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COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF NATIONAL DEVELOPMENT
BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS

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OBSERVATORY REPORT

FOR
OCTOBER
1952

*Under the authority of Senator The Hon. W. H. Spooner
Minister for National Development*

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Unless otherwise stated all times are given in
Greenwich Mean Time.

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CONTRIBUTING OBSERVATORIESWATHEROO MAGNETIC OBSERVATORY

Geographic Latitude $30^{\circ}19'S$ Longitude $115^{\circ}53'E$
 Geomagnetic Latitude -41.8° Longitude 185.6°

INSTRUMENTS

Magnetic Equipment - D.T.M. C.I.W. Magnetometer No.7.
 D.T.M. C.I.W. Earth Inductor No.2.
 Eschenhagen pattern D,H,Z, recording variometers, normal sensitivity, 20mm/hour recorder.
 La Cour pattern D,H,Z, recording variometers, normal sensitivity quick run (180mm/hour) recorder.

Ionospheric Equipment - C.S.I.R.O. pattern 1-20¹⁶Mc/s
 Sweeptime 2 minutes.

TOOLANGI MAGNETIC OBSERVATORY

Geographic Latitude $37^{\circ}32'S$ Longitude $145^{\circ}28'E$
 Geomagnetic Latitude -46.7° Longitude 220.8°

INSTRUMENTS

Askania pattern Magnetometer No.508813.
 Schulze Earth Inductor No.49.
 La Cour pattern D,H,Z, recording variometers, normal sensitivity 15mm/hour recorder.

MACQUARIE ISLAND MAGNETIC OBSERVATORY

Geographic Latitude $54^{\circ}30'S$ Longitude $158^{\circ}57'E$
 Geomagnetic Latitude -61° Longitude 243°

INSTRUMENTS

La Cour pattern QHM_s Nos.177,178,179.
 La Cour pattern BMZ No.64.
 La Cour pattern D,H,Z, recording variometers low sensitivity 15 mm/hour recorder.

HEARD ISLAND MAGNETIC OBSERVATORY

Geographic Latitude $52^{\circ}02'S$ Longitude $73^{\circ}22'E$
 Geomagnetic Latitude -61° Longitude 129°

INSTRUMENTS

La Cour pattern QHM_s Nos. 172,173,174.
 La Cour pattern BMZ No.62.
 La Cour pattern D,H,Z, recording variometers low sensitivity 15mm/hour recorder.

MAGNETIC K-INDICES - MATHEROO

Range for lower limit of K=9 is 350 gammas

<u>Day</u>	<u>K Indices</u>								<u>K- Sum</u>
1	2	3	3	2	1	2	1	1	15
2	3	2	2	2	3	2	3	2	19
3	2	1	1	1	2	4	5	4	20
4	4	5	4	4	5	4	5	5	36
5	4	5	5	4	5	5	5	3	36
6	3	4	3	3	4	4	2	1	24
7	2	1	3	2	3	2	0	3	16
8	3	2	3	1	4	3	3	5	24
9	4	3	1	2	2	1	2	2	17
10	2	2	1	2	0	2	4	3	16
11	2	2	2	3	3	4	4	4	24
12	4	3	3	2	3	2	2	2	21
13	2	1	1	1	0	3	1	1	10
14	1	3	3	2	0	2	0	0	11
15	1	1	0	1	0	2	2	1	08
16	2	3	3	2	3	1	0	2	16
17	3	2	2	2	2	4	3	1	19
18	3	2	3	1	1	2	3	2	17
19	x	x	x	x	(1)	1	0	2	xx
20	1	2	2	1	2	2	0	1	11
21	2	1	1	5	5	4	5	3	26
22	2	3	2	2	0	0	0	1	10
23	2	3	1	1	1	2	0	1	11
24	1	2	0	0	0	0	0	0	03
25	1	2	1	4	2	3	3	3	19
26	5	3	2	5	5	4	4	2	30
27	3	2	3	2	0	1	1	1	13
28	2	3	2	0	1	3	1	1	13
29	2	2	3	2	4	4	3	2	22
30	4	4	3	1	4	4	4	5	29
31	5	4	4	4	5	5	3	2	32

PRELIMINARY MONTHLY MEAN VALUES OF THE MAGNETIC ELEMENTS AT

MATHEROO - Declination 2° 48.2' west.
 Horizontal Intensity 24891 gammas.
 Vertical Intensity -52153 gammas.

MAGNETIC K-INDICES - TOOLANGI

Range for lower limit of K=9 is 500 gammas

<u>Day</u>	<u>K Indices</u>								<u>K- Sum</u>
1	3	4	3	3	2	2	3	2	22
2	3	3	2	2	3	2	3	1	19
3	2	2	3	2	3	4	3	3	22
4	4	5	5	5	5	5	4	5	38
5	4	4	6	5	5	5	5	3	37
6	4	4	4	4	4	4	2	2	28
7	3	2	3	3	3	3	2	3	22
8	3	3	3	3	5	3	3	4	27
9	3	4	2	3	3	2	3	2	22
10	2	2	1	3	2	2	4	3	19
11	3	3	3	3	3	4	4	4	27
12	5	4	4	2	4	2	2	3	26
13	3	3	2	1	2	3	2	2	18
14	3	3	1	1	1	3	2	2	18
15	2	2	2	1	1	2	3	2	15
16	3	2	2	2	3	2	2	2	18
17	3	2	3	3	2	4	3	3	22
18	2	2	3	3	3	2	3	2	20
19	2	2	3	3	2	2	2	2	18
20	2	2	2	3	3	2	2	2	18
21	2	1	2	5	5	4	5	3	27
22	2	4	2	2	2	1	2	1	16
23	3	2	1	1	3	2	2	2	16
24	3	3	1	1	1	1	3	1	15
25	3	2	2	4	3	3	3	3	23
26	4	4	3	5	5	4	2	3	30
27	4	3	3	3	2	1	2	2	20
28	2	3	2	2	2	3	2	2	18
29	2	2	2	2	4	4	3	3	22
30	3	4	3	2	3	5	4	4	28
31	5	4	4	5	5	5	3	3	34

PRELIMINARY MONTHLY MEAN VALUES OF THE MAGNETIC ELEMENTS AT

TOOLANGI - Declination 9° 46.0' east.
Horizontal Intensity 22784 gammas.
Vertical Intensity -56427 gammas.

MAGNETIC K-INDICES - MACQUARIE ISLAND

Range for lower limit of K=9 is 1500 gammas

<u>Day</u>	<u>K Indices</u>								<u>K- Sum</u>
1	3	3	3	5	3	2	1	1	21
2	2	3	3	4	5	3	3	2	25
3	1	4	4	1	6	6	5	4	31
4	4	5	7	7	7	7	5	4	46
5	3	5	8	7	7	7	7	2	46
6	4	5	5	6	6	6	2	1	35
7	1	2	3	5	6	5	2	1	25
8	x	x	x	x	x	x	x	x	xx
9	x	x	1	6	6	1	1	2	xx
10	2	2	2	3	2	2	4	3	20
11	2	3	5	5	5	4	5	3	32
12	4	5	5	4	6	2	2	1	29
13	2	2	1	1	2	2	1	2	13
14	2	3	4	1	2	3	1	1	17
15	1	1	0	1	1	1	2	1	08
16	1	2	0	2	3	1	0	1	10
17	2	3	3	5	4	5	4	1	27
18	3	3	5	4	4	3	2	2	26
19	1	1	4	5	3	3	1	1	19
20	1	2	2	5	4	4	1	1	20
21	1	1	1	6	6	6	4	2	27
22	1	3	1	0	4	0	1	1	11
x 23	1	1	0	1	5	1	1	0	10
x 24	1	1	0	1	2	0	1	1	07
25	1	1	1	5	5	5	4	2	24
26	6	5	4	5	7	7	4	2	40
27	3	3	4	4	3	1	1	1	20
28	3	3	3	4	3	2	1	1	20
29	1	1	2	3	6	6	3	3	25
30	4	6	3	4	6	7	4	4	38
31	6	5	5	6	7	7	3	3	42

x K8 on 23rd and K1 on 24th doubtful.

PRELIMINARY MONTHLY MEAN VALUES OF THE MAGNETIC ELEMENTS AT

MACQUARIE ISLAND - Declination 24°04.7' east.
Horizontal Intensity 13344 gammas.
Vertical Intensity -64537 gammas.

MAGNETIC K-INDICES - HEARD ISLAND

Range for lower limit of K=9 is 1000 gammas

<u>Day</u>	<u>K Indices</u>								<u>K- Sum</u>
1	4	3	2	1	2	3	3	3	21
2	2	1	1	2	3	2	5	3	19
3	3	2	2	2	4	7	7	7	34
4	8	5	5	4	4	5	7	7	45
5	6	4	6	6	6	6	7	4	45
6	4	4	3	3	3	4	3	2	26
7	0	2	2	2	3	2	3	3	17
8	3	3	2	2	4	3	5	3	25
9	5	2	1	2	2	1	3	4	20
10	3	1	2	1	1	3	6	5	22
11	3	2	2	3	2	5	6	6	29
12	6	3	3	2	2	2	3	3	24
13	3	1	1	1	1	3	2	3	15
14	1	3	3	1	1	2	1	1	13
15	2	1	1	0	0	2	3	1	10
16	1	1	1	2	2	1	0	3	11
17	4	3	2	2	2	5	4	2	24
18	1	2	2	3	2	3	5	3	21
19	1	1	2	1	2	1	0	1	09
20	2	1	1	1	2	3	3	2	16
21	0	1	1	4	7	6	7	4	30
22	1	2	1	1	1	0	0	0	06
23	0	0	1	1	1	1	1	1	06
24	0	1	1	1	0	0	0	0	03
25	0	1	1	3	2	5	5	5	22
26	7	5	2	4	6	7	5	5	41
27	4	3	2	2	1	2	2	2	18
28	3	2	2	2	2	3	3	1	18
29	2	1	1	2	4	4	5	5	24
30	6	5	2	1	3	7	7	7	38
31	5	4	3	4	7	6	4	5	38

PRELIMINARY MONTHLY MEAN VALUES OF THE MAGNETIC ELEMENTS AT

HEARD ISLAND - Declination 50° 00.1' west.
Horizontal Intensity 18468 gammas.
Vertical Intensity -47119 gammas.

PRINCIPAL MAGNETIC STORMS - WATHEROO

	<u>Began at</u>		<u>Ended at</u>	<u>Intensity</u>	<u>Maximum</u>
	d h m		d h		<u>K-Index</u>
October	03 20 50	October	06 18	Moderate	5
	21 10 11		22 09	Moderate	5
	25 17 00		26 23	Moderate	5
	30 14 10		31 23	Moderate	5

SUDDEN COMMENCEMENTS - WATHEROO

<u>Day</u>	<u>Time</u>	<u>Type</u>
	h m	
08	23 06	Sudden Impulse.
21	10 11	Storm Sudden Commencement.

PRINCIPAL MAGNETIC STORMS - TOOLANGI

	<u>Began at</u>		<u>Ended at</u>	<u>Intensity</u>	<u>Maximum</u>
	d h m		d h		<u>K-Index</u>
October	03 12 00	October	06 19	Moderately severe.	6
	21 10 11		22 08	Moderate	5
	25 03 25		27 12	Moderate	5
	29 12 00	November	02 01	Moderate	5

SUDDEN COMMENCEMENTS - TOOLANGI

<u>Day</u>	<u>Time</u>	<u>Type</u>
	h m	
08	23 06	Sudden Impulse.
21	10 11	Storm Sudden Commencement.

IONOSPHERIC DATA - WATHEROOMEDIAN HOURLY VALUES

120° Mean Time	<u>h'F1</u> Km	<u>h_pF2</u> Km	<u>h'F2</u> Km	<u>foE</u> Mc/s	<u>foF1</u> Mc/s	<u>foF2</u> Mc/s	<u>fEs</u> Mc/s	<u>MUF</u> 3000 Mc/s	<u>M3000</u>
00		330	260			3.6	2.1	11.4	3.0
01		320	260			3.8	2.4	11.3	3.0
02		300	240			3.5	2.4	11.4	3.2
03		310	240			3.4	2.1	10.2	3.1
04		315	250			3.1	2.1	9.0	3.0
05		320	260			3.0	2.0	9.1	3.0
06		275	250	1.7		4.2	1.9	13.3	3.4
07	230	270	260	2.3	3.6	4.9	2.4	15.8	3.4
08	220	295	300	2.8	4.2	5.6	3.4	18.5	3.4
09	210	300	305	3.0	4.3	5.7	3.6	18.4	3.2
10	200	330	325	3.2	4.4	6.2	3.7	19.3	3.1
11	200	330	320	3.2	4.4	6.5	3.7	20.4	3.0
12	200	330	315	3.3	4.4	7.2	3.7	21.6	3.0
13	200	310	300	3.3	4.4	7.4	3.8	23.2	3.1
14	210	310	300	3.2	4.4	7.0	3.6	22.6	3.2
15	220	300	290	3.1	4.3	6.6	3.5	21.2	3.2
16	220	290	280	2.8	4.1	6.2	3.7	19.9	3.2
17	230	280	260	2.4	3.5	5.9	3.3	19.6	3.3
18		270	245	1.8		5.8	1.9	20.0	3.4
19		290	240			4.6	+	14.9	3.2
20		320	240			4.3	+	13.1	3.1
21		330	250			4.0	1.6	11.8	3.0
22		335	260			3.8	2.1	11.2	3.0
23		330	260			3.9	2.1	11.2	2.9

+ Indicates fEs median below lowest frequency recorded.

IONOSPHERIC DATA - WATHEROOSUMMARY SPORADIC E

120° Mean Time	Percentage of time above			Median in Mc/s	No. of Obs.
	7 Mc/s	5 Mc/s	3 Mc/s		
00	-	-	34	2.1	29
01	-	-	31	2.4	29
02	-	-	28	2.4	29
03	-	-	18	2.1	28
04	-	-	15	2.1	27
05	-	-	8	2.0	26
06	-	-	0	1.9	25
07	-	-	20	2.4	25
08	-	-	86	3.4	21
09	-	-	(96)	3.6	27 (1G)
10	-	-	(93)	3.7	27 (2G)
11	-	4	(96)	3.7	28 (1G)
12	4	7	(96)	3.7	27 (1G)
13	-	-	(88)	3.8	26 (3G)
14	-	4	(81)	3.6	27 (5G)
15	-	4	(92)	3.5	25 (2G)
16	-	-	79	3.7	28
17	-	-	67	3.3	27
18	-	4	16	1.9	25
19	-	-	14	+	28
20	-	-	21	+	28
21	-	-	17	1.6	30
22	-	-	14	2.1	29
23	-	-	31	2.1	29

G Signifies $fEs < f_oE \geq 3.0$ Mc/s.

+ Indicates fEs median below lowest frequency recorded.

- Indicates zero percentage.