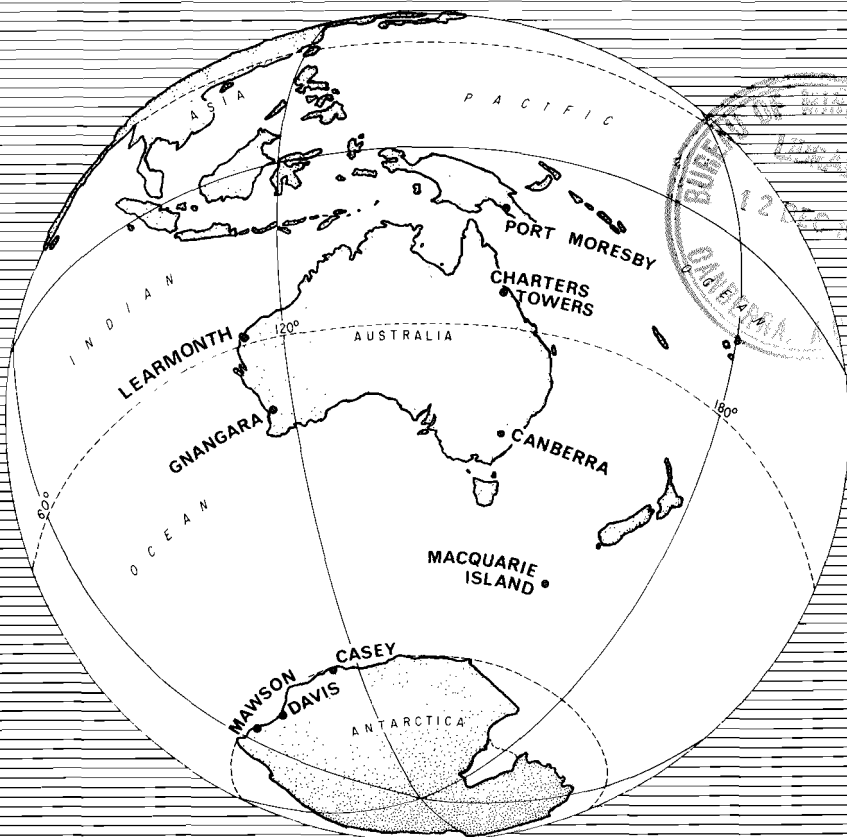




GEOFYSICAL OBSERVATORY REPORT



MAGNETIC OBSERVATORIES

BMR
5550
.389.5
AUS. 8
copy 2

VOLUME 37 No. 5
MAY 1989

OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

Minister for Resources:

Senator the Hon. Peter Cook

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

DIRECTOR:

R.W.R. Rutland AO

This report was prepared by:

**Geomagnetism Section
Division of Geophysics**

CHIEF OF DIVISION (Acting): D. Denham

For further Information write to:

**GEOMAGNETISM SECTION
BUREAU OF MINERAL RESOURCES
G.P.O. Box 378
CANBERRA, A.C.T., 2601
AUSTRALIA.**



**Published for the B.M.R.G. & G. by the
Australian Government Publishing Service**

ISSN 0433-5015

© Commonwealth of Australia 1989

CONTENTS

	Page
Contributing Observatories & Instrumentation ...	4
K-Indices	5
Principal Magnetic Storms	9
Monthly Mean Values	10
International Quiet & Disturbed Days	10
Sudden Commencements & other Rapid Variations .	11

The observers at Casey, Davis and Macquarie Island are officers of the Antarctic Division, The Department of the Arts, Sport, the Environment, Tourism and Territories. Their contributions are gratefully acknowledged. These observers and the Bureau of Mineral Resources' (BMR) geophysicist at Mawson are members of the Australian National Antarctic Research Expeditions (ANARE).

Data from the Port Moresby Geophysical Observatory are contributed by the Geological Survey of Papua New Guinea.

The terminology used in this report is that accepted by the International Association of Geomagnetism and Aeronomy (IAGA). The unit of field intensity is the nanoTesla (nT). All times are in Universal Time (UT).

CONTRIBUTING OBSERVATORIES

OBSERVATORY	OBSERVER IN CHARGE	GEOGRAPHIC		GEOMAGNETIC	
		LAT.	LONG.	LAT.	LONG.
PORT MORESBY	I.D.Ripper	9° 25'S	147° 09'E	-18.1°	219.8°
CHARTERS TOWERS	J.M.Millican	20° 05'S	146° 15'E	-28.7°	220.3°
LEARMONTH	M.W.McMullan	22° 13'S	114° 06'E	-33.2°	185.5°
GNANGARA	P.J.Gregson	31° 47'S	115° 57'E	-42.7°	188.0°
CANBERRA	P.A.Hopgood	35° 19'S	149° 22'E	-43.3°	226.6°
MACQUARIE IS.	M.J.Underwood	54° 30'S	158° 57'E	-60.4°	244.7°
MAWSON	P.Crosthwaite	67° 36'S	62° 53'E	-73.2°	106.3°
DAVIS	R.McLoughlin	68° 35'S	77° 58'E	-76.8°	124.0°
CASEY	O. Holmwood	66° 17'S	110° 32'E	-77.3°	182.7°

* Geomagnetic co-ordinates based on the 1980 DGRF Geomagnetic North pole position of 78.8°N, 70.9°W

MAGNETOGRAPHS

<u>OBSERVATORY</u>	<u>CODE</u>	<u>MODEL (TYPE/RES.)</u>	<u>ELEMENT/SCALE-VALUE</u>			
PORT MORESBY	PMG	La Cour (A)	H/3	D/5	Z/4	
CHARTERS TOWERS	CTA	EDA/Elsec (D/1)	X	Y	Z	
LEARMONTH	LRM	EDA/Elsec (D/1)	X	Y	Z	
GNANGARA	GNA	Eschenhagen(A)	H/3	D/7	Z/6	
CANBERRA	CNB	Elsec (D/.1)	D	I	F	
MACQUARIE IS.	MCQ	PEM (D/.1)	X	Y	Z	
MAWSON	MAW	PEM (D/.1)	X	Y	Z	

A = analogue, 20mm/hr, scale values in nT/mm
D/1 = digital, 1 minute readings, 1 nT resolution
D/.1 = digital, 1 minute readings, 0.1 nT resolution
PEM = BMR Photo-electronic magnetograph

MAGNETOMETERS

Absolute data are based on observations made with QHM's, BMZ's, fluxgate-theodolites, declinometers, proton vector magnetometers and proton precession magnetometers.

Errors in preliminary values obtained from magnetograms are not likely to exceed 5 nT or 0.5 minutes of arc.

PORT MORESBY

MAGNETIC K-INDICES - MAY 1989

Range for lower limit of K=9 is 300nT

DAY	K-INDICES								K-SUM
01	2	1	2	1	1	3	2	3	15
02	4	3	3	3	3	3	3	2	24
03	3	4	3	2	2	1	2	2	19
04	4	3	2	2	2	2	3	4	22
05	6	5	5	4	3	2	2	2	29
06	2	2	3	4	2	2	2	2	19
07	1	5	6	5	5	3	3	3	31
08	1	2	2	2	2	2	2	1	14
09	1	2	2	2	2	2	1	1	13
10	1	2	2	2	1	1	1	2	12
11	2	2	1	1	2	2	2	3	15
12	3	3	3	3	1	2	2	2	19
13	2	2	3	2	3	3	2	1	18
14	3	3	2	2	1	2	2	2	17
15	1	2	2	3	3	2	2	2	17
16	2	3	2	1	2	2	2	2	16
17	2	2	2	2	2	2	2	1	15
18	2	2	2	2	2	2	2	0	14
19	1	2	2	2	1	2	2	1	13
20	1	2	2	5	4	3	2	1	20
21	2	3	3	3	2	2	1	1	17
22	2	1	2	2	2	3	2	3	17
23	2	2	2	2	5	6	4	3	26
24	3	5	4	5	5	4	3	3	32
25	4	3	4	3	4	3	3	2	26
26	2	2	1	2	2	3	2	3	17
27	2	2	3	2	2	2	2	2	17
28	3	2	2	2	3	2	2	2	18
29	2	3	3	4	3	1	2	2	20
30	2	2	2	2	2	1	2	2	15
31	2	2	3	2	3	2	2	2	18

Mean of K-Sum is 18.9

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	1	33	133	54	14	10	3	0	0	0	0

GNANGARA

MAGNETIC K-INDICES - MAY 1989

Range for lower limit of K=9 is 450nT

DAY	K-INDICES								K-SUM
01	2	1	2	0	1	4	3	3	16
02	2	3	3	3	3	2	3	3	22
03	3	2	2	1	1	1	3	2	15
04	4	3	2	1	1	4	3	3	21
05	6	4	4	3	3	2	3	3	28
06	2	2	2	2	3	2	2	3	18
07	1	4	4	4	4	4	5	4	30
08	1	1	1	1	1	2	1	1	09
09	1	1	1	1	1	2	0	0	07
10	2	1	0	0	0	0	0	1	04
11	1	0	2	1	2	2	2	2	12
12	2	2	2	2	1	2	2	1	14
13	1	1	1	1	2	2	2	0	10
14	2	2	1	1	1	2	2	1	12
15	1	2	3	3	2	1	1	2	15
16	2	2	1	1	1	1	2	1	11
17	2	2	2	1	2	1	1	1	12
18	2	2	1	1	2	1	1	1	11
19	1	1	1	1	2	1	2	1	10
20	1	1	1	5	4	2	2	0	16
21	1	2	3	2	2	1	1	0	12
22	1	2	2	2	2	2	1	4	16
23	3	2	2	1	4	5	5	2	24
24	4	4	5	5	5	5	5	4	37
25	4	2	4	2	3	3	3	1	22
26	2	1	0	1	2	4	3	4	17
27	3	2	2	1	1	2	3	3	17
28	3	1	1	1	2	2	3	2	15
29	1	3	2	2	4	1	3	2	18
30	1	2	1	1	2	2	3	2	14
31	2	2	2	1	4	2	3	2	18

Mean of K-Sum is 16.2

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	13	80	86	36	23	9	1	0	0	0	0

CANBERRA

MAGNETIC K-INDICES - MAY 1989

Range for lower limit of K=9 is 450nT

DAY	K-INDICES								K-SUM
01	2	2	1	0	1	3	2	3	14
02	1	3	(2)	2	2	2	3	2	(17)
03	2	(2)	(1)	2	1	0	2	1	(11)
04	3	3	1	2	1	3	3	3	19
05	5	4	4	4	4	2	2	2	27
06	1	3	2	3	2	2	1	3	17
07	0	4	5	5	5	4	4	3	30
08	0	0	1	2	0	2	0	0	05
09	1	1	1	1	2	1	0	0	07
10	2	1	0	0	1	0	0	1	05
11	0	0	1	1	2	2	2	2	10
12	3	2	3	3	1	2	2	1	17
13	1	1	1	1	3	2	2	0	11
14	2	3	1	1	1	2	2	1	13
15	1	2	3	3	3	2	2	2	18
16	1	2	1	1	1	1	1	0	08
17	2	2	1	1	2	1	0	1	10
18	1	1	2	1	2	1	1	0	09
19	0	1	0	2	2	1	0	0	06
20	0	1	2	5	4	2	1	0	15
21	1	2	3	3	2	1	1	0	13
22	0	1	2	2	3	2	1	3	14
23	1	2	1	1	5	4	4	3	21
24	3	3	4	5	5	4	4	3	31
25	3	3	4	2	3	4	3	1	23
26	2	2	0	1	3	3	3	3	17
27	2	2	3	3	2	3	2	2	19
28	3	2	2	2	2	3	2	2	18
29	2	2	2	3	3	1	3	1	17
30	2	2	2	1	1	1	2	1	12
31	1	1	3	1	3	3	2	1	15

Mean of K-Sum is 15.1

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	29	71	77	48	15	8	0	0	0	0	0

MAWSON

MAGNETIC K-INDICES - MAY 1989

Range for lower limit or K=9 is 1500nT

DAY	K-INDICES								K-SUM
01	5	3	4	1	1	4	4	5	27
02	4	5	6	5	3	4	5	5	37
03	5	4	5	2	2	3	6	5	32
04	6	5	5	2	3	4	7	5	37
05	7	7	7	4	3	3	7	6	44
06	3	5	4	4	2	3	3	6	30
07	2	6	6	6	5	7	6	5	43
08	3	3	2	2	2	2	3	5	22
09	2	1	4	1	1	1	1	4	15
10	2	2	2	1	0	0	3	4	14
11	1	2	2	2	2	2	2	1	14
12	2	6	6	3	2	3	4	2	28
13	1	3	2	2	2	3	1	3	17
14	2	5	5	2	2	3	2	4	25
15	2	4	4	3	3	2	4	4	26
16	2	4	3	2	2	2	2	3	20
17	3	5	5	-	-	-	-	-	--
18	-	-	-	-	-	-	-	-	--
19	-	-	-	-	-	-	-	-	--
20	-	-	-	-	-	-	-	-	--
21	-	-	-	-	3	1	2	2	--
22	3	3	3	2	2	2	2	5	22
23	3	3	4	2	5	6	5	7	35
24	7	6	5	5	5	8	7	6	49
25	7	6	6	5	3	4	6	6	43
26	5	4	3	3	3	4	6	6	34
27	6	6	5	4	3	2	3	6	35
28	3	5	3	3	2	4	4	5	29
29	6	5	5	4	4	3	3	5	35
30	5	5	3	3	1	2	5	5	29
31	4	4	4	2	3	3	4	5	29

Mean of K-Sum is 29.7

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	2	14	47	45	33	39	24	10	1	0	33

PRINCIPAL MAGNETIC STORMS - MAY 1989

OBSERVATORY	Commencement		SSC-amplitude			Max. 3hr K-index		Ranges			UT End	
	day hr min	type	D(°)	H(nT)	Z(nT)	day (3hr-period)	K	D(°)	H(nT)	Z(nT)	day	hr
Port Moresby	04 23 51	SSC	+	+	+	05(1)	6	7	240	60	07	00
	07 05 12	SSC	-0.4	+60	+54	07(3)	6	7	190	100	08	00
	23 13 46	SSC	+0.4	+70	+58	23(6)	6	6	210	100	26	00
Charters Towers	04 23 52	SSC*	-1.8*	+28	-2	05(1)	6	10.4	148	42	05	12
	07 05 14	SSC*	+2.1*	+61	-6	07(3)	6	9.5	172	33	07	24
	23 13 47	SSC	-1.1	+69	-5	23(5,6);24(2,5)	6	9.9	206	35	25	09
Gnangara	Nil		Principal			Magnetic		Storms				
Canberra	07 05 13	SSC*	+3.8*	+63	+10	07(3,4,5)	5	19.7	143	55	07	23
	23 13 46	SSC*	-1.7*	+61	+18	23(5);24(4,5)	5	18.7	192	61	25	21

MAY 1989

PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D		Z	F
	nT	deg	min	nT	nT
PORT MORESBY	35913	06°	36.3' E	-23714	43036
CHARTERS TOWERS	31745	07°	46.6' E	-38264	49718
LEARMONTH	29469	00°	34.3' W	-44427	53312
GNANGARA	23181	03°	08.4' W	-53815	58595
CANBERRA	23651	12°	29.1' E	-53685	58664
MACQUARIE IS.	12603	29°	48.0' E	-63574	64811
MAWSON	18461	64°	13.6' W	-46109	49668
DAVIS	16660	77°	14.0' W	-52050	54650
CASEY	9655	91°	45.0' W	-63955	64680

The values are derived from magnetograms for selected quiet days except at Davis, Casey and Macquarie Is. where they are derived from semi-weekly absolute measurements.

INTERNATIONAL QUIET AND DISTURBED DAYS

Quietest days (1- 5): 10 08 09 19 11
Quietest days (6-10): 18 16 17 21 13
Most Disturbed days : 24 05 07 23 25

SUDDEN COMMENCEMENTS AND OTHER RAPID VARIATIONS

OBSERVATORY	DAY	TYPE AND QUALITY	TIME	SENSE AND AMPLITUDE OF CHIEF MOVEMENT		
				H (nT)	D (nT)	Z (nT)
PORT MORESBY	04	ssc A	2351	+	+	+
	07	ssc A	0512	+58	-4	+54
	23	ssc A	1346	+70	+4	+60
CHARTERS TOWERS	04	ssc*A	2352	+28	-17*	-2
	07	ssc*A	0514	+61	+19*	-6
	23	ssc A	1347	+69	-10	-5
GNANGARA	23	ssc B	1346	+18	+16	+10
CANBERRA	04	ssc*B	2352	+15	-23*	+12
	07	ssc*A	0513	+63	+26*	+10
	23	ssc*A	1346	+61	-12	+18

GEOPHYSICAL OBSERVATORY REPORT

VOLUME 37 No. 5

MAY 1989

B89/21901 Cat. No. 89 2209 4

Printed in Australia by Canberra Publishing and Printing Co.