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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. 1

JANUARY

1955

*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

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 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.
 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 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 JANUARY - 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	1	1	0	1	1	2	12
2	2	3	2	1	2	1	1	3	15
3	2	3	1	1	3	2	0	2	14
4	2	2	2	3	3	2	2	2	18
5	4	2	2	1	0	1	1	2	13
6	3	3	3	3	2	1	3	2	20
7	3	2	1	2	2	1	3	2	16
8	2	3	2	1	1	1	2	3	15
9	3	3	4	3	4	5	4	1	27
10	3	3	1	2	2	1	1	1	14
11	2	3	2	2	4	3	3	4	23
12	5	3	3	1	0	0	2	2	16
13	3	4	3	4	4	2	1	1	22
14	3	4	(1)	2	3	3	2	1	(19)
15	2	3	3	3	0	0	0	0	11
16	1	3	4	1	3	2	2	0	16
17	2	4	3	5	7	5	6	6	38
18	6	5	5	2	1	4	4	4	31
19	4	5	5	6	5	4	3	3	35
20	3	2	3	1	3	3	2	3	20
21	3	2	2	2	1	0	2	1	13
22	2	4	2	2	0	1	0	1	12
23	4	4	4	3	4	4	3	2	28
24	3	3	2	2	1	3	0	1	15
25	2	3	2	1	1	1	2	1	13
26	2	3	2	2	0	0	0	1	10
27	3	4	4	3	1	3	4	4	26
28	3	4	2	1	0	2	0	1	13
29	3	4	3	3	1	2	3	3	22
30	3	5	3	2	3	2	2	2	22
31	3	5	3	0	0	0	1	1	13

() Doubtful.

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR JANUARY

WATHEROO - Declination 2° 45.2' west.
Horizontal Intensity 24880 gammas.
Vertical Intensity -52168 gammas.

PROVISIONAL ANNUAL MEAN VALUES OF THE MAGNETIC ELEMENTS FOR 1954

WATHEROO - Declination 2° 46.0' west.
Horizontal Intensity 24868 gammas.
Vertical Intensity -52172 gammas.

MAGNETIC K-INDICES FOR JANUARY - 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	1	3	2	4	19
2	3	2	3	2	3	2	1	3	19
3	3	2	3	2	3	3	1	3	20
4	4	3	2	3	3	3	2	3	23
5	2	3	3	2	1	2	2	3	18
6	3	3	2	1	2	2	3	2	18
7	2	3	3	2	3	2	3	2	20
8	3	2	3	1	2	2	3	3	19
9	4	4	4	3	4	5	3	3	30
10	2	3	3	2	2	2	2	1	17
11	3	2	3	2	4	2	3	3	22
12	4	3	3	1	0	1	2	3	17
13	3	5	3	X	X	X	X	X	XX
14	2	3	2	2	3	3	3	2	20
15	2	3	2	1	0	0	2	2	12
16	3	2	3	2	3	3	2	3	21
17	2	3	3	5	7	5	5	5	35
18	6	5	5	2	3	3	4	3	31
19	4	6	6	6	5	3	3	3	36
20	3	3	3	2	3	3	3	4	24
21	4	3	2	1	2	1	2	2	17
22	2	3	3	2	1	1	2	2	16
23	3	3	3	3	4	3	3	3	25
24	2	3	2	2	1	2	1	1	14
25	2	2	2	0	3	3	1	3	16
26	2	3	2	1	1	0	1	3	13
27	2	3	2	2	2	3	4	3	21
28	3	4	3	1	1	3	1	2	18
29	2	3	3	2	1	2	3	3	19
30	3	4	3	2	3	2	2	3	22
31	3	4	3	1	0	0	2	3	16

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR JANUARY

TOOLANGI - Declination 9° 57.0' east.
Horizontal Intensity 22758 gammas.
Vertical Intensity -56435 gammas.

PROVISIONAL ANNUAL MEAN VALUES OF THE MAGNETIC ELEMENTS FOR 1954

TOOLANGI - Declination 9° 54.4' east.
Horizontal Intensity 22762 gammas.
Vertical Intensity -56425 gammas.

MAGNETIC K-INDICES FOR JANUARY - 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	3	2	2	0	2	2	2	15
2	2	2	2	1	1	1	1	2	12
3	0	2	2	1	2	3	1	1	12
4	3	2	1	1	5	3	1	2	18
5	1	1	1	0	1	0	1	2	07
6	2	3	1	1	1	1	1	1	11
7	1	2	2	1	5	5	2	2	20
8	1	1	1	1	0	0	1	1	06
9	2	3	4	6	7	7	4	1	34
10	1	1	1	1	0	2	2	1	09
11	1	1	1	1	7	6	2	3	22
12	3	2	1	1	1	0	1	1	10
13	3	4	4	6	5	3	1	0	26
14	1	1	1	2	4	4	2	1	16
15	1	1	1	0	0	0	0	1	04
16	1	0	2	1	5	5	1	1	16
17	1	3	2	5	7	7	6	5	36
18	7	6	6	2	4	5	3	4	37
19	6	7	7	7	6	6	4	4	47
20	3	3	2	0	5	5	3	3	24
21	2	2	1	2	3	1	1	1	13
22	2	1	3	0	0	1	1	1	09
23	2	2	3	4	6	3	2	2	24
24	1	2	1	0	2	2	1	2	11
25	1	1	1	1	2	2	1	1	10
26	1	1	1	0	1	0	0	1	05
27	1	1	1	2	1	4	4	2	16
28	3	3	3	3	0	3	0	1	16
29	1	1	1	2	2	2	1	2	12
30	2	2	1	1	4	2	1	1	14
31	1	1	2	1	0	0	0	0	05

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR JANUARY

MACQUARIE ISLAND - Declination 24°33.2' east.
Horizontal Intensity 13353 gammas.
Vertical Intensity -64495 gammas.

PROVISIONAL ANNUAL MEAN VALUES OF THE MAGNETIC ELEMENTS FOR 1954

MACQUARIE ISLAND - Declination 24°25.5' east.
Horizontal Intensity 13343 gammas.
Vertical Intensity -64516 gammas.

PRINCIPAL MAGNETIC STORMS AT WATHEROO DURING JANUARY

<u>Began at</u> d h m	<u>Ended at</u> d h	<u>Intensity</u>	<u>Maximum</u> <u>K-Index</u>
17 03 25	20 04	Moderately severe	7

SUDDEN COMMENCEMENTS AT WATHEROO DURING JANUARY

<u>Day</u>	<u>Time</u> h m	<u>Type</u>
11	12 19	Polar Sudden Commencement

PRINCIPAL MAGNETIC STORMS AT TOOLANGI DURING JANUARY

<u>Began at</u> d h m	<u>Ended at</u> d h	<u>Intensity</u>	<u>Maximum</u> <u>K-Index</u>
8 18 00	09 21	Moderate	6
13 02 00	Record incomplete from 11 00hr on 13th		
17 03 00	21 06	Moderately severe	7

SUDDEN COMMENCEMENTS AT TOOLANGI DURING JANUARY

<u>Day</u>	<u>Time</u> h m	<u>Type</u>
11	12 18	Polar Sudden Commencement
24	23 12	Sudden impulse

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		310	260			4.1	3.9	12.6	3.1
01		300	250			3.9	3.8	12.3	3.1
02		310	255			3.5	3.7	11.2	3.1
03		310	260			3.3	2.9	10.6	3.1
04		310	250			3.1	2.4	9.4	3.0
05		320	270			2.8	1.8	9.1	3.0
06		295	250	1.7		3.8	2.1	12.0	3.1
07	230	290	320	2.3	3.7	4.3	3.1	13.4	3.2
08	235	305	310	2.9	4.1	5.0	3.7	16.0	3.1
09	225	335	360	3.1	4.3	5.5	4.0	15.8	2.8
10	210	340	385	3.3	4.4	5.9	4.2	17.0	2.9
11	205	350	355	3.4	4.5	6.2	4.1	17.9	2.8
12	200	330	330	3.5	4.5	6.2	4.1	19.1	3.0
13	220	330	340	3.4	4.5	6.2	4.2	19.5	3.0
14	210	330	330	3.4	4.5	6.1	3.8	18.4	3.0
15	215	330	335	3.3	4.4	6.2	3.8	18.8	3.1
16	225	320	330	3.1	4.2	5.8	3.6	18.3	3.1
17	240	300	315	2.8	4.0	5.6	3.5	17.6	3.2
18	230	300	295	2.3	3.5	5.0	3.5	16.0	3.1
19		300	260			4.4	2.1	14.2	3.2
20		300	250			4.3	2.1	14.0	3.3
21		300	250			4.3	1.8	13.5	3.2
22		300	250			4.2	3.2	13.6	3.2
23		310	270			4.2	3.8	13.3	3.2

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	-	3	83	3.9	30
01	-	-	82	3.8	28
02	-	4	78	3.7	27
03	4	4	50	2.9	26
04	-	-	42	2.4	24
05	-	-	38	1.8	24
06	-	-	43	2.1	23
07	-	-	55	3.1	20
08	5	9	91	3.7	22
09	3	17	93	4.0	29
10	7	31	100	4.2	29
11	7	26	100	4.1	27
12	10	28	100	4.1	29
13	18	29	100	4.2	28
14	10	28	(93)	3.8	29(1G)
15	11	15	93	3.8	27
16	11	15	89	3.6	27
17	12	16	(84)	3.5	25(1G)
18	-	4	80	3.5	25
19	-	-	43	2.1	23
20	-	-	44	2.1	27
21	-	-	35	1.8	26
22	-	-	56	3.2	27
23	-	4	74	3.8	27

- Indicates zero percentage.

() Indicates doubtful.

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

PROVISIONAL SUMMARY OF AURORAE FOR JANUARY

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

MACQUARIE ISLAND

<u>Day</u>	<u>Cloud</u>	<u>First</u>	<u>Time of</u>	<u>Last</u>	<u>Time</u>	<u>Intensity</u>	<u>Remarks</u>
<u>Cover</u>	<u>Seen</u>	<u>Maximum</u>	<u>Seen</u>	<u>End</u>			
	h m	h m	h m	h m			

N i l