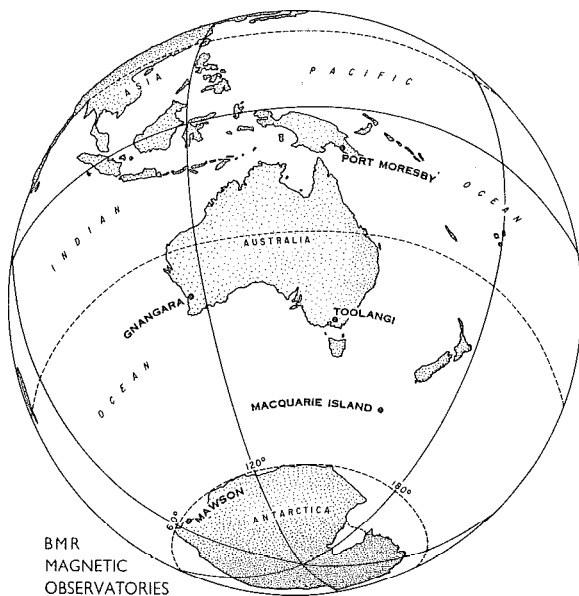




BUREAU OF MINERAL RESOURCES,
GEOLOGY & GEOPHYSICS

GEOPHYSICAL OBSERVATORY REPORT



Volume 15, No. 12
December 1967

*Issued under the authority of
The Hon. David Fairbairn, Minister for National Development*

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

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The terminology used in this report is that accepted by international convention. All times are in Greenwich Mean Time. Should further information be required, explanation can be obtained by applying to:-

Assistant Director (Geophysics),
Bureau of Mineral Resources,
P.O. Box 378,
CANBERRA CITY. A.C.T. 2601.

CONTRIBUTING OBSERVATORIES

OBSERVATORY	OBSERVER IN CHARGE	GEOGRAPHIC		GEOMAGNETIC	
		LAT.	LONG.	LAT.	LONG.
GNANGARA	<i>I.B. Everingham</i>	31°47'S	115°57'E	-43.2°	185.8°
MACQUARIE I.	<i>J. Major</i>	54°30'S	158°57'E	-60.7°	243.0°
MAWSON	<i>V. Dent</i>	67°36'S	62°53'E	-73.2°	103.1°
PORT MORESBY	<i>D. Denham</i>	9°24'S	147°09'E	-18.7°	218.0°
TOOLANGI	<i>C.A. van der Waal</i>	37°32'S	145°28'E	-46.7°	220.8°

MAGNETOGRAPHS

OBSERVATORY	TYPE	NOMINAL SCALE VALUES								
		NORMAL			INSENSITIVE			RAPID RUN		
		D	H	Z	D	H	Z	D	H	Z
GNANGARA	<i>Eschenhagen</i>	1.1	2.5	5.3						
MACQUARIE I.	<i>La Cour</i>	2.4	25	21				1.0	5.4	6.1
MAWSON	<i>La Cour</i>	0.9	9.6	9.7	2.4	51	50			
PORT MORESBY	<i>La Cour</i>	0.4	2.8	3.3				0.05	1.2	0.3
TOOLANGI	<i>La Cour</i>	1.2	4.5	4.4						

Scale values are in minutes of arc/mm (D) and gammas/mm (H,Z)

G N A N G A R A

MAGNETIC K-INDICES - DECEMBER 1967

Range for lower limit of K=9 is 350 gammas

<u>Day</u>	<u>K-Indices</u>					<u>K-Indices</u>				<u>K-Sum</u>
1	3	3	3	5		4	4	5	5	32
2	4	3	3	1		3	2	1	2	19
3	1	2	2	2		3	2	1	2	15
4	2	2	2	2		2	1	1	2	14
5	1	1	1	1		1	3	3	5	16
6	3	3	3	4		4	4	4	5	30
7	5	3	3	3		3	5	4	3	29
8	3	4	3	2		3	5	4	4	28
9	3	2	2	1		3	3	3	2	19
10	3	2	2	2		1	0	0	1	11
11	3	1	1	1		1	2	0	1	10
12	2	2	0	2		0	2	2	3	13
13	2	2	3	1		1	1	2	3	15
14	1	1	1	1		1	2	0	1	08
15	3	2	3	1		3	2	3	3	20
16	3	3	3	3		2	3	2	2	21
17	2	2	2	3		2	2	2	2	17
18	3	4	5	3		5	4	3	4	31
19	4	3	3	2		5	4	6	6	33
20	4	4	3+	4+		5	5	4	3	32+
21	3	2	4	4		4	4	3	3	27
22	2	3	3	3		3	2	2	4	22
23	3	3	2	3		3	4	5	3	26
24	2	1	2	2		2	2	1	1	13
25	1	1	1	1		2	0	0	2	08
26	1	2	3	2		2	2	2	2	16
27	3	2	3	2		3	2	1	2	18
28	2	2	2	1		1	1	2	2	13
29	4	2	1	0		1	1	1	3	13
30	3	2	2	2		3	3	2	3	29
31	4	3	4	5		5	6	6	3	36

MACQUARIE ISLAND
MAGNETIC K-INDICES - DECEMBER 1967

Range for lower limit of K=9 is 1500 gammas

<u>Day</u>	<u>K-Indices</u>				<u>K-Indices</u>				<u>K-Sum</u>
1	3	5	6	7	6	7	6	5	45
2	6	4	4	3	5	2	0	2	26
3	1	3	3	5	6	5	1	2	26
4	3	2	2	3	2	1	1	1	15
5	2	1	1	3	2	4	3	3	19
6	3	4	2	5	6	6	4	4	34
7	5	3	4	5	6	6	3	2	34
8	3	4	5	4	4	4	4	4	32
9	2	2	1	1	5	4	4	2	21
10	3	2	3	3	1	0	1	1	14
11	2	1	0	0	1	1	0	1	06
12	2	3	2	1	0	3	1	1	13
13	1	1	2	2	1	0	1	1	09
14	2	1	1	2	3	3	1	1	14
15	3	4	3	3	5	3	2	3	26
16	2	3	2	2	1	2	2	1	15
17	2	4	5	6	5	2	2	1	27
18	3	3	6	3	7	7	5	2	36
19	4	4	3	5	6	5	6	5	38
20	4	4	4	7	6	6	5	3	39
21	4	2	4	6	6	5	2	2	31
22	2	4	4	4	4	3	2	2	25
23	4	3	2	3	4	4	2	2	24
24	1	1	0	3	3	2	0	0	10
25	0	0	0	0	1	1	0	1	03
26	1	2	0	1	4	4	1	1	14
27	2	2	3	4	5	5	0	1	22
28	1	1	0	0	0	0	2	2	06
29	2	1	1	0	0	0	1	2	07
30	2	2	1	2	4	2	2	2	17
31	5	4	6	7	7	7	6	6	48

M A W S O N

MAGNETIC K-INDICES - DECEMBER 1967

Range for lower limit of K=9 is 1500 gammas

<u>Day</u>					<u>K-Indices</u>					<u>K-Sum</u>
1	4	6	6	6	4	4	6	6	42	
2	5		5	4	4	4	5	5	38	
3	4	2	3	5	5	4	3	6	32	
4	4	5	3	3	3	3	3	5	29	
5	3	3	2	3	3	4	3	6	27	
6	3	6	4	4	5	7	6	6	41	
7	6	5	5	4	4	4	6	3	37	
8	5	5	5	5	4	6	7+	5	42+	
9	5	4	3	2	4	4	5	4	31	
10	5	4	3	4	2	2	3	4	27	
11	5	4	2	2	2	3	1	3	22	
12	4	5	5	3	2	3	4	4	30	
13	3	4	3	2	2	2	3	2	21	
14	4	4	2	3	2	3	3	4	25	
15	5	5	4	3	3	4	4	4	32	
16	4	4	2	4	3	3	3	4	27	
17	5	4	5	4	5	4	2	5	34	
18	5	5	6	5	5	4	5	3	38	
19	4	5	4	5	5	5	7	6	41	
20	4	6	5	6	6	6	5	4	42	
21	4	4	4	5	4	5	5	4	35	
22	5	4	4	4	5	4	3	6	35	
23	5	5	4	3	4	5	7	4	37	
24	3	4	3	3	4	3	4	5	29	
25	4	4	3	2	4	3	2	3	25	
26	4	5	2	4	4	4	3	3	29	
27	5	3	4	5	5	4	1	4	31	
28	3	4	2	1	2	2	4	4	22	
29	5	4	3	3	3	2	2	3	25	
30	4	4	3	3	4	4	4	4	30	
31	5	6	7	5	6	8	8	3	48	

P O R T M O R E S B Y

MAGNETIC K-INDICES - DECEMBER 1967

Range for lower limit of K-9 is 300 gammas

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

T O O L A N G I

MAGNETIC K-INDICES - DECEMBER 1967

Range for lower limit of K=9 is 500 gammas

<u>Day</u>					<u>K-Indices</u>				<u>K-Sum</u>
1	2	3	3	5	4	4	5	4	30
2	3	3	3	1	3	3	1	3	20
3	1	2	1	2	3	2	2	2	15
4	2	2	2	3	2	1	1	2	15
5	2	2	2	2	2	3	3	4	20
6	3	3	3	3	4	4	3	4	27
7	3	2	4	3	4	4	3	2	25
8	3	4	3	2	3	3	4	4	26
9	3	1	2	1	3	3	3	2	18
10	2	2	3	1	1	0	1	1	11
11	2	1	1	1	1	1	0	1	08
12	2	2	1	1	1	2	2	2	13
13	-	-	3	1	1	1	2	2	-
14	1	1	2	1	2	3	1	1	12
15	3	3	3	1	3	2	4	3	22
16	2	4	3	3	2	2	2	2	20
17	2	3	3	3	2	1	1	1	16
18	2	4	5	3	4	4	3	3	28
19	3	3	3	3	4	4	4	5	29
20	3	5	3	5	4	4	3	2	29
21	2	3	3	4	3	3	1	2	21
22	1	3	3	3	3	2	2	3	20
23	3	3	3	2	3	4	3	3	24
24	1	2	2	2	2	1	1	0	11
25	1	1	2	1	1	1	0	2	09
26	1	2	2	1	2	2	2	3	15
27	2	2	3	2	3	2	2	2	18
28	1	2	1	1	1	1	2	3	12
29	3	3	3	1	1	1	1	2	15
30	2	2	3	2	3	3	2	3	20
31	3	4	4	5	6	5	5	4	36

PRINCIPAL MAGNETIC STORMS

Observatory	Storm - time					Sudden commencement				Degree of activity	Maximal activity on K - scale 0 to 9			Ranges		
	Begin			End		Type	Amplitudes				Day	3 - hour period	K	D	H	Z
							D	H	Z							
	d	h	m	d	h		/	γ	γ					/	γ	γ
GNANGARA	05	06	28	09	03	ssc*	-1	-4*	-4*	m	05	8	5	12	66	84
											06	8				
											07	1,6				
											08	6				
	18	05	39	21	18	ssc	+1	+12	-5	ms	19	7,8	6	24	106	150
	31	05	..	01	04	...				ms	31	6,7	6	20	103	164
PORT MORESBY																
N I L S T O R M S																
TOOLANGI	01	03	--	02	16	...				m	01	4,7	5	21.6	173	49
											18	3	5			
	18	05	37	21	18	ssc*	-1*	+16	+12	m	19	8		21.2	165	56
											20	2,4				
	30	02	28	01	18	ssc*	+14*			ms	31	5	6	25.1	166	89

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PRELIMINARY MONTHLY MEAN VALUES

Based on selected quiet days

OBSERVATORY	H γ	D °	Z γ
GNANGARA	23859	2 55.2W	-53498
MACQUARIE I.	13078	26 47.9E	-64141
MAWSON	18374	61 38.1W	-48127
PORT MORESBY	36268	6 10.4E	-23111
TOOLANGI	22444	10 34.6E	-56361

SUDDEN COMMENCEMENTS AND OTHER PHENOMENA

OBSERVATORY	DAY	TIME	TYPE	SENSE OF MOVEMENT		
				H	D	Z
GNANGARA	02	1447	bps B	+	+	+
	03	0720	pi2 B			
	05	0628	ssc* B	-*	-	-*
	18	0539	ssc B	+	+	+
	23	1630	bp B	+	+	+
	28	1856	bps B	+	+	+
	29	2315	pi2 B			
PORT MORESBY	1	1037	bp B	+		+
	8	1945	bp B	-	-	-
	15	0213	s1 B			
	19	1308	bp B	+		+
	27	1350	bp B	+	+	+
	29	2225	ssc B	+	+	+
TOOLANGI	15	0215	ssc B	+	+	+
	16	0347	s1 B			
	18	0537	ssc* B	+	-*	+
	30	0228	ssc* B	+		

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SOLAR FLARE EFFECTS

Observatory	Day	Time			Amp. (Gammas)		
		Begin	Max.	End	H	D	Z
PORT MORESBY	15	0502	0505	0510	+12	+4	+9

PRELIMINARY MONTHLY MEAN VALUES

Based on selected quiet days

OBSERVATORY	H γ	D $^{\circ}$,	Z γ
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GNANGARA

January	23879	2 ⁰ 53.7 W	-53503
February	23873	2 53.5	-53502
March	23877	2 53.5	-53497
April	23874	2 53.6	-53499
May	23865	2 53.8	-53502
June	23858	2 54.1	-53507
July	23862	2 54.1	-53502
August	23865	2 54.3	-53497
September	23866	2 54.4	-53493
October	23867	2 54.5	-53490
November	23870	2 54.9	-53493
December	23859	2 55.2	-53498
Mean 1967	23868	2 ⁰ 54.1W	-53499

MACQUARIE I.

January	13103	26 41.9E	-64171
February	13099	26 43.1	-64171
March	13097	26 44.5	-64171
April	13087	26 45.2	-64165
May	13078	26 45.7	-64169
June	13074	26 46.1	-64174
July	13081	26 47.1	-64170
August	13076	26 46.9	-64155
September	13078	26 47.8	-64154
October	13075	26 47.3	-64152
November	13078	26 47.9	-64141
December	13078	26 47.9	-64141
Mean 1967	13084	26 ⁰ 46.0E	-64161

PRELIMINARY MONTHLY MEAN VALUES

Based on selected quiet days

OBSERVATORY	H γ	D °	Z γ
MAWSON			
January	18362	61 31.9 W	-48163
February	18380	61 30.5	-48215
March	18386	61 32.2	-48209
April	18380	61 32.6	-48195
May	18381	61 33.0	-48192
June	18387	61 34.0	-48199
July	18381	61 34.7	-48180
August	18362	61 35.3	-48164
September	18362	61 36.6	-48119
October	18364	61 37.3	-48131
November	18364	61 36.9	-48119
December	18374	61 38.1	-48127
Mean 1967	18374	61 ⁰ 34.4 W	-48168
PORT MORESBY			
January	36296	6 10.1 E	-23046
February	36288	6 10.1	-23050
March	36306	6 10.7	-23052
April	36292	6 10.7	-23052
May	36279	6 10.7	-23052
June	36266	6 10.5	-23057
July	36273	6 10.7	-23061
August	36276	6 10.2	-23065
September	36271	6 11.0	-23069
October	36272	6 10.9	-23074
November	36278	6 10.7	-23106*
December	36268	6 10.4	-23111*
Means 1967	36280	6 ⁰ 10.6E	-23066

* Note:- BMZ correction changed by 30 gammas from November; Z values numerically 30 gammas greater from that date.

PRELIMINARY MONTHLY MEAN VALUES

Based on selected quiet days

OBSERVATORY	H γ	D $^{\circ}$,	Z γ
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TOOLANGI

January	22492	10 35.3 E	-56373
February	22483	10 35.3	-56368
March	22485	10 34.0	-56364
April	22481	10 34.3	-56363
May	22472	10 35.0	-56363
June	22469	10 35.5	-56372
July	22472	10 36.7	-56379
August	22466	10 36.7	-56368
September	22479	10 34.6	-56391
October	22471	10 34.6	-56389
November	22457	10 34.2	-56362
December	22444	10 34.6	-56361
Mean 1967	22473	10 ⁰ 35.1E	-56371