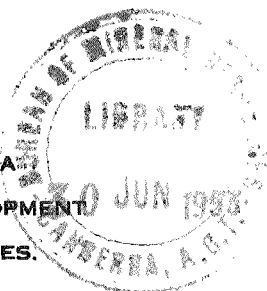


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COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF NATIONAL DEVELOPMENT
BUREAU OF MINERAL RESOURCES.
GEOLOGY AND GEOPHYSICS

GEOPHYSICAL OBSERVATORY REPORT

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FEBRUARY

1953

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Minister for National Development*

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DEPARTMENT OF NATIONAL DEVELOPMENT
Minister - SENATOR THE HON. W. H. SPOONER.
Secretary - H. G. RAGGATT.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS
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AUSTRALIA.

CONTRIBUTING OBSERVATORIESWATHEROO 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 QHMs 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 FOR FEBRUARY - WATHEROO

Range for lower limit of K=9 is 350 gammas

<u>Day</u>	<u>K Indices</u>								<u>K-Sum</u>
1	2	3	2	1	1	0	2	2	13
2	3	4	3	1	0	3	1	1	16
3	3	4	2	2	1	1	1	1	15
4	2	4	1	2	4	2	1	1	17
5	2	2	2	2	1	2	1	1	13
6	2	1	1	1	1	2	1	0	09
7	1	3	2	1	0	0	0	1	08
8	3	1	2	2	0	2	2	1	13
9	2	4	3	3	3	3	2	3	23
10	2	2	2	1	3	1	3	4	18
11	3	2	3	1	2	1	1	1	14
12	1	2	2	3	1	2	2	0	13
13	2	2	2	0	0	0	0	2	08
14	2	3	3	3	0	2	4	2	19
15	3	3	2	2	2	1	2	3	18
16	3	3	3	2	2	4	1	2	20
17	2	4	3	3	2	1	2	2	19
18	3	3	3	2	1	2	1	3	18
19	4	4	2	2	2	3	2	1	20
20	3	2	3	1	1	2	2	2	16
21	3	4	2	2	1	2	1	3	18
22	4	3	2	2	2	4	4	4	25
23	4	4	5	4	4	5	3	4	33
24	3	4	5	4	5	4	4	4	33
25	5	3	4	5	4	4	3	4	32
26	4	3	4	4	6	4	5	3	33
27	4	3	5	5	3	4	1	4	29
28	4	4	3	1	1	4	3	3	23

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR FEBRUARY

WATHEROO - Declination 2° 47.0' west.
 Horizontal Intensity 24865 gammas.
 Vertical Intensity -52159 gammas.

MAGNETIC K-INDICES FOR FEBRUARY - TOOLANGI

Range for lower limit of K=9 is 500 gammas

<u>Day</u>	<u>K Indices</u>								<u>K-Sum</u>
1	3	2	2	2	2	1	2	2	16
2	3	3	3	2	2	3	1	3	20
3	3	3	2	3	1	2	2	2	18
4	3	3	2	2	4	3	2	3	22
5	2	2	2	2	2	2	2	3	17
6	3	2	2	1	2	1	1	3	15
7	3	2	2	1	1	1	2	3	15
8	2	2	2	2	1	2	2	2	15
9	3	3	3	3	3	3	2	3	23
10	2	2	1	2	3	2	3	3	18
11	3	2	3	3	3	1	1	3	19
12	2	2	2	2	2	2	2	2	16
13	2	3	2	2	1	1	1	3	15
14	4	2	4	3	1	3	3	1	21
15	2	3	3	3	2	2	2	3	20
16	3	2	3	2	2	4	3	2	21
17	3	4	3	3	2	2	2	2	21
18	2	3	2	2	2	1	2	2	16
19	3	3	3	3	2	3	2	3	22
20	2	2	1	2	2	2	2	2	15
21	3	3	2	2	1	2	3	2	18
22	3	3	2	3	3	5	5	4	28
23	4	3	5	3	4	5	3	3	30
24	4	5	5	x	x	x	x	xx	
25	4	4	5	5	4	3	3	4	32
26	3	4	5	5	5	4	4	4	34
27	3	2	5	5	4	4	2	3	28
28	3	4	3	1	2	3	3	3	22

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR FEBRUARY

TOOLANGI - Declination 90 47.5' east.
Horizontal Intensity 22798 gammas.
Vertical Intensity -56426 gammas.

MAGNETIC K-INDICES FOR FEBRUARY - MACQUARIE ISLAND

Range for lower limit of K=9 is 1500 gammas

<u>Day</u>	<u>K Indices</u>					<u>K-Sum</u>			
1	1	0	1	0	0	1	1	1	05
2	2	2	1	2	2	4	1	1	15
3	2	2	1	5	3	2	1	0	16
4	1	1	0	4	5	5	2	0	18
5	1	1	0	2	3	1	1	0	09
6	0	1	1	1	3	1	2	0	09
7	0	1	1	1	1	0	1	0	05
8	1	1	1	1	0	0	1	1	06
9	1	3	3	4	5	4	2	3	25
10	1	0	0	2	5	4	3	4	19
11	2	2	3	5	5	1	1	1	20
12	1	2	1	3	3	3	2	1	16
13	1	0	1	2	1	0	1	1	07
14	2	2	4	4	3	3	2	1	21
15	2	3	2	3	3	2	1	2	18
16	3	2	3	4	5	6	4	1	28
17	3	3	4	5	3	2	1	0	21
18	1	1	1	2	1	1	1	1	09
19	2	3	3	3	3	3	1	2	20
20	1	1	1	2	3	2	2	1	13
21	2	3	5	2	0	3	2	1	18
22	1	1	1	3	3	5	5	4	23
23	4	4	7	4	6	6	6	3	40
24	5	6	5	7	7	7	5	4	46
25	5	4	7	7	7	4	4	3	41
26	3	4	7	7	6	6	6	4	43
27	3	3	6	7	5	6	3	4	37
28	3	5	4	3	5	5	3	2	30

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR FEBRUARY

MACQUARIE ISLAND - Declination 24°08.7' east.
Horizontal Intensity 13348 gammas.
Vertical Intensity -64540 gammas.

MAGNETIC K-INDICES FOR FEBRUARY - HEARD ISLAND

Range for lower limit of K=9 is 1000 gammas

<u>Day</u>	<u>K Indices</u>								<u>K-Sum</u>
1	1	1	1	1	1	1	2	3	11
2	1	2	2	1	2	3	2	2	15
3	2	2	2	2	1	1	1	2	13
4	2	1	2	2	2	3	2	1	15
5	1	0	1	1	1	2	2	0	08
6	0	1	1	1	1	3	2	1	10
7	1	1	1	1	1	0	1	0	06
8	1	0	0	0	2	2	1	2	08
9	3	3	2	2	2	4	2	6	24
10	3	1	1	1	3	3	6	7	25
11	5	3	2	1	1	0	2	2	16
12	1	1	1	1	2	2	2	0	10
13	1	0	1	1	0	0	1	2	06
14	4	2	2	2	2	2	5	2	21
15	3	2	2	1	2	0	2	5	17
16	4	2	2	1	2	5	3	1	20
17	2	2	2	3	1	1	3	2	16
18	1	0	1	1	2	3	2	3	13
19	3	2	2	2	2	2	3	3	19
20	3	1	1	2	1	3	2	2	15
21	5	3	2	1	1	1	4	4	21
22	3	2	1	1	2	5	8	8	30
23	7	4	3	3	4	5	6	6	38
24	5	4	4	3	4	5	8	7	40
25	7	3	4	4	4	4	4	7	37
26	6	4	4	4	6	6	7	6	43
27	6	2	3	4	3	4	3	6	31
28	4	5	3	2	1	4	3	3	25

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR FEBRUARY

HEARD ISLAND - Declination 50°03.6' west.
Horizontal Intensity 18470 gammas.
Vertical Intensity -47151 gammas.

PRINCIPAL MAGNETIC STORMS AT WATHEROO DURING FEBRUARY

<u>Began at</u>	<u>Ended at</u>	<u>Intensity</u>	<u>Maximum K-Index</u>
d h m	d h		
22 15 33	28 08	Moderately severe	6

SUDDEN COMMENCEMENTS AT WATHEROO DURING FEBRUARY

<u>Day</u>	<u>Time</u>	<u>Type</u>
	h m	
18	17 47	Sudden Impulse.

PRINCIPAL MAGNETIC STORMS AT TOOLANGI DURING FEBRUARY

<u>Began at</u>	<u>Ended at</u>	<u>Intensity</u>	<u>Maximum K-Index</u>
d h m	d h		
22 13 00	27 20	Moderate	5

SUDDEN COMMENCEMENTS AT TOOLANGI DURING FEBRUARY

<u>Day</u>	<u>Time</u>	<u>Type</u>
	h m	
02	15 47	Polar Sudden Commencement.
04	13 39	Polar 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> <u>3000</u> Mc/s	<u>M3000</u>
00		300	250			3.6	3.6	12.0	3.3
01		300	255			3.7	3.2	12.2	3.3
02		290	250			3.6	3.6	12.2	3.3
03		290	245			3.5	3.6	11.5	3.3
04		290	235			3.3	3.3	11.2	3.3
05		295	250			3.2	2.9	10.5	3.2
06		250	240	1.6	※	3.6	2.6	13.1	3.6
07	250	250	240	2.2	3.5	4.7	2.9	16.0	3.6
08	220	275	280	2.6	3.7	4.7	3.2	17.0	3.5
09	210	310	320	3.0	4.2	5.2	3.6	17.4	3.3
10	210	330	340	3.2	4.3	5.8	3.8	18.8	3.2
11	200	310	340	3.3	4.3	6.2	3.8	19.3	3.3
12	195	330	320	3.3	4.4	6.2	3.9	20.4	3.2
13	200	310	300	3.3	4.4	6.5	3.9	22.5	3.4
14	200	310	310	3.3	4.4	6.3	3.8	20.6	3.3
15	200	300	300	3.2	4.3	6.2	3.7	20.6	3.3
16	220	300	310	3.0	4.2	5.8	3.8	19.4	3.3
17	220	300	300	2.7	3.9	5.6	3.0	18.8	3.4
18	230	280	260	2.2	3.5	5.3	2.5	18.9	3.5
19		280	250		※	5.6	3.0	19.5	3.6
20		270	240			4.9	2.6	18.9	3.5
21		270	245			4.1	2.6	13.5	3.5
22		300	250			3.6	2.3	12.0	3.3
23		300	260			3.5	2.6	11.8	3.2

※ Insufficient values.

IONOSPHERIC DATA - WATHEROOSUMMARY SPORADIC E

1200 Mean Time	<u>Percentage of time above</u>			Median in Mc/s	No. of Obs.
	7 Mc/s	5 Mc/s	3 Mc/s		
00	-	7	70	3.6	27
01	-	7	63	3.2	27
02	-	-	78	3.6	27
03	-	11	70	3.6	27
04	-	4	67	3.3	27
05	-	8	50	2.9	26
06	-	4	31	2.6	26
07	-	8	48	2.9	25
08	-	4	70	3.2	23
09	4	11	(81)	3.6	27 (2G)
10	4	12	(83)	3.8	24 (3G)
11	8	17	(96)	3.8	24 (1G)
12	4	11	(96)	3.9	27 (1G)
13	-	27	100	3.9	26
14	-	15	(85)	3.8	27 (4G)
15	4	22	(81)	3.7	27 (5G)
16	7	15	(89)	3.8	27 (2G)
17	4	11	50	3.0	28
18	4	7	39	2.5	28
19	-	4	52	3.0	27
20	-	-	41	2.6	27
21	-	4	40	2.6	25
22	-	-	25	2.3	28
23	-	-	46	2.6	28

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

- Indicates zero percentage.