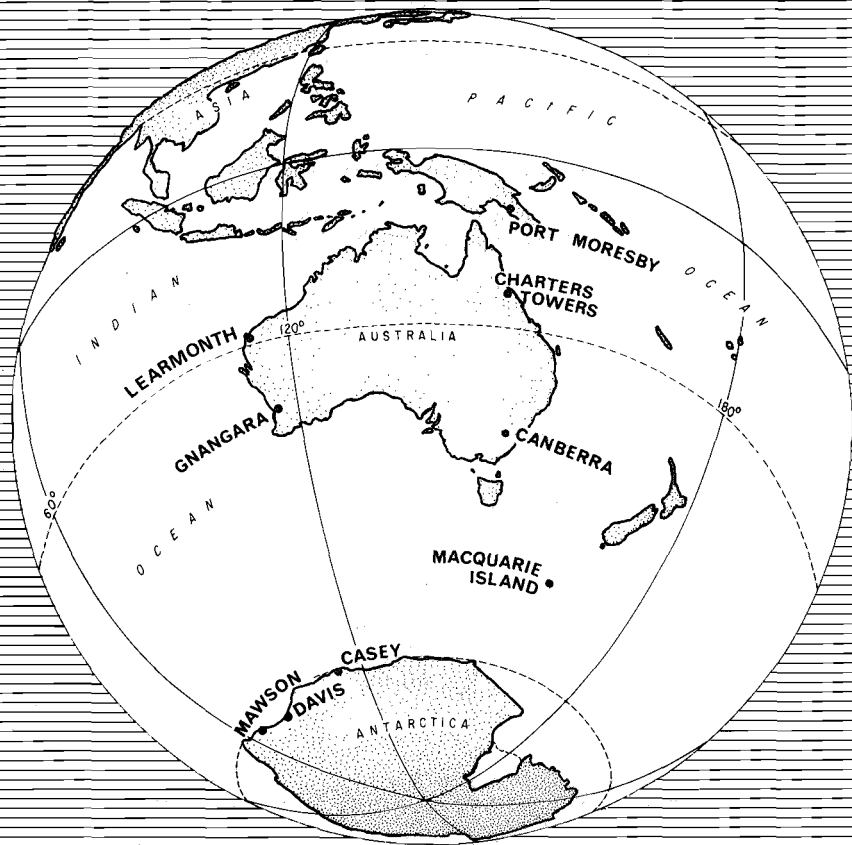


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GEOFYSICAL OBSERVATORY REPORT



MAGNETIC OBSERVATORIES

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AUGUST 1989

BUREAU 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

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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

<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 - AUGUST 1989

Range for lower limit of K=9 is 300nT

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

Mean of K-Sum is 19.6

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	0	62	86	53	24	19	3	1	0	0	0

GNANGARA

MAGNETIC K-INDICES - AUGUST 1989

Range for lower limit of K=9 is 450nT

DAY	K-INDICES								K-SUM
01	2	1	0	0	0	1	2	2	08
02	3	2	2	0	0	0	1	1	09
03	-	-	-	1	1	1	2	0	--
04	0	0	-	2	2	3	3	2	--
05	1	0	0	0	0	0	0	0	01
06	1	1	1	0	1	1	3	2	10
07	2	2	2	1	2	1	3	1	14
08	2	2	2	1	1	0	1	1	10
09	1	0	1	1	1	1	4	3	12
10	4	2	5	4	4	4	4	4	31
11	3	3	3	4	3	2	2	2	22
12	2	2	2	1	1	0	1	2	11
13	2	1	1	1	2	0	1	2	10
14	3	3	6	4	5	3	3	5	32
15	5	5	5	3	7	2	4	5	36
16	6	4	4	2	2	2	3	2	25
17	2	2	3	3	5	4	4	4	27
18	5	4	3	4	1	1	4	4	26
19	4	2	2	0	0	1	2	0	11
20	3	3	5	4	3	2	1	0	21
21	1	1	1	1	2	4	5	4	19
22	4	1	3	2	1	1	0	0	12
23	3	2	1	4	4	4	5	3	26
24	3	1	1	1	1	2	1	2	12
25	1	1	1	0	1	1	0	1	06
26	1	2	2	3	2	1	0	0	11
27	1	3	3	2	3	3	4	3	22
28	3	1	0	1	2	3	5	6	21
29	5	5	5	3	4	3	4	1	30
30	1	3	2	3	3	2	4	3	21
31	2	1	1	0	1	2	2	3	12

Mean of K-Sum is 17.5

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	33	65	54	41	31	16	3	1	0	0	4

CANBERRA

MAGNETIC K-INDICES - AUGUST 1989

Range for lower limit of K=9 is 450nT

DAY	K-INDICES								K-SUM
01	2	1	1	1	1	1	0	1	08
02	2	2	2	1	1	0	0	0	08
03	1	1	1	1	1	1	1	0	07
04	(1)	2	1	3	2	3	1	1	(14)
05	0	0	0	0	0	0	0	0	00
06	1	1	2	1	0	1	1	2	09
07	2	1	2	2	2	1	2	1	13
08	2	2	2	3	1	0	0	0	10
09	1	1	0	1	1	1	3	3	11
10	2	3	5	5	3	4	4	4	30
11	5	3	2	5	4	2	1	1	23
12	1	2	2	3	2	0	0	2	12
13	2	2	2	2	3	1	1	2	15
14	3	3	6	4	5	2	2	3	28
15	3	5	5	4	6	2	3	4	32
16	4	5	2	1	2	2	2	2	20
17	2	3	4	3	4	4	4	3	27
18	3	3	4	4	1	2	2	3	22
19	2	2	1	1	0	1	2	0	09
20	1	3	4	5	4	3	0	1	21
21	1	2	1	1	3	4	5	3	20
22	2	2	3	3	1	0	0	1	12
23	1	2	3	4	4	4	4	3	25
24	2	1	1	0	1	1	0	1	07
25	1	1	1	1	1	1	0	2	08
26	0	2	1	3	1	0	0	0	07
27	1	3	3	2	3	2	5	4	23
28	2	0	0	1	2	3	4	5	17
29	3	5	6	4	3	4	3	1	29
30	1	3	1	3	3	3	2	3	19
31	1	1	1	0	0	2	1	1	07

Mean of K-Sum is 15.9

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	36	74	55	42	25	13	3	0	0	0	0

MAWSON**MAGNETIC K-INDICES - AUGUST 1989**

Range for lower limit of K=9 is 1500nT

DAY	K-INDICES								K-SUM
01	3	2	2	0	1	1	3	4	16
02	6	3	3	1	0	0	1	5	19
03	2	4	4	2	1	2	2	3	20
04	3	2	2	2	2	1	6	6	24
05	3	1	1	0	0	0	0	3	08
06	2	3	3	2	2	2	4	3	21
07	3	3	3	2	2	2	3	4	22
08	4	4	4	3	1	0	1	4	21
09	4	2	1	2	1	2	4	4	20
10	3	5	7	5	3	4	5	6	38
11	5	6	5	2	3	3	3	4	31
12	6	4	3	3	3	2	1	5	27
13	5	5	4	3	3	2	2	3	27
14	5	5	(9)	8	6	4	5	6	(48)
15	6	6	7	5	5	4	4	8	45
16	4	5	4	3	3	3	4	5	31
17	5	5	4	4	4	5	5	6	38
18	6	6	5	5	3	3	6	6	40
19	6	6	4	2	2	2	3	2	27
20	3	3	5	5	3	3	1	1	24
21	2	2	2	1	2	5	6	5	25
22	5	5	5	3	-	-	-	-	--
23	-	-	-	-	-	-	-	-	--
24	-	-	-	-	-	-	-	2	--
25	1	2	1	2	0	1	1	3	11
26	2	4	3	3	3	2	1	2	20
27	2	7	6	3	3	2	5	4	32
28	3	2	1	1	2	4	5	7	25
29	6	8	7	3	3	3	6	5	41
30	3	5	3	3	3	7	5	6	35
31	4	4	2	1	2	5	3	5	26

Mean of K-Sum is 27.2

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	9	24	44	53	31	36	22	6	3	1	19

PRINCIPAL MAGNETIC STORMS - AUGUST 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	09 18 29	SSC*	-0.6*	+19	+14	10 (3)	6	9	220	90	11	19
	14 06 12	SSC*	+1.8*	+56	+54*	14 (3)	7	14	250	130	16	14
	23 00 (45)	SSC*	-0.3*	+18	+16	23 (4,5,6,7)	5	7	140	50	24	10
Charters Towers	09 18 31	SSC	-1.0	+19	-1	10 (3)	6	14.0	194	43	11	19
	14 06 14	SSC	+1.0	+67	-9	14 (3); 15 (5)	7	15.9	251	61	16	07
	28 10 ..	..	..	..	..	29 (1,3)	6	12.6	162	42	29	20
Gnangara	14 06 12	SSC*	+13.1	+68*	+63*	14 (3)	6	20	180	200	14	21
	14 23 --	..				15 (5)	7	37	180	170	16	10
	28 10 --	..				28 (8)	6	23	190	140	29	21
Canberra	09 18 31	SSC	-1.0	+9	+6	10 (3,4); 11 (1,4)	5	29.5	150	92	11	15
	14 06 13	SSC	+2.3	+81	+7	14 (3); 15 (5)	6	25.1	263	93	16	07
	28 14 --	..	..	..	..	29 (3)	6	29.3	200	76	29	20

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PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D		Z	F
	nT	deg	min	nT	nT
PORT MORESBY	35923	06°	36.4' E	-23710	43042
CHARTERS TOWERS	31757	07°	46.5' E	-38257	49720
LEARMONTH	29489	00°	33.9' W	-44436	53331
GNANGARA	23204	03°	07.9' W	-53809	58599
CANBERRA	23662	12°	29.5' E	-53673	58657
MACQUARIE IS.	12578	29°	41.2' E	-63524	64757
MAWSON	18474	64°	14.6' W	-46077	49643
DAVIS	17397	77°	30.0' W	-51732	54579
CASEY	9600	91°	54.0' W	-63864	64581

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):	5	25	3	1	24
Quietest days (6-10):	2	31	26	8	6
Most Disturbed days :	15	14	29	10	17

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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	09	ssc*B	1829	+19	-6*	+14
	14	ssc A	0612	+56	+19*	+54*
	23	ssc*B	00(45)	+18	-3*	+16
CHARTERS TOWERS	09	ssc B	1831	+19	-9	-1
	14	ssc A	0614	+67	+9	-9
	27	ssc B	1338	+28	-2	-2
GNANGARA	09	ssc B	1831	+20	+8	+11
	14	ssc*B	0152	+5*	-24*	-12*
	14	ssc*A	0612	+68*	+89*	+63*
	23	ssc*B	0047	+4	-29*	-14*
	27	ssc B	1338	+23*	+11	+10
CANBERRA	09	ssc B	1831	+9	-7	+6
	14	ssc A	0613	+81	+16	+7
	27	ssc B	1337	+30	+5	+5

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