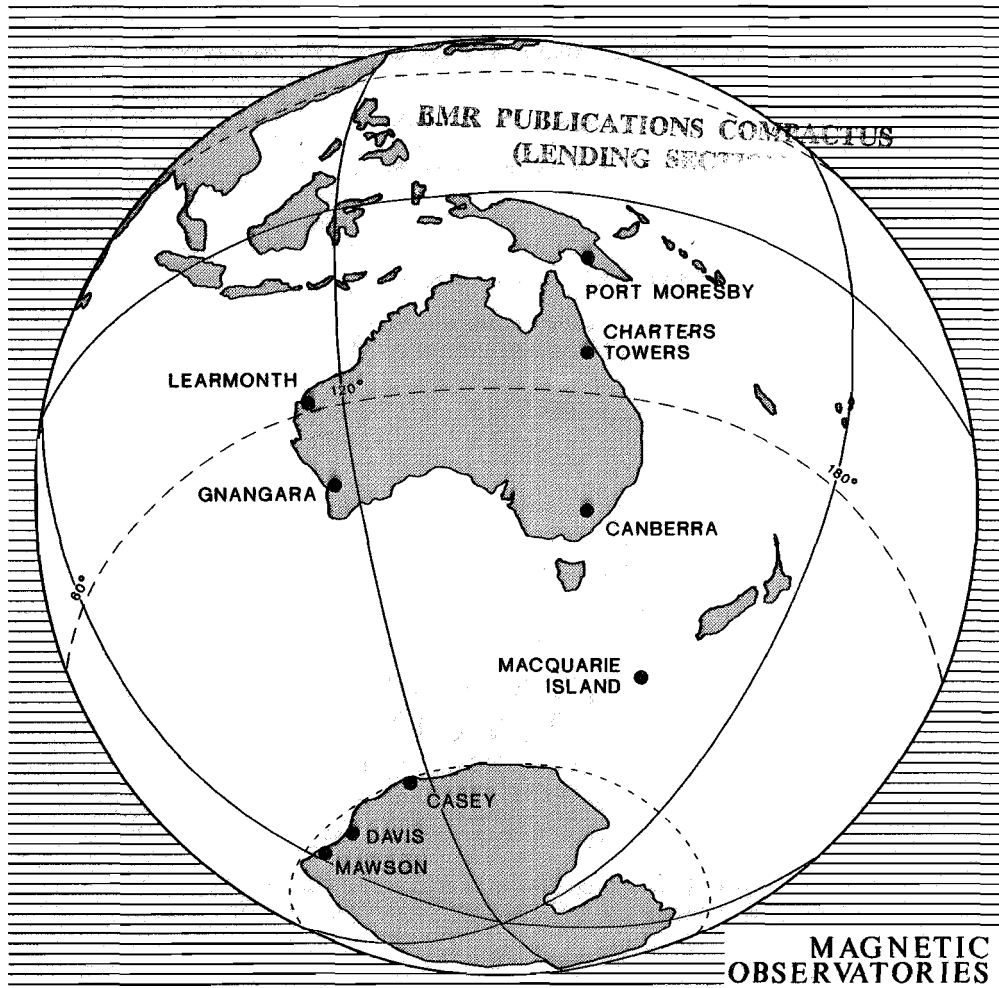


AUSTRALIAN GEOMAGNETISM REPORT



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BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

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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.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 - SEPTEMBER 1991

Range for lower limit of K=9 is 300nT

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

Mean of K-Sum is 19.1

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	2	67	58	62	34	10	0	0	0	0	7

GNANGARA

MAGNETIC K-INDICES - SEPTEMBER 1991

Range for lower limit of K=9 is 450nT

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

Mean of K-Sum is 13.2

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	43	55	52	39	17	7	1	0	0	0	26

CANBERRA

MAGNETIC K-INDICES - SEPTEMBER 1991

Range for lower limit of K=9 is 450nT

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

Mean of K-Sum is 17.9

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	16	61	60	63	32	8	0	0	0	0	0

MAWSON

MAGNETIC K-INDICES - SEPTEMBER 1991

Range for lower limit of K=9 is 1500nT

DAY	K-INDICES								K-SUM
01	6	6	7	5	4	4	7	7	46
02	6	5	5	6	3	4	3	5	37
03	3	5	5	4	3	4	6	7	37
04	5	5	6	4	3	3	4	3	33
05	5	6	6	4	3	4	4	4	36
06	4	5	5	3	3	3	3	5	31
07	4	5	4	3	2	3	3	5	29
08	5	6	5	2	3	4	7	4	36
09	6	5	5	5	4	4	6	6	41
10	6	6	5	2	3	5	5	5	37
11	3	4	3	4	4	4	7	5	34
12	3	4	5	5	3	2	4	4	30
13	5	4	4	2	2	2	3	6	28
14	6	6	5	5	4	5	6	5	42
15	5	5	3	2	1	2	5	5	28
16	3	4	2	2	2	2	2	3	20
17	3	3	2	1	2	2	3	4	20
18	2	2	2	2	1	1	2	4	16
19	4	3	3	3	2	3	4	5	27
20	4	4	5	3	1	2	2	4	25
21	4	4	4	2	1	1	1	3	20
22	4	3	2	2	2	1	0	2	16
23	4	2	2	1	0	0	4	3	16
24	3	4	2	1	2	2	4	3	21
25	5	6	6	4	4	5	7	6	43
26	4	5	7	5	4	3	5	5	38
27	6	6	7	6	6	7	7	5	50
28	5	5	5	6	5	4	6	5	41
29	4	4	4	4	3	4	5	5	33
30	4	5	5	5	5	5	5	5	39

Mean of K-Sum is 31.7

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	3	11	35	40	55	58	27	11	0	0	0

PRINCIPAL MAGNETIC STORMS - SEPTEMBER 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	09	05 ..	...	..	..	..	09(5);11(1,4)	5	7	170	90	11	20
	24	22 ..	...	..	..	..	25(8);26(4,5); 27(4,5);28(5).	5	9	200	70	29	00
Gnangara	08	13 ..	..	..	..	..	08(7),09(5,7)	5	14	90	110	09	24
	25	15 ..	..	..	..	..	28(5)	6	21	140	110	28	24
Canberra	09	05 17	SSC*	+0.4	+15*	+4*	09(5,6)	5	19.9	106	73	10	10
	25	11 ..	..	..	..	..	26(4,5),28(5)	5	22.0	108	69	29	00

SEPTEMBER 1991

PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D		Z	F
	nT	deg	min	nT	nT
PORT MORESBY	35921	06°	35.9' E	-23689	43029
CHARTERS TOWERS	31714	07°	47.3' E	-38246	49685
LEARMONTH	29531	00°	25.8' W	-44413	53335
GNANGARA	23176	03°	01.1' W	-53793	58573
CANBERRA	23628	12°	31.6' E	-53650	58623
MACQUARIE IS.	12574	29°	48.8' E	-63494	64727
MAWSON	18501	64°	30.3' W	-45948	49533
DAVIS	16697	77°	52.9' W	-51907	54526
CASEY	9636	92°	00.5' W	-63868	64591

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): 23 21 17 18 24

Quietest days (6-10): 16 22 20 12 15

Most Disturbed days : 25 01 09 27 28

SUDDEN STORM COMMENCEMENTS (ssc): SEPTEMBER 1991

Observatory	Day	Type and Quality	U.T.	Sense and Amplitude of Chief Movement		
				H(nT)	D(nT)	Z(nT)
PORT MORESBY	Nil	ssc's	reported			
GNANGARA	Nil	ssc's	reported			
CANBERRA	09	ssc*C	0517	+15*	+3	+4*

SOLAR FLARE EFFECTS (sfe): SEPTEMBER 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		Nil	sfe's	reported				

