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

GEOPHYSICAL
OBSERVATORY REPORT

VOL. 12

No. 12

DECEMBER

1964

*Issued under the authority of the Hon. D.E. Fairbairn,
Minister for National Development*

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DEPARTMENT OF NATIONAL DEVELOPMENT

Minister - Hon. D.E. Fairbairn, D.F.C., M.P.

Secretary - Sir HAROLD RAGGATT, C.B.E.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

J.M. RAYNER - Director

This Report was prepared in the Geophysical Branch;

L.S. PRIOR - Assistant Director

W.D. Parkinson - 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:-

Assistant Director (Geophysics),
Bureau of Mineral Resources,
Geology and Geophysics,
203 Collins Street,
MELBOURNE, C.I.,
A U S T R A L I A.

CONTRIBUTING OBSERVATORIES

GNANGARA MAGNETIC OBSERVATORY

P.M. McGregor, Observer in Charge

Geographic Latitude	31°47'S	Longitude	115°57'E
Geomagnetic Latitude	-43.2°	Longitude	185.8°

Instruments

Askania magnetometer No.508810

La Cour QHMs No.291, 292, 293

La Cour BMZ No.120

Eschenhagen D, H & Z recording variometers

Sensitivity	:	D 1.1 min/mm
		H 2.6 Y/mm
		Z 5.3 Y/mm
Recording speed	:	20 mm/hour
Askania (Eschenhagen type) H variometer with visual recorder		
Sensitivity	:	3 Y/mm
Recording speed	:	20 mm/hour

MACQUARIE ISLAND MAGNETIC OBSERVATORY

R.G. Sutton, Observer in Charge

Geographic Latitude	54°30'S	Longitude	158°57'E
Geomagnetic Latitude	-60.7°	Longitude	243.0°

Instruments

Askania declinometer No.640505

La Cour QHMs Nos.177, 178, 179

La Cour BMZ No.64

La Cour D, H & Z recording variometers

Standard instrument : Sensitivity	:	D 2.4 min/mm
		H 25 Y/mm
		Z 21 Y/mm
Recording speed	:	15 mm/hour
Rapid-run instrument: Sensitivity	:	D 1.0 min/mm
		H 5.4 Y/mm
		Z 9 Y/mm
Recording speed	:	180 mm/hour

CONTRIBUTING OBSERVATORIES

MAWSON MAGNETIC OBSERVATORY

R.J.S. Cooke, Observer in Charge

Geographic Latitude	67°36'S	Longitude	62°53'E
Geomagnetic Latitude	-73.2°	Longitude	103.1°

Instruments

Askania declinometer No.630332

La Cour QHMs Nos.300, 301, 302

La Cour BMZ No.62

La Cour D, H & Z recording variometers

Normal sensitivity	:	D	0.9 min/mm
		H	9.4 γ/mm
		Z	10.0 γ/mm

Recording speed	:	15 mm/hour
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Low sensitivity	:	D	2.4 min/mm
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		H	51 γ/mm
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		Z	50 γ/mm
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Recording speed	:	15 mm/hour
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Bar fluxmeter D magnetograph

Recording speed	:	5 mm/minute
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PORT MORESBY MAGNETIC OBSERVATORY

J.A. Brooks, Observer in Charge

Geographic Latitude	9°24'S	Longitude	147°09'E
Geomagnetic Latitude	-18.7°	Longitude	218.0°

Instruments

Askania declinometer No.580333

La Cour QHMs Nos.187, 188, 189

La Cour BMZ No.68

La Cour D, H & Z recording variometers

Standard instrument : Sensitivity	:	D	0.44 min/mm
		H	2.9 γ/mm
		Z	3.2 γ/mm

Recording speed	:	15 mm/hour
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Rapid-run instrument: Sensitivity	:	D	0.05 min/mm
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		H	1.2 γ/mm
--	--	---	----------

		Z	0.3 γ/mm
--	--	---	----------

Recording speed	:	180 mm/hour
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CONTRIBUTING OBSERVATORIES

TOOLANGI MAGNETIC OBSERVATORY

C.A. van der Waal, Observer in Charge

Geographic Latitude	37°32'S	Longitude	145°28'E
Geomagnetic Latitude	-46.7°	Longitude	220.8°

Instruments

Ruska magnetometer No.4813

La Cour QHMs Nos.288, 289, 290

La Cour BMZ No.119

La Cour D, H & Z recording variometers

Sensitivity	: D 1.2 min/mm
	H 4.6 Y/mm
	Z 4.4 Y/mm

Recording speed	: 15 mm/hour
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WILKES MAGNETIC OBSERVATORY

G.R. Small, Observer in Charge

Geographic Latitude	66°15'S	Longitude	110°31'E
Geomagnetic Latitude	-77.2°	Longitude	179.2°

Instruments

C.I.W. field magnetometer and theodolite earthinductor No.28

La Cour QHMs Nos.492, 493, 494

La Cour BMZ No.236

Ruska D, H & Z recording variometers

Standard instrument : Sensitivity	: D 10.6 min/mm
	H 24 Y/mm
	Z 24 Y/mm

Recording speed	: 20 mm/hour
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Rapid-run instrument: Sensitivity	: D 1.3 min/mm
	H 5.3 Y/mm
	Z 6.3 Y/mm

Recording speed	: 240 mm/hour
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M A W S O N

MAGNETIC K-INDICES - DECEMBER 1964

Range for lower limit of K=9 is 1500 gammas

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

PRELIMINARY MONTHLY MEAN VALUES

Based on 10 selected quiet days

1964	H	D	Z
	Y	°	Y
December	18364	61 06.3W	-48460

W I L K E S

MAGNETIC K-INDICES - DECEMBER 1964

Range for lower limit of K=9 is 2500 gammas

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

PRELIMINARY MONTHLY MEAN VALUES

Based on 10 selected quiet days

1964	H	D	Z
	γ	°	γ
December	9226	86 05.0W	-64747

MACQUARIE ISLAND

MAGNETIC K-INDICES - DECEMBER 1964

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	2	4	4	0	0	19
2	0	1	1	1	0	0	0	0	03
3	0	1	1	4	3	1	1	1	12
4	2	1	0	2	1	1	1	1	09
5	0	0	0	0	0	0	0	1	01
6	0	1	0	0	1	0	1	1	04
7	1	1	0	4	5	4	2	2	19
8	2	2	3	0	2	2	0	0	11
9	1	1	1	2	1	1	0	0	07
10	0	0	0	1	1	0	0	0	02
11	0	0	0	0	1	0	0	0	01
12	1	0	0	0	0	0	0	0	01
13	0	1	0	1	0	4	2	1	09
14	1	0+	1+	3+	2+	1+	0+	0+	08+
15	1	1	1	1	0	0	0	1	05
16	1	1	1	5	7	1	1	1	18
17	3+	-	3+	3+	4+	3+	1+	1+	18+
18	1	1	2	0	1	0	0	0	05
19	0	0	0	1	4	4	1	0	10
20	1	0	0	3	0	0	1	1	06
21	0	0	0	0	1	2	0	0	03
22	0	0	0	1	2	1	0	0	04
23	0	1	0	1	2	0	0	0	04
24	0	0	0	0	1	0	0	0	01
25	0	0	0	0	2	0	0	1	03
26	1	0	0	1	2	0	0	0	04
27	1	0	0	0	0	0	0	0	01
28	0	0	0	0	1	0	1	1	03
29	2	1	2	1	1	0	0	0	07
30	0	0	0	0	0	0	0	0	00
31	0	1	0	0	0	0	0	0	01

PRELIMINARY MONTHLY MEAN VALUES

Based on 10 selected quiet days

1964	H	D	Z
	γ	°	γ
December	13166	26 23.0E	-64233*

* Provisional instrument correction changed by 25 gammas

T O O L A N G I

MAGNETIC K-INDICES - DECEMBER 1964

Range for lower limit of K=9 is 500 gammas

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

T O O L A N G I

PRELIMINARY MONTHLY MEAN VALUES

Based on 10 selected quiet days

1964	H γ	D °	Z γ
December	22564	10 29.9E	-56371

PRINCIPAL MAGNETIC STORMS - DECEMBER 1964

NIL

SUDDEN COMMENCEMENTS AND OTHER PHENOMENA - DECEMBER 1964

<u>Day</u>	<u>Time</u> h m	<u>Type</u>	<u>Sense of Movement</u>		
			<u>H</u>	<u>D</u>	<u>Z</u>
01	13 50	bp C		+	+
02	07 20	pi2 B			
03	11 25	pi2 B			
04	10 32	pi2 B			
05	09 35	pi2 B			
06	05 44	pi2 B			
07	09 41	bs B	+		
07	10 05	pi2 B			
10	10 01	pi2 B			
11	07 57	pi2 B			
11	13 14	pi2 B			
12	11 40	pi2 B			
13	10 15	pi2 B			
16	10 06	bp B	+	-	+
16	13 08	bps B	+	-	+
17	08 46	bp C		-	+
18	12 07	bp C	+	-	+
19	12 16	bp B	+		+
20	09 36	pi2 B			
22	10 21	pi2 B			
22	14 11	bp B	+		+
24	12 11	pi2 B			
25	13 49	bps B	+	-	+
26	00 58	bp B	+	-	+
26	10 00	pi2 B			
26	13 55	bp B	+	+	+
30	08 30	pi2 B			
30	15 24	pi2 B			
31	13 15	pi2 B			

G N A N G A R AMAGNETIC K-INDICES - DECEMBER 1964

Range for lower limit of K=9 is 350 gammas

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

Note: No H Trace from 1200h 30th Dec. -
2400h 31st Dec. 1964.

G N A N G A R A

PRELIMINARY MONTHLY MEAN VALUES

Based on 5 selected quiet days

1964	H Y	D ° ' "	Z Y
December	23917	2 51.6W	-53501

PRINCIPAL MAGNETIC STORMS - DECEMBER 1964

NIL

SUDDEN COMMENCEMENTS AND OTHER PHENOMENA - DECEMBER 1964

<u>Day</u>	<u>Time</u> h m	<u>Type</u>	<u>Sense of Movement</u>		
			<u>H</u>	<u>D</u>	<u>Z</u>
01	11 56	pi2 B			
04	16 30	pi2 B			
05	15 42	pi2 B			
07	09 42	bs B	-	-	-
11	13 10	pi2 B			
12	11 31	pi2 B			
13	16 17	bp A	+	+	+
16	13 29	bp A	-	-	-
18	13 06	si B			
19	12 07	pi2 A			
23	15 01	pi2 A			

P O R T M O R E S B Y

MAGNETIC K-INDICES - DECEMBER 1964

Range for lower limit of K=9 is 300 gammas

<u>Day</u>	<u>K-Indices</u>								<u>K-Sum</u>
1	1	2	2	3	2	2	1	1	14
2	1	1	1	2	0	0	1	2	08
3	1	1	1	2	1	1	2	1	10
4	3	2	1	1	1	1	2	1	12
5	1	1	1	0	1	1	2	2	09
6	2	1	2	1	0	1	1	2	10
7	1	1	2	4	3	3	2	2	18
8	1	1	2	0	1	0	0	1	06
9	2	2	3	1	1	2	1	2	14
10	1	1	0	1	1	1	0	0	05
11	0	1	1	2	2	2	1	2	11
12	2	1	1	1	1	0	1	2	09
13	1	2	2	3	3	4	3	2	20
14	3	2	3	2	2	2	3	2	19
15	2	3	1	1	2	1	2	2	14
16	2	2	2	3	5	3	2	2	21
17	3	3	2	1	2	2	2	2	17
18	2+	1	2	1	1	1	1	1	10+
19	1	1	1	1	3	2	3	2	14
20	2	1	1	2	2	2	2	1	13
21	1	1	1	2	2	2	2	1	12
22	1	1	1	1	3	1	1	1	10
23	1	1	2	2	1	2	2	2	13
24	2	3	2	2	2	2	2	2	17
25	2	2	1	1	3	1	1	2	13
26	2	1	1	2	3	1	1	2	13
27	2	2	2	1	1	2	2	1	13
28	2	1	2	1	1	2	2	3	14
29	3	1	3	2	1	1	1	1	13
30	1	1	1	1	2	1	1	2	10
31	2	2+	2	2	2	1	1	2	14+

P O R T M O R E S B Y

PRELIMINARY MONTHLYMEAN VALUES

Based on 10 selected quiet days

1964	H γ	D ° , '	Z γ
December	36350	06 07.7E	-22977

PRINCIPAL MAGNETIC STORMS - DECEMBER 1964

NIL

SUDDEN COMMENCEMENTS AND OTHER PHENOMENA - DECEMBER 1964

<u>Day</u>	<u>Time</u> h m	<u>Type</u>	Sense of Movement		
			H	D	Z
07	09 40	si B	-		-
16	13 10	bp B	+	-	+
19	12 45	bp B	+		+
22	14 10	bp B	+		+

12/12
C

PRELIMINARY ANNUAL MEAN VALUES 1964

	H Y	D ° ' "	Z Y
Mawson	18353	60 59.2W	-48460
Wilkes	9228	85 56.8W	-64793
Macquarie Island	13177	26 16.7E	-64255
Toolangi	22565	10 29.2E	-56383
Gnangara	23916	2 51.7W	-53501
Port Moresby	36357	6 07.4E	-22964

Preliminary Annual Mean Value for Vertical Intensity at
Macquarie Island, based on amended monthly mean values :-

1962 -64337Y
1963 -64293Y

