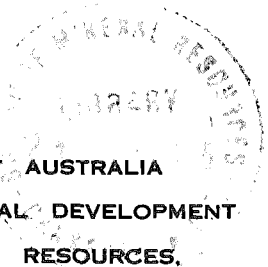


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COMMONWEALTH OF AUSTRALIA  
DEPARTMENT OF NATIONAL DEVELOPMENT  
BUREAU OF MINERAL RESOURCES,  
GEOLOGY AND GEOPHYSICS

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# GEOPHYSICAL OBSERVATORY REPORT

VOL. 3

No. 4

APRIL  
1955

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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

J. C. DOOLEY - 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 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 APRIL - WATHEROO

Range for lower limit of K=9 is 350 gammas

<u>Day</u>	<u>K-Indices</u>				<u>K-Sum</u>				
1	(3)	(3)	(2)	(3)	4	0	1	4	(20)
2	2	2	3	2	5	3	3	4	24
3	3	2	2	2	4	4	1	1	19
4	1	2	2	4	3	4	4	4	24
5	3	3	3	2	5	1	3	1	21
6	3	3	2	4	2	4	1	2	21
7	3	3	3	4	3	2	2	2	22
8	2	3	3	0	2	1	1	2	14
9	1	1	0	0	0	0	0	2	04
10	1	1	1	5	4	3	1	1	17
11	2	2	2	2	2	2	0	1	13
12	3	3	2	3	3	1	2	2	19
13	3	3	2	2	2	3	2	2	19
14	2	2	2	1	1	0	0	1	09
15	1	1	2	0	1	2	0	1	08
16	1	2	1	0	1	2	1	1	09
17	2	1	1	2	2	0	1	1	10
18	1	2	0	0	1	2	0	1	07
19	2	1	1	0	1	1	0	2	08
20	2	3	3	1	1	2	2	1	15
21	1	2	2	2	2	1	2	2	14
22	2	3	1	1	2	1	1	1	12
23	2	1	2	1	1	0	0	0	07
24	3	3	2	1	4	3	5	4	25
25	3	2	0	3	4	3	4	1	20
26	3	2	3	4	2	2	3	3	22
27	3	2	2	0	2	4	5	6	24
28	4	3	3	5	3	3	3	3	27
29	4	2	2	4	4	4	4	3	27
30	3	3	2	4	2	2	3	2	21

( ) Doubtful.

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR APRIL

WATHEROO - Declination            2° 44.8' west.  
Horizontal Intensity            24850 gammas.  
Vertical Intensity               -52168 gammas.

MAGNETIC K-INDICES FOR APRIL - TOOLANGI

Range for lower limit of K=9 is 500 gammas

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

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR APRIL

TOOLANGI - Declination 9° 58.5' east.  
Horizontal Intensity 22752 gammas.  
Vertical Intensity -56434 gammas.

MAGNETIC K-INDICES FOR APRIL - MACQUARIE ISLAND

Range for lower limit of K=9 is 1500 gammas

<u>Day</u>	<u>K-Indices</u>					<u>K-Sum</u>			
1	3	3	4	7	6	1	1	3	28
2	2	3	2	4	7	7	6	3	34
3	2	3	3	4	7	6	2	2	29
4	2	1	1	6	4	4	5	2	25
5	3	3	4	5	7	3	3	1	29
6	3	2	1	5	4	4	0	2	21
7	3	3	4	5	3	3	2	2	25
8	1	3	4	0	2	3	1	1	15
9	1	2	0	1	1	0	0	1	6
10	0	0	0	6	6	4	2	1	19
11	1	2	2	6	4	1	0	0	16
12	1	1	2	5	5	1	2	2	19
13	3	3	2	3	4	2	2	2	21
14	1	3	4	5	3	1	0	0	17
15	0	1	0	0	1	2	0	1	5
16	1	1	0	1	3	1	0	1	8
17	X	X	X	4	4	0	0	0	XX
18	0	0	0	0	2	3	1	0	6
19	0	1	1	0	0	0	0	1	3
20	2	2	3	0	3	3	1	1	15
21	0	1	3	3	4	3	1	1	16
22	0	2	2	3	2	1	1	1	12
23	0	0	1	2	0	0	0	0	3
24	1	1	2	3	6	7	6	3	29
25	2	2	2	5	5	4	4	2	26
26	3	3	5	7	5	3	2	3	31
27	3	3	3	1	3	5	7	7	32
28	4	4	6	7	5	3	3	3	35
29	4	3	4	6	5	4	4	4	34
30	4	3	2	7	3	1	1	2	23

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR APRIL

MACQUARIE ISLAND - Declination 24°37.7' east.  
Horizontal Intensity 13322 gammas.  
Vertical Intensity -64500 gammas.

PRINCIPAL MAGNETIC STORMS AT WATHEROO DURING APRIL

<u>Began at</u> d h m	<u>Ended at</u> d h	<u>Intensity</u>	<u>Maximum</u> <u>K-Index</u>
27 16 24	30 13	Moderately severe	6

SUDDEN COMMENCEMENTS AT WATHEROO DURING APRIL

<u>Day</u>	<u>Time</u> h m	<u>Type</u>
27	16 24	Storm Sudden Commencement

PRINCIPAL MAGNETIC STORMS AT TOOLANGI DURING APRIL

<u>Began at</u> d h m	<u>Ended at</u> d h	<u>Intensity</u>	<u>Maximum</u> <u>K-Index</u>
27 16 23	30 13	Moderately severe	6

SUDDEN COMMENCEMENTS AT TOOLANGI DURING APRIL

<u>Day</u>	<u>Time</u> h m	<u>Type</u>
5	13 26	Polar Sudden Commencement
16	12 48	Sudden impulse
27	16 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		305	255			3.3	2.7	10.0	3.1
01		310	250			3.5	3.4	10.3	3.1
02		300	250			3.3	2.4	10.0	3.1
03		290	250			3.3	2.4	10.4	3.2
04		270	240			3.5	2.1	11.0	3.3
05		275	230			3.2	1.6	10.2	3.2
06		285	240			3.0	1.9	9.5	3.2
07	*	250	240	1.7	*	4.5	*	15.4	3.5
08	230	250	250	2.3	3.5	5.8	2.6	20.2	3.6
09	220	270	250	2.7	4.0	6.4	3.1	21.4	3.4
10	210	260	260	2.9	4.2	6.3	3.3	21.8	3.5
11	200	280	270	3.0	4.4	6.1	3.6	21.0	3.4
12	200	300	290	3.1	4.4	6.5	3.7	22.2	3.2
13	210	300	280	3.1	4.4	6.8	3.7	22.9	3.3
14	230	300	280	3.0	4.4	6.9	3.7	23.2	3.3
15	230	285	270	3.0	4.0	7.0	3.7	23.3	3.3
16	240	260	250	2.6	3.7	7.0	3.6	24.0	3.5
17	*	250	240	2.2	*	6.4	3.6	23.2	3.6
18		250	220	*		5.4	2.6	18.8	3.5
19		250	210			3.8	1.8	12.7	3.3
20		300	250			3.0	1.8	9.4	3.1
21		300	250			3.2	*	10.0	3.1
22		300	250			3.2	<1.9	9.8	3.0
23		310	250			3.2	2.6	9.8	3.1

\* Denotes insufficient numerical values

IONOSPHERIC DATA - WATHEROO

SUMMARY 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	-	-	48	2.7	29
01	-	-	57	3.4	28
02	-	-	41	2.4	27
03	-	-	37	2.4	27
04	-	4	30	2.1	27
05	-	-	16	1.6	25
06	-	-	9	1.9	23
07	-	-	13	*	23
08	-	-	15	2.6	27
09	-	-	67	3.1	27
10	-	-	(85)	3.3	26(1G)
11	4	4	96	3.6	25
12	-	4	(96)	3.7	25(1G)
13	-	4	96	3.7	28
14	4	4	96	3.7	28
15	4	8	92	3.7	25
16	-	11	70	3.6	27
17	-	-	67	3.6	27
18	-	4	37	2.6	27
19	-	-	24	1.8	25
20	-	-	21	1.8	28
21	-	4	11	*	27
22	-	-	21	< 1.9	28
23	-	3	30	2.6	30

\* Denotes insufficient numerical values

(G) Signifies  $fE_s < f_oE \geq 3.0$  Mc/s.

PROVISIONAL SUMMARY OF AURORAE FOR APRIL

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

MACQUARIE ISLAND

<u>Day</u>	<u>Began</u>		<u>First</u>		<u>Minimum Geomagnetic</u>		<u>Intensity</u> <u>and Form</u>	<u>Last</u>		<u>Ended</u>	
	h	m	h	m	<u>Latitude</u> Degrees	<u>Time</u> h m		h	m		h
12			11	40	60	11 40	2 DS	12	20		
13			10	40	60	12 50	2 HA			16	00
24	09	00			59	18 20	4 RB	19	10		
25			08	10	60	10 50	1 HB	19	10		
26			07	10	59	08 00	1 HB	11	40		