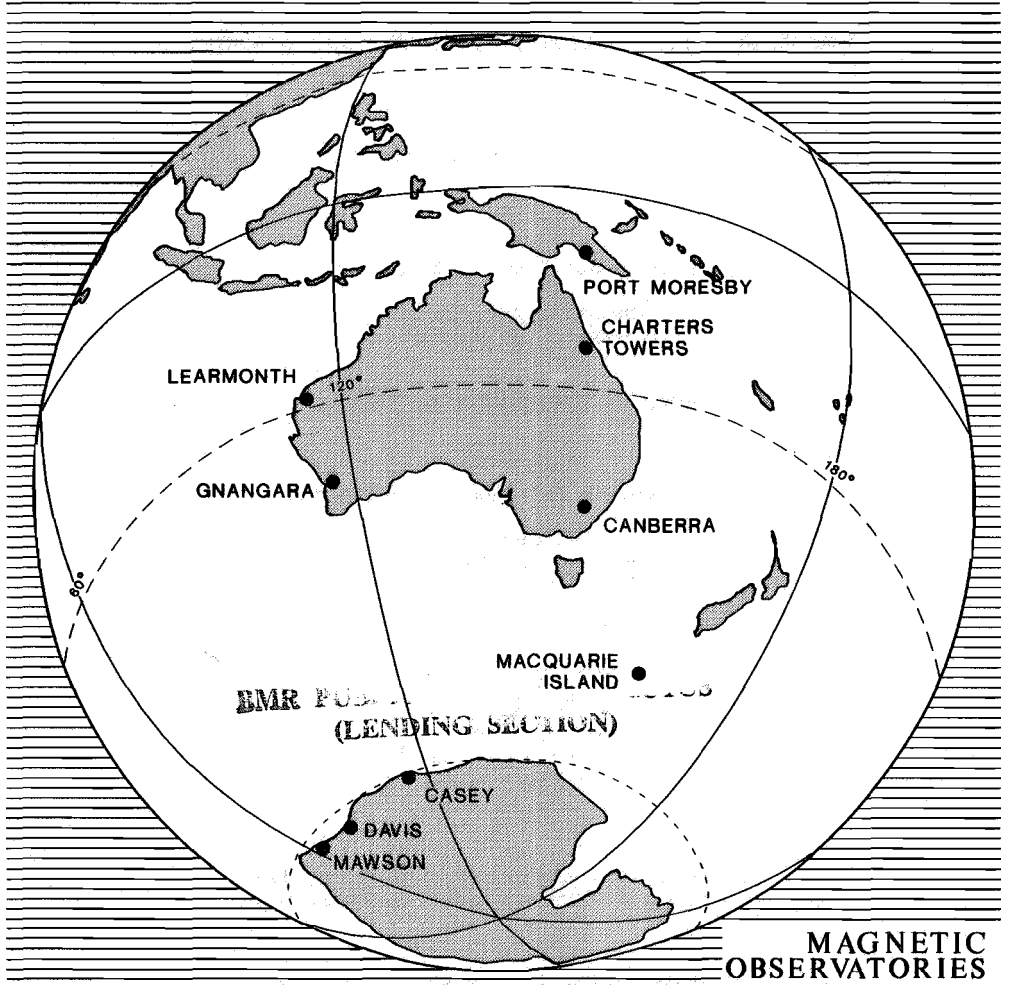


AUSTRALIAN GEOMAGNETISM REPORT



BmR
S550.389.5
Aus. 8

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

MAGNETIC
OBSERVATORIES
VOLUME 39 No. 6
JUNE 1991

DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

Minister for Resources:

The Hon. Alan Griffiths MP

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

EXECUTIVE DIRECTOR:

R.W.R. Rutland AO

This report was prepared by:

**Geomagnetism Section
Division of Geophysics**

CHIEF OF DIVISION : D. Denham

For further information write to:

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

BMR
GEOLOGY AND
GEOPHYSICS

A U S T R A L I A

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

ISSN 1035-1515

© Commonwealth of Australia 1991

CONTENTS

	Page
Contributing Observatories & Instrumentation ...	4
K-Indices	5
Principal Magnetic Storms	9
Preliminary Monthly Mean Values	10
International Quiet & Disturbed Days	10
Sudden Storm Commencements and Solar Flare Effects	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.	P. Barnaart	54° 30' S	158° 57' E	-60.4°	244.7°
MAWSON	M. A. DeDeuge	67° 36' S	62° 53' E	-73.2°	106.3°
DAVIS	L. Symons	68° 35' S	77° 58' E	-76.8°	124.0°
CASEY	P. Roberts	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	Elsec (D/.1)	D	I	F	
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 - JUNE 1991

Range for lower limit of K=9 is 300nT

DAY	K-INDICES								K-SUM
01	3	5	6	5	6	5	2	2	34
02	2	4	4	4	3	4	3	3	27
03	2	2	4	1	1	1	3	3	17
04	1	4	3	3	3	4	4	4	26
05	4	7	7	7	5	6	5	5	46
06	6	5	5	5	3	2	1	2	29
07	2	3	4	3	3	2	2	3	22
08	3	2	2	3	3	3	3	2	21
09	5	4	4	4	4	4	4	3	32
10	4	4	6	5	6	6	5	7	43
11	7	6	6	5	4	4	5	3	40
12	4	4	3	5	3	5	4	5	33
13	6	5	7	6	6	6	5	3	44
14	4	2	3	2	2	2	1	2	18
15	1	2	2	3	3	2	1	2	16
16	1	1	1	1	1	1	1	2	09
17	2	2	2	5	5	4	6	5	31
18	3	4	4	2	1	3	2	2	21
19	3	4	4	4	3	3	3	3	27
20	4	3	3	2	1	1	2	2	18
21	4	4	5	2	2	3	2	2	24
22	2	3	3	2	2	2	2	3	19
23	2	3	3	4	4	4	3	4	27
24	3	4	4	3	3	3	3	2	25
25	3	3	2	3	3	3	2	2	21
26	2	3	3	3	2	3	2	3	21
27	2	1	1	2	2	2	2	2	14
28	3	2	2	2	1	1	1	1	13
29	1	0	1	1	1	1	1	1	07
30	3	4	2	3	3	2	3	2	22

Mean of K-Sum is 24.9

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	1	31	61	63	41	23	14	6	0	0	0

GNANGARA

MAGNETIC K-INDICES - JUNE 1991

Range for lower limit of K=9 is 450nT

DAY	K-INDICES								K-SUM
01	3	4	5	5	4	4	2	3	30
02	3	3	4	4	3	5	4	5	31
03	3	3	3	2	2	1	3	3	20
04	2	2	2	1	4	5	6	5	27
05	5	6	5	6	6	8	5	5	46
06	5	4	4	3	2	2	2	2	24
07	2	3	4	3	3	2	2	3	22
08	3	2	3	2	2	5	4	3	24
09	6	5	4	4	4	4	5	3	35
10	4	3	5	5	5	5	4	4	35
11	5	5	6	5	5	5	5	4	40
12	4	4	3	5	4	5	4	4	33
13	6	4	5	5	6	5	6	3	40
14	4	2	3	2	2	1	1	1	16
15	1	2	4	4	3	3	3	2	22
16	1	1	1	1	1	2	2	2	11
17	2	2	2	4	5	4	6	6	31
18	3	3	3	2	1	3	4	4	23
19	3	3	3	3	4	5	4	3	28
20	3	3	2	1	1	1	3	2	16
21	2	3	3	1	1	3	3	2	18
22	2	2	2	2	3	3	3	-	--
23	-	-	2	4	5	4	5	-	--
24	3	3	3	3	3	3	2	3	23
25	2	3	3	4	3	4	3	3	25
26	3	3	3	3	3	3	3	3	24
27	3	1	2	3	2	2	3	2	18
28	2	2	1	2	2	2	2	1	14
29	1	1	1	1	2	1	2	1	10
30	3	3	2	3	4	1	4	3	23

Mean of K-Sum is 25.3

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	0	27	52	72	40	33	11	0	1	0	4

CANBERRA

MAGNETIC K-INDICES - JUNE 1991

Range for lower limit of K=9 is 450nT

DAY	K-INDICES								K-SUM
01	2	4	6	5	5	4	0	1	27
02	2	4	4	5	3	4	3	4	29
03	2	1	3	1	1	1	2	2	13
04	1	2	1	1	2	5	5	5	22
05	3	6	6	7	6	7	6	5	46
06	4	3	5	4	3	1	1	2	23
07	2	3	4	3	3	2	3	3	23
08	2	1	1	2	2	4	3	2	17
09	6	4	2	4	4	5	4	2	31
10	3	4	6	6	5	5	5	5	39
11	6	5	6	5	4	4	5	3	38
12	4	3	2	5	4	5	3	4	30
13	6	4	6	5	6	6	6	3	42
14	4	2	3	2	2	1	0	1	15
15	0	2	2	2	2	2	1	1	12
16	0	1	1	1	1	1	1	1	07
17	2	2	2	4	5	5	4	4	28
18	3	3	4	2	1	3	2	3	21
19	3	3	4	3	4	3	4	3	27
20	4	3	1	1	0	1	3	2	15
21	4	2	4	2	2	3	3	3	23
22	3	3	3	2	3	3	2	3	22
23	2	3	3	4	5	4	5	5	31
24	3	4	3	3	4	3	2	2	24
25	3	3	3	3	3	3	3	3	24
26	3	3	3	3	3	3	3	2	23
27	2	1	1	3	2	2	2	2	15
28	2	2	3	2	1	2	1	1	14
29	1	0	1	1	2	0	0	1	06
30	2	4	2	3	4	2	3	2	22

Mean of K-Sum is 23.6

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	8	36	54	63	38	24	15	2	0	0	0

MAWSON

MAGNETIC K-INDICES - JUNE 1991

Range for lower limit of K=9 is 1500nT

DAY	K-INDICES								K-SUM
01	4	5	7	5	5	3	4	7	40
02	6	7	6	4	3	7	6	8	47
03	3	4	6	3	2	3	7	6	34
04	3	3	3	3	6	8	6	6	38
05	6	8	6	6	6	6	6	5	49
06	6	6	6	5	3	2	2	5	35
07	5	5	6	4	4	3	5	4	36
08	3	4	4	3	4	5	4	5	32
09	8	4	5	4	4	5	6	4	40
10	5	5	7	5	4	6	7	4	43
11	6	4	6	5	5	5	7	7	45
12	7	7	5	7	7	5	5	5	48
13	6	6	7	6	6	7	8	4	50
14	4	3	3	3	2	2	1	3	21
15	4	4	5	4	4	4	3	2	30
16	3	2	3	3	3	2	1	3	20
17	5	4	4	6	6	4	7	6	42
18	5	4	5	4	3	3	7	5	36
19	6	6	6	4	3	4	6	6	41
20	5	5	4	3	3	2	2	4	28
21	6	5	5	3	3	3	6	5	36
22	5	5	5	3	4	3	3	6	34
23	6	5	6	6	5	5	6	7	46
24	7	6	5	3	3	3	5	4	36
25	5	5	5	5	3	3	6	5	37
26	5	5	6	4	3	4	7	5	39
27	4	4	4	3	3	2	3	3	26
28	5	5	5	3	2	3	3	3	29
29	3	2	2	1	1	1	2	4	16
30	3	4	3	3	4	4	4	5	30

Mean of K-Sum is 36.1

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	0	5	15	52	46	53	44	20	5	0	0

PRINCIPAL MAGNETIC STORMS - JUNE 1991

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	01	01	..	...	..	..	..	01(3,5)	6	5	180	100	01	18
	04	03	37	ssc	-3.0	+38	+37	05(2,3,4)	7	12	340	140	06	13
	09	00	40	ssc	+0.9	+55	+45	10(3,5)	6	6	220	110	10	15
	10	17	15	ssc	+1.8	+60	+58	10(8);11(1)	7	8	290	150	12	06
	12	10	12	ssc*	-0.4*	+39	+30	13(3)	7	9	320	..	14	03
	17	10	19	ssc*	-0.3*	+44	..	17(7)	6	7	170	..	18	10
Gnangara	04	14	..	..	..	..	..	05(6)	8	49	250	280	06	12
	08	15	..	..	..	..	..	09(1),11(3)	6	33	180	220	12	07
	12	10	12	ssc	+2.5	+31	+9	13(1,7)	6	27	180	170	14	03
	17	10	19	ssc*	+3.8*	+30	+9*	17(7,8)	6	26	170	170	18	09
Canberra	04	14	..	..	..	..	..	05(4,6)	7	46.8	286	182	06	13
	10	00	..	..	..	..	..	10(3,4),11(1,3)	6	32.5	193	93	12	06
	12	10	12	ssc	-1.7	+42	+12	13(1,3,5-7)	6	22.8	244	100	14	03
	23	00	..	..	..	..	..	23(7,8)	5	18.2	97	39	24	19

JUNE 1991

PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D		Z	F
	nT	deg	min	nT	nT
PORT MORESBY	35892	06°	36.2' E	-23702	43012
CHARTERS TOWERS	31714	07°	47.1' E	-38254	49690
LEARMONTH	29500	00°	26.2' W	-44427	53329
GNANGARA	23147	03°	02.1' W	-53803	58571
CANBERRA	23627	12°	31.7' E	-53656	58628
MACQUARIE IS.	12573	29°	47.8' E	-63511	64744
MAWSON	18495	64°	30.2' W	-45972	49553
DAVIS	16687	77°	51.8' W	-51942	54557
CASEY	9625	92°	12.1' W	-63906	64627

The values are derived from magnetograms over the Quietest 5 International Days, except at Mawson, Davis and Casey, where the locally quietest days are used.

INTERNATIONAL QUIET AND DISTURBED DAYS

Quietest days (1- 5): 16 29 14 28 27
Quietest days (6-10): 15 20 03 22 30
Most Disturbed days : 05 13 10 11 01

SUDDEN STORM COMMENCEMENTS (ssc): JUNE 1991

Observatory	Day	Type and Quality	U.T.	Sense and Amplitude of Chief Movement		
				H(nT)	D(nT)	Z(nT)
PORT MORESBY	04	ssc B	0337	+38	-31	+37
	09	ssc B	0040	+55	+9	+45
	10	ssc B	1715	+59	+19	+58
	12	ssc*B	1012	+39	-5*	+30
	17	ssc*B	1019	+44	-4*	..
GNANGARA	12	ssc B	1012	+31	+15	+9
	17	ssc*B	1019	+30	+26*	+9*
CANBERRA	12	ssc B	1012	+42	-12	+12
	17	ssc*B	1019	+45	-10*	+10

SOLAR FLARE EFFECTS (sfe): JUNE 1991

Observatory	----- U.T. of sfe -----			Con- fir- med.	Sense & Amplitude		
	Day	Began	Max. Ended		H(nT)	D(nT)	Z(nT)
PORT MORESBY	Nil sfe's reported						
GNANGARA	Nil sfe's reported						
CANBERRA	04	0339	0346 0415	*	+15	+15	-4

