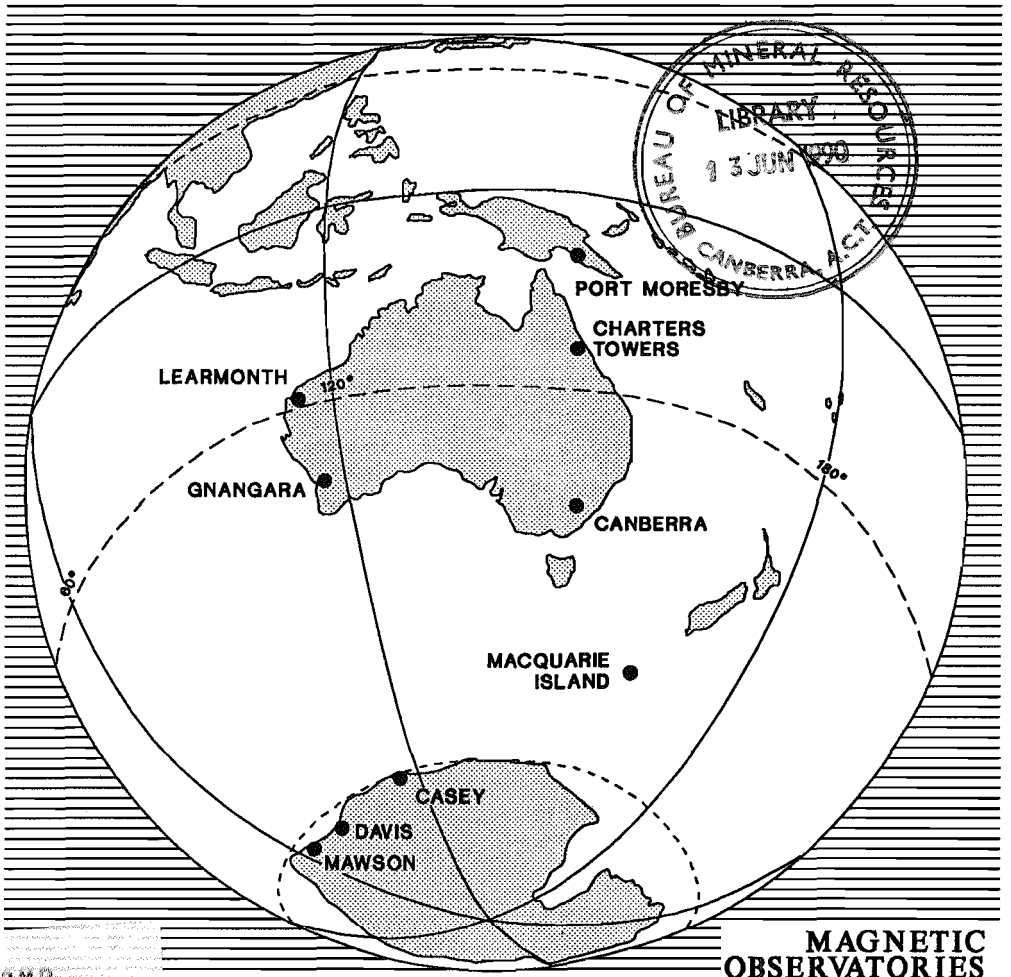
GEOPHYSICAL OBSERVATORY REPORT



MAGNETIC OBSERVATORIES

VOLUME 37 No.11
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BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

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Senator the Hon. Peter Cook

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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).
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CONTRIBUTING OBSERVATORIES

OBSERVATORY	OBSERVER IN CHARGE	GEOGRAPHIC LAT.	GEOGRAPHIC LONG.	GEOMAGNETIC* LAT.	GEOMAGNETIC* 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

OBSERVATORY	CODE	MODEL (TYPE/RES.)	ELEMENT/SCALE-VALUE		
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 - NOVEMBER 1989

Range for lower limit of K=9 is 300nT

DAY	K-INDICES								K-SUM
01	2	1	1	2	2	2	2	3	15
02	5	3	3	2	3	3	4	3	26
03	3	3	4	4	5	3	3	3	28
04	3	3	3	4	4	4	2	3	26
05	1	2	2	2	1	1	3	3	15
06	2	1	1	1	3	2	2	2	14
07	2	3	2	3	4	1	2	2	19
08	2	2	1	4	2	3	3	0	17
09	4	3	3	3	3	5	4	2	27
10	3	4	4	3	2	3	3	3	25
11	4	3	4	3	3	4	3	4	28
12	4	4	3	2	3	2	2	4	24
13	4	4	4	4	5	4	5	3	33
14	3	3	3	3	2	2	2	2	20
15	2	1	2	1	1	1	2	1	11
16	2	2	1	2	2	2	2	1	14
17	2	3	4	8	6	6	6	6	41
18	5	6	5	3	4	1	2	1	27
19	1	1	2	2	1	1	1	2	11
20	1	2	3	2	2	1	2	2	15
21	2	3	4	3	2	1	1	2	18
22	1	1	1	1	1	2	2	3	12
23	2	1	1	1	1	1	1	1	09
24	1	3	3	3	2	2	2	3	19
25	2	3	-	-	-	-	-	-	--
26	-	-	2	4	2	3	4	3	--
27	2	3	3	3	3	2	2	5	23
28	3	4	4	3	4	3	3	(5)	(29)
29	(3)	3	4	4	4	3	4	3	(28)
30	3	3	3	3	3	3	3	3	24

Mean of K-Sum is(21.4)

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	1	41	64	75	36	9	5	0	1	0	8

GNANGARA

MAGNETIC K-INDICES - NOVEMBER 1989

Range for lower limit of K=9 is 450nT

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

Mean of K-Sum is 21.6

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	10	36	62	69	45	11	3	3	1	0	0

CANBERRA

MAGNETIC K-INDICES - NOVEMBER 1989

Range for lower limit of K=9 is 450nT

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

Mean of K-Sum is(21.0)

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	12	38	61	75	34	14	2	4	0	0	0

MAWSON

MAGNETIC K-INDICES - NOVEMBER 1989

Range for lower limit of K=9 is 1500nT

DAY	K-INDICES								K-SUM
01	4	3	3	3	3	3	3	4	26
02	6	5	4	2	2	3	6	5	33
03	6	6	6	6	5	5	5	5	44
04	4	4	6	6	5	5	6	6	42
05	5	5	5	3	2	2	5	5	32
06	4	4	4	4	3	3	5	3	30
07	6	5	5	5	5	2	3	4	35
08	5	4	4	3	4	4	4	3	31
09	6	7	5	3	4	5	5	4	39
10	3	6	4	3	3	3	2	3	27
11	5	5	4	5	3	3	5	4	34
12	4	4	3	2	2	2	2	3	22
13	6	6	7	5	5	6	4	5	44
14	5	6	5	5	3	3	3	3	33
15	5	4	3	2	2	2	2	3	23
16	3	2	3	3	3	2	3	4	23
17	5	4	6	7	6	6	6	6	46
18	5	6	5	3	4	3	5	5	36
19	5	4	3	3	2	3	5	5	30
20	3	5	5	3	3	3	3	5	30
21	5	4	5	4	4	1	2	2	27
22	3	3	3	3	4	4	2	4	26
23	5	5	2	3	2	2	4	3	26
24	5	4	3	5	3	3	3	4	30
25	3	3	2	1	1	2	1	3	16
26	3	4	3	3	3	5	4	4	29
27	4	4	4	4	5	3	4	6	34
28	7	6	6	5	5	4	5	6	44
29	5	6	5	4	4	5	5	5	39
30	5	6	6	4	5	6	6	6	44

Mean of K-Sum is 32.5

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	0	4	25	63	49	62	33	4	0	0	0

PRINCIPAL MAGNETIC STORMS - NOVEMBER 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	02	00	35	ssc	+0.5	+26	+23	2(1);3(5)	5	9	180	80	05	00
	08	11	23	ssc	+0.5	+33	+27	9(6);13(5,7)	5	14	220	120	14	16
	17	09	25	ssc	+0.9	+68	+57	17(4)	8	14	260	120	18	15
	27	21	..	ssc*	-2.0*	+31	+16	28(8)	5+	11	120	60	29	21
Gnangara	12	20	..	....				13(1,5,6,7)	5	26	80	170	13	21
	17	09	25	ssc*	+8.2*	+86*	+49*	17(5)	8	41	300	290	18	12
Canberra	12	20	..	..	..	..	..	13(2,3,5,7)	5	26.6	231	46	14	02
	17	09	24	ssc*	-3.9*	+120	+27	17(4,5,6,7)	7	42.4	447	158	18	10

PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D	Z	F
	nT	deg min	nT	nT
PORT MORESBY	35906	06° 36.0′ E	-23720	43034
CHARTERS TOWERS	31754	07° 46.0′ E	-38263	49723
LEARMONTH	29491	00° 33.4′ W	-44439	53334
GNANGARA	23199	03° 07.9′ W	-53809	58597
CANBERRA	23660	12° 29.3′ E	-53676	58659
MACQUARIE IS.	12588	29° 40.5′ E	-63532	64767
MAWSON	18497	64° 14.0′ W	-46072	49647
DAVIS	16671	77° 00.0′ W	-52019	54625
CASEY	9654	88° 33.4′ W	-63511	64240

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

INTERNATIONAL QUIET AND DISTURBED DAYS

Quietest days (1- 5):	25	16	23	15	22
Quietest days (6-10):	24	01	19	20	12
Most Disturbed days :	17	13	18	28	4

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	02	ssc B	0235	+26	+6	+23
	08	ssc B	1123	+33	+6	+27
	17	ssc A	0925	+68	+9	+57
	27	ssc*B	21..	+31	-20*	+16
GNANGARA	17	ssc*A	0925	+82*	+55*	+49*
CANBERRA	08	ssc*B	1124	+41	-19*	+10
	15	sfe	0655	+10	+15	-5
	17	ssc*A	0924	+120	-27*	+27
	27	ssc*C	2139	+11*	-44*	+6*

CHANGE OF TITLE

To more accurately reflect the nature of the contents of this publication, the title will be changed to the **"Australian Geomagnetism Report"**. This will take effect from the January 1990 issue (Vol. 38, No. 1). The new ISSN will be 1035-1515.

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