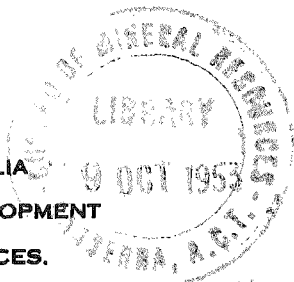


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COMMONWEALTH OF AUSTRALIA  
DEPARTMENT OF NATIONAL DEVELOPMENT  
BUREAU OF MINERAL RESOURCES.  
GEOLOGY AND GEOPHYSICS



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# GEOPHYSICAL OBSERVATORY REPORT

VOL. 1

No. 8

AUGUST

1953

*Issued under the authority of Senator The Hon. W.H. Spooner,  
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

P. B. NYE - Director

J. M. RAYNER - Deputy Director

This Report was prepared in the Geophysical Section:

R. F. THYER - Chief Geophysicist

L. S. PRIOR - Supervising Geophysicist

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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 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 AUGUST - 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	2	3	3	1	17
2	1	3	2	3	1	1	3	0	14
3	2	2	1	0	1	1	2	0	09
4	3	3	0	0	2	3	2	1	14
5	1	1	2	1	0	1	2	1	09
6	0	1	2	0	0	3	0	1	07
7	2	2	3	2	1	1	2	1	14
8	3	1	2	0	1	0	0	0	07
9	2	2	2	2	3	2	3	2	18
10	0	1	4	3	3	3	2	3	19
11	3	3	2	2	3	3	3	2	21
12	3	3	4	5	4	5	3	1	28
13	3	3	3	1	3	3	4	3	23
14	2	3	2	1	1	2	1	0	12
15	2	1	2	0	1	1	3	1	11
16	3	0	2	3	3	2	0	1	14
17	1	2	1	0	2	1	0	0	07
18	1	2	3	0	0	1	0	0	07
19	1	1	1	0	0	1	0	0	04
20	1	0	1	0	0	1	0	1	04
21	2	1	2	0	0	0	0	0	05
22	1	2	1	1	0	1	1	0	07
23	2	2	3	5	5	4	5	5	31
24	3	4	4	3	4	5	4	5	32
25	4	3	4	5	5	3	2	1	27
26	3	4	2	1	3	3	4	4	24
27	4	4	4	5	5	5	3	3	33
28	5	4	3	5	4	3	4	3	31
29	3	4	4	5	4	4	5	4	33
30	4	4	5	4	5	5	3	2	32
31	X	X	X	X	5	4	3	3	XX

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR AUGUST

WATHEROO - Declination            2° 46.1' west.  
Horizontal Intensity    24841 gammas.  
Vertical Intensity    -52135 gammas.

MAGNETIC K-INDICES FOR AUGUST - TOOLANGI

Range for lower limit of K=9 is 500 gammas

<u>Day</u>	<u>K-Indices</u>				<u>K-Sum</u>				
1	2	2	2	2	2	2	2	3	17
2	2	3	2	3	1	1	3	2	17
3	3	2	3	2	2	1	2	2	17
4	3	2	1	1	2	3	2	1	15
5	2	2	3	2	1	1	2	2	15
6	1	1	2	2	1	3	2	1	13
7	3	2	2	4	2	1	2	2	18
8	2	2	2	3	3	1	1	3	17
9	3	3	3	2	3	2	2	3	21
10	2	3	4	4	3	3	2	3	24
11	2	3	2	3	3	3	3	2	21
12	4	3	5	5	4	4	3	3	31
13	2	2	3	2	3	3	3	3	21
14	3	4	3	3	2	2	2	3	22
15	3	2	3	1	2	1	3	2	17
16	2	2	1	3	3	3	1	1	16
17	2	2	1	0	2	2	1	1	11
18	3	2	1	0	1	1	1	2	11
19	2	2	1	1	2	2	1	1	12
20	1	2	1	0	0	1	0	2	07
21	2	3	1	1	1	1	1	2	12
22	1	3	1	2	2	2	1	2	14
23	2	3	3	5	5	4	4	4	30
24	3	4	4	4	4	5	4	5	33
25	4	4	5	5	5	3	2	2	30
26	3	4	3	2	4	4	3	4	27
27	4	4	4	6	X	X	X	X	XX
28	3	4	4	5	4	3	2	3	28
29	3	4	5	5	4	4	4	4	33
30	4	4	6	5	5	5	3	3	35
31	4	3	3	5	5	3	2	2	27

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR AUGUST

TOOLANGI - Declination. 9° 49.9' east.  
Horizontal Intensity 22774 gammas.  
Vertical Intensity -56439 gammas.

MAGNETIC K-INDICES FOR AUGUST - MACQUARIE ISLAND

Range for lower limit of K=9 is 1500 gammas

<u>Day</u>	<u>K-Indices</u>				<u>K-Sum</u>				
1	2	2	2	3	4	4	4	2	23
2	1	3	2	4	1	1	1	1	14
3	1	1	3	1	1	1	1	1	10
4	1	1	1	0	4	5	1	1	14
5	1	0	2	2	1	1	2	2	11
6	0	0	1	3	1	3	1	1	10
7	2	3	1	5	3	1	1	0	16
8	1	2	2	3	3	0	1	1	13
9	2	4	2	1	4	1	1	1	16
10	2	2	6	5	4	3	2	2	26
11	3	4	4	5	4	6	4	1	31
12	4	5	6	7	5	5	2	2	36
13	3	3	2	1	4	3	2	3	21
14	2	2	1	3	2	2	2	1	15
15	1	1	2	X	X	X	X	X	XX
16	2	2	1	5	5	3	1	1	20
17	1	1	0	1	3	1	0	0	07
18	1	1	0	1	0	0	0	0	03
19	1	1	0	1	2	1	0	0	06
20	0	0	0	1	0	0	0	1	02
21	1	1	0	2	0	0	0	0	04
22	0	1	1	3	1	0	0	0	06
23	1	2	5	6	6	6	6	4	36
24	4	5	5	6	7	6	4	4	41
25	3	4	5	7	6	3	3	1	32
26	3	3	4	2	6	4	3	3	28
27	5	5	6	7	6	6	5	3	43
28	4	4	5	7	6	7	2	3	38
29	3	5	5	6	6	4	4	3	36
30	4	4	7	6	8	8	3	3	43
31	3	3	4	7	7	5	2	2	33

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR AUGUST

MACQUARIE ISLAND - Declination 24°16.7' east.  
Horizontal Intensity 13343 gammas.  
Vertical Intensity -64536 gammas.

MAGNETIC K-INDICES FOR AUGUST - HEARD ISLAND

Range for lower limit of K=9 is 1000 gammas

<u>Day</u>	<u>K-Indices</u>								<u>K-Sum</u>
1	3	3	2	2	2	4	4	3	23
2	2	3	2	2	1	2	3	2	17
3	3	1	1	1	1	0	3	0	10
4	3	X	1	0	1	3	3	1	XX
5	2	1	1	X	1	0	3	2	XX
6	1	1	1	1	0	3	1	2	10
7	3	2	1	2	1	2	1	3	15
8	3	1	1	1	1	0	2	1	10
9	X	3	3	1	2	2	5	3	XX
10	2	2	3	3	3	4	3	5	25
11	5	5	2	2	2	4	4	X	XX
12	X	4	X	X	X	X	X	X	XX
13	X	4	2	1	2	2	6	5	XX
14	3	3	1	1	2	3	2	0	15
15	1	1	1	1	1	1	5	4	15
16	3	2	1	3	2	2	1	2	16
17	1	1	1	1	2	1	0	0	07
18	2	2	0	0	2	1	0	2	09
19	1	1	0	0	1	1	1	0	05
20	1	0	0	0	0	0	0	0	01
21	0	1	1	1	0	0	0	0	03
22	0	2	1	1	1	0	2	2	09
23	2	3	2	3	5	5	7	7	34
24	5	5	3	3	3	5	6	8	38
25	4	4	4	4	4	3	4	3	30
26	4	4	2	2	2	4	4	5	27
27	6	5	3	4	6	6	7	6	43
28	4	4	3	4	3	5	5	5	33
29	4	4	4	3	4	5	6	5	35
30	6	4	5	4	5	5	5	5	39
31	4	4	2	4	4	3	5	4	30

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR AUGUST

HEARD ISLAND - Declination 50°10.4' west.  
Horizontal Intensity 18476 gammas.  
Vertical Intensity -47205 gammas.



PRINCIPAL MAGNETIC STORMS AT WATHEROO DURING AUGUST

<u>Began at</u> d h m	<u>Ended at</u> d h	<u>Intensity</u>	<u>Maximum</u> <u>K-Index</u>
23 00 24	25 20	Moderate	5
27 08 40	31 18	Moderate	5

SUDDEN COMMENCEMENTS AT WATHEROO DURING AUGUST

<u>Day</u>	<u>Time</u> h m	<u>Type</u>
23	00 24	Storm Sudden Commencement

PRINCIPAL MAGNETIC STORMS AT TOOLANGI DURING AUGUST

<u>Began at</u> d h m	<u>Ended at</u> d h	<u>Intensity</u>	<u>Maximum</u> <u>K-Index</u>
10 07 ..	14 06	Moderate	5
23 00 23	Storm still in progress at end of month	Moderately severe	6

SUDDEN COMMENCEMENTS AT TOOLANGI DURING AUGUST

<u>Day</u>	<u>Time</u> h m	<u>Type</u>
23	00 23	Storm Sudden Commencement

IONOSPHERIC DATA - WATHEROOMEDIAN HOURLY VALUES

120° Mean Time	<u>h'F1</u> Km	<u>hpF2</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		320	250			3.1	<1.4	9.6	3.0
01		310	260			3.2	2.0	9.9	3.0
02		320	250			3.2	2.4	9.6	3.0
03		320	250			3.3	2.4	9.9	3.0
04		300	250			3.3	2.3	10.4	3.1
05		300	250			3.0	2.2	9.6	3.2
06		310	250	⊘		2.7	2.1	8.4	3.1
07	210	270	250	1.7	⊘	3.6	+	12.1	3.3
08	250	270	250	2.2	3.4	4.8	+	16.9	3.3
09	240	290	280	2.6	3.8	5.2	+	17.8	3.4
10	240	300	300	2.9	4.2	5.4	+	17.8	3.3
11	230	310	300	3.1	4.2	5.6	+	18.0	3.4
12	220	300	290	3.0	4.3	5.8	+	19.4	3.3
13	220	315	300	3.1	4.2	5.7	3.4	18.1	3.2
14	220	310	300	3.1	4.1	5.8	3.4	18.6	3.2
15	220	300	290	2.8	4.0	5.8	3.1	19.2	3.3
16	230	280	260	2.5	3.6	5.5	2.8	18.8	3.4
17	230	265	250	2.0	2.9	5.1	+	17.0	3.3
18		275	240	1.4		4.1	1.8	13.0	3.3
19		280	235			3.8	2.4	11.8	3.3
20		300	240			3.1	2.0	9.1	3.1
21		320	250			3.1	+	9.0	3.0
22		320	260			3.2	+	9.8	3.0
23		310	250			3.2	1.8	9.7	3.1

+ Indicates fEs median below lowest frequency recorded.

⊘ Denotes insufficient values.

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	-	-	17	<1.4	30
01	-	-	17	2.0	30
02	-	-	37	2.4	30
03	-	-	33	2.4	30
04	-	-	43	2.3	30
05	-	-	31	2.2	29
06	-	-	21	2.1	29
07	-	-	14	+	28
08	-	-	17	+	30
09	-	-	14	+	29
10	-	-	(23)	+	26 (7G)
11	-	-	(48)	+	27 (12G)
12	-	-	(44)	+	27 (12G)
13	-	3	(59)	3.4	29 (10G)
14	-	-	(61)	3.4	28 (10G)
15	-	-	(62)	3.1	29 (6G)
16	-	4	43	2.8	28
17	-	-	31	+	29
18	-	4	30	1.8	27
19	-	-	31	2.4	29
20	-	-	39	2.0	28
21	-	-	30	+	30
22	-	-	7	+	29
23	-	-	24	1.8	29

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

+ Indicates  $fEs$  median below lowest frequency recorded.

- Indicates zero percentage.

PROVISIONAL SUMMARY OF AURORAE FOR AUGUST

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

MACQUARIE ISLAND

<u>Day</u>	<u>Cloud Cover</u>	<u>First Seen</u> h m	<u>Time of Maximum</u> h m	<u>Last Seen</u> h m	<u>Time End</u> h m	<u>Intensity</u>	<u>Remarks</u>
04	2	09 45	13 15		16 30	2	Additional maximum at 15h 45m.
07	8	unknown	unknown	18 00		2	
08	8	10 15	unknown	10 20		1	
09	2	10 30	13 45		14 20	4	
10	8	09 15	13 00		18 20	2	
12	8	07 05	unknown		19 00	4	
16	8	unknown	10 45	13 00		2	
23	8	09 00	11 01	11 20		3	
24	8	09 30	unknown	11 00		3	
25	8	07 30	11 25		11 30	4	
28	8	09 10	unknown	11 20		2	
29	3	09 15	10 00	15 20		4	Additional maximum at 11h 45m.
30	8	09 15	09 15	11 00		3	Additional maximum at 11h 00m.

HEARD ISLAND

<u>Day</u>	<u>Cloud Cover</u>	<u>First Seen</u> h m	<u>Time of Maximum</u> h m	<u>Last Seen</u> h m	<u>Time End</u> h m	<u>Intensity</u>	<u>Remarks</u>
27	8	14 50	unknown	16 45		X	Intensity not reported.
28	8	unknown	17 00	18 30		X	Intensity not reported.