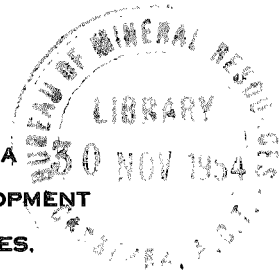


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COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF NATIONAL DEVELOPMENT
BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS

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GEOPHYSICAL OBSERVATORY REPORT

VOL. 2

No. 9

SEPTEMBER

1954

*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

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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 P.M. MCGREGOR, 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.
 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 P.B. TENNI, 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 C.S. ROBERTSON,
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.

HEARD ISLAND MAGNETIC OBSERVATORY K.B. LODWICK,
Observer in Charge.

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 SEPTEMBER - 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	1	3	4	5	4	3	25
2	4	3	3	4	0	3	2	3	22
3	2	2	2	6	4	5	4	3	28
4	3	3	3	3	3	3	1	1	20
5	2	3	3	3	4	1	1	2	19
6	2	2	2	1	2	4	5	3	21
7	2	2	3	2	2	3	3	1	18
8	2	1	1	0	1	2	3	1	11
9	2	3	3	1	4	3	1	2	19
10	1	3	2	2	2	2	1	1	14
11	1	2	3	3	2	3	2	1	17
12	1	1	2	2	2	1	1	1	11
13	3	2	2	0	0	0	0	3	10
14	3	5	3	4	4	3	1	3	26
15	1	2	3	3	4	2	1	1	17
16	3	2	2	3	4	3	3	1	21
17	2	3	2	1	0	0	2	2	12
18	2	1	3	3	1	2	2	2	16
19	2	2	2	1	2	2	1	2	14
20	2	2	2	3	5	5	5	3	27
21	3	3	3	3	4	4	2	2	24
22	2	2	2	2	4	3	2	1	18
23	2	2	2	3	1	1	1	1	13
24	2	2	2	2	2	3	1	3	17
25	2	3	2	2	4	3	4	2	22
26	2	2	2	2	3	2	1	1	15
27	1	1	2	1	2	3	4	3	17
28	2	3	3	2	4	2	0	1	17
29	2	2	2	3	2	4	4	4	23
30	1	3	2	4	1	2	3	3	19

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR SEPTEMBER

WATHEROO - Declination 2° 45.9' west.
 Horizontal Intensity 24855 gammas.
 Vertical Intensity -52171 gammas.

MAGNETIC K-INDICES FOR SEPTEMBER - TOOLANGI

Range for lower limit of K=9 is 500 gammas

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

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR SEPTEMBER

TOOLANGI - Declination 9° 55.8' east.
Horizontal Intensity 22758 gammas.
Vertical Intensity -56429 gammas.

MAGNETIC K-INDICES FOR SEPTEMBER - 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	2	3	5	6	6	4	3	30
2	4	4	4	5	1	4	3	2	27
3	1	2	3	8	6	7	3	2	32
4	3	3	3	6	5	6	2	1	29
5	2	3	4	6	6	3	1	1	26
6	1	2	2	2	4	7	4	3	25
7	3	4	4	3	4	4	4	1	27
8	2	3	1	2	4	3	4	1	20
9	2	3	6	4	5	4	2	1	27
10	1	2	5	5	4	3	1	0	21
11	1	2	4	7	6	4	3	1	28
12	2	1	1	3	3	1	1	1	13
13	2	1	1	4	3	1	1	2	15
14	3	5	5	6	7	6	2	3	37
15	3	3	4	6	6	3	1	1	27
16	3	3	3	4	6	3	3	1	26
17	3	3	2	2	1	0	2	2	15
18	3	3	4	7	3	3	3	2	28
19	2	2	3	2	3	2	3	2	19
20	3	4	4	5	7	8	7	5	43
21	3	4	4	6	6	5	4	2	34
22	1	3	2	6	5	3	2	1	23
23	1	2	3	5	4	1	0	1	17
24	1	2	1	3	2	2	1	3	15
25	2	4	4	5	5	5	2	2	29
26	2	3	3	3	3	2	1	1	18
27	1	1	1	2	2	4	3	2	16
28	3	4	5	5	5	3	1	1	27
29	1	3	3	4	6	4	4	5	30
30	2	5	5	6	4	2	3	2	29

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR SEPTEMBER

MACQUARIE ISLAND - Declination 24°29.8' east.
Horizontal Intensity 13330 gammas.
Vertical Intensity -64513 gammas.

MAGNETIC K-INDICES FOR SEPTEMBER - HEARD ISLAND

Range for lower limit of K=9 is 1000 gammas

<u>Day</u>	<u>K-Indices</u>								<u>K-Sum</u>
1	2	2	1	2	3	5	6	7	28
2	6	3	2	2	1	3	2	3	22
3	3	1	1	3	4	4	5	4	25
4	6	2	3	3	3	6	2	3	28
5	3	2	3	3	2	3	3	2	21
6	2	1	2	1	2	5	8	6	27
7	3	3	2	2	2	4	5	4	25
8	3	2	1	2	2	4	4	3	21
9	3	4	2	2	2	2	4	3	22
10	1	2	1	2	2	2	2	3	15
11	2	2	2	3	3	4	3	3	22
12	1	0	1	1	1	0	3	2	09
13	2	1	1	0	0	0	0	X	XX
14	X	X	3	X	X	X	X	X	XX
15	X	X	1	X	X	X	X	X	XX
16	X	X	3	2	3	4	4	3	XX
17	4	2	1	0	0	0	4	3	14
18	4	2	2	3	2	4	4	5	26
19	3	2	1	1	2	3	4	3	19
20	3	3	2	3	4	8	8	6	37
21	4	3	2	3	3	6	7	3	31
22	4	2	1	2	3	3	3	1	19
23	3	1	2	3	2	1	2	2	16
24	1	2	0	2	1	3	2	5	16
25	2	2	1	2	4	3	3	4	21
26	2	1	2	2	3	3	1	2	16
27	2	1	1	2	1	5	3	4	19
28	4	2	2	2	2	3	1	3	19
29	3	3	2	3	3	6	7	6	33
30	3	3	2	3	2	3	4	5	25

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR SEPTEMBER

HEARD ISLAND - Declination 50°23.2' west.
 Horizontal Intensity 18484 gammas.
 Vertical Intensity -47309 gammas.

PRINCIPAL MAGNETIC STORMS AT WATHEROO DURING SEPTEMBER

<u>Began at</u>	<u>Ended at</u>	<u>Intensity</u>	<u>Maximum</u>
<u>d h m</u>	<u>d h</u>		<u>K-Index</u>

n i l

SUDDEN COMMENCEMENTS AT WATHEROO DURING SEPTEMBER

<u>Day</u>	<u>Time</u>	<u>Type</u>
	<u>h m</u>	

n i l

PRINCIPAL MAGNETIC STORMS AT TOOLANGI DURING SEPTEMBER

<u>Began at</u>	<u>Ended at</u>	<u>Intensity</u>	<u>Maximum</u>
<u>d h m</u>	<u>d h</u>		<u>K-Index</u>
3 11 ..	04 18	Moderately severe	6
13 20 50	15 17	Moderate	5

SUDDEN COMMENCEMENTS AT TOOLANGI DURING SEPTEMBER

<u>Day</u>	<u>Time</u>	<u>Type</u>
	<u>h m</u>	

n i l

IONOSPHERIC DATA - WATHEROOMEDIAN HOURLY VALUES

120° Mean Time	<u>h'F1</u> Km	<u>h_pF2</u> Km	<u>h'F2</u> Km	<u>f_oE</u> Mc/s	<u>f_oF1</u> Mc/s	<u>f_oF2</u> Mc/s	<u>fEs</u> Mc/s	<u>MUF</u> <u>3000</u> Mc/s	<u>M3000</u>
00		320	250			3.1	+	9.7	3.1
01		300	250			3.2	+	10.2	3.2
02		300	240			3.2	+	10.2	3.2
03		285	220			3.1	+	10.0	3.2
04		310	250			3.0	+	9.2	3.1
05		320	250			2.8	+	8.6	3.0
06	*	300	250	1.3	*	2.9	+	9.0	3.2
07	250	300	250	1.7	(3.3)	4.0	+	13.6	3.3
08	235	320	300	2.3	3.7	4.7	+	15.7	3.3
09	220	340	310	2.8	4.0	5.0	+	16.5	3.2
10	210	370	350	3.0	4.2	5.0	+	15.8	3.2
11	210	385	350	3.0	4.2	5.2	3.4	16.0	3.1
12	210	360	330	3.1	4.2	5.6	+	17.8	3.1
13	210	325	300	3.2	4.2	5.7	+	19.0	3.2
14	210	330	305	3.0	4.1	5.5	3.2	18.8	3.3
15	200	310	300	2.9	4.0	5.2	3.0	17.3	3.3
16	220	300	290	2.6	3.7	5.3	2.6	17.1	3.3
17	220	270	250	2.1	3.0	4.9	+	16.4	3.3
18	*	270	240	1.6	*	4.3	+	14.0	3.4
19		295	240	*		3.8	+	12.1	3.2
20		300	250			3.5	+	10.8	3.1
21		320	250			3.4	+	10.2	3.1
22		300	250			3.2	+	10.4	3.1
23		310	250			3.2	+	10.0	3.1

+ Indicates fEs median below lowest frequency recorded.

* Denotes insufficient values.

() Indicates doubtful.

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	-	-	4	+	27
01	-	-	-	+	26
02	-	-	-	+	26
03	-	-	4	+	26
04	-	-	12	+	26
05	-	-	-	+	25
06	-	-	-	+	24
07	-	-	-	+	24
08	-	-	-	+	25
09	-	-	(15)	+	26 (1G)
10	-	-	(26)	+	23 (6G)
11	-	10	(62)	3.4	21 (5G)
12	-	6	(50)	+	18 (7G)
13	-	4	(35)	+	23 (11G)
14	-	9	(70)	3.2	23 (4G)
15	-	-	(54)	3.0	24 (3G)
16	-	-	(24)	2.6	25 (1G)
17	-	-	4	+	27
18	-	-	14	+	28
19	-	-	4	+	27
20	-	-	7	+	27
21	-	-	4	+	26
22	-	-	-	+	26
23	-	-	8	+	26

G Signifies fEs foE 3.0 Mc/s.

+ Indicates fEs median below lowest frequency recorded.

- Indicates zero percentage.

PROVISIONAL SUMMARY OF AURORAE FOR SEPTEMBER

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>
03	8	09 05	11 10	11 30	unknown	4	overhead
06	8	15 00	unknown	18 40	unknown	2	
15	8	08 30	09 00	15 40	unknown	3	overhead.
18	8	09 25	09 35	13 00	unknown	3	overhead
20	8	12 25	12 25	12 40	unknown	3	
23	8	10 00	unknown	15 20	unknown	3	
24	8	09 02	unknown	13 00	unknown	2	
25	0	08 45	09 57	17 30	unknown	4	overhead.
30	7	08 45	12 50		17 00	4	overhead

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>
03	8	21 20	21 25	22 00	unknown	2	
20	4	15 30	15 35	15 00	unknown	2	
29	1	17 45	19 55	21 30	unknown	2	
30	8	19 45	20 00	20 40	unknown	1	