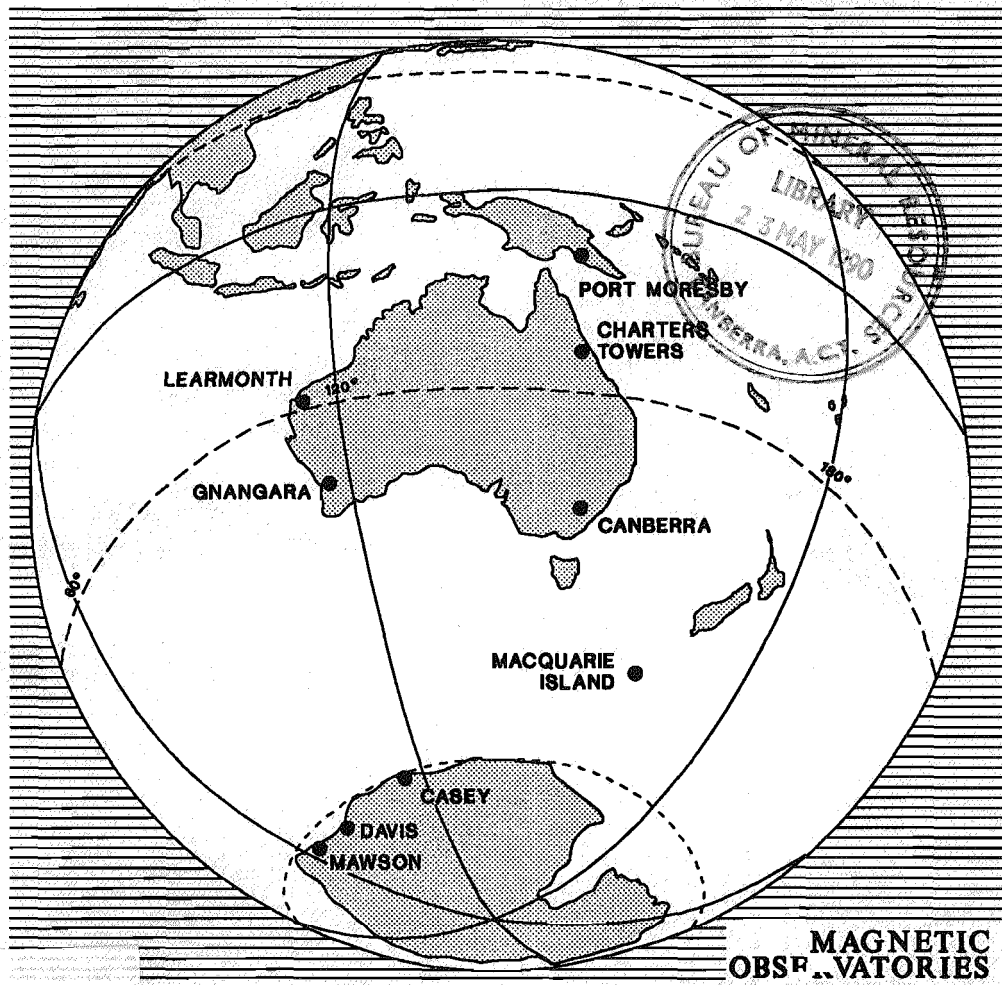




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GEOPHYSICAL OBSERVATORY REPORT



MAGNETIC
OBSERVATORIES

VOLUME 37 No.9

SEPTEMBER 1989

OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

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DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

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

ISSN 0433-5015

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DEPARTMENT OF THE ATTORNEY-GENERAL

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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).

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

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 - SEPTEMBER 1989

Range for lower limit of K=9 is 300nT

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

Mean of K-Sum is 19.4

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	0	50	99	53	23	7	8	0	0	0	0

GNANGARA

MAGNETIC K-INDICES - SEPTEMBER 1989

Range for lower limit of K=9 is 450nT

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

Mean of K-Sum is 16.5

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	29	67	57	50	25	7	5	0	0	0	0

CANBERRA

MAGNETIC K-INDICES - SEPTEMBER 1989

Range for lower limit of K=9 is 450nT

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

Mean of K-Sum is 15.3

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	38	64	64	44	18	9	3	0	0	0	0

MAWSON

MAGNETIC K-INDICES - SEPTEMBER 1989

Range for lower limit of K=9 is 1500nT

DAY	K-INDICES								K-SUM
01	4	4	3	3	2	3	2	0	21
02	3	3	2	2	2	4	2	2	20
03	2	5	4	2	2	3	4	4	26
04	5	5	4	4	3	2	3	5	31
05	6	6	6	3	1	1	2	1	26
06	2	4	3	3	3	4	4	3	26
07	4	3	2	4	3	5	6	6	33
08	6	6	6	4	2	3	3	4	34
09	4	4	2	3	2	2	4	4	25
10	4	5	5	2	2	3	3	3	27
11	3	3	2	1	0	0	0	2	11
12	3	5	6	4	3	2	1	1	25
13	3	3	3	1	2	3	4	5	24
14	3	4	3	3	2	0	1	1	17
15	3	7	4	3	4	6	7	6	40
16	6	4	5	4	3	3	4	4	33
17	4	3	2	1	1	1	2	3	17
18	7	4	5	3	2	4	5	7	37
19	7	7	5	5	2	3	4	2	35
20	2	4	4	2	2	1	3	4	22
21	4	4	4	3	2	2	1	4	24
22	4	3	4	4	5	5	3	4	32
23	2	3	2	2	1	1	0	1	12
24	2	2	2	1	3	2	2	5	19
25	4	5	2	1	1	1	4	3	21
26	2	1	6	5	4	5	5	6	34
27	4	4	3	1	2	0	0	2	16
28	4	4	2	3	2	3	3	3	24
29	3	4	2	2	2	3	3	5	24
30	5	4	3	2	2	4	6	5	31

Mean of K-Sum is 25.6

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	8	23	54	56	54	24	15	6	0	0	0

PRINCIPAL MAGNETIC STORMS - SEPTEMBER 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	00	26	ssc	-1.0	+38	+38	05(3)	6	7	150	90	06	00
	15	00	46	ssc	+0.4	+29	+28	15(2)	5	7	200	100	16	18
	17	07	42	ssc	+0.2	+12	+11	18(7,8);19(2,4)	6	11	330	100	19	21
	26	05	..	..	..	..	..	26(3,4,5)	6	6	230	60	27	14
Gnangara	15	00	45	ssc*	-6.6*	+10	-16*	15(8)	6	23	140	120	16	11
	17	07	42	ssc*	+2.2*	+17*	+12*	18(8)	6	21	280	180	19	19
	25	05	..	..	..	..	..	26(6,7)	6	29	150	210	27	09
Canberra	18	05	..	..	..	..	..	18(8)	6	22.3	240	104	19	13
	26	04	..	..	..	..	..	26(6,7)	6	25.6	170	77	27	01

SEPTEMBER 1969

PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D	Z	F
	nT	deg min	nT	nT
PORT MORESBY	35908	06° 36.5' E	-23713	43031
CHARTERS TOWERS	31736	07° 46.5' E	-38263	49712
LEARMONTH	29474	00° 33.5' W	-44440	53326
GNANGARA	23183	03° 08.0' W	-53812	58593
CANBERRA	23645	12° 29.7' E	-53680	58657
MACQUARIE IS.	12576	29° 41.5' E	-63558	64790
MAWSON	18467	64° 16.0' W	-46088	49650
DAVIS	16660	77° 17.8' W	-51999	54603
CASEY	9650	88° 19.1' W	-63984	64708

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):	11	23	25	14	20
Quietest days (6-10):	17	24	3	28	27
Most Disturbed days :	19	18	26	15	4

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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 B	0026	+38	-10	+38
	07	ssc B	1651	+29	-7	+20
	15	ssc B	0046	+29	+4	+28
	17	ssc B	0742	+12	+2	+11
GNANGARA	01	sfe	0816	-5	+7	+4
	15	ssc*B	0045	+10	-44*	-16
	17	ssc*A	0742	+17*	+15*	+12*
CANBERRA	04	ssc*B	0028	+8*	-23	+12
	07	ssc*B	1650	+30	+12*	+8
	15	ssc B	0046	+21	-8	+7
	18	ssc B	1028	+35	+12	+9
	30	ssc*B	1716	+20	+16*	+3

GEOPHYSICAL OBSERVATORY REPORT VOLUME 37 No.9 SEPTEMBER 1989



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