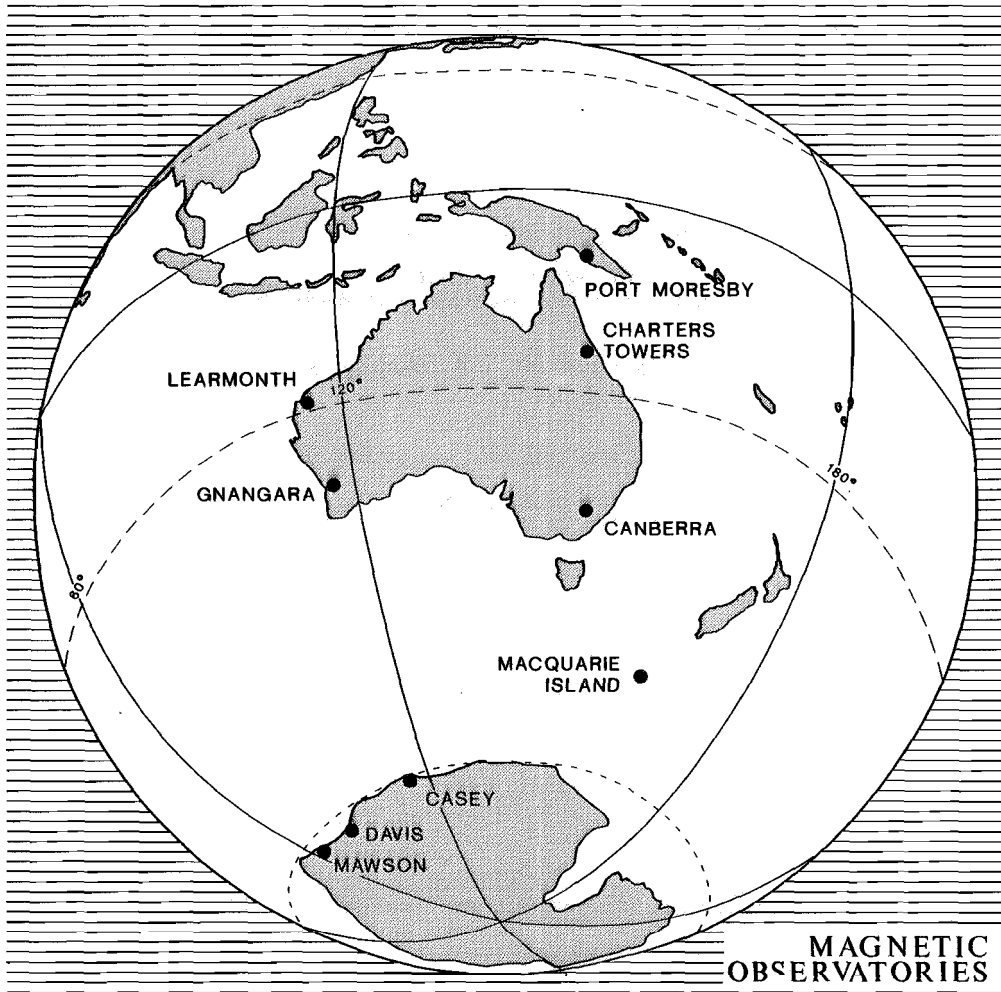




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DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

Minister for Resources:

The Hon. Alan Griffiths MP

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.	P.Crosthwaite	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 - NOVEMBER 1991

Range for lower limit of K=9 is 300nT

DAY	K-INDICES								K-SUM
01	4	3	4	5	7	6	6	5	40
02	5	5	3	2	4	4	3	2	28
03	2	3	2	4	3	2	2	3	21
04	3	2	3	4	2	2	4	4	24
05	5	5	4	2	3	3	3	3	28
06	3	3	4	2	2	3	3	3	23
07	3	2	2	2	2	3	2	2	18
08	3	3	4	5	7	6	6	7	41
09	6	5	6	7	6	5	4	3	42
10	3	3	4	4	4	3	3	3	27
11	2	2	2	3	4	4	4	5	26
12	3	3	3	2	1	1	2	2	17
13	2	2	3	3	3	2	2	3	20
14	5	4	3	3	4	3	3	4	29
15	4	3	4	5	5	4	3	3	31
16	2	4	3	5	4	3	3	3	27
17	3	2	3	4	3	3	3	2	23
18	2	3	3	5	4	4	5	5	31
19	4	4	4	4	6	4	5	3	34
20	3	2	3	3	2	3	3	3	22
21	2	3	5	4	5	5	6	6	36
22	4	3	5	5	4	2	2	2	27
23	3	3	4	4	4	3	2	2	25
24	2	2	1	3	3	3	3	2	19
25	1	3	3	2	1	2	-	-	--
26	2	2	3	3	2	2	1	1	16
27	1	1	2	2	2	3	2	2	15
28	1	1	2	2	4	3	3	4	20
29	3	2	2	2	3	3	2	3	20
30	3	3	2	3	2	2	2	3	20

Mean of K-Sum is 25.9

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	0	11	64	84	42	23	10	4	0	0	2

GNANGARA

MAGNETIC K-INDICES - NOVEMBER 1991

Range for lower limit of K=9 is 450nT

DAY	K-INDICES								K-SUM
01	5	3	4	5	7	7	7	6	44
02	6	4	3	3	3	4	3	3	29
03	2	2	3	4	4	3	3	4	25
04	3	3	3	3	2	3	5	5	27
05	6	4	3	2	2	4	3	2	26
06	2	3	3	1	2	3	1	3	18
07	2	2	1	2	2	3	2	3	17
08	3	2	4	4	6	6	6	8	39
09	7	6	6	6	5	5	5	3	43
10	2	3	4	3	4	3	2	3	24
11	2	1	1	2	3	4	5	5	23
12	2	1	2	1	0	2	1	2	11
13	1	1	1	2	3	3	2	2	15
14	4	3	3	2	3	1	2	3	21
15	4	2	2	5	5	4	2	3	27
16	3	3	1	5	5	4	3	3	27
17	2	2	2	4	3	2	4	3	22
18	3	1	2	5	2	2	4	4	23
19	4	4	4	4	5	5	5	5	36
20	3	2	3	2	3	4	4	2	23
21	3	3	4	5	5	6	6	6	38
22	5	4	5	5	6	4	3	4	36
23	3	3	4	4	3	3	3	4	27
24	2	1	2	1	3	3	3	3	18
25	1	2	3	2	1	3	3	3	18
26	1	2	2	3	2	2	1	0	13
27	2	1	1	0	2	3	2	1	12
28	1	1	1	1	2	2	3	3	14
29	4	2	1	1	4	4	2	4	22
30	2	2	2	1	2	1	2	3	15

Mean of K-Sum is 24.4

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	3	31	60	67	38	23	13	4	1	0	0

CANBERRA

MAGNETIC K-INDICES - NOVEMBER 1991

Range for lower limit of K=9 is 450nT

DAY	K-INDICES								K-SUM
01	3	4	4	6	6	6	6	6	41
02	4	5	3	2	3	4	2	1	24
03	2	2	2	4	4	2	2	4	22
04	2	2	3	3	2	3	5	6	26
05	4	4	3	2	3	3	2	2	23
06	3	4	3	2	2	4	2	3	23
07	3	2	2	2	2	3	2	3	19
08	3	2	5	5	6	5	6	8	40
09	6	6	5	6	6	6	5	2	42
10	2	3	4	3	4	3	2	2	23
11	1	1	2	3	4	4	4	5	24
12	2	3	3	1	0	1	2	1	13
13	0	1	3	2	3	3	2	2	16
14	4	3	3	4	4	2	3	4	27
15	3	3	3	5	5	3	3	3	28
16	2	4	3	5	4	3	3	4	28
17	2	2	3	5	3	3	4	3	25
18	2	3	3	5	3	3	5	4	28
19	3	4	4	4	5	5	5	3	33
20	2	2	3	3	3	3	2	2	20
21	2	3	3	5	5	5	5	5	33
22	4	4	5	5	5	3	2	4	32
23	3	3	5	4	4	3	2	2	26
24	2	1	2	1	3	3	2	2	16
25	0	2	3	2	2	2	2	2	15
26	1	2	2	3	2	2	1	0	13
27	1	2	2	1	2	3	2	2	15
28	1	0	1	1	3	2	4	3	15
29	4	2	1	2	4	3	2	4	22
30	3	3	3	3	2	2	2	4	22

Mean of K-Sum is 24.5

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	5	17	71	69	38	26	13	0	1	0	0

MAWSON

MAGNETIC K-INDICES - NOVEMBER 1991

Range for lower limit of K=9 is 1500nT

DAY	K-INDICES								K-SUM
01	5	6	6	6	6	6	7	7	49
02	6	6	5	4	4	4	5	5	39
03	4	4	4	5	4	3	4	5	33
04	5	6	5	4	3	3	7	6	39
05	5	6	6	3	4	6	5	3	38
06	4	5	5	3	3	4	3	5	32
07	6	5	4	3	3	2	5	3	31
08	4	4	5	4	7	7	6	7	44
09	6	9	8	6	5	5	7	5	51
10	5	5	5	4	4	3	6	6	38
11	5	3	4	4	3	4	7	5	35
12	4	5	5	3	2	2	4	4	29
13	3	3	3	3	4	4	3	4	27
14	4	6	6	3	4	3	3	4	33
15	5	5	5	5	5	5	5	4	39
16	4	4	4	4	5	4	5	5	35
17	4	5	3	5	5	4	5	3	34
18	5	6	6	5	5	4	4	4	39
19	5	8	8	5	5	8	6	5	50
20	4	5	5	4	3	4	6	5	36
21	4	7	7	6	6	8	6	5	49
22	5	7	7	7	6	4	3	3	42
23	5	6	7	6	6	4	5	6	45
24	5	5	4	3	4	4	6	5	36
25	4	5	4	2	3	4	5	6	33
26	4	5	4	4	3	3	4	2	29
27	4	4	3	3	4	4	3	4	29
28	4	2	3	4	4	3	4	4	28
29	5	5	4	3	5	4	3	6	35
30	5	6	5	3	3	2	2	6	32

Mean of K-Sum is 37.0

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	0	0	8	41	69	65	37	14	5	1	0

PRINCIPAL MAGNETIC STORMS - NOVEMBER 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	10	..	...	..	..	..	01(5)	7	14	150	90	02	10
	08	06	47	SSC*	+0.4*	+25	+23	08(5,8);09(4)	7	20	380	150	09	22
	14	00	..	...	..	..	..	14(1);15(4,5);						
								16(4)	5	9	160	80	16	16
	18	07	..	...	..	..	..	19(5)	6	12	130	60	20	00
	21	06	..	...	..	..	..	21(7,8)	6	11	140	70	23	19
Gnangara	01	10	..	...	..	..	..	01(5,6,7)	7	46	270	240	02	08
	08	06	49	SSC	-3.6	+30	+23	08(8)	8	55	460	330	09	22
	21	06	..	...	..	..	..	21(6,7,8);22(5)	6	31	135	170	22	18
Canberra	08	06	48	SSC*	0	+50*	+8*	08(8)	8	47.0	618	263	09	21
	19	04	20	SSC*	0.	+36*	+3	19(5,6,7)	5	27.0	141	101	20	00
	21	03	..	...	..	..	..	21(4-8), 22(3,4,5).	5	23.5	186	88	22	18

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PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D		Z	F
	nT	deg	min	nT	nT
PORT MORESBY	35909	06°	35.5' E	-23695	43022
CHARTERS TOWERS	31732	07°	47.1' E	-38245	49695
LEARMONTH	29521	00°	25.7' W	-44424	53339
GNANGARA	23159	03°	01.3' W	-53800	58573
CANBERRA	23637	12°	31.6' E	-53648	58625
MACQUARIE IS.	12573	29°	48.8' E	-63481	64714
MAWSON	18517	64°	30.4' W	-45940	49531
DAVIS	16690	78°	00.2' W	-51898	54515
CASEY	9626	92°	06.5' W	-63871	64593

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): 27 26 28 25 12
Quietest days (6-10): 07 13 30 24 29
Most Disturbed days : 09 01 08 21 19

SUDDEN STORM COMMENCEMENTS (ssc): NOVEMBER 1991

Observatory	Day	Type and Quality	U.T.	Sense and Amplitude of Chief Movement		
				H(nT)	D(nT)	Z(nT)
PORT MORESBY	08	ssc*B	0647	+25	+4*	+23
GNANGARA	08	ssc B	0649	+30	-24	-23
	11	ssc B	1751	+30	-30	-30
CANBERRA	08	ssc*B	0648	+50*	0	+8*
	19	ssc*C	0420	+36*	0	+3

SOLAR FLARE EFFECTS (sfe): NOVEMBER 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	15	2238	2240	2245	*	-6	-17	+5

