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

GEOPHYSICAL OBSERVATORY REPORT

VOL. 3

Nº. 10

OCTOBER
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

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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:-

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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
 Sweep time 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.
 La Cour pattern QHMs Nos.288,289,290.
 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 OCTOBER - WATHEROO

Range for lower limit of K=9 is 350 gammas

<u>Day</u>	<u>K-Indices</u>								<u>K-Sum</u>
1	3	1	2	4	3	1	2	2	18
2	3	2	3	3	4	4	4	1	24
3	3	3	3	3	2	2	1	1	18
4	2	2	2	3	1	0	0	1	11
5	3	4	3	2	3	4	4	4	27
6	4	3	3	3	3	4	1	0	21
7	0	1	1	2	2	2	0	4	12
8	3	3	3	2	1	2	2	2	18
9	1	1	1	0	0	2	0	4	09
10	3	3	4	3	3	2	1	0	19
11	2	1	3	3	3	2	1	0	15
12	3	2	0	0	0	0	0	0	05
13	3	2	2	1	0	0	0	1	09
14	1	2	3	2	1	0	1	1	11
15	1	3	2	0	0	0	0	1	07
16	2	2	2	1	1	1	0	1	10
17	3	4	2	1	1	0	0	1	12
18	2	2	1	1	0	0	0	1	07
19	1	2	1	1	1	0	0	1	07
20	3	2	3	2	3	2	1	1	17
21	1	1	1	2	1	2	2	2	12
22	2	1	1	3	3	1	1	1	13
23	3	2	0	2	2	2	1	1	13
24	1	4	2	0	0	0	0	1	08
25	3	3	5	5	5	6	5	3	35
26	5	3	3	4	4	4	5	2	30
27	3	2	2	2	1	2	2	2	16
28	2	2	2	2	3	2	0	1	14
29	2	1	1	1	1	4	3	2	15
30	3	3	2	1	2	3	3	1	18
31	2	2	3	2	3	3	4	4	23

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR OCTOBER

<u>WATHEROO</u> - Declination	2° 44.2' west.
Horizontal Intensity	24856 gammas.
Vertical Intensity	-52176 gammas.

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

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR OCTOBER

TOOLANGI - Declination 10°00.2' east.
 Horizontal Intensity 22754 gammas.
 Vertical Intensity -56422 gammas.

C O R R I G E N D U MPRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR AUGUST

(Geophysical Observatory Report Vol.3 No.8.)

For Declination read 10°00.0' east instead of west.

MAGNETIC K-INDICES FOR OCTOBER - 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	4	7	4	1	1	22
2	3	2	5	4	6	6	4	31
3	3	3	4	5	3	4	1	24
4	2	3	3	5	3	1	0	18
5	1	2	1	4	5	5	4	25
6	3	3	5	5	6	5	2	29
7	1	1	1	4	4	2	1	17
8	2	3	5	4	2	1	1	19
9	1	1	1	0	0	1	1	7
10	2	3	5	5	6	4	2	28
11	1	2	6	5	5	3	1	23
12	0	0	1	0	0	0	0	1
13	0	1	1	1	0	1	0	4
14	1	3	3	2	1	0	0	10
15	0	0	1	1	0	0	0	3
16	X	X	X	0	0	1	0	XX
17	1	1	1	0	0	0	0	4
18	0	0	1	0	0	0	0	1
19	0	1	0	0	0	0	0	2
20	2	1	3	4	4	4	1	19
21	0	1	1	3	3	1	1	10
22	0	1	2	4	4	3	2	16
23	0	1	1	5	4	1	1	14
24	0	1	0	0	0	0	0	1
25	3	3	6	6	6	7	6	41
26	5	5	5	7	7	5	6	42
27	2	3	5	5	4	4	2	26
28	1	1	1	5	5	4	1	19
29	1	3	2	2	3	4	4	20
30	1	1	1	4	5	5	4	22
31	3	4	5	4	6	7	6	40

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR OCTOBER

MACQUARIE ISLAND - Declination 24°43.4' east.
Horizontal Intensity 13334 gammas.
Vertical Intensity -64456 gammas.

MAGNETIC K-INDICES FOR OCTOBER - MAWSON

Range for lower limit of K=9 is 1500 gammas

<u>Day</u>	<u>K-Indices</u>								<u>K-Sum</u>
1	6	3	3	5	3	2	5	6	33
2	3	4	3	4	4	5	7	4	34
3	4	5	5	4	3	4	3	2	30
4	5	4	4	3	3	2	4	5	30
5	5	4	2	3	4	5	7	6	36
6	3	5	4	4	4	6	5	5	36
7	4	4	2	2	2	3	3	4	24
8	4	4	4	2	2	2	2	4	24
9	3	4	2	1	0	2	2	7	21
10	4	4	4	4	3	4	4	2	29
11	2	3	4	3	4	4	5	1	26
12	2	2	1	1	0	0	2	3	11
13	2	2	2	2	2	2	4	4	20
14	4	3	3	4	3	1	2	5	25
15	2	3	2	1	0	0	3	5	16
16	5	3	2	1	1	2	0	4	18
17	4	4	2	0	0	0	2	2	14
18	1	1	1	0	0	0	0	1	04
19	2	2	0	1	0	0	0	3	08
20	3	4	2	2	4	3	3	4	25
21	1	2	2	1	2	3	3	6	20
22	3	2	3	2	4	5	4	2	25
23	4	4	2	2	2	2	1	1	18
24	2	1	1	1	1	0	1	3	10
25	6	6	6	6	5	6	7	7	49
26	7	6	6	4	5	7	7	5	47
27	4	4	5	3	3	5	5	5	34
28	3	4	3	4	4	4	2	5	29
29	3	4	2	3	3	4	6	5	30
30	3	2	2	3	3	4	6	4	27
31	5	7	5	3	5	5	8	6	44

PRELIMINARY MEAN VALUES OF THE MAGNETIC ELEMENTS FOR OCTOBER

MAWSON - Will be published when available.

PRINCIPAL MAGNETIC STORMS AT WATHEROO DURING OCTOBER

<u>Began at</u> d h m	<u>Ended at</u> d h	<u>Intensity</u>	<u>Maximum</u> <u>K-Index</u>
25 06 00	26 20	Moderately severe	6

SUDDEN COMMENCEMENTS AT WATHEROO DURING OCTOBER

<u>Day</u>	<u>Time</u> h m	<u>Type</u>
7	22 56	Polar Sudden Commencement
30	17 05	Polar Sudden Commencement

PRINCIPAL MAGNETIC STORMS AT TOOLANGI DURING OCTOBER

<u>Began at</u> d h m	<u>Ended at</u> d h	<u>Intensity</u>	<u>Maximum</u> <u>K-Index</u>
25 01 00	27 18	Moderately severe	6

SUDDEN COMMENCEMENTS AT TOOLANGI DURING OCTOBER

<u>Day</u>	<u>Time</u> h m	<u>Type</u>
7	22 57	Sudden impulse
22	13 16	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>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		350	260			4.6	1.2	13.4	2.9
01		330	255			4.4	2.0	13.4	3.0
02		330	250			4.2	E	12.5	3.0
03		335	250			4.0	E	11.5	3.0
04		345	260			3.8	E	11.0	2.9
05		340	250			3.8	E	11.2	2.9
06	*	280	250	1.8		5.0	G	17.0	3.2
07	230	280	260	2.5	3.7	5.8	2.6	19.1	3.3
08	220	290	280	2.9	4.4	6.6	3.1	21.6	3.2
09	220	310	300	3.2	4.7	6.7	3.7	21.0	3.1
10	210	330	330	3.3	4.8	7.2	3.8	22.2	3.0
11	205	320	310	3.4	4.9	7.6	3.8	23.4	3.0
12	200	340	320	3.5	4.9	7.7	3.8	23.4	3.0
13	200	320	310	3.5	4.8	7.8	3.8	24.7	3.1
14	220	320	310	3.4	4.8	8.0	3.6	25.3	3.1
15	220	320	300	3.2	4.6	8.0	3.6	25.0	3.1
16	230	310	290	3.0	4.3	7.7	3.7	24.7	3.2
17	240	300	270	2.5	3.8	7.4	2.8	23.6	3.2
18	*	280	250	1.9	*	7.3	(1.6)	23.7	3.2
19		290	230			7.1	E	23.2	3.2
20		320	230			6.4	E	20.0	3.0
21		350	250			5.2	E	15.6	2.9
22		350	260			4.9	E	14.1	2.9
23		350	265			4.8	E	13.6	2.9

() Indicates doubtful.

* Denotes insufficient numerical values.

E Denotes frequency less than 1.0 Mc/s.

G Signifies fEs median foE.

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	1.2	29
01	-	-	14	2.0	29
02	-	-	3	E	29
03	-	-	14	E	29
04	-	-	10	E	29
05	-	-	3	E	29
06	-	-	7	G	30
07	-	-	11	2.6	27
08	-	-	(63)	3.1	27 (3G)
09	-	4	(85)	3.7	26 (4G)
10	-	15	(92)	3.8	26 (2G)
11	4	12	(92)	3.8	25 (2G)
12	7	10	(90)	3.8	29 (3G)
13	-	7	(90)	3.8	30 (3G)
14	-	4	(75)	3.6	28 (7G)
15	-	3	(76)	3.6	29 (7G)
16	-	-	(73)	3.7	30 (7G)
17	-	-	42	2.8	31
18	-	-	7	(1.6)	30
19	-	-	7	E	30
20	-	-	3	E	31
21	-	-	3	E	31
22	-	-	13	E	30
23	-	-	17	E	30

- Indicates zero percentage.

() Indicates doubtful.

E Denotes frequency less than 1.0 Mc/s.

G Signifies fEs foE 3.0 Mc/s.

PROVISIONAL SUMMARY OF AURORAE FOR OCTOBER

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</u>	<u>Geomagnetic</u>	<u>Intensity</u>	<u>Last</u>	<u>Ended</u>
		<u>Seen</u>	<u>Latitude</u>	<u>Time</u>	<u>and Form</u>	<u>Seen</u>	
	h m	h m	Degrees	h m		h m	h m
03	Display seen	-	no details				
04	Display seen	-	no details				
05		10 00	60	13 00	1 HB	15 20	
06		09 40	59	10 30	1 HB	15 50	
07		10 40	60	12 10	1 HB		16 50
08	09 00		60	10 00	1 HB	10 50	
21	Display seen	-	no details				
22	Display seen	-	no details				
25	09 00		55	11 00	3 RB	17 10	
26	Display seen	-	no details				