

Kodaikanal Observatory

Bulletin No. CXXXIX

PART I

Summary of prominence observations for the Second half of 1952.

This Bulletin is based upon the data computed from Kodaikanal observations during the second half of 1952 supplemented by those derived from the photographs obtained from the co-operating observatories of Mt. Wilson and Meudon for days on which Photographs were either incomplete or not possible at Kodaikanal.

During this period prominence photographs in the K line were taken at Kodaikanal on 124 days and these were supplemented by 49 photographs from Mt. Wilson and 29 from Meudon. In all data were available for 177 days which were counted as 169 effective days after weighting the photographs according to their quality.

The mean daily areas in square minutes of arc and the mean daily numbers computed from the combined observations as well as those derived from Kodaikanal photographs (116 effective days) are given below:—

	Combined data		Kodaikanal data	
	Mean daily areas	Mean daily numbers	Mean daily areas	Mean daily numbers
North	1.12	4.83	1.15	5.19
South	1.06	3.93	1.13	4.34
TOTAL	2.18	8.76	2.28	9.53

Compared with figures for the previous half year, the areas and numbers from the combined data show an increase of 1.8% and 30.5% respectively.

The latitudinal distribution of the areas and numbers in 5° zones is illustrated in diagram I where the full lines represent the areas and the broken lines the numbers. The curves show maxima of activity of prominence areas in the latitude zones 15°-20° and 40°-45° in the north and 15°-20° and 35°-40° in the south.

The monthly, quarterly and half-yearly mean areas, numbers, heights and extents of prominences are given in table I.

TABLE I

Months 1952	Number of days (effective)	Areas (Square minutes)	Numbers	Daily means		Mean height "	Mean extent °
				Areas (sq. min.)	Number		
July	30	62.40	202	2.08	6.73	44.4	3.54
August	30	68.15	291	2.24	9.70	40.5	2.73
September	28½	64.90	264	2.25	9.19	39.2	3.15
October	29½	64.30	273	2.20	9.33	39.1	2.68
November	23	48.20	204	2.09	8.87	33.6	2.91
December	28	59.85	253	2.14	9.07	40.6	3.10
3rd quarter	88½	195.45	757	2.20	8.53	41.2	3.07
4th quarter	80½	172.35	730	2.14	9.09	38.1	2.89
2nd half-year	169	367.80	1487	2.18	8.80	39.6	2.98

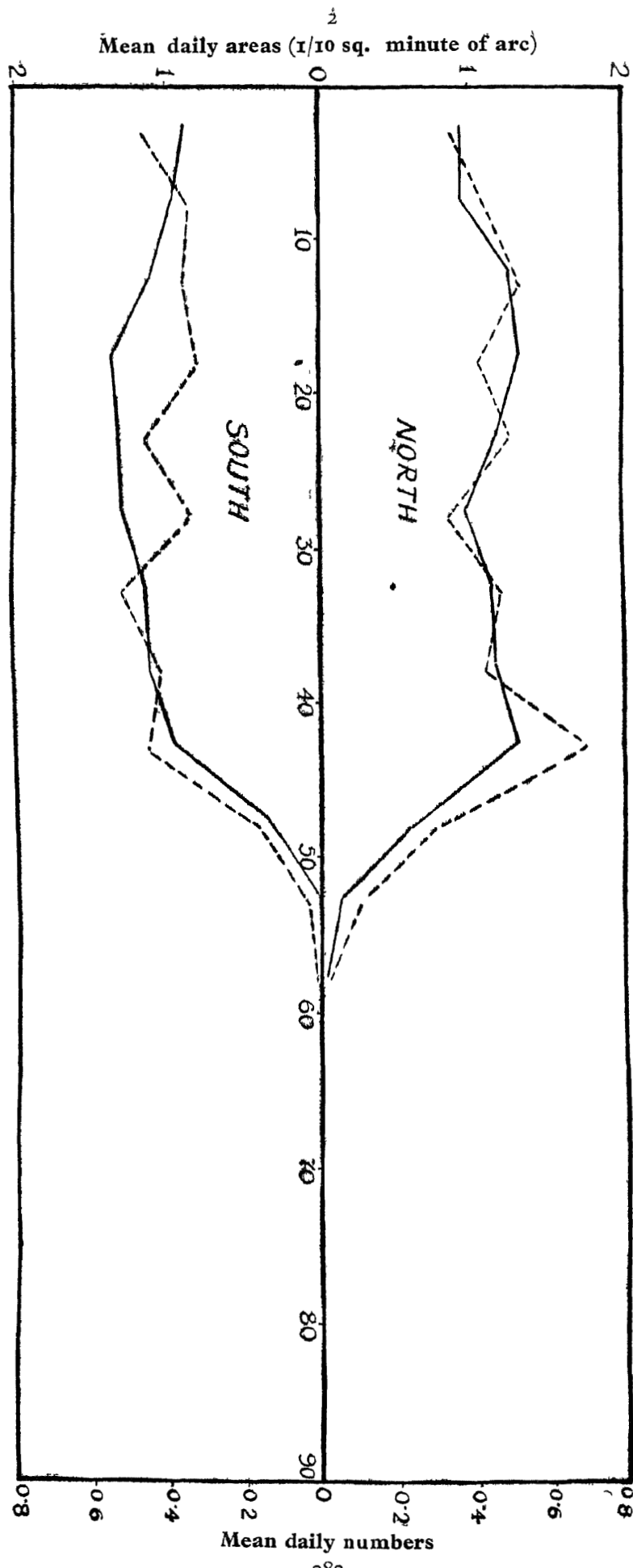


DIAGRAM 1
 Mean Areas and Mean Numbers
 of
 Calcium Prominences
 July to December 1952
 Mean Areas—Full line.
 Mean Numbers—Broken line.

The east-west distribution of prominence areas and numbers are given below:

	East	West	Percentage East
Total area (sq. minutes)	182.0	185.8	49.5
Total number	758	729	51.0

Observation with the prominence spectroscopie

Two metallic prominences were observed during the period. Details are given in Table II.

TABLE II

Date	Time I. S. T. (GMT + 5h 30m)	Base	Mean Latitude		Limb	Height in H-alpha	Lines in which observed.
			North	South			
Oct. 17	09 25	7°	16° 5	—	W	32"	D ₁ , D ₂ , 4923.92, 5234.62, 5316.61, 7065.20 b ₁ , b ₂ , 5015.68, 5275.25, 5362.86, b ₃ , b ₄ , 5018.43, 5275.99, 6678.10,
Nov. 15	08 30	3°	5° 5	—	E	27"	—do— —do— —do—

Particulars of displacements observed in the chromosphere and prominences with the spectroscopie are given in the following table:

Date	Time I. S. T.		Latitude		Limb.	Displacements			Remarks.
	h	m	North °	South °		Red	Violet	Both ways.	
August 5	08	03		4.5	E		0.5		At top
Oct. 3	08	10	10.5		E	1.0	0.5		Top displaced to red & bottom to violet, D ₂ displaced by 0.75 Å to red.
Oct. 17	09	15	16.5		W	1.0	0.5		Metallic.
Nov. 15	08	35	4		E	1.0	1.0		Metallic: eruption at limb.

Reversals and displacements on the disc.

Bright reversals of H-alpha line and dark reversals of D₃ were observed on 49 occasions. Doppler displacements of H-alpha line on the disc were observed on 4 occasions (one towards red and 3 both ways) Their distributions were as follow:

	North	South	East	West	Total
Bright reversals of H-alpha	31	18	33	16	49
Dark reversals of D ₃	31	18	33	16	49
Displacement of H-alpha	4	0	3	1	4

Heights of prominences in K, H-alpha, D₃ and H_β lines.

The mean heights of 12 prominences observed in the different lines are given below:—

K	42.9"
H-alpha	38.9"
D ₃	33.9"
H _β	31.9"

Observations with the Hale Spectroheliograph.

Details of Doppler displacements in H-alpha line observed in prominences and dark markings are given below:—

	North	South	East	West	Total	Displacement		
						To red	To violet	Both ways
Displacements in prominences	6	6	8	4	12	1	—	11
Displacements in absorption markings	9	4	10	3	13	5	1	7

Solar Flares.

Details of solar flares observed during the period are included in the following table:—

Date	Time (I.S.T)			Mean latitude	Mean longitude from central meridian	Intensity	Maximum width of H α line observed	Remarks
	Beg h. m.	Max h. m.	End h. m.					
Aug. 2 . . .	12 01	—	—	11°S	1°.5W	2	—	From spectroheliogram
Aug. 16 . . .	11 04	—	11 15	12°S	85°E	1	—	
Sep. 26 . . .	10 52	—	11 05	3°N	14°E	2	1.8	—do—
Nov. 14 . . .	09 27	—	09 46	13½°N	W limb	2	—	
Nov. 15 . . .	08 15	—	10 15	4°N	E limb	2	1.4	
Dec. 20 . . .	11 20	11 24	11 30	11°S	36½°W	1	1.6	

Sudden disappearances of Prominences and dark markings

Details of K-prominences and H-alpha absorption markings whose sudden disappearances were observed are given below:

Nature of phenomenon	Date, time & co-ordinates of phenomenon when last seen					Remarks	
	Month	Date	Time I.S.T		Mean latitude		Mean longitude
H-alpha dark marking	Sep.	11	07	56	17°N	35°W	Disappeared next day.
Prominences	Nov	20	14	55	45°N	90°E	—do—
—do—	Nov	20	14	55	13°S	90°E	—do—
—do—	Dec	5	08	04	30°N	90°E	—do—
—do—	Dec.	10	13	14	20°S	90°E	—do—

Prominences projected on the disc as H-alpha absorption markings.

H-alpha disc photographs were obtained at Kodaikanal on 144 days. These were supplemented by 33 photographs supplied by Mt Wilson and 21 by Meudon. On the whole records were available for 181 days which were counted as 160½ effective days. The mean daily areas in millionths of the sun's visible hemisphere (uncorrected for foreshortening) and the mean daily numbers as derived from all the records are given below:—

			Combined data	
			Mean daily areas (millionths of the sun's visible hemisphere)	Mean daily numbers
North	. . . . .		993.8	11.31
South	. . . . .		716.5	8.21
TOTAL			1710.3	19.52

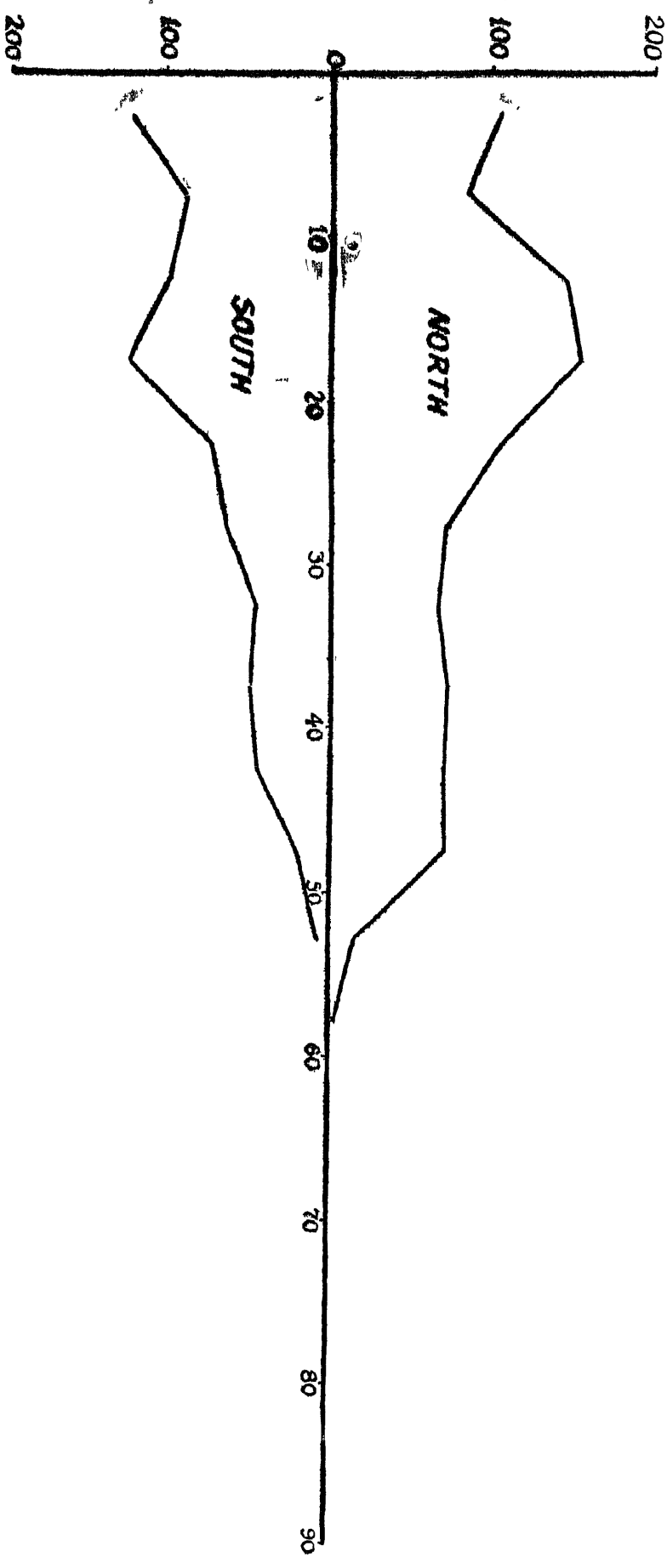
Compared with the figures for the previous half-year the areas show a decrease of 20.8% and the numbers an increase of 2.9%.

The figures based on Kodaikanal data alone are given below:

			Mean daily areas (millionths of the sun's visible hemisphere)	Mean daily numbers
North	. . . . .		915.6	10.89
South	. . . . .		620.5	7.55
TOTAL			1536.1	18.44

The distribution in 5° ranges of latitude of the mean daily areas is shown in diagram II. The peaks of activity are centred round 15°-20° in both the hemispheres.

Millionths of the sun's visible hemisphere



The east-west distribution of the total areas and numbers of dark markings is given below:—

	East	West	Percentage East
Areas (millionths of sun's visible hemisphere) .	135,705	138,802	49.4
Number	1511	1623	48.2

As in the previous half year both the areas and the numbers show an eastern defect.

Thanks are due to the co-operating observatories for the photographs supplied by them.

PART II

SUMMARY OF MAGNETIC OBSERVATIONS FOR THE SECOND HALF OF 1952.

Introduction

The history of the Kodaikanal Observatory, a brief description of the absolute instruments and the Watson variometers and the system of observations are given in Bulletin No. CXXXI of this observatory. As mentioned in Bulletin No. CXXXVI a set of La Cour magnetographs became available since 1951. Since the La Cour records are more steady and reliable than the Watson records, the practice of using the La Cour records for routine statistics has been adopted since the beginning of 1952. The data for the second half of 1952 derived from the records of the La Cour instruments are given here. Watson magnetographs were however used to derive the data on a few occasions when there was loss of La Cour records.

Determination of absolute values

(1) Absolute observations of horizontal force are made once every week (on Wednesdays) with Kew Magnetometer No. 3.

(2) Absolute observations of declination are made once every week (on Thursdays) with the same instrument.

(3) Observations of inclination are made with the earth inductor on all days excepting Saturdays, Sundays and other holidays.

*Variometer records**(a) Watson instruments:—*

The charts of the three Watson variometers are changed every alternate day, the records for two consecutive days being obtained on the same paper in the usual way. The optical arrangements for the magnetographs are such that with the H and V instruments an increase in the ordinate corresponds to an increase in the value of the elements; for the D magnetograph, however, an increase in the ordinate corresponds to a decrease in the westerly declination.

(b) La Cour instruments:—

The chart for the La Cour instruments is changed daily with all the three elements recorded on the same paper. The optical arrangements for the H, V and D magnetographs are such that with the H and V instruments an increase in the ordinate corresponds to an increase in the value of the elements; for the D magnetograph, however, an increase in the ordinate corresponds to a decrease in the westerly declination.

*Determination of scale coefficients**(a) Watson variometers:*

The scale coefficients of the H.F. and V.F. magnetographs are obtained fortnightly from deflection observations performed on the instruments with the deflector magnet at distances of 100 cms. and 120 cms. in the case of the H.F. instrument and at distances of 122.6 cms. and 148.6 cms. in the case of the V.F. instrument. The value of the scale coefficient adopted for any month is the average of the mean observed value for that month and those of the preceding and succeeding months.

The scale coefficient of the declination magnetograph has been determined once for all and is 1.03 per mm.

(b) La Cour variometers:

The scale coefficients of the H.F. and V.F. magnetographs are obtained once every month by placing a Helmholtz coil over the instruments and noting the deflections when known currents are passed through the coil. The coil constant as given by the manufacturer is 7.491/milliamp.

The scale coefficient of the declination magnetograph was re-determined taking into account the torsion in the suspension fibre and a value of 1.5'/mm was adopted. The adopted scale coefficients of the H.F. and V.F. magnetographs for the second half of 1952 are 80.07/cm. and 110.07/cm respectively.

Temperature coefficients of the magnetographs

(a) Watson magnetographs:

The adopted value for the H.F. magnetograph is $32\gamma/^\circ\text{F}$. The temperature coefficient of the V.F. magnetograph was found to be negligible.

(b) La Cour magnetographs:

Temperature compensation has been incorporated in the design of these instruments.

Base line values

(a) Base line values for H.F. magnetograms are derived by converting the mean ordinates corresponding to absolute observation with Kew Magnetometer No. 3 in terms of gammas and subtracting these converted ordinates from the mean observed horizontal force. The values derived from the Watson instruments are further reduced to a uniform temperature of 65°F to make the series comparable from month to month and year to year.

The adopted base line value for any week is the mean of five values (all reduced to 65°F in the case of the Watson instrument) including the week in question as the third among the five. In the case of the Watson instrument the base line values for the individual days of the week were determined after applying necessary temperature correction. The accuracy of the base line values derived from the above procedure is estimated to be $\pm 10\gamma$.

(b) The base line values for the V. F. magnetograms are derived by expressing the mean ordinates of the V. F. magnetograms at the times of inclination observations in terms of gammas and subtracting these from the values of vertical force obtained by multiplying the values of H. F. at that time by the tangent of the inclination.

(c) The base line values for ' δ ' were derived by the usual procedure of converting the ordinates corresponding to absolute observations with Kew Magnetometer No. 3 into angles and adding these to the corresponding observed absolute declination values.

Basic hourly values and associated means

Basic results: Tables 1 to 18 contain hourly values of magnetic declination, horizontal intensity and vertical intensity. The hourly values from the magnetograms represent the average values during one hour centred at the full hours of G. M. T.

The columns headed 'maximum' and 'minimum' give the momentary extreme values of the element for each day.

Computed means: At the bottom of each table are given the average hourly values obtained (i) for all days, (ii) for five international quiet days and (iii) for five international disturbed days.

Principal magnetic storms

Magnetically a day is considered to be (a) a quiet day, (b) a day of slight disturbance, (c) a day of moderate storm, (d) a day of moderately severe storm and (e) a day of severe storm depending on the ranges and oscillations in the magnetograms. At Kodaikanal a day is provisionally being taken as one of (i) severe storm if the range in H is above 400γ (ii) moderately severe storm if the range is between 251 and 400γ and (iii) moderate storm if the range is between 150γ and 250γ . The range is, however, not the only criterion used in assigning the character of a storm.

Table 19 gives a list of principal magnetic storms recorded during the second half of 1952.

Kodaikanal Observatory,
Kodaikanal,
February 1954.

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TABLES

TABLE I

Hourly values of Declination, 1952

[Averages for sixty minutes centred at the full hours of Greenwich mean time.]

2° plus tabular quantities.

July

Date	Hours G. M. T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	33.9	33.5	33.3	34.4	35.0	35.9	36.5	36.3	36.3	35.7	35.3	35.3	35.3	35.5	35.5
2†	34.4	34.7	34.4	35.0	35.5	35.9	36.3	36.5	36.2	35.5	35.0	35.1	35.3	35.3	35.3
3	34.1	33.8	33.7	34.3	35.0	35.5	36.3	37.1	36.9	36.5	35.5	34.4	35.0	35.3	35.1
4	35.0	34.9	34.3	33.8	34.1	34.7	35.1	36.1	36.2	35.6	35.3	35.0	34.9	34.9	35.6
5††	34.9	33.9	33.7	33.9	34.9	36.2	35.7	36.1	35.5	34.9	35.1	35.5	35.5	35.1	34.3
6††	33.9	33.8	34.4	35.0	35.1	35.6	36.1	36.1	35.6	35.3	34.7	34.9	34.5	35.0	35.5
7	34.1	34.1	34.1	35.0	35.7	36.3	36.5	36.7	36.5	36.3	35.9	35.7	35.7	35.9	36.2
8	35.0	35.0	34.9	35.0	35.3	36.5	37.5	37.9	37.3	36.8	35.6	35.5	35.3	35.9	36.1
9†	35.0	34.7	34.7	34.5	34.9	35.1	36.1	36.7	36.7	36.3	35.3	35.5	35.1	35.5	35.1
10	34.5	34.1	33.9	34.7	35.7	35.5	37.3	38.0	37.5	36.9	36.5	35.6	35.0	35.0	35.1
11	34.1	33.7	33.5	33.5	33.9	35.5	37.4	37.9	37.3	36.7	36.3	36.1	35.7	36.1	36.1
12	35.3	34.5	33.8	34.1	34.5	36.2	36.9	37.4	37.4	37.1	36.3	36.2	35.9	36.1	36.3
13	35.5	34.1	34.1	33.9	34.3	35.5	36.1	36.9	37.3	37.1	36.7	36.2	36.5	36.7	36.5
14	35.3	34.9	34.7	35.0	35.6	36.3	36.8	36.9	37.3	37.7	37.9	36.8	36.5	36.1	36.3
15	35.1	34.9	34.4	35.0	35.3	35.9	36.9	36.7	37.1	37.1	36.2	35.9	36.5	36.5	36.5
16	35.5	35.3	34.9	35.0	35.5	36.3	36.9	36.7	37.1	37.9	37.3	36.7	36.2	36.3	36.2
17	34.9	34.1	33.9	34.3	34.7	35.6	36.5	36.8	36.8	36.7	35.6	35.0	35.1	35.6	35.7
18	35.0	34.3	34.4	34.5	35.3	36.1	36.5	37.1	36.5	35.7	35.5	34.7	34.7	35.0	35.9
19†	34.7	34.1	33.9	34.4	35.3	36.2	36.9	37.1	36.2	35.7	36.2	36.1	36.1	35.7	36.5
20††	34.9	34.4	34.1	34.1	34.7	36.1	38.3	38.5	36.9	36.5	36.5	36.2	35.9	36.9	36.7
21††	33.5	33.1	33.2	33.8	35.4	37.1	38.5	38.1	37.8	37.7	37.8	37.2	36.7	36.5	36.1
22	34.7	34.5	34.1	34.2	34.8	34.0	35.0	35.6	35.6	35.7	35.2	34.8	34.4	35.0	35.4
23	34.0	33.6	33.4	33.8	33.9	34.5	34.5	35.4	35.6	35.7	36.0	35.7	35.0	34.4	34.8
24	33.8	33.6	33.4	33.6	34.8	35.4	36.3	36.2	36.2	36.0	35.8	35.7	35.4	35.2	35.1
25	33.4	33.0	32.4	33.2	34.5	35.4	36.0	37.0	37.2	36.9	35.8	35.6	34.8	35.0	34.8
26	33.3	33.4	33.0	33.3	34.0	34.8	35.0	35.1	36.2	36.3	35.4	34.5	34.5	34.5	34.5
27	33.2	32.8	32.7	33.3	34.1	34.3	34.4	35.1	35.0	34.4	33.7	33.8	34.1	34.3	34.4
28†	33.1	32.5	32.3	33.1	34.1	34.5	35.1	35.6	35.5	35.6	35.1	34.5	34.4	34.4	34.7
29†	33.1	32.9	32.5	33.1	33.9	35.1	36.1	36.5	35.3	34.4	33.9	33.8	34.1	34.1	34.1
30†	32.7	32.5	32.1	32.5	32.6	33.2	34.4	35.3	35.5	35.6	35.1	34.5	34.4	34.3	34.4
31	32.9	32.5	32.1	33.1	33.9	35.5	36.1	36.5	35.7	35.6	35.5	34.7	33.9	34.4	34.4
Mean	34.3	33.9	33.7	34.1	34.7	35.8	36.3	36.6	36.5	36.2	35.7	35.4	35.2	35.4	35.5
Mean†	33.6	33.2	33.0	33.6	34.3	35.0	35.8	36.2	35.7	35.4	35.1	34.8	34.9	34.8	35.0
Mean††	34.5	34.0	34.0	34.3	35.0	36.0	36.9	37.1	36.5	36.1	35.9	35.4	35.5	35.8	35.5

* Loss of record, Day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

II

TABLE I

Hourly values of Declination, 1952

[Averages for sixty minutes centred at the full hours of Greenwich mean time.]

July

2° plus tabular quantities

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	0	21	22	23		Time.	Mag	Time	Mag		
									H	M	H	M			
35.6	35.3	35.1	35.0	35.0	34.7	34.3	34.7	34.3	35.0	07 02	36.7	01 54	33.2	3.5	I
35.5	35.1	35.1	35.0	34.9	34.7	34.3	34.3	34.1	35.1	07 00	36.8	01 02	33.9	2.9	2†
35.3	35.3	35.3	35.3	35.1	35.0	35.0	34.7	35.0	35.2	07 42	37.5	01 38	33.5	4.0	3
35.1	35.7	35.6	35.6	35.5	35.5	35.1	35.0	35.1	35.2	06 34	36.8	02 38	33.7	3.1	4
34.3	34.3	34.3	34.4	34.5	34.4	33.9	33.9	34.1	34.7	05 26	36.7	14 04	33.2	3.5	5††
35.5	35.3	35.1	35.0	34.9	34.4	34.4	34.3	34.4	34.9	05 54	36.5	01 00	33.7	2.8	6††
36.1	35.9	35.7	35.5	35.6	35.5	35.1	35.1	35.0	35.6	06 56	36.9	02 34	33.8	3.1	7
35.9	35.9	35.9	35.9	35.7	35.3	35.3	35.1	35.1	35.8	06 52	38.0	02 26	34.3	3.7	8
35.0	35.5	35.5	35.3	35.5	35.1	35.0	35.0	34.9	35.3	07 30	36.8	02 22	34.3	2.5	9††
35.0	35.3	35.1	34.9	35.1	35.3	35.1	35.1	34.7	35.5	07 20	38.3	01 30	33.7	4.6	10
36.2	36.2	36.2	36.1	35.9	35.7	35.6	35.5	35.5	35.7	07 38	38.1	03 04	33.2	4.9	11
36.3	36.3	36.1	36.1	35.9	35.7	35.6	35.5	35.6	35.9	07 04	38.1	02 00	33.6	4.5	12
36.5	36.3	36.3	36.2	36.2	36.2	36.3	35.6	35.5	35.9	07 38	37.5	03 54	33.8	3.7	13
36.5	36.1	36.2	36.3	35.9	35.7	35.6	35.5	35.3	36.1	08 00	38.3	02 04	34.4	3.9	14
36.5	36.5	36.3	36.2	35.7	35.6	35.5	35.5	35.6	36.0	08 22	37.5	02 14	34.3	3.2	15
36.3	36.7	36.7	36.3	36.2	35.7	35.5	35.3	35.1	36.2	07 30	38.3	01 10	34.7	3.6	16
36.2	36.5	36.2	36.2	35.7	35.7	35.6	35.5	35.5	35.6	06 34	36.9	02 38	33.7	3.2	17
36.1	36.1	35.9	35.7	35.5	35.3	35.1	35.0	35.0	35.5	06 54	37.5	01 30	33.9	3.6	18
36.5	36.5	36.3	36.2	35.9	35.7	35.6	35.5	35.1	35.8	07 04	37.4	01 30	33.8	3.6	19†
35.7	35.3	35.1	34.9	34.1	33.7	33.5	33.8	34.1	35.5	06 42	39.3	21 14	32.9	6.4	20††
37.8	36.1	36.1	35.9	35.9	35.7	35.1	34.8	34.7	35.9	06 40	38.7	00 50	31.9	6.8	21††
35.7	35.4	35.0	34.8	34.5	34.2	33.8	34.0	34.0	34.8	07 30	36.0	21 34	33.6	2.4	22
35.0	35.0	35.0	34.5	34.4	34.2	33.9	33.8	33.9	34.6	09 10	36.4	01 14	33.2	3.2	23
35.2	35.2	35.0	34.5	34.4	34.0	33.6	33.4	33.3	34.8	06 50	36.9	01 46	33.2	3.7	24
35.0	35.0	34.6	34.4	34.2	33.8	33.8	33.9	33.4	34.7	07 30	37.4	02 42	32.2	5.2	25
34.4	34.2	34.0	33.9	33.8	33.4	33.3	33.3	33.3	34.2	09 34	36.8	01 54	32.8	4.0	26
34.3	34.1	34.1	33.7	32.9	32.6	32.5	33.1	33.5	33.8	08 14	35.5	22 00	32.3	3.2	27
34.5	34.4	34.3	34.1	34.1	33.9	33.8	33.7	33.3	34.2	07 42	35.9	01 50	31.9	4.0	28†
34.1	34.1	33.9	33.7	33.2	33.1	32.9	32.9	32.9	33.9	06 54	36.9	01 40	32.3	4.6	29†
34.3	34.3	34.1	33.9	33.7	33.3	33.1	32.9	32.9	33.8	08 50	35.7	02 30	31.7	4.0	30†
34.1	34.1	34.1	33.8	33.9	33.8	33.8	33.5	33.5	34.2	06 46	36.8	01 40	31.9	4.9	31
35.5	35.4	35.3	35.1	35.0	34.7	34.5	34.5	34.4	35.1					3.9	Mean
34.9	34.9	34.7	34.6	34.4	34.1	33.9	33.9	33.7							Mean†
35.7	35.3	35.2	35.1	35.0	34.5	34.4	34.4	34.4							Mean††

* Loss of record; day omitted for means

† Five international quiet days.

†† Five international disturbed days.

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TABLE 2
Hourly values of Declination, 1952

[Averages for sixty minutes centred at the full hours of Greenwich mean time.]

August

2° plus Tabular quantities

Date	Hours G. M. T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	33.4	32.5	32.0	32.5	33.1	34.2	34.8	36.0	35.4	35.4	34.9	34.0	34.0	34.0	34.3
2	33.6	33.1	32.5	33.1	34.3	34.9	35.6	35.8	35.6	35.4	35.9	34.2	33.7	33.8	34.2
3††	33.1	32.5	32.0	32.2	32.6	33.6	33.4	33.1	33.0	32.6	32.4	32.5	32.8	33.7	33.7
4	33.4	32.6	32.6	33.0	33.4	34.0	34.2	34.2	34.3	34.2	34.0	33.6	33.6	34.0	34.2
5	32.8	32.5	32.5	32.6	33.1	34.4	35.0	34.9	34.4	33.7	33.2	33.2	33.2	33.8	34.0
6	32.6	32.4	32.0	32.6	34.0	34.2	34.3	34.3	34.2	34.3	34.3	33.8	33.6	33.8	34.0
7	32.6	32.4	32.5	33.2	34.4	35.4	35.8	36.2	35.6	35.5	34.8	34.0	33.2	33.6	34.0
8	33.6	32.6	32.5	32.6	34.2	35.2	35.5	35.6	35.4	34.8	34.4	34.0	33.8	33.8	34.0
9	33.2	32.6	32.5	32.6	33.7	34.3	35.4	35.4	35.2	35.0	34.6	34.3	34.3	34.3	34.2
10	32.6	32.0	32.2	32.4	33.1	34.3	34.2	34.3	34.8	34.4	34.0	33.8	33.0	32.2	33.2
11	33.4	32.4	32.0	32.4	32.6	33.4	34.8	36.1	36.0	35.6	35.4	34.8	34.8	34.6	34.8
12††	32.6	32.2	31.3	31.6	32.5	34.2	35.5	36.0	35.6	34.9	34.6	33.1	33.0	33.0	33.0
13	33.1	32.5	32.2	33.2	35.3	36.7	35.5	35.3	35.3	35.3	35.0	34.6	33.6	33.4	33.8
14†	33.2	32.2	31.6	32.4	32.4	33.1	34.4	35.4	35.0	34.4	34.0	33.6	33.2	32.5	33.1
15	33.2	32.2	31.9	32.4	33.2	34.8	35.8	35.6	35.6	35.4	34.2	33.7	33.6	33.8	34.0
16†	33.8	33.6	32.6	32.5	32.8	34.6	35.2	35.5	35.5	35.4	34.4	34.0	33.6	33.4	33.8
17††	33.0	32.6	32.5	32.6	34.0	34.4	34.6	35.0	34.9	35.0	34.8	34.2	33.1	34.0	34.4
18††	32.4	31.6	31.3	32.5	33.8	34.0	34.8	35.5	35.5	35.4	34.8	33.7	33.6	33.1	33.4
19	32.5	32.0	31.2	32.0	33.2	34.0	34.9	36.2	36.6	35.6	35.4	34.8	34.0	34.0	34.0
20	33.2	33.1	32.5	33.0	33.7	34.0	34.2	35.0	34.4	34.2	33.6	33.0	32.6	33.6	34.0
21	33.1	32.0	31.3	32.3	33.6	34.6	35.5	36.1	36.8	37.0	36.6	35.2	34.0	34.0	34.0
22	33.2	32.6	32.5	32.6	33.0	34.6	35.6	36.2	36.7	36.1	35.4	34.3	34.0	34.0	34.0
23	33.2	32.0	31.4	31.8	32.0	33.2	34.9	35.6	36.1	36.0	35.2	34.4	34.0	34.2	34.0
24	33.7	33.1	32.2	31.9	32.2	24.0	36.7	38.8	38.8	38.4	37.2	36.2	35.6	35.4	35.4
25†	33.6	32.5	31.6	31.6	32.8	34.9	35.6	35.4	35.4	35.5	34.9	34.0	34.0	34.3	34.0
26†	33.8	32.5	32.2	32.4	32.6	34.3	35.6	37.3	37.9	36.8	36.0	34.4	34.0	34.0	34.3
27	33.6	32.6	32.0	32.6	34.0	35.5	36.6	37.0	37.0	36.4	35.5	34.3	33.7	33.4	33.8
28†	33.4	32.5	32.2	32.6	33.7	34.4	35.2	35.6	35.6	35.4	34.6	33.8	33.6	33.6	33.7
29	33.4	32.6	32.0	32.4	32.8	33.4	35.0	35.8	36.0	35.5	35.0	34.6	33.8	33.7	34.0
30††	32.6	32.0	31.3	31.6	32.0	32.6	33.1	33.6	34.0	34.0	34.0	34.0	33.8	34.3	34.8
31	33.4	33.0	32.6	33.1	33.7	34.0	34.9	35.6	35.4	35.2	34.8	34.0	33.6	33.6	34.0
Mean	33.2	32.4	32.1	32.5	33.3	34.3	35.1	35.6	35.5	35.3	34.8	34.1	33.7	33.8	34.0
Mean†	33.6	32.9	32.0	32.3	32.3	34.1	35.2	35.9	35.9	35.5	34.8	34.0	33.7	33.7	33.8
Mean††	32.7	32.2	31.7	32.1	33.0	33.8	34.3	34.6	34.6	34.4	34.2	33.5	33.5	33.6	33.9

‡ Loss of record ; day omitted for means

† Five international quiet days.

†† Five international disturbed days.

TABLE 2

Hourly values of Declination, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time.)

2° plus tabular quantities

August

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
'	'	'	'	'	'	'	'	'	'	H. M.	'	H. M.	'	'	
34.8	34.9	34.9	34.4	34.0	34.0	34.0	34.0	33.7	34.1	08 46	35.5	01 46	32.1	3.4	1
34.4	34.3	34.0	34.0	34.0	34.0	34.0	33.8	33.7	33.6	06 34	36.6	01 34	32.2	4.4	2
33.6	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	33.4	15 46	34.3	02 34	31.8	2.5	3††
34.3	34.2	34.0	34.0	34.0	34.0	33.6	33.0	33.0	32.6	07 58	34.9	00 58	32.4	2.5	4
34.0	34.0	33.7	33.6	33.4	33.2	33.0	32.6	32.6	33.5	06 06	35.5	01 22	32.2	3.3	5
34.0	34.0	34.0	34.0	33.6	33.2	33.0	32.6	32.6	33.5	10 12	34.8	01 42	31.8	3.0	6
34.3	34.2	34.0	34.0	34.0	34.0	34.0	34.0	33.8	34.1	06 02	36.7	01 02	32.2	4.5	7
34.2	34.2	34.0	34.0	34.0	34.0	34.0	34.1	33.6	34.1	06 42	36.1	02 22	32.2	3.9	8
34.6	34.8	34.6	34.3	34.2	34.0	33.7	33.6	32.8	34.1	06 46	35.6	01 58	32.2	3.4	9
33.8	34.0	34.0	34.0	34.0	34.0	33.8	33.7	33.7	33.6	07 54	35.0	02 26	31.8	3.2	10
34.6	34.8	34.6	34.2	34.0	33.8	33.7	33.1	33.0	34.1	07 10	37.0	01 42	31.8	5.2	11
33.2	33.2	33.4	33.7	33.8	34.0	34.0	34.0	33.6	33.6	07 02	36.6	02 10	31.0	5.6	12††
34.0	34.0	34.0	34.0	34.0	33.8	33.8	33.8	33.4	34.2	05 34	36.9	02 02	31.9	5.0	13
33.8	34.0	34.0	34.0	34.0	34.0	33.8	33.8	33.8	33.6	07 02	35.8	02 26	31.2	4.6	14†
34.0	34.0	34.0	34.0	34.0	34.2	34.0	34.0	34.0	34.0	06 42	36.7	02 10	31.6	5.1	15
33.8	33.8	34.0	33.8	33.8	33.7	33.6	33.2	33.1	33.9	06 50	35.8	02 10	32.2	3.6	16†
34.0	34.0	34.0	33.4	33.4	33.2	33.1	32.8	32.6	33.7	08 06	36.4	01 46	32.2	4.2	17††
33.7	33.6	33.4	32.8	32.6	32.6	32.5	32.5	32.5	33.4	07 36	35.8	01 32	31.0	4.8	18††
34.0	33.8	33.8	34.0	34.0	33.7	33.6	33.4	33.4	33.9	08 10	36.8	02 10	31.0	5.8	19
34.0	34.0	34.0	33.8	33.8	33.7	33.2	32.8	33.0	33.6	06 50	35.6	01 42	32.4	3.2	20
34.2	34.2	34.0	34.0	33.7	33.6	33.6	33.6	33.1	34.2	09 06	37.3	01 50	31.2	6.1	21
34.0	34.0	34.0	33.8	33.8	33.7	33.6	33.4	33.6	34.1	07 06	37.0	02 22	32.0	5.0	22
34.0	34.2	34.0	34.0	34.0	33.6	33.4	33.2	33.6	33.8	07 34	36.4	01 38	31.2	5.2	23
35.4	35.4	35.0	34.6	34.3	34.0	33.8	33.7	33.7	35.0	07 30	39.6	02 40	31.8	7.8	24
34.0	34.0	34.0	33.8	33.8	34.0	34.0	34.0	33.8	34.0	05 50	36.2	02 30	31.3	4.9	25†
34.6	34.3	34.3	34.2	34.0	34.0	33.8	33.7	33.7	34.4	07 50	38.4	02 00	32.0	6.4	26†
34.2	34.0	33.8	34.0	34.0	33.8	33.8	33.7	33.6	34.3	07 14	37.2	01 50	31.8	5.4	27
34.0	34.0	33.8	33.8	33.7	33.7	33.4	33.2	33.4	33.9	07 26	35.8	01 50	31.9	3.9	28†
34.0	33.8	33.6	33.2	33.1	33.0	33.1	32.8	32.8	33.7	06 34	36.6	01 50	31.9	4.7	29
34.9	34.6	34.2	34.0	34.0	33.8	34.0	34.0	33.6	33.5	14 34	35.8	02 00	31.3	4.5	30††
34.0	34.0	34.0	33.8	33.7	33.4	33.0	32.5	32.6	33.8	06 20	36.2	16 30	32.4	3.8	31
34.1	34.1	34.0	33.9	33.8	33.7	33.6	33.4	33.3	33.9					4.5	Mean
34.0	34.0	34.0	34.0	33.9	33.9	33.7	33.6	33.5							Mean†
33.9	33.9	33.8	33.6	33.6	33.5	33.5	33.5	33.1							Mean††

* Loss of record ; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 3

Hourly Values of Declination, 1952

(Average for sixty minutes centred at the full hours of Greenwich mean time)

September

2° plus tabular quantities

Date	Hours G.M.T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1††	32.5	32.4	32.3	32.7	33.1	33.7	34.9	34.8	34.2	33.6	33.5	33.0	33.0	32.9	32.9
2	33.6	33.0	32.3	33.1	34.7	35.7	36.5	36.5	35.1	33.6	32.7	32.9	33.6	33.9	33.5
3	33.6	33.1	32.4	33.9	34.7	35.3	35.5	35.5	35.5	35.3	34.9	34.2	34.1	33.9	33.9
4	33.5	32.1	31.8	32.4	33.7	34.9	36.0	36.6	36.0	35.4	34.3	33.6	33.5	33.6	33.7
5	33.6	32.5	32.1	32.4	33.6	33.9	34.4	34.6	34.4	34.1	34.0	34.8	34.0	34.1	34.3
6	33.8	32.5	32.2	32.5	33.7	34.8	35.3	35.5	34.8	34.3	33.6	33.3	33.6	33.7	33.7
7	33.7	34.3	32.1	32.4	33.3	33.7	34.5	34.9	34.8	34.2	33.7	33.7	33.9	33.9	34.2
8††	33.7	33.0	31.8	31.9	32.7	33.3	34.5	35.5	35.9	34.3	34.1	34.1	33.9	33.5	33.0
9††	33.7	33.0	32.9	32.4	32.9	34.3	35.3	36.3	35.5	35.5	34.9	33.5	33.6	33.6	34.1
10	34.2	33.3	32.5	32.5	32.7	33.1	34.1	34.3	34.3	33.7	33.3	32.9	33.3	33.7	33.9
11	33.6	33.7	31.9	31.9	32.3	33.6	34.1	34.3	34.1	33.8	33.7	33.5	33.7	33.8	33.9
12	33.5	33.4	33.1	32.5	32.9	34.1	34.9	36.0	36.3	35.1	34.5	34.2	34.7	34.8	35.1
13†	33.6	33.0	32.3	32.5	32.9	33.3	33.9	34.7	35.1	34.8	33.9	33.6	33.7	33.9	33.9
14	33.6	33.3	32.9	33.1	33.5	33.9	34.9	35.1	35.5	35.5	34.8	33.9	33.7	33.7	33.9
15	33.1	32.1	31.9	32.7	34.1	35.3	36.3	36.5	36.3	35.4	34.7	33.9	33.9	34.1	34.2
16	33.7	33.3	32.9	33.5	34.7	35.9	33.6	37.2	36.5	35.1	33.9	33.9	34.1	34.2	34.2
17†	33.7	33.3	33.1	33.7	34.2	35.1	36.6	37.2	37.1	36.0	35.5	33.6	33.3	33.1	33.6
18†	33.5	33.1	32.4	33.1	35.4	37.1	37.2	37.3	36.7	36.1	34.5	34.1	33.9	34.1	34.1
19†	33.7	33.3	32.7	33.3	34.8	35.5	36.5	36.7	36.6	36.0	34.8	34.3	34.2	34.2	34.3
20	33.8	33.6	33.1	33.7	35.0	35.9	36.5	36.3	35.7	35.3	34.5	34.5	34.7	34.9	34.9
21	34.8	34.8	34.9	33.1	34.2	34.8	35.4	35.7	35.4	34.8	34.1	34.2	34.1	34.1	33.9
22	34.2	33.7	33.5	34.2	35.7	36.9	37.8	37.8	37.1	36.3	35.3	44.5	34.3	34.3	34.3
23†	34.1	33.3	32.7	33.3	34.2	35.3	35.9	36.3	35.4	34.5	33.9	33.7	34.3	34.3	34.3
24	34.2	33.9	33.5	33.9	34.7	35.4	36.3	36.5	36.6	35.9	35.3	35.1	35.3	35.1	34.8
25	34.3	34.1	33.7	34.1	34.5	34.9	35.1	35.7	35.5	35.3	34.5	34.2	34.2	34.2	34.3
26	33.5	33.1	32.3	32.3	33.1	34.3	35.5	35.5	35.4	35.1	34.7	34.2	34.1	34.2	34.3
27	33.9	33.9	33.9	33.7	33.6	34.1	34.1	34.1	33.9	33.7	32.1	32.7	32.7	33.5	33.6
28	34.1	33.6	33.0	33.6	34.3	34.7	34.7	34.9	33.8	33.9	33.5	33.6	34.1	33.9	33.9
29††	34.1	33.5	33.1	33.9	34.3	34.9	34.8	34.7	33.9	32.5	31.4	31.3	32.1	33.0	33.6
30††	33.7	32.4	31.9	32.9	33.5	34.8	35.5	35.4	35.1	34.7	33.1	32.1	33.3	33.3	33.6
Mean	33.8	33.3	32.7	33.0	33.9	34.7	35.4	35.7	35.4	34.8	34.1	33.7	33.8	33.9	34.0
Mean†	33.7	33.2	32.6	33.2	34.3	35.3	35.9	36.4	36.2	35.5	34.5	33.9	33.9	33.9	34.0
Mean††	34.5	32.9	32.4	32.8	33.3	34.2	35.0	35.3	34.9	34.1	33.4	32.8	33.2	33.3	33.4

* Loss of record ; Day omitted for .means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 3
Hourly Values of Declination, 1952

(Average for sixty minutes centered at the full hours of Greenwich mean time)

2° plus tabular quantities

September

Hours G.M.T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
									H. M.		H. M.				
33.0	33.0	33.1	33.3	33.5	33.6	33.7	33.5	33.9	33.4	06 34	35.3	01 40	32.0	3.3	1††
33.9	33.9	33.9	33.7	33.7	33.7	33.7	33.6	33.5	33.9	07 18	37.2	02 00	31.9	5.3	2
34.1	33.9	33.9	33.9	33.7	33.9	33.9	33.7	33.7	34.2	08 18	36.0	02 14	32.3	3.7	3
33.9	34.1	34.1	34.1	34.1	34.1	33.9	33.9	33.9	34.1	07 20	36.9	11 46	31.7	5.2	4
34.3	34.1	34.1	34.1	34.1	34.0	33.9	33.8	33.9	33.8	06 38	35.0	01 42	31.9	3.1	5
33.7	33.7	33.9	33.7	33.9	33.9	33.9	33.9	33.9	33.8	06 56	36.0	01 06	31.9	4.1	6
34.1	33.7	33.6	33.5	33.5	33.6	33.7	34.1	34.5	33.8	07 26	35.3	02 00	31.8	3.5	7
33.6	33.6	33.9	33.6	33.7	33.7	34.1	34.2	34.1	33.7	07 42	36.3	02 22	31.2	5.1	8††
33.6	34.2	34.1	34.1	34.1	34.2	33.9	33.7	34.2	34.1	06 50	36.6	01 54	31.7	4.9	9††
33.7	33.9	33.9	33.9	33.7	33.7	33.9	33.7	33.7	33.6	07 24	34.9	02 26	31.9	3.0	10
33.9	33.8	33.8	33.8	33.8	33.7	33.6	33.5	33.6	33.6	06 34	34.5	02 38	31.5	3.0	11
34.7	34.5	34.3	34.1	33.6	33.6	33.7	34.1	33.7	34.2	07 50	36.9	02 22	32.4	4.5	12
33.9	33.9	33.9	33.7	34.1	34.3	33.9	33.9	33.7	33.8	07 46	35.4	02 10	31.9	3.5	13†
34.1	33.9	33.9	33.9	33.9	33.9	33.9	33.7	33.6	34.0	07 46	36.0	01 46	32.7	3.3	14
34.3	34.2	34.1	33.9	33.9	33.9	33.7	33.7	33.6	34.2	07 50	36.7	01 46	31.3	5.4	15
34.2	34.3	34.3	34.2	34.2	34.1	33.9	33.9	33.7	34.4	07 26	37.5	01 54	32.4	5.1	16
33.7	33.9	33.9	33.7	33.7	33.6	33.6	33.6	33.6	34.2	06 36	37.9	01 30	32.7	5.2	17†
34.1	34.1	33.9	33.9	33.9	33.7	33.9	33.9	33.9	34.5	07 00	37.6	01 54	32.1	5.5	18†
34.2	34.1	34.1	33.9	33.9	33.9	33.9	33.9	33.9	34.4	07 00	37.2	01 56	32.5	4.7	19†
34.8	34.7	34.2	34.1	33.9	34.1	33.9	33.9	33.6	34.2	06 26	36.7	01 54	33.0	3.7	20
33.7	33.6	34.1	34.3	34.1	33.9	34.1	34.1	34.1	34.3	05 42	36.3	02 46	32.5	3.8	21
34.2	34.1	34.1	34.1	33.9	33.9	34.1	34.2	34.2	34.9	06 34	38.3	01 54	33.1	5.2	22
34.3	34.3	34.2	34.2	34.2	34.2	34.3	34.3	34.3	34.3	06 42	36.7	02 00	32.4	4.3	23†
34.3	34.1	33.9	33.9	33.7	33.7	33.7	33.7	34.2	34.7	06 10	36.7	01 54	33.3	3.4	24
34.5	34.9	34.3	34.1	33.9	33.9	34.1	34.2	33.9	34.4	07 14	36.3	01 38	33.6	2.7	25
34.2	34.1	33.9	33.7	33.7	33.6	33.6	33.5	33.7	34.0	06 40	36.0	02 20	31.9	4.1	26
33.5	33.5	33.6	33.7	33.7	33.6	33.6	33.6	33.9	33.6	06 06	34.5	10 18	32.4	2.1	27
33.9	34.1	33.5	33.1	32.9	33.3	33.5	33.6	33.7	33.8	05 14	35.3	19 26	32.5	2.8	28
33.6	33.6	33.5	33.7	33.9	33.6	33.5	33.3	34.1	33.5	05 00	35.3	10 34	31.1	4.2	29††
33.6	33.7	33.7	33.9	33.9	33.9	33.9	34.1	33.9	33.7	06 58	36.0	01 30	31.1	4.9	30††
34.0	34.0	33.9	33.9	33.8	33.8	33.8	33.8	33.9	34.1					4.1	Mean
34.0	34.1	34.0	33.9	34.0	33.9	33.9	33.9	33.9							Mean†
33.5	33.6	33.7	33.7	33.8	33.8	33.8	33.8	34.0							Mean††

* Loss of record ; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 4

Hourly values of Declination, 1952

[Averages for sixty minutes centred at the full hours Greenwich mean time]

October

2° plus tabular quantities

Date	Hours G.M.T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	33.8	33.5	33.2	33.6	34.2	34.6	35.6	36.4	36.2	35.3	34.2	34.0	34.1	34.1	34.1
2	34.1	33.6	33.5	33.4	34.4	34.8	35.3	35.6	35.3	34.1	33.6	33.6	34.0	33.8	33.6
3	34.1	33.6	33.5	33.6	34.2	34.8	34.8	34.7	34.8	34.6	34.2	34.1	34.1	34.2	34.0
4††	34.1	34.2	33.5	33.6	33.8	34.0	33.8	33.0	32.6	32.8	33.2	33.4	34.0	34.1	33.6
5††	33.6	33.2	33.4	33.8	34.2	34.0	34.1	33.6	33.0	32.3	31.4	31.1	31.2	31.7	32.9
6	33.4	33.2	33.5	34.6	35.0	34.2	34.0	33.9	33.6	33.4	33.2	33.1	33.0	33.0	33.0
7	33.3	33.2	33.1	33.0	*	*	34.7	33.5	33.4	33.4	33.2	33.2	33.0	33.0	33.4
8	33.6	33.5	33.4	33.4	35.0	35.0	34.8	34.2	34.2	34.8	34.6	33.6	33.6	33.6	33.4
9	34.4	33.5	33.5	33.4	33.5	33.8	34.1	34.2	34.7	34.2	34.0	33.8	34.0	34.0	34.0
10	33.4	32.9	32.8	33.4	33.6	34.1	35.6	35.3	36.2	36.0	34.7	33.6	33.6	33.8	33.8
11	33.6	33.0	32.6	32.8	33.4	34.0	34.8	35.2	35.4	35.4	34.7	34.2	34.0	33.5	33.5
12	33.8	34.0	34.1	34.0	33.8	34.1	34.4	35.2	35.0	34.7	34.4	33.6	33.5	33.5	33.6
13†	33.0	33.4	33.0	33.5	34.7	35.0	35.2	35.0	34.8	34.6	33.8	34.0	33.6	33.8	33.8
14	34.2	34.0	33.6	33.8	33.5	34.0	34.7	34.6	34.4	34.2	34.0	34.0	34.0	34.0	33.8
15†	33.8	33.8	33.6	33.8	34.0	34.1	34.4	34.0	34.0	33.8	33.2	33.4	34.0	34.1	34.0
16	34.1	34.2	34.7	35.2	35.4	35.4	35.6	35.0	34.2	34.0	34.0	33.8	34.1	34.1	34.1
17	34.1	34.2	34.1	34.4	34.7	34.7	35.2	34.6	34.2	34.0	33.6	33.4	33.6	33.8	33.8
18	34.1	34.1	34.0	34.2	34.7	35.2	35.3	34.7	33.8	33.5	33.4	33.6	34.0	34.0	34.1
19	34.2	34.0	33.6	34.1	34.7	35.4	35.6	34.7	34.1	33.0	32.8	33.4	33.5	33.8	34.0
20	34.2	34.0	33.6	34.0	34.7	34.6	35.0	34.6	34.5	34.8	33.6	33.6	33.6	34.0	33.6
21	34.1	34.2	34.2	34.7	34.6	35.4	35.6	35.3	35.2	34.7	34.6	34.4	34.1	34.0	33.6
22†	33.8	34.2	34.6	34.7	34.4	34.8	35.2	34.8	34.4	34.0	33.6	33.8	33.8	33.8	33.8
23†	33.8	33.8	33.6	33.8	34.9	36.0	36.6	36.1	35.5	34.8	34.2	34.1	34.2	34.3	34.3
24†	34.3	34.3	34.1	34.3	34.8	35.3	35.5	35.3	34.8	34.5	34.7	34.3	34.2	34.2	34.2
25	34.9	34.8	34.5	34.3	34.8	35.4	35.5	35.4	34.9	34.3	33.9	33.6	33.5	33.7	33.6
26††	34.3	34.5	34.1	33.7	34.2	34.1	34.3	34.5	34.9	34.8	34.2	33.5	32.9	32.1	31.7
27	34.2	33.7	33.6	33.7	34.2	34.8	35.1	35.1	34.7	33.9	33.3	33.3	33.6	33.6	33.6
28	34.2	34.1	33.9	33.9	34.2	35.1	36.0	36.0	35.3	34.7	33.7	33.7	33.9	33.7	33.7
29	34.8	34.5	33.9	33.7	33.5	33.9	34.2	34.1	33.7	33.6	33.0	33.0	33.6	33.0	33.6
30††	34.5	34.1	33.7	33.6	33.6	33.7	34.1	34.2	34.1	33.8	33.4	33.8	33.9	33.6	33.6
31††	34.1	34.7	34.6	34.3	34.1	34.8	34.2	33.0	32.9	33.5	33.6	33.7	33.3	32.5	33.0
Mean	34.0	33.9	33.7	33.9	34.3	34.6	35.0	34.7	34.5	34.2	33.8	33.6	33.7	33.6	33.6
Mean†	33.7	33.9	33.8	34.0	34.6	35.0	35.4	35.0	34.7	34.3	33.9	33.9	34.0	34.0	34.0
Mean††	34.1	34.1	33.9	33.8	34.0	34.1	34.1	33.7	33.5	33.4	33.2	33.1	33.1	32.8	33.0

*Loss of record ; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 4

Hourly values of Declination, 1952

[Averages for sixty minutes centred at the full hours Greenwich mean time]

2° plus tabular quantities

October

Hours G. M. T									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
										H. M.		H. M.			
34.1	34.1	34.1	34.1	34.2	34.1	34.0	34.0	33.8	34.3	06 50	37.0	01 40	31.8	5.2	1
34.1	34.2	34.2	34.2	34.1	34.0	34.0	33.8	34.0	34.1	07 30	36.2	01 42	32.3	3.9	2
33.8	33.5	33.4	33.2	33.5	33.6	34.0	33.8	34.2	34.0	05 34	35.2	17 24	33.0	2.2	3
33.2	33.0	32.8	33.0	33.4	33.8	33.6	33.6	34.0	33.9	04 22	34.7	15 04	32.2	2.5	4††
33.5	33.5	33.4	33.4	33.4	33.2	33.0	33.2	33.4	33.1	06 54	34.6	11 22	30.6	4.0	5††
33.1	33.2	33.2	33.3	33.3	33.1	33.2	33.2	33.2	33.5	04 04	35.3	00 22	32.9	2.4	6
34.0	33.6	34.0	33.5	33.4	33.4	33.4	33.4	33.5	*	*	*	*	*	*	7
33.8	33.6	33.5	33.4	33.2	33.2	33.4	33.8	34.4	33.9	05 38	35.2	18 00	33.0	2.2	8
33.8	33.8	33.6	33.6	33.6	33.6	33.5	33.4	33.5	33.8	07 54	34.8	01 04	32.9	1.9	9
33.8	33.6	33.6	33.5	33.4	33.2	32.8	33.0	33.5	33.9	08 14	36.6	21 10	32.4	4.2	10
33.5	33.5	33.5	33.5	33.2	33.2	33.5	33.6	33.5	33.8	07 55	35.9	02 00	32.4	3.5	11
33.6	33.6	33.5	33.2	32.9	33.0	32.9	33.0	33.4	33.8	05 10	35.3	21 30	32.6	2.7	12
33.8	33.8	33.8	33.8	33.6	33.6	33.8	33.8	34.1	34.0	05 56	35.3	00 22	32.9	2.4	13†
33.8	33.8	33.8	33.6	33.6	33.8	33.8	33.6	34.0	33.9	06 14	35.2	04 00	33.4	1.8	14
34.1	34.1	34.0	33.8	33.8	33.6	33.8	34.0	34.1	33.9	05 50	34.8	11 30	32.9	1.9	15†
34.1	34.0	34.0	33.8	33.8	33.8	33.8	33.6	34.0	34.3	05 12	35.9	11 18	33.4	2.5	16
34.0	33.8	33.8	33.5	33.6	33.6	33.8	33.8	34.0	34.0	05 50	35.4	11 00	32.9	2.5	17
34.0	33.8	33.6	33.5	34.1	34.0	33.6	34.0	34.2	34.1	06 06	35.4	08 22	32.8	2.6	18
34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.2	34.0	05 50	35.9	09 26	32.4	3.5	19
33.5	33.5	33.4	33.5	33.5	33.6	33.8	33.8	34.0	34.0	06 06	35.2	15 30	33.4	1.8	20
33.2	33.5	33.4	32.8	32.6	33.0	33.4	33.6	34.0	34.1	05 50	35.9	18 50	32.4	3.5	21
33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	34.1	05 00	35.4	11 38	33.5	1.9	22†
34.3	34.2	34.3	34.3	34.3	34.2	34.2	34.2	34.2	34.5	05 38	36.9	11 34	33.5	3.4	23†
34.2	34.2	34.2	34.2	34.3	34.3	34.3	34.5	34.8	34.5	06 04	35.7	08 34	33.9	1.8	24†
33.9	33.9	33.9	33.7	33.6	33.7	34.1	34.2	34.5	34.3	06 06	35.7	11 38	33.3	2.4	25
31.8	31.9	32.7	32.9	33.3	33.6	33.7	33.7	34.1	33.5	08 06	35.3	14 16	31.2	4.1	26††
33.9	33.9	34.1	33.9	33.9	33.9	33.9	34.1	34.1	34.0	05 34	35.3	11 30	32.7	2.6	27
33.9	33.9	34.1	33.9	34.1	34.2	34.3	34.5	34.5	34.3	06 22	36.5	11 26	33.5	3.0	28
34.1	34.1	33.7	33.6	33.6	33.7	34.1	34.3	34.8	33.8	05 46	35.5	10 34	32.7	2.8	29
33.6	33.6	33.7	33.6	34.0	33.9	34.1	34.4	34.1	33.9	07 06	34.8	10 26	33.2	1.6	30††
33.6	33.9	34.1	33.7	34.1	33.9	33.9	34.1	34.3	33.8	04 42	34.9	13 42	31.3	3.6	31††
33.7	33.7	33.7	33.7	33.7	33.7	33.7	33.8	34.0	34.0					2.8	Mean
34.0	34.0	34.0	34.0	34.0	33.9	34.0	34.1	34.2							Mean†
33.1	33.2	33.3	33.3	33.6	33.7	33.7	33.8	34.0							Mean††

*Loss of record; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 5

Hourly Values of Declination, 1952

[Averages for sixty minutes centred at the full hours of Greenwich mean time]

November

2° plus tabular quantities

Date	Hours G. M. T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1††	34.7	34.9	35.1	34.7	34.2	34.3	34.9	34.2	33.7	33.6	33.6	33.7	33.7	34.1	34.1
2	34.2	34.1	33.9	34.3	34.7	35.3	34.7	33.9	33.5	32.9	33.5	33.3	33.7	33.9	33.9
3	34.8	34.7	34.3	34.8	35.4	35.4	34.7	34.1	33.7	33.9	34.1	34.2	34.5	34.2	34.1
4	34.5	34.1	33.9	33.9	33.7	34.5	35.5	35.3	35.1	34.5	34.1	33.7	33.9	33.7	33.6
5	35.7	36.0	36.0	35.7	35.4	35.3	35.1	34.8	33.9	33.9	33.9	33.9	33.9	34.1	34.2
6	34.7	34.9	34.7	34.5	34.2	34.5	34.9	34.2	34.5	34.8	34.3	34.1	33.9	33.9	34.1
7	34.3	34.7	34.8	34.3	34.1	34.3	34.5	33.9	33.9	33.7	33.7	33.7	34.1	34.1	33.9
8	34.3	34.5	34.2	34.7	34.7	35.5	36.5	36.1	35.9	35.3	34.7	34.1	34.1	33.9	34.1
9	34.3	34.8	35.1	34.7	34.3	34.9	35.5	34.9	34.2	34.1	33.9	33.9	34.1	33.9	33.9
10†	34.5	35.1	35.4	35.4	35.5	35.5	35.5	35.3	34.8	34.2	34.1	34.2	34.2	34.2	34.3
11†	34.2	34.3	34.7	35.1	35.4	35.4	35.3	35.1	34.7	33.6	33.7	34.1	34.2	34.2	34.2
12†	34.5	34.8	34.7	34.8	34.8	35.0	34.7	34.2	34.4	34.6	34.4	34.2	34.1	34.0	34.0
13†	35.3	35.6	35.4	35.4	35.8	35.4	35.3	34.8	34.2	34.1	34.4	34.7	34.8	34.8	34.8
14	35.0	35.3	35.6	35.4	35.3	35.3	35.4	35.6	34.7	33.1	33.6	32.2	33.5	33.8	34.0
15	35.3	36.2	36.5	36.8	35.3	35.6	35.2	34.7	34.0	33.8	33.8	33.8	33.4	33.0	32.9
16	35.3	35.6	35.7	35.9	35.6	35.2	34.8	34.2	33.8	33.6	33.5	34.0	34.0	34.0	34.0
17	33.8	34.1	35.3	35.6	35.4	35.2	34.7	34.8	34.4	33.6	33.4	34.0	34.0	34.0	33.8
18	35.0	35.2	35.3	35.3	35.4	35.8	36.2	35.9	34.8	34.2	34.0	34.1	34.1	34.0	34.1
19†	34.8	35.4	35.6	35.6	35.4	35.3	35.4	35.4	35.2	34.6	33.8	33.8	34.0	34.2	33.8
20	35.3	35.4	35.6	35.9	35.3	35.0	34.4	33.6	32.9	31.8	32.2	32.9	33.0	33.2	33.5
21††	34.2	34.7	33.8	34.1	34.4	34.2	34.0	33.8	33.4	33.5	33.4	33.0	32.9	33.0	33.5
22	35.0	35.2	34.8	34.4	33.8	33.8	34.1	34.0	33.5	33.4	33.0	33.4	33.5	33.5	33.5
23	34.6	34.4	34.8	34.6	34.2	34.1	34.1	33.8	33.0	32.4	32.4	32.8	33.2	33.5	33.6
24	34.8	34.8	35.2	34.8	33.8	33.6	33.8	34.1	34.0	33.5	32.9	33.4	33.6	33.8	33.8
25	34.6	34.6	34.7	34.2	34.2	34.7	34.8	34.2	33.6	32.8	32.4	32.9	33.6	33.6	33.5
26††	35.2	35.2	35.3	35.3	35.2	34.8	33.8	33.2	32.4	32.0	32.3	32.2	31.8	32.4	32.6
27††	35.0	34.8	35.3	36.0	36.5	35.8	35.3	34.8	34.2	34.1	33.6	33.8	33.6	34.0	33.5
28††	34.7	34.8	35.2	35.2	35.2	35.3	35.3	35.0	34.7	34.0	33.4	33.8	34.0	33.0	32.9
29	35.2	35.2	35.4	35.4	35.3	35.0	34.6	33.5	33.6	33.8	33.8	34.0	33.8	33.6	33.8
30															
Mean	34.4	34.9	35.0	35.1	34.9	35.0	34.9	34.5	34.1	33.7	33.5	33.7	33.8	33.8	33.8
Mean†	34.5	34.8	35.0	35.1	35.1	35.3	35.4	35.1	34.6	34.1	34.0	34.1	34.1	34.1	34.1
Mean††	35.0	35.0	35.2	35.3	35.3	35.1	34.6	33.9	33.3	32.7	32.6	32.9	33.0	33.1	33.3

* Loss of record ; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 5

Hourly Values of Declination, 1952

[Averages for sixty minutes centred at the full hours of Greenwich mean time].

November

2° plus tabular quantities

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
									H. M.		H. M.				
33.9	33.7	33.6	33.6	33.7	33.7	33.7	*	*	*	*	*	*	*	*	1††
33.6	33.7	33.7	33.7	33.9	34.1	34.1	34.1	34.2	*	*	*	*	*	*	2
33.7	33.9	33.9	33.9	33.9	34.1	34.2	34.3	34.5	34.0	05 22	35.4	09 50	32.3	3.1	3
34.2	34.3	34.2	34.1	34.1	34.2	34.3	34.5	34.2	34.4	05 34	36.0	08 50	33.5	2.5	4
33.6	33.6	33.6	33.6	33.9	34.1	34.5	34.9	35.5	34.2	23 40	35.9	04 04	33.5	2.4	5
34.3	34.1	33.9	33.9	33.9	33.9	33.9	34.1	34.3	34.5	01 26	36.3	12 34	33.6	2.7	6
34.2	34.2	34.1	34.1	33.6	33.7	33.7	34.1	34.2	34.3	05 56	35.3	19 10	33.5	1.8	7
34.1	34.2	34.2	34.2	34.3	34.2	34.2	34.3	34.7	34.2	05 34	34.8	10 30	33.3	1.5	8
34.1	34.2	34.2	34.2	34.2	34.2	34.2	34.1	34.2	34.6	06 26	36.7	11 34	33.7	3.0	9
33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	34.1	34.2	05 46	35.9	03 14	33.5	2.4	10†
34.3	34.3	33.9	33.7	33.7	33.9	34.1	34.1	34.2	34.5	02 50	35.7	18 34	33.3	2.4	11†
34.1	34.1	34.1	34.1	33.9	33.9	33.9	33.9	34.1	34.2	05 46	35.5	10 10	33.5	2.0	12†
34.0	34.0	34.0	34.0	34.2	34.4	34.6	34.8	35.2	34.4	05 00	35.3	18 10	33.6	1.7	13†
34.7	34.7	34.7	34.7	34.6	34.6	34.4	34.6	34.8	34.9	01 06	35.9	09 06	33.6	2.3	14
34.1	34.2	34.2	34.4	34.6	34.6	34.7	34.8	35.0	34.5	01 06	35.9	09 54	32.9	3.0	15
33.4	33.8	33.8	33.8	34.0	34.1	34.2	34.4	34.7	34.4	02 00	37.0	14 38	32.6	4.4	16
34.0	34.1	34.1	34.0	33.5	33.0	32.9	33.2	33.8	34.2	01 34	36.2	20 34	32.6	3.6	17
33.8	33.8	34.0	33.8	34.0	33.8	33.8	34.0	34.4	34.2	03 24	35.8	09 08	32.4	3.4	18
34.1	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.4	34.6	06 36	36.5	11 34	33.6	2.9	19†
33.8	33.8	33.8	33.8	34.0	34.1	34.2	34.6	35.2	34.6	02 50	36.2	09 10	33.4	2.8	20
33.6	33.8	34.0	34.0	33.6	34.0	34.1	34.1	34.1	34.0	02 54	36.0	09 14	31.4	4.6	21††
33.5	33.6	34.0	33.8	33.8	33.8	34.1	34.4	34.7	33.8	01 16	35.2	11 18	32.4	2.8	22
33.5	33.6	34.0	34.0	34.0	34.1	34.2	34.2	34.2	33.9	01 30	35.3	10 00	32.8	2.5	23
33.8	34.0	34.1	34.0	34.0	34.1	34.2	34.6	34.8	33.9	02 04	35.2	09 16	32.2	3.0	24
34.0	34.0	34.0	34.1	34.1	34.0	34.2	34.4	34.7	34.1	01 18	35.3	10 04	32.6	2.7	25
33.5	33.2	33.4	33.6	33.8	34.1	34.0	34.8	35.4	33.9	02 20	35.6	10 06	31.8	3.8	26††
32.9	33.4	33.6	33.6	34.0	34.4	34.2	34.4	34.8	33.7	02 50	35.4	11 54	31.0	4.4	27††
33.6	34.1	34.0	34.2	34.6	34.6	34.2	35.1	34.8	34.6	04 20	36.8	13 54	33.4	3.4	28††
33.5	33.8	34.0	34.1	34.4	34.2	34.1	34.2	35.0	34.3	05 20	35.4	13 50	32.6	2.8	29
34.0	33.8	33.8	33.8	34.0	34.1	34.2	34.4	34.2	34.3	02 00	35.6	11 58	33.4	2.2	30
33.9	33.9	34.0	34.0	34.0	34.1	34.1	34.3	34.6	34.3					2.8	Mean
34.1	34.1	34.0	33.9	33.9	34.0	34.1	34.2	34.4							Mean†
33.4	33.6	33.7	33.9	34.1	34.3	34.1	34.6	34.8							Mean††

* Loss of record ; day omitted for means.
 † Five international quiet days.
 †† Five international disturbed days.

TABLE 6

Hourly values of Declination, 1952

[Averages for sixty minutes, centred at the full hours of Greenwich mean time]

December

2° plus tabular quantities

Date	Hours G. M. T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	34.6	34.8	35.3	35.4	35.4	35.4	35.4	35.3	34.4	33.4	33.6	33.8	33.8	33.8	33.8
††2	34.0	34.0	34.2	34.7	35.0	35.3	35.2	35.2	34.4	33.5	32.9	32.6	32.9	33.4	32.4
3	34.0	34.2	34.8	34.7	34.7	34.8	35.0	34.8	33.6	32.8	32.4	32.3	32.4	32.4	32.4
††4	33.6	34.0	33.5	33.4	34.2	34.7	34.6	34.1	33.4	32.8	32.3	32.3	32.3	32.6	32.8
5	34.0	33.6	33.8	34.0	33.6	35.0	35.4	35.2	34.0	33.2	32.6	32.4	33.0	33.2	33.6
6	34.2	34.4	34.6	34.4	34.4	34.7	34.8	34.6	34.0	33.8	33.8	33.8	34.0	33.8	33.8
7	34.0	34.2	34.4	35.2	35.3	35.2	34.8	34.1	33.4	32.2	32.2	33.5	33.6	33.6	33.8
8	34.2	34.4	34.8	34.4	34.8	35.3	35.3	35.0	34.6	33.4	33.0	33.0	33.5	33.6	33.5
†9	34.1	34.6	34.8	34.6	34.4	34.6	34.6	34.2	33.6	33.4	33.5	33.6	33.8	33.8	33.8
10	34.8	35.2	35.0	34.6	34.0	34.1	34.1	33.8	33.5	33.4	33.2	32.4	32.9	33.6	33.5
11	34.4	34.7	35.2	35.0	34.8	34.7	34.4	34.2	34.0	33.6	33.5	33.0	33.2	33.2	33.4
12	34.6	34.7	34.4	34.2	34.7	35.2	35.2	35.2	34.6	33.8	33.6	33.4	33.2	32.6	32.8
††13	35.3	35.4	35.6	35.0	34.6	34.4	34.1	33.4	32.3	32.3	31.6	31.2	31.4	31.8	32.2
14	34.7	34.8	34.6	34.4	34.1	34.4	34.7	34.4	34.2	34.0	33.8	33.8	33.8	33.8	33.8
15	35.3	35.3	35.6	35.3	34.7	34.6	34.1	34.4	34.0	33.6	33.5	33.6	33.8	33.8	33.8
16	34.1	34.4	34.8	35.0	35.2	34.8	34.4	35.0	34.7	33.6	32.9	32.9	33.4	33.5	33.8
17	34.4	34.8	35.6	35.8	35.9	35.3	35.2	35.2	34.6	34.0	33.6	33.5	33.8	33.8	33.8
18	35.0	35.3	36.0	36.4	36.0	35.8	35.6	35.3	35.2	34.7	34.2	33.8	33.8	33.8	34.0
†19	35.2	35.0	35.2	35.0	34.4	34.2	34.7	35.0	34.8	34.4	34.2	34.1	34.0	34.1	34.0
†20	34.8	34.8	35.3	35.2	35.0	35.2	35.4	35.8	35.4	35.0	34.7	34.2	34.0	34.0	34.0
†21	35.3	35.3	35.4	35.3	35.0	35.4	35.6	35.2	34.7	34.2	34.0	33.8	33.8	34.0	34.1
22	35.2	35.2	34.8	34.0	33.5	34.0	34.0	34.0	33.6	34.0	33.2	32.8	32.9	33.4	33.4
†23	34.1	34.2	34.1	34.1	34.7	35.6	36.4	36.2	35.8	35.4	35.0	34.4	34.2	34.2	34.2
24	35.6	35.9	35.4	34.4	34.0	34.2	34.4	34.0	34.2	34.1	33.5	33.2	32.9	32.8	32.6
25	34.7	34.4	34.4	34.7	35.2	34.7	35.0	35.2	35.2	34.6	34.8	33.0	33.0	33.2	32.9
26	34.4	34.2	34.0	33.8	33.5	34.0	34.1	34.2	34.6	34.8	34.1	33.6	33.5	33.6	33.8
27	34.8	34.2	34.2	34.4	34.1	34.2	34.7	34.0	33.5	33.6	33.6	33.5	33.6	33.8	34.0
28	33.6	33.6	33.6	34.4	35.0	35.4	35.4	34.8	34.2	34.1	34.0	33.6	33.5	33.6	33.5
††29	34.7	34.7	35.2	34.8	35.4	35.0	34.1	34.6	32.9	32.9	33.5	33.8	34.0	34.1	34.0
††30	34.0	34.0	34.8	35.2	35.2	35.4	35.0	34.6	34.1	33.3	33.4	33.5	34.0	33.6	33.6
31	34.1	34.1	34.4	34.8	35.4	35.4	35.3	34.4	34.3	33.6	33.4	32.8	32.9	33.4	33.5
Mean	34.5	34.6	34.8	34.7	34.7	34.9	34.9	34.7	34.2	33.9	33.5	33.3	33.4	33.5	33.5
†Mean	34.7	34.8	34.8	34.8	34.7	35.0	35.3	35.3	34.9	34.5	34.3	34.0	34.0	34.0	34.0
††Mean	34.3	34.4	34.7	34.6	34.9	35.0	34.6	34.4	33.4	33.0	32.6	32.7	32.9	33.1	33.0

* Loss of record; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 6

Hourly values of Declination, 1952

[Averages for sixty minutes, centred at the full hours of Greenwich mean time)

December

2° plus tabular quantities

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
									H. M.	'	H. M.	'			
33.4	33.6	33.8	33.8	34.0	34.0	33.7	33.4	34.0	34.2	02 46	35.6	09 14	32.8	2.8	1
32.3	33.4	33.8	33.8	34.0	34.6	34.0	33.8	34.1	33.9	06 34	35.4	13 06	31.8	3.6	2††
32.8	33.5	33.8	33.8	33.6	33.8	33.6	33.5	33.8	33.6	06 26	35.8	10 34	32.0	3.8	3
32.9	33.0	33.5	33.8	34.0	33.8	34.1	34.0	33.8	33.5	06 38	35.0	12 06	32.0	3.0	4††
33.8	33.8	33.8	33.8	33.8	34.0	33.8	33.8	34.0	33.8	05 36	35.9	09 40	32.3	3.6	5
34.0	33.8	34.0	34.0	34.0	34.0	33.8	33.8	34.0	34.1	05 34	35.2	09 38	33.4	1.8	6
34.0	34.1	34.4	34.6	34.4	34.4	34.6	34.7	34.4	34.1	03 58	35.6	08 34	32.6	3.3	7
33.5	33.8	33.6	33.8	33.6	33.8	33.8	33.8	34.0	34.0	06 14	35.6	09 40	32.6	3.0	8
33.8	33.8	33.8	33.8	33.8	33.8	34.0	34.1	34.6	34.1	02 10	35.2	09 10	32.6	2.6	9†
33.5	33.4	33.5	33.6	33.8	33.8	34.0	34.1	34.1	34.8	01 06	35.3	11 06	32.4	2.9	10
33.6	33.8	33.8	34.1	33.8	34.1	34.2	34.4	34.2	34.1	02 10	35.3	11 46	32.8	2.5	11
32.9	33.4	33.5	33.6	33.8	33.8	34.0	34.6	34.8	34.0	06 30	35.4	13 14	32.2	3.2	12
32.8	33.0	33.2	33.4	33.5	33.6	33.6	34.1	34.6	33.4	02 20	35.9	09 54	30.8	5.1	13††
33.8	33.8	33.8	33.8	33.8	33.8	34.0	34.1	34.8	34.1	01 42	35.0	10 22	33.6	1.4	14
33.6	33.6	33.8	33.8	33.8	33.8	33.8	34.0	34.2	34.2	02 14	35.9	09 50	32.8	3.1	15
33.8	33.8	33.8	33.8	33.6	33.8	34.0	34.0	34.1	34.1	02 10	35.3	12 04	32.6	2.7	16
34.0	34.0	34.1	34.1	34.1	34.4	34.6	34.4	34.2	34.5	03 40	36.2	11 10	33.4	2.8	17
34.0	33.8	34.0	34.0	34.2	35.1	34.8	35.0	35.0	34.8	02 40	36.6	10 56	33.5	3.1	18
34.0	34.0	34.1	34.1	34.2	34.4	34.6	34.6	34.7	34.5	01 50	35.3	11 38	33.6	1.7	19†
34.0	34.0	34.1	34.1	34.2	34.4	34.7	35.0	35.2	34.7	06 06	35.9	10 54	33.6	2.3	20†
34.2	34.2	34.4	34.4	34.6	34.7	34.8	35.0	35.0	34.7	05 50	35.9	11 34	33.6	2.3	21†
33.5	33.4	33.5	33.6	33.6	33.6	33.6	33.6	33.8	34.8	01 38	35.3	11 38	32.6	2.7	22
34.1	34.1	34.1	34.4	34.4	34.6	34.7	34.8	35.0	34.7	05 14	36.8	13 20	34.0	2.8	23†
32.8	33.2	33.5	33.6	34.0	33.5	34.0	34.1	34.1	33.9	01 10	36.4	14 50	31.8	4.6	24
33.2	33.5	33.8	34.0	34.1	34.2	34.1	34.0	34.2	34.2	05 30	35.4	12 10	32.6	2.8	25
33.8	34.1	34.4	34.1	34.2	34.2	34.4	34.7	34.7	34.1	08 50	35.3	12 06	33.4	1.9	26
34.1	34.1	34.2	34.4	34.7	34.7	34.7	34.2	32.9	34.1	05 50	35.0	22 54	32.0	3.0	27
33.4	33.8	33.8	34.0	33.8	33.5	34.0	33.5	34.6	34.0	06 10	35.6	12 06	33.0	2.6	28
33.5	33.4	33.6	34.0	34.1	33.6	33.8	34.1	34.2	34.1	05 10	35.8	09 38	32.2	3.6	29††
33.8	34.0	34.0	33.8	34.0	34.0	34.1	34.4	34.2	34.2	04 46	35.6	09 50	32.6	3.0	30††
33.5	33.8	33.6	33.8	34.0	34.1	34.1	33.8	34.0	34.0	05 00	35.6	11 30	32.2	3.4	31
33.6	33.7	33.8	33.9	34.0	34.1	34.1	34.2	34.3	34.1					2.9	Mean
34.0	34.0	34.1	34.2	34.2	34.4	34.6	34.8	34.9							Mean†
33.1	33.0	33.6	34.0	33.9	33.9	33.9	34.1	34.2							Mean††

* Loss of record ; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 7

Hourly values of Horizontal Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

July

39,000 γ plus tabular quantities

Date	Hours G. M. T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	383	386	396	413	424	433	431	432	430	430	423	414	408	405	406
2†	437	438	438	452	462	465	456	441	435	424	422	421	417	421	423
3	429	429	437	445	459	477	480	469	454	435	423	415	415	417	410
4	423	426	429	437	450	460	454	448	430	409	400	405	410	410	411
5††	429	437	440	450	469	479	446	421	416	384	379	374	379	368	341
6††	395	410	421	441	444	440	443	424	390	397	384	386	390	404	408
7	413	421	431	443	456	468	480	481	471	455	432	417	413	419	423
8	416	420	429	444	461	485	487	477	464	447	422	401	402	410	401
9††	430	435	438	441	446	440	469	449	439	439	409	408	404	408	414
10	421	425	432	448	457	464	461	456	440	430	419	400	400	400	409
11	422	414	405	405	433	439	437	421	415	409	402	398	403	411	408
12	423	427	436	454	471	472	479	470	454	445	430	429	425	422	426
13	446	446	449	450	454	469	482	486	469	448	427	417	422	442	430
14	427	430	441	458	479	474	475	471	464	443	439	425	413	408	406
15	428	438	436	450	452	463	466	462	463	442	429	417	418	422	419
16	423	422	427	439	456	477	474	454	448	438	424	418	415	416	419
17	424	430	438	454	467	469	468	448	446	438	432	430	429	426	424
18	438	438	440	458	472	481	480	464	447	438	429	413	405	410	418
19†	430	439	442	454	478	480	487	483	466	457	450	442	439	434	433
20††	429	442	458	478	496	500	506	506	492	473	448	404	401	411	420
21††	414	420	430	450	437	437	469	448	440	441	434	393	389	384	384
22	405	405	403	414	423	445	447	441	427	404	393	395	401	398	396
23	397	403	408	417	435	442	465	465	463	455	446	422	410	409	404
24	404	404	410	418	434	451	466	466	452	441	430	418	410	411	406
25	402	404	410	421	438	460	472	470	460	437	420	403	394	394	396
26	399	399	402	404	418	436	435	430	425	426	426	420	412	406	406
27	406	409	411	428	439	452	454	454	453	450	447	428	413	410	410
28†	421	419	426	434	450	450	452	442	442	446	450	430	421	424	424
29†	409	414	419	442	462	480	470	447	424	411	411	412	412	419	420
30†	412	414	421	436	449	465	466	461	458	450	435	417	410	417	418
31	430	441	460	476	491	522	524	508	465	427	425	406	382	387	393
Mean	418	422	428	440	454	464	467	458	447	434	424	412	408	410	410
Mean †	422	425	429	444	460	468	466	455	445	438	434	424	420	423	424
Mean ††	419	429	437	452	458	459	467	450	435	427	411	393	393	395	393

* Loss of record; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 7

Hourly values of Horizontal Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

July

39,000 γ plus tabular quantities

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag		
γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	H. M.	γ	H. M.	γ	γ	
408	408	408	411	414	414	424	442	447	416	22 50	451	00 12	381	70	1
422	423	421	424	425	425	427	428	427	432	04 42	472	12 20	416	56	2†
399	390	398	400	402	413	408	408	416	426	05 30	488	15 58	387	101	3
408	410	415	421	421	420	418	422	425	423	05 10	465	09 32	399	66	4
357	355	356	357	376	382	387	387	383	398	04 58	495	14 02	329	166	5††
408	408	408	408	409	411	411	411	408	411	03 50	457	07 54	374	83	6††
421	416	415	417	416	419	419	419	417	433	07 18	483	12 18	412	71	7
399	403	408	416	416	416	415	421	421	428	05 26	490	15 02	398	92	8
400	406	417	421	421	417	424	422	420	426	06 10	484	16 20	398	86	9††
406	413	415	408	406	404	409	411	419	423	05 22	475	11 02	392	83	10
407	409	414	421	420	422	424	425	424	416	03 52	448	11 10	396	52	11
427	430	432	434	434	435	432	430	438	440	05 36	482	13 18	420	62	12
422	422	419	423	430	430	427	427	426	440	06 46	492	10 46	411	81	13
413	407	411	422	420	422	423	422	422	434	07 30	502	13 36	405	97	14
415	418	420	423	424	425	424	421	424	433	05 30	476	14 36	414	62	15
416	420	421	419	424	421	417	421	423	430	05 24	490	15 02	414	76	16
419	414	416	424	431	428	424	430	439	435	04 50	477	15 38	412	65	17
418	416	431	429	426	426	429	430	430	436	05 22	488	08 01	403	85	18
434	433	439	436	443	445	446	437	432	448	05 26	489	23 58	427	62	19
406	414	406	405	408	408	411	440	427	441	07 16	518	11 20	387	131	20
387	386	384	392	406	399	399	397	395	413	06 01	488	13 06	383	105	21
399	398	398	397	397	403	406	397	396	408	05 38	467	09 44	387	80	22
400	397	399	403	402	403	405	411	405	419	06 50	485	15 38	395	90	23
404	402	409	404	404	403	399	399	401	419	06 34	482	21 42	397	85	24
398	412	411	408	402	408	405	401	400	418	05 46	478	12 42	388	90	25
414	412	410	413	412	409	407	404	404	414	05 18	452	00 31	398	54	26
410	412	414	417	409	401	404	410	429	424	06 50	458	15 54	398	60	27
420	420	412	410	418	414	410	411	411	427	05 38	461	16 52	409	52	28†
419	421	422	423	424	421	424	420	417	427	04 59	482	11 22	408	74	29†
420	420	418	418	418	419	420	421	425	429	05 46	469	11 50	407	62	30†
396	400	385	386	393	402	408	410	410	430	05 18	534	12 01	379	155	31
409	410	411	413	415	415	416	417	418	426					82	Mean
423	423	422	422	426	445	425	423	422							Mean†
392	394	394	397	404	403	406	411	407							Mean††

* Loss of record ; day omitted for means

† Five international quiet days

†† Five international disturbed days

TABLE 8

Hourly values of Horizontal Force, 1952
(Averages for sixty minutes centred at the full hours of Greenwich mean time)

39,000 γ plus tabular quantities.

August

Date	Hours G. M. T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	410	411	419	427	438	437	439	437	442	438	434	413	402	441	417
2	410	414	427	439	459	469	467	466	435	414	407	404	407	416	421
††3	426	428	430	463	475	454	439	403	361	362	387	405	409	389	370
4	395	395	403	418	425	427	427	412	409	412	404	399	411	420	419
5	415	421	421	434	445	457	461	447	431	419	413	423	426	427	429
6	415	409	409	432	443	434	435	433	419	411	405	388	387	395	395
7	412	419	427	446	460	476	483	475	451	435	421	403	393	403	403
8	408	416	422	444	461	454	442	434	426	404	408	406	403	407	410
9	416	418	428	436	446	457	464	468	461	452	438	426	419	414	410
10	402	400	410	414	442	467	480	473	458	429	404	388	371	379	382
11	393	403	406	418	433	450	462	466	460	451	431	409	402	404	406
††12	408	403	414	432	465	482	483	485	469	442	410	387	395	398	401
13	406	410	421	442	484	499	493	470	441	403	396	397	401	404	406
†14	405	406	414	437	458	467	468	460	458	436	427	418	414	417	413
15	416	420	429	450	468	476	479	470	471	470	458	441	428	426	424
†16	425	418	427	444	448	441	427	441	456	439	421	410	412	416	414
††17	426	450	471	496	500	512	536	506	467	428	393	374	406	410	390
††18	410	430	450	445	452	469	475	464	464	446	432	412	398	402	417
19	412	411	411	434	452	459	468	475	468	442	428	416	406	408	412
20	411	411	408	417	434	412	411	414	418	426	411	398	394	402	403
21	417	419	426	437	461	480	477	473	467	467	475	470	456	442	437
22	430	429	441	469	491	514	527	523	501	483	467	449	442	434	433
23	417	409	399	389	431	467	488	493	475	461	451	448	447	446	433
24	432	433	441	461	496	532	555	556	529	506	489	469	458	456	450
†25	434	433	433	449	467	484	474	453	440	438	437	438	439	437	434
†26	427	427	432	456	481	506	521	517	497	475	459	443	443	445	443
27	425	425	432	455	480	503	515	506	479	464	449	425	424	417	418
†28	425	426	436	462	485	509	507	488	467	450	436	432	433	432	427
29	425	428	440	465	493	514	528	528	515	490	464	444	441	437	433
††30	413	416	395	409	417	425	419	427	441	471	464	450	435	435	429
31	410	410	413	424	451	456	464	442	421	409	408	405	410	419	415
Mean	415	418	424	440	459	471	475	468	455	441	430	419	417	419	416
Mean †	423	422	428	450	468	481	479	472	464	448	436	428	428	429	426
Mean ††	417	425	432	449	462	468	470	457	440	430	417	406	409	407	407

* Loss of record, day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 8

Hourly values of Horizontal Force, 1952
(Averages for sixty minutes centred at the full hours of Greenwich mean time)

August

39,000γ plus tabular quantities

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	H. M.	γ	H. M.	γ	γ	
418	419	419	417	407	415	411	412	410	422	07 46	447	11 58	400	47	1
421	419	414	410	425	423	423	419	427	427	05 18	471	10 54	403	68	2
355	363	379	387	387	394	395	395	397	402	03 42	486	15 04	346	140	3††
415	403	408	407	420	427	419	419	415	413	05 34	439	00 02	394	45	4
423	415	415	407	408	417	419	421	418	425	06 10	469	18 26	401	68	5
391	399	403	405	411	407	405	409	412	411	03 48	453	11 32	382	71	6
399	398	401	404	412	413	411	407	403	423	05 50	495	12 26	389	106	7
412	412	412	412	415	413	417	418	418	420	04 20	468	09 10	398	70	8
408	412	413	419	422	414	408	410	407	428	06 24	470	00 24	404	66	9
382	371	366	389	401	396	390	388	395	407	06 40	484	16 38	359	125	10
408	411	412	413	414	418	418	419	424	422	07 18	468	00 16	392	76	11
395	401	396	402	400	406	408	407	406	421	05 22	494	11 01	384	110	12††
403	402	410	407	406	404	404	405	404	422	05 34	508	10 28	392	116	13
412	412	412	412	414	417	417	416	415	426	05 26	474	00 22	404	70	14†
421	425	425	426	426	428	450	438	439	442	05 50	482	00 18	409	73	15
414	413	414	414	414	415	416	416	419	424	08 46	461	12 10	409	52	16†
387	399	398	406	422	416	414	412	409	435	06 26	560	11 44	361	199	17††
412	396	402	402	403	406	406	412	420	426	06 46	489	17 10	388	101	18††
408	399	401	402	407	410	413	412	412	424	07 44	477	15 56	396	81	19
403	409	408	412	414	409	406	407	418	411	03 58	438	11 31	387	51	20
434	429	427	425	425	428	432	432	433	445	05 31	489	00 20	415	74	21
432	433	428	430	428	432	428	429	426	454	07 01	533	21 26	425	108	22
437	440	437	433	427	428	428	428	428	439	06 54	501	03 12	374	127	23
451	453	442	437	437	437	437	437	435	468	06 38	569	00 18	429	140	24
429	428	426	426	431	433	433	432	429	440	05 02	489	17 30	425	64	25†
441	441	441	441	433	428	426	420	421	453	06 42	525	22 14	417	108	26†
420	416	417	423	423	419	422	425	425	442	06 30	526	12 38	411	115	27
427	427	416	424	425	425	425	425	425	443	05 32	518	19 26	423	95	28†
415	394	387	394	387	389	413	413	411	444	06 30	531	19 16	383	148	29
432	417	408	411	400	393	407	403	407	422	08 42	476	20 18	388	88	30††
409	410	410	413	417	417	413	409	413	420	06 06	472	23 54	403	69	31
413	412	412	413	415	415	417	416	417	429					93	Mean
425	424	424	423	423	424	423	422	422							Mean †
396	395	397	402	402	403	406	406	408							Mean ††

* Loss of record, day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 9

Hourly values of Horizontal Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

September

39,000γ plus tabular quantities.

Date	Hours G. M.T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1††	412	419	424	452	445	421	445	429	414	397	396	395	387	372	363
2	403	397	396	413	460	486	469	469	423	381	364	373	395	401	399
3	414	413	419	438	456	468	445	421	411	405	413	414	415	413	407
4	409	412	427	444	476	507	528	519	491	461	422	395	400	403	404
5	413	421	435	452	483	502	498	477	453	439	416	403	404	387	369
6	390	404	425	453	469	481	467	447	423	404	402	405	411	413	409
7	421	425	433	457	481	481	485	469	449	437	429	423	431	437	429
8††	414	403	388	412	452	460	460	456	456	417	410	402	398	396	390
9††	398	398	388	388	404	440	428	432	420	424	409	387	386	384	388
10	404	410	410	424	451	480	468	452	430	399	384	386	396	397	402
11	404	412	420	440	464	478	472	452	440	428	412	402	407	402	398
12	417	411	420	430	447	450	456	458	446	428	426	427	426	425	428
13†	404	405	415	434	452	474	484	476	460	442	428	419	421	418	420
14	428	430	438	468	473	476	486	473	455	448	442	428	412	399	398
15	412	411	417	421	451	474	485	481	454	436	421	425	428	425	422
16	426	426	428	440	468	487	487	476	457	435	415	414	420	419	418
17†	422	417	427	459	491	507	510	484	448	426	412	409	414	418	421
18†	426	422	430	459	489	512	518	506	478	455	441	436	436	434	428
19†	421	418	428	461	499	529	553	542	513	482	446	436	437	438	436
20	422	406	414	480	524	518	515	499	471	452	434	434	442	445	442
21	417	419	425	413	444	469	484	482	474	451	427	416	413	418	420
22	425	428	435	445	480	509	517	507	482	452	436	429	427	429	427
23†	419	417	427	447	490	508	513	493	465	442	435	435	437	434	431
24	433	433	442	461	498	522	513	488	475	459	456	437	434	431	421
25	424	424	427	452	482	501	509	491	474	461	450	445	445	441	437
26	393	380	443	364	401	427	442	429	419	416	409	402	401	398	401
27	417	418	430	451	475	478	467	440	411	399	402	385	377	373	366
28	404	400	411	441	467	463	449	425	396	379	389	403	416	403	393
29††	387	395	419	419	433	458	436	418	378	347	331	326	341	343	372
30††	371	377	366	403	426	459	467	452	416	386	338	335	363	376	371
Mean .	412	412	420	437	464	481	482	468	446	426	413	407	411	409	407
Mean † . .	418	416	425	452	484	506	515	500	473	449	432	427	429	428	427
Mean †† . .	396	398	397	415	432	448	447	437	417	394	377	369	375	374	377

* Loss of record; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 9

Hourly values of Horizontal Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

September

39,000γ plus tabular quantities.

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
γ	γ	γ	γ	γ	γ	γ	γ	γ	H. M.	γ	H. M.	γ	γ		
364	390	393	394	397	391	387	394	396	403	05 36	474	14 50	355	119	1††
405	391	396	395	396	402	403	411	419	410	05 06	507	10 18	352	155	2
404	403	413	412	404	404	403	406	412	417	04 50	479	16 50	401	78	3
406	411	407	404	415	414	413	413	414	433	06 14	532	10 58	391	141	4
352	346	376	341	341	359	376	381	389	409	05 26	515	14 30	337	178	5
404	408	407	404	405	405	413	420	421	420	05 04	491	19 18	399	92	6
433	429	429	425	423	424	413	413	413	437	04 06	490	22 30	397	93	7
400	416	414	391	395	404	410	417	412	416	06 10	482	18 14	386	96	8††
380	403	389	388	396	408	402	398	398	401	06 10	462	12 42	374	88	9††
396	397	403	408	408	406	412	412	408	414	05 24	490	10 30	381	109	10
402	386	388	397	405	404	414	421	420	419	05 12	486	16 34	380	106	11
418	417	410	412	389	396	396	404	403	423	06 40	472	19 18	385	87	12
419	418	418	418	419	418	426	427	426	431	06 06	488	00 02	403	85	13†
390	402	396	399	404	414	418	410	418	429	05 14	516	15 10	386	130	14
418	419	420	421	426	426	423	419	418	431	05 50	488	01 01	410	78	15
418	418	418	423	422	419	421	433	426	434	04 50	497	10 40	410	87	16
426	422	426	428	426	427	428	429	428	438	05 32	516	10 54	404	112	17†
426	422	421	420	419	423	425	426	425	445	06 10	524	19 10	418	106	18†
432	428	428	430	435	430	423	423	422	454	06 06	558	00 50	417	141	19†
440	435	433	434	436	449	436	428	427	451	05 14	526	01 20	403	123	20
417	417	416	414	413	415	416	414	419	430	05 54	492	21 56	411	81	21
422	417	415	411	412	413	417	421	425	441	05 58	523	17 52	410	113	22
426	427	429	429	430	429	428	432	434	444	05 38	513	00 44	415	98	23†
417	398	390	406	409	407	405	407	415	440	04 56	531	16 36	387	144	24
437	441	435	417	419	427	437	443	413	447	05 50	516	23 26	398	118	25
399	402	401	403	404	400	404	409	413	407	06 04	457	02 54	355	102	26
368	381	389	398	395	397	401	403	405	409	05 10	489	14 52	357	132	27
396	419	404	387	372	369	403	386	387	407	03 58	479	19 36	346	133	28
376	386	394	394	395	392	427	416	409	391	04 52	469	10 44	316	153	29††
370	389	389	381	387	395	398	400	395	392	06 04	485	10 34	315	170	30††
405	408	408	406	407	409	413	414	414	424					115	Mean
426	423	424	425	426	425	426	427	427							Mean †
378	397	396	390	394	398	405	405	402							Mean ††

*Loss of record, day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 10

Hourly values of Horizontal Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time.)

October

39,000 γ plus tabular quantities

Date	Hours G. M. T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	394	393	411	439	476	503	514	496	467	434	417	414	418	416	411
2	417	416	427	459	496	514	499	475	450	428	426	426	419	409	400
3	410	415	433	453	476	485	467	441	426	413	413	417	417	409	401
4††	393	411	405	441	470	490	444	389	339	347	373	403	409	403	379
5††	397	395	411	443	467	449	437	385	373	341	323	325	331	349	365
6	383	387	403	411	416	461	440	401	385	369	377	391	392	380	378
7	403	404	420	444	472	482	489	456	434	429	417	414	397	397	389
8	409	411	423	443	467	477	491	475	471	458	444	423	411	403	405
9	416	388	387	401	420	433	447	447	440	432	419	406	395	389	387
10	401	392	391	416	438	458	467	454	441	427	417	417	415	415	410
11	397	397	396	418	435	449	441	432	427	417	417	417	403	387	387
12	403	401	414	425	446	455	449	448	431	424	415	401	395	395	395
13†	394	395	400	415	434	439	437	426	424	426	415	414	411	403	400
14	397	401	411	425	454	463	450	440	434	426	424	412	409	404	401
15†	395	401	417	425	435	455	458	447	430	415	401	409	410	408	403
16	407	406	425	443	463	455	473	463	445	438	434	428	430	416	407
17	401	403	409	425	443	435	432	417	408	400	399	393	395	400	400
18	387	393	405	427	444	454	456	432	399	379	377	387	395	391	392
19	401	403	416	439	465	473	461	446	420	398	391	395	399	395	392
20	398	395	409	426	457	463	473	457	433	411	400	403	404	401	392
21	403	403	413	437	457	475	481	470	455	441	447	439	424	411	395
22†	415	417	426	425	419	448	455	457	448	435	422	417	409	407	406
23†	398	391	393	423	459	495	504	457	478	455	434	423	409	406	409
24†	415	415	417	431	452	477	487	483	470	455	437	425	423	417	415
25	423	423	427	412	474	499	517	518	509	495	480	438	423	411	401
26††	411	393	393	385	415	429	443	449	442	433	421	398	337	295	303
27	383	385	390	407	430	451	461	455	433	398	379	376	384	382	379
28	392	393	392	416	442	471	493	478	457	440	423	417	409	402	399
29	415	413	414	421	435	448	447	431	415	401	401	407	401	387	384
30††	383	377	392	409	419	416	431	438	431	417	409	407	403	404	389
31††	383	377	382	393	417	423	409	370	352	360	369	374	350	321	343
Mean . . .	401	400	408	425	448	462	463	446	431	417	410	407	401	394	391
Mean † . . .	403	404	411	424	440	463	468	454	450	437	422	418	412	408	407
Mean †† . . .	393	391	397	414	438	441	433	406	387	380	379	381	366	354	356

* Loss of record; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 10

Hourly values of Horizontal Force, 1952

(Averages for sixty minutes, centred at the full hours of Greenwich mean time.)

October

39,000γ plus tabular quantities

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag		
γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	H. M	γ	H. M	γ	γ	
409	409	416	414	417	417	416	411	413	430	05 50	519	01 16	390	129	1
409	417	420	412	413	429	414	409	411	433	05 10	522	12 01	398	124	2
380	373	371	375	381	406	421	413	409	417	05 54	499	16 40	362	137	3
379	376	375	387	413	395	401	401	409	401	04 22	511	08 02	327	184	4††
376	378	378	369	387	386	379	379	381	383	03 42	475	11 42	315	160	5†
381	397	389	409	395	396	402	405	407	398	04 50	471	09 15	365	106	6
389	389	387	387	394	397	404	410	405	417	05 52	492	17 26	384	108	7
403	394	385	385	399	409	403	408	419	426	06 02	501	16 50	379	122	8
391	391	391	393	397	399	406	399	398	407	05 52	457	01 40	385	72	9
407	399	398	397	398	415	399	391	394	415	05 52	468	21 28	385	83	10
399	399	395	403	394	391	393	399	395	408	05 28	469	17 34	382	87	11
393	387	383	383	379	391	399	398	393	408	05 10	472	18 30	378	94	12
392	387	391	398	394	393	395	393	393	407	05 36	443	15 38	385	58	13†
400	394	391	388	393	395	393	394	395	412	05 02	472	17 34	386	86	14
401	401	395	406	406	400	410	407	408	414	05 50	466	17 28	394	72	15†
403	403	406	406	408	407	407	406	401	424	05 34	479	22 46	400	79	16
396	382	382	380	378	381	385	385	385	401	03 54	449	19 02	376	73	17
391	371	369	375	388	396	393	393	399	400	05 50	464	16 36	367	97	18
392	393	397	400	402	402	400	403	401	412	04 34	477	09 24	385	92	19
377	374	377	391	399	399	399	401	402	410	06 10	477	15 42	371	106	20
368	363	384	359	351	377	390	398	411	415	06 06	485	19 18	345	140	21
403	399	399	399	398	400	400	399	397	417	05 12	474	23 20	395	79	22†
407	404	407	403	407	408	408	408	410	425	05 50	508	01 20	390	118	23†
415	415	415	415	417	418	419	420	423	432	05 58	491	17 50	414	77	24†
406	409	406	408	393	399	403	413	422	438	06 30	536	18 52	392	144	25
297	295	305	333	351	363	368	376	375	375	06 10	459	15 30	289	170	26††
377	377	385	386	393	393	393	393	391	399	05 50	468	10 26	375	93	27
395	407	415	414	417	413	414	415	414	422	05 54	502	00 52	390	112	28
382	362	368	360	363	377	383	379	390	399	05 38	457	18 50	358	99	29
368	305	293	302	325	360	352	378	394	383	07 06	443	17 26	282	161	30††
331	353	367	345	368	379	377	377	379	371	05 46	433	13 34	312	121	31††
388	384	385	387	391	396	398	399	401	410					109	Mean
404	401	401	404	404	404	406	406	406							Mean†
350	341	344	347	369	376	375	382	388							Mean ††

* Loss of record; · day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE II

Hourly values of Horizontal Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

November

39,000γ plus tabular quantities

Date	Hours G. M. T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1††	382	386	401	417	433	435	423	389	369	371	385	403	379	382	372
2	391	393	403	423	446	465	454	432	402	390	390	395	400	401	391
3	399	399	408	425	439	447	443	433	424	412	393	393	391	392	382
4	398	403	421	468	459	474	448	441	421	403	401	407	410	407	403
5	407	406	413	425	448	471	472	464	443	423	406	407	409	407	402
6	433	435	447	463	466	486	495	462	429	405	413	409	404	393	407
7	407	408	417	438	456	466	478	465	455	443	429	416	416	414	403
8	409	408	421	435	455	465	462	442	427	418	407	401	401	400	399
9	400	400	409	435	445	455	466	473	465	446	431	418	409	408	407
10†	409	410	419	434	450	461	467	469	468	455	438	425	423	421	417
11†	416	417	427	438	458	477	480	472	458	449	443	438	429	427	427
12†	411	415	422	441	455	457	453	435	409	404	408	419	424	423	423
13†	416	421	428	440	447	455	461	353	439	430	420	412	405	405	407
14	415	413	421	439	455	465	466	455	443	436	433	430	429	423	415
15	415	417	418	438	465	472	457	426	397	365	353	368	383	390	389
16	400	407	429	456	481	493	481	461	439	421	420	415	393	360	339
17	384	397	419	429	445	453	447	436	408	389	381	383	388	391	392
18	385	393	415	439	438	445	438	435	420	396	391	398	404	400	396
19†	389	394	409	423	435	447	449	423	397	373	371	381	391	390	387
20	389	397	411	445	473	487	470	447	422	407	403	399	410	409	405
21††	406	413	430	456	473	473	464	453	407	349	348	343	345	356	358
22	366	366	358	360	375	391	412	413	402	398	389	375	368	358	346
23	374	375	376	381	399	421	415	413	401	386	376	375	389	388	388
24	386	384	390	403	429	443	450	450	437	413	394	393	369	378	376
25	384	381	384	400	423	440	452	453	445	425	407	405	394	388	388
26††	382	383	391	407	438	457	463	447	428	404	380	375	380	378	376
27††	365	361	378	409	438	449	438	392	359	341	343	339	327	325	311
28††	372	373	375	485	397	403	406	393	389	387	381	375	359	368	349
29	373	375	393	413	433	442	437	429	416	401	401	392	378	369	380
30	376	390	403	417	434	432	411	389	375	371	366	366	369	368	365
31															
Mean.	395	397	408	426	443	454	452	438	420	404	397	395	392	391	387
Mean †	408	411	421	435	449	459	462	450	434	422	416	415	414	413	412
Mean. ††	381	383	395	415	436	423	439	415	390	370	367	367	358	362	353

* Loss of record, day omitted for means

† Five international quiet days.

†† Five international disturbed days.

TABLE II

Hourly values of Horizontal Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

November

39,000γ plus tabular quantities

Hours G. M. T.									Mean.	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time.	Mag		
γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	H. M.	γ	H. M.	γ	γ	
379	368	374	379	383	385	387	398	385	390	05 20	449	13 50	365	84	1†
384	383	377	382	385	403	409	401	399	404	05 38	466	17 26	375	91	2
391	383	386	391	393	395	396	398	395	405	04 40	449	16 10	378	71	3
402	401	399	401	401	401	402	403	406	416	05 30	479	10 02	400	79	4
401	403	405	409	408	410	415	409	425	420	05 30	476	16 31	400	76	5
409	399	393	402	422	422	409	408	407	426	05 40	505	16 18	391	114	6
409	411	415	417	425	421	397	415	416	427	05 54	483	21 20	392	91	7
400	400	402	399	414	407	400	406	407	416	05 36	487	18 16	395	92	8
412	411	410	417	415	408	411	409	409	424	07 04	475	00 50	399	76	9
412	409	411	411	411	413	414	415	417	428	07 24	473	16 30	408	65	10†
423	417	406	397	399	406	409	409	411	431	05 50	483	18 30	392	91	11†
422	420	418	421	420	420	419	419	416	424	05 18	459	08 56	401	58	12†
405	404	401	402	407	413	415	417	418	422	06 01	463	17 38	400	63	13†
413	413	413	411	406	406	409	409	412	426	06 14	470	20 10	405	65	14
389	385	389	389	386	398	397	399	399	403	04 18	487	09 58	352	135	15
349	356	364	375	376	380	381	381	381	406	05 06	499	14 14	330	169	16
394	396	396	388	378	391	380	373	383	401	05 34	457	20 40	367	90	17
394	392	392	393	395	395	388	389	388	405	05 04	463	09 20	383	80	18
387	387	386	388	389	389	393	391	389	398	05 48	458	09 54	367	91	19†
401	401	391	405	404	403	399	401	409	416	05 02	495	00 02	388	107	20
356	356	373	397	374	375	375	373	367	392	05 06	507	11 06	339	168	21††
341	345	365	364	359	363	347	369	371	371	06 18	417	15 58	338	79	22
381	381	383	388	389	387	389	390	389	390	05 42	424	00 28	370	54	23
369	377	386	383	388	390	389	389	386	398	06 54	454	15 22	366	88	24
377	375	376	381	384	385	386	385	383	400	06 46	457	15 30	373	84	25
369	364	353	366	365	395	377	358	372	392	06 06	471	17 10	351	120	26††
320	340	356	347	357	379	374	369	368	366	05 18	469	13 32	297	172	27††
356	376	365	377	389	384	381	375	374	379	05 46	416	14 18	343	73	28††
377	374	381	391	398	388	385	389	390	396	04 52	445	12 42	367	78	29
379	369	364	365	368	369	371	374	371	382	05 12	437	18 50	362	75	30
															31
387	387	388	391	393	396	393	394	395	405					93	Mean.
410	407	404	404	405	408	410	410	410							Mean.†
356	361	364	373	374	384	379	375	373							Mean.††

* Loss of records ; day omitted for means

† Five international quiet days.

†† Five international disturbed days.

TABLE 12

Hourly values of Horizontal Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

December

39,000γ plus tabular quantities

Date	Hours G. M. T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	371	375	391	403	423	431	430	417	415	395	385	387	391	392	376
2††	355	361	365	380	407	411	411	411	395	377	372	359	360	345	329
3	350	354	363	379	385	379	395	388	370	354	361	374	378	372	365
4††	357	374	361	379	379	405	424	411	371	360	347	337	344	343	352
5	361	353	352	371	380	402	400	394	380	355	347	342	345	362	357
6	354	349	354	371	386	402	405	397	376	362	361	365	366	364	361
7	361	357	371	386	422	447	453	441	412	394	381	377	371	372	365
8	363	363	366	388	408	424	425	417	403	386	378	382	385	385	379
9†	377	379	386	401	416	431	434	424	411	400	392	387	386	387	386
10	379	377	373	385	397	416	421	427	417	403	399	385	376	363	363
11	355	361	369	381	403	410	401	393	389	389	385	377	369	364	360
12	366	369	371	383	405	427	434	432	423	401	385	373	363	349	334
13††	381	377	373	393	395	415	425	418	392	342	281	254	243	263	294
14	346	345	342	349	363	379	381	378	373	369	362	357	353	348	347
15	366	371	381	403	422	443	450	442	427	401	379	384	385	384	383
16	378	382	392	401	414	433	443	442	428	408	385	366	357	360	352
17	364	364	369	378	394	404	410	394	377	367	370	371	372	371	370
18	371	376	387	412	431	432	441	441	442	433	417	405	399	392	385
19†	377	377	382	391	407	425	427	425	419	412	400	387	381	386	387
20†	386	390	402	415	433	451	464	450	434	423	410	399	389	387	387
21†	387	388	393	403	409	415	423	426	427	426	425	418	409	399	387
22	387	385	385	401	414	425	440	435	433	429	420	406	397	393	381
23†	374	377	382	397	416	431	443	435	421	406	402	395	395	395	396
24	413	417	411	420	425	442	453	456	442	430	403	381	372	347	326
25	377	375	368	383	376	383	404	412	405	389	370	373	361	355	348
26	377	378	377	387	401	427	437	425	376	369	402	386	365	363	368
27	387	383	381	391	405	423	431	429	417	408	402	391	386	385	385
28	364	355	354	377	392	411	409	403	403	403	400	389	382	379	366
29††	379	377	377	379	390	395	382	363	353	333	347	327	377	374	369
30††	363	361	369	383	381	403	352	346	344	343	361	355	367	363	354
31	368	369	374	387	407	403	417	395	392	387	392	382	385	387	386
Mean.	371	372	375	389	403	417	421	415	402	389	381	373	371	369	364
Mean †	380	382	389	401	416	431	438	432	422	413	406	397	392	391	389
Mean ††	367	370	369	383	390	406	399	390	371	351	342	326	338	338	340

* Loss of record, day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 12

Hourly values of Horizontal Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

December

39,000γ plus tabular quantities

Hours G. M. T.									Mean.	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag		
γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	H M.	γ	H M	γ	γ	
352	347	351	357	352	352	376	363	355	383	05 26	436	15 34	345	91	1
299	291	313	325	337	352	349	343	352	358	06 50	419	15 42	281	138	2††
361	362	366	366	362	361	360	369	369	368	06 38	404	09 10	345	59	3
355	342	346	353	363	344	346	349	357	362	05 38	451	11 22	327	124	4††
361	358	359	357	355	372	358	361	357	364	05 04	411	11 02	335	76	5
362	362	361	363	369	370	368	362	363	369	05 26	411	01 04	347	64	6
365	363	354	353	362	367	363	363	363	382	06 00	459	18 50	351	108	7
368	365	370	371	371	374	378	376	378	383	05 30	428	01 10	361	67	8
386	385	380	381	379	380	381	379	379	393	05 34	440	00 10	374	66	9†
354	342	332	329	335	344	344	352	354	374	06 36	429	17 50	326	103	10
362	363	355	361	363	364	369	371	369	374	04 42	417	17 32	354	63	11
329	335	350	361	361	363	370	376	378	377	05 32	443	15 28	327	116	12
309	318	328	333	338	337	345	344	346	343	04 52	442	12 04	239	203	13||
346	346	349	354	356	357	361	369	369	358	05 26	389	02 16	340	49	14
383	382	382	380	379	382	385	381	381	394	05 32	458	00 10	365	93	15
345	341	339	352	358	363	366	369	363	381	05 48	451	16 38	336	115	16
370	364	370	371	371	372	373	378	373	376	06 12	417	16 12	363	54	17
384	378	375	369	376	375	381	387	384	399	07 42	444	17 38	365	79	18
387	385	381	379	380	381	384	385	384	393	05 58	429	00 14	374	55	19†
385	382	381	385	386	389	389	390	393	404	05 42	468	16 50	379	89	20†
381	381	381	380	381	383	386	387	387	399	06 58	428	17 10	379	49	21†
363	346	346	352	361	363	365	371	371	390	05 58	444	16 08	342	102	22
395	394	394	391	391	394	397	402	408	401	05 48	445	00 10	371	74	23†
343	345	352	355	364	363	361	368	376	390	06 50	460	13 32	317	143	24
351	353	362	370	371	368	370	370	372	374	07 10	417	14 16	345	72	25
371	379	385	378	377	380	384	386	367	385	05 50	442	12 30	362	80	26
384	383	393	394	401	401	386	369	371	395	07 12	435	22 34	335	100	27
362	357	353	375	368	357	363	368	383	378	05 38	413	16 56	342	71	28
361	362	362	337	336	345	353	363	363	363	05 08	405	11 42	323	82	29†||
347	353	368	358	358	365	369	365	368	362	05 10	413	08 04	342	71	30††
384	379	369	374	392	390	390	383	392	387	06 00	429	17 42	367	62	31
361	359	362	363	366	368	370	371	372	379					88	Mean
387	385	383	383	383	385	387	389	390							Mean†
334	333	343	341	346	349	352	353	357							Mean ††

* Loss of record, day omitted for means.

† Five international quiet days.

†|| Five international disturbed days

TABLE 13

Hourly values of Vertical Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

July

2,000 γ plus Tabular quantities

Date	Hours G.M.T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	456	457	458	455	456	451	444	436	438	440	442	441	442	444	445
2†	452	451	444	442	438	434	436	441	445	445	443	445	446	446	446
3	456	457	461	460	456	450	443	444	449	451	456	453	451	449	444
4	454	454	450	445	446	451	452	453	460	464	463	462	456	448	446
5††	455	460	455	452	449	439	431	440	441	446	450	440	445	438	433
6††	452	454	449	444	446	444	452	445	440	452	452	452	452	453	453
7	456	460	457	455	454	453	451	443	439	435	444	451	452	451	451
8	455	458	464	462	455	449	442	438	440	448	452	453	451	445	443
9††	455	457	456	456	468	471	466	452	452	452	449	461	460	461	453
10	456	457	454	448	441	441	438	440	445	452	455	453	452	451	453
11	461	461	464	464	455	442	448	462	470	472	470	465	462	452	449
12	452	453	451	445	440	440	435	433	438	445	450	451	449	445	448
13	451	453	456	453	448	441	435	433	434	438	443	450	451	445	440
14	452	453	452	450	450	439	442	450	446	445	442	442	443	444	444
15	451	452	450	444	441	441	444	443	439	443	444	443	442	442	440
16	446	446	445	442	442	443	438	440	443	448	445	445	448	445	445
17	449	451	451	448	444	440	438	450	453	451	452	451	448	444	445
18	453	452	446	443	445	445	449	448	449	446	444	452	453	451	450
19†	450	451	450	445	441	433	432	434	440	442	442	441	441	442	443
20††	443	445	448	449	453	450	449	455	462	471	462	440	442	444	451
21††	450	450	445	440	430	438	434	430	439	442	441	433	445	442	446
22	455	456	457	453	446	455	453	453	457	455	458	463	456	446	445
23	448	452	453	452	456	456	451	443	440	440	441	441	445	449	448
24	446	450	456	455	458	456	450	443	443	441	440	439	439	442	442
25	449	452	450	445	439	434	436	434	429	428	428	427	434	436	440
26	444	445	443	442	450	444	440	435	434	441	445	446	449	450	450
27	450	451	449	443	440	436	433	439	435	434	434	435	436	440	442
28†	448	446	443	440	434	438	441	439	440	427	432	440	443	443	442
29†	442	445	441	435	436	432	433	440	455	462	457	451	445	448	449
30†	450	452	456	454	449	439	430	429	428	423	430	435	441	445	444
31	455	458	454	445	430	424	420	410	405	409	420	423	427	439	441
Mean .	451	453	452	449	446	443	441	441	443	445	446	446	447	446	446
Mean † . .	448	449	447	443	440	435	434	437	442	440	441	442	443	445	445
Mean †† . .	451	453	451	448	449	448	446	442	447	453	451	445	449	448	447

* Loss of record ; day omitted for means.

† Five international quiet days

†† Five international disturbed days.

TABLE 13

Hourly values of Vertical Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

July

2,000 γ plus Tabular quantities

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
γ	γ	γ	γ	γ	γ	γ	γ	γ		H M	γ	H. M	γ		
448	451	451	451	452	452	454	465	460	450	21 40	475	07 35	432	43	1
448	449	451	452	453	455	455	455	454	447	23 55	460	05 25	427	33	2†
443	443	450	449	451	456	451	452	453	451	05 05	463	14 20	438	25	3
449	451	453	455	454	452	452	453	454	453	08 40	467	13 15	442	25	4
446	445	446	446	456	454	455	451	446	446	18 55	475	14 00	428	47	5††
454	454	455	455	455	454	453	453	454	451	05 53	462	07 55	418	44	6††
451	451	452	452	453	453	452	453	454	451	03 20	462	08 30	426	36	7
446	450	452	454	454	454	454	455	454	451	03 17	464	13 50	434	30	8
452	453	462	463	462	456	460	455	454	458	05 18	474	09 50	440	34	9†
452	453	456	455	454	454	456	456	457	451	09 55	463	06 02	431	32	10
449	451	452	452	451	451	451	450	450	456	08 45	473	05 33	434	39	11
448	449	449	450	449	445	446	450	451	446	11 10	455	06 40	426	29	12
441	442	443	445	448	445	446	449	450	445	03 10	458	07 48	429	29	13
449	446	449	452	450	450	450	450	450	447	03 25	455	05 25	434	21	14
441	445	446	448	444	444	444	443	450	444	03 15	453	08 07	435	18	15
444	449	449	449	450	446	445	448	448	445	03 18	452	06 35	429	23	16
446	446	450	452	454	451	450	452	453	449	07 55	456	06 03	429	27	17
450	450	453	454	453	452	452	451	450	450	11 05	457	09 42	428	29	18
445	445	449	449	450	449	448	443	443	444	18 28	453	05 00	424	29	19†
446	453	451	452	454	455	463	452	452	452	09 05	477	11 15	431	46	20††
446	450	449	452	456	451	452	453	451	444	18 40	460	11 15	420	40	21††
445	446	449	450	451	452	451	448	446	452	07 30	466	13 15	440	26	22
446	448	449	451	451	451	449	451	446	448	04 42	458	08 30	433	25	23
445	445	451	450	451	450	449	450	449	447	03 35	462	11 55	433	29	24
441	446	448	446	444	446	445	442	443	440	17 25	456	10 30	423	33	25
451	450	451	452	451	450	450	448	449	446	03 55	454	08 40	427	27	26
443	445	450	451	450	450	450	452	454	444	22 35	458	08 37	427	31	27
442	442	442	442	443	442	441	441	441	441	06 45	451	09 15	422	29	28†
450	450	451	451	451	451	451	450	450	447	09 05	467	05 05	427	40	29†
446	449	449	451	451	452	452	453	453	444	03 12	460	08 55	420	40	30†
443	444	443	443	444	449	449	449	449	436	20 20	462	08 40	400	62	31
447	448	450	451	451	451	451	451	451	448					33	Mean
446	447	448	449	450	450	449	448	448							Mean †
449	451	453	454	457	454	455	455	451							Mean ††

* Loss of record, day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 14

Hourly values of Vertical Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

August

2,000 γ plus Tabular quantities

Date	Hours G. M. T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	450	451	445	441	436	436	442	446	451	449	446	444	443	442	442
2	449	450	447	441	433	433	436	442	451	461	464	462	455	451	446
†3	453	454	452	444	430	428	433	441	452	465	471	461	451	440	435
4	451	453	452	449	452	450	450	453	462	461	461	462	462	453	449
5	455	455	454	453	449	444	449	451	462	464	473	473	463	453	454
6	454	455	456	454	435	440	446	452	447	446	447	456	455	451	446
7	450	454	447	441	428	420	413	411	413	421	428	434	439	442	440
8	450	453	452	441	433	430	428	433	441	446	450	446	443	443	442
9	449	451	452	445	441	439	440	442	441	436	436	440	443	442	443
10	447	452	457	451	441	431	430	424	427	429	435	439	439	444	443
11	452	454	452	447	441	433	430	428	433	431	429	434	442	446	447
††12	454	457	462	445	431	417	409	411	411	417	424	433	442	441	441
13	446	452	450	443	429	418	419	*	*	*	456	454	447	446	446
†14	450	453	449	443	434	425	425	433	442	443	444	446	450	443	443
15	445	446	441	435	430	420	421	429	428	423	429	436	441	440	436
†16	443	446	451	450	446	451	452	453	451	444	442	444	447	447	446
††17	452	454	456	445	443	441	441	442	435	429	427	429	432	444	445
††18	450	452	444	440	432	430	430	429	430	430	430	433	434	434	442
19	449	451	447	441	425	419	422	423	430	430	435	443	446	446	446
20	445	449	450	443	440	434	439	440	441	441	435	431	436	443	445
21	447	449	443	431	422	422	422	431	434	440	445	445	440	440	440
22	449	451	451	441	420	407	402	406	406	412	420	425	430	437	441
23	446	449	455	462	462	456	452	452	452	453	451	446	442	440	437
24	444	447	450	442	430	419	417	419	418	421	433	436	439	440	440
†25	442	444	444	441	440	425	428	441	453	454	453	445	439	440	441
†26	446	451	452	444	436	424	419	417	420	424	433	436	437	439	439
27	442	445	441	433	428	418	414	405	402	411	419	424	432	435	437
†28	444	444	441	439	434	429	423	430	431	433	439	442	444	442	441
29	446	452	445	432	420	412	408	411	419	421	424	431	435	435	435
††30	443	443	435	429	430	430	433	446	453	451	447	442	439	439	440
31	443	444	441	432	429	422	424	434	441	445	446	444	440	439	437
Mean	448	450	449	443	435	429	429	433	436	438	441	442	443	442	442
Mean †	445	448	447	443	438	431	429	435	439	440	442	443	443	442	442
Mean ††	450	452	450	441	433	429	429	434	436	438	440	440	440	440	441

* Loss of record, day omitted for means

† Five International quiet days.

†† Five International disturbed days.

TABLE 14

Hourly values of Vertical Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

August

2,000 γ plus Tabular quantities

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	H. M.	γ	H. M.	γ	γ	
443	444	445	445	443	447	445	446	446	445	07 50	456	04 30	432	24	1
446	447	449	447	453	451	451	449	453	449	09 45	467	04 15	427	40	2
435	443	452	453	452	453	452	451	451	448	09 35	477	04 45	421	56	3††
450	447	452	453	457	456	453	454	454	454	08 05	464	15 45	443	21	4
453	452	453	452	453	456	455	455	454	456	10 08	477	04 30	431	46	5
445	447	450	451	452	449	447	449	450	449	11 18	463	04 28	423	40	6
440	442	443	445	450	447	445	445	446	437	22 40	457	06 20	408	49	7
445	446	447	449	450	446	447	447	447	444	09 20	456	05 40	423	33	8
444	445	447	450	452	447	446	446	446	445	18 45	456	09 10	433	23	9
444	443	444	452	453	447	446	449	451	442	18 34	459	07 00	421	38	10
449	451	452	453	453	454	455	455	455	445	22 20	458	10 00	424	34	11
441	445	445	447	445	446	445	444	444	437	01 40	465	05 45	402	63	12††
443	444	446	445	445	446	445	446	446	*	*	*	*	*	*	13
443	444	443	443	445	444	444	443	443	442	11 35	456	05 17	419	37	14†
437	441	442	443	443	445	453	444	444	437	20 45	456	05 20	414	42	15
445	446	446	446	447	447	446	447	450	447	07 15	456	09 30	434	22	16†
441	442	451	450	452	456	450	444	445	444	20 07	464	09 40	419	45	17††
451	447	446	450	450	453	454	458	453	442	22 25	466	12 30	424	42	18††
446	445	446	449	450	447	447	445	444	441	18 45	454	05 08	408	46	19
446	446	446	451	450	446	445	449	450	444	18 28	453	11 30	423	30	20
442	444	445	447	446	447	450	447	447	440	20 30	452	05 52	415	37	21
443	445	444	445	445	446	445	447	446	433	22 10	454	06 12	399	55	22
441	443	444	443	443	444	443	443	443	448	03 30	466	13 25	434	32	23
442	444	444	443	442	442	442	441	440	436	02 10	453	07 55	411	42	24
441	442	442	442	444	445	445	446	445	442	08 08	456	05 15	421	35	25†
439	441	442	443	442	441	441	439	441	437	01 45	457	07 30	411	46	26†
439	439	440	441	441	439	441	442	443	431	21 50	449	07 25	396	53	27
442	443	443	443	444	443	443	444	445	439	22 17	447	06 05	419	28	28†
432	431	433	440	439	441	452	445	443	433	21 15	455	06 03	402	53	29
432	440	441	445	442	441	444	443	443	441	08 00	456	06 00	421	35	30††
439	440	441	442	443	442	441	441	443	439	09 54	452	04 40	413	39	31
443	444	445	447	447	447	447	447	447	442					39	Mean
442	443	443	443	444	444	444	444	445							Mean†
442	443	447	449	448	450	449	448	447							Mean††

* Loss of record, day omitted for means.

† Five International quiet days.

†† Five International disturbed days.

TABLE 15

Hourly values of Vertical Force, 1952

[Averages for sixty minutes centred at the full hours of Greenwich mean time]

September

2,000γ plus tabular quantities

Date	Hours G M T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1††	443	444	445	444	439	435	428	418	423	423	433	433	435	430	432
2	445	446	446	436	435	432	424	426	413	420	433	440	441	439	439
3	440	442	436	430	418	407	401	408	420	424	438	436	435	435	435
4	442	442	433	419	405	395	386	389	396	406	416	421	430	430	433
5	440	441	438	429	428	427	425	431	446	460	458	452	444	437	436
6	449	450	440	427	414	407	400	411	424	442	448	446	440	440	440
7	445	449	442	431	412	397	398	405	411	430	435	438	436	434	432
8††	440	440	434	429	422	412	413	422	422	420	430	434	440	436	438
9††	441	442	433	420	407	408	401	409	418	429	428	426	432	433	435
10	438	440	429	419	417	416	402	401	406	411	429	439	435	432	433
11	434	440	435	429	423	416	409	417	427	431	431	427	426	427	430
12	434	435	431	423	420	421	429	431	435	436	435	434	432	431	434
13†	429	431	429	429	424	422	426	424	423	429	431	433	431	430	432
14	433	434	439	435	426	416	413	417	418	421	423	424	428	427	430
15	432	431	428	422	419	414	414	418	419	424	429	430	426	423	427
16	433	435	431	429	427	419	417	414	414	422	424	430	430	429	430
17†	431	434	434	434	429	421	412	416	424	432	433	429	426	428	434
18†	440	444	440	433	430	422	417	412	416	419	422	424	427	428	429
19†	434	440	440	430	419	407	398	391	391	401	412	421	427	429	429
20	435	439	438	427	417	411	408	408	417	421	429	432	431	432	431
21	431	438	440	426	428	427	421	422	420	422	427	430	430	432	433
22	439	439	431	426	410	401	397	399	406	416	422	427	428	429	430
23†	433	439	440	434	439	432	428	423	429	433	432	427	426	427	428
24	432	433	429	423	423	417	407	416	418	421	426	427	428	430	428
25	442	443	440	434	423	421	420	420	423	423	429	430	429	430	430
26	432	430	428	423	418	409	413	417	419	421	423	428	431	432	433
27	434	439	438	431	419	409	406	400	411	423	424	421	420	423	427
28	434	435	432	427	423	421	421	420	420	426	428	429	429	432	430
29††	439	443	438	422	418	413	400	400	401	410	417	419	430	429	444
30††	427	440	429	418	409	407	408	407	410	412	409	418	430	431	431
Mean	437	439	436	428	421	415	411	413	417	424	428	430	431	431	432
Mean†	433	438	437	432	428	421	416	413	417	423	426	427	427	428	430
Mean††	438	442	436	427	419	415	410	411	415	419	423	426	433	432	436

* Loss of record, day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 15
Hourly values of Vertical Force, 1952

[Averages for sixty minutes centred at the full hours of Greenwich mean time]
September
2,000y plus tabular quantities

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	H. M.	Y	H. M.	Y	Y	
434	446	444	443	443	441	440	442	443	437	02 45	452	07 05	411	41	1††
441	436	440	441	441	441	440	442	442	437	22 35	450	08 20	408	42	2
436	436	440	438	436	438	439	440	441	431	17 20	449	06 12	398	51	3
435	438	436	438	442	441	439	439	438	425	18 45	445	06 05	383	62	4
436	438	446	436	439	445	450	448	448	441	09 18	465	04 30	422	43	5
441	443	442	441	442	442	443	445	445	436	10 25	451	05 55	396	55	6
434	436	440	438	436	436	434	435	440	439	23 25	452	05 10	390	62	7
442	446	442	433	440	441	443	442	440	433	16 06	450	04 40	400	50	8††
432	440	433	435	438	442	439	434	434	429	19 55	449	06 00	389	60	9††
432	435	436	439	438	436	436	436	435	428	11 15	443	06 25	386	57	10
432	429	434	438	440	439	440	441	438	431	21 30	445	05 42	405	40	11
433	433	432	434	426	433	429	431	429	431	14 30	444	04 45	413	31	12
432	433	434	433	434	433	432	434	434	430	21 08	442	07 45	419	23	13†
429	438	433	435	436	439	439	432	433	429	20 06	442	06 15	408	34	14
428	431	432	433	434	432	430	431	430	427	19 15	440	05 40	405	35	15
432	433	434	436	435	434	434	438	433	429	18 15	441	07 38	408	33	16
436	436	439	440	440	440	439	439	439	432	17 40	442	06 15	407	35	17†
431	433	433	434	435	436	436	435	438	430	00 55	448	06 40	407	41	18†
431	432	435	440	442	438	436	438	436	425	13 05	445	07 25	385	60	19†
431	431	432	434	434	440	432	432	433	428	20 00	445	06 30	404	41	20
433	433	434	435	436	438	436	434	436	431	22 35	442	08 15	412	30	21
429	429	431	431	432	433	434	434	434	424	21 20	441	06 20	392	49	22
428	430	432	434	434	434	434	433	432	432	03 45	442	13 25	420	22	23†
429	423	428	440	441	441	440	439	440	428	18 00	444	06 05	400	44	24
432	433	432	429	431	436	440	436	427	431	21 15	446	06 40	416	30	25
432	434	434	435	436	434	434	434	436	428	18 55	440	04 55	404	36	26
431	434	438	440	435	435	434	434	435	427	15 30	443	07 00	391	52	27
434	442	435	433	430	431	443	433	435	430	20 55	453	07 35	417	36	28
443	445	446	442	442	439	449	440	435	429	20 40	460	05 45	394	66	29††
432	440	435	433	439	440	440	440	434	426	16 20	444	04 45	398	46	30††
434	436	436	437	437	438	438	437	437	430					44	Mean
432	433	435	436	437	436	435	436	436							Mean†
437	443	440	437	440	441	442	440	437							Mean††

* Loss of record ; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 16

Hourly values of Vertical Force, 1952
(Average of sixty minutes centred at the full hours of Greenwich mean time)
2,000 γ plus tabular quantities

October

Date	Hours G. M. T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1	433	435	432	429	416	407	401	398	402	413	420	427	427	428	427
2	434	436	429	420	417	407	401	406	416	423	428	427	424	424	427
3	433	435	433	430	430	422	421	426	430	434	435	432	428	428	428
4††	424	434	431	429	423	405	398	407	419	433	442	434	433	430	427
5††	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
6	*	*	*	*	*	*	434	434	437	444	448	446	436	427	426
7	430	429	426	421	407	394	389	388	392	397	404	407	408	412	415
8	413	419	421	421	415	410	408	401	400	393	400	400	403	402	405
9	408	403	405	407	413	415	409	408	405	405	402	401	403	408	413
10	415	417	414	410	399	391	388	390	387	388	399	401	403	407	408
11	409	410	409	409	409	401	401	404	400	397	403	407	409	405	410
12	420	414	410	407	409	400	391	394	397	398	401	404	410	412	413
13†	413	414	417	421	417	414	415	420	421	420	417	414	411	410	409
14	408	408	407	404	399	386	382	393	395	397	394	399	403	404	405
15†	409	411	410	408	400	395	395	394	397	400	403	401	399	402	404
16	405	407	408	407	409	407	403	403	405	411	411	408	405	402	401
17	401	404	401	399	394	387	390	398	401	404	402	399	398	401	402
18	403	405	400	399	401	399	397	398	399	402	405	407	402	404	408
19	408	404	399	398	390	380	378	387	388	389	394	400	401	401	402
20	401	402	400	402	398	390	389	394	394	391	393	399	398	400	400
21	412	412	412	410	404	401	401	401	399	400	405	401	398	400	395
22†	411	410	409	405	394	397	390	390	389	388	391	393	397	400	401
23†	408	410	411	405	399	389	389	389	388	391	393	398	397	398	400
24†	404	404	402	404	400	394	390	386	382	382	386	391	398	399	400
25	402	403	404	410	409	407	402	398	391	392	393	388	397	398	399
26††	409	403	407	414	412	407	409	402	392	389	390	389	382	382	400
27	417	417	416	415	451	445	441	440	434	434	432	435	438	442	443
28	448	452	451	448	440	432	433	431	424	423	426	434	441	444	445
29	453	454	448	447	446	442	444	449	448	451	451	446	438	437	441
30††	438	440	437	435	441	446	441	436	433	432	432	433	434	436	436
31††	447	446	445	434	445	437	438	432	442	455	452	443	432	429	447
Mean	418	418	417	415	413	407	405	406	405	407	409	410	410	411	414
Mean†	409	410	410	409	402	398	396	396	395	396	398	399	400	402	403
Mean††	431	430	430	428	433	430	429	423	422	425	425	422	416	416	428

* Loss of record; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 16

Hourly values of Vertical Force, 1952
(Average of sixty minutes centred at the full hours of Greenwich mean time)
2,000γ plus tabular quantities

October

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	H. M.	γ	H. M.	γ	γ	
429	432	433	433	432	432	431	431	432	424	16 45	440	07 25	394	46	1
432	436	439	434	436	441	432	431	432	426	19 35	445	05 55	392	53	2
422	423	428	429	434	442	444	435	431	431	20 35	451	05 45	413	38	3
430	430	423	419	429	*	*	*	*	*	*	*	*	*	*	4††
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	5††
429	436	430	441	429	431	434	432	430	*	*	*	*	*	*	6
416	419	417	420	419	417	416	415	413	411	21 30	432	06 05	381	51	7
405	401	403	404	412	413	411	408	410	412	03 05	430	08 52	388	42	8
415	415	415	417	416	417	419	412	413	410	05 00	423	11 45	397	26	9
408	408	409	410	411	419	409	405	409	404	20 15	425	08 15	383	42	10
413	413	413	421	414	411	412	413	412	409	18 15	431	19 07	388	43	11
414	414	413	415	415	419	420	415	411	409	21 00	426	06 20	386	40	12
407	407	408	411	411	408	408	408	407	413	03 00	427	15 30	403	24	13†
408	407	408	409	409	409	408	409	410	403	03 05	412	06 00	379	33	14
404	404	404	409	407	402	403	404	404	403	18 15	416	11 42	391	25	15†
405	408	410	409	419	407	407	404	402	406	09 35	415	05 25	386	29	16
401	401	400	400	399	401	402	402	401	399	04 00	412	13 30	383	29	17
404	401	404	408	414	414	410	408	408	400	19 00	421	16 40	392	29	18
403	403	405	407	407	407	405	404	402	398	19 15	413	05 20	372	41	19
398	401	405	411	412	412	412	412	412	401	18 48	416	05 45	386	41	20
393	399	409	402	404	414	414	413	414	405	20 20	427	14 17	381	30	21
402	403	405	407	405	407	405	405	405	400	02 52	414	08 42	385	29	22†
401	400	402	403	405	405	404	404	403	400	03 00	415	07 48	385	30	23†
401	403	404	403	403	403	403	403	402	398	02 55	408	08 50	379	29	24†
404	405	407	409	402	407	408	411	411	402	02 55	416	11 20	380	36	25
399	401	409	410	411	411	417	414	415	403	20 25	424	12 00	377	47	26††
443	442	447	448	453	451	448	447	447	439	19 15	456	02 40	412	44	27
446	453	455	451	454	449	449	448	448	443	16 30	458	09 15	419	39	28
442	436	442	437	440	444	445	441	438	444	04 15	459	15 55	431	28	29
434	422	427	436	444	452	445	453	455	438	22 18	463	16 00	418	45	30††
447	454	453	445	454	455	449	447	445	445	16 22	466	13 00	421	45	31††
414	415	417	418	419	420	419	418	418	413					7	Mean
403	403	405	407	406	405	405	405	404							Mean†
427	426	430	430	436	439	437	438	438							Mean††

*Loss of record; day omitted for means.

†Five international quiet days.

††Five international disturbed days.

TABLE 17

Hourly values of Vertical Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

November

2,000γ plus Tabular quantities

Date	Hours G. M. T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1††	444	446	451	449	455	452	453	459	474	475	464	449	443	448	445
2	448	455	448	448	445	436	442	447	452	456	454	447	447	447	445
3	449	449	445	444	445	446	449	448	447	448	444	443	443	445	446
4	448	448	451	447	437	434	434	435	442	444	443	438	436	442	443
5	448	449	447	445	442	430	424	430	432	434	442	443	441	441	441
6	447	449	454	452	449	457	459	448	443	447	445	441	437	437	443
7	441	442	441	442	442	434	434	433	431	430	434	437	441	441	440
8	441	441	440	435	426	420	421	421	415	421	424	429	435	437	437
9	434	432	436	441	443	434	433	430	419	444	434	438	436	437	438
10†	444	444	444	445	445	444	446	442	433	432	434	440	438	440	441
11†	442	441	441	442	442	438	434	435	437	441	438	435	438	440	441
12†	440	437	434	432	431	432	434	436	443	448	451	443	437	438	440
13†	437	437	440	437	434	435	435	436	436	434	434	434	434	437	441
14	437	434	434	438	444	446	446	445	444	436	432	427	433	436	437
15	436	438	434	434	436	431	426	426	430	426	425	430	432	436	436
16	434	434	433	432	432	426	422	422	425	430	433	433	431	423	421
17	434	435	435	434	437	440	438	440	437	438	441	441	440	440	440
18	437	434	434	435	434	446	447	447	443	437	442	440	438	438	438
19†	435	435	435	435	435	433	426	432	437	445	444	438	436	434	435
20	425	432	432	436	441	433	433	434	441	448	447	441	440	441	440
21††	440	445	445	445	444	434	431	427	411	408	417	416	432	438	441
22	440	447	448	445	445	446	445	443	437	440	435	432	434	434	432
23	433	433	433	434	441	438	436	434	436	431	425	430	433	436	435
24	432	432	431	436	441	445	445	444	435	431	425	430	431	432	434
25	434	436	437	441	444	441	432	425	425	422	422	426	430	431	433
26††	535	435	437	441	435	429	425	427	430	429	433	427	427	430	434
27††	426	427	430	438	434	433	426	422	424	426	432	430	430	425	432
28††	438	441	433	431	435	435	434	433	435	433	433	431	426	434	427
29	430	430	427	425	424	423	424	424	424	424	426	422	423	427	435
30	427	430	430	426	427	424	422	422	426	436	437	434	434	436	435
Sum.															
Mean	438	439	439	439	439	437	435	435	435	436	436	435	435	437	438
† Mean	440	439	439	438	437	436	435	436	437	440	440	438	437	438	440
†† Mean	437	439	439	441	441	437	434	434	435	434	436	431	432	435	436

TABLE 17

Hourly values of Vertical Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

November

2,000γ plus Tabular quantities

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	H. M.	γ	H. M.	γ	γ	
449	445	453	453	454	455	454	455	449	453	08 45	477	11 50	432	45	1††
445	446	446	452	456	458	456	451	449	449	09 12	461	05 10	431	30	2,
452	448	451	453	452	451	451	449	449	448	18 15	455	11 47	433	22	3
443	443	444	445	445	446	446	445	445	443	08 50	454	11 40	431	23	4
442	444	445	446	445	446	446	445	447	441	03 08	453	05 35	413	40	5
444	442	442	447	447	445	444	441	441	446	06 10	463	12 15	423	40	6
443	443	444	445	448	445	433	445	443	440	22 15	452	08 45	422	30	7
441	440	442	437	446	440	437	438	437	433	19 15	454	07 40	409	45	8
443	443	442	445	444	443	444	443	444	438	03 15	449	08 10	411	38	9
442	442	443	444	445	445	444	443	442	442	06 10	449	08 50	420	29	10†
440	440	435	436	440	441	441	441	441	439	03 25	445	10 52	430	15	11†
441	441	441	442	441	440	440	440	437	439	09 25	452	04 40	421	31	12†
441	441	441	443	443	444	443	442	440	438	22 10	447	09 00	429	18	13†
435	436	437	438	438	436	438	437	436	437	05 55	449	11 20	416	33	14
436	435	437	436	435	441	435	434	435	433	04 25	443	08 45	417	26	15
431	434	438	444	443	441	438	436	435	432	07 35	449	14 20	411	38	16
442	443	443	440	437	445	435	434	435	439	20 05	451	19 25	426	25	17
437	437	440	441	442	442	436	435	435	439	05 38	452	03 30	423	29	18
435	434	435	435	436	435	435	434	432	435	09 00	449	06 05	419	30	19†
440	438	440	445	444	443	442	438	444	439	09 05	453	05 30	424	29	20
437	438	445	444	443	443	442	441	441	435	03 52	453	08 40	399	54	21††
434	435	444	437	435	434	434	434	433	438	03 30	452	10 55	419	33	22
433	433	435	434	435	434	434	434	433	434	04 05	444	10 05	419	25	23
434	438	442	440	440	440	438	435	434	436	05 15	449	09 50	421	28	24
431	432	434	435	435	434	434	434	434	433	03 25	447	09 40	415	32	25
433	434	430	435	434	438	430	421	430	432	19 50	448	17 00	417	31	26††
436	444	445	438	441	445	440	437	436	433	20 00	448	13 30	410	38	27††
434	442	434	438	438	434	433	431	430	434	16 08	446	12 15	419	27	28††
430	431	434	435	433	429	430	430	429	428	18 40	444	08 30	415	29	29
437	436	437	437	438	441	440	441	440	433	15 45	444	06 30	412	32	30
															Sum
439	439	441	441	442	442	440	439	439	438					31	Mean
440	440	439	440	441	441	441	440	438							Mean †
438	441	441	442	442*	443	440	437	437							Mean ††

* Loss of record, Day omitted for means.

† Five International quiet days.

†† Five-International disturbed days.

TABLE 18

Hourly values of Vertical Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

December

2,000 γ plus Tabular quantities

Date	Hours G. M. T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	γ
1	438	435	433	432	421	423	424	431	431	426	430	434	437	438	430
2††	429	433	426	425	423	433	429	432	433	432	435	434	432	422	426
3	435	433	430	429	433	432	434	438	451	456	456	447	444	443	442
4††	443	452	446	436	433	427	429	430	433	436	440	434	442	437	442
5	442	441	433	424	424	423	423	426	429	432	435	430	425	433	431
6	427	427	426	423	420	419	421	425	430	433	437	434	432	434	432
7	430	431	424	422	415	416	416	417	417	419	420	421	421	423	424
8	419	419	413	412	422	423	424	426	426	430	434	433	427	430	427
9†	430	429	426	423	419	415	415	416	421	422	422	422	423	424	426
10	423	422	423	430	434	429	430	426	423	421	421	416	415	415	419
11	427	426	430	432	433	430	433	434	432	429	426	424	425	424	426
12	431	434	436	434	429	423	422	421	419	409	416	416	417	419	417
13††	430	429	431	424	423	416	417	407	392	380	379	392	403	422	434
14	423	423	422	423	423	417	415	419	420	422	422	421	421	422	422
15	421	422	419	41	421	415	413	410	409	410	415	426	426	430	427
16	429	427	423	424	422	421	412	405	408	409	411	419	421	423	422
17	422	421	421	422	415	409	404	407	419	427	432	425	422	423	425
18	422	422	419	421	421	422	420	417	411	405	405	412	417	421	421
19†	421	423	424	425	419	408	404	405	401	400	405	414	420	423	424
20†	425	424	423	421	415	412	414	420	412	411	411	411	413	416	419
21†	422	422	422	423	425	429	433	433	431	425	421	420	416	415	415
22	419	420	422	426	435	438	442	438	437	432	427	423	422	422	419
23†	423	424	426	426	423	419	411	411	416	420	420	421	422	421	421
24	420	419	415	419	417	422	423	419	411	413	410	413	416	410	409
25	423	425	417	415	408	417	425	423	430	423	416	421	421	422	420
26	422	424	421	419	415	410	403	399	408	411	411	410	408	419	422
27	423	422	422	419	415	411	410	414	412	410	415	416	417	420	422
28	411	408	411	411	413	417	421	426	426	425	422	421	421	421	417
29††	420	419	416	415	417	413	415	424	433	431	431	426	421	421	420
30††	417	415	413	415	416	417	425	435	443	438	426	415	421	420	419
31	421	420	421	419	413	410	412	413	421	422	423	417	421	422	424
Mean	425	425	424	423	421	420	420	421	422	421	422	422	422	424	424
Mean †	424	424	424	424	420	417	415	417	416	416	416	418	419	420	421
Mean ††	428	430	426	423	422	421	423	426	427	423	422	420	424	424	428

* Loss of record; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 18

Hourly values of Vertical Force, 1952

(Averages for sixty minutes centred at the full hours of Greenwich mean time)

December

2,000γ plus Tabular quantities.

Hours G. M. T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	H M		H. M.		γ	
426	429	433	433	432	434	438	432	429	431	20 38	451	14 35	417	34	1
416	424	434	437	443	443	438	435	438	431	19 30	452	15 13	408	44	2††
436	438	442	443	440	441	441	444	443	440	09 15	459	05 20	423	36	3
442	433	437	442	443	434	435	436	442	438	18 40	455	06 50	417	38	4††
432	430	431	430	430	433	429	429	429	430	20 00	445	06 08	416	29	5
433	433	431	433	433	432	431	427	430	429	18 40	441	05 20	410	31	6
425	424	422	423	426	427	422	421	420	422	20 43	433	04 00	407	26	7
425	429	432	433	433	432	432	431	431	427	10 05	436	03 55	408	28	8
425	424	423	423	423	423	425	424	424	423	03 00	433	05 07	412	21	9†
421	419	417	419	423	424	424	425	425	423	03 50	433	16 30	409	24	10
431	431	429	432	432	432	432	431	430	430	06 15	437	10 30	417	20	11
420	425	432	432	430	430	432	429	430	425	17 53	441	09 05	402	39	12
434	434	434	433	432	426	426	423	423	419	14 05	437	09 15	371	66	13††
423	423	423	424	425	423	423	424	424	422	22 40	429	06 08	410	19	14
430	429	430	429	431	432	432	429	429	423	15 35	434	06 30	401	33	15
422	422	422	426	430	429	430	427	423	421	19 25	434	07 00	397	37	16
426	424	427	429	426	426	427	429	424	422	09 35	435	05 52	398	37	17
422	421	422	422	427	423	424	426	423	419	19 00	432	09 35	400	32	18
424	424	423	425	425	425	426	425	425	418	03 10	431	08 30	394	37	19†
419	419	421	423	425	425	423	423	422	419	20 25	428	11 25	405	23	20†
416	417	417	419	420	420	421	421	419	422	06 25	436	14 30	411	25	21†
416	412	417	423	426	426	426	427	425	426	05 45	444	16 05	408	36	22
420	420	421	420	419	420	419	419	419	420	03 40	431	06 40	400	31	23†
419	419	422	423	425	422	421	423	425	418	23 16	430	13 35	392	38	24
422	421	425	425	424	421	421	422	421	421	08 10	432	03 45	399	33	25
423	427	426	423	423	423	422	423	422	417	16 20	432	07 10	394	38	26
422	422	425	423	423	421	414	411	420	418	23 15	431	21 25	392	39	27
419	417	421	429	423	419	421	423	427	420	23 10	432	14 30	408	29	28
419	421	420	414	412	417	421	420	419	420	08 50	437	18 25	403	34	29††
415	416	425	420	420	422	421	419	419	421	08 10	448	14 35	410	38	30††
423	420	419	422	427	423	421	416	421	420	18 30	431	05 15	404	27	31
424	424	426	427	427	427	426	426	426	424					33	Mean
421	421	421	422	422	423	423	422	422							Mean †
425	426	430	429	430	428	428	427	428							Mean ††

* Loss of record ; day omitted for means.

† Five international quiet days.

†† Five international disturbed days.

TABLE 19
PRINCIPAL MAGNETIC STORMS
(July—December, 1952)

Greenwich date 1952	Storm time				Sudden commencement			Degree of activity (4)	Maximum activity Greenwich day	Ranges			Remarks	
	G.M.T. of beginning		G.M.T. of ending (1)		Type (2)	Amplitude (3)				D '	H γ	Z γ		
	h.	m.	d.	h.		D '	H γ							Z γ
July 5 .	00	42	6	12	..	...	...	m	5	3	158	53	
August 17	01	26	18	09	...	...	...	m	17	4	203	43	
September 1 .	01	24	2	12	...	...	..	m	1	5	154	39	
September 28 .	15	24	30	18	s.c.	+1	+14	+5	m	29	5	172	71	
October 3 . .	19	02	6	19	...	..	...	m	4	5	193	*	
October 25 . .	17	00	27	01	...	.	..	m	26	3	170	46	
November 20	17	28	21	19	s.c.	+1	+15	+10	m	21	5	169	46	
November 26	19	22	28	19	...	...	..	m	27	5	175	37	
December 13	01	58	13	22	...	..	...	m	13	4	200	55	

The following symbols and conventions have been used according to recognised practice:—

(1) Approximate time of ending of storm construed as the time of cessation of reasonably marked disturbance movements in the traces

(2) s.c. = sudden commencement ; (..) = Gradual commencement.

(3) Signs of amplitudes of 'D' and 'Z' Taken algebraically, (D—reckoned negative being westerly)
(Z—reckoned positive being vertically downwards)

(4) Storm described by three degrees of activity ; (m)—for moderate (when range is between 150γ and 250γ);
(ms)—for moderately severe (when range is between 251γ and 400γ),
(s)—for severe (when range is above 400γ).

* = Loss of record.