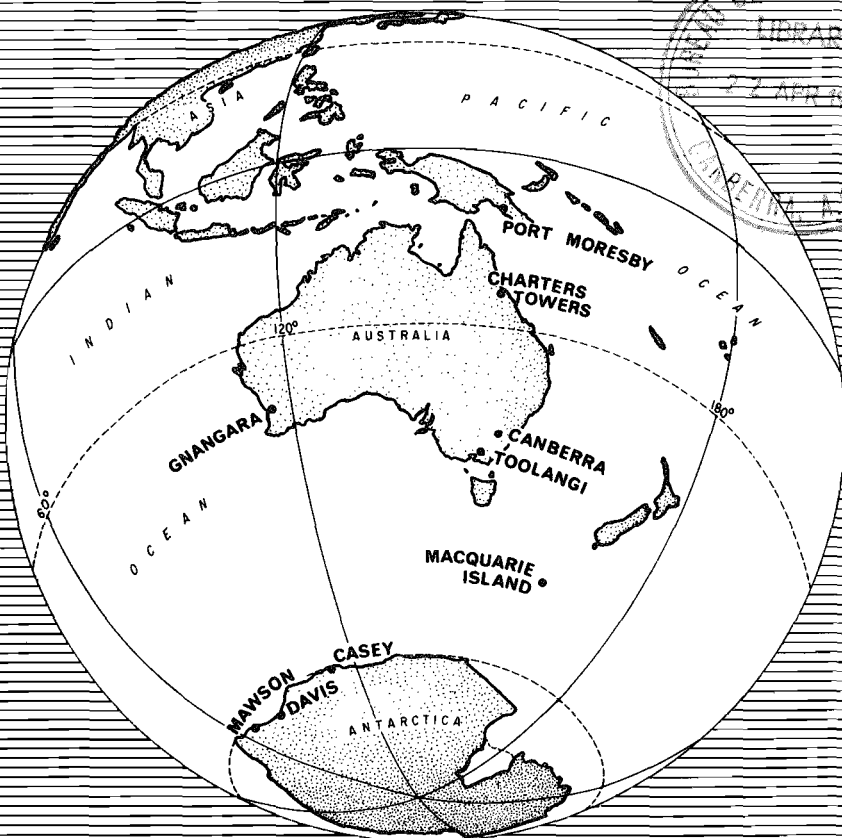


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GEOPHYSICAL OBSERVATORY REPORT



MAGNETIC OBSERVATORIES

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VOLUME 34 No. 8
AUGUST 1986

MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

DEPARTMENT OF RESOURCES AND ENERGY

Minister: Senator The Hon. Gareth J Evans

SECRETARY: A J Woods

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

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The observers at Casey, Davis and McQuarie 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	R. Hutchinson	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.

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 $22^{\circ}13'$ south, longitude $114^{\circ}6'$ 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 - AUGUST 1986

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

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

Mean of K-Sum is 18.1

Frequency of K-indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	0	56	100	61	24	3	0	0	0	0	4

GNANGARA

MAGNETIC K-INDICES - AUGUST 1986

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

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

Mean of K-Sum is 16.9

Frequency of K-indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	24	64	68	55	26	9	2	0	0	0	0

CANBERRA

MAGNETIC K-INDICES - AUGUST 1986

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

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

Mean of K-Sum is 14,5

Frequency of K-indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	45	67	58	48	27	3	0	0	0	0	0

MAWSON

MAGNETIC K-INDICES - AUGUST 1986

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

<u>DAY</u>	<u>K-INDICES</u>								<u>K-SUM</u>
01	4	3	3	3	1	1	5	3	23
02	2	2	3	2	1	1	0	4	15
03	4	5	4	4	3	2	8	8	38
04	7	5	5	5	4	5	3	6	40
05	3	6	4	2	2	3	3	6	29
06	3	4	3	1	1	1	3	4	20
07	3	2	1	1	0	0	4	6	17
08	5	3	3	2	2	3	3	3	24
09	3	3	3	2	2	5	4	5	27
10	5	3	2	2	1	1	3	4	21
11	3	4	3	3	3	1	4	3	24
12	1	4	4	4	4	2	1	1	21
13	3	4	4	5	3	3	2	4	28
14	2	3	4	3	2	2	5	6	27
15	5	3	3	1	2	3	1	5	23
16	4	3	3	1	2	0	0	2	15
17	3	3	1	0	2	1	1	3	14
18	2	1	2	1	0	0	0	2	08
19	2	1	1	2	3	2	2	5	18
20	2	3	1	0	3	3	7	5	24
21	2	3	3	5	5	5	5	6	34
22	5	5	5	5	4	3	6	6	39
23	4	5	6	5	5	6	7	7	45
24	6	5	6	5	2	6	7	6	43
25	6	6	6	4	2	2	6	6	38
26	6	4	5	3	4	2	2	5	31
27	6	5	4	5	4	2	3	5	34
28	2	3	3	2	3	4	6	5	28
29	5	5	5	6	5	5	6	6	43
30	5	6	6	5	5	3	7	7	44
31	7	6	4	4	4	2	3	6	36

Mean of K-Sum is 28.0

Frequency of K-indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	10	26	40	56	34	43	29	8	2	0	0

AUGUST 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	20	30	51	ssc	+0.3	+19	+15	21(6);22(3)	5	6	100	70	23	18
Charters Towers	20	13	52	ssc	-0.3	+19	- 2	21(6);22(2,3,5)	5	6.1	119	27	23	18
Gnangara	20	13	52	ssc	+0.4	+13	+ 6	21(6);22(5)	6	23	120	120	22	23
Canberra	20	13	52	ssc	..	+17	+ 2	21(6);22(3,5)	5	20.4	134	43	23	18

AUGUST 1986
PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H nT	D deg min	Z nT	F nT
PORT MORESBY	35938	06° 35.2'E	-23711	43055
CHARTERS TOWERS	31780	07° 44.5'E	-38269	49744
GNANGARA	23237	03° 15.3'W	-53792	58596
CANBERRA	23695	12° 23.1'E	-53710	58704
MACQUARIE I	12601	29° 18.0'E	-63577	64814
MAWSON	18468	63° 48.9'W	-46259	49809
DAVIS	16630	76° 49 'W	-52222	54806
CASEY	9640	91° 00 'W	-64121	64842

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	20	ssc B	1351	+19	+3	+15
CHARTERS TOWERS	20	ssc B	1352	+19	-2	- 2
GNANGARA	20	ssc B	1352	+13	+3	+ 6
CANBERRA	20	ssc B	1352	+17	-	+ 2

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