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Magnetic Observations at Heard Island, 1954

By

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P R E F A C E

The geomagnetic work at Heard Island, which is described in this report, was planned and carried out by the Bureau of Mineral Resources, Geology and Geophysics of the Department of National Development, and was made possible by the Australian National Antarctic Research Expedition (A.N.A.R.E.), which established a scientific research station at the island in 1947-48. The instruments used in making the geomagnetic observations were supplied by the Bureau of Mineral Resources, but the observatory buildings and living accommodation were provided by the A.N.A.R.E., which is responsible for the general administration of the research station.

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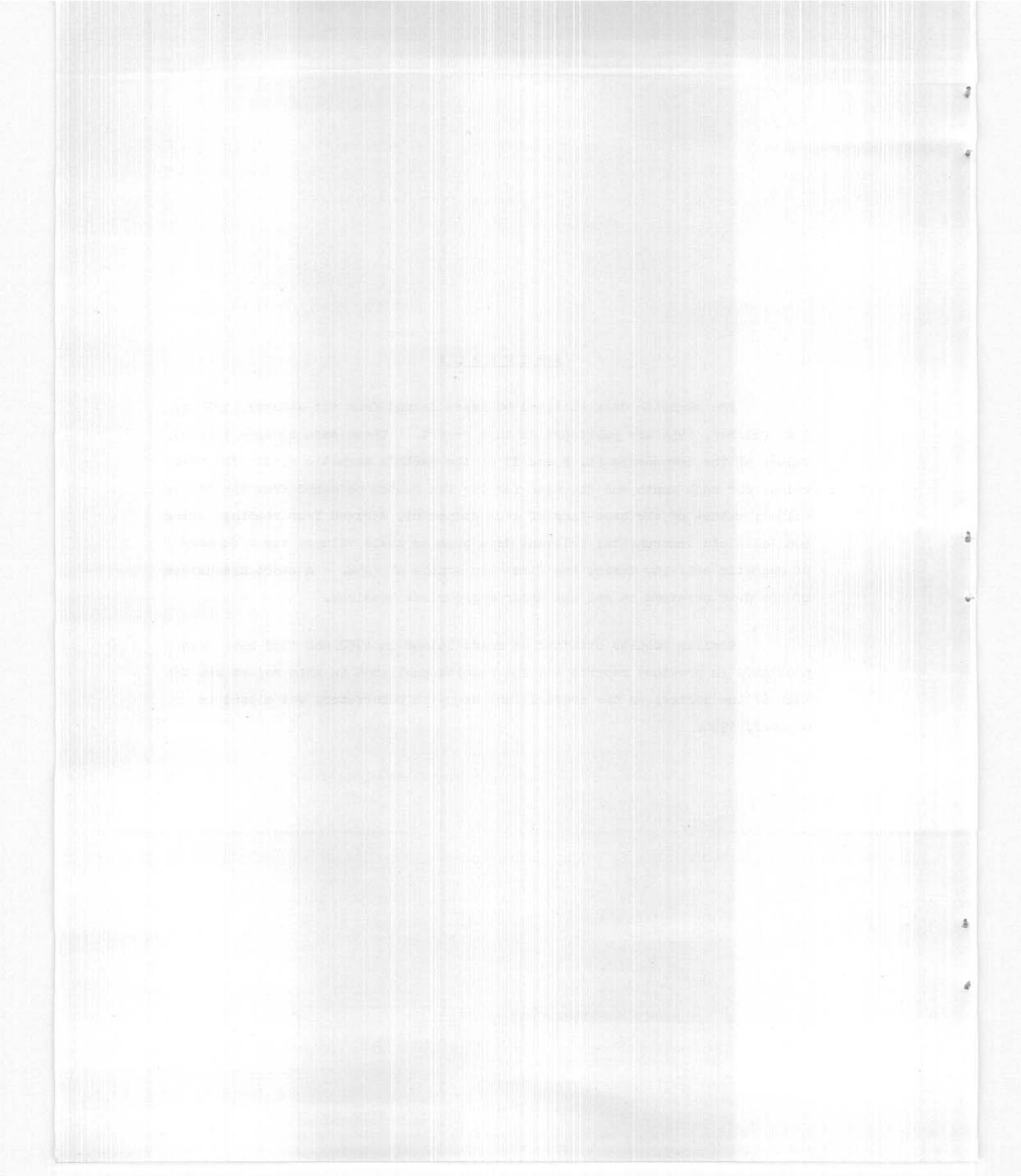
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A B S T R A C T

The magnetic data obtained on Heard Island from 1st January, 1954 to 31st October, 1954 are published in this report. These data include : hourly values of the components (D, H and Z) of the earth's magnetic field; the mean values for each month and the mean for the ten months obtained from the hourly values; values of the base-line of each component, derived from readings using semi-absolute instruments; relevant data such as scale values; and a summary of magnetic activity during the first ten months of 1954. A short discussion of the data obtained is set out under appropriate headings.

Similar results obtained at Heard Island in 1952 and 1953 have been published in previous reports and the results published in this report are the last of the series, as the Heard Island Magnetic Observatory was closed in October, 1954.



INTRODUCTION

Heard Island is situated about 2,400 nautical miles south-west of Perth, Western Australia, at latitude 53°S and longitude 73°E. A magnetic observatory was established by the Bureau of Mineral Resources, Geology and Geophysics, working in conjunction with the Australian National Antarctic Research Expedition, in 1951.

Detailed descriptions of the observatory, its site, the buildings in which it is housed and the operational routine carried on there are contained in reports by Chamberlain (1952), Doyle (1953), Ingall (1953 and 1955), Brooks (1955 and 1956) and Lodwick (1957).

The absolute and semi-absolute instruments and the variation instruments and subsidiary equipment are fully described in reports by La Cour (1930, 1936 and 1942), La Cour and Laursen (1930), Ingall (1955) and McGregor (1956). The instruments used were:-

(a) Absolute instruments.

- (i) Declination - Elliott Magnetometer No.18.
- (ii) Horizontal Intensity - Quartz Horizontal Magnetometers (Q.H.M.) Nos. 172, 173 and 174.
- (iii) Vertical Intensity - Magnetometric Zero Balance (B.M.Z.) No.62.

(b) Variation instruments.

- (i) La Cour D variometer No.80.
- (ii) La Cour H variometer No.75.
- (iii) La Cour Z variometer No.95.

Quartz Horizontal Magnetometers Nos. 173 and 174 were used for observations of horizontal intensity at Heard Island in 1954 while No.172 was intercompared at Toolangi. The results of the intercomparison of No.172 at Toolangi Observatory were used in the control of the H base-line at Heard Island.

The Australian National Antarctic Research Expedition has been obliged to cease operations at Heard Island in favour of developing a new base at Mawson on the Antarctic continent. Regular observations in geomagnetism ceased at the island on 31st October, 1954.

VARIOMETER SCALE VALUES AND BASE-LINE VALUES

Scale values for the D variometer.

The scale value of the D variometer is calculated from the distance of the recording drum of the variometer from the variometer itself and the deflection of the light spot caused by the introduction of torsion in the magnet suspension. The scale value was checked three times during the year and a constant value of 0.91 minutes per millimetre

was obtained; this was adopted as the scale value from January to October.

Scale values for the H variometer.

Scale values for the H variometer were found by using the Helmholtz coil method. The values obtained throughout the ten months were reasonably constant. The sub-standard milliammeter used in January for measuring the current through the Helmholtz coil had a temperature coefficient, and it was replaced in February by another milliammeter for which the temperature coefficient was negligible. During February, there were slight fluctuations in the current through the Helmholtz coil, but after soldering all joints in the circuit, a steady reading was obtained. A slight increase in scale value from 10.01 gammas per millimetre to 10.12 gammas per millimetre, adopted from the 1st March, could be attributed to either the change in milliammeter or the soldering of the joints in the circuit. The values obtained after February were reasonably constant, except for some scattered results in May, and the mean of all the values from February onwards was adopted as the scale value until the station was closed at the end of October.

Scale values for the Z variometer.

A Helmholtz coil was used to determine Z scale values throughout 1954; the results obtained showed little scatter about the mean for the period even though the circuit was rewired and a different milliammeter was used from February onwards. The mean for the period January to October (3.11 gammas per millimetre) was adopted as the scale value throughout the period.

Base-line values for the D variometer.

A La Cour variometer was used to record changes in declination and Elliott Magnetometer No.18 was used for calibration. The base line from January to October showed a slight apparent change in the easterly direction until August and then, after remaining approximately constant during August and September, showed a gradual change to the west in October. This variation is unexplained, though it appears to be a seasonal one.

In adopting values for the D base line, increases of 0.3 minute easterly were made at the end of each month until July, a constant value was adopted in August and September and an increase of 0.3 minute more westerly than the constant value in August and September was adopted for October. The mean, weighted with respect to time, of all the adopted base-line values was made to agree with the mean of the base-line values calculated from the Elliott Magnetometer readings. As an increase in base-line of 0.3 minute could not be detected from one record to the next on the disturbed Heard Island magnetograms, the continuity of the hourly scalings will have no sudden break.

Base-line values for the H variometer.

Quartz Horizontal Magnetometers Nos. 173 and 174 were used to determine the base-line values of the La Cour H variometer. Q.H.M. No. 174 gave consistent results throughout 1954, but Q.H.M. No. 173 gave unreliable readings from August onwards. No explanation can be found for the behaviour of Q.H.M. No. 173, although some of the erratic readings were caused by a brass shim tilting the instrument out of its level position. The La Cour H variometer needed no adjustment during 1954. Base-line values obtained for the instrument showed an apparent decrease of about 8 gammas from 1st January to mid-February, when there was an increase to the value obtained at the beginning of January. On the Heard Island records even a sudden change of 8 gammas would be difficult to detect because the scale value was approximately ten gammas per millimetre and the magnetograms were so disturbed that a change of 0.8 of a millimetre between the base line spot and the recording spot would not be apparent. No definite explanation for this change can therefore be offered.

The adopted base-line for the H variometer has two values for the year, chosen so that the mean of all the base-line determinations made with the Q.H.M. is equal to the mean (weighted with respect to time) of the two adopted values of the H base-line. The difference in the values of the two adopted base-lines, the first value adopted from 1st January to 14th February, the second value from 15th February to 31st October, is only 6 gammas, and this is considered to be undetectable on the disturbed Heard Island magnetograms.

The base-line value for the H variometer was examined for temperature effects, but none were apparent.

Base-line values for the Z variometer.

Magnetometric Zero Balance (B.M.Z.) No. 62 was used to calibrate the La Cour Z variometer. From January to July, the Z base-line value showed an apparent increase of about 60 gammas, then a decrease, then was more or less constant from August to October. No temperature effect on either the B.M.Z. or the Z variometer could be isolated. The apparent change between January and July could be attributed to a decrease in the moment of either the field or the twin magnet of the B.M.Z., but this could not apply to the decrease of the base-line value in July. Any change in the moment of the variometer magnet would have been evident in the scale values, but these remained constant.

B.M.Z. No. 62 was not compared with an absolute instrument during the three years it was at Heard Island. The constants used during this time were those determined at Rude Skov.

After its return, the instrument was compared with long range B.M.Z. No. 121 at Byron Bay, New South Wales, in October, 1955.

The result of this comparison is as follows:-

$$Z_{IMS} = Z_{62} - 12 \text{ gammas.}$$

However, when the tabulated data for this report were compiled, this correction was not known and no I.M.S. correction was applied. A PROVISIONAL CORRECTION OF -12 GAMMAS SHOULD THEREFORE BE APPLIED TO ALL VALUES OF VERTICAL INTENSITY IN THIS REPORT, but it should be kept in mind that this value is based on only one comparison and that it may have to be changed when further comparisons are made.

The Z variometer base line was adopted so that from 1st January to 26th July a decrease of 4 gammas was made and then adopted so that it remained constant from 27th July to 31st October. The mean (weighted with respect to time) of all the adopted base-lines was made to agree with the mean of all the base-line determinations with B.M.Z. No.62 over the ten-month period.

K-INDICES

K-Indices were scaled each month at the observatory and the results transmitted to Melbourne by radio. Sq curves used in scaling the K-Indices were calculated from the five quietest days on Heard Island each month; these five quiet days did not always coincide with the five international quiet days. K-Indices from Heard Island were published each month in the "Geophysical Observatory Report" issued by the Bureau of Mineral Resources, Geology and Geophysics.

GENERAL REMARKS ON THE PUBLISHED RESULTS

During the period in which the Heard Island Magnetic Observatory was operating in 1954, the power supply and the time-marking device for the magnetograph gave much trouble. Lead-acid accumulators used for the light sources of the magnetograph failed because of age and the cold conditions on the island. In June, the coldest month of the year, this trouble became very acute and a lot of record was lost. Many blank spaces in the results for the months after June are due to failures in the power supply.

The La Cour pendulum clock used for marking the time on the magnetograms failed during May, and as no replacement was available the magnetograms after May have no time marks. Fortunately, the escapement controlling the drum speed of the magnetograph recorder gave the drum a reasonably constant speed, and the position of the time marks calculated from the time the magnetogram was put on and taken off should not be in error by more than ± 3 minutes. The failure of the La Cour pendulum clock was probably due to corrosion of the escapement in the moist atmospheric conditions on the island.

COMPARISON OF ABSOLUTE AND SEMI-ABSOLUTE INSTRUMENTS

Quartz Horizontal Magnetometers can give reliable results for base-lines, but the control has to be strict. On Heard Island, three Q.H.M. were used; two were used on the island each time absolute observations were taken and the third was intercompared at Toolangi Observatory. When the relief ship arrived at Heard Island, the instrument which had been intercompared at Toolangi Observatory was exchanged for one on the island. This procedure was repeated each successive year, and even though Q.H.M. No.173 became unreliable in 1954 good control of the Heard Island base-line was maintained.

The control of the B.M.Z. has to be very strict to maintain a constant base-line value. The base-line value given by B.M.Z. No.62 during the three years was not as accurate as desired. As B.M.Z. No.62 is a fixed-range instrument, it was difficult to intercompare, but with the introduction of the Universal B.M.Z. the control should be very much easier.

BASIC HOURLY VALUES AND ASSOCIATED MEANS

Many values are missing in the tables of hourly values because of frequent failure of the lead-acid accumulators. In calculating the mean for a month, only the days which had three or less hourly values missing were taken into account. In any future use of the results published in this report this method of calculating the monthly means will have to be taken into account. Days with any doubtful hourly values should have been omitted from the calculations, but this would have seriously depleted the number of days that could be used in a month; this is particularly so for June.

It is unfortunate that only one complete set of annual results is available for Heard Island, namely that for 1953. In Table 41 the mean for ten months is given and each month is given equal weight in the mean even though days are missing in some months.

MAGNETIC ACTIVITY

The magnetic activity on Heard Island for the first ten months of 1954 was not as great as in preceding years. Several magnetic storms were observed although a sunspot minimum occurred about this time. None of the storms was very intense.

The table of sudden commencements contains many Polar Sudden Commencements (P.S.C.) throughout the ten months. Examination of the magnetograms from Heard Island and comparison of the magnetic activity with the list of magnetic phenomena published by the International Union of Geodesy and Geophysics, shows several features, particularly with respect to P.S.C.

- (i) P.S.C. were observed with the characteristic sudden beginning followed by a bay of up to an hour's duration. The first movement was of the order of 50 gammas for H, 10 minutes for D and 40 gammas for Z.

- (ii) Some disturbances began with a series of microvibrations and a gradual change in the value of each element of the magnetic field; the sudden movement followed and the magnetic bay formed. The time of this sudden movement often agrees with the time given at other observatories for a P.S.C., but the microvibrations began up to fifteen minutes earlier than the sudden movement.
- (iii) In P.S.C. beginning in ways described in either (i) or (ii), the bay which formed was sometimes of short duration. The value of the element returned to its original value fairly rapidly and was then followed by either another P.S.C. or a sudden impulse in the same, or sometimes the opposite, direction. The time of the second impulse is often quoted from other observatories as the time for a P.S.C. The bays formed in some P.S.C. were often not smoothly defined, but were interrupted in their formation by sudden impulses which may be associated with aurorae.
- (iv) In some instances only a microvibration appeared on the magnetogram at Heard Island at a time when a P.S.C. was observed at other observatories.
- (v) During some magnetic storms not reported elsewhere, other observatories give times for a P.S.C. which coincides with a sudden impulse during the magnetic storm at Heard Island.

Polar Sudden Commencements of the types described in (i), (ii) and (iii) above have been included in Table 43 of this report. The time given is the time of the first sudden impulse. Where the times of magnetic disturbances are enclosed by brackets in Table 43, they are subject to possible errors up to ± 3 minutes. This error is due to the failure of the La Cour pendulum clock after May.

MAGNETIC WORK AFTER CLOSURE OF THE OBSERVATORY

After continuous recording ceased on 31st October, 1954, absolute observations were taken until the middle of January, 1955. The results are given in Table 45 of this report. Observations for H were made with Q.H.M. No.174 because Q.H.M. No.173 gave erratic results. Declination was observed with Elliott Magnetometer No.18 and vertical intensity was measured with B.M.Z. No.62.

CONCLUSIONS

The results for the ten months are not as complete as desirable because of the trouble with the La Cour pendulum clock and the lead-acid accumulators. Absolute observations were made only when a trustworthy accumulator was in the light source circuit of the magnetograph.

This accounts for the uneven spacing of absolute observations after May. If it had not been for the introduction of a device which marked the magnetogram at the instant absolute observations were taken, base-line determinations after June would have been very inaccurate. In view of the costly failure of the La Cour pendulum clock and the lead-acid accumulators it is suggested that:-

1. Lead-acid accumulators should be replaced at least every two years; the risk involved in using them after that period at an isolated observatory is too great.
2. Mechanisms such as the La Cour pendulum clock and the escapement device of the La Cour recorder need a complete overhaul after two years.

Scientific work at Heard Island ceased on the 31st October, 1954, and it is not known if the station will be re-occupied. All the magnetic equipment has been transferred to Mawson, Antarctica, and magnetic results from there have been published in the "Geophysical Observatory Report" since August, 1955.

The site of the magnetic observatory at West Bay, Heard Island, is clearly marked by wooden piers; the exact location is given by Ingall (1955).

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TABLE 1
 Observed and adopted base-line values for D variometer
 (Observed values determined with Elliott Magnetometer No. 18)
 (West declination)

Date	Observed	Adopted	Adopted value used to	Remarks
1954	° ′	° ′		
January 7	-50 33.2	-50 31.6		
" 14	31.1	31.6		
" 20	31.4	31.6		
" 22	33.1	31.6		
" 28	31.9	31.6	00h Feb. 1	
February 4	30.9	31.3		
" 11	31.2	31.3		
" 18	31.3	31.3		
" 25	31.7	31.3	00h Mar. 1	
March 5	30.9	31.0		
" 12	31.5	31.0		
" 19	31.3	31.0		
" 27	30.1	31.0	00h Apr. 1	
April 16	30.8	30.7		
" 16	31.2	30.7		
" 23	30.4	30.7		
" 30	30.8	30.7	00h May 1	
May 8	31.9	30.4		
" 19	31.1	30.4		
" 28	31.0	30.4		
" 31	32.0	30.4	00h June 1	
June 26	30.2	30.1		
" 26	30.1	30.1		
" 26	30.4	30.1		
" 28	29.9	30.1	00h July 1	
July 15	29.3	29.8		
" 19	29.4	29.8		
" 27	30.0	29.8		
" 31	29.9	29.8	00h Aug. 1	
August 26	28.8	29.5		
" 26	29.3	29.5		
" 28	29.5	29.5		
" 31	28.8	29.5		
September 8	28.9	29.5		
" 27	29.5	29.5		
" 27	30.0	29.5		
" 30	28.7	29.5	00h Oct. 1	
October 13	30.2	29.8		
" 23	29.6	29.8		
" 27	29.9	29.8		
" 29	29.8	29.8	00h Nov. 1	

NOTE: Failure of the lead-acid accumulators prevented regular taking of absolute observations during June. Trouble with the accumulators was also experienced from August onwards.

TABLE 2
 Abrupt changes in the adopted D base-line values
 (West declination reckoned as negative; changes below taken algebraically)

Date	Change from preceding value	Cause of change
1954	+	
January 1	+0.2	Unknown
February 1	+0.3	"
March 1	+0.3	"
April 1	+0.3	"
May 1	+0.3	"
June 1	+0.3	"
July 1	+0.3	"
August 1	+0.3	"
October 1	-0.3	"

TABLE 3
 Observed and adopted base-line values for H variometer
 (Observed values determined with QHMs Nos. 173 & 174)

Date	Instrument QHM No.	Observed	Adopted	Adopted value used to	Remarks
1954		γ	γ		
January	7 174	-18458	-18453		
"	7 173	18457	18453		
"	7 174	18458	18453		
"	7 173	18457	18453		
"	7 174	18456	18453		
"	7 173	18455	18453		
"	7 174	18455	18453		
"	14 173	18456	18453		
"	14 174	18457	18453		
"	22 174	18454	18453		
"	28 173	18449	18453		
"	28 174	18451	18453		
February	4 173	18450	18453		
"	4 174	18451	18453		
"	11 173	18449	18453		
"	11 174	18448	18453	OOh Feb. 15	Reason for change unknown.
"	18 173	18461	18459		
"	18 174	18463	18459		
"	25 173	18458	18459		
"	25 174	18458	18459		
March	5 173	18463	18459		
"	5 174	18464	18459		
"	12 173	18461	18459		
"	12 174	18462	18459		
"	19 173	18459	18459		
"	19 174	18459	18459		
"	26 173	18456	18459		
"	26 174	18459	18459		
April	1 173	18460	18459		
"	1 174	18460	18459		
"	9 173	18456	18459		
"	9 174	18457	18459		
"	16 173	18457	18459		
"	16 174	18457	18459		
"	23 173	18459	18459		
"	23 174	18459	18459		
May	8 173	18458	18459		
"	8 174	18457	18459		
"	19 173	18457	18459		
"	19 174	18456	18459		
"	21 173	18460	18459		
"	21 174	18461	18459		
"	28 173	18459	18459		
"	31 174	18458	18459		
June	29 173	18456	18459		
"	30 173	18454	18459		
"	30 174	18459	18459		
"	30 174	18457	18459		
July	13 173	18456	18459		
"	15 174	18459	18459		
"	19 173	18456	18459		
"	19 174	18458	18459		
"	27 173	18457	18459		
"	27 174	18457	18459		
"	31 174	18456	18459		
August	26 173	18459	18459		
"	26 174	18460	18459		
"	28 173	18456	18459		
"	28 174	18459	18459		
"	31 173	18458	18459		
"	31 174	18460	18459		
September	8 174	18461	18459		
"	27 174	18458	18459		
"	27 174	18461	18459		
"	30 174	18460	18459		
October	13 174	18459	18459		
"	23 174	18460	18459		
"	27 174	18464	18459		
"	29 174	18461	18459	OOh Nov. 1	

NOTE: Failure of the lead-acid accumulators prevented regular taking of absolute observations during June. Trouble with the accumulators was also experienced from August onwards.

False readings by QHM No. 173 during July and August, due to shim throwing instrument off level.

Unlikely reading not included.
 " " " "
 QHM No. 173 became unreliable during September and October. Base-lines had to be obtained from QHM No. 174 only.

TABLE 4

Abrupt changes in the adopted H base-line values
 (Horizontal intensity is reckoned as positive; changes below taken algebraically)

Date	Change from preceding value	Cause of change
1954	γ	
January 1	+3	Unknown
February 14	+6	Unknown

TABLE 5

Observed and adopted base-line values for Z variometer
 (Observed values determined with BMZ No. 62)

Date	Observed	Adopted	Adopted value used to	Remarks
1954	γ	γ		
January 7	-47129	-47141		
" 8	47130	47141		
" 9	47136	47141		
" 14	47138	47141		
" 22	47136	47141	00h Jan. 24	
" 28	47143	47145		
February 4	47145	47145		
" 11	47147	47145	00h Feb. 16	
" 18	47153	47149		
" 25	47158	47149		
March 5	47164	47149	00h Mar. 11	
" 12	47161	47153		
" 19	47158	47153		
" 26	47159	47153		
April 1	47161	47153	00h Apr. 3	
" 9	47161	47157		
" 16	47166	47157		
" 23	47167	47157	00h Apr. 26	
May 8	47159	47161		
" 19	47166	47161	00h May 19	
" 21	47171	47165		
" 28	47166	47165	00h June 11	
June 25	47163	47169	00h July 4	
July 13	47176	47173	00h July 27	
" 19	47170	47173		
" 27	47193	47177		
" 31	47190	47177		
August 12	47184	47177		
" 25	47179	47177		
" 28	47172	47177		
" 31	47174	47177		
September 8	47175	47177		
" 16	47176	47177		
" 26	47170	47177		
" 30	47170	47177		
October 13	47166	47177		
" 23	47167	47177		
" 27	47185	47177		
" 29	47177	47177	00h Nov. 1	

NOTE: Failure of the lead-acid accumulators prevented regular taking of absolute observations during June. Trouble with the accumulators was also experienced from August onwards.

TABLE 6

Abrupt changes in the adopted Z base-line values

(Vertical intensity is reckoned as negative; changes below taken algebraically)

Date	Change from preceding value	Cause of change
1954	Y	
January 1	-4	Unknown but see text
" 24	-4	" " " "
February 16	-4	" " " "
March 11	-4	" " " "
April 3	-4	" " " "
" 26	-4	" " " "
May 19	-4	" " " "
June 11	-4	" " " "
July 4	-4	" " " "
" 27	-4	" " " "

TABLE 7

Observed and adopted D scale-values

Date	Observed	Adopted	Method used for determination
1954	'/mm	'/mm	
April 9	0.912	0.91	Torsion head deflections
August 28	0.912	0.91	" " "
October 28	0.912	0.91	" " "

TABLE 8

Observed and adopted H scale-values
(Observed values determined with Helmholtz coil)

Date	Observed	Adopted	Adopted value used to	Remarks
1954	Y/mm	Y/mm		
January	4	9.95	10.01	
"	11	10.03	10.01	
"	20	10.02	10.01	
"	28	10.07	10.01	
"	28	10.04	00h Mar. 1	Erratic values obtained during February and March not included.
March	22	10.20	10.12	Scale-value circuit rewired during March.
"	25	10.15	10.12	
"	27	10.14	10.12	
"	30	10.21	10.12	
April	9	10.20	10.12	
"	16	10.16	10.12	
"	23	10.28	10.12	Erratic values not included.
May	18	10.16	10.12	
"	28	10.14	10.12	
"	31	10.18	10.12	
June	25	10.06	10.12	Circuit adjusted and joints soldered.
"	26	10.11	10.12	
"	28	10.10	10.12	
"	29	10.21	10.12	
July	13	10.03	10.12	
"	19	10.08	10.12	
"	27	10.07	10.12	
"	31	10.08	10.12	
August	12	10.00	10.12	
"	25	10.12	10.12	
"	28	10.11	10.12	
"	31	10.13	10.12	
September	16	10.11	10.12	
"	26	10.05	10.12	
"	27	10.13	10.12	
"	30	10.17	10.12	
October	13	10.16	10.12	
"	21	10.04	10.12	Erratic values not included.
"	28	10.03	00h Nov. 1	

TABLE 9

Abrupt changes in the adopted H scale-values

Date	Change from preceding value	Cause of change
1954	Y/mm	
March 1	+0.11	Rewiring of scale-value circuit

TABLE 10

Observed and adopted Z scale values
(Observed values determined with Helmholtz coil)

Date	Observed	Adopted	Remarks
	Y/mm	Y/mm	
1954			
January	4	3.12	
"	11	3.12	3.11
"	20	3.14	3.11
"	28	3.07	3.11
"	28	3.12	3.11
February	4	3.18	3.11
"	11	3.07	3.11
"	18	3.09	3.11
March	22	3.08	3.11
"	25	3.06	3.11
"	27	3.08	3.11
"	30	3.09	3.11
April	9	3.10	3.11
"	16	3.10	3.11
"	23	3.18	3.11
May	8	3.11	3.11
"	18	3.12	3.11
"	28	3.11	3.11
"	31	3.13	3.11
June	25	3.11	3.11
"	26	3.09	3.11
"	28	3.13	3.11
"	29	3.07	3.11
July	13	3.07	3.11
"	19	3.09	3.11
"	27	3.09	3.11
"	31	3.16	3.11
August	12	3.11	3.11
"	25	3.15	3.11
"	28	3.13	3.11
"	31	3.13	3.11
September	16	3.11	3.11
"	26	3.08	3.11
"	27	3.06	3.11
"	30	3.13	3.11
October	13	3.12	3.11
"	21	3.09	3.11
"	27	3.08	3.11
"	28	3.12	3.11 00h Nov. 1 No abrupt changes in adopted value

TABLE 11
HOURLY VALUES OF DECLINATION

JANUARY 1954 49°30' West plus tabular quantities expressed in tenths of minutes of arc G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range																																																																																																																																																		
1 *	443	442	477	487	483	463	427	407	414	411	417	414	407	411	407	412	414	423	405	414	433	426	03	25	489	21	40	376																																																																																																																																																			
2 *	459	535	483	477	460	433	421	396	396	391	386	378	387	398	394	407	404	417	436	435	445	426	01	34	580	14	40	003																																																																																																																																																			
3 *	445	478	498	470	471	474	462	425	425	429	432	430	434	433	430	432	433	435	436	435	435	426	01	36	523	10	36	577																																																																																																																																																			
4 *	458	467	469	(470)	471	472	441	425	425	429	432	430	434	433	430	432	433	435	436	435	435	426	05	42	482	08	09	424																																																																																																																																																			
5	446	470	472	480	462	461	424	404	404	403	397	397	394	392	397	394	407	415	429	418	430	409	609	489	492	454	21	09	762																																																																																																																																																		
6	484	191	497	488	503	454	451	424	404	405	405	405	416	415	404	405	404	401	415	427	422	424	426	1.24	1.24	1.24	1.24	07	514																																																																																																																																																		
7	462	476	476	466	484	476	458	443	454	416	405	405	405	404	404	405	404	398	415	421	426	426	1.24	1.24	1.24	1.24	05	507																																																																																																																																																			
8	435	478	497	511	506	488	467	443	424	419	404	397	411	432	435	438	437	433	434	440	421	426	426	426	426	426	426	02	516																																																																																																																																																		
9	442	459	474	489	488	481	451	439	422	404	395	388	380	403	397	401	413	414	414	418	424	431	445	445	445	445	02	522																																																																																																																																																			
10 *	460	475	482	486	492	488	453	435	435	416	417	406	406	415	415	415	415	415	415	415	415	415	415	415	415	415	03	522																																																																																																																																																			
11	441	443	466	479	476	452	425	404	393	398	397	405	405	404	404	404	404	404	404	404	404	404	404	404	404	404	02	522																																																																																																																																																			
12	497	534	506	496	487	496	462	429	445	453	453	458	425	425	425	425	425	425	425	425	425	425	425	425	425	425	02	522																																																																																																																																																			
13 *	463	478	490	497	486	469	466	453	437	425	416	415	414	414	414	414	414	414	414	414	414	414	414	414	414	414	02	522																																																																																																																																																			
14 *	496	490	496	484	477	471	461	453	452	447	443	438	435	427	423	423	423	423	423	423	423	423	423	423	423	423	02	522																																																																																																																																																			
15	461	481	488	491	479	468	477	440	434	431	431	431	431	431	431	431	431	431	431	431	431	431	431	431	431	431	02	522																																																																																																																																																			
16	491	503	505	500	500	480	460	463	453	450	442	440	440	438	436	435	435	435	435	435	435	435	435	435	435	435	02	522																																																																																																																																																			
17	471	487	495	475	473	477	445	427	425	417	417	417	417	417	417	417	417	417	417	417	417	417	417	417	417	417	02	522																																																																																																																																																			
18	582	625	535	520	504	501	478	456	467	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	02	522																																																																																																																																																			
19	490	515	494	503	506	493	468	428	429	404	391	398	390	409	424	424	424	424	424	424	424	424	424	424	424	424	02	522																																																																																																																																																			
20	454	511	477	475	475	467	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	02	522																																																																																																																																																			
21	438	476	477	477	477	477	466	454	452	440	437	420	409	409	409	409	409	409	409	409	409	409	409	409	409	409	02	522																																																																																																																																																			
22	469	486	504	472	466	488	477	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	02	522																																																																																																																																																			
23 *	461	468	486	491	479	491	488	481	462	462	462	462	462	462	462	462	462	462	462	462	462	462	462	462	462	462	02	522																																																																																																																																																			
24 *	460	464	487	489	480	463	452	440	430	420	419	426	427	427	427	427	427	427	427	427	427	427	427	427	427	427	02	522																																																																																																																																																			
25 *	460	464	487	489	487	460	455	451	430	432	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423	423	02	522																																																																																																																																																			
26 *	467	476	480	488	489	470	466	455	453	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	02	522																																																																																																																																																			
27 *	467	482	475	482	475	482	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	02	522																																																																																																																																																			
28 *	468	479	487	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	02	522																																																																																																																																																			
29 *	468	479	487	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	02	522																																																																																																																																																			
30 *	468	479	487	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	02	522																																																																																																																																																			
31	482	502	518	529	523	497	478	475	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	02	522																																																																																																																																																			
Mean	468	489	489	491	491	481	463	447	435	424	415	412	413	422	423	435	442	447	454	456	459	475	475	475	475	475	475	475	475	475	475																																																																																																																																																
Mean *	460	468	479	486	489	480	463	452	440	430	425	420	419	426	427	433	437	438	445	447	450	450	450	450	450	450	450	450	450	450	450																																																																																																																																																
Mean *	457	468	476	483	487	478	464	453	439	428	423	418	419	426	427	433	441	440	440	443	446	449	454	454	454	454	454	454	454	454	454	454	454																																																																																																																																														
Mean *	491	548	499	495	497	481	467	450	441	421	410	405	404	422	402	416	460	471	501	508	546	537	521	508	472	472	472	472	472	472	472	472	472	472	472																																																																																																																																												
a. Means of 9 values	b. Means of 8 values	c. Means of 4 values	d. Mean of 4 values	e. Mean of 4 values	f. Mean of 4 values	g. Mean of 4 values	h. Mean of 4 values	i. Mean of 4 values	j. Mean of 4 values	k. Mean of 4 values	l. Mean of 4 values	m. Mean of 4 values	n. Mean of 4 values	o. Mean of 4 values	p. Mean of 4 values	q. Mean of 4 values	r. Mean of 4 values	s. Mean of 4 values	t. Mean of 4 values	u. Mean of 4 values	v. Mean of 4 values	w. Mean of 4 values	x. Mean of 4 values	y. Mean of 4 values	z. Mean of 4 values	aa. Mean of 4 values	bb. Mean of 4 values	cc. Mean of 4 values	dd. Mean of 4 values	ee. Mean of 4 values	ff. Mean of 4 values	gg. Mean of 4 values	hh. Mean of 4 values	ii. Mean of 4 values	jj. Mean of 4 values	kk. Mean of 4 values	ll. Mean of 4 values	mm. Mean of 4 values	nn. Mean of 4 values	oo. Mean of 4 values	pp. Mean of 4 values	qq. Mean of 4 values	rr. Mean of 4 values	ss. Mean of 4 values	tt. Mean of 4 values	uu. Mean of 4 values	vv. Mean of 4 values	ww. Mean of 4 values	xx. Mean of 4 values	yy. Mean of 4 values	zz. Mean of 4 values	aa. Mean of 4 values	bb. Mean of 4 values	cc. Mean of 4 values	dd. Mean of 4 values	ee. Mean of 4 values	ff. Mean of 4 values	gg. Mean of 4 values	hh. Mean of 4 values	ii. Mean of 4 values	jj. Mean of 4 values	kk. Mean of 4 values	ll. Mean of 4 values	mm. Mean of 4 values	nn. Mean of 4 values	oo. Mean of 4 values	pp. Mean of 4 values	qq. Mean of 4 values	rr. Mean of 4 values	ss. Mean of 4 values	tt. Mean of 4 values	uu. Mean of 4 values	vv. Mean of 4 values	ww. Mean of 4 values	xx. Mean of 4 values	yy. Mean of 4 values	zz. Mean of 4 values	aa. Mean of 4 values	bb. Mean of 4 values	cc. Mean of 4 values	dd. Mean of 4 values	ee. Mean of 4 values	ff. Mean of 4 values	gg. Mean of 4 values	hh. Mean of 4 values	ii. Mean of 4 values	jj. Mean of 4 values	kk. Mean of 4 values	ll. Mean of 4 values	mm. Mean of 4 values	nn. Mean of 4 values	oo. Mean of 4 values	pp. Mean of 4 values	qq. Mean of 4 values	rr. Mean of 4 values	ss. Mean of 4 values	tt. Mean of 4 values	uu. Mean of 4 values	vv. Mean of 4 values	ww. Mean of 4 values	xx. Mean of 4 values	yy. Mean of 4 values	zz. Mean of 4 values	aa. Mean of 4 values	bb. Mean of 4 values	cc. Mean of 4 values	dd. Mean of 4 values	ee. Mean of 4 values	ff. Mean of 4 values	gg. Mean of 4 values	hh. Mean of 4 values	ii. Mean of 4 values	jj. Mean of 4 values	kk. Mean of 4 values	ll. Mean of 4 values	mm. Mean of 4 values	nn. Mean of 4 values	oo. Mean of 4 values	pp. Mean of 4 values	qq. Mean of 4 values	rr. Mean of 4 values	ss. Mean of 4 values	tt. Mean of 4 values	uu. Mean of 4 values	vv. Mean of 4 values	ww. Mean of 4 values	xx. Mean of 4 values	yy. Mean of 4 values	zz. Mean of 4 values	aa. Mean of 4 values	bb. Mean of 4 values	cc. Mean of 4 values	dd. Mean of 4 values	ee. Mean of 4 values	ff. Mean of 4 values	gg. Mean of 4 values	hh. Mean of 4 values	ii. Mean of 4 values	jj. Mean of 4 values	kk. Mean of 4 values	ll. Mean of 4 values	mm. Mean of 4 values	nn. Mean of 4 values	oo. Mean of 4 values	pp. Mean of 4 values	qq. Mean of 4 values	rr. Mean of 4 values	ss. Mean of 4 values	tt. Mean of 4 values	uu. Mean of 4 values	vv. Mean of 4 values	ww. Mean of 4 values	xx. Mean of 4 values	yy. Mean of 4 values	zz. Mean of 4 values	aa. Mean of 4 values	bb. Mean of 4 values	cc. Mean of 4 values	dd. Mean of 4 values	ee. Mean of 4 values	ff. Mean of 4 values	gg. Mean of 4 values	hh. Mean of 4 values	ii. Mean of 4 values	jj. Mean of 4 values	kk. Mean of 4 values	ll. Mean of 4 values	mm. Mean of 4 values	nn. Mean of 4 values	oo. Mean of 4 values	pp. Mean of 4 values	qq. Mean of 4 values	rr. Mean of 4 values	ss. Mean of 4 values	tt. Mean of 4 values

TABLE 12
HOURLY VALUES OF DECLINATION

Day	49°30' West plus tabular quantities expressed in tenths of minutes of arc																								G.M.T. used			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	473	504	522	520	504	495	477	454	423	422	422	424	424	420	414	416	416	416	416	416	416	416	416	416	416	416		
2	468	522	539	515	495	475	457	443	423	423	423	423	423	421	421	421	421	421	421	421	421	421	421	421	421	421		
3	504	513	506	513	513	513	511	511	498	498	498	498	498	498	498	498	498	498	498	498	498	498	498	498	498	498		
4	*	473	498	539	514	513	511	504	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487		
5	*	456	487	501	504	495	494	490	485	470	456	442	432	430	430	430	430	430	430	430	430	430	430	430	430	430		
6	*	469	490	503	514	513	507	504	504	495	491	483	476	473	473	473	473	473	473	473	473	473	473	473	473	473	473	
7	*	505	493	505	502	503	495	495	495	495	493	483	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	
8	*	477	495	504	504	496	487	478	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	
9	*	464	472	483	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	
10	*	485	520	504	516	503	501	516	491	488	492	477	457	433	433	433	433	433	433	433	433	433	433	433	433	433	433	
11	*	470	483	504	514	524	524	510	483	477	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	
12	*	517	494	506	518	511	501	499	494	487	470	450	441	432	432	432	432	432	432	432	432	432	432	432	432	432	432	
13	*	470	496	503	511	522	459	409	431	439	442	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	
14	*	470	496	503	511	522	459	409	431	439	442	421	421	421	421	421	421	421	421	421	421	421	421	421	421	421	421	
15	*	504	550	506	495	504	494	472	473	476	474	468	463	461	460	467	461	463	462	461	460	460	460	460	460	460	460	
16	*	506	550	549	505	511	497	494	477	477	470	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	
17	*	474	483	493	502	507	494	494	477	477	470	467	449	419	419	419	419	419	419	419	419	419	419	419	419	419	419	
18	*	466	476	477	486	486	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	
19	*	476	479	479	465	464	479	475	459	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	
20	*	476	479	479	465	464	479	475	459	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	
21	*	903	645	566	531	477	446	426	417	416	415	415	415	415	415	415	415	415	415	415	415	415	415	415	415	415	415	
22	*	486	531	550	474	474	460	449	464	473	465	448	434	442	433	418	431	424	423	422	421	420	420	420	420	420	420	420
23	*	527	498	491	491	484	484	488	498	510	504	487	469	436	438	463	473	464	473	504	494	508	504	505	496	505	497	505
24	*	483	485	494	495	492	479	488	498	494	494	494	494	494	494	494	494	494	494	494	494	494	494	494	494	494	494	494
25	*	485	490	494	483	484	485	493	493	494	492	492	492	492	492	492	492	492	492	492	492	492	492	492	492	492	492	492
26	*	577	500	495	498	485	488	482	489	480	483	487	494	493	487	494	473	451	440	438	446	458	464	484	494	483	473	473
27	*	507	507	508	504	497	489	484	474	463	451	439	435	429	439	438	450	467	469	501	494	500	513	521	506	479 ^a	DESIGNATIONS	320
28	*	507	507	508	504	497	489	484	474	463	451	439	435	429	439	438	450	467	469	501	494	500	513	521	506	479 ^a	DESIGNATIONS	320
29	*	507	507	508	504	497	489	484	474	463	451	439	435	429	439	438	450	467	469	501	494	500	513	521	506	479 ^a	DESIGNATIONS	320
30	*	507	507	508	504	497	489	484	474	463	451	439	435	429	439	438	450	467	469	501	494	500	513	521	506	479 ^a	DESIGNATIONS	320
31	*	507	507	508	504	497	489	484	474	463	451	439	435	429	439	438	450	467	469	501	494	500	513	521	506	479 ^a	DESIGNATIONS	320

* Ten least disturbed
days
/ Five international
quiet days
Five international
disturbed days
() Approximate

TABLE 13
MARCH 1954 49°30' West plus tabular quantities expressed in tenths of minutes of arc G.M.T. used
HOURLY VALUES OF DECLINATION

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range			
1 *	482	491	496	503	501	501	470	491	485	470	466	462	460	455	460	464	465	463	465	473	479	619	628	488	21 59	736	21 37	431				
2 *	569	540	527	510	501	476	467	461	454	447	446	458	459	461	460	459	463	474	458	454	491	489	462	504	478	20 11	583	18 44	371			
3 **	495	501	474	505	511	501	471	466	449	447	432	421	429	434	466	458	468	466	465	463	464	473	564	556	574	472	00 15	630	22 44	367		
4 **	584	561	555	511	501	501	469	448	437	436	429	402	418	406	446	460	464	472	463	470	477	436	513	481	00 16	578	11 09	407				
5 *	543	512	520	491	487	482	473	463	454	449	448	441	460	453	464	465	466	464	461	491	420	537	513	481	21 09	407	171	263				
6 *	492	487	518	492	482	499	491	475	453	435	441	449	449	429	449	429	475	483	529	477	491	420	596	553	484	22 55	657	20 22	350			
7	528	515	528	520	488	445	480	469	457	444	443	450	453	454	465	462	460	460	461	460	464	462	460	460	460	23 00	709	09 35	434			
8	487	484	511	523	523	500	474	462	440	420	420	423	426	446	428	446	447	487	476	470	537	583	633	555	484	475	470	490	18 59	683	09 30	489
9	474	497	520	525	517	509	502	489	466	450	450	446	442	437	453	489	493	473	492	476	470	470	470	470	470	20 27	591	19 28	389			
10 *	511	510	501	511	490	473	470	472	447	439	429	424	420	398	402	463	467	471	476	481	476	471	476	471	476	18 35	582	13 20	350			
11	528	490	499	493	499	499	491	493	494	498	493	484	473	462	446	435	433	469	469	468	468	468	468	468	468	21 09	603	11 56	421			
12	473	485	501	491	483	494	498	493	484	473	462	446	447	462	462	462	462	462	462	462	462	462	462	462	462	17 23	512	15 55	509			
13	448	499	496	521	517	493	523	452	446	470	463	474	470	463	474	470	470	470	470	470	470	470	470	470	470	19 21	803	16 51	295			
14 *	677	501	502	510	481	481	477	476	459	450	448	438	438	438	448	448	463	465	465	465	465	465	465	465	465	00 09	838	19 51	370			
15	484	506	520	510	508	498	501	493	466	464	456	456	456	456	456	456	456	456	456	456	456	456	456	456	456	17 27	345	307	468			
16	466	474	499	470	472	447	470	472	447	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	22 47	1375	15 16	512			
17	646	658	536	(501)	496	504	506	502	488	481	473	459	455	461	470	466	470	467	451	470	467	467	467	467	467	17 16	420	14 18	402			
18	467	485	501	501	508	511	505	509	490	480	478	467	455	451	454	456	456	456	456	456	456	456	456	456	456	12 34	572	22 34	154			
19 *	491	531	509	502	489	494	480	478	467	472	454	435	474	466	451	454	454	454	454	454	454	454	454	454	454	11 55	674	11 44	274			
20	463	509	529	(519)	512	494	491	486	463	473	470	469	475	475	475	475	475	475	475	475	475	475	475	475	475	21 21	588	00 45	418			
21	510	499	510	517	521	511	499	486	467	460	464	470	472	472	472	472	472	472	472	472	472	472	472	472	472	21 32	914	20 09	720			
22	677	627	658	565	558	530	523	502	490	472	448	466	474	483	484	481	491	510	510	510	510	510	510	510	510	20 09	501	21 32	914			
23 *	514	563	544	519	512	508	511	519	501	498	492	470	468	469	476	494	491	501	503	503	503	503	503	503	503	20 01	615	20 10	440			
24 *	483	493	498	484	477	496	492	482	474	472	457	462	475	475	475	475	475	475	475	475	475	475	475	475	475	20 01	593	16 13	279			
25	493	493	498	484	477	496	492	482	474	472	457	462	475	475	475	475	475	475	475	475	475	475	475	475	475	14 49	539	11 49	158			
26 *	491	481	492	507	510	511	509	508	509	509	501	498	498	498	498	498	498	498	498	498	498	498	498	498	498	14 49	539	11 49	158			
27 *	472	482	500	505	505	488	513	510	520	519	519	513	500	486	469	466	466	465	465	465	465	465	465	465	465	14 49	539	11 49	158			
28 *	526	505	488	513	510	520	513	510	520	519	519	513	500	486	469	466	466	465	465	465	465	465	465	465	465	14 49	539	11 49	158			
29 *	472	482	500	505	505	488	513	510	520	519	519	513	500	486	469	466	466	465	465	465	465	465	465	465	465	14 49	539	11 49	158			
30 *	511	532	513	508	502	496	492	480	466	459	455	451	454	451	454	451	454	451	454	451	454	451	454	451	454	14 49	539	11 49	158			
31 *	484	487	496	500	499	504	500	491	479	474	469	467	464	461	468	461	464	461	468	461	464	461	468	461	464	14 49	539	11 49	158			
Mean																																
Mean *																																
Mean /																																
Mean #																																
a. Means of 9 values	b. Means of 8 values	c. Means of 4 values																														
Mean *	484	487	496	500	499	504	500	491	479	474	469	467	464	468	475	476	480	484	489	484	488	484	480	480	480	480	480	480	480	480	480	
Mean /																																
Mean #																																
Mean #																																

Insufficient data Insufficient data Means of 8 values Means of 4 values

a. Means of 9 values b. Means of 8 values c. Means of 4 values

* Ten least disturbed days # Five international quiet days / Five international disturbed days

() Approximate

DESIGNATIONS

299

TABLE 14
HOURLY VALUES OF DECLINATION

HOURLY VALUES OF DECLINATION

TABLE 15

MAY 1954 49°30' West plus tabular quantities expressed in tenths of minutes of arc

G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range
1 * #	501	474	472	486	498	493	496	495	482	470	473	476	479	479	482	482	483	482	482	483	482	482	482	482	478(478)	482	05 00	511	01 34 ^a 466
2	474	487	487	492	496	490	486	471	462	463	464	467	469	470	475	485	485	485	485	485	485	485	485	485	477 474 476	479	18 10	529	22 43 445
3	466	478	487	487	492	494	494	492	483	473	474	476	483	493	497	497	497	497	497	497	497	497	497	497	467 458 463	498	22 27	832	08 59 441
4	484	486	491	501	512	520	503	493	474	475	466	461	475	485	490	495	495	495	495	495	495	495	495	495	483 481 480	489	05 36	533	11 18 443
5 *	480	464	451	478	495	501	502	502	484	474	473	476	485	487	491	502	495	494	495	495	495	495	495	495	484 483 480	485	06 94 ^a	512	02 25 443
6 *	480	480	484	490	510	516	507	496	483	472	470	469	475	483	485	480	497	477	476	475	474	473	473	473	475 474 473	483	06 10	516	11 99 446
7 *	467	462	458	455	483	502	505	491	478	470	468	456	469	474	460	474	474	474	474	474	474	474	474	474	475 474 473	498	14 ^b	736	14 ^b 449
8	620	557	524	513	503	510	501	506	479	467	469	479	477	482	488	480	482	485	485	485	485	485	485	485	476 475 474	498	00 25	686	10 50 456
9	484	476	476	474	482	486	491	483	476	478	477	480	485	489	493	493	493	493	493	493	493	493	493	493	482 481 480	491	00 25	686	10 50 463
10	455	471	464	454	453	464	458	457	455	474	472	483	485	487	487	485	487	485	487	485	487	485	487	485	479 478 476	488	19 00	618	23 50 463
11	475	494	492	499	498	495	494	486	477	470	474	479	481	488	487	493	496	496	496	496	496	496	496	496	486 484 482	498	19 00	618	01 55 462
12	452	466	474	491	491	491	491	486	476	477	475	476	477	478	477	483	485	485	488	488	488	488	488	488	482 481 480	489	17 20	538	00 00 451
13	467	469	442	459	488	483	465	468	472	477	475	478	478	478	478	488	488	488	488	488	488	488	488	488	482 481 480	489	17 15	547	00 53 450
14	477	459	471	489	499	495	490	488	480	476	467	464	474	478	467	488	487	487	487	487	487	487	487	487	482 481 480	489	21 40	517	02 43 442
15	500	478	478	478	483	487	486	479	479	479	478	477	478	478	477	476	476	476	476	476	476	476	476	476	475 474 473	483	22 50	524	01 25 454
16 *	479	478	478	478	483	487	486	479	479	479	478	477	477	477	477	476	476	476	476	476	476	476	476	476	475 474 473	484	18 20	516	19 05 445
17 *	#	479	478	478	478	483	487	486	479	479	478	477	477	477	477	476	476	476	476	476	476	476	476	476	475 474 473	484	18 20	517	20 00 467
18	474	474	483	483	480	486	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	475 474 473	484	18 20	517	20 00 467
19	552	511	495	497	501	495	476	475	470	478	484	485	485	487	487	484	485	485	485	485	485	485	485	485	482 481 480	491	19 00	617	22 30 358
20	491	517	495	494	504	495	494	494	477	475	472	478	484	484	485	485	485	485	485	485	485	485	485	485	482 481 480	492	15 00	567	22 30 358
21	#	482	485	476	479	474	466	469	465	469	469	469	469	469	469	469	469	469	469	469	469	469	469	469	467 466 465	488	19 00	525	00 00 461
22 *	510	515	503	495	501	507	504	499	484	481	484	485	485	486	489	493	495	495	495	495	495	495	495	495	492 491 490	495	19 00	554	21 25 449
23	488	474	477	474	475	475	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	475 474 473	486	19 00	554	00 35 461
24	484	479	485	493	489	493	495	493	481	474	476	475	476	476	476	476	476	476	476	476	476	476	476	476	475 474 473	486	19 00	554	00 35 461
25 *	495	485	482	485	495	492	488	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	484 483 482	491	18 30	640	18 30 452
26 *	496	513	503	486	488	471	471	467	476	478	478	476	476	476	476	476	476	476	476	476	476	476	476	476	475 474 473	486	18 30	505	21 10 452
27 *	487	487	486	485	485	493	495	495	495	495	495	495	495	495	495	495	495	495	495	495	495	495	495	495	494 493 492	486	18 00	521	21 10 467
28	505	498	489	486	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	484 483 482	491	01 25	522	07 35 464
29	30 *	#	484	484	479	485	490	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	487	486 485 484	494	19 25	557	20 45 477
31	Mean	490	484	481	484	490	492	489	488	483	477	476	477	475	474	475	474	474	474	474	474	474	474	474	473 472 471	493	19 30	556	12 00 478
Mean *	489	482	479	484	491	490	488	488	483	477	476	477	475	474	475	474	474	474	474	474	474	474	474	474	473 472 471	493	19 30	556	12 00 478
Mean #	486	478	480	488	496	499	498	495	484	477	474	475	476	474	475	474	475	474	475	474	475	474	475	474	473 472 471	493	19 30	556	12 00 478
Mean #	504	495	490	478	470	482	487	490	472	470	469	470	470	469	470	469	470	469	470	469	470	469	470	469	468 467 466	497	09	547	07 35 478
a. Means of 9 values	b. Means of 8 values	c. Means of 4 values	d. Mean of 26 complete days only	() Approximate																									

DESIGNATIONS

122

* Ten least disturbed

days

Five international

quiet days

Five international

disturbed days

Five international

disturbed days

() Approximate

0.45

0.84

0.91

0.92

0.93

0.94

0.95

0.96

0.97

0.98

0.99

0.99

0.99

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0.99

0.99

TABLE 16

HOURLY VALUES OF DECLINATION

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range
1 *	488	485	465	474	492	492	493	497	496	491	488	488	486	492	496	497	508	513	492	491	490	488	478	476	490	451	093		
2 *	491	492	492	492	492	476	482	490	494	492	480	474	476	478	474	484	477	492	499	503	498	490	488	482	485	480	456	074	
3 *	492	492	492	492	492	492	493	497	496	493	497	496	493	496	496	484	477	492	496	492	490	490	488	482	485	480	456	074	
4 *	499	477	475	479	483	482	482	483	482	482	480	482	482	482	482	482	480	487	492	491	500	501	529	519	513	509	494	086	
5 *	502	496	496	496	496	495	494	495	495	494	495	495	494	495	495	494	494	494	494	494	495	495	494	494	494	494	494	070	
6 *	501	492	492	492	492	492	493	493	493	493	493	493	493	493	493	493	493	483	489	490	492	492	502	502	502	502	502	073	
7 *	483	488	492	502	500	500	502	501	499	493	490	494	483	482	482	482	482	482	482	482	482	482	502	501	503	503	502	053	
8 *	499	501	493	491	492	493	490	491	492	493	490	491	492	493	490	492	497	490	492	497	501	501	491	497	495	495	495	053	
9	491	488	475	482	491	501	510	513	503	492	487	471	490	483	492	490	483	492	490	483	492	490	492	490	492	490	492	022	
10 *	503	518	501	485	498	497	471	479	466	471	475	490	471	475	479	471	475	490	500	502	507	503	507	503	507	503	507	079	
11 *	503	508	499	505	509	511	510	503	503	492	493	495	492	493	495	492	493	495	501	501	501	501	501	501	501	501	501	195	
12 *	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13 *	502	503	507	507	508	502	501	501	492	487	477	492	501	502	502	502	502	502	502	502	502	502	502	502	502	502	502	074	
14 *	520	514	510	498	493	501	503	501	493	492	492	492	492	492	492	492	492	492	492	492	492	492	492	492	492	492	492	074	
15 *	503	501	492	491	492	492	496	500	496	496	496	496	496	496	496	496	496	496	496	496	496	496	496	496	496	496	496	074	
16 *	503	502	503	506	509	502	498	498	495	491	492	490	493	490	493	490	493	490	493	490	493	490	493	490	493	490	493	056	
17 *	482	536	525	499	498	490	503	501	497	491	492	492	492	492	492	492	492	497	471	479	484	495	501	509	511	510	493	056	
18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
24 *	500	495	492	493	500	501	501	503	497	499	499	499	499	499	499	499	498	493	498	503	503	503	503	503	503	503	503	063	
25 *	482	493	501	510	517	510	517	503	516	498	503	496	500	498	498	498	498	503	503	503	503	503	503	503	503	503	503	063	
26 *	521	539	518	517	503	516	487	560	482	497	501	493	501	493	493	493	493	501	493	501	503	503	503	503	503	503	503	503	069
27 *	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
28 *	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
29 *	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
30 *	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Mean	499	496	494	494	496	497	495	494	490	486	486	490	491	493	490	504	508	511	507	508	506	501	494	493	493	493	74		
Mean *	Mean /	Mean #	Mean /	Mean *	Mean /	Mean *	Mean /	Mean *	Mean /	Mean *	Mean /	Mean *	Mean /	Mean *	Mean /	Mean *	Mean /	Mean *	Mean /	Mean *	Mean /	Mean *	Mean /	Mean *	Mean /	Mean *	Mean /	DESIGNATIONS	
a Means of 9 values	b Means of 8 values	c Means of 4 values	d Mean of 15 complete days only	e Insufficient data	f Five international days	g quiet days	h Five disturbed days	i Approximate	*	Ten least disturbed days																			

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TABLE 17

HOURLY VALUES OF DECLINATION

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TABLE 18
HOURLY VALUES OF DECLINATION

Day	Range																								
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	517	519	530	533	531	524	526	522	515	515	512	497	483	496	502	524	534	532	541	550	540	531	516	522	521
2	* *	521	520	522	522	520	522	520	511	513	512	512	502	497	513	518	507	515	506	522	502	524	532	532	521
3	* *	522	517	522	523	521	516	523	519	505	508	511	506	502	512	506	502	507	522	522	524	524	524	524	521
4	* *	523	520	522	523	521	516	523	523	519	519	519	506	512	512	506	502	512	528	528	528	528	528	528	521
5	*	560	559	541	531	504	523	519	512	510	505	501	498	485	486	519	524	528	537	519	505	506	506	506	504
6	*	532	528	540	540	538	540	525	516	510	510	497	483	483	483	509	498	494	527	527	527	527	527	527	521
7	*	529	517	523	530	538	540	540	525	516	510	510	497	483	483	483	509	498	494	527	527	527	527	527	527
8	*	522	525	528	530	540	540	540	525	516	510	510	497	483	483	483	509	498	494	527	527	527	527	527	527
9	*	506	525	528	530	540	540	540	525	516	510	510	497	483	483	483	509	498	494	527	527	527	527	527	527
10	*	506	525	528	530	533	531	533	528	519	506	511	513	512	512	506	525	525	525	525	525	525	525	525	521
11	*	499	511	522	522	521	513	532	521	522	506	522	522	521	522	522	521	522	525	525	525	525	525	525	521
12	*	499	511	517	495	520	531	521	520	521	521	521	521	521	521	521	521	521	525	525	525	525	525	525	521
13	*	499	511	519	521	520	521	520	521	520	521	521	521	521	521	521	521	521	525	525	525	525	525	525	521
14	*	499	495	505	515	519	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	521
15	*	504	507	524	520	521	520	521	520	521	520	521	520	521	520	521	520	521	525	525	525	525	525	525	521
16	*	504	507	524	520	521	520	521	520	521	520	521	520	521	520	521	520	521	525	525	525	525	525	525	521
17	*	509	514	524	520	521	520	521	520	521	520	521	520	521	520	521	520	521	525	525	525	525	525	525	521
18	*	532	535	529	539	530	533	539	533	532	525	516	519	500	504	523	517	520	525	525	525	525	525	525	521
19	*	554	529	531	539	533	523	521	531	532	525	521	520	511	511	511	511	511	525	525	525	525	525	525	521
20	*	510	505	529	532	542	542	547	547	545	524	521	510	510	511	511	511	511	525	525	525	525	525	525	521
21	*	524	522	525	522	523	523	524	523	522	521	520	520	521	520	521	520	521	525	525	525	525	525	525	521
22	*	535	493	529	522	522	522	522	522	522	521	522	521	520	521	520	521	520	525	525	525	525	525	525	521
23	*	548	513	520	540	542	538	539	541	528	523	516	517	516	515	516	517	516	525	525	525	525	525	525	521
24	*	545	521	524	538	542	538	545	542	538	527	521	520	516	517	516	517	516	525	525	525	525	525	525	521
25	*	515	517	520	540	532	538	538	538	538	538	538	538	538	538	538	538	538	525	525	525	525	525	525	521
26	*	526	549	542	567	564	559	539	523	523	523	523	523	523	523	523	523	523	525	525	525	525	525	525	521
27	*	527	549	542	567	564	559	559	559	559	559	559	559	559	559	559	559	559	525	525	525	525	525	525	521
28	*	546	474	496	521	520	520	520	520	520	518	517	517	516	516	516	516	516	525	525	525	525	525	525	521
29	*	504	533	519	528	538	538	538	538	538	538	538	538	538	538	538	538	538	525	525	525	525	525	525	521
30	*	529	519	531	540	541	541	541	541	541	541	541	541	541	541	541	541	541	525	525	525	525	525	525	521
31	*	513	511	538	542	546	541	545	533	531	542	526	526	526	526	526	526	526	525	525	525	525	525	525	521
Mean		526	519	526	531	534	532	536	529	526	523	514	511	511	514	526	530	538	542	552	549	541	539	534	529
Mean *		519	516	521	525	529	530	531	528	524	520	514	509	511	514	520	526	534	534	548	544	534	531	535	532
Mean #		524	520	525	524	529	528	530	521	516	514	508	508	505	508	518	526	529	534	547	535	534	531	535	538
Mean #		534	527	537	538	539	526	522	523	523	528	520	518	508	512	536	531	542	541	560	568	545	564	546	546

SEPTEMBER 1954

TABLE 19

49°30' West plus tabular quantities expressed in tenths of minutes of arc

G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range							
1	#	540	545	531	532	538	536	524	538	524	513	517	520	495	480	497	454	559	556	559	579	538	662	762	686	549	22	43	887	15 55	341	546				
2		622	577	574	579	548	527	533	541	538	517	497	538	521	532	522	519	564	561	561	543	560	534	549	548	00	09	763	10 32	467	296					
3		548	548	523	524	564	552	525	511	520	524	496	522	507	505	524	567	530	546	588	597	621	515	523	525	523	23	48	712	16 26	393	319				
4		557	539	551	564	554	552	525	524	528	523	513	533	493	523	541	517	556	546	548	551	551	525	525	525	523	16	45	703	15 50	423	280				
5		534	513	567	569	548	524	525	524	528	523	510	527	521	522	520	524	527	528	528	528	528	525	525	525	523	18	06	600	12 27	479	121				
6		520	527	548	559	557	550	520	521	528	523	517	547	540	528	521	520	524	528	528	528	528	528	525	525	525	21	30	958	17 58	300	658				
7	*		560	590	584	593	552	540	544	547	540	554	534	538	520	524	520	528	528	528	528	528	525	525	525	523	17	05	630	20 51	468	162				
8	*		537	549	554	561	548	550	549	551	549	538	538	521	523	520	528	526	526	526	526	526	523	523	523	521	17	51	629	00 22	515	114				
9			545	547	548	547	548	545	548	542	541	543	538	529	520	524	520	528	545	557	560	556	570	560	531	546	21	06	575	14 40	511	124				
10	*		547	551	559	559	554	566	545	548	542	541	543	538	528	520	523	528	545	531	523	528	520	520	520	520	07	32	487	12 47	511	124				
11			529	540	566	568	563	562	552	540	540	508	520	520	517	508	487	521	529	529	529	529	520	520	520	517	19	44	708	12 12	437	271				
12	*		543	545	544	538	548	520	522	540	520	516	508	520	514	514	523	520	529	529	529	529	520	520	520	517	21	19	579	19 44	497	082				
13	*		528	537	538	530	538	518	520	520	521	516	508	520	516	516	516	516	516	516	516	516	516	516	516	516	05	52	(560)	05 52	(560)	(050)				
14			540	540	549	540	540	549	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	
15			540	540	520	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	
16			499	511	530	501	526	505	497	524	520	526	520	526	520	526	520	526	520	526	520	526	520	526	520	526	520	526	520	526	520	526	520	526	520	
17	*		567	560	539	542	518	517	525	524	525	520	521	524	520	522	520	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	
18	*		577	531	564	577	568	569	560	543	528	519	470	522	520	522	520	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	
19	*	#	540	546	559	566	566	557	555	558	548	547	523	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	
20		#	539	552	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	
21		#	578	561	584	588	581	588	581	588	581	577	559	549	542	495	495	515	504	495	515	504	523	528	528	528	528	528	528	528	528	528	528	528		
22	*		543	535	540	543	540	543	540	543	540	543	540	543	540	543	540	543	540	543	540	543	540	543	540	543	540	543	540	543	540	543	540	543	540	
23	*		532	542	553	554	553	553	553	555	558	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	
24	*		548	556	550	527	559	559	559	555	559	559	559	559	559	559	559	559	559	559	559	559	559	559	559	559	559	559	559	559	559	559	559	559	559	
25			548	548	568	569	569	568	568	578	579	577	553	528	522	523	521	529	528	563	563	563	562	560	560	560	560	560	560	560	560	560	560	560		
26	*		538	559	567	565	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	551	
27			557	610	566	569	566	566	569	570	569	569	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	
28			528	572	561	569	577	579	562	540	546	546	534	534	534	534	534	534	534	534	534	534	534	534	534	534	534	534	534	534	534	534	534	534	534	
29			551	561	579	578	562	540	523	518	520	522	496	496	507	529	526	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	
30			551	561	579	578	562	540	523	518	520	522	496	496	507	529	526	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	
31			548	552	559	560	552	547	545	542	538	530	515	515	518	521	525	526	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520
Mean			543	547	550	553	552	552	552	545	539	533	524	523	525	523	524	523	524	523	524	523	524	523	524	523	524	523	524	523	524	523	524	523	524	
Mean *			536	544	550	546	549	551	553	545	540	534	526	522	524	529	538	546	558	556	555	557	565	544	537	545	545	545	545	545	545	545	545	545	545	
Mean #			546	558	559	559	552	547	539	545	532	516	498	492	482	489	482	462	500	523	581	634	762	772	721	641	543	543	543	543	543	543	543	543	543	543
a Means of 9 values	b Means of 8 values	c Means of 4 values	d Mean of 4 values	e Mean of 27 complete days only	f Approximate	g Designations	264																													

Ten least disturbed

days

Five international

quiet days

Five international

disturbed days

() Approximate

TABLE 20

OCTOBER 1954 49°30' West plus tabular quantities expressed in tenths of minutes of arc

Day	G.M.T. used																								
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	#	579	574	627	635	634	546	562	519	526	548	488	514	524	534	537	607	610	578	594	562	555	554	16	48
2	#	559	570	582	562	563	562	596	574	561	543	535	532	525	543	543	545	550	550	552	534	569	563	23	53
3		606	696	572	548	545	543	528	519	541	557	528	516	528	542	542	548	598	557	580	554	573	575	20	45
4	*	761	747	616	596	595	586	568	538	537	526	518	515	526	535	535	534	549	549	589	555	568	568	686	834
5		543	563	573	582	577	553	533	499	500	411	477	406	503	537	540	540	549	549	589	555	568	560	560	626
6		557	572	580	580	587	574	562	560	540	538	510	487	513	531	547	502	544	593	595	573	577	571	560	548
7		57	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	27
8	*	544	552	563	562	554	554	550	554	554	545	551	523	534	545	545	545	545	545	545	545	545	545	545	545
9	*	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	31	447
10	*	544	552	563	562	554	554	550	554	554	545	551	523	534	545	545	545	545	545	545	545	545	545	545	545
11	*	554	567	582	578	562	559	549	536	537	541	528	516	524	535	543	543	543	543	543	543	543	543	543	543
12	*	551	553	556	557	555	561	561	554	545	541	537	534	534	536	536	536	536	536	536	536	536	536	536	536
13	*	549	554	562	566	570	572	572	569	553	521	528	516	517	523	523	523	523	523	523	523	523	523	523	523
14	*	521	560	571	572	564	572	572	563	543	522	522	510	500	508	522	522	517	517	517	517	517	517	517	517
15	*	558	570	571	568	565	563	554	554	554	526	504	486	500	508	522	522	522	522	522	522	522	522	522	522
16	*	534	544	558	562	562	562	570	576	558	527	523	523	523	523	523	523	523	523	523	523	523	523	523	523
17	*	554	562	568	581	571	563	570	562	541	523	516	520	520	523	523	523	523	523	523	523	523	523	523	523
18	*	603	614	591	593	579	579	579	579	579	501	431	386	495	361	471	471	471	471	471	512	512	512	512	512
19	*	539	559	586	576	569	559	556	557	557	532	507	554	501	487	487	487	487	487	578	578	578	578	578	578
20	*	545	581	576	569	569	569	569	569	569	510	490	452	445	444	444	444	444	444	444	562	572	580	590	579
21	*	551	562	569	569	569	569	569	569	569	532	524	523	523	523	523	523	523	523	523	523	523	523	523	523
22	*	560	567	577	582	582	576	582	582	582	551	551	549	546	498	519	519	519	519	519	519	519	519	519	519
23	*	742	881	619	605	574	557	551	533	510	494	495	484	433	425	482	482	482	482	482	482	482	482	482	482
24	*	616	738	698	580	558	567	505	508	499	492	460	479	424	330	550	550	550	550	550	550	550	550	550	550
25	*	569	603	594	593	593	593	593	593	593	590	543	529	529	529	529	529	529	529	529	529	529	529	529	529
26	*	581	(582)	572	588	584	581	578	590	578	523	523	523	523	523	523	523	523	523	523	523	523	523	523	523
27	*	572	572	588	572	580	580	577	562	562	540	541	551	543	542	542	542	542	542	542	537	537	537	537	537
28	*	554	563	571	571	571	571	571	571	571	546	546	546	546	546	546	546	546	546	546	546	546	546	546	546
29	*	595	646	647	634	560	562	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547
30	*	582	594	588	581	581	588	581	587	581	587	581	587	581	587	581	587	581	587	581	587	581	587	581	587
31	*	586	597	587	580	569	567	555	544	531	522	508	504	503	510	518	527	520	531	567	570	571	576	570	579
Mean	*	551	562	571	571	571	571	571	571	571	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561
Mean	#	549	560	566	566	566	566	566	566	566	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564
Mean	#	732	691	602	594	573	557	538	524	514	508	460	448	470	443	486	475	499	512	588	606	632	630	628	675
a	Means of 9 values	b	Means of 8 values	c	Means of 8 values	d	Means of 8 values	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v

551^d DESIGNATIONS 287
 * Ten least disturbed days
 # Five international quiet days
 / Five disturbed days
 560^c Five international disturbed days
 () Approximate

561^b Ten least disturbed days
 562^b Five international quiet days
 563^b Five disturbed days
 564^b Four international disturbed days
 565^b Three international disturbed days

566^b Two international disturbed days
 567^b One international disturbed day

568^b No international disturbed days

TABLE 21
HOURLY VALUES OF HORIZONTAL INTENSITY
18000 plus tabular quantities expressed in g
JANUARY 1954

FEBRUARY 1954

18000 plus tabular quantities expressed in grammes

G.M.T. used

TABLE 22
HOURLY VALUES OF HORIZONTAL INTENSITY

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range		
1	498	504	506	479	466	474	448	454	444	461	493	480	485	510	571	561	575	462	484	497	474	461	450	388	484	16	49	689	23 50 302		
2	375	453	431	477	497	462	458	466	473	492	506	501	533	496	493	492	494	457	381	476	14	46	573	00 00	331	387					
3	362	433	476	493	508	470	430	436	444	496	574	498	495	483	489	493	496	504	518	489	449	436	476	12	47	573	00 07	304	248		
4	475	484	472	484	492	471	455	444	458	471	483	489	487	495	506	493	493	486	488	480	486	479	16	36	524	09 32	438	269			
5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
24	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
26	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
29	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Mean	451	464	473	485	493	487	482	472	466	466	469	478	487	489	504	522	517	494	484	479	474	458	435	434	478 ^d	DESIGNATIONS	260				
Mean *																															
Mean *																															
Mean *																															
Mean *																															
a Means of 9 values	b Means of 8 values	c Means of 4 values	d Mean of 20 complete days only	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z						

* Ten least disturbed days
 # Five international quiet days
 \$ Five international disturbed days
 (%) Approximate

MARCH 1954

TABLE 23
HOURLY VALUES OF HORIZONTAL INTENSITY

G.M.T. used

18000 plus tabular quantities expressed in gammas

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range			
1 *	469	479	491	497	490	481	479	477	478	477	479	477	479	477	479	484	484	487	483	487	487	486	489	495	476	21	496	22	247			
2 *	468	470	479	489	477	467	469	467	468	468	459	470	475	466	486	487	489	495	528	471	489	495	528	471	479	18	580	19	27			
3 *	489	491	475	504	489	484	477	474	461	456	460	468	471	502	483	487	484	482	487	491	490	470	356	434	476	21	580	19	27			
4 *	416	411	419	477	486	471	451	449	448	460	460	468	468	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	
5 *	458	460	486	481	486	485	477	467	466	468	474	474	475	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	
6 *	480	493	441	473	487	489	469	458	460	462	468	476	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	
7	467	488	491	480	479	481	469	458	457	462	468	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	
8	478	502	501	507	499	477	454	450	449	452	459	459	459	459	459	459	459	459	459	459	459	459	459	459	459	459	459	459	459	459	459	
9	482	492	494	498	502	491	473	459	444	451	445	445	445	445	445	445	445	445	445	445	445	445	445	445	445	445	445	445	445	445	445	
10 *	473	489	479	466	480	484	465	451	447	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	
11 *	472	487	479	500	502	485	465	463	452	459	469	481	481	472	483	481	480	488	499	511	442	458	459	478	476	19	00	572	21	52	396	
12	482	489	488	502	503	502	494	480	476	467	470	479	481	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	
13 *	368	403	461	472	477	466	450	435	451	465	472	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	
14 *	284	450	489	472	451	489	457	427	450	459	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	
15	471	466	475	486	469	478	477	463	464	466	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	
16	444	468	499	498	479	480	474	466	465	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	
17	376	211	598	1449	1459	1459	509	508	497	479	477	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471
18 *	452	477	468	471	477	474	479	471	474	479	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	
19 *	452	429	441	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	
20	477	462	493	1490	1489	1479	506	491	486	483	483	482	482	482	482	482	482	482	482	482	482	482	482	482	482	482	482	482	482	482	482	482
21	459	418	493	500	491	486	483	483	482	477	472	471	472	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475
22	477	315	434	480	471	469	480	471	469	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471
23	478	101	389	461	465	470	477	466	461	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471
24	491	482	491	494	497	479	471	459	457	462	485	497	496	496	496	496	496	496	496	496	496	496	496	496	496	496	496	496	496	496	496	496
25	487	464	497	477	480	477	466	461	467	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470
26 *	477	477	477	479	477	477	479	477	477	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479
27 *	477	477	477	479	477	477	479	477	477	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479
28 *	477	477	477	479	477	477	479	477	477	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479
29 *	477	491	510	505	497	490	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479
30	479	454	506	498	487	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470
31 *	477	477	477	479	477	477	479	477	477	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479
Mean	444	455	475	487	482	471	463	462	465	472	472	472	472	472	472	472	472	472	472	472	472	472	472	472	472	472	472	472	472	472	472	472
Mean *	478	479	497	498	494	486	477	472	473	474	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478
Mean #	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478
Mean #	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478
Mean #	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478
a Means of 9 values	b Means of 8 values	c Means of 4 values	d Mean of 25 complete days only	e Ten least disturbed days	f Five international quiet days	g Five international disturbed days	h Approximate	274																								

474^d DESIGNATIONS 274474^e DESIGNATIONS 274474^f DESIGNATIONS 274474^g DESIGNATIONS 274474^h DESIGNATIONS 274

TABLE 24
HOURLY VALUES OF HORIZONTAL INTENSITY
18000 plus tabular quantities expressed in gammas

APRIL 1954

G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range
1 * /	497(499 502)	504	491	478	467	460	463	467	474	460	487	489	491	489	488	491	497	494	496	488	459	485	485	21 43	(522)	22 05	(1447)	(075)	
2 *	480	491	497	491	486	477	464	459	461	476	472	470	467	462	460	458	456	454	452	451	450	452	451	452	451	452	23 4	302	
3 *	489	499	503	498	484	469	465	469	473	489	488	489	487	480	487	482	472	472	459	459	458	462	453	454	453	454	145	369	
4	476	497	490	49	470	454	451	460	461	462	475	479	466	488	487	466	476	477	490	494	451	467	464	475	20 05	352	21 12	189	
5 *	471	487	499	502	489	480	477	461	447	469	468	473	479	482	482	488	489	489	489	489	491	489	482	481	481	481	441	666	
6 *	460	487	498	503	493	484	477	467	466	469	471	471	482	488	487	489	488	489	489	490	488	490	489	488	488	488	489	066	
7 *	469	481	490	495	494	482	469	459	463	471	479	482	486	486	485	484	487	496	517	479	492	488	486	486	486	486	486	029	
8	490	492	496	498	490	481	471	468	472	479	484	487	481	479	472	479	484	487	496	517	479	492	488	484	484	484	484	484	029
9	458	456	473	498	489	479	470	470	471	472	486	479	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	238	
10	491	491	499	493	494	489	481	477	474	484	485	480	482	493	495	487	488	488	489	498	504	489	489	489	489	489	489	489	168
11	453	472	489	496	491	486	481	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	106	
12 *	(-27)	494	499	504	495	475	454	440	430	457	457	472	472	478	523	470	475	485	477	479	479	479	479	479	479	479	479	106	
13	477	465	437	400	419	459	468	469	467	463	477	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	204	
14	481	465	427	402	465	484	495	489	469	451	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	125	
15	427	402	465	484	489	469	451	449	449	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	451	215	
16 *	482	484	492	495	490	480	468	426	474	478	481	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486	077	
17 *	482	491	494	493	489	479	468	468	476	478	481	481	481	481	481	481	481	481	481	481	481	481	481	481	481	481	481	161	
18	470	469	484	497	492	482	485	482	482	480	482	482	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	217	
19	492	496	492	492	493	487	497	492	493	487	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	175	
20	488	493	489	457	465	459	455	462	468	471	479	487	486	487	492	491	493	516	516	516	516	516	516	516	516	516	336		
21	468	481	489	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	336	
22 *	476	476	450	471	498	483	479	477	470	471	482	486	484	484	484	484	484	484	484	484	484	484	484	484	484	484	484	123	
23 *	457	456	464	480	507	500	481	461	461	467	476	476	473	483	483	483	483	483	483	483	483	483	483	483	483	483	483	437	
24 *	489	489	470	457	492	489	480	481	478	472	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	187	
25 *	452	479	492	498	492	488	476	468	475	478	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	230	
26	477	461	439	470	475	481	476	475	475	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	230	
27	297	367	378	479	488	490	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	372	
28 *	454	480	491	499	492	487	480	477	476	481	486	487	487	489	489	489	489	489	489	489	489	489	489	489	489	489	489	077	
29 *	442	485	499	499	492	487	482	477	477	478	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	090	
30	493	492	488	479	479	476	471	457	449	469	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	471	090	
31																													081

Mean	447	460	467	474	482	478	468	463	465	471	477	484	487	487	484	490	492	491	490	492	497	494	492	497	494	494	494	475 ^d	DESIGNATIONS
Mean *	469	485	491	496	492	483	474	467	466	472	478	484	487	489	489	490	490	492	492	496	499	483	481	481	481	481	481	481	202
Mean *	463	485	495	499	492	484	475	468	471	476	480	486	489	491	491	492	490	494	494	494	494	494	494	494	494	494	494	79	
Mean *	336	351	383	389	459	466	458	451	461	466	474	484	493	479	479	486	488	486	494	494	494	494	494	494	494	494	494	494	
a. Means of 9 values	b. Means of 8 values	c. Means of 4 values	d. Mean of 29 complete days only	e. Approximate	f. Approximate	g. Approximate	h. Approximate	i. Approximate	j. Approximate	k. Approximate	l. Approximate	m. Approximate	n. Approximate	o. Approximate	p. Approximate	q. Approximate	r. Approximate	s. Approximate	t. Approximate	u. Approximate	v. Approximate	w. Approximate	x. Approximate	y. Approximate	z. Approximate	aa. Approximate			

MAY 1954

TABLE 25
HOURLY VALUES OF HORIZONTAL INTENSITY
18000 plus tabular quantities expressed in gammas

G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range
1 * #	4.79	4.67	4.80	4.91	4.99	4.96	4.85	4.79	4.76	4.79	4.85	4.89	4.90	4.90	4.90	4.91	4.91	4.89	4.89	4.90	4.90	4.91	4.91	4.87	0.05	0.01	5.02	0.1 0.3 4.59	
2	4.74	4.88	4.98	5.00	4.98	4.97	4.84	4.74	4.77	4.77	4.77	4.71	4.71	4.72	4.65	4.69	4.72	4.79	4.81	4.89	4.91	4.92	4.92	4.89	0.03	0.01	5.06	0.0 2.23	
3	4.96	5.05	5.07	5.09	5.10	4.97	4.76	4.78	4.85	4.92	4.98	4.97	4.91	4.91	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.89	0.03	0.01	5.29	0.0 2.23	
4	4.81	4.88	4.92	4.98	4.97	4.92	4.78	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.87	4.87	4.87	4.88	4.88	4.88	4.88	4.88	4.88	4.86	0.02	0.01	5.09	0.0 2.23
5	4.76	4.60	4.76	4.89	4.92	4.94	4.86	4.78	4.82	4.82	4.82	4.86	4.86	4.86	4.86	4.87	4.87	4.87	4.88	4.88	4.88	4.88	4.88	4.88	4.86	0.01	0.01	5.09	0.0 2.23
6 *	4.95	4.97	4.99	5.00	5.03	4.97	4.83	4.79	4.79	4.77	4.79	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.88	4.88	4.88	4.88	4.88	4.88	4.86	0.01	0.01	5.09	0.0 2.23
7 *	4.93	4.81	4.88	4.91	5.00	4.99	4.92	4.84	4.78	4.79	4.86	4.86	4.86	4.86	4.86	4.87	4.87	4.87	4.88	4.88	4.88	4.88	4.88	4.88	4.86	0.01	0.01	5.09	0.0 2.23
8	4.27	4.48	4.79	4.92	4.88	4.87	4.74	4.78	4.78	4.77	4.72	4.76	4.76	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.80	0.01	0.01	5.09	0.0 2.23
9	4.98	4.97	4.89	4.91	4.96	4.98	4.81	4.82	4.82	4.82	4.82	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.87	0.01	0.01	5.09	0.0 2.23
10	4.66	4.18	4.40	4.71	4.74	4.76	4.72	4.72	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.72	0.01	0.01	5.09	0.0 2.23
11	4.60	4.97	4.98	5.03	5.04	5.05	4.90	4.85	4.82	4.80	4.75	4.80	4.78	4.76	4.74	4.72	4.70	4.68	4.66	4.64	4.62	4.60	4.58	4.56	4.54	0.01	0.01	5.09	0.0 2.23
12	4.73	4.81	4.83	4.97	4.98	4.89	4.88	4.87	4.85	4.82	4.82	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.79	0.01	0.01	5.09	0.0 2.23
13	4.54	4.59	4.67	4.77	4.87	4.93	4.76	4.79	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.78	0.01	0.01	5.09	0.0 2.23
14	4.88	4.87	4.98	5.08	5.02	4.92	4.86	4.79	4.75	4.77	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.84	0.01	0.01	5.09	0.0 2.23
15 *	4.53	4.74	4.77	4.89	4.85	4.78	4.81	4.79	4.77	4.77	4.77	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.84	0.01	0.01	5.09	0.0 2.23
16 *	4.99	4.98	4.97	5.00	5.06	5.05	4.94	4.94	4.84	4.80	4.87	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.87	0.01	0.01	5.09	0.0 2.23
17 *	4.95	4.91	5.02	5.12	4.85	4.64	4.95	4.87	4.81	4.78	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.70	0.01	0.01	5.09	0.0 2.23
18	4.67	4.90	4.89	4.92	4.89	4.85	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.87	0.01	0.01	5.09	0.0 2.23
19	4.71	4.99	5.03	5.02	4.99	4.99	4.97	4.97	4.98	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.80	0.01	0.01	5.09	0.0 2.23
20	4.78	4.89	4.92	4.95	4.93	4.96	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.87	0.01	0.01	5.09	0.0 2.23
21	4.84	4.98	5.07	5.07	5.04	4.78	4.76	4.73	4.70	4.77	4.80	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.90	0.01	0.01	5.09	0.0 2.23
22 *	4.95	4.92	4.95	4.95	4.96	4.96	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.93	0.01	0.01	5.09	0.0 2.23
23	4.99	4.96	5.00	5.02	4.98	4.98	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.94	0.01	0.01	5.09	0.0 2.23
24 *	4.97	4.98	4.99	4.99	4.96	4.99	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.96	0.01	0.01	5.09	0.0 2.23
25 *	4.97	4.97	4.98	4.98	4.98	4.98	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.95	0.01	0.01	5.09	0.0 2.23
26 *	4.97	4.97	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.98	4.96	0.01	0.01	5.09	0.0 2.23
27 *	4.70	4.80	4.88	4.97	4.94	4.89	4.97	4.91	4.85	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.85	0.01	0.01	5.09	0.0 2.23
28	4.98	4.98	4.98	4.99	4.99	5.05	5.08	4.96	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.86	0.01	0.01	5.09	0.0 2.23
29	4.91	4.86	4.90	4.94	4.98	4.89	4.89	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.86	0.01	0.01	5.09	0.0 2.23
30 *	4.92	4.98	4.98	4.99	5.03	5.07	5.08	5.02	4.92	4.98	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.94	0.01	0.01	5.09	0.0 2.23
31	4.80	4.84	4.90	4.97	4.97	4.94	4.86	4.83	4.80	4.81	4.87	4.91	4.95	4.95	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.92	0.01	0.01	5.09	0.0 2.23
Mean	4.83	4.84	4.91	4.96	4.96	4.94	4.93	4.84	4.82	4.85	4.89	4.94	4.97	4.97	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.94	0.01	0.01	5.09	0.0 2.23
Mean *	4.92	4.90	4.94	4.98	5.01	4.99	4.90	4.83	4.80	4.84	4.88	4.89	4.94	4.96	4.96	4.97	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.94	0.01	0.01	5.09	0.0 2.23
Mean #	4.71	4.66	4.82	4.98	4.89	4.81	4.80	4.82	4.79	4.77	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.80	0.01	0.01	5.09	0.0 2.23
a Means of 9 values	b Means of 8 values	c Means of 4 values	d Mean of 4 values	e Values of 4 values	f Mean of 26 complete days only	g Approximate	h Designations	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	aa	bb	cc	dd

4.82 DESIGNATIONS 82
 4.91 * Ten least disturbed days 45
 4.92 # Five international quiet days 025
 4.92 c Five international disturbed days 040
 4.82 c Five international disturbed days 031

() Approximate

TABLE 26
HOURLY VALUES OF HORIZONTAL INTENSITY
 18000 plus tabular quantities expressed in g.
 JUNE 1954

18000 plus tabular quantities expressed in gammas G.M.T. used

MULTI-Y AGRI

TABLE 28
HOURLY VALUES OF HORIZONTAL INTENSITY
18000 plus tabular quantities expressed in gammas

AUGUST 1954

Day	G.M.T. used																								
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	490	494	494	496	496	499	507	506	497	484	469	477	491	483	482	499	498	495	495	497	497	497	497	493	493
2	*	496	497	489	458	483	490	486	481	483	482	499	498	496	491	497	497	497	497	497	497	497	497	497	497
3	*	495	495	497	495	509	502	509	505	497	478	476	485	491	492	492	482	489	488	493	497	497	497	497	497
4	*	499	499	499	502	507	505	497	478	476	485	491	492	497	497	497	497	497	497	497	497	497	497	497	497
5	*	497	494	489	499	488	497	499	490	489	488	489	491	491	490	494	499	499	499	499	499	499	499	499	499
6	#	469	476	478	497	504	504	506	488	461	471	487	498	488	480	498	496	498	497	497	497	497	497	497	497
7	*	475	492	496	500	496	494	492	488	486	474	457	477	511	502	522	497	494	505	506	510	494	494	494	494
8	*	468	486	497	502	505	495	478	478	481	481	477	497	491	487	495	497	495	497	495	497	495	497	495	497
9	*	502	500	497	509	512	502	(497)	489	484	484	487	495	497	491	487	495	497	495	497	495	497	495	497	495
10	*	471	503	510	509	502	499	482	478	480	481	478	489	490	491	491	497	495	497	495	497	495	497	495	497
11	*	497	488	478	491	506	508	491	477	479	479	497	479	499	496	498	498	497	497	497	497	497	497	497	497
12	*	483	468	482	507	508	502	497	489	479	472	481	490	496	498	495	496	494	492	497	497	497	497	497	497
13	*	496	497	499	504	508	498	492	488	480	479	481	491	498	499	497	497	497	497	497	497	497	497	497	497
14	*	458	469	496	508	511	508	499	486	480	482	481	492	495	494	497	495	495	493	495	495	495	495	495	495
15	*	477	492	497	503	511	514	512	492	482	479	479	490	495	498	498	492	495	492	495	492	495	492	495	492
16	*	497	499	507	516	520	516	506	488	481	478	478	485	492	492	492	492	492	492	492	492	492	492	492	492
17	*	492	492	498	499	502	504	487	478	458	479	469	478	478	478	478	478	478	478	478	478	478	478	478	478
18	*	490	491	503	503	504	503	481	476	478	478	482	478	478	478	478	478	478	478	478	478	478	478	478	478
19	*	471	467	497	499	502	496	488	489	489	489	481	488	481	488	481	488	481	488	481	488	481	488	481	488
20	*	471	468	498	510	507	496	488	491	487	481	482	489	482	492	492	492	492	492	497	497	497	497	497	497
21	*	499	500	503	511	514	512	512	492	482	479	479	479	479	479	479	479	479	479	479	479	479	479	479	
22	#	464	343	379	474	460	471	479	471	479	472	482	480	483	488	487	494	491	494	494	494	494	494	494	494
23	*	484	464	474	496	502	499	497	491	484	481	471	484	486	487	490	489	492	498	509	499	492	491	491	491
24	*	489	477	484	484	500	503	502	508	498	489	483	479	479	479	479	479	479	479	479	479	479	479	479	479
25	*	410	481	499	502	508	498	478	483	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479	479
26	*	492	496	500	500	508	502	504	481	487	481	480	479	483	489	484	480	499	495	495	495	495	495	495	495
27	*	444	392	472	502	514	507	494	489	484	477	472	481	489	480	489	482	492	490	491	491	491	491	491	491
28	*	431	357	469	470	487	491	475	471	479	471	482	479	471	481	491	492	492	492	492	492	492	492	492	492
29	*	377	354	489	471	480	481	466	464	467	466	472	484	495	486	478	471	478	477	492	491	491	491	491	491
30	*	478	359	480	499	499	488	477	468	471	471	478	477	471	478	477	481	487	488	487	487	487	487	487	487
31	*	474	476	492	505	508	499	488	478	470	460	480	487	491	487	488	487	481	481	481	481	481	481	481	481
Mean		476	476	488	496	502	498	491	486	479	478	476	479	487	493	492	495	494	495	496	496	496	496	496	496
Mean *		487	491	495	502	507	504	497	488	483	482	483	489	494	494	495	496	498	495	501	504	497	496	493	492
Mean #		495	494	496	500	506	503	497	488	486	485	484	489	494	497	496	496	498	498	503	505	497	497	497	497
Mean #		458	449	466	490	494	476	475	473	470	474	479	486	490	487	492	491	494	491	496	507	486	480	474	474

a Means of 9 values b Means of 8 values c Means of 4 values

DESIGNATIONS

* Ten least disturbed days

Five international quiet days

Five disturbed days

() Approximate

TABLE 31
HOURLY VALUES OF VERTICAL INTENSITY
47000 plus tabular quantities expressed in gammas

Day	G.M.T. used																																
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range				
1 *	232	222	218	217	217	226	225	229	235	241	250	254	251	249	245	243	243	242	240	244	238	210	207	210	233	11	21	256	200	056			
2 #	204	173	188	203	207	220	228	236	241	246	250	252	253	256	263	262	263	269	254	251	249	207	209	213	241	14	49	256	01	158			
3 *	225	231	236	235	237	244	245	250	252	250	256	252	253	253	253	253	253	253	253	250	244	238	245	247	247	244	243	14	01	237			
4 * #	241	245	249	241	242	246	248	246	244	249	251	253	253	253	253	253	253	253	253	250	244	238	249	249	249	248	247	14	01	057			
5 #	211	212	216	218	217	215	214	215	217	214	216	217	215	215	214	214	214	215	216	217	216	216	217	217	217	217	217	18	25	256	00	00	
6 #	190	216	224	228	250	229	232	237	239	244	246	250	255	253	253	257	278	276	269	263	261	256	250	244	244	245	15	51	290	00	00		
7 #	230	216	246	244	241	244	244	250	252	251	250	250	251	250	250	250	250	250	250	250	250	250	250	250	250	250	250	18	12	312	23	45	
8 #	230	216	213	226	231	231	229	226	230	238	250	241	247	248	248	247	248	248	248	248	248	248	248	248	248	248	19	40	266	24	00		
9 #	204	224	232	241	239	240	236	234	235	241	244	244	247	256	260	260	256	256	254	244	235	236	238	242	16	03	263	00	13				
10 *	236	243	242	248	247	248	248	247	247	247	247	247	247	250	253	250	256	256	256	256	256	256	256	256	256	256	252	14	04	194	069	069	
11 #	248	246	243	244	243	244	247	243	247	247	247	247	247	247	247	247	247	247	247	247	247	249	249	249	249	249	249	18	02	21	08	033	
12 #	219	228	206	205	206	222	229	232	210	250	255	259	264	266	273	271	273	278	284	280	278	286	280	285	285	285	285	18	02	191	083	083	
13 #	214	228	228	206	205	205	205	222	229	232	210	250	255	259	259	257	256	256	253	250	250	250	250	250	250	250	250	16	05	353	00	00	
14 *	222	235	240	241	241	241	241	244	244	245	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	20	06	239	11	18	
15 #	219	227	233	238	238	237	236	236	237	236	236	236	236	236	236	236	236	236	237	237	237	237	237	237	237	237	237	18	30	281	22	53	
16 #	163	193	213	222	226	228	236	234	234	241	242	241	249	253	255	253	255	253	251	250	253	270	241	232	232	231	230	230	11	39	253	23	32
17 #	241	244	244	244	244	244	244	244	244	243	243	243	247	250	250	250	256	256	262	251	241	229	216	223	242	17	23	276	21	43			
18 #	229	231	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	12	23	293	22	37	
19 #	100	055	148	192	222	231	233	235	244	244	245	246	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	17	03	320	22	45	
20 #	075	079	167	216	231	246	252	257	252	257	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	17	02	326	21	50	
21 #	197	157	183	208	224	229	237	237	241	246	249	250	250	257	257	256	256	256	256	256	256	256	256	256	256	256	256	17	08	303	21	291	
22 #	171	205	216	210	213	213	213	227	225	241	241	241	247	255	255	252	257	271	269	282	271	270	268	268	268	268	268	17	08	303	23	42	
23 #	240	247	235	220	231	242	246	253	238	246	246	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	16	06	270	21	45	
24 #	237	232	238	246	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	16	15	278	03	20	
25 #	242	238	232	233	235	235	235	235	235	243	245	244	248	248	247	247	247	247	247	247	247	247	247	247	247	247	247	16	49	(290)	17	37	
26 #	247	247	248	250	251	251	251	251	251	251	251	251	251	251	251	251	251	251	251	251	251	251	251	251	251	251	251	18	39	263	04	39	
27 #	250	249	247	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	18	39	285	20	00	
28 #	247	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	18	39	253	02	21	
29 #	247	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	18	39	254	05	19	
30 #	243	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	242	18	39	254	05	19	
31 #	226	237	242	248	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	18	39	254	05	19	
Mean	216	217	226	232	235	238	240	243	245	249	250	252	255	258	259	264	264	264	265	265	264	264	263	258	246	234	218	207	207	241	DESIGNATIONS	114	
Mean *	240	241	241	242	242	243	243	243	244	244	247	249	249	251	252	253	254	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
Mean #	243	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245	245
Mean #	163	142	184	208	223	234	239	244	246	246	247	249	249	250	251	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252
a Means of 9 values	b Means of 8 values	c Means of 4 values	d Mean of 4 values	e Mean of 29 complete days only	f Five international quiet days	g Five international disturbed days	h Five international disturbed days	i Approximate	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	aa	ab	ac	ad	ae			

NOTE. A PROVISIONAL CORRECTION OF -12 GAMMAS SHOULD BE APPLIED TO ALL VALUES OF VERTICAL INTENSITY IN THIS REPORT (See p. 4).

TABLE 32
HOURLY VALUES OF VERTICAL INTENSITY

TABLE 33.
HOURLY VALUES OF VERTICAL INTENSITY
47000 plus tabular quantities expressed in
MARCH 1954

NOTE. A PROVISIONAL CORRECTION OF -12 GAMMAS SHOULD BE APPLIED TO ALL VALUES OF VERTICAL INTENSITY IN THIS REPORT (See p-4).

TABLE 34
HOURLY VALUES OF VERTICAL INTENSITY

APRIL 1954

NOTE. A PROVISIONAL CORRECTION OF -12 GAMMAS SHOULD BE APPLIED TO ALL VALUES OF VERTICAL INTENSITY IN THIS REPORT (See p.4).

TABLE 35.
HOURLY VALUES OF VERTICAL INTENSITY

AY 1951

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range		
1 *	267	265	266	275	277	279	280	284	282	281	284	281	282	283	285	284	285	282	285	284	285	282	280	279	(279)	280	06 30	345	01 48	261	
2 *	265	265	269	276	283	282	285	287	285	281	275	275	273	275	279	277	279	288	292	295	298	291	281	266	273	281	18 10	302	00 53	261	
3 *	271	274	278	281	284	287	286	287	285	278	277	278	276	275	278	282	281	284	288	294	297	314	282	281	266	271	279	18 40	329	22 51	113
4 *	272	269	269	273	280	285	288	292	291	291	285	283	282	284	284	282	282	284	286	284	282	282	282	281	282	282	07 35	294	01 46	266	
5 *	282	283	283	286	289	293	286	285	284	286	282	285	286	285	284	281	280	282	282	282	284	281	280	280	280	06 15	293	00 35	279		
6 *	278	275	274	275	275	282	285	286	286	285	284	285	286	286	286	286	286	286	286	286	286	286	286	286	286	280	16 05	367	24 00	151	
7 *	158	190	211	218	261	277	291	292	294	298	298	297	297	302	306	304	305	301	295	298	280	280	275	275	275	17 00	316	00 35	191		
8 *	10	284	284	285	285	288	287	289	288	289	289	288	289	288	288	289	289	291	290	294	293	290	292	291	290	291	253	229	19 50	205	
9 *	11	233	206	193	223	234	252	269	270	283	288	288	291	296	294	293	290	294	293	290	294	293	290	291	290	291	261	250	224	125	
10 *	12	224	248	265	275	276	276	275	277	277	279	283	283	286	285	283	283	285	289	293	293	298	290	272	273	274	13 07	273	00 00	207	
11 *	13	268	261	267	273	273	277	276	277	277	282	282	282	282	282	282	282	282	289	291	291	289	290	290	290	290	18 00	302	02 17	238	
12 *	14	263	254	252	264	271	273	276	277	277	280	282	284	284	285	284	284	285	288	288	288	285	283	275	266	264	16 55	290	02 23	247	
13 *	15	270	270	272	276	279	279	283	283	282	282	274	274	276	280	274	274	276	280	289	293	293	282	276	275	275	18 45	297	03 35	199	
14 *	16	220	237	257	264	270	272	272	274	274	273	273	274	274	274	274	274	275	281	282	285	280	275	270	273	275	18 15	288	00 35	197	
15 *	17	274	275	276	277	279	279	276	276	276	276	276	276	276	276	276	276	275	278	279	280	283	281	276	272	272	276	22 45	285	02 15	215
16 *	18	274	274	272	272	272	263	261	269	270	270	270	270	270	270	270	270	270	275	275	275	275	275	275	275	275	274	15 50	326	03 50	209
17 *	19	209	237	261	274	285	291	292	291	287	270	286	285	286	297	291	290	294	292	293	294	295	293	291	291	291	251	224	202	110	
18 *	20	199	215	233	251	267	271	278	279	282	283	283	283	284	285	283	283	284	286	287	287	286	287	287	287	287	274	15 50	309	03 50	199
19 *	21	257	265	271	275	279	284	287	290	297	277	277	276	276	274	274	274	275	278	279	280	281	276	272	272	272	276	18 15	285	02 30	224
20 *	22	257	266	271	275	279	284	287	290	297	296	296	296	296	296	296	296	296	297	297	297	297	297	297	297	297	297	19 05	301	23 30	224
21 *	23	244	260	271	283	289	292	290	294	293	293	293	293	293	293	293	293	293	292	292	292	292	292	292	292	292	292	07 30	296	00 25	225
22 *	24	283	285	286	289	292	290	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	07 30	296	22 40	215
23 *	25	278	279	280	282	285	288	289	291	291	291	292	290	289	288	287	287	287	286	286	286	286	286	286	286	286	286	09 40	284	02 00	271
24 *	26	259	258	261	265	272	277	280	282	286	286	286	287	287	287	287	287	287	289	289	289	289	289	289	289	289	289	17 05	302	03 00	264
25 *	27	259	287	287	287	285	284	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	18 30	286	02 00	254
26 *	28	273	258	258	261	265	272	277	280	282	286	286	287	287	287	287	287	287	289	289	289	289	289	289	289	289	289	18 30	290	00 50	254
27 *	29	287	287	287	287	285	284	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283	19 25	307	02 20	265
28 *	30	273	258	258	261	265	272	277	280	282	286	286	287	287	287	287	287	287	289	289	289	289	289	289	289	289	289	273	268	272	289
29 *	31	288	290	291	292	292	292	291	288	287	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	18 50	302	21 50	274
Mean	258	262	267	273	279	281	284	286	285	286	285	285	286	285	285	286	287	288	284	283	284	285	285	285	285	285	285	279	261	254	77
Mean *	266	268	261	276	280	282	284	286	286	284	284	284	284	284	284	284	284	284	284	284	284	284	284	284	284	284	284	279	276	274	280
Mean *	275	275	276	280	282	284	285	286	284	284	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	278	276	274	281
Mean *	234	236	238	254	262	271	281	284	284	285	285	288	292	296	295	295	295	295	296	296	296	296	296	296	296	296	296	278	276	274	281
Mean *	234	236	238	254	262	271	281	284	284	285	285	288	292	296	295	295	295	295	296	296	296	296	296	296	296	296	296	278	276	274	281

NOTE. A PROVISIONAL CORRECTION OF -12 GAMMAS SHOULD BE APPLIED TO ALL VALUES OF VERTICAL INTENSITY IN THIS REPORT (See p. 4).

TABLE 36
HOURLY VALUES OF VERTICAL INTENSITY
47000 Plus tabular quantities expressed in gammas

Day	JUNE 1954												G.M.T. used																		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range		
1 *	284	288	288	293	296	296	291	291	291	290	288	286	288	290	292	297	296	296	293	292	291	291	291	291	291	16 50	304	00 00	280		
2	289	290	292	293	295	295	293	290	290	287	290	289	284	284	287	285	287	287	290	290	292	291	291	291	291	17 35	304	00 00	283		
3	286	287	290	291	292	294	295	295	293	290	290	287	284	284	287	285	287	287	290	290	292	291	291	291	291	16 35	299	21 35	274		
4 *	282	280	281	284	284	287	291	293	292	292	292	292	289	289	287	287	287	287	290	290	292	291	291	291	291	18 38	300	21 00	271		
5 *	280	282	285	287	290	293	292	292	292	292	292	292	286	284	283	283	285	285	293	293	293	293	293	293	293	17 00	295	00 00	279		
6 *	278	280	282	284	285	286	289	286	285	285	287	286	288	287	287	288	287	287	290	290	290	290	290	290	290	287	287	278	279		
7 *	278	280	282	284	285	286	289	286	285	285	287	286	288	287	287	288	287	287	290	290	290	290	290	290	290	285	285	280	285		
8 *	280	281	281	282	283	283	285	285	287	288	287	286	286	285	285	285	284	284	284	285	285	285	284	284	285	284	288	00 00	279	00 09	286
9	284	283	280	281	283	284	285	285	285	285	285	284	284	285	285	285	285	285	283	283	284	283	283	283	283	282	282	282	285		
10	271	265	263	269	277	277	280	274	279	285	286	288	289	287	287	287	287	295	295	297	297	297	297	297	297	280	280	280	285		
11 *	275	284	287	292	291	291	292	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	16 57	321	01 47	255		
12 *	291	292	293	293	293	294	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	286	286	286	286		
13 *	291	292	293	293	293	294	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	286	286	286	286		
14 *	286	285	284	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	284	284	284	285		
15 *	281	284	284	284	286	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	284	284	284	284		
16 *	283	283	282	284	283	283	284	284	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	284	284	284	284		
17 *	278	282	286	289	290	291	293	295	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	285	285	285	285		
18	229	240	248	256	271	283	290	292	297	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	287	287	287	287		
19	297	296	295	294	293	293	292	292	290	291	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290		
20	282	295	289	292	293	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292		
21	299	300	303	304	304	301	301	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300		
22	284	286	286	287	289	289	290	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	288	288	288	288		
23 *	297	296	295	294	293	293	292	292	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290		
24 *	273	276	269	280	293	297	295	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292		
25 *	299	300	303	304	304	301	301	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300		
26	284	286	286	287	289	289	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290		
27	299	300	303	304	304	301	301	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300		
28	299	300	303	304	304	301	301	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300		
29 *	284	286	286	287	289	289	290	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289		
30	299	300	303	304	304	301	301	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300		
31	284	286	286	287	289	289	290	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289		
Mean	284	286	286	287	289	289	290	289	289	289	289	289	289	289	289	289	289	289	290	290	290	290	290	290	290	288 ^d	288 ^d	288 ^d	288 ^d		
Mean *	297	296	295	294	293	293	292	292	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	
Mean /	278	280	282	284	286	288	290	292	294	296	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	
Mean #	299	300	303	304	304	301	301	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	
a Means of 9 values	b Means of 8 values	c Means of 4 values	d Mean of 13 complete days only																												

29

DESIGNATIONS

Ten least disturbed

days

/ Five international

quiet days

Five international

disturbed days

() Approximate

NOTE. A PROVISIONAL CORRECTION OF -12 GAMMAS SHOULD BE APPLIED TO ALL VALUES OF VERTICAL INTENSITY IN THIS REPORT. (See p.4).

TABLE 37
HOURLY VALUES OF VERTICAL INTENSITY
47000 plus tabular quantities expressed in gammas

Day	G.M.T. used																								
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	237	259	273	290	297	299	294	297	302	305	306	314	310	312	312	312	312	312	312	312	312	312	312	312	312
2	*	298	299	300	301	301	302	299	297	295	293	294	294	294	294	294	294	294	294	294	294	294	294	294	294
3	*	295	295	296	296	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297
4	*	295	295	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297
5	*	299	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298
6	*	295	297	299	300	301	301	302	302	302	302	302	302	302	302	302	302	302	302	302	302	302	302	302	302
7	308	295	294	303	305	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304
8	*	294	297	298	300	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298
9	*	292	294	297	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298
10	*	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294
11	*	285	281	284	282	282	285	287	288	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
12	*	242	276	286	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
13	*	283	279	284	285	275	281	295	297	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298
14	*	283	279	284	285	275	281	295	297	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298
15	*	290	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
16	*	223	234	260	264	269	277	281	285	288	290	292	294	294	294	294	294	294	294	294	294	294	294	294	294
17	*	223	234	260	264	269	277	281	285	288	290	292	294	294	294	294	294	294	294	294	294	294	294	294	294
18	*	265	263	273	286	289	291	293	297	300	300	297	295	295	295	295	295	295	295	295	295	295	295	295	295
19	*	288	278	285	290	291	291	292	293	294	295	296	296	296	296	296	296	296	296	296	296	296	296	296	296
20	*	293	292	287	287	291	291	291	292	293	294	295	295	295	295	295	295	295	295	295	295	295	295	295	295
21	*	282	287	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
22	*	297	296	294	292	292	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
23	*	291	267	25	275	277	279	280	282	285	287	291	291	291	291	291	291	291	291	291	291	291	291	291	291
24	*	291	290	289	289	287	286	285	284	283	282	277	277	277	277	277	277	277	277	277	277	277	277	277	277
25	*	271	272	282	283	284	284	285	285	285	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286
26	*	288	285	280	274	278	280	283	285	286	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287
27	*	240	260	274	274	274	274	274	274	274	274	274	274	274	274	274	274	274	274	274	274	274	274	274	274
28	*	254	257	258	275	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282
29	*	277	261	265	271	275	277	281	283	283	284	285	285	285	285	285	285	285	285	285	285	285	285	285	285
30	*	295	297	273	278	280	284	285	285	285	285	287	287	287	287	287	287	287	287	287	287	287	287	287	287
Mean	*	277	279	282	286	287	288	289	291	292	293	295	296	296	298	301	299	300	299	296	291	287	285	291	291
Mean	*	295	296	297	296	297	296	298	298	297	296	295	294	294	294	295	296	296	295	294	294	294	294	294	294
Mean	#	264	274	279	282	283	280	281	284	287	289	292	297	306	306	310	320	306	300	299	296	294	294	294	294
Mean	#	a	Means of 9 values	b	Means of 8 values	c	Means of 4 values	d	Mean of 4 values	e	Mean of 21 complete days only	f	Mean of 21 complete days only	g	Mean of 21 complete days only	h	Mean of 21 complete days only	i	Mean of 21 complete days only	j	Mean of 21 complete days only	k	Mean of 21 complete days only	l	Mean of 21 complete days only

47000 plus tabular quantities expressed in gammas

47000 plus tabular

TABLE 38

AUGUST 1954
47000 plus tabular quantities expressed in gammas

Day	G. M. T. used																										
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	273	276	280	283	285	285	285	285	286	286	289	290	292	291	301	308	306	307	308	304	304	294	288	283	283		
2	283	285	285	281	271	275	280	289	290	290	291	290	290	289	289	290	296	300	303	314	312	306	298	295	290	292	
3	*	285	282	284	286	287	287	284	284	285	287	290	289	289	289	289	294	294	297	304	312	311	314	308	305	305	
4	*	280	283	284	283	284	285	285	286	286	285	286	289	289	289	289	294	294	297	304	312	311	314	308	305	305	
5	*	291	289	287	287	285	286	286	285	286	285	286	289	291	293	293	295	295	295	305	317	308	324	324	324	324	
6	#	257	271	289	293	292	290	289	289	289	287	271	276	281	283	288	289	293	293	305	311	308	314	314	314	314	
7	7	8	*	#	283	282	287	287	287	285	284	284	284	284	284	284	284	284	284	284	291	295	294	294	294	294	294
8	9	290	290	290	287	287	285	284	284	284	284	284	284	284	284	284	284	284	284	291	290	290	290	290	290	290	
9	10	*	245	272	285	285	285	284	284	284	284	284	284	284	284	284	284	284	284	291	294	294	294	294	294	294	294
11	*	267	271	270	270	274	280	283	288	288	288	291	293	290	292	294	294	295	295	304	304	304	297	297	297	297	297
12	*	289	281	281	286	288	289	291	293	290	292	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	
13	*	289	292	293	293	294	295	297	297	295	295	293	293	291	291	289	287	287	288	291	293	293	293	293	293	293	
14	15	*	270	251	269	280	285	285	285	285	285	285	285	285	285	285	285	285	285	285	292	292	292	292	292	292	292
15	*	245	269	280	287	289	288	289	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	
16	*	279	283	292	293	293	295	296	298	301	307	310	307	302	302	301	301	303	303	308	312	325	325	325	325	325	
17	17	279	289	292	295	296	298	298	298	298	298	298	298	298	298	298	298	298	298	301	313	308	303	303	303	303	
18	18	287	290	293	295	296	295	295	295	295	297	300	304	305	302	301	300	301	301	310	313	307	314	314	314	314	
19	269	267	283	288	289	291	292	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	
20	*	272	277	283	288	289	291	292	295	298	299	299	299	299	299	299	299	299	299	301	314	316	319	319	319	319	
21	*	296	293	293	293	293	292	290	290	288	292	297	308	313	307	305	305	305	304	302	300	308	298	298	298	298	
22	*	287	230	193	227	32	270	273	284	284	284	285	285	285	285	285	285	285	287	307	312	307	301	277	270	264	
23	*	273	272	275	282	284	286	288	292	295	295	296	296	296	296	296	296	296	296	309	318	329	329	329	329	329	
24	*	285	277	279	279	286	285	284	284	284	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	
25	*	232	266	292	299	298	298	298	298	298	303	305	303	304	305	303	303	304	304	305	307	310	310	310	308	308	
26	*	301	305	305	307	305	303	297	304	305	305	307	308	311	316	314	314	314	314	319	335	317	317	317	317	317	
27	*	273	206	253	201	281	281	281	281	281	281	281	281	281	281	281	281	281	281	281	281	281	281	281	281	281	
28	*	254	262	256	264	267	274	289	299	304	303	301	304	306	306	306	306	306	306	308	314	314	314	314	314	314	
29	*	212	213	280	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	309	319	319	319	319	319	319	
30	*	280	282	292	295	305	307	308	314	317	309	306	309	315	317	314	314	314	314	320	311	311	311	311	311	311	
31	*	287	290	300	302	306	309	315	317	314	313	311	311	311	311	311	311	311	311	325	325	325	325	325	325	325	
Mean	272	273	279	285	286	289	291	295	297	297	298	298	298	298	298	298	298	298	306	310	312	313	305	297	288	282	
Mean *	275	280	283	285	286	287	289	292	292	292	291	293	295	299	304	304	304	304	307	301	294	294	294	294	294	294	294
Mean #	286	286	287	287	287	288	289	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	
Mean #	264	260	262	271	273	282	286	290	295	299	302	300	301	311	321	313	315	313	318	309	295	271	271	271	271	271	

NOTE. A PROVISIONAL CORRECTION OF -12 GAMMAS SHOULD BE APPLIED TO ALL VALUES OF VERTICAL INTENSITY IN THIS REPORT (See p.4).

DESIGNATIONS

* Ten least disturbed days

Five international quiet days

† Five international disturbed days

() Approximate

TABLE 32
HOURLY VALUES OF VERTICAL INTENSITY
47000 plus tabular quantities expressed in
SEPTEMBER 1954

NOTE. A PROVISIONAL CORRECTION OF $-1^{\circ} 2$ GAMMAS SHOULD BE APPLIED TO ALL VALUES OF VERTICAL INTENSITY IN THIS REPORT (See p. 4).

TABLE 40
HOURLY VALUES OF VERTICAL INTENSITY

Day	47000 plus tabular quantities expressed in gammas																								G.M.T. used		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	#	211	227	216	239	249	279	298	326	342	351	360	354	344	337	333	347	335	273	320	318	298	283	291	304	301	
2	*	311	312	310	311	308	317	324	324	323	319	317	315	316	317	318	318	319	320	322	319	307	266	223	189	205	
3	*	170	201	192	230	252	269	269	299	310	311	308	308	310	315	345	354	373	377	361	324	305	194	133	130	277	
4	*	143	152	189	252	276	290	303	318	315	316	315	321	322	322	322	322	322	322	323	330	303	230	251	266	277	
5	*	297	314	313	312	316	317	319	320	320	324	311	345	344	395	411	434	392	296	312	307	286	275	286	301	328	
6	*	310	315	318	320	320	321	322	322	321	324	316	322	325	325	344	352	342	360	341	338	334	323	15	10	454	
7	*	310	315	318	320	320	321	322	322	321	324	316	322	325	325	344	352	342	360	341	338	334	323	16	40	(393)	328
8	*	312	315	316	315	311	314	314	312	313	314	314	315	314	316	315	317	318	319	320	320	320	319	318	316	310	
9	*	312	315	316	315	311	314	314	312	313	314	314	315	314	315	315	317	318	319	320	320	320	319	318	316	310	
10	*	313	316	315	316	314	314	314	314	315	315	317	314	314	315	315	317	324	325	326	326	326	321	317	318	315	
11	*	320	322	324	324	324	326	326	327	326	327	324	321	321	321	321	317	321	321	321	321	318	320	318	316	315	
12	*	316	318	319	321	324	324	324	324	325	325	319	315	315	315	315	315	315	315	315	315	315	315	315	315	315	
13	*	299	305	310	310	314	318	320	320	320	320	313	318	316	316	316	316	316	316	316	316	316	316	316	316	316	
14	*	304	310	311	312	313	314	316	314	313	313	313	311	314	314	314	314	314	314	314	314	314	314	314	314	314	
15	*	304	305	305	306	310	312	315	315	315	314	311	309	311	314	320	320	320	320	320	320	320	320	320	320	320	
16	*	316	318	318	312	313	313	314	314	314	315	314	318	321	321	321	321	321	321	321	321	321	321	321	321	321	
17	*	262	262	249	249	264	264	278	285	299	308	329	322	322	326	326	314	326	326	326	326	326	326	326	326	326	
18	*	302	314	323	320	320	322	322	322	322	322	322	327	327	327	327	327	327	327	327	327	327	327	327	327	327	
19	*	295	296	301	316	320	320	320	320	320	320	320	325	325	325	325	325	325	325	325	325	325	325	325	325	325	
20	*	307	311	315	319	321	320	320	320	320	320	323	327	327	327	327	327	327	327	327	327	327	327	327	327	327	
21	*	321	323	321	320	320	320	320	320	320	320	323	323	323	323	323	323	323	323	323	323	323	323	323	323	323	
22	*	321	323	321	319	317	317	319	317	319	319	353	353	359	387	386	375	398	381	348	277	233	236	258	161	016	
23	*	009	026	111	187	196	233	291	269	292	330	340	352	379	426	429	395	286	240	323	323	323	323	323	323	323	323
24	*	310	262	208	262	263	293	317	319	316	321	351	352	350	370	370	370	363	371	371	371	371	371	371	371	371	
25	*	301	311	318	320	320	320	320	320	320	320	324	324	324	324	324	324	324	324	324	324	324	324	324	324	324	
26	*	309	307	311	312	317	317	319	319	319	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320	
27	*	314	317	320	319	319	319	323	321	320	323	323	326	326	326	326	326	326	326	326	326	326	326	326	326	326	
28	*	272	254	256	255	277	255	311	315	315	318	319	316	316	316	316	316	316	316	316	316	316	316	316	316	316	
29	*	291	296	304	311	315	315	318	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	
30	*	291	296	304	311	315	315	318	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	
Mean	*	279	278	284	291	297	305	313	318	324	324	325	331	335	338	348	352	342	329	328	323	317	298	286	287	315 ^d	
Mean *	310	313	316	317	318	319	320	319	319	318	320	321	322	324	325	325	327	325	319	310	310	308	307	307	307	318 ^a	
Mean #	313	316	317	318	320	321	314	319	318	315	316	316	317	318	319	321	321	320	316	312	310	308	308	308	308	317 ^c	
Mean #	163	179	192	226	240	265	291	313	323	330	332	341	352	355	382	375	330	301	332	332	332	290	263	259	295 ^c	529	
a Means of 9 values	b Means of 8 values	c Means of 4 values	d Mean of 22 complete days only																								

NOTE. A PROVISIONAL CORRECTION OF -12 GAMMAS SHOULD BE APPLIED TO ALL VALUES OF VERTICAL INTENSITY IN THIS REPORT (See p. 4).

DESIGNATIONS

161

ten least disturbed

days

Five international

quiet days

Five international

disturbed days

() Approximate

values

days

TABLE 41

Summary of monthly mean values

Month	D	H	Z	D	H	Z	
1954	°	t	Y	°	t	Y	
All days							
January	-50	15.4	18491	-47241	-50	14.9	18496
February	-50	17.9	18478	-47241	x	x	-47246
March	-50	19.1	18474	-47248	x	x	x
April	-50	19.5	18475	-47266	-50	19.0	18484
May	-50	18.9	18489	-47279	-50	18.6	18491
June	-50	19.7	18495	-47288	x	x	-47280
July	-50	21.6	18493	-47291	-50	21.4	18495
August	-50	23.0	18490	-47294	-50	22.6	18494
September	-50	21.8	18482	-47311	-50	24.5	18487
October	-50	25.1	18482	-47315	-50	24.8	18490
Ten least disturbed days							
January	-50	14.8	18495	-47248	-50	17.2	18488
February	x	x	x	x	x	x	x
March	-50	18.6	18484	-47255	x	x	x
April	-50	18.9	18486	-47270	x	x	x
May	-50	18.7	18492	-47281	-50	19.0	18482
June	x	x	x	x	x	x	x
July	-50	21.3	18495	-47297	-50	21.5	18489
August	-50	22.4	18495	-47292	-50	23.4	18483
September	-50	24.3	18490	-47314	-50	26.2	18468
October	-50	24.5	18494	-47317	-50	26.0	18463

x Insufficient data

TABLE 42

Average of monthly mean values
(from January to October)

Year	D	H	Z
1954	°	t	Y
All days	-50	20.5	18485
Ten least disturbed days	-50	20.8 ^b	18491 ^b
Five international quiet days	-50	20.4 ^c	18491 ^c
Five international disturbed days	-50	22.2 ^a	18474 ^b

a Mean of 6 out of 10 months only.
 b Mean of 7 out of 10 months only.
 c Mean of 8 out of 10 months only.

TABLE 43

Sudden Commencements
(January to October)

Date	Time (G.M.T.)	Type	Date	Time (G.M.T.)	Type
1954	h m		1954	h m	
Jan. 2	01 11	Polar Sudden Commencement	April 18	19 16	Polar Sudden Commencement
" 2	14 14	Polar Sudden Commencement	" 20	17 35	Polar Sudden Commencement
" 5	20 36	Polar Sudden Commencement	" 26	19 28	Polar Sudden Commencement
" 11	17 55	Polar Sudden Commencement	" 27	19 15	Polar Sudden Commencement
" 11	21 09	Polar Sudden Commencement			
" 15	23 09	Polar Sudden Commencement *	May 4	21 16	Polar Sudden Commencement
" 16	18 15	Polar Sudden Commencement	" 8	15 48	Polar Sudden Commencement
" 17	17 15	Polar Sudden Commencement *	" 8	20 03	Polar Sudden Commencement
" 18	04 42	Storm Sudden Commencement (small impulse)	" 9	13 39	Polar Sudden Commencement *
" 25	16 35	Polar Sudden Commencement	" 24	18 15	Polar Sudden Commencement
" 30	21 11	Polar Sudden Commencement	" 25	19 52	Polar Sudden Commencement
" 31	16 05	Polar Sudden Commencement			
			June 10	16 45	Polar Sudden Commencement
Feb. 1	21 25	Polar Sudden Commencement	" 12	19 04	Polar Sudden Commencement
" 2	13 21	Polar Sudden Commencement	" 13	(17 30)	Polar Sudden Commencement
" 2	22 36	Polar Sudden Commencement	" 18	(20 24)	Polar Sudden Commencement
" 3	19 55	Polar Sudden Commencement	" 29	(22 45)	Polar Sudden Commencement *
" 4	16 20	Polar Sudden Commencement			
" 8	19 34	Polar Sudden Commencement	July 12	(23 10)	Polar Sudden Commencement
" 11	18 01	Polar Sudden Commencement	" 17	(23 48)	Polar Sudden Commencement
" 11	20 00	Polar Sudden Commencement	" 19	(19 42)	Polar Sudden Commencement
" 14	19 51	Polar Sudden Commencement	" 24	(18 42)	Polar Sudden Commencement
" 18	17 27	Polar Sudden Commencement	" 28	(16 07)	Polar Sudden Commencement
" 21	10 34	Storm Sudden Commencement			
" 28	20 25	Polar Sudden Commencement	Aug. 3	(20 03)	Polar Sudden Commencement
			" 6	(19 40)	Polar Sudden Commencement
March 1	21 25	Polar Sudden Commencement	" 21	(00 56)	Polar Sudden Commencement
" 2	17 56	Polar Sudden Commencement	" 26	(16 38)	Polar Sudden Commencement
" 4	20 50	Polar Sudden Commencement	" 26	(19 55)	Polar Sudden Commencement
" 5	22 27	Polar Sudden Commencement	" 27	(11 29)	Sudden Impulse
" 6	11 06	Solar Flare Effect	" 28	(23 31)	Polar Sudden Commencement
" 7	15 10	Polar Sudden Commencement	" 29	(18 19)	Polar Sudden Commencement
" 7	20 07	Polar Sudden Commencement	" 31	(21 24)	Polar Sudden Commencement
" 8	(19 45)	Polar Sudden Commencement			
" 9	17 15	Polar Sudden Commencement	Sept. 4	(15 45)	Polar Sudden Commencement
" 10	18 38	Polar Sudden Commencement	" 11	(17 22)	Polar Sudden Commencement
" 11	21 07	Polar Sudden Commencement	" 12	(19 35)	Polar Sudden Commencement
" 22	18 09	Storm Sudden Commencement	" 17	(19 39)	Polar Sudden Commencement
" 26	15 59	Polar Sudden Commencement	" 26	(17 38)	Polar Sudden Commencement
" 26	19 16	Polar Sudden Commencement			
" 27	18 23	Polar Sudden Commencement	Oct. 2	(21 05)	Polar Sudden Commencement
" 27	19 24	Polar Sudden Commencement	" 5	(19 33)	Polar Sudden Commencement
			" 10	(18 37)	Polar Sudden Commencement
April 2	20 24	Polar Sudden Commencement	" 21	(19 25)	Polar Sudden Commencement
" 3	21 50	Polar Sudden Commencement	" 23	(07 18)	Storm Sudden Commencement
" 4	20 50	Polar Sudden Commencement			
" 6	23 24	Polar Sudden Commencement			
" 7	18 40	Polar Sudden Commencement			
" 15	18 25	Polar Sudden Commencement			

* Polar Sudden Commencement is doubtful.

() Times in brackets accurate to ± 3 mins.

TABLE 144
Principal magnetic storms

Greenwich Date	Storm time				Sudden commencement			Degree of activity			Maximal activity on K-scale 0-9			Ranges		
	G.M.T. of beginning	G.M.T. of ending	Type	D	H	Z	Amplitudes	Gr.	Gr.	2-hour period	K-index	D	H	Z		
1954	h m	d n		'	Y							'	Y	Y		
January 18	04 42	24 20	SSC	+1	+5	-9	C	19	7	7	72	716	341			
February 15	04 14	16 03	***	***	***	***	C	15	5	6	47	649	340			
February 16	13 30	17 24	SSC	***	***	-3	C	16	7,8	7	77	747	296			
February 21	10 34	24 01	SSC	***	***	-3	B	21	7	8	146	900	482			
March 13	11 30	17 03	***	***	***	***	C	14	7	7	66	666	313			
March 17	14 24	18 21	SSC	***	***	+13	B	17	8	8	95	844	340			
March 22	18 07	25 04	SSC	***	***	-9	C	(25)	(7)	(6)	(76)	(445)	(260)			
April 11	(16 10)	14 16	***	***	***	***	B	12	1	7	(118)	886	-			
September 1	{07 40}	02 11	***	***	***	***	C	1	8	7	54	626	349			
September 6	{10 00}	08 06	***	***	***	***	C	6	7	8	66	1064	382			
September 20	{02 23}	22 21	***	***	***	***	B	20	7	8	98	1072	368			
September 29	{08 05}	01 23	***	***	***	***	C	29	7	7	109	749	353			
October 23	(07 18)	25 15	SSC	-2	-2	-4	B	23	7	7	142	1040	559			

φ Severe storm classified A. Moderately severe storm classified B. Moderate storm classified C.

() Times in brackets accurate to ± 5 minutes. Values in brackets are the greatest measured.

TABLE 45

Absolute values of components of the Earth's magnetic field
(Measured after cessation of continuous recording)

Date	Horizontal Intensity			Declination (West)		Vertical Intensity	
	Time h m	Value Y		Time h m	Value °	Time h m	Value Y
1954							
November 4	08 24	18485		09 03	50 22.5	09 04	-47330
" 19	07 18	18485		07 53	50 21.5	06 12	-47311
" 26	10 46	18481		11 23	50 20.1	09 35	-47316
December 4	10 14	18495		10 49	50 20.7	08 54	-47307
" 11	11 33	18484		12 10	50 23.7	10 20	-47319
" 18	11 29	18489		12 03	50 22.3	09 47	-47338
" 29	12 04	18486		12 31	50 23.3	11 09	-47331
1955							
January 6	11 47	18492		12 27	50 25.3	10 33	-47342
" 13	11 56	18481		12 24	50 25.1	11 07	-47352

