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COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS

OBSERVATORY REPORT

FOR

DECEMBER

1952

...der the authority of Senator The Hon. W. H. Spooner

Minister for National Development

DEPARTMENT OF NATIONAL DEVELOPMENT

Minister - SENATOR THE HON. W. H. SPOONER.

Secretary - H. G. RAGGATT.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

P. B. NYE - Director.

J. M. RAYNER - Deputy Director.

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C O N T E N T S

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CONTRIBUTING OBSERVATORIES

WATHEROO MAGNETIC OBSERVATORY

Geographic Latitude 30°19'S Longitude 115°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 1-16Mc/s
Sweeptime 2 minutes.

TOOLANGI MAGNETIC OBSERVATORY

Geographic Latitude 37°32'S Longitude 145°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°30'S Longitude 158°57'E
Geomagnetic Latitude -61° Longitude 243°

Instruments

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

HEARD ISLAND MAGNETIC OBSERVATORY

Geographic Latitude 53°02'S Longitude 73°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 - WATHEROO

Range for lower limit of K=9 is 350 gammas

Day	K Indices								K-Sum
1	3	3	3	3	4	3	4	3	26
2	5	4	3	3	5	4	4	4	32
3	5	4	3	3	5	3	3	3	29
4	5	3	4	4	4	3	4	3	30
5	5	3	3	3	3	1	5	1	24
6	3	3	2	1	1	2	2	2	16
7	2	4	2	2	1	1	1	1	14
8	3	3	3	2	2	3	0	2	18
9	2	1	1	0	0	0	1	2	07
10	2	1	1	1	2	3	2	2	14
11	0	3	2	2	3	2	2	3	17
12	2	2	3	2	3	3	1	2	18
13	4	3	5	5	5	2	0	3	27
14	1	1	1	1	1	1	0	3	09
15	2	3	4	4	3	3	1	2	22
16	3	2	3	3	2	2	2	3	20
17	2	2	2	2	0	1	1	2	12
18	3	1	2	2	2	3	3	2	18
19	1	2	3	1	0	0	0	1	08
20	1	3	2	3	1	0	1	1	12
21	1	2	3	2	2	1	0	2	13
22	4	3	3	2	3	3	3	1	22
23	3	2	3	2	1	1	0	3	15
24	4	2	3	4	5	4	3	4	29
25	4	4	3	3	3	3	2	1	23
26	x	x	x	x	x	x	x	x	xx
27	3	2	2	3	1	3	4	6	24
28	3	2	2	3	5	4	3	5	27
29	4	2	3	3	3	5	5	4	29
30	4	4	3	4	4	4	2	2	27
31	3	3	4	4	4	4	3	3	28

PRELIMINARY MONTHLY MEAN VALUES OF THE MAGNETIC ELEMENTS AT

WATHEROO -	Declination	2^{o} 47.5'	west.
	Horizontal Intensity	24858	gammas.
	Vertical Intensity	-52129	gammas.

MAGNETIC K-INDICES - TOOLANGI

Range for lower limit of K=9 is 500 gammas

Day	K-Indices								K-Sum
1	2	3	3	3	4	5	4	3	27
2	3	4	3	3	5	4	4	4	30
3	3	4	3	3	4	3	3	3	26
4	6	4	5	5	4	4	4	4	36
5	3	3	4	3	3	2	4	3	25
6	3	3	2	1	2	3	3	2	19
7	2	3	3	2	1	2	2	3	18
8	3	3	2	2	3	3	2	1	19
9	2	1	1	1	0	1	2	1	09
10	1	2	2	2	2	3	3	2	17
11	2	3	3	3	3	2	3	1	20
12	3	4	3	3	4	3	2	2	24
13	4	5	5	6	5	2	3	3	33
14	3	2	2	2	2	1	3	2	17
15	2	3	3	4	3	3	2	3	23
16	3	4	2	3	3	2	2	3	22
17	3	2	3	3	1	2	2	3	19
18	3	3	2	1	1	1	2	2	15
19	2	3	2	2	2	3	3	4	21
20	2	3	3	2	2	1	2	2	17
21	2	2	1	1	3	2	2	2	15
22	3	3	2	2	4	3	2	1	20
23	3	2	2	1	2	1	x	x	xx
24	x	x	3	4	5	3	3	3	xx
25	3	4	3	4	4	3	3	3	27
26	3	3	3	3	3	3	2	2	22
27	3	3	3	2	2	3	3	5	24
28	4	3	3	3	4	4	3	4	28
29	4	3	3	3	3	4	5	3	28
30	4	4	3	3	4	4	3	3	28
31	3	3	5	4	4	4	3	3	29

PRELIMINARY MONTHLY MEAN VALUES OF THE MAGNETIC ELEMENTS AT

TOOLANGI -	Declination	9° 46.3' east.
	Horizontal Intensity	22794 gammas.
	Vertical Intensity	-56431 gammas.

MAGNETIC K-INDICES - MACQUARIE ISLAND

Range for lower limit of K=9 is 1500 gammas

Day	K Indices								K-Sum
1	2	1	3	4	6	6	4	3	29
2	3	3	2	5	7	7	4	3	34
3	3	5	4	4	5	5	3	3	32
4	5	4	4	7	6	5	5	3	39
5	4	3	2	5	6	2	4	1	27
6	2	3	2	1	2	3	1	2	16
7	2	2	3	2	1	2	1	1	14
8	1	1	2	2	4	4	1	1	16
9	2	1	1	1	2	2	2	1	12
10	1	2	1	2	4	4	3	1	18
11	1	4	4	5	6	3	2	1	26
12	1	2	3	4	6	6	2	1	25
13	3	6	5	7	6	3	2	1	33
14	1	1	1	2	3	1	2	1	12
15	2	2	3	6	2	3	2	2	22
16	2	3	1	6	6	5	3	2	28
17	2	5	5	3	3	2	2	2	24
18	2	3	1	1	3	3	3	2	18
19	1	2	1	1	2	2	2	1	12
20	1	1	1	3	3	1	1	1	12
21	1	1	1	2	3	1	1	1	11
22	1	1	1	4	6	5	3	1	22
23	1	1	1	2	3	2	2	1	13
24	2	3	2	6	7	6	4	3	33
25	4	4	3	6	6	3	2	2	30
26	3	3	3	4	4	3	2	1	23
27	2	2	3	4	4	2	3	5	25
28	3	3	1	3	6	5	4	3	28
29	4	4	3	5	4	7	7	4	38
30	4	5	5	6	6	7	3	3	39
31	3	3	4	5	7	7	3	3	35

PRELIMINARY MONTHLY MEAN VALUES OF THE MAGNETIC ELEMENTS AT

MACQUARIE ISLAND - Declination 24° 05.1' east.
Horizontal Intensity 13352 gammas.
Vertical Intensity -64538 gammas.

MAGNETIC K-INDICES - HEARD ISLAND

Range for lower limit of K=9 is 1000 gammas

Day	K Indices								K-Sum
1	2	1	1	2	3	5	6	6	26
2	7	3	2	3	6	5	7	7	40
3	4	3	3	3	3	3	4	4	27
4	6	5	3	4	4	4	5	5	36
5	6	3	3	3	4	1	5	3	28
6	1	2	2	1	2	3	2	2	15
7	3	2	2	1	2	2	4	2	18
8	2	1	1	1	1	1	1	2	10
9	1	1	1	1	0	0	2	0	06
10	2	2	2	1	2	4	6	2	21
11	2	3	3	2	3	4	4	1	22
12	1	1	2	3	3	4	1	2	17
13	3	4	3	6	6	2	2	2	28
14	1	1	0	2	2	2	1	2	11
15	4	3	2	3	3	3	1	1	20
16	1	2	1	2	2	3	3	4	18
17	3	2	3	2	1	1	0	5	17
18	3	3	1	2	2	2	5	2	20
19	2	2	1	1	1	0	1	1	09
20	0	1	1	1	1	1	1	2	08
21	1	0	1	1	1	1	1	1	07
22	2	1	0	2	3	4	3	2	17
23	1	1	1	2	1	0	2	1	09
24	3	3	2	3	7	5	5	6	34
25	3	4	3	4	3	2	2	3	24
26	3	2	2	2	2	3	1	2	17
27	2	2	2	2	2	1	5	8	24
28	5	x	x	x	x	x	x	x	xx
29	x	x	x	x	x	x	7	6	xx
30	5	3	3	3	4	6	5	4	33
31	4	2	3	4	3	4	5	5	30

PRELIMINARY MONTHLY MEAN VALUES OF THE MAGNETIC ELEMENTS AT

HEARD ISLAND - Declination 50° 00.3' west.
Horizontal Intensity 18482 gammas.
Vertical Intensity -47143 gammas.

PRINCIPAL MAGNETIC STORMS - WATHEROO

	Began at d h m		Ended at d h	Intensity	Maximum K-Index
December	01 14 30	December	05 14	Moderate	5
	13 00 00		13 15	Moderate	5
	27 18 00	January	01 21	Moderately severe	6

SUDDEN COMMENCEMENTS - WATHEROO

Day	Time	Type

N i l

PRINCIPAL MAGNETIC STORMS - TOOLANGI

	Began at d h m		Ended at d h	Intensity	Maximum K-Index
December	01 03 50	December	05 14	Moderately severe	6
	13 01 50		13 19	Moderately severe	6
	24 05 15		25 16	Moderate	5
	27 16 00		Still in progress at 31 December		

SUDDEN COMMENCEMENTS - TOOLANGI

	Day	Time h m	Type
December	14	21 40	Storm Sudden Commencement

IONOSPHERIC DATA - WATHEROO

MEDIAN HOURLY VALUES

120° Mean Time	h'F1 Km	hpF2 Km	h'F2 Km	foE Mc/s	foF1 Mc/s	foF2 Mc/s	fEs Mc/s	MUF 3000 Mc/s	M3000
00		330	250			4.7	3.8	13.2	3.0
01		320	250			4.3	4.2	13.2	3.1
02		325	250			4.3	3.9	13.0	3.0
03		310	250			3.9	4.0	11.6	3.0
04		310	260			3.4	3.6	10.8	3.1
05		305	265			3.2	3.1	10.2	3.1
06	230	285	270	2.0	3.1	4.1	2.9	14.1	3.4
07	230	300	320	2.5	3.8	4.9	3.7	16.8	3.3
08	220	310	330	3.0	4.2	5.4	3.8	17.6	3.2
09	210	340	340	3.2	4.3	5.6	4.1	18.6	3.0
10	200	350	350	3.3	4.4	6.0	4.1	18.2	3.0
11	210	345	340	3.4	4.4	6.3	4.2	19.7	3.0
12	*	340	330	3.4	4.5	6.5	4.2	20.3	3.0
13	200	340	330	3.4	4.4	6.6	4.2	19.7	3.0
14	205	340	320	3.3	4.4	6.8	4.6	20.0	3.0
15	220	320	310	3.2	4.3	6.4	4.7	20.1	3.1
16	220	330	300	3.0	4.2	6.3	4.2	19.7	3.0
17	220	310	290	2.7	4.0	6.1	4.2	19.3	3.1
18	230	300	270	2.2	3.5	5.9	3.6	18.8	3.1
19		295	250			6.0	3.3	19.6	3.2
20		310	240			5.8	2.1	18.3	3.1
21		330	250			5.5	2.4	16.9	3.0
22		330	260			5.0	2.4	14.8	3.0
23		330	260			4.8	3.0	14.6	3.0

* Insufficient values

IONOSPHERIC DATA - WATHEROO

SUMMARY SPORADIC E

120° Mean Time	Percentage of time above 7 Mc/s	5 Mc/s	3 Mc/s	Median in Mc/s	No. of Obs.	
00	-	17	77	3.8	30	
01	7	24	79	4.2	29	
02	-	14	82	3.9	28	
03	4	11	79	4.0	28	
04	-	14	86	3.6	28	
05	-	-	48	3.1	27	
06	8	12	42	2.9	26	
07	-	12	100	3.7	24	
08	4	21	100	3.8	28	
09	7	36	100	4.1	28	
10	15	27	(96)	4.1	26	(1G)
11	15	27	100	4.2	26	
12	7	41	100	4.2	27	
13	4	37	100	4.2	27	
14	14	46	100	4.6	28	
15	14	38	100	4.7	29	
16	14	41	100	4.2	29	
17	6	19	97	4.2	31	
18	-	7	80	3.6	30	
19	-	3	55	3.3	31	
20	-	7	41	2.1	29	
21	-	7	38	2.4	29	
22	-	-	26	2.4	27	
23	-	7	53	3.0	30	

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

- Indicates zero percentage.