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MAGNETISM**

Magnetic Observations at Heard Island, 1952

By

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THE SCHOOLS

IN 1906-07

IN 1907-08

INDIAN METHOD

BY HENRY C. COOPER

1908

THE INDIAN

EDUCATIONAL SOCIETY OF AMERICA

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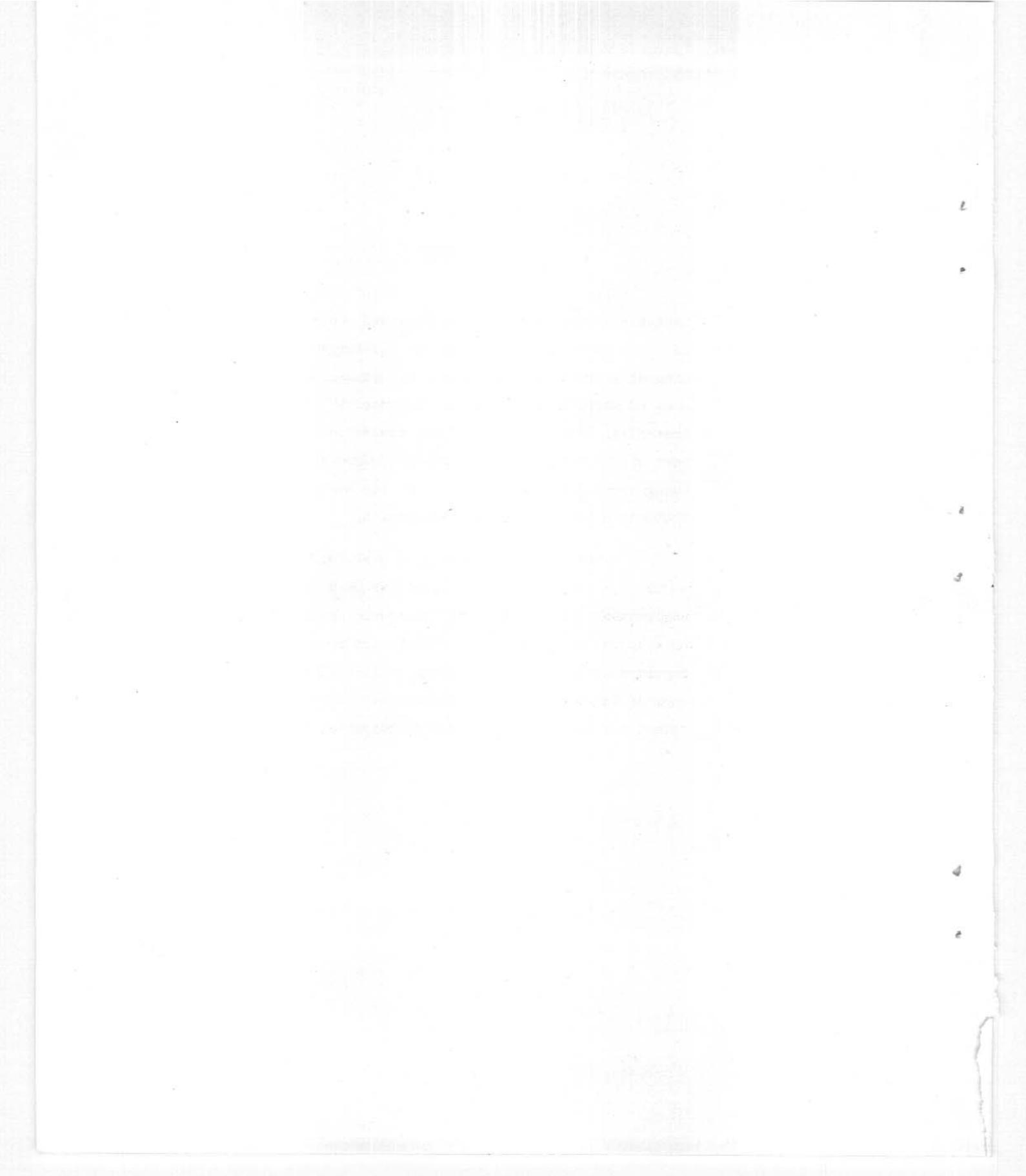
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A B S T R A C T

This report describes the Heard Island Magnetic Observatory, the staffing and operation of which is the responsibility of the Bureau of Mineral Resources, Geology and Geophysics, Department of National Development, Commonwealth of Australia. The work done at the observatory is part of the scientific research programme which is being carried out in Antarctica by the Australian National Antarctic Research Expedition.

Details are given of the observatory site and buildings, and of the instruments used at the observatory, which commenced full-scale operations on 11th March, 1952. The greater part of the report consists of the presentation in tabular form of the magnetic observations made at Heard Island during the period March to December, 1952.



INTRODUCTION

The Australian National Antarctic Research Expedition of the Antarctic Division, Department of External Affairs, has been carrying out a programme of scientific research on Heard Island since 11th December, 1947. Included in the programme is the study of terrestrial magnetism, and since March, 1952, a magnetic observatory has been in full scale operation. The Bureau of Mineral Resources, Geology and Geophysics, Department of National Development, is responsible for the planning and carrying out of the terrestrial magnetism research programme.

Heard Island is in the Southern Ocean at latitude 53° South and longitude 73° East. The Island was discovered by Peter Kemp, an English sealer, in 1833, but Kemp did not publicise his discovery. The Island takes its name from John Heard, an American, who rediscovered the Island in 1853.

Up to December, 1947, when the Australian National Antarctic Research Expedition established the first permanent base, the island was visited only by sealers and occasional scientific expeditions. Three scientific expeditions, the "Challenger" of 1847, the "Gauss" of 1902 and the "BANZAR" Expedition of 1929, called at the Island for short periods.

The Island is of volcanic origin and volcanic cones and lava flows give evidence of considerable activity in the past. The only activity observed now is from Big Ben, an ice-covered group of cones, 9,000 ft. high. Clouds of smoke can occasionally be seen rising from the vents, and at night a red glow is sometimes visible.

The Island is elongated in a north-west direction. It is about 25 miles long and tapers to a long narrow spit in the south-east. The widest part of the Island is about 12 miles.

Heard Island is in a hurricane zone and high velocity winds are frequent. The temperature ranges between 20°F and 60°F. Conditions generally are wet, cold and correspondingly unpleasant.

SELECTION OF OBSERVATORY SITE

The site for a magnetic observatory should be free from natural and artificial local disturbances. No suitable site free from natural disturbance was found among those examined. With consideration given to such factors as protection from prevailing winds and freedom from artificial disturbances, a site was selected where natural disturbances were a minimum. This site was at West Bay, one and a quarter miles from the camp area (see Plate 1).

DESCRIPTION OF OBSERVATORY SITE AND BUILDINGS

The site co-ordinates are -

(a) Geographic - Latitude 53°01.9'S.
Longitude 73°21.9'E.

(b) Geomagnetic - Latitude -61°.
Longitude 129°.

The site is approximately 20 ft. above sea level on a flat shingle plain in the lee of Mt. Andree, which is 461 ft. high. Scattered vegetation in the form of poa grass and azorella hummocks relieves the flatness of the terrain in the near vicinity of the site.

Climatic conditions are severe. Although Mt. Andree protects the site to a certain extent from the prevailing south-west winds, strong west winds sweep across the site.

In summer the mean temperature is about 35°F and in winter about 30°F. Rainfall is about 45 inches annually, March and April being the wettest months.

Both the Absolute and Variometer Huts (Plates 2 and 3) are constructed of pre-fabricated wooden panels. Each panel is composed of two layers of bondwood separated by 2.1/2 in. of "Onozote" for insulation. Detailed hut descriptions can be found in a previous report (Ingall, 1953).

PROGRAMME OF INVESTIGATION AND STAFF

Continuous recording variometers were installed during late 1951 and early 1952. The variometers are controlled by absolute magnetic determinations made regularly each week. The data obtained is treated by routine magnetic observatory techniques.

The magnetic observatory is operated and maintained by a single observer.

ABSOLUTE AND SEMI-ABSOLUTE INSTRUMENTS AND METHODS OF USE

Modified Kew Pattern Magnetometer manufactured by Elliott Bros. (Plate 4, Fig.1).

Description. This absolute instrument is used for declination measurements only. The horizontal circle for the instrument has verniers reading to 20 seconds of arc. One eyepiece division corresponds to 1.23 minutes of arc and tenths of a division can be estimated by eye. The large magnet is hollow and approximately 7 centimetres in length. At each end of the magnet are glass discs on which two lines are engraved at right angles. The magnet is held in a brass sheath in which the magnet can be rotated. Small marks are engraved on both the magnet and sheath so that the magnet can be rotated accurately from the "erect" to the "inverted" position. Phosphor-bronze ribbon fibre is used to suspend the magnet stirrup, onto which the magnet and sheath are hooked.

Method of use. On each absolute observation day two sets of declination measurements are made, usually with a time break between them. The line of detorsion of the fibre is determined first, using a graduated inertia mass, then the magnet is suspended and readings are taken with the magnet erect, then inverted, and finally erect again.

Quartz Horizontal Magnetometers Nos. 172, 173 and 174. (Plate 4, Fig.2).

Description. These instruments are semi-absolute, in that the main instrument constant based on the magnet and fibre constants has to be determined by comparison with an absolute instrument. Due to the change in time of this constant, regular intercomparisons must be made. Three Quartz Horizontal Magnetometers (QHM's) are used, so that comparative changes in any of the individual QHM constants can be detected.

The QHM's are used to make regular horizontal intensity measurements. Since November, 1952, QHM 172 has also been used as a declination instrument.

The QHM's are of La Cour design, manufactured in Denmark. One graduated horizontal circle is used for all three QHM's, and each instrument can be clamped to the circle in turn. The magnet is made of cobalt steel, 15 mm long and of moment 2 c.g.s. units. The magnet, magnet carrier and mirror are suspended by a quartz fibre from the top of the QHM. A mercury thermometer is fitted to the instrument so that the chamber temperature, which is presumed to be the temperature of the magnet and fibre, can be read.

Method of use. The principle of operation of the QHM is the balancing of the horizontal component of the earth's magnetic field which acts on the QHM magnet, by the torsion in the quartz suspension fibre. In practice the fibre is given a torsional value of 2π and the angle between the magnet and the magnetic meridian is observed. This angle is related to the horizontal intensity by a simple relationship. In order to allow for residual torsion in the quartz fibre and change of declination during readings, it is usual to commence observations with a reading for zero torsion (neglecting residual torsion), then a plus 2π reading is followed by a minus 2π reading, and finally another zero torsion reading is made. Absolute magnetic determinations of horizontal intensity on Heard Island are made using two QHM's each week. QHM's 173 and 174 are used alternately with QHM 172, which is regarded as the standard instrument and which is in constant use.

On each absolute observation day two sets of readings are made with each of the two QHM's. One set consists of 0 , $+2\pi$, -2π , -2π , $+2\pi$, 0 readings, thus enabling two values of horizontal intensity to be obtained from each set. Declination changes during sets are corrected for by scaling declination values for each reading from the variometer trace.

The equation connecting horizontal intensity with deflection angle is:-

$$\log H = C - \log \sin \theta - c_1 t + c_2 H \cos \theta,$$

where C = constant based on magnet and fibre constants

c_1 = temperature coefficient

t = temperature

c_2 = induction coefficient

θ = deflection angle for 2π torsion in fibre.

The constant C is not stable and, as stated earlier, regular intercomparisons are necessary for control of its drift.

Magnetometric Zero Balance No.62. (Plate 5, Fig.1).

Description. This instrument, commonly called the BMZ, is semi-absolute in that it depends for its stability upon the constancy of the moments of the compensating magnets used in its construction. Regular intercomparison is necessary to control the compensating magnet moments. As the name implies the BMZ is a balance, in which the vertical intensity of the Earth's magnetic field is balanced by compensating magnets, the strength of which can be evaluated.

A cobalt steel magnet, 60 millimetres long and of moment 100 c.g.s. units, is balanced about a horizontal axis on agate bearers. The optical system of the instrument is arranged so that the position of the balance magnet is determined by reflecting a crosshair object from a mirror on the magnet, onto a scale in the observing telescope. The scale reading when the magnetic axis of the magnet is horizontal is called the Neutral Division, and this point is easily found by observing the magnet with its north-seeking end at first south and then north.

The balancing of the vertical intensity is generally achieved by using two compensating magnets, though auxiliary magnets are provided in case exceptional values of intensity occur. One magnet, the "Orstit" steel field magnet, is fixed in position and compensates for approximately 99% of the Earth's field. This magnet is carefully insulated against rapid temperature changes and a delicate thermometer inserted into the centre of the magnet allows the temperature to be read to 0.02 degrees Centigrade.

The remaining uncompensated part of the vertical intensity is balanced by a small "Orstit" steel magnet capable of being rotated about a horizontal axis in the same vertical plane as that of the balance magnet. The influence of this turn magnet on the balance magnet is related to the degree of rotation of the turn magnet, so that exact balancing of the Earth's field is done by rotating the turn magnet until the balance magnet is in the neutral position. The field magnet has a strength of a few thousand c.g.s. units, and the turn magnet about 160 c.g.s. units. Auxiliary magnets, when required, are screwed on underneath the turn magnet.

Method of use. A four-legged stand was constructed so that the BMZ could be used on a pier. On absolute observation days, the instrument is assembled and allowed to stand for ten minutes to reach temperature equilibrium. The Neutral Division is determined before observations are commenced because it is found that small changes take place from week to week. Every few months the disc zero is determined, i.e. the position for which the turn magnet has no effect on the balance magnet. The disc zero determinations indicate that it is very constant in value.

A series of four readings is taken, the balance magnet being clamped between each reading and finally the Neutral Division is checked. It is found that the BMZ gives very consistent values on any one absolute day, and four readings are ample.

In the reduction of readings, corrections are made for temperature and rate of change of temperature, by using the following formula:-

$$Z = Z_c - \alpha_1 t - 2\alpha_1 \Delta t + Z_t + Z_s$$

Z = total compensating field, which is numerically equal to the Earth's field
 Z_C = field of field magnet at 0°C
 α_1 = temperature coefficient of field magnet
 t = temperature
 Δt = rate of change of temperature
 Z_t = field of turn magnet
 Z_s = field of supplementary magnet.

Cambridge Dip Circle No.226.

This instrument is available for use, but was not used during 1952.

VARIATION INSTRUMENTS

Magnetograph. (Plate 5, Fig.2).

A La Cour magnetograph of normal sensitivity and speed 15 mm per hour was installed during late 1951 and early 1952, and controlled recording commenced on 11th March, 1952. The arrangement of the variometers and recorder is shown in Plate 3. Time marks are put on the magnetograms from an independent light source operated from a pendulum clock. Every five minutes, contacts on the clock close and a time mark is registered on the magnetogram. To mark the hour, three consecutive minute marks are registered, one before the hour, one on the hour and one after the hour.

The time lamp is situated behind the recording lamp and the time marks appear as a series of dotted lines and curves parallel to the continuous lines and curves obtained from the recording lamp.

The reflected images of the recorder lamp and time lamp are focussed on to the recorder drum by cylindrical lenses. Each variometer has its own cylindrical lens, and by having the variometers and their respective lenses at different heights, the reflected images from each variometer are confined to one-third of the recorder drum. Several total reflecting prisms set in front of the recording lamp provide a series of secondary light sources so that it is possible to record large variations in magnetic field components. When a light spot approaches the edge of its one-third of the recorder drum, a secondary image moves onto the drum from the opposite edge.

The weight-driven pendulum clock is wound once a week and regulated when necessary by lengthening or shortening the pendulum.

Horizontal Intensity Variometer.

Description. The horizontal intensity variometer consists basically of a magnet suspended in the magnetic prime vertical.

The magnet is made of cobalt steel, is 8 mm long, 25 milligrams in weight, and has a moment of 0.8 c.g.s. units. The suspension is a quartz fibre, at each end of which is a small conical globule for attachment. The magnet is attached to a mirror and stirrup, and the whole unit is attached to the fibre.

Two total reflection prisms are used to transmit the light through the front lens of the variometer to the magnet mirror and back. One prism is fixed on an adjustable plate controlled by three screws. The other prism is moveable and suspended by a bi-metallic strip, the length of which is adjustable, to enable temperature compensation of the variometer to be made. The temperature trace is the record of a beam of light reflected from the top silvered part of this suspended prism. The bi-metallic strip is held in a clamp which is in turn attached to a plate. The latter can be adjusted by three screws in the same way as the lower fixed prism. The base-line mirror is on a frame mounted on a plate which is also adjustable by three screws.

"Ghost" images from the prism and mirror surfaces are eliminated by using 87° reflecting prisms instead of right-angled ones, and setting the angle between the front and back surfaces of the baseline mirror at 1°.

Scale value. Scale-value determinations are made at approximately weekly intervals, care being taken not to make the determination on a disturbed day. The method used is that of Helmholtz-Gaugain coil deflections. The instrument scale value is about 10.2 gammas per mm. and a deflecting field of 300 gammas is used. This field, applied first positively and then negatively, gives a double deflection on the trace of about 60 millimetres.

The scale value equation is:-

$$E_H = \frac{ci}{u}$$

where E_H = scale value in gammas/mm.

c = coil constant of 7.49 gammas/ma.

i = current in millamps.

u = trace deflection in mm.

The milliammeter used to measure the coil current is a Victorian Meter Laboratories Meter S/N10922. The instrument can be read accurately to 0.1 millamps on the range 0-50 millamps, and corrections are applied for temperature. Before being sent to the Island in March 1952, the meter was calibrated against a sub-standard meter.

Temperature compensation. When the variometer was set up initially, it was undercompensated, with a temperature coefficient of 16.9 gammas per degree Centigrade. In April, 1952 the bi-metallic temperature strip was reversed and shortened. An analysis made in September, 1952 showed that the variometer was still undercompensated to the extent of 0.9 gammas per degree Centigrade. On the basis of this result a small final adjustment of the bi-metallic strip was made late in September, 1952 and thereafter no temperature effect has been observed.

Orientation. In September, 1952, the magnetic meridian in the Absolute Hut declination pier was transferred by theodolite traverse into the Variometer Hut. For this purpose the anticipated provisional monthly mean declination for September of 50°00' West was chosen. After the magnetic meridian line had been established, orientation tests were made on the H variometer using deflecting currents of 100 millamps in the Helmholtz-Gaugain coil. Results showed the magnet in the variometer to be 1°02' out of the prime vertical. A torsion head adjustment of half a degree was made so that the misorientation of the magnet was about half a degree. The misorientation was such that secular variation of declination would bring about complete orientation by the end of 1954.

Baselines. Absolute observations are made each week and baseline values are computed after the H ordinates are scaled at the times corresponding to the times of absolute observations.

A check on the temperature compensation of the variometer is made by observing whether any relation exists between baseline value and temperature ordinate.

Declination Variometer.

Description. The declination variometer has a magnet 12 mm. long, with a moment of 1 c.g.s. unit, suspended in the magnetic meridian. The method of suspension is similar to that of the H variometer. A large adjustable prism lens transmits the light beams through the variometer. The baseline mirror is mounted on an adjustable support.

Scale value. Scale-value determinations are made every four months by the torsion head deflection method, in which the variometer torsion head is rotated through three 30° steps on either side of the zero position, and the deflection of the magnet is recorded for each position of the torsion head.

The scale value of the declinometer is given by the expression:-

$$E_D = \frac{f}{f - h} \times \frac{\text{Cotangent } 1'}{2R}$$

where E_D = scale value in minutes of arc per millimetre

f = angle in minutes through which the torsion head is rotated
 h = angle in minutes through which the magnet turns when the torsion head is rotated through an angle f

R = distance in millimetres from the first nodal plane of the prism lens of the variometer, to the drum, diminished by one third of the thickness of the cylindrical lens in front of the drum.

Three determinations made in 1952 showed good agreement and the value $E_D = 0.912$ minutes per mm. was adopted for the whole year.

On one occasion the scale value was determined by using a Helmholtz-Gaugain coil to deflect the magnet. The value obtained by this method was 0.909 minutes per mm.

Orientation. Orientation tests were made in September, 1952, using a Helmholtz-Gaugain coil. Results showed that the variometer magnet was 15 minutes of arc out of the magnetic meridian 50°00' West. No adjustment was made. Secular variation is such that orientation will be complete in early 1954.

Baselines. Absolute observations are made each week with the Elliott Bros. magnetometer. Declination ordinates are scaled for the time of absolute observation, and the baseline values computed.

Vertical Intensity Variometer.

Description. The vertical intensity Variometer has a "Monad" tungsten-steel magnet balanced on agate bearers. The magnet is 60 mm long, 2,500 milligrams in weight and has a moment of 100 c.g.s. units. The magnet mirror is the polished, flat, upper surface of the magnet. A total reflection prism transmits the light beam down to the magnet mirror. This total reflection prism is suspended by a bi-metallic strip from a fixed support and its movement serves to register temperature changes in the variometer. A baseline mirror is mounted on an adjustable support.

Scale value. Scale-value determinations are made at approximately weekly intervals, using a Helmholtz-Gaugain coil centred over the variometer magnet. Initially, the magnet was oriented with its north-seeking end north and the scale value was 14.4 gammas per mm. Late in March, 1952 the magnet was oriented with its north-seeking end south, and the scale value became 3.1 gammas per mm. For the latter orientation a deflecting field of 110 gammas is used. This field, applied positively and then negatively gives a double deflection on the trace of about 60 millimetres.

The scale value equation is:-

$$E_Z = \frac{ci}{u}$$

where E_Z = scale value in gammas per mm.

c = coil constant of 6.10 gammas per ma.

i = current in millamps

u = trace deflection in mm.

Temperature compensation. When the variometer was set up initially with the north-seeking end of the variometer magnet oriented north, it was overcompensated for temperature, there being a coefficient of 6.4 gammas per degree Centigrade. When the magnet was reversed late in March, 1952, with the north-seeking end oriented south, the variometer became undercompensated for temperature, with a coefficient of 11.6 gammas per degree Centigrade. In April, 1952 the bi-metallic temperature strip was reversed and lengthened, and thereafter no temperature effect has been observed.

Orientation and horizontality of the variometer magnet. The horizontality of the magnet was tested by alternately placing the magnet on the agates, north-seeking end north, then north-seeking end south and checking that it balanced evenly in both orientations. It was found necessary to grind the magnet for horizontality.

Baselines. Absolute observations are made each week with the Magnetometric Zero Balance No.62. The Z ordinates are scaled at each time of absolute observation and the baseline value computed. A check on the temperature compensation of the variometer is made by observing whether any relation exists between baseline value and temperature ordinate.

Shrinkage of Magnetograms.

A shrinkage gauge was used, consisting of a twelve-inch length of well-seasoned wood with five metal points protruding. Each magnetogram is "pricked" after removal from the magnetograph drum and measurement of the distances between the pricks serves to indicate to what degree expansion or contraction of the magnetogram has taken place. All scalings made for derivation of mean hourly values, baseline values, scale values, and for other computation purposes, are corrected for expansion or shrinkage.

COMPARISON OF ABSOLUTE AND SEMI-ABSOLUTE INSTRUMENTS

Quartz Horizontal Magnetometers Nos.172,173 and 174.

In February, 1952, QHM 172 was intercompared with QHM's 187,188 and 189 on Heard Island. These last three QHM's had previously been intercompared with Askania Magnetometer No.508813 at Toolangi. During 1952 and early 1953, QHM's 172, 173 and 174 were regularly compared through baselines and after a special series of baseline intercomparisons had been done in February 1953, QHM 172 was returned to Toolangi for intercomparison with Askania Magnetometer No.508813 again. This last intercomparison took place in June, 1953. The correction to International Magnetic Standard for Askania Magnetometer No. 508813 had previously been determined.

I.M.S. Corrections.

February, 1952 -	QHM172 H _{ims}	= -0.00039H
	QHM173 H _{ims}	= -0.00034H
	QHM174 H _{ims}	= -0.00048H
June, 1953 -	QHM172 H _{ims}	= -0.00081H
	QHM173 H _{ims}	= -0.00070H
	QHM174 H _{ims}	= -0.00081H

Elliott Bros. Magnetometer.

The Elliott Bros. magnetometer was intercompared in January, 1951 with D.T.M. C.I.W. Magnetometer No.18 at Toolangi and again in February, 1952 with Askania Magnetometer No.508810 at Heard Island. The latter series of intercomparisons was not reliable and the I.M.S. correction in use is that obtained from the former intercomparison, the relationship being:-

$$D_{ims} = D_{Elliott} - 0.3'.$$

Magnetometric Zero Balance No.62.

Magnetometric Zero Balance No.62 was calibrated at Rude Skov before being sent to Heard Island. An intercomparison series at Heard Island in February 1952 with Askania Earth Inductor No.5010174 did not yield reliable results, and no up to date I.M.S. correction is available for BMZ No.62.

VARIOMETER BASELINE VALUES AND SCALE VALUES

The observed baseline values and adopted baseline values of the variometers are listed in Tables 1, 3 and 5. Abrupt changes in the adopted baseline values together with the causes of such changes are shown in Tables 2, 4 and 6.

The observed and adopted variometer scale values are listed in Tables 7, 9 and 10. Abrupt changes in the adopted scale values and the causes of such changes are listed in Tables 8 and 11.

BASIC HOURLY VALUES AND ASSOCIATED MEANS

Tables 12 to 41 list the mean hourly values of horizontal intensity, declination and vertical intensity. Declination and vertical intensity are tabulated in a numerical sense to avoid using negative signs, since both declination and vertical intensity are negative in the algebraic sense at the Heard Island Observatory.

All hourly scalings were made in millimetres at the observatory. The scalings were checked in Melbourne in readiness for conversion to gammas in the case of horizontal intensity and vertical intensity, and degrees and minutes of arc for declination. Daily maxima and minima were also scaled and checked in millimetres.

Scale values and baseline values were computed at the observatory and checked in Melbourne. Using this checked data the scale values and baseline values were analysed in order to obtain adopted scale values and adopted baseline values.

The temperature coefficients of the horizontal intensity and vertical intensity variometers for the period during which they were not temperature compensated, were obtained after a statistical analysis of the variations of observed baseline values with temperature. From these coefficients, temperature corrections, in gammas, for each hourly value were computed and tabulated.

By combining the adopted baseline values, adopted scale values and temperature corrections, the hourly millimetre scalings were converted to gammas in the case of horizontal and vertical intensity and degrees and minutes of arc for declination. From these final reductions, daily means and hourly means for composite days were computed.

MONTHLY MEANS AND ANNUAL MEAN

Monthly means were computed using the mean hourly values of the magnetic elements. The annual mean was computed from the monthly mean values. For 1952, January, February and part of March were not available for inclusion in the annual mean (see Tables 42 and 43).

MAGNETIC ACTIVITY

The principal magnetic storms are shown in Table 44. In classifying these storms, the frequent short term disturbances which were associated with aurorae and which usually occurred about 1600 hours and 2200 hours Greenwich Mean Time were omitted, though K-indices as high as 7 were sometimes recorded during these periods.

The sudden commencements are listed in Table 45. Only clear cases have been noted, this criterion applying particularly to polar sudden commencements.

K-INDICES

K-indices are scaled each month from the records. The scale adopted has a lower limit of 1000 gammas for K=9. The procedure followed is to select the magnetically quiet days from each month's records and use the mean hourly scalings of these quiet days to prepare S_q curves, which are used as the basis of the K-Index scalings.

REPRODUCED MAGNETOGRAMS

Two selected magnetograms representing a quiet day and a disturbed day are reproduced as Plates 6 and 7 respectively, in order to illustrate the type of record produced at the Heard Island Magnetic Observatory.

REFERENCE

Ingall, L. N., 1953 - Geophysical Work at Heard Island, 1952/1953, Bur. Min. Res. Geol. & Geophys., Records 1953 No. 54.

TABLE 1
Observed and adopted base-line values for H variometer
(Observed values determined with QHM's Nos. 172, 173 & 174)

Date	Observed	Adopted	Adopted value used to	Remarks	Date	Observed	Adopted	Adopted value used to	Remarks
1952	Y	Y	18093		1952	Y	Y	18253	
12 March	18096	18093	18093		13 August	18253	18253	18253	00h, August 22
13 "	18098	18093	18093		21 "	18256	18256	18256	
14 "	18092	18093	18093		28 "	18249	18249	18250	
15 "	18094	18093	18093		4 Sept.	18248	18248	18250	
20 "	18092	18093	20h, March 28	Uncontrolled 20h, March 28 to 09h, March 30	11 "	18252	18252	18250	
26 "	(18178)	18175	18175		20 "	18251	18250	18250	09h, Sept. 23
3 April	18175	18175	09h, April 21	Uncontrolled 08h, April 23 to 10h, April 24	20 "	18249	18249	18250	
9 "	18176	18175	09h, April 23		24 "	18158	18158	18158	09h, Sept. 25
16 "	18282	18282	09h, April 26		28 "	18141	18141	18141	07h, Sept. 28
23 "	18242	18242	09h, April 26		2 Oct.	18120	18124	18124	
25 "	18250	18253	18253		9 "	18123	18123	18124	
8 May	18253	18253	18253		16 "	18122	18124	18124	
14 "	18252	18253	18253		23 "	18124	18124	18124	
21 "	18256	18256	18253		30 "	18128	18128	18124	05h, Nov. 3
26 "	18252	18252	18253		6 Nov.	18132	18132	18127	
11 June	18252	18254	18253		13 "	18126	18127	18127	
18 "	18254	18254	18253		20 "	18127	18127	18127	
23 "	18254	18254	18253		27 "	18124	18127	18127	00h, Nov. 29
2 July	18252	18252	18253		4 Dec.	18119	18119	18119	
9 "	18256	18256	18253		11 "	18119	18119	18119	
16 "	18257	18257	18250		18 "	18117	18117	18119	
25 "	18250	18253	18253		25 "	18120	18120	18119	
29 "	18252	18252	18252		1 Jan.	1953	1953	1953	Uncontrolled 03h, Dec. 28 to 03h, Dec. 30
30 "	18252	18253	18253			18080	18080	18080	
7 August	18252	18253	18253						

TABLE 2
Abrupt changes in the adopted H base-line values
(Horizontal intensity is reckoned as positive; changes below taken algebraically)

Date	Change from preceding value	Cause of change
1952	Y	
28 March	+ .82	Z magnet reversed
21 April	+ 1.07	Bimetallic strip reversed and shortened
23 "	- .40	Bimetallic strip adjusted
26 "	+ 1.1	H-focus altered
22 August	- .3	Spontaneous
23 Sept.	- .92	H magnet reoriented and bimetallic strip slightly lengthened
25 "	- 1.7	Prism moved
28 "	- 1.7	Prism and torsion head adjusted
3 Nov.	+ .3	Base-line mirror adjusted
28 Dec.	- .39	Magnet realigned after displacement caused by hurricane

TABLE 3
Observed and adopted base-line values for D variometer
(Observed values determined with Elliott Magne-tome) (West declination)

Date	Observed	Adopted	Adopted value used to	Remarks	Date	Observed	Adopted	Adopted value used to	Remarks
1952					1952				
13 March	-50 06.1	-50 06.5	06.5		21 August	-50 21.8	-50 21.4	00h, August 28	
20 "	06.4	06.5	06.5		4 Sept.	20.6	20.5	20.1	
26 "	06.8	06.5	20h, March 28	Uncontrolled 20h, March 28 to 09h, March 30	6 "	19.5	20.0	20.1	
3 April	(20.6)	21.1	21.1		11 "	"	19.8	20.4	
9 "	21.0	21.1	21.1		19 "	"	20.0	20.1	
16 "	21.1	21.1	21.1	00h, May 1	24 Oct.	"	20.4	20.1	00h, Sept. 25
25 May	21.1	21.5	21.5		9 "	"	19.6	19.7	
8 "	21.5	21.7	21.4		16 "	"	19.8	19.7	
14 "	21.7	21.4	21.4		23 "	"	19.8	19.7	
21 "	21.8	21.4	21.4		30 "	"	19.8	19.7	
26 "	21.0	21.4	21.4		6 Nov.	"	19.1	19.7	00h, Nov. 13
10 June	21.8	21.4	21.4		13 "	"	20.7	20.5	
18 "	21.3	21.4	21.4		25 "	"	20.0	20.5	
23 "	21.6	21.4	21.4		27 "	"	20.9	20.5	
2 July	21.0	21.4	21.4		4 Dec.	"	20.0	20.5	
9 "	21.4	21.4	21.4		11 "	"	20.8	20.5	
16 "	22.2	21.4	21.4		18 "	"	21.0	20.5	
25 "	21.0	21.4	21.4		25 "	"	20.0	20.5	
30 "	21.2	21.4	21.4		1 Jan. 1953	20.1	20.5	03h, Dec. 28	Abrupt change from negative to positive
7 August	21.4	21.4	21.4		1 Jan. 1953	19.6	20.0	03h, Dec. 30	Uncontrolled 03h, Dec. 28 to 03h, Dec. 30
13 "	21.6	21.4	21.4						

TABLE 4
Abrupt changes in the adopted D base-line values
(West declination reckoned as negative; changes below taken algebraically)

Date	Change from preceding value	Cause of change
1952		
28 March	-14.6	Z magnet reversed
1 May	-0.3	Spontaneous
28 August	+1.3	Spontaneous
25 Sept.	+0.4	Spontaneous
13 Nov.	-0.8	Observatory building moved against pier by hurricane
28 Dec.	+0.9	

TABLE 5
 Observed and adopted base-line values for Z variometer
 (Observed values determined with BMZ No. 62)

Date	Observed	Adopted	Adopted value used to	Remarks	Date	Observed	Adopted	Adopted value used to	Remarks
1952	Y	Y	-46897		1952	Y	Y	-46973	
12 March	-46896	-46897	-46897		13 August	-46970	-46970	-46986	00h, August 21
19 "	46898	46897	46897		21 "	46970	46970	46986	
20 "	46898	46897	46897	09h, March 28	29	"	46978	46985	
26 "	46895	46897	46897	Uncontrolled 09h, March 28 to 08h, March 30	5 Sept.	"	46985	46986	
3 April	47100	47101	47101		11	"	46988	46986	
9 "	47102	47101	47101	Uncontrolled 08h, April 23 to 08h, April 24	19	"	46984	46986	
16 "	47100	47101	47101		22	"	46984	46986	
23 "	47072	47072	47072		24	"	46987	46986	
25 "	46968	46967	46967		2 Oct.	"	46982	46986	
8 May	46968	46967	46967		9	"	46986	46986	
14 "	46965	46967	46967		16	"	46985	46986	
21 "	46967	46967	46967		23	"	46992	46986	
26 "	46966	46967	46967		30	"	46984	46986	05n, Nov. 3
10 June	46962	46967	46967		6 Nov.	"	46974	46977	
18 "	46966	46967	46967		13	"	46975	46977	
23 "	46968	46967	46967		20	"	46972	46977	
2 July	46970	46967	46967		27	"	46979	46977	
9 "	46966	46967	46967		4 Dec.	"	46973	46977	
16 "	46967	46967	46967		11	"	46983	46977	
25 "	46966	46967	46967	09h, July 26	18	"	46979	46977	
30 "	46970	46973	46973		25	"	46976	46977	
6 August	46976	46973	46973		1953	"	46976	46977	03h, Dec. 28
7 "	46978	46973	46973		1 Jan.	"	47100	47100	Uncontrolled 03h, Dec. 30

TABLE 6

Abrupt changes in the adopted Z base-line values
 (Vertical intensity is reckoned as negative; changes below taken algebraically)

Date	Change from preceding value	Cause of change
1952	Y	
28 March	-204	Z magnet reversed
21 April	+29	Bi-metallic strip reversed
23 "	+105	Base-line moved up trace
26 July	-6	Spontaneous
21 August	-15	Spontaneous
3 Nov.	+9	Base-line mirror tilted
28 Dec.	-123	Observatory building moved against pier by hurricane

TABLE 7
 Observed and adopted H scale-values
 Determinations with Helmholtz coil

Date	Observed H	Adopted H	Adopted value used from	Date	Observed H	Adopted H	Adopted value used from
1952 16 March	9.79	10.13	March 11	1952 5 Sept.	(9.83)	10.13	
24 "	10.01			7 "	10.19		
27 "	10.35			13 "	10.06		
1 April	9.72			17 "	10.12		
8 "	9.96			20 "	10.16		
15 "	10.42			24 "	10.10		
27 "	10.18			25 "	10.18		
6 May	10.00			3 Oct.	10.45	10.46	11 ^h 30 ^m , Sept. 28
13 "	10.17			9 "	10.43		
22 "	10.06			11 "	10.39		
26 "	10.56			16 "	10.47		
11 June	10.16			22 "	10.48		
13 "	10.18			4 Nov.	10.43		
18 "	10.09			10 "	10.48		
22 "	10.08 x			19 "	10.51		
29 "	10.13			25 "	10.42		
2 July	10.06			2 Dec.	10.50 x		
8 "	10.12			10 "	10.47		
14 "	10.22 x			18 "	10.50		
19 "	10.08			23 "	10.40		
25 "	10.07						
30 "	10.14						
6 August	10.17 x			1953 1 Jan.	10.34 x	10.42	17 ^h 16 ^m , Dec. 29
9 "	10.15			5 "	10.49		
16 "	10.11			10 "	10.45		
24 "	10.12			16 "	10.38		
				23 "	10.40		

x Disturbed conditions; disregarded in mean

TABLE 8
 Abrupt changes in the adopted H scale-values

Date	Change from preceding value	Cause of change
1952 28 Sept.	+0.33	Torsion head adjusted
29 Dec.	-0.04	Torsion head adjusted after displacement by hurricane

TABLE 9
 Observed and adopted D scale values

Date	Observed D	Adopted D	Method used for determination
1952 16 March	0.9118	0.912	Torsion head deflections
20 July	0.9118	0.912	" " "

TABLE 10

Observed and adopted Z scale-values

Determinations with Helmholtz coil

Date	Observed Z	Adopted Z	Adopted value used from	Date	Observed Z	Adopted Z	Adopted value used from
1952	Y/mm	Y/mm		1952	Y/mm	Y/mm	
13 March	14.31	14.36	March 11	5 Sept.	3.15	3.14	
14 "	14.32			13 "	3.13		
16 "	14.62			17 "	3.14		
19 "	14.34			25 "	3.15		
24 "	14.64 x			3 Oct.	3.17	3.15	00h, Oct. 1
27 "	14.45			9 "	3.13		
29 "	3.06	3.11	15h, March 28	16 "	3.15		
1 April	3.17 x			22 "	3.13		
8 "	3.02			4 Nov.	3.15		
15 "	3.08			10 "	3.16		
27 "	3.12			19 "	3.14		
13 May	3.17			25 "	3.15		
22 "	3.16			2 Dec.	3.15		
26 "	3.06			10 "	3.15		
11 June	3.12			18 "	3.15		
18 "	3.11			23 "	3.17		
22 "	3.12 x						
29 "	3.10						
2 July	3.13	3.13	00h, July 1	1953			
8 "	3.13			1 Jan.	3.08xx	3.09	17h, Dec. 29
14 "	3.11			16 "	3.09		
19 "	3.14			23 "	3.06		
25 "	3.13						
30 "	3.14						
6 August	3.11 x	3.14	00h, August 1				
9 "	3.14						
16 "	3.14						
24 "	3.13						

x Disturbed conditions

xx Positive deflection only

TABLE 11

Abrupt changes in the adopted Z scale-values

Date	Change from preceding value	Cause of change
1952	Y/mm	
28 March	-11.25	Magnet reversed to South end pointing North
11 July	+ 0.02	
1 Aug.	+ 0.01	
1 Oct.	+ 0.01	
29 Dec.	- 0.06	Magnet reground

TABLE 12
HOURLY VALUES OF HORIZONTAL INTENSITY
17700 plus tabular quantities expressed in gamma
MARCH 1952

Day	Continuous recording started on 11th March, 1952																		Mean																	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	Range										
1	*																																			
2	#																																			
3																																				
4																																				
5																																				
6																																				
7																																				
8																																				
9																																				
10																																				
11	664	632	715	773	771	759	754	750	747	749	764	781	770	803	845	802	809	733	641	762	752	681	652	745	14	24	909	02	38	605						
12	745	770	780	780	767	749	729	731	772	773	771	775	770	772	777	771	762	701	663	728	728	714	753	745	03	25	786	22	21	612						
13	*																																			
14	#																																			
15																																				
16	731	764	779	782	777	774	765	750	741	742	753	756	751	763	774	775	777	774	777	775	766	740	744	777	731	23	31	725	073	073	174					
17	795	796	786	798	767	761	769	755	780	740	755	780	766	769	770	785	807	797	799	792	805	776	763	679	731	23	28	845	23	28	593					
18	*																																			
19	#																																			
20																																				
21																																				
22	664	540	670	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690			
23	(67)	500	644	718	732	728	714	708	725	711	728	711	759	731	759	725	777	768	777	797	785	793	608	629	503	1.9	114	662	18	19	831	22	37	-100		
24																																				
25																																				
26	*																																			
27																																				
28	*																																			
29	*																																			
30																																				
31	#	222	259	518	682	709	781	779	745	751	757	763	774	777	775	772	803	802	795	638	441	78	232	334	656	15	40	1014	01	13	-296					

Insufficient data

TONG

10 Ten least disturbed
days

✓ Five international
quiet days

Five international
disturbed days

Approximate

TABLE 12
HOURLY VALUES OF HORIZONTAL INTENSITY

APRIL 1952

TABLE 14
HOURLY VALUES OF HORIZONTAL INTENSITY

MAY 1952

TABLE 15
HOURLY VALUES OF HORIZONTAL INTENSITY
117700 plus tabular quantities expressed in %

TABLE 16
HOURLY VALUES OF HORIZONTAL INTENSITY
17700 plus tubular quantities expressed in E_h
JULY 1952

AUGUST 1952													17900 plus tabular quantities expressed in gammas											G.M.T. used					
Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range
1	569	566	567	546	553	571	570	557	555	560	562	566	567	576	576	577	578	579	577	575	575	575	575	562	569	565	537		
2	566	558	571	584	587	587	580	577	569	566	565	568	568	580	582	581	581	581	581	582	582	582	582	575	569	565	108		
3	576	581	583	585	540	523	522	525	524	577	560	571	584	616	657	677	670	638	596	607	556	546	546	546	534	577	540	237	
4	563	552	540	571	584	584	554	545	561	563	567	561	563	567	582	586	586	575	582	582	582	582	582	560	566	556	237		
5	450	567	595	587	584	584	577	567	561	571	555	550	559	568	568	588	587	582	582	582	582	582	582	575	575	575	237		
6	536	447	523	567	544	561	571	555	550	559	568	568	577	580	580	577	583	577	599	575	575	575	575	565	566	559	237		
7	512	503	566	578	580	575	567	559	558	569	569	569	571	569	571	574	572	577	577	572	572	572	572	568	566	564	205		
8	558	570	577	585	586	569	561	553	553	558	561	561	561	569	571	571	570	573	573	575	575	575	575	574	574	574	205		
9	*	578	579	578	578	585	585	578	569	564	561	561	560	560	565	565	565	565	565	565	565	565	565	564	564	564	205		
10	485	465	566	562	574	575	562	565	565	560	560	565	565	565	565	565	565	565	565	565	565	565	565	558	558	558	205		
11	570	563	519	519	575	574	583	575	574	565	552	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	205		
12	*	568	574	577	579	581	576	574	568	565	562	560	571	571	575	575	576	578	576	576	576	576	576	576	576	576	205		
13	*	567	575	578	584	576	563	571	573	568	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	205	
14	*	567	567	567	567	569	599	586	573	577	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	205	
15	*	593	563	577	578	573	587	578	571	566	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	205	
16	*	580	569	596	601	605	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	205	
17	*	580	569	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	596	205	
18	*	417	531	562	540	544	574	568	565	566	566	570	570	570	574	574	574	574	574	574	574	574	574	574	574	574	574	205	
19	567	559	495	519	547	567	575	575	575	575	555	555	555	555	555	555	555	555	555	555	555	555	555	555	555	555	205		
20	*	577	567	556	570	556	570	570	570	570	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	205	
21	*	578	576	570	578	596	601	592	578	572	573	573	579	579	579	579	579	579	579	579	579	579	579	579	579	579	579	205	
22	*	580	583	563	589	561	594	583	572	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	205	
23	*	541	582	527	573	584	584	584	584	584	584	584	584	584	584	584	584	584	584	584	584	584	584	584	584	584	584	205	
24	*	582	584	589	591	592	592	587	576	570	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	205	
25	*	584	584	583	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	205	
26	*	578	575	575	578	583	598	592	584	577	571	571	571	571	571	571	571	571	571	571	571	571	571	571	571	571	571	205	
27	*	583	573	572	572	590	591	582	555	548	556	552	552	552	552	552	552	552	552	552	552	552	552	552	552	552	552	205	
28	*	572	565	574	581	584	577	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	205	
29	*	579	571	572	583	594	591	574	563	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	205	
30	*	511	404	306	402	456	508	561	576	573	566	569	569	569	569	569	569	569	569	569	569	569	569	569	569	569	569	205	
31	*	579	578	572	561	560	572	560	552	550	548	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	553	205	
Mean		555	553	555	569	573	575	572	566	562	563	570	575	581	582	585	586	585	582	581	582	581	582	581	582	581	582	581	
Mean *		578	578	578	582	586	587	581	574	568	565	566	570	575	578	578	578	578	578	578	578	578	578	578	578	578	578	578	
Mean †		579	576	577	581	582	583	576	573	568	565	566	568	573	578	578	578	578	578	578	578	578	578	578	578	578	578	578	
Mean ≠ c		521	525	504	538	535	543	564	564	567	567	563	569	576	588	602	614	602	600	586	577	568	554	529	536	562	562	562	
c Means of 4 values																													

DESIGNATIONS

* Ten least disturbed days

† Five international quiet days

‡ Five international disturbed days

() Approximate

179

51

TABLE 18
HOURLY VALUES OF HORIZONTAL INTENSITY
17600 plus tabular quantities expressed in erg/cm²/sec.
SEPTEMBER 1952

TABLE 19
HOURLY VALUES OF HORIZONTAL INTENSITY
17600 plus tabular quantities expressed in ga
OCTOBER 1952

Day	Range																										
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum
1	797	802	807	812	817	822	827	832	837	842	847	852	857	862	867	872	877	882	887	892	897	902	907	912	917	147	
2	880	882	891	898	904	911	918	925	932	939	946	953	960	967	974	981	988	995	997	999	999	999	999	999	999	161	
3	#	870	882	887	898	909	920	931	942	953	964	975	986	997	999	999	999	999	999	999	999	999	999	999	999	999	715
4	#	477	781	886	896	906	916	926	936	946	956	966	976	986	996	999	999	999	999	999	999	999	999	999	999	999	1023
5	#	828	882	904	911	918	925	932	939	946	953	960	967	974	981	988	995	999	999	999	999	999	999	999	999	999	1005
6	#	771	825	834	841	848	855	862	869	876	883	890	897	904	911	918	925	932	939	946	953	960	967	974	981	988	278
7	#	881	886	895	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	668
8	#	860	872	879	887	892	898	904	910	916	922	928	934	940	946	952	958	964	970	976	982	988	994	999	999	999	141
9	#	860	862	865	867	869	872	875	878	881	884	887	890	893	896	899	902	905	908	911	914	917	921	925	929	933	141
10	#	867	893	896	901	909	911	919	920	928	934	941	948	955	962	969	976	983	990	997	999	999	999	999	999	999	251
11	#	879	879	887	889	897	905	913	921	929	937	945	953	961	969	977	985	993	999	999	999	999	999	999	999	999	334
12	#	711	864	868	872	876	880	884	888	892	896	900	904	908	912	916	920	924	928	932	936	940	944	948	952	956	1096
13	#	830	881	893	891	895	895	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	084
14	#	884	884	892	895	899	901	904	909	914	919	924	929	934	939	944	949	954	959	964	969	974	979	984	988	992	084
15	#	867	884	892	895	899	901	904	909	914	919	924	929	934	939	944	949	954	959	964	969	974	979	984	988	992	084
16	#	894	905	911	908	919	920	929	937	941	947	953	959	965	971	977	983	989	995	999	999	999	999	999	999	999	205
17	#	891	891	895	897	898	901	904	907	910	913	916	919	922	925	928	931	934	937	940	943	946	949	952	955	958	141
18	#	874	882	889	870	870	874	875	878	881	884	887	890	893	896	899	902	905	908	911	914	917	920	923	926	929	084
19	#	880	888	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	894	061
20	#	881	870	870	874	875	879	882	885	888	891	894	897	900	903	906	909	912	915	918	921	924	927	930	933	936	069
21	#	890	897	902	903	908	908	913	918	923	928	933	938	943	948	953	958	963	968	973	978	983	988	993	998	999	075
22	#	903	903	912	915	920	925	930	935	940	945	950	955	960	965	970	975	980	985	990	995	999	999	999	999	999	075
23	#	890	894	902	902	901	901	901	901	901	901	901	901	901	901	901	901	901	901	901	901	901	901	901	901	901	070
24	#	894	902	902	902	902	902	902	902	902	902	902	902	902	902	902	902	902	902	902	902	902	902	902	902	902	067
25	#	777	777	643	577	528	506	484	462	440	418	396	374	352	330	308	286	264	242	220	198	176	154	132	110	97	465
26	#	769	769	822	873	877	881	885	889	893	897	901	905	909	913	917	921	925	929	933	937	941	945	949	953	957	440
27	#	860	851	860	864	868	872	876	880	884	888	892	896	899	903	907	911	915	919	923	927	931	935	939	943	947	173
28	#	888	889	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	898	173
29	#	892	892	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	153
30	#	892	892	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	153
31	#	836	880	776	728	685	667	638	619	599	579	559	539	519	499	479	459	439	419	399	379	359	339	319	299	279	806

NOVEMBER 1952

TABLE 20
HOURLY VALUES OF HORIZONTAL INTENSITY
17900 plus tabular quantities expressed in gammae

G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range	
1	/	439	495	550	573	574	580	565	550	547	562	558	582	556	587	628	617	627	602	582	613	552	519	511	389	557	19	12	729	23
2	/	477	563	579	581	585	571	562	543	536	543	561	570	577	593	610	598	602	605	585	509	487	573	580	586	566	14	17	629	288
3	/	577	580	572	595	577	596	605	598	587	569	552	550	575	572	573	570	576	577	585	581	584	586	572	515	19	19	613	297	
4	*	563	577	596	595	597	598	569	545	543	548	558	561	568	561	565	573	575	576	585	581	585	586	575	575	19	19	610	290	
5	*	589	593	593	593	597	586	573	573	573	574	574	573	574	574	574	574	574	574	574	574	574	574	574	574	19	19	596	283	
6	*	622	628	626	606	603	585	594	572	542	544	555	563	562	574	574	573	573	574	574	574	574	574	574	574	19	19	596	283	
7	*	542	545	584	592	584	582	564	552	542	544	555	563	562	561	574	574	574	574	574	574	574	574	574	574	19	19	596	283	
8	*	586	610	611	606	594	583	591	583	580	575	578	582	583	588	584	589	589	589	589	589	589	589	589	589	19	19	596	283	
9	*	575	562	562	585	561	563	560	561	562	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	19	19	596	283	
10	*	587	595	603	603	603	595	588	576	564	564	565	565	565	565	565	565	565	565	565	565	565	565	565	565	19	19	596	283	
11	*	584	596	606	606	603	595	585	573	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	19	19	596	283	
12	*	584	596	606	606	603	599	586	580	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	19	19	596	283	
13	*	605	599	614	616	607	594	582	575	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	563	19	19	596	283	
14	*	623	616	615	609	604	592	580	563	563	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	19	19	596	283	
15	*	620	626	631	627	616	596	575	545	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	19	19	596	283	
16	*	606	614	616	616	612	593	565	539	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	541	19	19	596	283	
17	*	588	593	608	617	615	595	578	549	528	546	547	551	566	583	583	581	581	581	581	581	581	581	581	581	19	19	596	283	
18	*	604	628	641	637	615	595	589	562	559	546	546	546	546	546	546	546	546	546	546	546	546	546	546	546	19	19	596	283	
19	*	594	601	604	611	593	581	563	545	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	19	19	596	283	
20	*	601	606	613	626	617	601	581	567	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	19	19	596	283	
21	*	584	583	615	636	629	604	575	561	553	540	541	541	541	541	541	541	541	541	541	541	541	541	541	541	19	19	596	283	
22	*	491	509	553	583	592	594	575	559	550	550	556	556	556	556	556	556	556	556	556	556	556	556	556	556	19	19	596	283	
23	*	592	590	587	591	586	565	562	559	550	550	552	552	552	552	552	552	552	552	552	552	552	552	552	552	19	19	596	283	
24	*	587	605	609	614	605	594	583	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	19	19	596	283	
25	*	583	571	592	604	613	609	595	584	573	552	542	563	574	585	598	590	591	591	591	591	591	591	591	591	19	19	596	283	
26	*	591	596	606	612	611	613	612	594	578	559	536	552	566	565	565	565	565	565	565	565	565	565	565	565	19	19	596	283	
27	*	528	529	614	618	612	610	575	546	544	540	534	775	741	732	633	663	646	646	646	646	646	646	646	646	19	19	596	283	
28	*	425	544	566	594	606	590	573	551	551	562	552	587	605	671	688	627	628	635	647	647	647	647	647	647	19	19	596	283	
29	*	571	590	613	606	610	602	585	572	563	557	572	563	564	564	564	564	564	564	564	564	564	564	564	564	19	19	596	283	
30	*	541	552	568	600	604	597	575	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	19	19	596	283	
Mean		569	586	599	605	602	590	575	561	553	552	560	577	584	594	598	595	595	598	595	595	595	595	595	595	19	19	596	283	
Mean x		594	600	608	610	602	592	578	562	554	552	558	564	571	577	580	582	584	586	590	592	593	590	590	597	19	19	596	283	
Mean /		505	592	603	605	600	591	578	560	554	555	560	563	570	577	580	582	583	584	588	587	590	590	594	593	19	19	596	283	
Mean #		513	569	596	607	606	592	571	558	562	565	591	638	629	637	643	620	620	600	575	529	507	468	489	435	19	19	596	283	

() Approximate
DESIGNATIONS
225
* Ten least disturbed days
76
/ Five international quiet days
Five international disturbed days

TABLE 21
HOURLY VALUES OF HORIZONTAL INTENSITY
17700 plus tabular quantities expressed in gammas

Day	DECEMBER 1952																					G.M.T. used	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1	785	800	802	806	797	788	782	745	766	740	745	759	761	775	804	788	798	832	788	797	618	668	
2	#	566	708	773	776	807	811	793	773	723	755	764	743	913	946	879	839	764	651	669	755	759	
3	#	774	790	789	785	774	797	785	766	758	764	764	764	756	787	786	785	790	761	691	762	728	
4	#	665	503	701	742	784	797	798	751	755	774	767	807	820	836	838	804	787	809	734	659	666	557
5	#	691	765	776	765	776	777	776	780	785	775	763	777	770	755	786	778	788	786	786	786	786	519
6	#	778	783	785	782	802	814	819	808	784	766	755	752	764	759	768	781	787	781	784	783	784	519
7	#	763	782	802	814	819	808	793	776	756	742	752	758	766	776	774	773	783	783	785	783	782	519
8	#	781	782	804	811	810	808	791	784	768	760	784	784	780	776	778	780	784	780	793	783	782	519
9	#	791	798	810	810	810	801	784	768	756	751	759	767	775	776	776	780	784	780	793	783	782	519
10	#	805	804	796	795	790	777	770	766	765	764	766	765	750	757	752	774	799	782	787	791	797	785
11	#	799	809	805	807	789	753	752	767	762	800	828	827	811	777	776	776	774	776	782	781	785	782
12	#	797	797	798	798	796	791	787	772	768	756	744	744	752	755	755	755	755	755	755	755	755	458
13	#	760	728	798	785	778	756	763	756	778	018	064	026	026	026	026	026	026	026	026	026	026	
14	#	795	791	797	799	798	792	780	766	758	751	760	767	781	782	774	776	779	793	795	797	799	059
15	#	786	734	608	797	812	815	793	775	765	766	767	767	767	777	777	777	780	792	793	794	795	115
16	#	803	805	820	806	807	798	787	781	774	756	755	755	755	755	755	755	755	755	755	755	755	106
17	#	758	791	792	797	790	772	767	764	759	759	759	759	759	759	759	759	759	759	759	759	759	106
18	#	788	821	815	800	806	808	789	772	762	762	759	759	759	759	759	759	759	759	759	759	759	106
19	#	788	765	811	827	815	801	789	770	759	753	757	757	757	757	757	757	757	757	757	757	757	106
20	#	801	802	812	810	805	799	799	775	765	751	751	751	751	751	751	751	751	751	751	751	751	106
21	#	812	819	818	822	818	802	818	819	795	774	762	754	761	765	775	786	788	791	793	795	797	146
22	#	808	813	806	809	816	819	802	787	774	755	747	744	764	783	780	784	784	784	784	784	784	146
23	#	785	800	808	823	828	819	809	791	777	762	755	755	755	755	755	755	755	755	755	755	755	146
24	#	818	816	796	793	806	823	815	797	785	785	785	785	785	785	785	785	785	785	785	785	785	146
25	#	751	764	793	787	793	776	769	772	775	765	766	767	767	767	767	767	767	767	767	767	767	107
26	#	775	788	775	782	788	787	774	767	762	765	758	758	758	758	758	758	758	758	758	758	758	107
27	#	693	780	783	775	782	788	787	774	767	762	765	758	758	758	758	758	758	758	758	758	758	107
28	#	746	733	746	775	798	753	784	772	761	810	798	794	794	794	828	826	841	822	854	793	788	145
29	#	746	733	746	801	799	804	770	752	772	767	784	752	752	752	805	855	812	796	796	796	796	272
30	#	746	733	746	801	799	804	770	752	772	767	784	752	752	752	805	855	812	796	796	796	796	272
31	#	746	733	746	801	799	804	770	752	772	767	784	752	752	752	805	855	812	796	796	796	796	272
Mean		764	774	792	796	798	794	784	772	766	769	771	773	784	800	796	795	792	794	785	767	765	252
Mean *		790	795	806	811	810	804	790	777	766	755	752	759	767	774	780	785	788	790	791	784	784	86
Mean †		795	801	813	818	815	806	792	779	767	758	754	762	770	774	779	783	787	793	798	798	798	798

Intrafleasant data

Mean ‡

HOURLY VALUES OF HORIZONTAL INTENSITY
17700 plus tabular quantities expressed in gammas

TABLE 22

MARCH 1952 49° West plus tabular quantities expressed in tenth of minutes of arc

G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range	h m	h m	h m
1 *																																
2 *																																
3 *																																
4 *																																
5 *																																
6 *																																
7																																
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25																																
26 *																																
27																																
28 *																																
29 *																																
30 *																																
31 *																																

Mean	Insufficient data	DESIGNATIONS
Mean *	"	* Ten least disturbed days
Mean *	"	† Five international quiet days
Mean *	"	‡ Five international disturbed days
Mean *	"	() Approximate

TABLE 23

LIGO West plus triaxial quantities expressed in tenth of minutes of arc

APPENDIX II

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range			
#	590	630	740	653	584	556	529	564	545	525	504	512	507	474	580	498	487	520	588	601	571	555	539	533	562	02	30	942	h m			
1	576	562	747	596	627	575	577	561	526	534	455	502	510	512	523	502	526	563	585	597	610	727	594	784	645	20	48	(1935)	17			
2	658	781	805	739	665	657	551	548	521	517	497	510	520	514	524	504	526	562	585	591	612	667	694	701	601	11	50	1811	16			
3	659	683	750	651	567	551	548	519	558	507	487	443	539	520	474	520	474	520	549	562	571	612	747	767	728	607	23	49	1311	18		
4	634	692	630	590	538	564	573	578	544	501	472	498	520	511	571	539	509	571	557	591	585	566	526	772	793	855	605	23	16	1182	19	
5	743	596	595	598	584	592	592	592	595	530	521	521	521	544	521	521	521	521	563	562	544	600	590	628	609	569	17	27	754	18		
6	827	622	547	578	548	562	567	565	557	537	519	540	500	517	525	525	525	525	525	525	525	640	599	628	628	588	09	09	1003	19		
7	699	555	573	526	526	562	567	565	557	537	519	540	500	517	525	525	525	525	525	525	525	640	599	628	628	588	09	09	1003	19		
8	827	622	547	578	548	562	567	565	557	537	519	540	500	517	525	525	525	525	525	525	525	640	599	628	628	588	09	09	1003	19		
9	827	622	547	578	548	562	567	565	557	537	519	540	500	517	525	525	525	525	525	525	525	640	599	628	628	588	09	09	1003	19		
10	557	560	564	563	559	565	584	573	555	545	527	516	538	527	516	526	519	516	526	529	544	547	546	544	547	543	03	27	653	04		
11	*	547	554	610	620	545	538	556	550	548	529	519	528	514	526	514	526	530	549	547	546	601	573	552	552	552	04	36	495	158		
12	*	550	555	566	577	580	582	578	571	551	507	529	526	514	526	514	526	530	549	547	546	520	530	520	520	520	16	18	1181	145		
13	*	555	561	566	569	592	564	567	561	526	514	526	514	492	514	514	514	526	537	537	537	520	530	520	520	520	13	05	227	401		
14	*	555	561	566	569	592	564	567	561	526	514	526	514	492	514	514	514	526	537	537	537	520	530	520	520	520	13	05	482	167		
15	*	555	561	566	569	592	564	567	561	526	514	526	514	492	514	514	514	526	537	537	537	520	530	520	520	520	13	05	507	129		
16	*	550	545	577	559	529	554	556	529	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525
17	*	550	554	558	566	560	529	554	556	529	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525
18	*	550	543	550	543	550	565	557	551	529	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525
19	*	712	590	541	554	568	548	571	553	529	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525
20	*	574	557	545	573	512	525	581	584	555	546	539	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525
21	*	610	536	546	562	527	514	559	541	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525
22	*	546	630	620	620	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529
23	*	546	566	582	560	556	557	565	565	556	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545
24	*	546	554	552	565	561	565	565	565	565	543	557	556	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545
25	*	561	559	556	573	580	565	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564
26	*	537	545	552	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565
27	*	554	540	547	556	565	566	567	562	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556
28	*	586	561	549	556	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561	561
29	*	975	893	668	581	590	547	562	547	540	547	542	546	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547
30	*	975	893	668	581	590	547	562	547	540	547	542	546	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547	547
Mean	626	604	604	590	577	560	562	555	537	503	514	512	518	525	512	543	547	572	596	610	615	626	676	661	575	DESIGNATIONS	598					
Mean *																																
Mean / c	555	548	555	565	570	570	572	565	551	538	530	526	534	536	538	539	539	549	555	551	553	560	550	555	550	550	550	550	550	550	550	
Mean # c	749	714	689	618	611	598	548	548	507	515	470	478	519	532	546	567	598	579	660	723	767	788	984	938	633	* Ten least disturbed days						
Mean # c values	556	548	555	565	570	570	572	565	551	538	530	526	534	536	538	539	539	549	555	551	553	560	550	555	550	550	550	550	550	550		
Mean # c Approximate	749	714	689	618	611	598	548	548	507	515	470	478	519	532	546	567	598	579	660	723	767	788	984	938	633	/ Five international quiet days						
Mean # c Disturbed days	749	714	689	618	611	598	548	548	507	515	470	478	519	532	546	567	598	579	660	723	767	788	984	938	633	# Five disturbed days						
Mean # c International	749	714	689	618	611	598	548	548	507	515	470	478	519	532	546	567	598	579	660	723	767	788	984	938	633	() Approximate						

TABLE 21
HOURLY VALUES OF DECLINATION

49° West plus tabular quantities expressed in tenth of minutes of arc

G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range						
1	#	7142	806	610	635	560	552	577	580	538	521	476	465	532	548	602	593	612	542	580	540	679	576	586	830	596	00	36(1161)	h m						
2	#	624	636	767	676	568	575	575	567	576	520	496	554	520	621	573	536	520	623	641	796	674	597	02	57(1127)	12 19	348	(733)							
3	#	752	728	684	577	550	559	550	557	562	574	520	516	520	568	620	569	621	871	564	942	863	654	22	10(1846)	18 49	234	(925)							
4	10 *	792	632	626	614	590	557	562	574	552	548	518	531	538	592	556	575	593	565	564	577	762	734	948	614	622	00	11(1856)	19 03	486	(1612)				
5	11	788	691	606	547	576	564	566	548	530	532	511	539	557	529	595	625	595	599	512	578	730	625	588	00	37(1121)	12 17	472	(1370)						
6	12 *	602	611	592	575	562	558	576	562	503	500	494	532	562	566	594	574	564	564	564	548	579	557	23	50(1684)	07	37	459							
7	#	591	602	205	541	500	492	577	510	488	506	493	366	332	359	(368)	602	613	732	784	758	643	899	668	580	22	02(1684)	14 29	(1492)						
8	13 *	584	575	770	506	575	565	575	567	504	539	530	549	559	554	575	614	592	581	598	576	566	549	548	566	02	21	929	05	427	502				
9	*	538	523	548	548	548	540	539	542	544	540	548	552	557	551	551	551	551	551	551	546	542	546	548	548	03	32	595	22	56	511				
10	*	496	510	558	558	558	558	558	560	561	520	519	550	548	550	550	548	550	548	548	546	544	548	548	548	00	46	459	109	084					
11	14 *	518	545	546	550	558	561	570	558	523	520	512	549	549	548	548	548	548	548	548	548	548	548	548	548	01	12	578	17	54	468				
12	*	559	510	550	569	569	572	550	540	524	523	510	541	543	541	550	540	540	540	540	540	540	540	540	540	05	51	560	15	37	523				
13	*	559	560	563	568	560	557	550	540	532	521	519	519	520	512	550	549	549	549	549	549	549	549	549	549	05	51	560	15	37	523				
14	*	568	570	580	592	587	580	577	558	540	534	539	539	539	539	539	539	539	539	539	539	539	539	539	539	05	51	560	15	37	523				
15	*	539	540	540	531	538	539	539	538	539	538	539	538	539	539	539	539	539	539	539	539	539	539	539	539	05	51	560	15	37	523				
16	*	539	540	540	531	538	539	539	538	539	538	539	538	539	539	539	539	539	539	539	539	539	539	539	539	05	51	560	15	37	523				
17	*	558	660	603	554	563	568	568	573	560	498	468	539	521	515	533	540	545	553	560	558	548	548	548	548	01	50	750	06	12	292				
18	*	575	549	531	560	570	540	549	556	550	549	556	550	531	539	529	531	529	531	529	531	529	531	529	529	529	556	583	556	01	50	750	06	12	292
19	*	550	539	557	529	549	551	554	560	553	562	545	522	520	522	520	522	520	522	520	522	520	522	520	520	520	520	520	520	520	520	520	520	520	
20	*	566	575	557	555	558	560	565	566	560	562	564	562	562	562	562	562	562	562	562	562	562	562	562	562	562	04	42	572	13	477	272			
21	*	557	550	551	558	565	563	570	559	550	538	540	540	547	545	550	550	550	550	550	550	550	550	550	550	550	00	593	12	06	493				
22	*	525	544	548	550	544	548	548	548	550	533	533	533	533	533	533	533	533	533	533	533	533	533	533	533	04	51	578	09	49	529				
23	*	516	544	548	550	544	548	548	548	550	533	533	533	533	533	533	533	533	533	533	533	533	533	533	533	04	51	578	09	49	529				
24	*	534	522	556	549	542	547	547	547	547	521	521	521	521	521	521	521	521	521	521	521	521	521	521	521	04	51	578	09	49	529				
25	*	623	642	593	559	572	560	533	534	521	541	553	553	553	553	553	553	553	553	553	553	553	553	553	553	04	51	578	09	49	529				
26	*	568	547	548	551	558	552	557	559	559	497	505	513	515	515	515	515	515	515	515	515	515	515	515	515	04	51	578	09	49	529				
27	*	(506	815	743)	579	592	573	577	559	569	497	522	515	515	515	515	515	515	515	515	515	515	515	515	515	04	51	578	09	49	529				
28	*	653	596	579	560	559	558	541	547	540	541	546	546	546	546	546	546	546	546	546	546	546	546	546	546	04	51	578	09	49	529				
29	*	538	649	598	551	559	545	548	545	545	539	531	531	531	531	531	531	531	531	531	531	531	531	531	531	04	51	578	09	49	529				
30	*	577	635	560	543	541	515	505	529	519	533	521	521	521	521	521	521	521	521	521	521	521	521	521	521	04	51	578	09	49	529				
31	*	586	632	592	549	541	540	474	519	532	550	551	543	551	551	551	551	551	551	551	551	551	551	551	551	04	51	578	09	49	529				
Mean		610	618	593	564	558	553	555	549	540	534	526	528	533	538	548	560	569	574	576	568	591	632	644	651	571	DESIGNATIONS	469							
Mean # a		547	547	556	562	562	560	559	552	543	538	537	538	536	545	547	552	555	555	549	548	549	550	549	549	549	* Ton least disturbed	90							
Mean # c		533	541	551	553	555	552	557	553	550	545	543	544	545	542	547	548	555	555	552	558	548	548	548	548	/ Five international quiet days									
Mean # c		744	796	688	602	554	550	562	549	540	536	506	508	500	511	551	576	591	592	600	596	678	805	780	779	612	/ Five international disturbed days								
a	Means of 9 values	c	Means of 4 values																								() Approximate								

TABLE 25

JUNE 1952 49° West plus tabular quantities expressed in tenth of minutes of arc

Day	G.M.T. used																								
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	567	552	544	547	542	519	535	522	555	543	549	558	553	553	558	560	564	562	567	568	604	558	571	560	554
2 *	555	560	550	538	532	557	539	519	552	548	549	550	547	519	557	558	560	565	567	631	579	571	557	557	
3	550	539	531	521	496	525	530	512	557	557	550	553	522	552	558	558	563	572	578	567	573	551	551	557	557
4 *	526	567	547	576	520	560	568	572	566	555	544	548	520	520	552	558	560	564	580	581	574	559	575	583	557
5	561	567	537	562	567	521	544	521	531	520	538	531	521	521	541	575	567	579	580	589	569	577	575	583	557
6 *	578	557	541	546	558	520	539	548	547	550	550	547	521	521	547	550	558	558	578	577	575	551	549	558	557
7 *	566	560	557	546	546	549	549	549	547	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550
8	550	550	541	503	538	551	539	517	582	478	495	476	466	499	510	520	517	567	568	583	588	557	557	557	557
9	597	577	585	568	518	570	558	537	540	534	529	526	549	521	521	521	521	521	521	521	521	521	521	521	521
10	587	560	551	562	557	550	558	546	542	545	552	539	539	530	535	521	519	500	556	560	567	557	557	557	557
11	587	557	555	567	550	551	559	567	558	539	529	534	529	529	529	529	529	529	529	529	529	529	529	529	529
12 *	585	550	554	556	559	559	551	559	567	557	557	557	557	557	557	557	557	557	557	557	557	557	557	557	557
13 *	556	551	558	559	559	559	560	559	558	558	558	558	558	558	558	558	558	558	558	558	558	558	558	558	558
14 *	560	551	555	560	551	549	544	540	548	541	519	481	486	486	519	500	521	473	506	588	588	545	571	554	554
15	591	574	579	584	547	579	550	532	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529
16	576	568	586	576	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586	586
17	579	577	566	576	565	563	553	538	549	547	529	517	549	547	547	547	547	547	547	547	547	547	547	547	547
18	556	543	597	596	595	580	575	561	550	533	531	531	531	531	531	531	531	531	531	531	531	531	531	531	531
19 *	560	560	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566
20 *	560	556	556	558	558	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562
21 *	556	539	560	558	556	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560
22	685	556	548	555	548	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520
23	641	870	578	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570
24	558	558	560	563	566	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565
25	595	575	520	469	508	522	521	520	512	529	530	519	559	559	559	559	559	559	559	559	559	559	559	559	559
26	560	564	556	555	555	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556
27	575	550	529	567	568	567	568	567	567	567	567	567	567	567	567	567	567	567	567	567	567	567	567	567	567
28 *	575	550	529	567	568	567	568	567	567	567	567	567	567	567	567	567	567	567	567	567	567	567	567	567	567
29	559	557	550	543	539	539	539	539	539	539	539	539	539	539	539	539	539	539	539	539	539	539	539	539	539
30	#	732	600	520	(942	798	958	768	636	541	311	274	494	607	601	590	609	604	623	632	616	625	593	578	581

DESTINATIONS

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

263

06

301

226

147

131

263

131

263

131

263

131

263

131

263

131

263

TABLE 26
HOURLY VALUES OF DECLINATION
 49° West plus tabular quantities expressed in tenth of minutes of arc
 JULY 1952 G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range
1	585	580	585	584	582	579	582	585	585	577	575	576	577	578	583	583	580	577	575	568	773	622	616	977	10	37	539		
2	#	589	580	588	581	579	582	578	578	569	562	562	562	567	578	578	578	577	570	569	568	570	570	570	591	21	48	977	
3	#	574	575	574	584	579	577	577	574	565	560	560	560	560	578	578	578	577	570	569	568	570	570	570	573	20	48	639	
4	#	567	579	578	584	574	597	550	544	520	529	520	520	514	576	578	581	591	575	575	561	614	517	517	561	10	37	532	
5	#	632	620	585	587	609	586	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	573	20	48	542
6	#	569	570	568	570	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	573	20	48	542
7	#	562	568	594	552	571	551	567	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	573	20	48	542
8	#	603	576	578	584	595	577	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	573	20	48	542
9	#	592	606	594	595	587	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	573	20	48	542
10	#	578	548	519	519	548	579	572	569	562	548	550	550	550	550	550	550	550	550	550	550	550	550	550	550	553	20	48	542
11	#	563	562	566	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	573	20	48	542
12	#	578	562	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	573	20	48	542
13	#	576	566	550	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	553	20	48	542
14	#	578	566	550	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	556	553	20	48	542
15	#	539	527	576	576	569	569	569	569	569	569	569	569	569	569	569	569	569	569	569	569	569	569	569	569	563	20	48	542
16	#	595	577	576	568	566	582	559	562	567	550	529	529	529	529	529	529	529	529	529	529	529	529	529	529	523	20	48	542
17	#	567	565	568	568	569	560	532	539	549	528	548	548	548	548	548	548	548	548	548	548	548	548	548	548	543	20	48	542
18	#	578	573	578	582	582	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578	573	20	48	542
19	#	567	565	567	564	560	560	557	557	557	557	557	557	557	557	557	557	557	557	557	557	557	557	557	557	553	20	48	542
20	#	572	524	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	543	20	48	542
21	#	551	576	560	568	570	570	571	571	571	571	571	571	571	571	571	571	571	571	571	571	571	571	571	571	571	20	48	542
22	#	587	580	582	578	582	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578	573	20	48	542
23	#	602	594	581	589	582	591	577	576	571	567	562	560	560	560	560	560	560	560	560	560	560	560	560	560	563	20	48	542
24	#	570	574	575	561	537	566	560	567	568	562	567	567	567	567	567	567	567	567	567	567	567	567	567	567	563	20	48	542
25	#	564	561	566	581	588	591	593	567	568	567	566	566	566	566	566	566	566	566	566	566	566	566	566	566	563	20	48	542
26	#	578	567	573	582	587	588	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	583	20	48	542
27	#	567	568	574	582	582	587	588	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	583	20	48	542
28	#	559	566	569	566	567	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	563	20	48	542
29	#	559	560	564	556	567	562	571	576	581	577	565	568	568	568	568	568	568	568	568	568	568	568	568	568	563	20	48	542
30	#	559	560	564	556	567	562	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	563	20	48	542
31	#	559	560	564	556	567	562	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	566	563	20	48	542
Mean		580	576	572	575	572	570	564	564	558	550	551	549	552	548	552	550	551	549	549	548	548	548	548	548	543	20	48	542
Mean #		576	571	569	576	568	571	567	566	564	556	553	558	558	558	558	558	558	558	558	558	558	558	558	558	553	20	48	542
Mean #		572	570	574	578	576	574	577	576	569	560	565	570	570	575	577	577	582	576	577	570	568	567	570	570	569	20	48	542
Mean #		599	590	577	571	562	561	539	548	528	531	519	533	523	516	490	563	581	601	649	663	653	700	655	605	577	20	48	542

TABLE 27

AUGUST 1952 45° West plus tabular quantities expressed in tenth of minutes of arc
HOURLY VALUES OF DECLINATION

TABLE 28
HOURLY VALUES OF DECLINATION

49° West plus tabular quantities expressed in tenth of minutes of arc
HOURLY VALUES OF DECLINATION

TABLE 29

49° West plus tabular quantities expressed in tenth of minutes of arc

G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range		
1	586	599	633	637	603	594	595	588	576	570	575	579	585	587	602	622	615	586	636	630	617	604	570	601	19.17	67.9	5.8	145			
2	594	623	633	635	632	620	595	557	545	560	582	585	594	589	589	605	678	662	614	598	604	604	616	598	604	13.17	52.2	1.74	1036		
3	612	626	634	650	680	625	604	590	562	560	589	551	512	504	620	536	713	582	806	690	913	650	23.08	1352	21.00	31.6	1161				
4	614	641	622	652	689	668	624	600	549	522	568	576	581	569	595	620	588	715	722	688	657	916	642	00.29	1569	18.34	35.4	(888)			
5	680	639	630	618	612	605	640	545	493	412	346	377	412	494	607	608	724	689	750	731	689	649	618	621	11.56	(181)	1.56	256			
6	685	626	670	670	611	614	632	595	595	582	578	562	549	552	613	605	636	605	603	626	602	577	581	593	609	17.30	762	09.12	1069		
7	603	614	614	617	610	620	614	616	587	585	567	554	557	560	595	597	600	597	614	618	610	600	562	602	598	596	14.53	653	21.18	504	
8	614	652	655	620	622	629	619	636	587	582	527	527	583	566	591	593	605	607	613	595	605	595	598	596	598	02.18	696	12.38	491		
9	580	613	616	613	613	615	604	605	599	578	568	565	563	590	525	595	595	595	595	595	595	595	595	595	599	00.58	718	22.21	494		
10	622	631	614	601	605	586	586	586	589	593	565	567	568	569	552	577	583	586	587	642	725	559	621	604	597	600	600	17.54	824	23.26	430
11	620	661	677	670	605	586	586	586	589	593	565	568	568	568	574	576	581	587	596	595	605	602	600	600	00.06	699	10.48	531			
12	569	607	613	616	610	595	596	596	586	589	591	587	587	588	598	598	587	588	589	589	582	586	566	592	03.58	624	23.34	538			
13	595	598	613	620	614	570	579	586	579	580	579	588	591	589	587	580	582	584	586	589	589	582	586	566	06.31	552	100	086			
14	*	588	603	605	605	606	615	612	616	615	616	615	615	615	615	615	615	614	607	598	587	587	587	594	20.02	628	03.36	521			
15	*	596	606	608	620	619	615	616	615	616	615	616	615	615	615	615	615	615	615	615	615	615	615	605	03.03	628	12.29	520			
16	*	611	645	636	647	632	624	616	597	574	571	555	565	576	583	577	574	583	583	583	583	583	583	583	583	02.22	674	17.52	475		
17	625	647	660	613	616	614	603	588	559	533	533	541	543	532	558	557	574	575	575	574	582	580	580	582	02.50	664	08.52	533			
18	595	614	620	616	614	605	588	559	533	533	541	543	543	543	543	543	543	543	543	543	543	543	543	543	543	02.10	629	09.50	516		
19	*	599	621	622	633	618	599	599	599	599	599	599	599	599	599	599	599	599	599	599	599	599	599	599	599	04.46	641	15.02	512		
20	*	598	608	620	631	631	611	605	593	574	577	577	577	577	577	577	577	577	577	577	577	577	577	577	577	20.03	1273	14.49	227		
21	*	591	603	611	613	615	603	586	572	571	577	577	577	577	577	577	577	577	577	577	577	577	577	577	577	04.32	632	12.47	563		
22	*	587	603	613	623	628	621	620	615	597	597	597	597	597	597	597	597	597	597	597	597	597	597	597	05.47	637	11.4	560			
23	*	581	596	612	621	631	630	615	597	580	569	569	569	569	569	569	569	569	569	569	569	569	569	569	05.47	637	11.4	560			
24	*	591	599	605	614	616	615	615	596	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	05.47	637	11.4	560			
25	*	591	599	605	614	616	615	615	596	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	05.47	637	11.4	560			
26	*	722	678	818	620	629	623	634	624	603	599	568	578	578	578	578	578	578	578	578	578	578	578	578	06.35	620	6.0	577			
27	*	650	649	613	633	635	620	618	632	638	614	612	604	596	574	558	566	568	569	569	569	569	569	569	06.35	620	10.02	542			
28	*	607	659	632	618	632	618	618	596	574	594	595	595	595	595	595	595	595	595	595	595	595	595	595	06.35	620	11.29	545			
29	601	604	606	604	606	604	604	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	06.35	620	12.20	543			
30	*	917	871	778	799	688	589	574	567	557	549	549	549	549	549	549	549	549	549	549	549	549	549	549	06.35	620	13.24	-101			
31	*	705	714	799	659	640	641	340	253	474	337	587	606	674	678	641	754	756	672	754	756	672	754	756	06.35	620	13.08	839			

Mean	635	636	643	636	628	618	609	595	581	569	555	548	538	545	555	550	567	596	614	627	628	632	637	632	599	DESIGNATIONS	376	
Mean *	595	610	613	621	619	616	607	600	586	572	570	572	569	580	581	583	593	592	591	594	590	592	593	592	590	Ten least disturbed days	101	
Mean †	589	605	613	619	619	615	610	599	586	576	572	569	570	579	575	575	586	589	581	584	584	581	584	581	580	Five international quiet days	1427	
Mean ‡	789	709	729	676	658	621	624	582	553	546	516	483	436	430	469	405	459	583	635	689	683	743	699	720	600	Five international disturbed days	1234	
Mean #	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	(1) Approximate	(1) Approximate	(1) Approximate

TABLE 30
NOVEMBER 1952 49° West, plus tabular quantities expressed in tenth of minutes of arc

Day	Hourly values of declination																								G.M.T. used					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1	#	758	680	666	635	625	623	605	590	567	540	522	561	540	560	574	556	584	636	618	602	579	632	813	614	23.32	962	14.10	445	517
2		652	651	678	677	677	620	586	579	559	555	523	509	524	553	571	587	593	595	607	603	590	603	582	01.45	823	11.05	532	291	
3	*	615	626	624	616	605	595	594	595	569	548	587	579	587	594	585	586	593	594	595	607	603	590	603	582	01.45	826	12.12	495	1.11
4	*	609	645	661	640	625	629	605	587	595	567	523	509	524	553	571	587	593	595	607	603	590	603	582	02.21	668	08.49	578	090	
5	*	621	623	633	634	616	639	630	622	598	586	581	578	579	577	587	585	586	593	594	595	598	596	597	02.36	646	22.31	558	088	
6		623	626	634	634	611	586	559	559	525	502	525	521	568	568	565	567	565	567	565	567	565	567	565	03.31	578	11.51	468	198	
7		594	595	623	628	621	607	580	570	580	540	567	549	560	561	565	565	567	565	567	565	567	565	567	02.30	908	10.51	511	297	
8		633	623	630	583	576	568	565	541	559	560	559	585	589	612	592	593	605	605	605	605	605	605	605	02.15	658	17.47	504	396	
9	*	621	597	615	637	623	634	619	614	605	584	578	579	595	592	593	620	587	588	578	589	602	605	605	01.13	567	15.13	504	154	
10	*	604	614	616	616	613	609	597	595	586	579	576	574	578	573	582	585	587	588	589	591	592	592	595	01.05	623	11.05	567	056	
11	*	593	609	621	624	605	627	620	594	584	582	572	568	569	574	576	577	578	577	578	577	578	577	578	01.10	631	23.23	550	081	
12	*	594	625	634	627	613	605	593	587	580	576	577	578	579	577	580	581	582	583	584	585	586	587	588	02.26	640	12.60	566	074	
13	*	613	611	615	622	623	622	613	606	604	593	589	584	592	584	583	585	587	588	589	590	593	593	596	05.06	627	21.48	573	054	
14	*	604	620	634	621	626	604	591	566	556	556	556	568	568	567	567	570	578	575	576	578	579	580	581	03.30	652	58.53	538	114	
15		612	623	629	628	620	617	593	568	566	547	570	574	585	582	583	592	593	594	595	594	595	596	597	04.59	643	09.47	541	107	
16		597	612	623	633	640	651	624	586	553	557	544	511	465	386	393	558	560	562	561	594	596	601	600	05.09	658	14.25	253	405	
17		615	630	648	647	623	624	610	625	598	587	583	585	591	592	593	594	595	596	597	606	604	604	604	01.25	648	21.24	520	721	
18	*	589	624	644	628	613	615	588	574	544	551	551	568	591	602	598	595	591	594	593	606	586	586	587	02.26	648	08.57	519	139	
19	*	621	629	641	642	613	635	605	613	587	585	586	586	593	594	595	595	595	597	597	598	599	599	599	04.08	660	21.08	541	119	
20	*	605	597	660	678	655	625	606	588	579	451	437	527	516	568	602	653	634	628	612	593	571	616	597	03.06	697	32.36	537	160	
21	*	623	634	671	623	621	617	646	677	660	570	579	540	514	513	510	505	523	588	623	615	596	595	604	597	03.08	750	11.00	222	528
22		624	641	664	619	657	643	624	589	568	525	542	542	542	542	542	542	542	542	542	542	542	542	542	03.12	713	16.24	458	255	
23		605	626	647	648	618	613	615	619	617	613	613	576	583	576	576	576	576	576	576	576	576	576	576	03.52	665	16.29	538	166	
24		625	634	658	634	619	641	634	613	590	575	575	576	576	576	576	576	576	576	576	576	576	576	576	03.52	665	16.29	538	127	
25		624	634	659	634	619	641	634	613	593	576	575	576	576	576	576	576	576	576	576	576	576	576	576	03.52	662	09.54	557	105	
26	*	787	677	653	688	624	665	600	590	571	550	560	560	534	539	539	539	539	539	539	539	539	539	539	02.10	662	09.54	557	105	
27	*	716	647	675	658	643	648	624	605	586	576	576	576	576	576	576	576	576	576	576	576	576	576	576	02.11	643	19.27	367	1076	
28	*	661	670	675	651	649	642	616	595	576	576	576	576	576	576	576	576	576	576	576	576	576	576	576	02.11	643	11.53	-081	1098	
29		621	618	634	648	647	638	613	595	580	570	555	536	477	490	542	564	587	603	608	617	610	623	596	02.38	679	12.12	396	414	
30		621	618	634	648	647	638	613	595	580	570	557	553	565	579	579	579	579	579	579	579	579	579	579	02.33	458	22.21	550	221	
Mean		629	630	644	644	637	631	613	594	575	564	553	542	550	551	566	583	590	600	602	618	627	642	618	631	601	DESIGNATIONS	281		
Mean *		606	624	635	633	628	622	608	592	579	576	574	574	581	584	584	584	589	592	591	589	585	586	587	596	* Ten least disturbed days	98			
Mean #		605	621	629	626	624	618	609	597	589	587	580	578	582	583	588	595	591	598	595	596	596	597	597	596	# Five international quiet days	98			
Mean #		698	647	659	656	643	651	631	596	571	549	507	466	493	485	551	575	584	614	620	622	686	745	718	781	644	# Five international disturbed days	98		
																										(1) Approximate				

TABLE 31

49° West plus tabular quantities expressed in tenth of minutes of

TABLE 32
HOURLY VALUES OF VERTICAL INTENSITY
46500 plus tabular quantities expressed in gammas

MARCH 1952

Mean

Insufficient data

DESIGNATIONS

卷之三

Digitized by srujanika@gmail.com

Five International

quiet days

Five international

BRIEF REPORT

TABLE 33

APRIL 1952 46500 plus tabular quantities expressed in gammas

Day	G.M.T. used																																	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range					
1	507	496	521	507	553	583	605	622	640	633	637	637	616	660	712	679	659	623	596	574	572	560	577	588	598	14 h	754	00 m	474	280				
2	#	585	518	470	550	469	542	579	597	611	632	659	629	616	694	672	665	667	645	456	441	512	579	17	719	22	43	364	355					
3	409	447	454	510	548	540	572	620	633	665	667	652	674	656	673	622	599	617	562	511	59	742	22	10	256	486	401							
4	435	491	510	518	566	590	606	616	660	655	661	652	682	673	660	644	659	599	558	554	402	455	406	437	572	12	23	20	313					
5	475	506	490	493	532	567	587	613	610	622	641	646	628	615	633	641	628	615	557	512	310	455	435	432	559	13	514	689	208					
6	532	562	580	580	562	580	593	614	642	644	646	648	642	646	648	626	624	615	605	574	316	474	488	563	12	59	683	23	252					
7	386	489	535	564	580	590	608	623	641	647	642	646	619	610	642	619	610	616	563	558	541	468	492	477	571	17	19	672	00	313				
8	407	467	537	566	573	560	574	587	607	617	612	622	622	616	645	610	627	613	615	579	495	486	430	470	437	555	14	24	680	341				
9	442	448	488	522	561	585	593	605	622	645	650	608	622	606	627	613	627	613	561	581	578	517	469	444	562	16	55	663	24	289				
10	552	573	587	595	601	606	610	616	616	614	608	611	637	614	608	611	601	600	599	599	596	595	596	592	584	14 h	582	588	588	588				
11	*	552	573	587	595	601	606	610	616	616	613	607	604	601	600	599	599	598	596	595	596	595	592	584	14 h	582	588	588	588					
12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
13	592	585	562	555	547	578	592	595	599	600	602	598	595	596	597	596	598	595	596	598	594	585	586	589	587	589	08	537	07	537	080			
14	*	585	592	598	601	590	594	598	601	604	604	604	606	600	600	604	602	604	600	594	586	575	575	588	588	588	16	36	705	21	42			
15	589	589	592	594	595	595	598	601	604	606	606	606	625	620	620	614	620	616	606	601	601	601	601	601	601	13	21	763	21	573				
16	591	594	594	594	594	594	598	600	604	607	607	608	608	610	610	602	628	610	610	610	610	610	610	610	610	14	14	654	07	572				
17	*	592	577	578	564	563	574	563	563	574	560	598	600	604	602	601	600	600	599	598	598	598	596	595	593	06	41	617	04	557				
18	456	483	517	519	575	575	598	601	605	603	602	601	600	598	595	593	591	596	595	596	625	626	623	550	566	14	19	645	23	41				
19	*	518	545	561	572	579	587	595	599	601	598	597	597	597	597	597	597	597	597	597	597	597	597	597	597	14 h	558	558	558	558				
20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
22	*	606	607	592	578	566	584	610	622	626	625	626	626	612	607	608	606	606	614	610	588	568	529	522	563	596	07	53	645	22	12			
23	*	581	583	588	588	591	593	596	599	601	600	598	605	603	603	603	603	603	603	603	603	603	603	603	603	14 h	573	573	573	573				
24	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
26	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
29	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
30	*	474	367	466	518	556	592	607	617	632	643	661	646	654	632	625	620	635	594	595	487	514	477	286	411	555	16	15	730	22	45			
Mean	506	521	541	554	567	582	596	607	615	619	622	618	620	624	635	634	632	615	601	574	532	521	497	501	581	DESIGNATIONS	269							
Mean *																																		
Mean \neq c	564	576	585	591	594	597	599	600	598	597	595	594	594	593	594	595	598	602	606	604	587	563	556	560	589	14 h	554	554	554	554	104			
Mean \neq c	460	455	486	512	534	564	588	613	628	640	651	638	647	634	693	658	636	604	618	602	606	602	601	602	602	23	33	570	032	415				
c Means of 4 values																																		

() Approximate

days

quiet days

disturbed days

international

TABLE 34
HOURLY VALUES OF VERTICAL INTENSITY
16500 plus tabular quantities expressed in grammes

MAY 1952

G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range								
1	#	#	444 (493) 456	495	532	583	601	633	652	646	656	661	666	645	631	614	638	589	588	528	479	459	486	508	572	h	m	288									
2	#	#	508 445 455	505	559	597	615	626	648	649	671	637	690	655	679	658	638	620	539	483	505	479	574	12	33	753	02	35									
3	#	#	474 493 459	552	520	561	523	540	579	599	613	621	616	629	632	623	626	648	636	619	596	546	492	449	541	15	46	663	21	37							
4	#	#	(383) 402 461	523	540	579	599	601	605	622	642	629	657	626	613	612	627	624	614	507	421	273	233	539	15	53	695	23	09								
5	335	361	440	516	558	576	589	601	605	622	642	629	657	626	613	612	627	624	614	507	424	455	557	12	51	695	00	27									
6	#	#	458 471 504	549	565	583	603	627	651	642	642	642	657	626	613	612	627	624	617	596	546	492	449	541	15	46	695	00	27								
7	489	546	565	577	567	619	636	632	623	621	679	695	684	598	624	622	635	619	632	613	607	576	525	579	592	16	17	658	03	01							
8	#	#	558 565 526	520	561	588	606	619	636	632	623	621	679	695	684	604	604	604	604	604	605	607	609	604	604	604	604	604	604	604	604	604					
9	*#	#	585 590 597	601	601	601	601	601	608	608	607	606	605	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604						
10	*#	#	568 561 586	595	600	600	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604						
11	#	#	604 624	605	607	609	611	612	610	607	604	607	604	607	604	607	604	607	604	607	604	607	604	607	604	607	604	607	604	607	604	607					
12	#	#	608 591 605	604	604	605	607	610	610	608	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607					
13	#	#	604 604	598	521	539	567	589	597	601	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604					
14	#	#	558 597	598	597	598	601	604	605	607	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606	606					
15	#	#	596 595	595	595	595	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598					
16	#	#	596 595	595	595	595	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598	598					
17	#	#	529 523	518	551	579	582	586	592	598	601	611	625	619	608	611	619	607	604	601	601	592	591	590	607	601	601	602	601	601	601	601					
18	#	#	561 570	585	590	572	573	585	594	603	613	625	620	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610					
19	#	#	578 579	588	586	593	595	598	604	604	604	607	609	617	630	627	629	616	614	609	606	606	603	600	600	603	600	600	603	600	600	603	600				
20	#	#	582 591	595	600	599	595	595	594	598	601	606	612	612	616	616	616	616	616	616	616	616	616	616	616	616	616	616	616	616	616	616					
21	#	#	600 601	602	604	605	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604					
22	#	#	581 579	587	590	593	595	596	597	598	594	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592					
23	#	#	502 472	488	533	561	579	587	588	598	604	598	599	598	601	600	601	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604				
24	#	#	596 597	599	515	531	572	598	610	626	603	606	606	611	619	651	629	628	628	628	628	628	628	628	628	628	628	628	628	628	628	628	628				
25	#	#	(392 366 349)	576	576	587	587	592	602	606	612	615	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626					
26	#	#	422 429	554	576	587	587	592	602	606	612	615	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626					
27	#	#	439 460	517	543	567	583	592	602	606	612	615	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626	626					
28	#	#	569 567	528	557	564	584	602	615	623	631	640	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622	622					
29	#	#	568 479	468	539	565	585	589	613	618	618	617	616	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619					
30	#	#	539 565	565	539	565	585	589	613	618	617	616	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619	619					
31	#	#	568 527	536	565	580	592	600	607	613	617	618	622	620	621	624	625	620	605	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604		
Mean			568 527	536	565	580	592	600	607	613	617	618	622	620	621	624	625	620	605	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604		
Mean * b			590 583	589	596	601	602	604	605	604	603	601	600	601	600	601	600	601	600	601	600	601	600	601	600	601	600	601	600	601	600	601	600				
Mean f c			568 587	596	600	602	602	605	605	604	604	602	602	602	603	604	604	604	605	606	607	606	607	606	607	606	607	606	607	606	607	606	607	606	607		
Mean # c			154 434	435	517	554	588	604	623	638	638	645	648	661	651	664	650	635	608	564	569	586	588	596	596	596	596	596	596	596	596	596	596	596	596	596	596
b Means of 8 values	c Means of 4 values																																				

(1) Approximate

(2) Designations

240

DESIGNATIONS

* Ten least disturbed

50 days

Five international quiet days

/ Five international

Disturbed days

212

Approximate

TABLE 26
HOURLY VALUES OF VERTICAL INTENSITY
16900 plus tabular quantities expressed in grammes

G.M.T. used

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	Maximum	Minimum	Range				
1	214	215	214	215	211	213	216	218	217	218	216	215	215	215	215	214	214	214	214	213	214	209	163	108	171	206	10 35	220	22				
2 *	182	195	202	204	201	204	204	205	209	208	210	212	212	212	212	212	213	213	212	211	210	216	217	205	14 54	207	14	54					
3 *	212	212	211	209	210	212	213	215	215	215	215	211	209	212	237	280	295	261	247	236	220	215	215	215	215	225	17 17	332	15	14			
4 *	218	216	215	218	216	215	215	215	208	207	205	210	219	224	237	216	239	227	222	224	220	215	215	215	215	218	15 59	252	07	10			
5 *	199	202	207	211	209	209	203	193	199	208	221	208	206	236	207	348	313	303	292	226	148	126	125	114	156	211	13 48	198	19	11			
6 *	183	199	210	211	214	221	220	231	231	224	224	227	227	228	228	227	228	225	223	221	219	216	211	214	214	218	08 07	261	00 13	173			
7 *	245	215	218	214	221	221	221	221	219	218	215	217	216	215	215	216	218	213	213	218	216	214	214	214	214	219	17 33	259	12 33	209			
8 *	214	214	215	217	216	215	215	215	211	211	209	206	206	218	218	219	218	218	219	219	219	219	219	219	219	219	219	219	219	219	219	050	
9 *	182	185	192	194	196	192	196	196	202	199	193	196	204	203	203	205	208	213	214	214	218	217	217	215	215	215	215	215	215	215	215	215	085
10 *	192	197	204	206	203	204	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	
11 *	140	139	160	185	184	191	198	202	210	210	211	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	
12 *	208	199	186	184	189	193	195	205	205	205	208	206	206	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	
13 *	204	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	
14 *	206	199	186	182	185	193	195	197	199	200	202	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	
15 *	158	174	189	195	193	197	198	197	199	203	206	211	214	215	215	215	215	215	215	215	215	214	214	214	214	214	214	214	214	214	214	214	
16 *	158	185	191	201	205	204	202	204	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	
17 *	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	
18 *	208	208	210	210	210	209	209	208	208	208	210	213	214	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	
19 *	195	202	207	208	208	209	211	208	208	208	209	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	213	
20 *	186	187	182	196	195	199	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	203	
21 *	016	097	117	158	156	191	208	238	234	225	224	225	227	241	292	250	309	279	277	276	274	182	115	066	036	017	194	15 19	370	23 59	007		
22 *	094	114	159	168	183	193	202	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	
23 *	184	197	202	207	204	208	208	211	213	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	
24 *	177	174	183	198	196	202	204	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	
25 *	183	198	205	208	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	
26 *	116	145	458	150	171	189	204	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	
27 *	205	203	205	210	212	212	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	
28 *	165	179	168	195	197	198	199	200	206	208	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	
29 *	212	212	213	214	214	214	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	
30 *	210	209	209	209	213	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	
31 *	210	208	207	205	204	202	201	203	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	
Mean	183	190	195	204	200	204	206	209	210	212	214	216	218	223	225	235	234	225	223	225	225	225	225	225	225	225	225	225	225	225	225	225	
Mean *	196	202	204	206	206	206	206	209	210	211	212	213	214	214	215	214	215	216	217	218	219	222	219	215	214	213	212	211	210	209	207		
Mean *	193	200	204	206	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	
Mean *	125	174	184	194	194	203	205	213	215	216	218	227	234	258	256	288	263	242	212	214	216	218	219	216	148	131	134	206	206	206	206	206	

DESTINATIONS

119

* Ten least disturbed

days

47

Five international

quiet days

97

Five international

disturbed days

116

() Approximate

TABLE 37
HOURLY VALUES OF VERTICAL INTENSITY
166800 plus tabular quantities expressed in
AUGUST 1952

TABLE 38
HOURLY VALUES OF VERTICAL INTENSITY
46600 Plus tabular quantities expressed in
SEPTEMBER 1952

TABLE 39
OCTOBER 1952
16700 plus tabular quantities expressed in gammae
HOURLY VALUES OF VERTICAL INTENSITY

Day	G.M.T. used												Minimum	Range																			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean							
1	384	416	421	424	427	429	432	434	436	433	431	433	435	434	444	446	440	447	449	440	440	424	424	415	424	424							
2	413	425	425	427	427	427	430	434	437	430	431	432	436	436	453	444	444	447	391	357	357	390	414	425	44	477	378						
3	425	418	403	405	412	419	427	432	434	425	425	426	426	426	476	477	477	476	377	377	314	314	314	314	405	414	413	405					
4	#	(295)	277	324	388	381	409	411	419	413	413	413	413	413	450	451	451	451	377	377	301	301	301	301	405	415	415	405					
5	426	431	451	428	428	429	429	429	429	432	432	432	432	432	457	476	477	477	470	470	355	355	355	355	420	430	430	420					
6	426	370	371	384	399	413	425	432	432	432	432	432	432	432	460	460	460	460	460	460	460	460	460	460	460	460	460	460	460				
7	416	416	417	400	400	409	419	422	428	428	431	435	435	435	457	476	476	476	476	476	476	476	476	476	476	476	476	476	476				
8	415	375	375	393	393	404	414	426	429	432	432	432	432	432	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476				
9	385	405	416	421	421	424	428	432	433	428	428	428	428	428	429	429	429	429	429	429	429	429	429	429	429	429	429	429	429				
10	394	407	413	417	420	418	421	420	422	429	431	432	432	432	436	442	449	453	441	463	463	463	463	463	463	463	463	463	463				
11	384	396	406	414	414	418	418	418	418	421	421	421	421	421	435	441	441	441	441	441	441	441	441	441	441	441	441	441	441	441			
12	360	386	406	414	414	418	418	419	422	425	425	425	425	425	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432			
13	* #	422	422	423	423	424	424	424	424	424	424	424	424	424	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428			
14	* #	426	426	426	428	428	428	428	428	428	428	428	428	428	428	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432		
15	* #	426	426	426	428	428	428	428	428	428	428	428	428	428	428	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432		
16	*	426	426	426	429	429	429	429	429	429	429	429	429	429	429	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432		
17	*	406	410	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412		
18	407	416	423	426	426	427	427	427	427	427	427	427	427	427	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432		
19	* #	418	428	430	429	431	431	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432		
20	* #	415	416	416	416	417	421	421	423	423	423	423	423	423	423	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	
21	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	
22	* #	425	425	425	425	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	
23	* #	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	
24	* #	426	426	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	427	
25	*	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	
26	*	315	273	283	309	308	409	416	421	425	425	425	425	425	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	
27	*	#	318	350	362	387	402	412	419	423	429	430	430	430	430	435	435	435	435	435	435	435	435	435	435	435	435	435	435	435	435	435	
28	L08	411	397	409	412	415	416	422	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	
29	L28	425	416	416	420	425	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	426	
30	#	321	315	314	314	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	
31	#	327	388	387	384	402	419	436	461	461	461	461	461	461	461	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476
Mean		386	395	399	405	412	419	426	430	434	434	435	436	436	436	436	436	436	436	436	436	436	436	436	436	436	436	436	436	436	436	436	436
Mean *		407	413	417	420	423	427	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428	428
Mean #		297	316	338	361	387	406	423	439	445	450	451	457	467	452	479	464	450	472	456	383	339	346	298	321	403	298	321	403	298	321	403	298

() Approximate

183 DESTINATIONS

1426 * Ten least disturbed

57 days

425 Five international

429 Quiet days

422 Four international

422 disturbed days

403 # Five international

422 days

TABLE 40
HOURLY VALUES OF VERTICAL INTENSITY
46600 plus tabular quantities expressed in
NOVEMBER 1952

TABLE 41
COUNTRY TRENDS OF INTELLIGENT INVESTMENT

HOURLY VALUES OF VERTICAL INTENSITY

16800 blue tabular quantities expressed in gamma

DECEMBER 1952

TABLE 42
Summary of monthly mean values

MONTH	H	D	Z	H	D	Z
	Y	°	Y	Y	°	Y
All days						
March	18450	49 54.4	47077	18468	49 59.5	47076
April	18432	49 57.4	47081	18472	49 54.9	47089
May	18445	49 57.1	47088	18474	49 54.8	47100
June	18463	49 56.0	47102	18472	49 55.6	47102
July	18467	49 57.2	47109	18469	49 57.4	47111
August	18470	49 58.3	47114	18477	49 58.2	47120
Sept.	18460	49 59.8	47117	18473	49 59.0	47121
Oct.	18466	49 59.9	47120	18475	49 59.2	47126
Nov.	18477	49 60.1	47136	18484	49 59.6	47135
Dec.	18478	49 60.7	47142	18484	49 60.7	47149
Year	18461	49 58.1	47099	18475	49 57.9	47113
Ten least disturbed days						
March	18472	49 52.9	47085	Insufficient records		
April	18472	49 55.0	47090	18475	49 61.7	47071
May	18473	49 54.7	47101	18494	49 61.2	47073
June	18474	49 55.4	47104	18441	49 57.1	47098
July	18471	49 57.8	47110	18477	49 55.0	47106
August	18477	49 58.2	47121	18462	49 58.1	47112
Sept.	18477	49 58.8	47123	18428	49 62.5	47110
Oct.	18477	49 59.0	47129	18453	49 60.0	47103
Nov.	18482	49 59.6	47136	18470	49 61.4	47141
Dec.	18488	49 60.7	47148	18469	49 60.5	47123
Year	18476	49 57.2	47115	18457	49 53.8	47194

TABLE 43
Summary of annual mean values
Based on the months March-December 1952

YEAR	H	D	Z	H	D	Z
	Y	°	Y	Y	°	Y
All days						
1952	18461	49 58.1	47099	18475	49 57.9	47113
Five international quiet days						
1952	18476	49 57.2	47115	18457	49 53.8	47194

TABLE 44
 Principal Magnetic Storms
 March-December 1952

Month	Began at	Ended at	Intensity	Maximum K-Index
March	d h m	d hh		
	03 07 29	12 24	Severe	9
	15 14 00	17 19	Severe	8
	21 04 00	26 04	Severe	9
	30 13 00	10 06	Severe	9
April	18 16 00	20 01	Moderately severe	7
	21 12 00	23 14	Severe	8
	28 00 00	08 22	Severe	9
May	17 23 59	19 20	Moderately severe	7
	26 08 00	31 24	Severe	8
June	08 05 00	11 10	Moderately severe	6
	14 04 00	15 09	Moderately severe	6
	22 07 00	25 00	Moderately severe	7
	29 19 01	30 12	Severe	8
July	05 02 00	06 13	Severe	8
	20 07 00	22 12	Moderately severe	6
August	17 01 24	19 06	Moderately severe	6
	29 14 00	30 09	Moderately severe	7
	31 18 47	04 06	Moderately severe	7
September	07 17 00	10 15	Moderately severe	7
	13 22 00	15 03	Moderate	5
	25 18 00	26 09	Moderately severe	7
	27 03 00	27 18	Moderate	5
	28 - -	01 06	Severe	8
October	03 14 00	06 19	Severe	8
	21 10 10	22 09	Moderately severe	7
	25 17 00	27 06	Moderately severe	7
	29 11 00	02 03	Moderately severe	7
November	20 22 00	22 21	Moderately severe	6
	26 09 00	29 21	Moderately severe	7
December	01 12 00	05 14	Moderately severe	7
	13 00 00	13 15	Moderately severe	6
	24 01 15	26 03	Moderately severe	7
	27 16 00	03 03	Severe	8

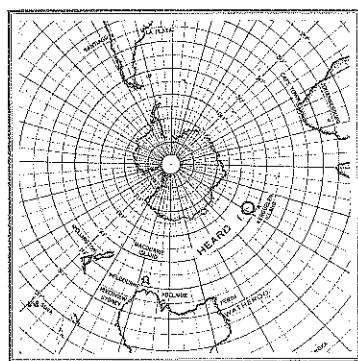
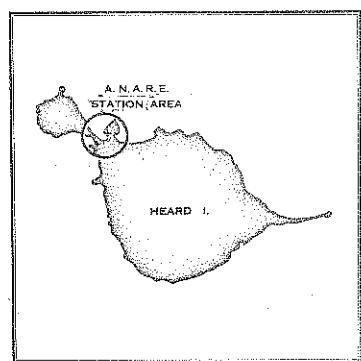
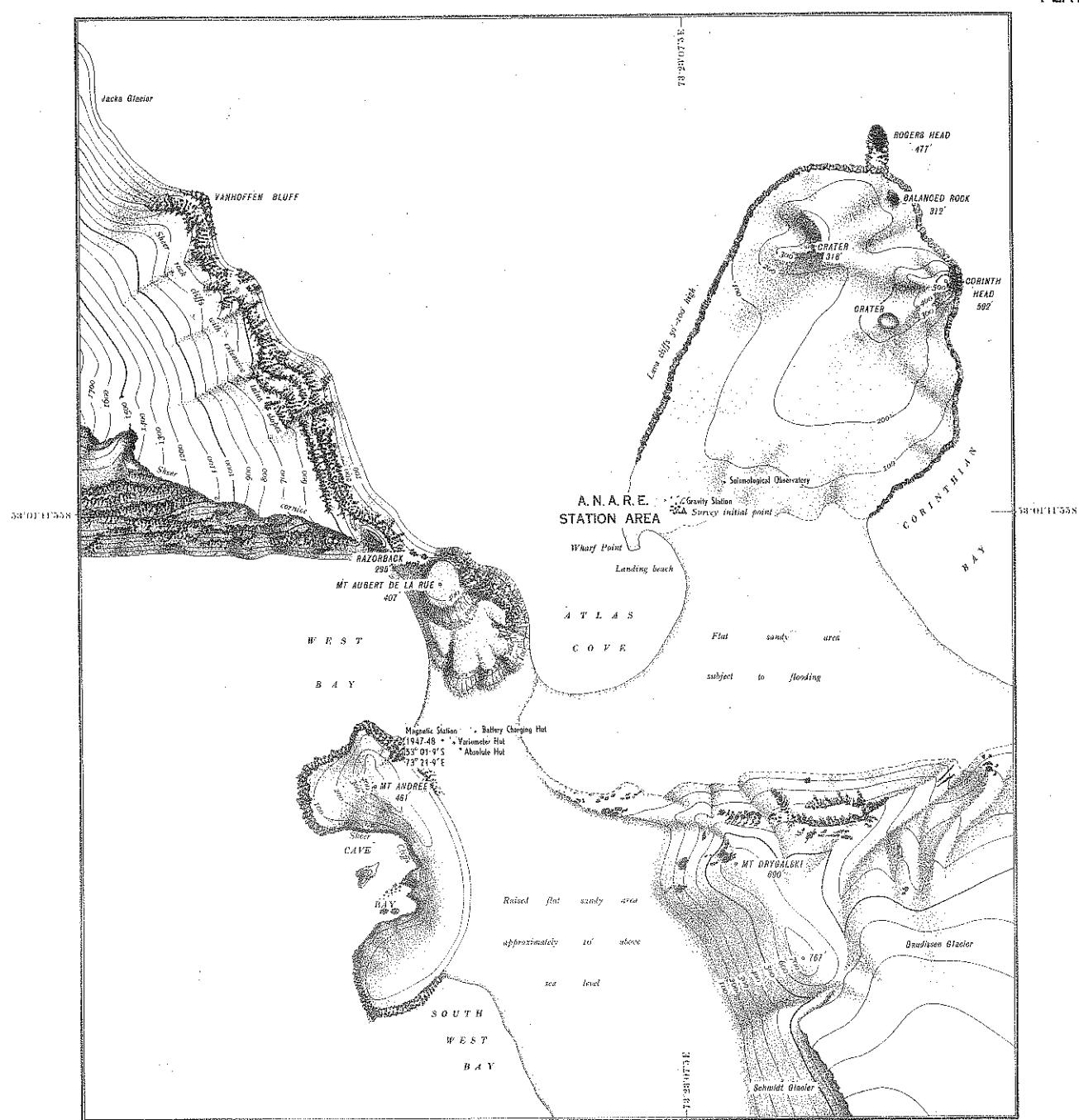
TABLE 45
 Sudden Commencements
 March-December 1952

Date	Time	Type	Date	Time	Type
h m		N i l	h m		
March			7 Sept.	07 12	Sudden Impulse
24 April	16 25	Polar Sudden Commencement	2 Oct.	18 57	Polar Sudden Commencement
17 May	23 59	Storm Sudden Commencement (Small initial impulse)	10 "	16 37	Polar Sudden Commencement
2 June	18 51	Polar Sudden Commencement	10 "	19 17	Polar Sudden Commencement
11 "	21 21	Polar Sudden Commencement	11 "	17 17	Polar Sudden Commencement
29 "	19 01	Polar Sudden Commencement	21 "	10 10	Storm Sudden Commencement (Small initial impulse)
1 July	20 34	Storm Sudden Commencement	6 Nov.	17 49	Polar Sudden Commencement
27 "	22 10	Polar Sudden Commencement	5 Dec.	19 30	Polar Sudden Commencement
2 Aug.	22 40	Polar Sudden Commencement	14 "	21 39	Storm Sudden Commencement (Small initial impulse)
15 "	20 04	Storm Sudden Commencement	24 "	01 15	Storm Sudden Commencement (Small initial impulse)
17 "	01 24	Storm Sudden Commencement			
31 "	18 47	Polar Sudden Commencement			
4 Sept.	18 33	Polar Sudden Commencement			

TABLE 46

HEARD ISLAND MAGNETIC OBSERVATORY
SUMMARY OF VARIOMETER ROOM TEMPERATURE MARCH 1952 - DECEMBER 1952
As indicated by H Variometer Thermometer

Month	Temperatures °C			Range
	Maximum	Minimum	Mean	
March	6.0	2.4	4.0	3.6
April	6.9	1.4	2.9	5.5
May	4.4	-1.9	1.4	6.3
June	1.5	-2.4	-0.3	3.9
July	3.2	-1.4	0.3	4.6
August	4.0	-3.1	0.0	7.1
September	1.0	-2.1	0.1	3.1
October	2.6	-1.3	0.7	3.9
November	3.5	0.1	1.7	3.4
December	5.0	0.8	2.9	4.2
Year	6.9	-3.1	1.4	10.0

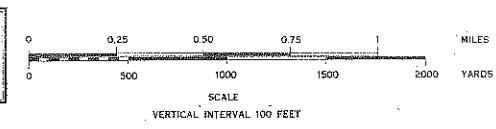


SKETCH MAP
SHOWING LOCATION OF
MAGNETIC AND
SEISMOLOGICAL OBSERVATORIES.
AT
HEARD ISLAND

LOCALITY

DIAGRAMS

Reference: Survey Initial Point (Camp Area) 53°01'11.5S 73°23'07.5E
Control: Based on Triangulation Control Survey by R. Davies 1948.
Detail: Sketched in from uncontrolled ground photography based on known stations by K. Summons and I. Mather, 1950.
Reliability: Reliable sketch.



Cliffs
Contours
Spot heights

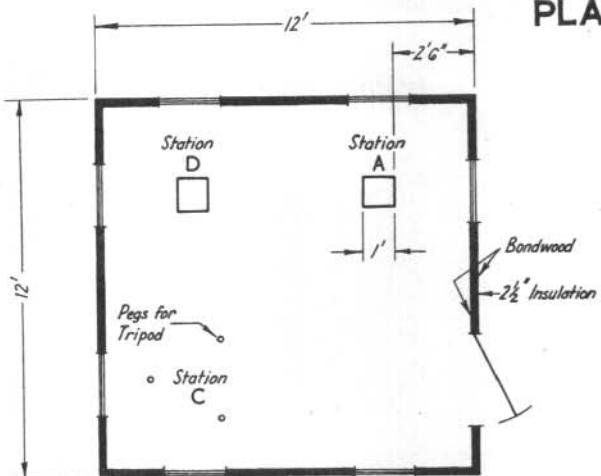


Fig 1. Absolute hut, looking west.



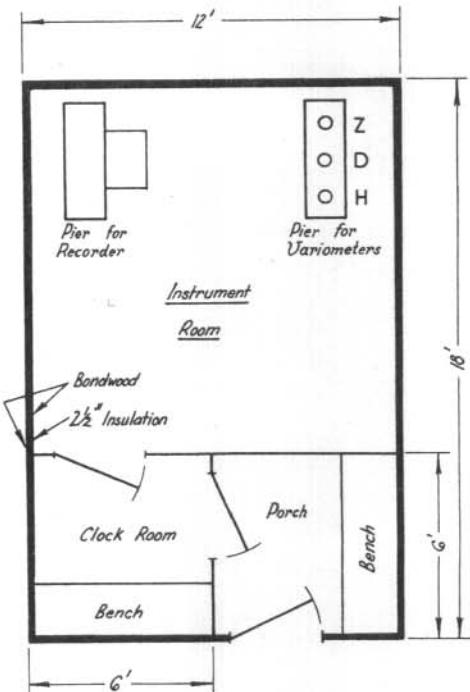
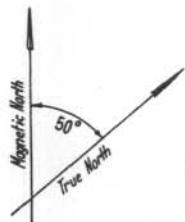
Fig 2. Variometer hut, looking north-west

PLATE 3



FLOOR PLAN
ABSOLUTE HUT

Fig. 1



FLOOR PLAN
VARIOMETER HUT
HEARD ISLAND

Fig. 2

G 21-18

Geophysical Section, Bureau of Mineral Resources, Geology & Geophysics.

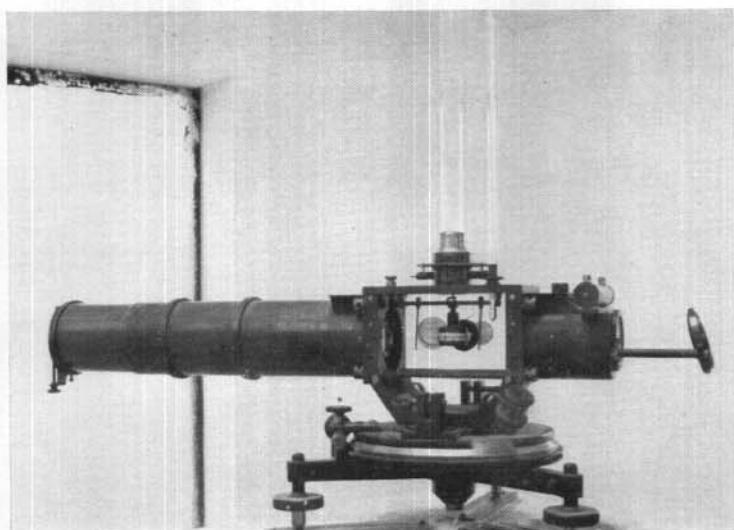


Fig 1 Modified Kew-pattern Magnetometer.

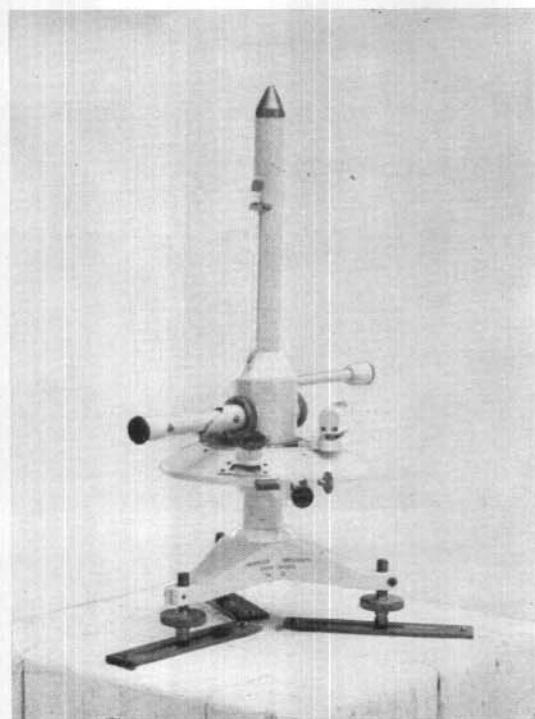


Fig. 2 Quartz Horizontal Magnetometer

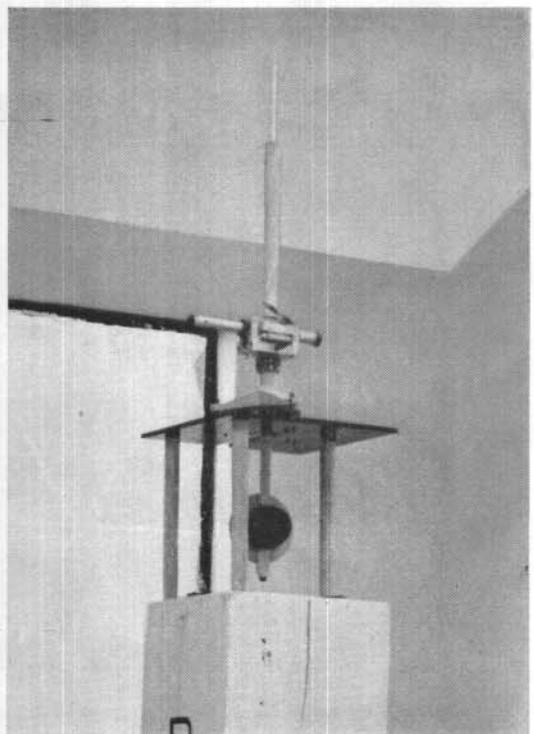


Fig 1 Magnetometric Zero Balance

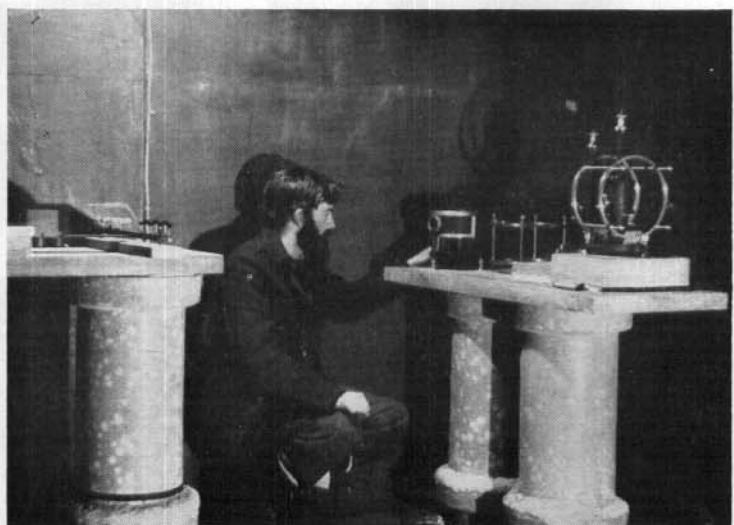


Fig 2 La Cour Magnetograph

3 APR. 1952

4 APR. 1952

PLATE 7

H TEMP

H BASE

D BASE

Z TEMP

Z BASE

12

16

20

24

1

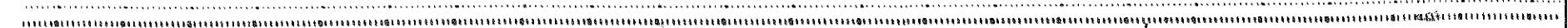
8

MAGNETIC OBSERVATORY
HEARD ISLAND
TYPICAL DISTURBED DAY MAGNETOGram

22 MAY 1952

23 MAY 1952

PLATE 6



12

16

20

24

4

8



MAGNETIC OBSERVATORY
HEARD ISLAND
TYPICAL QUIET DAY MAGNETOGRAm