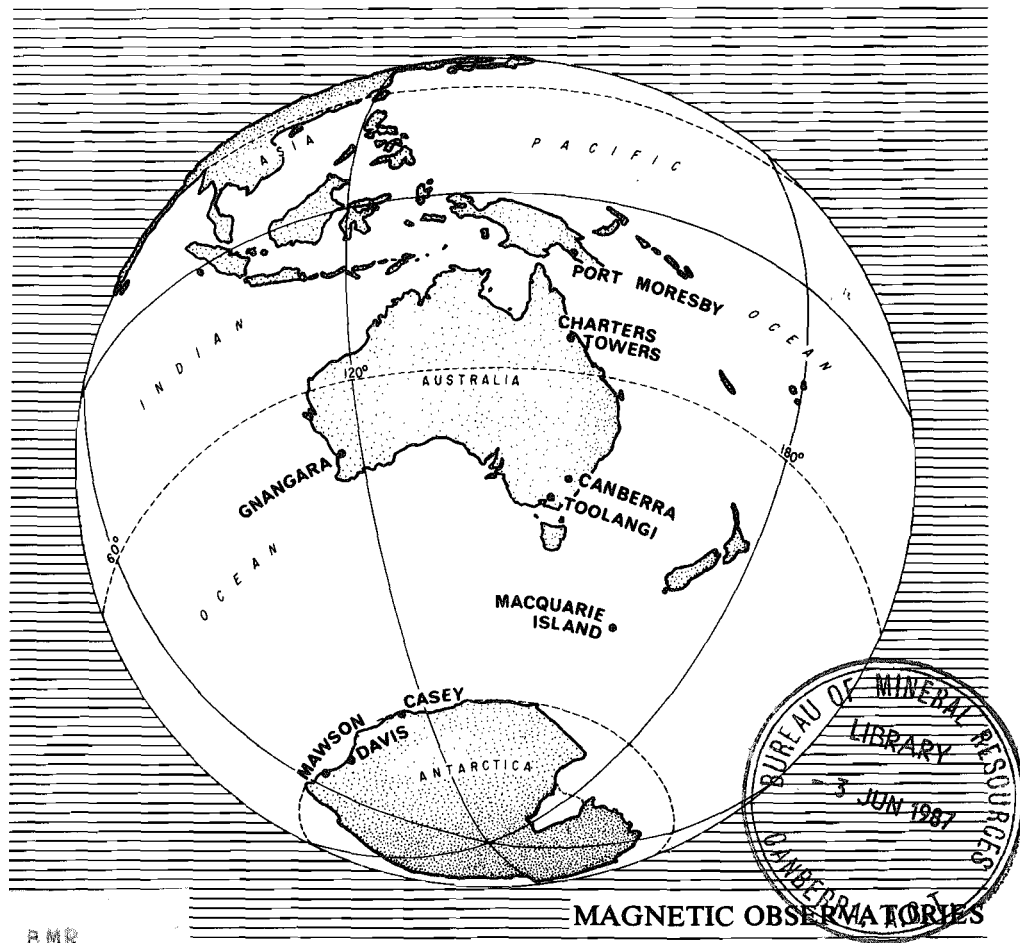


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GEOFYSICAL OBSERVATORY REPORT



MAGNETIC OBSERVATORIES

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SEPTEMBER 1986

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

DEPARTMENT OF RESOURCES AND ENERGY

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SECRETARY: A J Woods

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

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CONTENTS

	Page
Contributing Observatories.....	4
Learmonth Magnetic Observatory.....	5
K-indices.....	6
Principal Magnetic Storms.....	10
Monthly Mean Values, Sudden Commencements and Other Rapid Variations.....	11

The observers at Casey and Davis, and Macquarie Island are officers of the Antarctic Division (Department of Science and Technology) and their contributions are gratefully acknowledged; they and the BMR geophysicists of Mawson are members of the Australian National Antarctic Research Expeditions (ANARE).

The 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 IAGA. The units of field intensity, nanotesla (nT), are those of the SI system. All times are in Universal Time. Should further Information be required, apply to:

GEOMAGNETISM SECTION
BUREAU OF MINERAL RESOURCES
G.P.O. Box 378
CANBERRA A.C.T. 2601



CONTRIBUTING OBSERVATORIES

OBSERVATORY	OBSERVER IN CHARGE	<u>GEOGRAPHIC</u>		<u>GEOMAGNETIC</u>	
		LAT	LONG	LAT	LONG
PORT MORESBY	I.D. Ripper	9 25'S	147 09'E	-18.2	219.6
CHARTERS TOWERS	J.M. Millican	20 05'S	146 15'E	-28.8	220.2
GNANGARA	P.J. Gregson	31 47'S	115 57'E	-42.9	187.8
CANBERRA	P.A. Hopgood	35 19'S	149 22'E	-43.5	226.4
MACQUARIE I	R. Lachal	54 30'S	158 57'E	-60.6	244.6
MAWSON	P.J. Kelsey	67 36'S	62 53'E	-73.3	105.9
DAVIS	R.G. McLoughlin	68 35'S	77 58'E	-76.9	123.5
CASEY	B. Martin	66 17'S	110 32'E	-77.5	182.4

MAGNETOGRAPHS

OBSERVATORY	CODE	TYPE	ELEMENT/SCALE-VALUE		
PORT MORESBY	PMG	La Cour (A)	H/3	D/5	Z/4
CHARTERS TOWERS	CTA	EDA/ELSEC digital (D1/1)			
GNANGARA	GNA	Eschenhagen (A)	H/3	D/7	Z/6
CANBERRA	CNB	Elsec digital (D1/0.1)			
MACQUARIE I	MCQ	Photo-electronic magnetometer (D1/0.1)			
MAWSON	MAW	Photo-electronic magnetometer (D1/0.1)			

Scale values are in nT/mm

A = analogue, 20 mm/hr

D1/0.1,1 = digital/1 min readings/0.1 or 1 nT resolution

MAGNETOMETERS

Absolute data are based on observations made with QHM's BMZ's, fluxgate-theodolites, declinometers and proton precession magnetometers.

Errors in preliminary values obtained from magnetograms are not likely to exceed 5 nT or 0.5 minutes.

The revised geomagnetic coordinates were derived using the 1980 DGRF geomagnetic north pole position: latitude = 78.80 N, longitude = 289.24 E.

NEW MAGNETIC OBSERVATORY AT LEARMONTH, NW AUSTRALIA

A new magnetic observatory is scheduled to come into operation in 1986 at Learmonth on North-West Cape, Western Australia, overlooking Exmouth Gulf. The geographic co-ordinates are latitude 22°13' south, longitude 114°6' east. The 3-letter code for the observatory is LRM.

The new observatory is a joint project between the Bureau of Mineral Resources, Geology and Geophysics (BMR) of the Australian Department of Resources and Energy, and the Ionospheric Prediction Service (IPS) of the Australian Department of Science.

The observatory will be situated within the area of the Learmonth Solar Observatory which is jointly operated by the Australian Department of Science and the United States Air Force.

An EDA 3-axis fluxgate magnetometer will be used to measure variations in X, Y and Z which will be recorded digitally each minute. Absolute observations of D, I and F will be performed semi-weekly using a fluxgate theodolite and a proton precession magnetometer.

The data will be reduced by the BMR and published in the Geophysical Observatory Report.

PORT MORESBY

MAGNETIC K-INDICES - SEPTEMBER 1986

Range for lower limit of K = 9 is 300 nT.

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

Mean of K-Sum is 19.1

Frequency of K-indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	6	50	93	66	20	8	2	1	0	0	0

GNANGARA

MAGNETIC K-INDICES - SEPTEMBER 1986

Range for lower limit of K = 9 is 450 nT.

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

Mean of K-Sum is 17.5

Frequency of K-indices											
K :	0	1	2	3	4	5	6	7	8	9	-
f :	13	65	72	55	25	9	1	0	0	0	0

CANBERRA

MAGNETIC K-INDICES - SEPTEMBER 1986

Range for lower limit of K = 9 is 450 nT.

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

Mean of K-Sum is 15.1

<u>Frequency of K-indices</u>											
K :	0	1	2	3	4	5	6	7	8	9	-
f :	32	65	76	37	26	2	2	0	0	0	0

MAWSON

MAGNETIC K-INDICES - SEPTEMBER 1986

Range for lower limit of K = 9 is 1500 nT.

<u>DAY</u>	<u>K-INDICES</u>								<u>K-SUM</u>
01	3	5	5	4	3	1	5	6	32
02	5	5	6	3	3	3	5	4	34
03	3	3	2	2	3	2	1	5	21
04	4	4	2	1	1	2	4	4	22
05	5	3	4	3	2	2	5	5	29
06	5	4	2	2	3	3	0	4	23
07	3	3	2	2	2	1	1	3	17
08	3	3	3	1	0	1	1	5	17
09	5	4	4	1	3	1	0	1	19
10	3	3	2	1	0	0	1	0	10
11	3	4	3	1	2	1	4	7	25
12	5	8	6	5	4	4	7	7	46
13	7	6	4	5	2	3	3	7	37
14	5	5	3	1	0	3	6	3	26
15	3	3	2	2	3	4	5	3	25
16	2	3	4	1	0	0	2	3	15
17	5	4	5	3	3	2	5	5	32
18	5	5	5	4	2	3	6	6	36
19	7	6	6	3	3	6	2	7	40
20	5	5	5	3	3	1	5	7	34
21	6	4	4	2	3	1	6	3	29
22	1	2	2	1	1	0	2	2	11
23	6	7	5	4	4	5	7	8	46
24	5	6	5	3	3	2	7	6	37
25	3	4	4	3	5	6	5	8	38
26	7	6	5	5	3	5	5	5	41
27	4	4	5	4	3	4	7	4	35
28	3	5	5	3	2	1	6	6	31
29	6	5	4	4	2	3	5	7	36
30	3	3	4	2	1	0	0	2	15

Mean of K-Sum is 28.6

Frequency of K-indices											
K :	0	1	2	3	4	5	6	7	8	9	-
f :	12	25	32	54	34	46	20	14	3	0	0

SEPTEMBER 1986
PRINCIPAL MAGNETIC STORMS

OBSERVATORY	COMMENCEMENT				SSC AMPLITUDES			MAX 3h K-INDEX			RANGES			UT END	
	d	h	min	TYPE	D(')	H(nT)	Z(nT)	d (3h-PERIOD)	K	D(')	H(nT)	Z(nT)	d	h	
Port Moresby	11	18	35	ssc*	+0.8*	+26	+20	12 (2)	7	9	310	130	13	18	
	22	18	..	...	..	..	..	23 (2,3,6)	5	7	130	60	24	18	
Charters Towers	11	18	37	ssc*	+1.1*	+21	-2	12 (2)	7	13.5	297	55	12	20	
Gnangara	11	18	36	ssc*	4.4*	17	19*	12 (4)	6	22	280	120	14	07	
	22	19	..	...	..	..	..	25 (4, 5)	5	20	90	80	28	08	
Canberra	11	18	38	ssc*	+2.6*	+17	+2	12 (2, 3)	6	23.3	270	164	12	20	

SEPTEMBER 1986
PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H nT	D deg min	Z nT	F nT
PORT MORESBY	35934	06° 35.0'E	-23710	43051
CHARTERS TOWERS	31777	07° 44.7'E	-38269	49742
GNANGARA	23232	03° 14.7'W	-53797	58599
CANBERRA	23693	12° 23.6'E	-53710	58704
MACQUARIE I	12596	29° 20.0'E	-63584	64820
MAWSON	18476	63° 52.2'W	-46267	49820
DAVIS	16612	76° 52 'W	-52204	54783
CASEY	9634	90° 57 'W	-64126	64846

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

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	11	ssc B	18 35	+26	+ 8	+20
CHARTERS TOWERS	11	ssc*B	18 37	+21	+10	- 2
GNANGARA	11	ssc*B	18 36	+17	+29*	+19*
CANBERRA	11	ssc*B	18 38	+17	+18*	+ 2

