.4	24.0	1 59	14 25	2 37	15 04
S 21	075.4	25.0	2 54	15 02	3 35	15 38
S 22	076.4	26.0	3 47	15 40	4 32	16 13
M 23	077.4	27.0	4 41	16 19	5 28	16 49
T 24	078.4	28.0	5 34	16 59	6 24	17 27
W 25	079.4	29.0	6 25	17 40	7 18	18 07
T 26	080.4	0.4	7 17	18 24	8 10	18 50
F 27	081.4	1.4	8 06	19 11	9 00	19 36
S 28	082.4	2.4	8 54	19 59	9 48	20 24
S 29	083.4	3.4	9 39	20 48	10 32	21 14
M 30	084.4	4.4	10 22	21 39	11 14	22 07
T 31	085.4	5.4	11 03	22 30	11 53	23 01

PHASES OF THE MOON

First Quarter	May 4 <sup>d</sup>	03 <sup>h</sup>	01 <sup>m</sup>
Full Moon	11	07	43
Last Quarter	17	21	55
New Moon	25	14	27

MOONRISE AND MOONSET

1960 JUNE

DAY	At 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 2437000+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
W 1	086.4	6.4	11 <sup>h</sup> 42 <sup>m</sup>	23 <sup>h</sup> 23 <sup>m</sup>	12 <sup>h</sup> 29 <sup>m</sup>	23 <sup>h</sup> 56 <sup>m</sup>
T 2	087.4	7.4	12 20	.....	13 05	.....
F 3	088.4	8.4	12 59	0 16	13 40	0 53
S 4	089.4	9.4	13 37	1 12	14 16	1 51
S 5	090.4	10.4	14 17	2 09	14 53	2 52
M 6	091.4	11.4	15 01	3 09	15 34	3 55
T 7	092.4	12.4	15 49	4 12	16 18	5 01
W 8	093.4	13.4	16 41	5 16	17 08	6 08
T 9	094.4	14.4	17 39	6 22	18 04	7 16
F 10	095.4	15.4	18 41	7 27	19 06	8 22
S 11	096.4	16.4	19 45	8 28	20 12	9 23
S 12	097.4	17.4	20 50	9 26	21 18	10 18
M 13	098.4	18.4	21 54	10 17	22 25	11 07
T 14	099.4	19.4	22 54	11 04	23 29	11 50
W 15	100.4	20.4	23 53	11 46	.....	12 30
T 16	101.4	21.4	.....	12 26	0 30	13 06
F 17	102.4	22.4	0 49	13 04	1 30	13 42
S 18	103.4	23.4	1 44	13 42	2 28	14 16
S 19	104.4	24.4	2 37	14 20	3 23	14 51
M 20	105.4	25.4	3 29	14 59	4 19	15 28
T 21	106.4	26.4	4 21	15 39	5 13	16 07
W 22	107.4	27.4	5 13	16 22	6 06	16 48
T 23	108.4	28.4	6 02	17 08	6 56	17 33
F 24	109.4	29.4	6 51	17 55	7 46	18 20
S 25	110.4	0.8	7 37	18 44	8 31	19 10
S 26	111.4	1.8	8 22	19 34	9 14	20 02
M 27	112.4	2.8	9 03	20 26	9 53	20 55
T 28	113.4	3.8	9 42	21 18	10 31	21 50
W 29	114.4	4.8	10 21	22 10	11 06	22 45
T 30	115.4	5.8	10 58	23 04	11 41	23 41

PHASES OF THE MOON

First Quarter	Jun 2 <sup>d</sup>	18 <sup>h</sup> 02 <sup>m</sup>
Full Moon	9	15 02
Last Quarter	16	06 36
New Moon	24	05 27

MOONRISE AND MOONSET

1960 JULY

DAY	At 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 2437000+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
F 1	116.4	6.8	11 <sup>h</sup> 35 <sup>m</sup>	23 <sup>h</sup> 59 <sup>m</sup>	12 <sup>h</sup> 15 <sup>m</sup>	..... <sup>m</sup>
S 2	117.4	7.8	12 14	.....	12 51	0 40
S 3	118.4	8.8	12 54	0 55	13 28	1 39
M 4	119.4	9.8	13 38	1 55	14 09	2 42
T 5	120.4	10.8	14 27	2 56	14 56	3 47
W 6	121.4	11.8	15 21	4 01	15 47	4 53
T 7	122.4	12.8	16 20	5 05	16 45	6 00
F 8	123.4	13.8	17 23	6 09	17 49	7 04
S 9	124.4	14.8	18 29	7 09	18 57	8 02
S 10	125.4	15.8	19 35	8 04	20 05	8 56
M 11	126.4	16.8	20 39	8 55	21 12	9 43
T 12	127.4	17.8	21 41	9 41	22 17	10 26
W 13	128.4	18.8	22 40	10 23	23 19	11 05
T 14	129.4	19.8	23 37	11 03	.....	11 42
F 15	130.4	20.8	.....	11 42	0 19	12 17
S 16	131.4	21.8	0 32	12 20	1 17	12 52
S 17	132.4	22.8	1 25	12 59	2 13	13 20
M 18	133.4	23.8	2 18	13 39	3 08	14 07
T 19	134.4	24.8	3 09	14 21	4 01	14 48
W 20	135.4	25.8	3 59	15 06	4 53	15 31
T 21	136.4	26.8	4 48	15 52	5 42	16 17
F 22	137.4	27.8	5 35	16 40	6 29	17 07
S 23	138.4	28.8	6 20	17 31	7 13	17 58
S 24	139.4	0.1	7 03	18 22	7 54	18 51
M 25	140.4	1.1	7 43	19 14	8 33	19 45
T 26	141.4	2.1	8 22	20 06	9 09	20 40
W 27	142.4	3.1	9 00	21 00	9 44	21 37
T 28	143.4	4.1	9 37	21 54	10 18	22 33
F 29	144.4	5.1	10 15	22 49	10 53	23 32
S 30	145.4	6.1	10 54	23 46	11 29	.....
S 31	146.4	7.1	11 35	.....	12 07	0 32

PHASES OF THE MOON

First Quarter	Jul 2 <sup>d</sup>	05 <sup>h</sup>	49 <sup>m</sup>
Full Moon	8	21	37
Last Quarter	15	17	43
New Moon	23	20	31
First Quarter	31	14	39



MOONRISE AND MOONSET

1960 AUGUST

DAY	At 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 2437000+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
M 1	147.4	8.1	12 <sup>h</sup> 20 <sup>m</sup>	0 <sup>h</sup> 45 <sup>m</sup>	12 <sup>h</sup> 49 <sup>m</sup>	1 <sup>h</sup> 33 <sup>m</sup>
T 2	148.4	9.1	13 10	1 46	13 37	2 36
W 3	149.4	10.1	14 04	2 48	14 30	3 41
T 4	150.4	11.1	15 04	3 50	15 29	4 45
F 5	151.4	12.1	16 07	4 51	16 34	5 45
S 6	152.4	13.1	17 13	5 49	17 41	6 40
S 7	153.4	14.1	18 18	6 42	18 50	7 31
M 8	154.4	15.1	19 22	7 32	19 57	8 18
T 9	155.4	16.1	20 24	8 15	21 02	8 59
W 10	156.4	17.1	21 23	8 57	22 05	9 38
T 11	157.4	18.1	22 21	9 38	23 05	10 15
F 12	158.4	19.1	23 16	10 17	.....	10 51
S 13	159.4	20.1	.....	10 57	0 03	11 28
S 14	160.4	21.1	0 10	11 37	1 00	12 06
M 15	161.4	22.1	1 02	12 19	1 54	12 46
T 16	162.4	23.1	1 54	13 02	2 46	13 28
W 17	163.4	24.1	2 43	13 49	3 37	14 14
T 18	164.4	25.1	3 31	14 36	4 25	15 02
F 19	165.4	26.1	4 17	15 26	5 10	15 53
S 20	166.4	27.1	5 01	16 17	5 52	16 45
S 21	167.4	28.1	5 42	17 09	6 32	17 39
M 22	168.4	29.1	6 22	18 02	7 10	18 34
T 23	169.4	0.5	7 00	18 55	7 46	19 31
W 24	170.4	1.5	7 39	19 50	8 20	20 28
T 25	171.4	2.5	8 16	20 45	8 55	21 27
F 26	172.4	3.5	8 54	21 41	9 31	22 26
S 27	173.4	4.5	9 35	22 38	10 08	23 27
S 28	174.4	5.5	10 18	23 38	10 48	.....
M 29	175.4	6.5	11 04	.....	11 33	0 29
T 30	176.4	7.5	11 56	0 38	12 23	1 31
W 31	177.4	8.5	12 52	1 39	13 17	2 33

PHASES OF THE MOON

Full Moon	Aug 7 <sup>d</sup>	04 <sup>h</sup>	41 <sup>m</sup>
Last Quarter	14	07	37
New Moon	22	11	16
First Quarter	29	21	23

MOONRISE AND MOONSET

1960 SEPTEMBER

DAY	At 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 2437000+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
T 1	178.4	9.5	13 <sup>h</sup> 52 <sup>m</sup>	2 <sup>h</sup> 39 <sup>m</sup>	14 <sup>h</sup> 18 <sup>m</sup>	3 <sup>h</sup> 32 <sup>m</sup>
F 2	179.4	10.5	14 55	3 35	15 22	4 28
S 3	180.4	11.5	15 59	4 29	16 28	5 20
S 4	181.4	12.5	17 03	5 19	17 36	6 07
M 5	182.4	13.5	18 06	6 05	18 41	6 50
T 6	183.4	14.5	19 06	6 49	19 46	7 31
W 7	184.4	15.5	20 06	7 30	20 49	8 09
T 8	185.4	16.5	21 04	8 11	21 49	8 46
F 9	186.4	17.5	21 59	8 51	22 48	9 23
S 10	187.4	18.5	22 54	9 32	23 44	10 02
S 11	188.4	19.5	23 46	10 14	.....	10 42
M 12	189.4	20.5	.....	10 57	0 39	11 24
T 13	190.4	21.5	0 36	11 43	1 30	12 08
W 14	191.4	22.5	1 25	12 30	2 19	12 55
T 15	192.4	23.5	2 12	13 19	3 05	13 45
F 16	193.4	24.5	2 56	14 09	3 49	14 36
S 17	194.4	25.5	3 38	15 01	4 29	15 30
S 18	195.4	26.5	4 19	15 53	5 08	16 25
M 19	196.4	27.5	4 58	16 47	5 44	17 22
T 20	197.4	28.5	5 36	17 42	6 20	18 20
W 21	198.4	29.5	6 15	18 38	6 55	19 18
T 22	199.4	0.9	6 54	19 34	7 31	20 19
F 23	200.4	1.9	7 34	20 33	8 08	21 20
S 24	201.4	2.9	8 17	21 32	8 48	22 23
S 25	202.4	3.9	9 03	22 33	9 32	23 26
M 26	203.4	4.9	9 53	23 33	10 20	.....
T 27	204.4	5.9	10 47	.....	11 13	0 27
W 28	205.4	6.9	11 44	0 32	12 10	1 26
T 29	206.4	7.9	12 44	1 29	13 11	2 22
F 30	207.4	8.9	13 46	2 22	14 15	3 14

PHASES OF THE MOON

Full Moon	Sep 5 <sup>d</sup>	13 <sup>h</sup>	19 <sup>m</sup>
Last Quarter	13	00	20
New Moon	21	01	13
First Quarter	28	03	13

MOONRISE AND MOONSET

1960 OCTOBER

DAY	At 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 2437000+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
S 1	208.4	9.9	14 <sup>h</sup> 49 <sup>m</sup>	3 <sup>h</sup> 12 <sup>m</sup>	15 <sup>h</sup> 20 <sup>m</sup>	4 <sup>h</sup> 01 <sup>m</sup>
S 2	209.4	10.9	15 50	3 58	16 25	4 45
M 3	210.4	11.9	16 51	4 42	17 29	5 25
T 4	211.4	12.9	17 50	5 24	18 32	6 03
W 5	212.4	13.9	18 48	6 04	19 33	6 41
T 6	213.4	14.9	19 46	6 44	20 33	7 18
F 7	214.4	15.9	20 41	7 25	21 31	7 56
S 8	215.4	16.9	21 35	8 07	22 27	8 36
S 9	216.4	17.9	22 28	8 50	23 20	9 17
M 10	217.4	18.9	23 17	9 36	.....	10 01
T 11	218.4	19.9	.....	10 23	0 11	10 48
W 12	219.4	20.9	0 06	11 11	1 00	11 35
T 13	220.4	21.9	0 51	12 00	1 44	12 27
F 14	221.4	22.9	1 34	12 51	2 25	13 19
S 15	222.4	23.9	2 15	13 43	3 04	14 14
S 16	223.4	24.9	2 54	14 36	3 41	15 09
M 17	224.4	25.9	3 32	15 30	4 17	16 07
T 18	225.4	26.9	4 11	16 25	4 52	17 05
W 19	226.4	27.9	4 50	17 23	5 28	18 06
T 20	227.4	28.9	5 30	18 21	6 05	19 08
F 21	228.4	0.4	6 12	19 23	6 44	20 12
S 22	229.4	1.4	6 58	20 25	7 27	21 16
S 23	230.4	2.4	7 48	21 26	8 15	22 20
M 24	231.4	3.4	8 41	22 27	9 08	23 22
T 25	232.4	4.4	9 39	23 25	10 05	.....
W 26	233.4	5.4	10 39	.....	11 05	0 19
T 27	234.4	6.4	11 40	0 19	12 08	1 12
F 28	235.4	7.4	12 41	1 10	13 11	2 00
S 29	236.4	8.4	13 42	1 56	14 15	2 44
S 30	237.4	9.4	14 42	2 39	15 17	3 23
M 31	238.4	10.4	15 40	3 21	16 20	4 02

PHASES OF THE MOON

Full Moon	Oct 5 <sup>d</sup>	00 <sup>h</sup>	17 <sup>m</sup>
Last Quarter	12	19	26
New Moon	20	14	03
First Quarter	27	09	34

MOONRISE AND MOONSET

1960 NOVEMBER

DAY	At 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 243700+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
T 1	239.4	11.4	16 <sup>h</sup> 37 <sup>m</sup>	4 <sup>h</sup> 00 <sup>m</sup>	17 <sup>h</sup> 20 <sup>m</sup>	4 <sup>h</sup> 39 <sup>m</sup>
W 2	240.4	12.4	17 34	4 40	18 20	5 15
T 3	241.4	13.4	18 30	5 20	19 19	5 51
F 4	242.4	14.4	19 25	6 01	20 16	6 30
S 5	243.4	15.4	20 18	6 44	21 11	7 11
S 6	244.4	16.4	21 09	7 28	22 03	7 54
M 7	245.4	17.4	21 58	8 15	22 52	8 40
T 8	246.4	18.4	22 46	9 03	23 39	9 28
W 9	247.4	19.4	23 29	9 52	.....	10 18
T 10	248.4	20.4	.....	10 42	0 21	11 09
F 11	249.4	21.4	0 11	11 33	1 01	12 03
S 12	250.4	22.4	1 00	12 24	1 38	12 56
S 13	251.4	23.4	1 28	13 17	2 14	13 52
M 14	252.4	24.4	2 05	14 11	2 49	14 49
T 15	253.4	25.4	2 43	15 07	3 23	15 48
W 16	254.4	26.4	3 22	16 05	3 59	16 49
T 17	256.4	27.4	4 03	17 05	4 37	17 53
F 18	257.4	28.4	4 52	18 08	5 18	18 58
S 19	257.4	29.4	5 45	19 12	6 04	20 05
S 20	258.4	0.9	6 31	20 15	6 56	21 10
M 21	259.4	1.9	7 28	21 16	7 53	22 12
T 22	260.4	2.9	8 29	22 14	8 55	23 08
W 23	261.4	3.9	9 32	23 07	9 59	23 59
T 24	262.4	4.9	10 35	23 56	11 04	.....
F 25	263.4	5.9	11 36	.....	12 09	0 45
S 26	264.4	6.9	12 36	0 40	13 11	1 26
S 27	265.4	7.9	13 35	1 21	14 13	2 04
M 28	266.4	8.9	14 31	2 01	15 13	2 40
T 29	267.4	9.9	15 27	2 39	16 12	3 16
W 30	268.4	10.9	16 22	3 19	17 10	3 51

PHASES OF THE MOON

Full Moon	Nov 3 <sup>d</sup>	13 <sup>h</sup>	58 <sup>m</sup>
Last Quarter	11	15	48
New Moon	19	01	47
First Quarter	25	17	42

MOONRISE AND MOONSET

1960 DECEMBER

DAY	At 0 <sup>h</sup> S.A.S.T.		JOHANNESBURG		CAPE TOWN	
	J.D. 243700+	AGE	MOONRISE S.A.S.T.	MOONSET S.A.S.T.	MOONRISE S.A.S.T.	MOONSET S.A.S.T.
T 1	269.4	11.9	17 <sup>h</sup> 14 <sup>m</sup>	3 <sup>h</sup> 55 <sup>m</sup>	18 <sup>h</sup> 07 <sup>m</sup>	4 <sup>h</sup> 28 <sup>m</sup>
F 2	270.4	12.9	18 13	4 37	19 02	5 08
S 3	271.4	13.9	19 05	5 20	19 56	5 49
S 4	272.4	14.9	19 56	6 06	20 47	6 34
M 5	273.4	15.9	20 43	6 53	21 35	7 21
T 6	274.4	16.9	21 29	7 42	22 19	8 10
W 7	275.4	17.9	22 10	8 32	22 59	9 01
T 8	276.4	18.9	22 50	9 23	23 38	9 54
F 9	277.4	19.9	23 28	10 14	.....	10 47
S 10	278.4	20.9	.....	11 06	0 13	11 41
S 11	279.4	21.9	0 04	11 59	0 47	12 36
M 12	280.4	22.9	0 39	12 53	1 20	13 32
T 13	281.4	23.9	1 16	13 49	1 55	14 31
W 14	282.4	24.9	1 54	14 48	2 30	15 32
T 15	283.4	25.9	2 35	15 49	3 09	16 36
F 16	284.4	26.9	3 21	16 52	3 52	17 41
S 17	285.4	27.9	4 11	17 58	4 41	18 48
S 18	286.4	28.9	5 07	19 01	5 36	19 53
M 19	287.4	0.5	6 07	20 04	6 36	20 55
T 20	288.4	1.5	7 12	21 00	7 43	21 50
W 21	289.4	2.5	8 18	21 52	8 50	22 41
T 22	290.4	3.5	9 24	22 39	9 56	23 25
F 23	291.4	4.5	10 27	23 22	11 03	.....
S 24	292.4	5.5	11 28	.....	12 06	0 05
S 25	293.4	6.5	12 27	0 02	13 07	0 44
M 26	294.4	7.5	13 24	0 41	14 06	1 19
T 27	295.4	8.5	14 20	1 19	15 05	1 54
W 28	296.4	9.5	15 14	1 58	16 02	2 30
T 29	297.4	10.5	16 08	2 37	16 57	3 08
F 30	298.4	11.5	17 01	3 19	17 50	3 48
S 31	299.4	12.5	17 51	4 02	18 42	4 31

PHASES OF THE MOON

Full Moon            Dec 3<sup>d</sup> 06<sup>h</sup> 25<sup>m</sup>  
 Last Quarter               11        39  
 New Moon                   18        47  
 First Quarter               25        04 30

OCCULTATIONS OF BRIGHT STARS

Date	Z.C.	Mag	Sp	Dec	Ph	Cape Town		Johannesburg		Luanshya	
						P.A.	h. m.	P.A.	h. m.	P.A.	h. m.
<b>Jan</b>											
2	3285	6.1	K0	- 7° 27'	D	-	-	54°	19 37.1	9	20 09.8
3	3416	5.6	A2	- 3 46	D	-	-	-	-	87	19 29.6
6	257	4.5	K0	+ 8 54	D	34	21 45.8	14	22 24.3	-	-
6	258	6.6	A0	+ 8 19	D	-	-	-	-	132	22 26.2
7	384	5.7	F5	+12 14	D	84	23 59.8	62	24 21.3	-	-
9	609	7.5	B9	+16 24	D	-	-	-	-	125	20 04.9
9	620	6.3	G5	+17 09	D	61	23 24.4	34	24 04.7	-	-
17	1486	4.6	K2	+10 15	R	330	02 16.2	-	-	-	-
18	1589	6.0	M3	+ 6 27	R	275	01 29.6	302	01 38.0	344	01 04.3
19	1712	3.8	F8	+ 2 03	D	96	03 30.1	-	-	-	-
19	1712	3.8	F8	+ 2 03	R	320	04 50.7	-	-	-	-
21	1937	6.1	A5	- 6 13	R	254	02 54.5	287	03 02.7	325	02 38.6
21	1941	4.8	M0	- 6 00	R	337	03 29.1	-	-	-	-
<b>Feb</b>											
1	81	6.6	K0	+ 2 52	D	-	-	-	-	90	20 38.0
2	215	6.7	F2	+ 7 02	D	*157	22 07.0	-	-	-	-
2	215	6.7	F2	+ 7 02	R	*164	22 11.3	-	-	-	-
7	832	4.7	M0	+18 34	D	*158	20 49.0	127	20 55.1	87	20 46.6
7	832	4.7	M0	+18 34	R	*192	21 18.2	-	-	-	-
7	836	5.5	B3	+18 30	D	-	-	148	22 12.5	101	21 56.2
8	955	6.9	K0	+18 47	D	131	23 05.6	102	23 22.7	60	23 36.1
14	1658	6.4	F0	+ 4 08	R	-	-	272	21 14.6	-	-
15	1678	5.8	F5	+ 3 20	R	279	02 58.1	317	03 11.3	-	-
15	1770	5.9	A3	- 0 31	R	-	-	-	-	245	22 16.4
15	1772	4.0	A0	- 0 23	D	175	22 33.4	142	22 13.3	104	21 52.1
15	1772	4.0	A0	- 0 23	R	227	23 01.6	263	23 13.4	301	22 59.5
21	2460	6.1	K0	-17 33		*Grazed		-	-	-	-
29	153	6.2	K2	+ 5 23	D	-	-	35	19 37.3	-	-
<b>Mar</b>											
2	404	5.2	A3	+12 14	D	123	20 05.9	98	20 19.6	-	-
4	650	5.7	A2	+16 40	D	-	-	-	-	135	20 34.6
4	653	4.8	A5	+17 20	D	34	20 35.2	-	-	-	-
5	787	7.5	B3	+18 23	D	96	22 12.2	65	22 36.1	-	-
9	1284	6.3	A5	+15 29	D	104	19 55.8	83	20 11.7	-	-
16	1994	6.5	F8	- 7 49	R	296	02 25.9	336	02 26.7	-	-
17	2128	5.8	K0	-11 42	R	328	04 26.5	-	-	-	-

\* Feb 2.   Grazed  
 7.       Grazed  
 21.      Near miss about 05<sup>h</sup>06<sup>m</sup>

Date	Z.C.	Mag	Sp	Dec	Fh	Cape Town		Johannesburg		Luanshya	
						P.A.	h. m.	P.A.	h. m.	P.A.	h. m.
Apr											
2	871	6.9	K5	+18°41'	D	121°	19 52.0	92°	20 10.7	45°	20 32.9
5	1246	6.6	K0	+15 50	D	-	-	151	22 11.0	106	21 58.2
5	1247	6.8	A0	+16 17	D	66	22 04.4	-	-	-	-
7	1467	7.3	K0	+10 42	D	114	21 19.0	79	21 43.2	-	-
8	1474	7.1	F2	+10 08	D	115	00 52.4	76	01 09.9	-	-
9	1589	6.0	M3	+ 6 27	D	68	02 01.8	-	-	-	-
10	1712	3.8	F8	+ 2 03	D	51	03 58.6	-	-	-	-
14	2223	4.0	K0	-14 37	D	-	-	-	-	111	05 30.2
15	2372	4.4	K0	-16 30	D	132	02 05.5	96	02 12.6	35	02 30.6
15	2372	4.4	K0	-16 30	R	255	03 16.6	289	03 38.9	353	03 03.5
16	2674	6.0	B8	-17 50	R	254	24 15.2	288	24 11.9	346	23 41.9
17	2686	5.2	A0	-18 26	R	-	-	-	-	207	01 30.3
19	2995	6.2	G0	-15 13	R	-	-	-	-	239	02 25.7
20	3146	6.5	F5	-11 47	R	254	03 22.7	285	03 21.2	-	-
24	Venus	-3.3			D	88	15 24.0	71	15 46.1	29	16 14.6
24	Venus	-3.3			R	236	16 39.4	-	-	-	-
May											
2	1198	6.2	K0	+16 39	D	-	-	173	20 56.0	118	20 33.7
2	1210	5.9	A0	+16 36	D	-	-	-	-	77	22 21.6
5	1525	5.9	M0	+ 9 02	D	115	18 30.0	86	18 46.2	-	-
7	1658	6.4	F0	+ 4 08	D	69	01 54.3	-	-	-	-
7	1746	7.1	F2	+ 0 54	D	105	19 32.1	68	19 50.5	-	-
8	1770	5.9	A3	- 0 31	D	127	02 50.6	-	-	-	-
8	1866	5.9	A0	- 3 33	D	153	19 07.5	122	18 58.6	85	18 44.6
10	2022	5.5	F5	- 9 07	D	146	02 30.4	113	02 36.9	61	02 47.6
14	2640	6.1	A2	-18 41	R	-	-	-	-	220	05 01.4
14	2647	6.4	Oe5	-18 29	R	-	-	187	05 39.5	-	-
31	1386	6.6	F5	+13 20	D	112	19 45.7	71	20 09.8	-	-
Jun											
1	1486	4.6	K2	+10 15	D	160	18 38.1	121	18 41.0	79	18 39.9
1	1497	7.5	G5	+ 9 26	D	-	-	-	-	107	22 42.4
2	1589	6.0	M3	+ 6 27	D	-	-	-	-	139	18 15.9
2	1600	5.1	A5	+ 6 22	D	104	21 20.2	57	21 50.1	-	-
3	1712	3.8	F8	+ 2 03	D	157	22 05.9	117	22 08.6	66	22 17.0
4	1808	7.0	F5	- 2 03	D	-	-	-	-	174	19 16.7
4	1828	6.6	A2	- 2 34	D	181	24 05.5	133	23 56.2	85	23 55.5
5	1933	7.0	K0	- 5 42	D	-	-	110	17 56.2	-	-
5	1937	6.1	A5	- 6 13	D	-	-	192	19 46.3	136	18 58.6

Date	Z.C.	Mag	Sp	Dec	Ph	Cape Town			Johannesburg			Luanshya	
						P.A.	h.	m.	P.A.	h.	m.	P.A.	h.
Jun													
5	1941	4.8	MO	- 6°00'	D	130°	19	47.2	91°	19	56.6	- °	-
8	2223	4.0	KO	-14 37	D	-	-	-	169	01	49.8	106	01 28.8
13	3188	5.4	AO	-11 36	R	-	-	-	-	-	-	226	23 42.4
14	3208	6.5	B9	-10 33	R	261	04	04.4	277	04	27.3	-	-
15	3334	6.3	B9	- 7 14	R	226	00	56.2	254	01	03.2	314	00 45.8
30	1678	5.8	F5	+ 3 20	D	-	-	-	-	-	-	127	21 27.7
Jul													
1	1772	4.0	AO	- 0 23	D	-	-	-	-	-	-	148	19 02.0
3	2020	6.6	AO	- 8 39	D	162	20	42.8	120	20	43.9	71	20 45.5
3	2022	5.5	F5	- 9 05	D	-	-	-	-	-	-	150	21 26.1
4	2158	7.3	AO	-12 43	D	156	23	22.6	120	23	26.7	71	23 32.0
5	2167	7.5	KO	-12 52	D	129	01	38.5	106	01	44.8	-	-
10	3112	6.2	AO	-13 29	R	-	-	-	-	-	-	232	20 53.4
11	3131	5.5	A5	-13 06	R	-	-	-	-	-	-	237	00 42.7
11	3270	6.1	KO	- 9 17	R	-	-	-	272	21	55.9	-	-
19	650	5.7	A2	+16 40	R	211	05	05.3	225	05	16.0	267	05 19.7
28	1746	7.1	F2	+ 0 54	D	-	-	-	144	19	38.4	96	19 31.9
29	1866	5.9	AO	- 3 33	D	-	-	-	186	21	31.0	118	21 05.6
29	1869	6.1	KO	- 3 06	D	86	21	07.9	40	21	36.2	-	-
30	1985	7.0	KO	- 7 32	D	-	-	-	161	21	27.7	106	21 13.0
Aug													
1	2231	6.9	KO	-14 21	D	-	-	-	145	20	07.1	96	19 51.4
1	2245	6.4	KO	-14 53	D	-	-	-	-	-	-	170	23 28.2
3	2548	7.5	F5	-17 43	D	25	22	35.1	-	-	-	-	-
4	2555	7.5	F0	-18 05	D	114	00	06.8	95	00	24.0	48	00 41.2
11	219	5.1	K2	+ 5 53	R	-	-	-	229	23	36.0	277	23 35.2
13	354	5.5	B5	+10 23	R	277	02	29.6	292	02	36.5	-	-
27	2072	6.7	KO	- 9 47	D	108	19	28.6	76	19	49.6	-	-
30	2365	7.1	F5	-16 06	D	121	00	02.9	-	-	-	-	-
30	2495	6.0	AO	-17 42	D	136	20	05.2	105	20	18.6	55	20 31.0
31	2647	6.4	Oe5	-18 29	D	-	-	-	157	18	30.8	-	-
31	2653	6.4	B0	-18 38	D	-	-	-	-	-	-	129	18 58.7
Sep													
1	2674	6.0	B8	-17 50	D	54	00	00.7	37	00	23.5	-	-
1	2826	4.0	A5	-17 57	D	-	-	-	-	-	-	104	19 29.5
1	2830	6.9	B9	-17 18	D	53	20	39.0	19	21	22.2	-	-
3	2995	6.2	G0	-15 13	D	85	00	02.7	74	00	27.3	31	00 52.4
3	3131	5.5	A5	-13 06	D	-	-	-	-	-	-	83	19 56.0
13	832	4.7	MO	+18 34	R	232	05	39.9	-	-	-	-	-



Date	Z.C.	Mag	Sp	Dec	Ph	Cape Town			Johannesburg			Luanshya	
						P.A.	h.	m.	P.A.	h.	m.	P.A.	h.
Sep													
16	1207	5.8	K0	+17 27	R	-	-	-	309	04	22.3	-	-
17	1323	6.3	G0	+15 32	R	-	-	-	342	04	34.9	-	-
24	2158	7.3	A0	-12 43	D	-	-	-	-	-	-	133	18 36.5
26	2454	7.2	G5	-17 25	D	150	20	04.0	121	20	11.2	74	20 15.8
26	2460	6.1	K0	-17 33	D	-	-	-	-	-	-	104	22 06.7
29	2808	7.4	A2	-17 26	D	103	01	03.2	-	-	-	-	-
Oct													
13	1158	5.2	K5	+17 47	R	-	-	-	219	01	55.7	266	02 00.4
24	2555	7.5	F0	-18 05	D	-	-	-	79	19	19.3	25	19 47.1
26	2889	7.1	M0	-17 12	D	-	-	-	-	-	-	50	18 37.3
28	3188	5.4	A0	-11 36	D	125	20	32.0	110	20	52.9	66	21 00.2
29	3205	6.8	K0	-10 48	D	93	00	23.8	83	00	37.4	46	00 54.5
29	3208	6.5	B9	-10 33	D	54	00	48.3	42	01	04.0	-	-
29	3322	6.4	G0	- 8 09	D	-	-	-	-	-	-	58	18 36.5
29	3334	6.3	B9	- 7 14	D	48	21	56.0	41	22	26.6	-	-
30	3470	7.0	A0	- 3 18	D	5	19	55.4	-	-	-	-	-
Nov													
6	836	5.5	B3	+18 30	R	-	-	-	-	-	-	270	21 37.0
21	2680	5.8	K0	-18 46	D	-	-	-	-	-	-	147	20 06.7
21	2686	5.2	A0	-18 26	D	135	20	14.8	118	20	19.2	-	-
21	2690	7.0	B0	-18 24	D	143	21	00.1	-	-	-	-	-
23	3008	6.9	K0	-15 19	D	119	21	52.7	106	22	01.1	-	-
23	3015	5.3	B5	-15 08	D	106	22	41.6	-	-	-	-	-
24	3155	6.8	K5	-12 29	D	93	20	16.5	85	20	38.9	48	20 57.6
26	3437	6.7	A0	- 4 57	D	-	-	-	-	-	-	102	20 55.2
Dec													
5	947	5.2	F5	+19 11	R	-	-	-	-	-	-	250	03 00.2
13	1825	6.1	G0	- 1 18	R	-	-	-	-	-	-	249	02 08.2
14	1950	5.8	K0	- 5 09	R	-	-	-	314	03	02.6	-	-
21	3109	6.5	K0	-13 25	D	84	21	32.7	-	-	-	-	-
24	4	6.3	K0	- 0 47	D	34	25	49.2	-	-	-	-	-
25	109	6.5	G5	+ 3 07	D	10	21	12.0	351	21	52.0	-	-
31	764	5.0	G0	+18 35	D	73	00	10.7	52	00	46.8	-	-

## ECLIPSES

There will be four eclipses in 1960, two of the Sun and two of the Moon. None of these, however, will be visible in Southern Africa.

1. Total eclipse of the Moon, March 13. Invisible in Africa.
2. Partial eclipse of the Sun, March 27. Invisible in Africa. Visible in S. Australia and Antarctica.
3. Total eclipse of the Moon, September 5. Invisible in Africa.
4. Partial eclipse of the Sun, September 20-21. Invisible in Africa. Visible in E. Siberia and N. America.

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## TRANSIT OF MERCURY

A transit of Mercury over the disk of the Sun will occur on November 7.

In Southern Africa ingress occurs during late afternoon, but egress occurs after sunset and is therefore, not visible.

The S.A. standard times of ingress have been computed for four localities as follows:-

	Exterior Contact	Interior Contact
Port Elizabeth	$16^{\text{h}} 33^{\text{m}} 18^{\text{s}}.9$	$16^{\text{h}} 35^{\text{m}} 19^{\text{s}}.3$
Durban	16 33 19.3	16 35 19.7
Cape Town	16 33 21.1	16 35 21.6
Johannesburg	16 33 21.4	16 35 21.8

Duration from exterior ingress to exterior egress is approximately  $4^{\text{h}} 38^{\text{m}} 20^{\text{s}}$ . Position angle of the point of exterior ingress reckoned from the North point of the Sun =  $148^{\circ}.3$       Least angular distance =  $8' 48''.1$ .

## THE PLANETS

The chart (frontispiece) shows the S.A.S.T. of the rising and setting of the Sun and the Planets at a place whose latitude and longitude are  $30^{\circ}\text{S}$ ,  $30^{\circ}\text{E}$ . The approximate times for other places can be found by applying the longitude differences shown in Table I with the sign reversed, e.g. for Cape Town add 46 minutes, for Durban subtract 4 minutes. The correction in latitude will, in general, be sufficiently small to be ignored, and in no case will it exceed 15 minutes.

Mercury will be most easily seen just after sunset near the time of greatest (evening) elongation in June/July and October, and just before sunrise in March/April. Its magnitudes at these times will be +0.8, +0.1 and +0.6, respectively.

Venus can be seen as a morning star from January to May. From July to December it will be an evening star. It reaches its maximum brightness at magnitude -3.8 at the end of the year.

Mars will be visible in the morning sky from January to the middle of October. During the rest of the year it rises in the first half of the night and it will be in opposition to the Sun on December 30. Its brightness increases steadily throughout the year from magnitude +1.6 in January to magnitude -1.3 at the end of December, and its apparent diameter increases during the same period from  $3''.9$  to  $15''.3$ .

Jupiter, rising well after midnight in the beginning of the year, will be in opposition to the Sun on June 30; it then remains a fine object in the evening sky until November.

Saturn can be observed in the morning sky from January to March, and during the whole night in June and July. It will be an evening object for the rest of the year. It reaches its maximum brightness, magnitude +0.3, near the time of opposition (July 7).

Neither Uranus, magnitude 5.7, nor Neptune, magnitude 7.7, is readily visible to the naked eye, but both are easy telescopic objects. They can easily be found during the first part of the year by means of the following ephemeris. Their respective times of opposition to the Sun are February 8 and April 28.

Ephemeris for Uranus and Neptune 1960

		Uranus		Neptune	
		R.A.	Decl.	R.A.	Decl.
Jan	7	9 <sup>h</sup> 32. <sup>m</sup> 0	+ 15° 24'	14 <sup>h</sup> 28. <sup>m</sup> 0	- 12° 47'
"	27	9 29.0	+ 15 39	14 29.1	- 12 51
Feb	16	9 25.5	+ 15 55	14 29.3	- 12 51
Mar	7	9 22.3	+ 16 10	14 28.6	- 12 46
"	27	9 19.8	+ 16 21	14 27.2	- 12 39
Apr	16	9 18.6	+ 16 27	14 25.3	- 12 29
May	6	9 18.7	+ 16 25	14 23.3	- 12 18
"	26	9 20.2	+ 16 18	14 21.3	- 12 09
Jun	15	9 23.0	+ 16 04	14 19.7	- 12 02
Jul	5	9 26.7	+ 15 46	14 18.8	- 11 58
"	25	9 31.2	+ 15 24	14 18.6	- 11 58
Aug	14	9 36.0	+ 15 01	14 19.3	- 12 03
Sep	3	9 40.8	+ 14 37	14 20.7	- 12 11
"	23	9 45.3	+ 14 15	14 22.8	- 12 23
Oct	13	9 49.0	+ 13 56	14 25.4	- 12 36
Nov	2	9 51.7	+ 13 43	14 28.3	- 12 50
"	22	9 53.1	+ 13 37	14 31.2	- 13 04
Dec	12	9 53.1	+ 13 38	14 33.8	- 13 16
"	32	9 51.6	+ 13 46	14 35.9	- 13 25

The coordinates are apparent geocentric positions for the equinox of date.

METEOR CALENDAR 1960

Date	Shower	Radiant l      b	M a x i m u m		
			Date	Hourly Rate	Transit of Radiant
Jan 3	Quadrantids	227° + 46°	Jan 3	40	08 <sup>h</sup> 30 <sup>m</sup>
Mar 12	Hydraids	184 - 27	Mar 25	?	00 00
-Apr 25					
Mar 1	Virginids	200 - 6	Apr 3	?	00 00
-May 10					
Apr 2	Lyrids	273 + 35	Apr 21	12	04 00
-Apr 24					
Apr 29	Eta Aquarids	338 - 1	May 6	10	07 36
-May 21					
Apr 20	Sco - Sgr System	270 - 30	Jun 14	?	00 30
-Jul 30					
Jul 25	Delta Aquarids	343 - 17	Jul 28	20	02 00
-Aug 10					
Jul 18	Alpha Capricornids	304 - 12	?	?	-- --
-Jul 30					
Jul 20	Perseids	43 + 56	Aug 12	50	05 36
-Aug 19					
Aug 16	Piscids	0 + 14	Sep 12	?	00 30
-Oct 8					
Oct 11	Orionids	94 + 16	Oct 22	20	04 24
-Oct 30					
Sep 24	Taurids	58 + 21	Nov 13	6	00 36
-Dec 10					
Nov 16	Leonids	151 + 21	Nov 16	6	06 32
Dec 5	Geminids	113 + 30	Dec 12	30	02 00
-Dec 12					
Dec 5	Veloids	149 - 51	Dec 29	?	03 30
-Jan 7					

The hourly rates would apply if the radiants were in the observer's zenith. The orbits of the cometary currents are closely related to the orbits of the comets named: the orbits of ecliptical currents to those of certain minor planets.

METEOR CALENDAR 1960

Recommended SAST of watch	Conditions at maximum	Nature of current	Appearance
Difficult in SA.	-	Unknown	
22h - 24h	Favourable	Unknown	
22h - 24h	Favourable	Ecliptical	
02h - 04h	Favourable	Cometary: Comet 1861 I	Swift, with streaks
03h - dawn	-	Cometary: Halley	Very swift, long paths.
20h - 24h	-	Ecliptical	
23h - 02h	Favourable	Ecliptical	Slow, long paths.
22h - 02h	Favourable	Cometary: Comet 1881 IV	Very slow, bright.
03h - dawn	-	Cometary: Comet 1862 III	
22h - 24h	-	Ecliptical	
02h30m - 04h30m	Favourable	Cometary: Halley	Swift, with streaks.
22h - 24h	-	Ecliptical	
03h - dawn	-	Cometary: Comet 1866 I	
23h - 02h	-	Ecliptical	Medium speed, white.
23h - 03h30m	Poor, Moon	Unknown	

ASTRONOMICAL DIARY

JANUARY 1960

Mercury is too close to the Sun for easy visibility. Venus is bright in the morning sky. Mars rises two hours before the Sun, a little after Jupiter. Saturn rises just before the Sun.

d. h.

Jan	4		Earth in perihelion.
	9	6	Venus $7^{\circ}$ N of Antares.
	11	6	Mercury $1^{\circ}.8$ S of Saturn.
	21	13	Venus $1^{\circ}.1$ N of Jupiter.
	22	7	Neptune $2^{\circ}$ S of Moon.
	25	17	Venus $4^{\circ}$ S of Moon.
	26	11	Mars $6^{\circ}$ S of Moon.
	26	17	Saturn $4^{\circ}$ S of Moon.
	26	17	Mercury in superior conjunction.
	31	13	Mars $1^{\circ}.2$ S of Saturn.

FEBRUARY 1960

Mercury may be visible in the western sky soon after sunset at the end of the month. Venus is still visible in the morning sky, while Mars rises about 3 hours before the Sun. Jupiter and Saturn rise about 4 hours before the Sun.

d. h.

Feb	6	18	Aldebaran $0^{\circ}.5$ S of Moon.
	7	13	Venus $0^{\circ}.2$ N of Saturn.
	8	21	Uranus at opposition.
	17	5	Venus $1^{\circ}.1$ N of Mars.
	22	2	Jupiter $5^{\circ}$ S of Moon.
	23	6	Saturn $4^{\circ}$ S of Moon.
	24	2	Mercury at greatest eastern elongation, ( $18^{\circ}$ ).
	24	9	Mars $5^{\circ}$ S of Moon.

MARCH 1960

Mercury is close to the Sun, while Venus is still visible in the eastern sky before dawn. Mars rises about 3 hours before the Sun while Jupiter and Saturn rise about midnight.

d. h.

Mar	10	23	Mercury in inferior conjunction.
	13	10	Eclipse of the Moon, not visible in South Africa.
	20	17	Equinox.
	21	16	Saturn $4^{\circ}$ S of Moon.
	24	6	Mars $4^{\circ}$ S of Moon.
	25	11	Mercury $1^{\circ}.9$ N of Venus.
	27	10	Eclipse of the Sun, not visible in South Africa.

#### APRIL 1960

Mercury is easily visible in the morning sky, but Venus is becoming lost in the dawn light. Mars rises about 3 a.m., while Jupiter and Saturn rise before midnight.

d. h.

Apr	7	4	Uranus $4^{\circ}$ N of Moon.
	7	15	Mercury at greatest western elongation, ( $28^{\circ}$ ).
	16	21	Jupiter $5^{\circ}$ S of Moon.
	17	23	Saturn $4^{\circ}$ S of Moon.
	20	7	Jupiter stationary in R.A.
	22	3	Mars $2^{\circ}$ S of Moon.
	24	3	Mercury $1^{\circ}$ S of Moon.
	24	15	Occultation of Venus by the Moon.
	27	17	Saturn stationary in R.A.
	28	18	Aldebaran $0^{\circ}.5$ S of Moon.

#### MAY 1960

Mercury is close to the Sun, and Venus rises in the dawn light. Mars rises about 2.30 a.m. Jupiter and Saturn rise in the early evening.

d. h.

May	6	4	Mercury $0^{\circ}.2$ S of Venus.
	14	3	Jupiter $5^{\circ}$ S of Moon.
	15	5	Saturn $4^{\circ}$ S of Moon.
	17	17	Mercury in superior conjunction.
	21	00	Occultation of Mars by the Moon, not visible in South Africa.



JUNE 1960

Mercury is easily visible in the evening sky after sunset, but Venus is close to the Sun. Mars rises about 2.30 a.m. Jupiter and Saturn rise about sunset and are visible all night.

	d.	h.	
June	18	21	Mars $2^{\circ}$ N of Moon.
	19	16	Mercury at greatest eastern elongation, ( $25^{\circ}$ ).
	20	4	Jupiter at opposition.
	20	7	Mercury $6^{\circ}$ S of Pollux.
	21	12	Solstice
	22	6	Aldebaran $0^{\circ}.5$ S of Moon.
	22	18	Venus in superior conjunction.

JULY 1960

Mercury is close to the Sun and Venus sets soon after the Sun. Mars rises about 2 a.m. Jupiter and Saturn are still visible most of the night.

	d.	h.	
July	2		Earth at Aphelion.
	4	3	Neptune $2^{\circ}$ S of Moon.
	7	8	Saturn at opposition.
	8	20	Saturn $4^{\circ}$ S of Moon.
	17	3	Mercury in inferior conjunction.
	17	19	Mars $3^{\circ}$ N of Moon.

AUGUST 1960

Mercury is too close to the Sun for easy visibility, while Venus sets soon after sunset. Mars rises about 1.30 a.m. Jupiter and Saturn set soon after midnight.

	d.	h.	
Aug	3	20	Jupiter $5^{\circ}$ S of Moon.
	5	3	Saturn $4^{\circ}$ S of Moon.
	5	21	Mercury at greatest western elongation, ( $19^{\circ}$ ).
	8	16	Venus $1^{\circ}$ N of Regulus.
	17	14	Mars $5^{\circ}$ N of Aldebaran.
	20	20	Jupiter stationary in R.A.
	31	2	Mercury in superior conjunction.
	31	3	Jupiter $5^{\circ}$ S of Moon.

SEPTEMBER 1960

Mercury sets soon after sunset, and Venus about half an hour later. Mars rises and Jupiter and Saturn set, soon after midnight.

d. h.

Sep	5	13	Eclipse of the Moon, not visible in South Africa.
	12	3	Aldebaran $0^{\circ}.2$ S of Moon.
	15	22	Saturn stationary in R.A.
	21	0	Venus $3^{\circ}$ N of Spica.
	21	1	Eclipse of the Sun, not visible in South Africa.
	23	3	Equinox.
	26	18	Mercury $1^{\circ}$ N of Spica.
	28	16	Saturn $4^{\circ}$ S of Moon.

OCTOBER 1960

Mercury is visible in the evening sky, just west of Venus. Mars rises at midnight, and Jupiter and Saturn set at about the same time.

d. h.

Oct	12	0	Mars $5^{\circ}$ N of Moon.
	16	0	Mercury at greatest eastern elongation, ( $25^{\circ}$ ).
	25	0	Jupiter $5^{\circ}$ S of Moon.
	25	23	Saturn $4^{\circ}$ S of Moon.
	28	22	Venus $3^{\circ}$ N of Antares.

NOVEMBER 1960

There is a transit of Mercury on the 7th, beginning at 4.33 p.m. and continuing until sunset. Venus is high in the evening sky. Jupiter and Saturn set soon after sunset.

d. h.

Nov	5	20	Aldebaran $0^{\circ}.4$ S of Moon.
	7	19	Mercury in inferior conjunction.
	9	2	Mars $6^{\circ}$ N of Moon.
	13	3	Mercury $0^{\circ}.2$ S of Neptune.
	19	4	Venus $2^{\circ}$ S of Jupiter.
	21	7	Mars stationary in R.A.
	21	17	Jupiter $5^{\circ}$ S of Moon.
	21	21	Venus $7^{\circ}$ S of Moon.
	24	10	Mercury at greatest western elongation, ( $20^{\circ}$ ).

DECEMBER 1960

Mercury will be too close to the Sun for easy visibility. Venus reaches its greatest brightness at the end of the month. Mars is in opposition at the end of the month and is visible all night. Jupiter and Saturn set at sunset.

Dec	3	3	Aldebaran $0^{\circ}.5$ S of Moon.
	3	6	Full Moon.
	6	8	Mars $7^{\circ}$ N of Moon.
	21	17	Venus $4^{\circ}$ S of Moon.
	21	22	Solstice
	25	8	Mars nearest to earth, (56 million miles).
	30	12	Mars at opposition.

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BRIGHT VARIABLE STARS

Name	Position R.A.	(1950) Dec.	Range	Period Days	Expected Maxima 1960
$\circ$ Ceti (Mira)	02 <sup>h</sup> 16 <sup>m</sup> .8	- 3° 1'	2.6-9.4	33	Jul 18
R Doradus	04 36.2	-60 11	5.3-6.4	Irr.	Nov 11?
R Pictoris	04 44.8	-49 20	6.9-9.2	172?	Feb 5?, Jul 26?
L <sub>2</sub> Puppis	07 12.0	-44 35	3.1-6.3	140?	Feb 8?, Jun 27?
R Carinae	09 31.0	-62 31	4.5-9.4	309	Mar 31
S Carinae	10 07.3	-61 18	5.7-8.3	149	Mar 30, Aug 26
R Hydrae	13 27.0	-23 01	4.7-9.6	385	Feb 3
T Centauri	13 38.9	-33 21	6.0-8.2	90	Mar 25, Jun 23, Sep 21, Dec 20
R Centauri	14 12.9	-59 41	5.7-12.0	547	Oct 4
R Aquarii	23 41.2	-15 34	6.7-11.6	387	Feb 19

## SOUTH AFRICAN OBSERVATORIES

Name	Place	E. Long.	S. Lat.	Alt.	Director
		1h+		ft	
	Johannesburg	52m 18s.0	26°10'55"3	5925	W.S. Finsen
Annexe	Hartebeespoort	51m 30s	25°46'22"	4002	
	Cape Town	13m 54s.6	33°56'02"5	26	R.H. Stoy
Bliffe	Pretoria	52m 54s.9	25°47'18"	5059	A.D. Thackeray
	Bloemfontein	45m 37s.4	29°02'20"	4550	P.F. Bertiau S.J.
	Hartebeespoort	51m 30s	25°46'22"	4002	P.Th. Walraven
De's	Port Elizabeth	42m 20s	33°57'	300	P.E. Centre
Mont-Hussey	Bloemfontein	44m 56s.8	29°05'46"1	4825	No resident director
Robsonian Elite-Tracking Station	Olifantsfontein				J. Knight
Botham	Johannesburg	52m 17s.3	26°11'22"5	5605	
Huber	Germiston	52m 45s.6	26°14'11"5	5370	
Hoogenhout	Pretoria	52m 58s.6	25°46'46"	4725	
Jooste	Pretoria	52m 47s.2	25°45'14"	4359	
G. Knipe	Johannesburg	52m 09s.2	26°11'18"	5915	
Lagerweij	Johannesburg	52m 02s	26°08'36"5	5487	
Overbeek	Germiston	52m 33s.7	26°11'42"	5605	
Venter	Pretoria	52m 46s.9	25°40'14"8	4050	
Williams	Johannesburg	52m 28s.4	26°12'00"	5590	

## PAST PRESIDENTS

1922 - 23	S.S. Hough	1940 - 41	E.B. Ford
1923 - 24	R.T.A. Innes	1941 - 42	H. Knox-Shaw
1924 - 25	J.K.E. Halm	1942 - 43	A.F.I. Forbes
1925 - 26	W. Reid	1943 - 44	W.H. van den Bos
1926 - 27	H. Spencer Jones	1944 - 45	A.W.J. Cousins
1927 - 28	A.W. Roberts	1945 - 46	R.H. Stoy
1928 - 29	A.W. Long	1946 - 47	W.P. Hirst
1929 - 30	H.E. Wood	1947 - 48	J. Jackson
1930 - 31	D. Cameron-Swan	1948 - 49	A.E.H. Bleksley
1931 - 32	H.L. Alden	1949 - 50	W.S. Finsen
1932 - 33	H. Spencer Jones	1950 - 51	H.E. Krumm
1933 - 34	D.G. McIntyre	1951 - 52	A.D. Thackeray
1934 - 35	J.K.E. Halm	1952 - 53	J.C. Bentley
1935 - 36	J. Jackson	1953 - 54	David S. Evans
1936 - 37	H.E. Houghton	1954 - 55	P. Kirchhoff
1937 - 38	J.S. Paraskevopoulos	1955 - 56	W.H. van den Bos
1938 - 39	T. MacKenzie	1956 - 57	S.C. Venter
1939 - 40	R.A. Rossiter	1957 - 58	M.W. Feast
	1958 - 59		P. Smits

## HONORARY MEMBERS

Dr. R.O. Redman	Dr. H. Spencer Jones	Dr. H.L. Alden
Dr. R.v.d.R. Woolley	Dr. J. Schilt	Dr. J.H. Oort
Dr. H. Haffner	Dr. H. Knox-Shaw	Dr. H. Shapley
Dr. W.H. van den Bos		Mr. D.G. McIntyre

## HONORARY SECRETARIES

1922	H.W. Schonegevel
1922	
August	T. MacKenzie
1923	C.L. O'Brien Dutton
1923	
October	H.E. Houghton
1930	
July	S. Skewes
1931	H. Horrocks
1934	
November	H.W. Schonegevel
1935	A. Menzies

## OBSERVING SECTIONS

The Observing Sections exist to encourage amateurs in carrying out useful research. Enquiries about their activities should be addressed to the Directors of the Observing Sections, whose names and addresses are given below:—

### Variable Stars:

Mr. R. P. de Kock, The Royal Observatory, Observatory, Cape.

### Meteor Section:

Vacant.

### Computing and Occulation Section:

Mr. W. P. Hirst, "Water's Edge", Greenbanks Road, Rondebosch, Cape.

### Planetary Section:

Mr. I. R. H. Brickett, c/o Union Observatory, Johannesburg.

### Nova Search Section:

Mr. R. S. Tuffin, P.O. Box 1431, Johannesburg.

A number of autonomous local Centres of the Society exists, which hold regular meetings.

Details of Centre organisation are as follows:—

### CAPE CENTRE:

Chairman: Mr. W. C. Bentley.  
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Hon. Secretary: Mr. N. Saville.  
Hon. Treasurer: Mr. H. E. Krumm.  
Hon. Auditor: Mr. A. Menzies.  
Council Representative: Mr. R. J. Johnston.  
Members of Committee: Messrs. J. Churms, P. L. Meadows, I. Rodger, T. W. Russo and J. C. van Loon.

Meetings in winter on 2nd Wednesday of month at the Royal Observatory.  
**Secretarial address, c/o The Royal Observatory, Observatory, Cape.**

### TRANSVAAL CENTRE:

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Curator of Instruments: Dr. P. Kirchhoff.  
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Pretoria Member: Mr. R. Smith.  
Members of Committee: Mr. I. R. H. Brickett, Dr. M. W. Feast, Dr. K. G. Fuhr, Mr. R. S. Tuffin, Dr. C. N. Williams.

Observing and lecture meetings in alternate months.  
**Secretarial address, c/o Union Observatory, Gill Street, Observatory, Johannesburg.**

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Members of Committee: Dr. Reid, Messrs. H. Welsh, A. A. Foster, E. Warring, Woodall, G. Anderson, Haigh, B. Simpson, E. Blignaut.

**Secretarial address, 120a Princes Street, Port Elizabeth.**

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**Secretarial address, Bloemfontein Club, P.O. Box 83, Bloemfontein.**

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**Secretarial address, 57 Delew Court, 110 Stanger Street, Durban.**