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

GEOPHYSICAL OBSERVATORY REPORT

VOL. 3 NO. 2

FEBRUARY

1955

Issued under 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

This Report was prepared in the Geophysical Section:

R. F. THYER - Chief Geophysicist

J. C. DOOLEY - Supervising Geophysicist

C O N T E N T S

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

The terminology used in this report is that accepted by international convention. Should further information be required, explanation can be obtained by applying to:-

Chief Geophysicist,
Bureau of Mineral Resources,
Geology and Geophysics,
485 Bourke Street,
Melbourne, C.1.
AUSTRALIA.

CONTRIBUTING OBSERVATORIES

WATHEROO MAGNETIC OBSERVATORY A.F. TILLOTT, Observer in Charge.

Geographic Latitude 30°19'S Longitude 115°53'E
Geomagnetic Latitude -41.8° Longitude 185.6°

Instruments

Magnetic Equipment - Askania pattern Magnetometer No.508810.
D.T.M. C.I.W. Earth Inductor No.2.
Exchenhagen 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 I.B. EVERINGHAM, Observer in Charge.

Geographic Latitude 37°32'S Longitude 145°28'E
Geomagnetic Latitude -46.7° Longitude 220.8°

Instruments

Ruska pattern Magnetometer No.4813.
Schulze Earth Inductor No.49.
La Cour pattern D,H,Z, recording variometers, normal sensitivity 15mm/hour recorder.

MACQUARIE ISLAND MAGNETIC OBSERVATORY P.E. MANN, Observer in Charge.

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.

MAGNETIC K-INDICES FOR FEBRUARY - WATHEROO

Range for lower limit of K=9 is 350 gammas

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

x K-indices derived from H and D only.

() Indicates doubtful.

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR FEBRUARY

WATHEROO - Declination 2° 45.0' west.
Horizontal Intensity 24863 gammas.
Vertical Intensity -52158 gammas.

MAGNETIC K-INDICES FOR FEBRUARY - TOOLANGI

Range for lower limit of K=9 is 500 gammas

Day	K-Indices								K-Sum
1	3	4	2	1	2	1	2	3	18
2	3	4	2	3	3	2	2	3	22
3	2	3	3	2	1	2	2	3	18
4	3	4	3	5	4	3	3	3	28
5	3	3	2	3	4	2	3	3	23
6	3	3	4	3	3	3	3	3	25
7	3	4	3	3	4	3	2	2	24
8	2	4	3	2	2	3	3	3	22
9	X	X	3	4	2	2	3	3	XX
10	3	3	2	2	2	0	2	3	17
11	2	3	1	3	3	3	5	5	25
12	3	4	3	2	3	2	3	3	23
13	4	4	2	X	X	X	X	X	XX
14	3	3	3	2	3	3	2	3	22
15	3	3	3	3	1	0	1	2	16
16	3	3	3	3	3	3	3	3	24
17	3	4	1	3	2	0	2	3	18
18	2	3	3	1	1	1	3	3	17
19	3	3	3	2	3	2	2	2	20
20	3	3	2	3	3	3	2	2	21
21	3	3	3	3	3	3	2	2	22
22	4	3	2	4	3	3	3	3	25
23	3	3	3	4	5	4	3	2	27
24	3	3	3	2	3	3	3	3	23
25	4	4	2	4	3	4	3	3	27
26	3	3	1	2	3	1	2	2	17
27	3	3	1	1	3	2	3	3	19
28	4	4	4	3	5	3	2	2	27

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR FEBRUARY

TOOLANGI - Declination 9° 57.6' east.
Horizontal Intensity 22742 gammas.
Vertical Intensity -56421 gammas.

MAGNETIC K-INDICES FOR FEBRUARY - MACQUARIE ISLAND

Range for lower limit of K=9 is 1500 gammas

Day	K-Indices								K-Sum
1	0	0	1	1	1	1	0	0	4
2	1	1	1	2	3	3	1	1	13
3	1	2	4	3	3	3	1	1	18
4	1	2	2	5	4	4	3	3	24
5	2	3	1	4	6	3	3	3	25
6	1	3	5	4	6	6	1	2	28
7	2	3	1	4	6	5	1	1	23
8	1	1	1	3	3	5	3	2	19
9	2	3	3	4	3	3	4	0	22
10	0	1	2	2	3	1	1	1	11
11	0	1	1	2	4	4	4	5	21
12	2	3	2	4	3	3	3	3	23
13	3	3	3	4	3	5	2	1	24
14	1	2	3	3	5	3	3	2	22
15	0	3	3	3	1	0	0	0	10
16	1	0	2	3	5	3	2	1	17
17	1	1	1	3	4	1	0	1	12
18	1	3	2	2	1	0	2	2	13
19	1	2	2	3	4	2	0	0	14
20	1	2	3	4	4	5	1	1	21
21	1	4	2	3	5	5	1	1	22
22	2	4	2	7	4	2	2	1	24
23	1	2	3	7	7	6	5	2	33
24	2	1	2	3	5	4	1	1	19
25	1	3	2	6	5	4	2	2	25
26	2	3	1	3	4	3	0	1	17
27	1	1	1	0	3	2	0	1	9
28	4	7	3	4	7	5	1	1	32

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR FEBRUARY

MACQUARIE ISLAND - Declination 24°34.8' east.
Horizontal Intensity 13339 gammas.
Vertical Intensity -64504 gammas.

PRINCIPAL MAGNETIC STORMS AT WATHEROO DURING FEBRUARY

Began at d h m	Ended at d h	Intensity	Maximum K-Index

N i l

SUDDEN COMMENCEMENTS AT WATHEROO DURING FEBRUARY

Day	Time h m	Type

N i l

PRINCIPAL MAGNETIC STORMS AT TOOLANGI DURING FEBRUARY

Began at d h m	Ended at d h	Intensity	Maximum K-Index
4 04 00	05 14	Moderate	5
11 10 00	12 11	Moderate	5
23 08 30	26 16	Moderate	5
28 00 50	28 18	Moderate	5

SUDDEN COMMENCEMENTS AT TOOLANGI DURING FEBRUARY

Day	Time h m	Type
22	14 56	Polar 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		320	260			3.9	2.4	11.3	3.0
01		300	250			3.6	3.6	11.4	3.1
02		300	250			3.6	3.6	11.8	3.1
03		300	250			3.4	3.6	10.5	3.1
04		300	250			3.2	2.4	10.3	3.2
05		300	250			3.1	1.8	9.6	3.1
06		290	250	1.5		3.6	G	11.5	3.3
07	240	270	265	2.2	3.5	4.4	3.2	14.8	3.3
08	220	*	340	2.8	4.0	5.0	3.7	15.2	3.0
09	210	(340)	365	3.1	4.3	5.4	3.9	16.2	3.0
10	210	(340)	340	3.3	4.4	5.6	3.8	18.0	3.1
11	200	330	330	3.4	4.5	6.0	4.0	18.3	3.0
12	200	310	330	3.4	4.6	6.5	4.0	20.3	3.1
13	200	310	330	3.4	4.5	6.6	4.0	20.5	3.1
14	190	330	330	3.4	4.5	6.6	3.9	20.0	3.1
15	200	320	330	3.3	4.4	6.2	3.8	20.0	3.1
16	210	305	300	3.1	4.3	6.0	3.8	19.4	3.2
17	220	300	300	2.8	4.0	5.6	G	17.8	3.1
18	240	290	265	2.2	3.4	5.3	G	16.2	3.2
19		280	250	1.5		4.8	G	15.4	3.2
20		290	245			4.6	E	14.2	3.2
21		300	250			4.5	E	13.6	3.1
22		310	260			4.2	E	12.5	3.0
23		320	260			4.0	E	12.2	3.0

() Indicates doubtful.
* Denotes 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	-	-	39	2.4	28	
01	-	-	61	3.6	28	
02	4	4	70	3.6	27	
03	4	7	67	3.6	27	
04	4	4	37	2.4	27	
05	-	-	23	1.8	26	
06	-	-	27	G	26	
07	-	-	52	3.2	25	
08	-	4	84	3.7	25	
09	-	7	(96)	3.9	28	(1G)
10	7	14	(89)	3.8	28	(3G)
11	4	21	(82)	4.0	28	(5G)
12	4	14	(86)	4.0	28	(4G)
13	4	14	(82)	4.0	28	(5G)
14	4	7	(89)	3.9	27	(3G)
15	4	15	(78)	3.8	27	(6G)
16	7	19	(78)	3.8	27	(6G)
17	4	4	(48)	G	23	(2G)
18	-	-	42	G	24	
19	-	-	26	G	27	
20	-	-	12	E	25	
21	-	-	12	E	26	
22	-	-	19	E	26	
23	-	-	19	E	27	

\- Indicates zero percentage.

() Indicates doubtful.

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

PROVISIONAL SUMMARY OF AURORAE FOR FEBRUARY

Reported by and published through the courtesy of the Australian National Antarctic Research Expedition

MACQUARIE ISLAND

Day	Began	First Seen	Minimum Geomagnetic Latitude		Intensity and Form	Last Seen	Ended
			Degrees	Time			
	h m	h m		h m		h m	h m
23	09 50		57	11 40	2 RB	17 30	
25		10 30	60	11 30	1 HB	16 00	
28		10 00	59	11 30) 13 20)	1 HB	17 10	