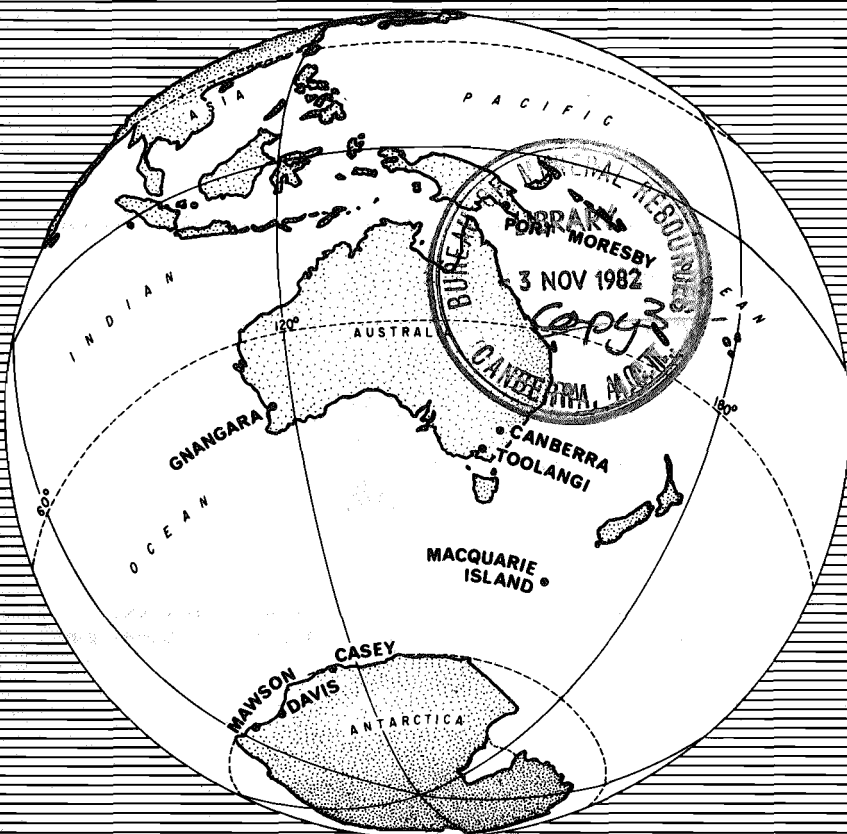


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~~23~~ **GEOPHYSICAL
OBSERVATORY REPORT**



MAGNETIC OBSERVATORIES

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VOLUME 29 NO 12

DECEMBER 1981

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

DEPARTMENT OF NATIONAL DEVELOPMENT AND ENERGY

MINISTER: Senator The Hon. J.L. Carrick

SECRETARY: A. Woods

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

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The observers at Casey and Davis are officers of the Antarctic Division (Department of Science and Technology) and their contributions are gratefully acknowledged: they and the BMR geophysicists at Macquarie Island and 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 International convention. 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 & SEISMOLOGY SUBSECTION
BUREAU OF MINERAL RESOURCES
P.O. BOX 378
CANBERRA CITY, A.C.T. 2601

CONTRIBUTING OBSERVATORIES

OBSERVATORY	OBSERVER IN CHARGE	GEOGRAPHIC		GEOMAGNETIC	
		LAT	LONG	LAT	LONG
PORT MORESBY	I.D. Ripper	9°25'S	147°09'E	-18.6°	217.9°
GNANGARA	P.J. Gregson	31°47'S	115°57'E	-43.3°	185.8°
CANBERRA	R.S. Smith	35°19'S	149°22'E	-44.0°	224.7°
*TOOLANGI	R.S. Smith	37°32'S	145°28'E	-46.7°	220.8°
MACQUARIE I	G.H.Y. Thomas	54°30'S	158°57'E	-61.1°	243.1°
MAWSON	A.S. Marks	67°36'S	62°53'E	-73.1°	102.9°
DAVIS	R. Morris	68°35'S	77°58'E	-76.7°	119.9°
CASEY	E. Davis	66°17'S	110°32'E	-77.8°	179.1°

MAGNETOGRAPHS

OBSERVATORY	TYPE	NOMINAL SCALE VALUES					
		NORMAL			SENSITIVE		
		D	H	Z	D	H	Z
PORT MORESBY	La Cour	0.5	3	4			
GNANGARA	Eschenhagen	1	3	6			
TOOLANGI	La Cour	1	5	5			
MACQUARIE I	La Cour	2.5	20	21			
MAWSON	La Cour	2.5	21	22	1	10	10
CANBERRA	Elsec digital	D	F	I			
			0.1nT				

Scale values are in minutes of arc/mm (D) and nT/mm (H,Z)

MAGNETOMETERS

Absolute data are based on observations made with QHM'S BMZ's declinometers and proton precession magnetometers.

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

*From 1 July 1979 Toolangi Observatory is only a variation observatory.

PORT MORESBY

MAGNETIC K-INDICES - DECEMBER 1981

Range for lower limit of K = 9 is 300 nT

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

GNANGARAMAGNETIC K-INDICES - DECEMBER 1981Range for lower limit of K = 9 is 450 nT

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

CANBERRAMAGNETIC K-INDICES - DECEMBER 1981Range for lower limit of K = 9 is 450 nT

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

TOOLANGIMAGNETIC K-INDICES - DECEMBER 1981Range for lower limit of K = 9 is 500 nT

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

MACQUARIE ISLAND

MAGNETIC K-INDICES - DECEMBER 1981

Range for lower limit of K = 9 is 1500 nT

<u>Day</u>	<u>K-Indices</u>								<u>K-Sum</u>
01	3	2	2	2	5	5	2	3	24
02	2	2	2	5	4	1	3	3	22
03	3	2	2	4	4	2	2	2	21
04	3	5	3	4	4	1	3	2	25
05	3	2	4	4	3	3	2	2	23
06	2	3	4	1	2	3	2	2	19
07	3	2	1	2	1	1	1	3	14
08	3	5	5	2	2	5	3	2	27
09	3	5	5	4	4	5	3	3	32
10	3	5	4	2	1	2	1	2	20
11	3	2	1	1	1	2	1	2	13
12	4	3	5	5	6	6	4	4	37
13	4	5	6	4	5	5	1	1	31
14	2	3	2	3	1	1	1	2	15
15	2	2	2	2	0	1	2	3	14
16	2	1	3	4	1	1	2	2	16
17	2	2	1	1	1	2	2	2	13
18	4	4	4	4	4	5	3	2	30
19	3	3	3	5	5	2	1	2	24
20	2	2	2	2	2	3	1	2	16
21	3	3	3	2	4	3	1	2	21
22	2	2	2	2	2	3	1	2	16
23	3	3	3	0	1	2	2	3	17
24	4	3	4	2	2	3	3	2	23
25	3	3	1	5	5	6	2	3	28
26	3	3	2	4	2	0	1	2	17
27	2	3	3	1	3	1	2	2	17
28	3	2	3	3	6	5	3	2	27
29	3	6	6	7	6	4	3	2	37
30	5	5	6	5	6	6	4	2	39
31	3	2	6	4	5	6	2	2	30

MAWSONMAGNETIC K-INDICES - DECEMBER 1981Range for lower limit of K = 9 is 1500 nT

<u>Day</u>	<u>K-Indices</u>								<u>K-Sum</u>
01	2	4	3	2	4	4	3	5	27
02	4	3	3	5	4	3	3	5	30
03	3	4	4	4	5	3	5	3	31
04	4	6	5	4	4	3	4	4	34
05	4	4	4	3	4	3	3	4	29
06	4	5	4	2	3	3	3	3	27
07	4	4	3	2	3	4	2	3	25
08	4	6	6	2	3	5	4	4	34
09	5	5	5	4	3	4	2	4	32
10	4	4	5	4	4	4	2	3	30
11	4	5	3	2	3	3	5	4	29
12	5	4	4	5	6	5	6	4	39
13	4	5	6	5	4	4	3	3	34
14	4	5	5	2	3	2	3	3	27
15	4	3	3	2	1	1	5	5	24
16	3	2	4	3	2	1	2	4	21
17	2	1	2	3	2	3	6	6	25
18	5	5	5	4	4	4	3	4	34
19	5	4	4	4	4	4	3	4	32
20	3	4	3	2	4	3	3	4	26
21	3	4	3	3	4	3	4	4	28
22	3	2	3	2	3	3	2	2	20
23	2	5	4	2	2	3	3	3	24
24	4	5	5	3	3	3	3	5	31
25	4	5	3	4	3	4	4	5	32
26	5	4	3	3	3	2	2	3	25
27	4	4	4	2	3	2	3	4	26
28	5	5	4	4	5	3	4	3	33
29	3	7	8	6	6	5	5	3	43
30	4	7	6	6	6	6	5	4	44
31	5	5	5	5	5	4	3	4	36

DECEMBER 1981

PRINCIPAL MAGNETIC STORMS

OBSERVATORY	COMMENCEMENT				SSC AMPLITUDES			MAX 3h INDEX K	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	12	01	44	ssc*	+0.4*	+46	+40	12(1,5)	5	10	170	100	13	16
	29	04	55	ssc*	+1.4*	+58*	+46*	29(2,3)	5	13	190	100	30	19
								30(3,5)						
GNANGARA	12	01	44	ssc*	-2.0	+30*	- 7	12(1,5)	5	21	90	140	13	17
	29	04	54	ssc*	+1.8*	+44*	+19*	29(3,4)	5	17	100	190	29	23
	30	02						30(2,5)	5	17	70	140	30	23
TOOLANGI	29	04	55	ssc*	-0.6	+87*	+13	30(2)	6	24	190	87	30	19

DECEMBER 1981

PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D		Z	F
	nT	o	'	nT	nT
PORT MORESBY	35961	06.30.6E		-23692	43064
GNANGARA	23359	03 19.9W		-53700	58561
CANBERRA	23780	12 12.1E		-53764	58788
MACQUARIE I	12688	28 37.3E		-63688	64940
MAWSON	18451	63 16.2W		-46662	50178
DAVIS	16608	76 20.4W		-52532	55095
CASEY	9410	88 33.0W		-64093	64780

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	12	ssc*A	0144	+46	+ 4*	+40
	29	ssc*A	0455	+58*	+14*	+46*
	31	ssc B	0206	+ 6	0	+ 6
GNANGARA	07	ssc B	2123	+ 5	- 1	- 1
	12	ssc*B	0144	+30*	-14	- 7
	29	ssc*B	0454	+44*	-12*	+19*
TOOLANGI	12	ssc*B	0145	+51*	-10	+ 9
	29	ssc*A	0455	+87*	- 4	+13

PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D		Z	F
	nT	o	'	nT	nT
PORT MORESBY*					
JANUARY	35974	06	29.2E	-23668	43062
FEBRUARY	35971	06	29.4E	-23666	43058
MARCH	35966	06	29.9E	-23671	43057
APRIL	35963	06	30.1E	-23670	43054
MAY	35960	06	30.4E	-23675	43054
JUNE	35970	06	30.2E	-23674	43062
JULY	35961	06	30.4E	-23681	43058
AUGUST	35945	06	30.5E	-23584	42991
SEPTEMBER	35956	06	30.4E	-23684	43055
OCTOBER	35953	06	30.6E	-23687	43055
NOVEMBER	35960	06	30.8E	-23695	43065
DECEMBER	35961	06	30.6E	-23692	43064
Mean	35962	06	30.2E	-23671	43053
GANANGARA					
JANUARY	23394	03	18.5W	-53662	58540
FEBURARY	23381	03	18.9W	-53665	58537
MARCH	23369	03	19.0W	-53671	58538
APRIL	23371	03	19.0W	-53677	58544
MAY	23366	03	18.6W	-53685	58550
JUNE	23370	03	18.6W	-53685	58551
JULY	23357	03	18.8W	-53689	58550
AUGUST	23352	03	18.9W	-53697	58555
SEPTEMBER	23352	03	19.4W	-53692	58550
OCTOBER	23342	03	19.7W	-53696	58550
NOVEMBER	23360	03	19.8W	-53702	58563
DECEMBER	23359	03	19.9W	-53700	58561
Mean	23364	03	19.1W	-53685	58549

PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D		Z	F
	nT	o	'	nT	nT
CANBERRA**					
JANUARY	23801	12	09.3E	-53767	58799
FEBRUARY	23788	12	10.4E	-53771	58798
MARCH	23785	12	10.5E	-53771	58797
APRIL	23771	12	10.6E	-53773	58793
MAY	23784	12	11.0E	-53770	58795
JUNE	23782	12	10.7E	-53773	58797
JULY	23776	12	11.2E	-53771	58793
AUGUST	23770	12	11.6E	-53772	58791
SEPTEMBER	23766	12	12.0E	-53771	58789
OCTOBER	23766	12	12.1E	-53772	58790
NOVEMBER	23782	12	12.3E	-53764	58789
DECEMBER	23780	12	12.1E	-53764	58788
Mean	23779	12	11.2E	-53770	58793
MACQUARIE I					
JANUARY	12710	28	31.5E	-63746	65001
FEBRUARY	12705	28	35.9E	-63739	64993
MARCH	12684	28	36.4E	-63747	64997
APRIL	12687	28	36.7E	-63749	64999
MAY	12686	28	37.4E	-63752	65002
JUNE	12695	28	38.3E	-63742	64994
JULY	12683	28	38.6E	-63748	64997
AUGUST	12681	28	39.6E	-63738	64987
SEPTEMBER	12674	28	40.0E	-63726	64974
OCTOBER	12671	28	40.7E	-63725	64973
NOVEMBER	12674	28	37.9E	-63716	64964
DECEMBER	12688	28	37.3E	-63688	64940
Mean	12687	28	37.5E	-63735	64985

PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D		Z	F
	nT	o	'	nT	nT
MAWSON					
JANUARY	18450	63	09.9W	-46718	50229
FEBRUARY	18446	63	09.0W	-46726	50235
MARCH	18434	63	13.9W	-46728	50233
APRIL	18435	63	14.8W	-46724	50229
MAY	18448	63	13.6W	-46717	50228
JUNE	18454	63	15.5W	-46700	50214
JULY	18444	63	16.0W	-46707	50217
AUGUST	18428	63	17.5W	-46706	50210
SEPTEMBER	18439	63	16.3W	-46692	50201
OCTOBER	18436	63	17.9W	-46706	50213
NOVEMBER	18455	63	14.6W	-46676	50192
DECEMBER	18451	63	16.2W	-46662	50178
Mean	18443	63	14.6W	-46705	50215
DAVIS					
JANUARY		not available			
FEBRUARY		not available			
MARCH	n/a	76	53.6W	-52950	n/a
APRIL	16616	76	18.4W	-52989	55533
MAY	16651	76	20.3W	-53013	55566
JUNE	16568	76	20.3W	-52859	55395
JULY	16567	76	21.7W	-51801	54386
AUGUST	16573	76	21.4W	-51788	54375
SEPTEMBER	16579	76	24.5W	-52493	55049
OCTOBER	16509	76	15.8W	-52668	55195
NOVEMBER	16557	76	26.6W	-52564	55110
DECEMBER	16608	76	20.4W	-52532	55095
Mean***	16587	76	18.0W	-52576	55130

PRELIMINARY MONTHLY MEAN VALUES

OBSERVATORY	H	D	Z	F
	nT	o	nT	nT
CASEY				
JANUARY		not available		
FEBRUARY	n/a	88 17.0W	-64542	n/a
MARCH	9518	87 57.8W	-64211	64913
APRIL	9479	87 51.8W	-64067	64764
MAY	9485	88 15.8W	-64062	64760
JUNE	9529	88 02.8W	-64108	64812
JULY	9580	88 04 7W	-64116	64828
AUGUST	9553	88 11.4W	-64115	64823
SEPTEMBER	9575	88 18.2W	-64058	64770
OCTOBER	9611	88 35.9W	-64018	64735
NOVEMBER	9527	87 36.3W	-64054	64759
DECEMBER	9410	88 33.0W	-64093	64780
Mean***	9540	88 02.1W	-64083	64789

* H values at Port Moresby are 11 nT greater from January 1981 owing to amended magnetometer corrections.

** The above values for Canberra were derived by machine methods from the International Quiet Days and differ from previously published monthly values which were derived manually from local quiet days.

*** The annual means for Casey and Davis were obtained graphically from the periodic absolute observations; they are better estimates than the arithmetic means.

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OBSERVATORY	D		I		H	X	Y	Z	F
	o	'	o	'	nt	nt	nt	nt	nt
PORT MORESBY	06	30.2E	-33	21.2	35962	35731	4073	-23671	43053
GNANGARA	03	19.1W	-66	28.9	23364	23325	- 1352	-53685	58549
CANBERRA	12	11.2E	-66	08.6	23779	23243	5020	-53770	58793
MACQUARIE ISLAND	28	37.5E	-78	44.5	12687	11136	6078	-63735	64985
MAWSON	63	14.6W	-68	27.1	18443	8303	-16468	-46705	50215
DAVIS	76	18.0W	-72	29.4	16587	3928	-16115	-52576	55130
CASEY	88	02.1W	-81	32.0	9540	327	- 9534	-64083	64789

