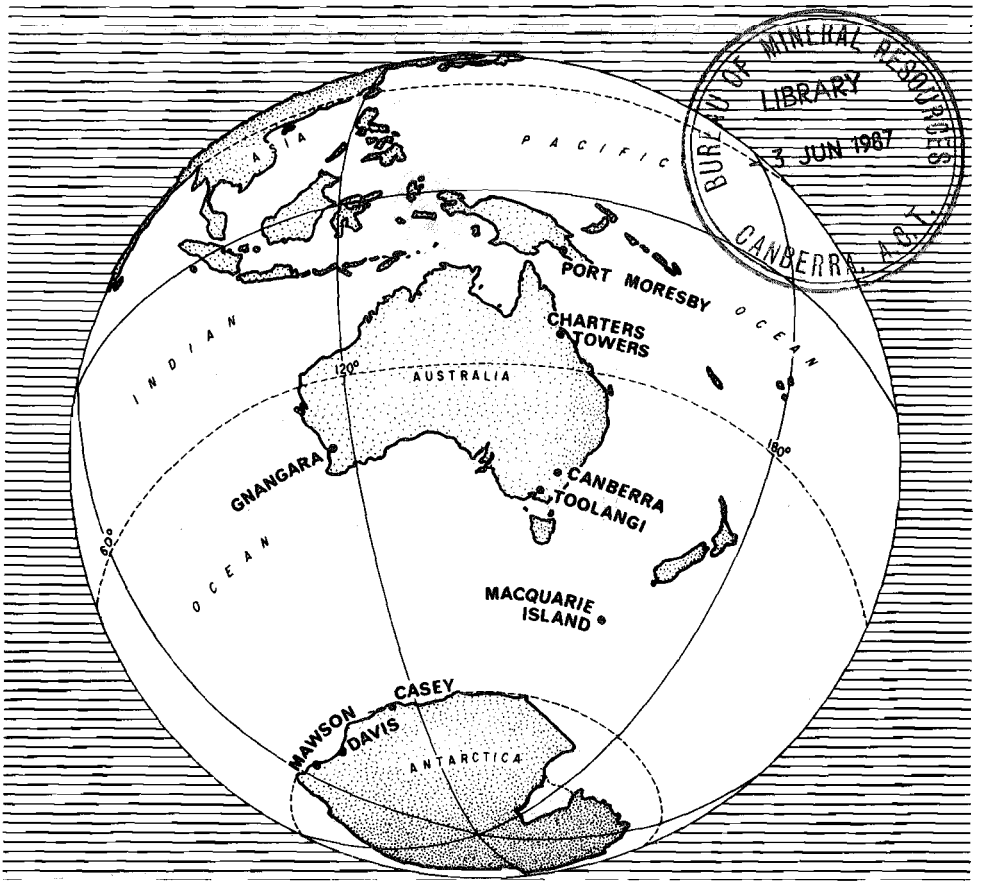
GEOPHYSICAL OBSERVATORY REPORT



MAGNETIC OBSERVATORIES

VOLUME 34 No. 11
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F MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

DEPARTMENT OF RESOURCES AND ENERGY

Minister: Senator The Hon. Gareth J. EVANS

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, Department of Science and Technology: 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 International Association of Geomagnetism and Aeronomy. The unit of field intensity is nanotesla (nT). All times are in Universal Time.
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CONTRIBUTING OBSERVATORIES

OBSERVATORY	OBSERVER IN CHARGE	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC 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	S.D.Dennis	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	(D/1)	X	Y	Z
GNANGARA	GNA	Eschenhagen	(A)	H/3	D/7	Z/6
CANBERRA	CNB	ELSEC	(D/.1)	D	I	F
MACQUARIE ISLAND	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 = ditigal, 1 min readings, 1 nT resolution
D/.1 = ditigal, 1 min 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 and proton precession magnetometers.

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

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; longtitude 114° 06′ 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 BMR and published in the Geophysical Observatory Report.

PORT MORESBY

MAGNETIC K-INDICES - NOVEMBER 1986

Range for lower limit of K=9 is 300nT

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

Mean of K-Sum is 17.9

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	0	63	101	45	17	7	4	0	0	0	3

GNANGARA

MAGNETIC K-INDICES - NOVEMBER 1986

Range for lower limit of K=9 is 450nT

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

Mean of K-Sum is 16.1

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	14	82	77	36	17	11	3	0	0	0	0

CANBERRA

MAGNETIC K-INDICES - NOVEMBER 1986

Range for lower limit of K=9 is 450nT

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

Mean of K-Sum is 13.7

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	37	80	50	30	13	9	1	0	0	0	20

MAWSON

MAGNETIC K-INDICES - NOVEMBER 1986

Range for lower limit of K=9 is 1500nT

DAY	K-INDICES								K-SUM
01	-	6	5	3	2	1	1	1	--
02	2	2	2	2	3	2	1	4	18
03	3	5	4	3	2	4	5	5	31
04	-	7	7	6	7	6	6	6	--
05	6	7	6	4	3	2	5	5	38
06	4	4	3	4	3	3	6	5	32
07	5	4	2	2	2	1	1	4	21
08	4	4	2	2	2	2	2	2	20
09	3	3	2	2	1	1	1	2	15
10	3	3	2	1	1	1	2	4	17
11	5	6	5	3	3	2	2	3	29
12	6	5	4	2	2	1	1	1	22
13	3	2	1	1	3	2	5	3	20
14	5	2	1	3	2	1	2	5	21
15	4	4	3	3	3	5	4	6	32
16	4	4	4	3	3	3	5	4	30
17	4	5	3	3	2	2	3	4	26
18	4	3	3	2	1	1	3	3	20
19	2	1	1	1	1	2	5	5	18
20	4	5	1	1	2	1	3	3	20
21	2	1	1	1	0	1	3	3	12
22	1	3	1	1	0	0	1	3	10
23	2	2	1	1	2	5	5	5	23
24	5	6	3	5	3	7	6	6	41
25	5	6	6	4	4	4	6	4	39
26	5	5	3	3	3	5	2	3	29
27	5	5	-	3	2	1	1	2	--
28	2	1	2	1	2	2	3	3	16
29	3	4	1	1	4	3	5	4	25
30	2	4	3	3	3	4	3	6	28

Mean of K-Sum is 24.1

Frequency of K-Indices

K :	0	1	2	3	4	5	6	7	8	9	-
f :	3	44	49	53	33	32	18	5	0	0	3

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PRINCIPAL MAGNETIC STORMS

OBSERVATORY	Commencement day	hr	min	type	SSC-amplitude D(′)	H(nT)	Z(nT)	Max. 3hr K-index day	(3hr-period)	K	Ranges D(′)	H(nT)	Z(nT)	UT End day	hr
Port Moresby	03	23	54	ssc	-	+	+	03	(8)						
								04	(1,2,4)	6	13	240	140	05	12
Charters Towers	03	23	54	ssc	-3.2	+50	+ 3	04	(1,2,4,5)	6	17.2	174	53	05	10
	23	14	..	...	..	..	..	23	(8)	5	10.4	119	40	25	21
								24	(4,7)	5					
								25	(5,6)	5					
Gnangara	03	23	54	ssc	+3.3	+34	+17	04	(4,5)	6	30	170	190	05	10
	23	13	..	...	..	..	..	24	(7)	6	23	122	130	26	18
Canberra	03	23	54	ssc*	-4.4	+32*	+25	04	(5)	6	30.2	143	93	05	10
	23	18	..	...	..	..	..	23	(8)	5	21.8	110	60	25	21
								24	(6,7)	5					
								25	(5)	5					

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PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D	Z	F
	nT	deg min	nT	nT
PORT MORESBY	35930	06° 35.0′ E	-23714	43050
CHARTERS TOWERS	31781	07° 44.6′ E	-38271	49747
GNANGARA	23241	03° 15.0′ W	-53799	58604
CANBERRA	23698	12° 23.7′ E	-53707	58703
MACQUARIE ISLAND	12593	29° 23 ′ E	-63575	64810
MAWSON	18468	63° 50.4′ W	-46252	49802
DAVIS	16640	76° 54 ′ W	-52165	54755
CASEY	9660	90° 39 ′ W	-64068	64792

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	03	ssc A	2354	+	-	+
CHARTERS TOWERS	03	ssc A	2354	+50	-30	+ 3
GNANGARA	03	ssc A	2354	+34	+22	+17
CANBERRA	03	ssc*B	2354	+32*	-30	+25

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