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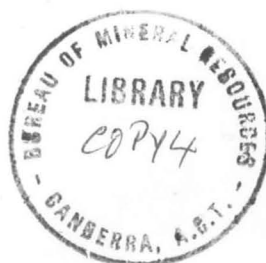
DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

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Record No. 1971/25

**First-Order Regional Magnetic
Survey of Northern and Western
Australia, 1969**



by

D. M. Finlayson

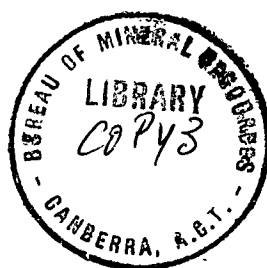
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Record 1971/25

FIRST-ORDER REGIONAL MAGNETIC SURVEY OF NORTHERN AND
WESTERN AUSTRALIA, 1969



by

D.M. Finlayson

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SUMMARY

The Bureau of Mineral Resources, Geology & Geophysics (BMR) has established a network of 72 first-order regional magnetic survey stations throughout Australia and its Territories which is intended to provide precise information on the values of the geomagnetic field and its secular variation.

From June to December 1969, magnetic observations were made at 34 stations in northern and western Australia. The observations were made over a period of approximately 60 hours at each station with instruments calibrated against the Australian standard controlling a three-component fluxgate variograph. Except at five stations the intensities of the horizontal and vertical components of the geomagnetic field were measured within the desired limits of ± 5 gammas and declination to within ± 1 minute of arc.

These survey results, together with the results of the 1968 survey of southeastern Australia and 1969 survey of the Territory of Papua & New Guinea give data from over 90 percent of the first order regional magnetic station network which will be used in the compilation of the 1970.0 series of isomagnetic maps.

1. INTRODUCTION

This Record describes the first-order regional magnetic survey work carried out during June to December 1969 in the northern and western areas of Australia. A total of 34 stations were occupied (Plate 1); all but six of these had been occupied on previous occasions (van der Linden, 1961, 1965a, 1965b, 1968, 1969; van der Linden & Parkinson, 1963). The six new stations were Alpha, Weipa, Gove, Swindells, Meekatharra, and Neale. Table 1 lists the stations occupied and summarizes the work carried out at each.

The work was part of the complete survey over the network of Australian first-order regional magnetic stations. The objective was to provide information for the compilation of the 1970.0 series isomagnetic maps. Reference should be made to other first-order survey reports to obtain details of the aims and techniques of the survey method (Finlayson, 1971a, 1971b).

The personnel on the survey were:

1/7/69 - 3/9/69	: D.M. Finlayson, J. van der Linden, P. Maylor (field assistant)
4/9/69 - 19/9/69	: D. M. Finlayson, J. Connelly, P. Maylor
20/9/69 - 5/11/69	: J. van der Linden, J. Connelly, P. Maylor
6/11/69 - 12/12/69	: J. van der Linden, E. Paul, P. Maylor

Appendix 1 gives the BMR classification of regional magnetic stations.

2. METHODS AND EQUIPMENT

Logistics

The survey party travelled by road for the whole survey except to Gove station, which was visited by commercial airline from Darwin. The vehicles used for the survey were an International 4 + 4 utility truck and a long-wheel base Land Rover. For part of the survey the International truck towed a trailer, which was used to house the fluxgate variometer equipment at each station while the detectors were housed under an insulating cover about 50 metres from the trailer. At stations Laverton to Oodnadatta the electronics etc. were housed in a tent because the trailer was left in Perth. It was found that the trailer did not stand up to the travelling required for the survey. No valuable equipment could be carried in it because of the severe treatment it received during the journey from station to station.

Throughout the survey attempts were made to improve the physical conditions of each site. Where sites were deemed in danger of becoming

unusable for any reason, the site was changed to one which could be used for the foreseeable future. Wherever possible, new sites were chosen on airfields so that future occupations may be made using air transport if desired. Any information on the position of the site was also gathered from local authorities, DCA officials, etc. Latitudes and longitudes are required for azimuth computations, as well as for defining the station location.

Variograph

At each station a magnetic variograph was set in operation and usually ran for at least three nights (approx. 60 hours). The variograph used was the BMR three-component fluxgate variograph (MFR1) used on previous first-order surveys during 1968 and 1969 (Finlayson, 1971a, 1971b; Seers, in prep.).

The variograph recorded changes in: horizontal intensity in the approximate magnetic meridian (H); horizontal intensity normal to this direction; and vertical intensity (Z). The variations of horizontal intensity normal to the approximate magnetic meridian were converted to equivalent declination (D) changes in the reduction process.

The fluxgate detector coil constants used in the determination of scale values are listed below:

Detector	H	D	Z
Coil constant 1/7/69-25/8/69	2.40	2.41	2.37 gammas per microamp
" " 26/8/69-30/9/69	2.40	2.41	2.76
" " 1/10/69-20/12/69	2.40	2.76	2.41

A spare detector had to be used during the survey after a fault developed in the original Z detector.

Scale values at the various stations were measured three times daily using a BMR fluxgate calibrating unit (MCR1).

Usually the variograph was operated at the station at which control observations were being made. However where it was scientifically tolerable and logistically desirable the variograph was operated at another station up to 500 kilometres away. Onslow and Swindells were occupied with the variograph operating at Port Hedland. Similarly, Mount Vernon, Cue, and Carnegie were occupied with the variograph at Meekatharra, and Neale was occupied with the variograph at Laverton.

Magnetometers

Control observations were made at the magnetic station marker and at any previous station sites as well, if a new site had been chosen. Usually six sets of control observations were made, distributed over the variograph recording period. Each set of control observations consisted of an observation of horizontal intensity (H) with a QHM or HTM magnetometer, an observation of total intensity (F) with an Elsec proton precession magnetometer, and an observation of declination (D) with an Askania declinometer.

The necessary sun observations for the determination of azimuth were also made at every station.

The instruments used to make magnetic control observations during the survey are listed below together with their corrections:

Instrument	Correction to Australian Standard	Remarks
QHM 305	-5 gammas/gauss	Corrections adopted after comparison at Kowen (12/3/70) and Darwin (3/9/70)
QHM 306	+11	
HTM 158	+38	
Askania Declinometer 509320	+0.3 minutes	(van der Waal, 1966)
Askania Declinometer 630812	+0.3 minutes	" " " "
Wilde Compass Theodolite 93794	-32.7 minutes	Corrections adopted after comparisons at Kowen (13/2/70) and Toolangi (21/3/69)
Elsec Proton Precession Magnetometer No. 329	0	Instrument crystal oscillator frequency checked in BMR laboratory.
Elsec Proton Precession Magnetometer No. 424	0	"

At Darwin, intercomparison of the QHM and HTM instruments was carried out, and at Gngangara they were compared with the observatory instruments. Both before and after the survey, instrument comparisons were made with instruments from Toolangi Observatory.

Third-order magnetic observations

In the vicinity of each station, an average of eleven third-order magnetic stations were occupied on road traverses radiating from the first-order station. This work was intended to highlight any regional magnetic anomalies. Generally the traverses ran normal to the isogonic (D) lines at each station. The work was designed this way because from past experience the magnetic component with the largest spatial variation is D. A single observation of H, D, and F was made at the third-order stations; which were approximately 15 kilometres apart.

3. RESULTS

Derivation

The reduction procedure was the same as that applied to the results from the 1968 first-order survey and the 1969 first-order survey of TPNG; an outline of the method is given below.

- (a) Control observations computed complete with instrument corrections.
- (b) Variograph scale values measured and adopted.
- (c) Variograph baseline values computed and adopted.
- (d) A 24-hour period at each station scaled for mean hourly values of H, D, and Z

The adopted variograph scale values and baseline values of H, D, and Z are listed in Tables 2 and 3 respectively. In these tables, the stations are indicated where no variograph records were available owing to instrumental failure.

The hourly mean values of H, D, and Z are plotted in Plates 2-8 and the daily means are listed in Table 4.

At the following stations new sites were chosen and magnetic observations were made at the old sites wherever possible to determine the site differences: Ingham, Cooktown, Croydon, Alice Springs, The Granites, Port Hedland, Laverton, Eucla, and Oodnadatta. The site differences of H, D, and Z are listed in Table 5 and the resultant mean values of H, D, and Z are listed in Table 6 using the corrections in Table 5.

Precision

The precision of the observations can be gauged by considering

- (a) the systematic errors inherent in the method of observation, and
- (b) the errors introduced by natural magnetic disturbances.

(a) The systematic errors can be estimated from the standard deviation of the observed baseline values from the adopted values. For H, D, and Z the deviations are + 4 gammas, + 0.5 minutes and + 5 gammas respectively. For D, another systematic error is introduced because azimuth observations have a standard deviation of + 0.75 minutes, which if combined with the error of the baseline observations gives a resultant error of + 0.9 minutes. Thus the majority of the observations are within the limits aimed at viz. + 5 gammas for intensity measurements and + 1 minute for angular measurements.

At a number of stations, indicated by RR in Table 3, the azimuth observations were not satisfactory, with estimated errors of approximately + 2 minutes. These observations have not been included in the estimation of the standard deviation value of + 0.75 minutes given above.

(b) The degree of magnetic disturbance during the adopted 24-hour periods at each station is indicated in Table 7 where the K-index sum, C-index, and phenomena as observed at Gnangara magnetic observatory are listed. A measure of the effect of magnetic disturbance on the mean values for each station can be gauged from Table 8, where differences between the mean of the monthly 5 quiet days and the daily means are listed for Gnangara. In the Record of the 1968 first-order magnetic survey of eastern Australia (Finlayson, 1971a) 15 gammas was arbitrarily taken as the departure from quiet-day mean above which the magnetic conditions were described as disturbed. If the same condition is applied to this survey, then the results from Daly Waters, Gove, Port Hedland, Onslow, Eucla, and Etadunna must be regarded as being slightly inaccurate owing to magnetic disturbance.

Third-order magnetic observations

Third-order magnetic observations were made in the area of many of the first-order stations in order to detect any regional anomalies. These stations are indicated in Plate 9. The computer listing of the results is given in Table 9. The third-order results are not suitable for contouring until further traverses are completed and are of doubtful value in revealing regional anomalies. They show up some of the more obviously anomalous first-order stations viz. Halls Creek, Meekatharra, and Eucla, and to a lesser extent Weipa and The Granites, but it is not possible to give a quantitative value to the anomalies in the various components.

4. DISCUSSION

The survey results are within the accuracy tolerances set for this type of survey except at those stations indicated in Table 3 where poor azimuth observations were made. At the stations where no variograph records were available it is probable that the mean values of the magnetic components are still within tolerance.

The third-order survey results are of limited value until a full third-order survey is conducted in the areas concerned. The results succeeded in highlighting the anomalous first-order stations at Halls Creek, Meekatharra, and Eucla, and the less anomalous stations at Weipa and The Granites. Thus it is recommended that the station at Cue be continued and not replaced by Meekatharra, and that a new site be found at Eucla. It is doubtful whether better sites can be obtained at Halls Creek, Weipa, and The Granites, so it is recommended that the present sites be kept to determine secular variation.

The sites for the stations on this survey have been carefully marked but it is recommended that the existence of the sites be officially brought to the attention of local authorities so that the sites will be preserved for future use.

During the survey, sites have generally been chosen on airfields so that use can be made of air transport in future surveys. It is recommended that future equipment designs be geared towards airborne reoccupations.

5. ACKNOWLEDGEMENTS

The author would like to express his appreciation of the assistance rendered by the Department of Civil Aviation, Comalco Pty Ltd (Weipa), Department of Supply (Giles and Gove) and the staff of BMR observatories at Mundaring and Melbourne during the course of the survey.

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APPENDIX

CLASSIFICATION OF REGIONAL MAGNETIC STATIONS

First-order station

A first-order station is a place at which the geomagnetic field has been observed (or recorded with 'absolute' control) more or less continuously for two or three days, with an accuracy of 5 gammas or better in the absence of magnetic storms, and which is sufficiently well marked and located that reoccupation within three to five years will be possible.

Second-order station

A second-order station is a place at which the field has been observed several times during one day with an accuracy of 5 gammas and which is marked so that reoccupation may be possible in the future.

Third-order station

A third-order station is one at which the field, or one of its components, has been observed once with an accuracy of about 20 gammas (or the equivalent angle) and which is located only by a map.

TABLE 1

SUMMARY OF WORK CARRIED OUT AT STATIONS

Station	Date 1969	No. of hours recording	No. of control observations	Remarks
Alpha	1-3/7	66	7	New station on airfield.
Mackay	5-7/7	65	6	Site on airfield.
Ingham	9-11/7	71	7	New site on airfield. Old site on airfield unusable.
Cooktown	14-16/7	65	6	New site on airfield. Old site in town re- occupied.
Weipa	19-20/7	31	4	New station on airfield. Rodents damaged variograph cable.
Croydon	25-27/7	46	8	New site on airfield. Old site reoccupied.
Wonarah	29-30/7	30	3	Old site reoccupied. Variograph faulty.
Alice Springs	2-5/8	69	6	New site on airfield. Old site D reoccupied. H-variograph fault.
Ayers Rock	8-11/8	71	5	Old site reoccupied. Z variograph fault.
Giles	12-14/8	67	6	Old site reoccupied. Rodents damaged vario- graph cable.
The Granites	19-21/8	64	4	New site. Old site reoccupied. Intermittent variograph faults.

TABLE 1. (cont'd)

Station	Date 1969	No. of hours recording	No. of control observations	Remarks
Daly Waters	25-28/8	71	6	Old site reoccupied.
Darwin	1-3/9	65	6	Old site in botanical gardens reoccupied.
Gove	6-8/9	18	6	New station at tracking station. Variograph fault.
Wyndham	13-16/9	66	6	Old site on airfield reoccupied.
Halls Creek	16-19/9	86	7	Old site on airfield reoccupied.
Derby	21-24/9	71	6	Old site on airfield reoccupied.
Swindells	28-29/9		3	New station. Outstation of Port Hedland.
Port Hedland	28/9-7/10	100	8	New site on airfield. Old site reoccupied. Z variograph fault.
Onslow	7/10		4	Old site reoccupied. Outstation of Port Hedland.
Meekatharra	13-21/10	144	10	New station on airfield. Intermittent variograph faults.
Carnegie	13-14/10		4	Old site reoccupied. Outstation of Meekatharra.
Cue	17-18/10		5	Old site reoccupied. Outstation of Meekatharra.

TABLE 1 (cont'd)

Station	Date 1969	No. of hours recording	No. of control observations	Remarks
Mount Vernon	20-21/10		5	Old site reoccupied. Outstation of Meekatharra.
Carnarvon	24-28/10	93	5	Old site reoccupied.
Geraldton	29/10-1/11	63	6	Old site reoccupied.
Laverton	12-15/11	63	3	New site on airfield. Old site at Laverton Downs reoccupied.
Neale	13-14/11		2	New station. Outstation of Laverton.
Zanthus	17-19/11	44	4	Old site reoccupied. Intermittent variograph fault.
Albany	21-24/11	62	5	Old site reoccupied. Intermittent variograph fault.
Esperance	24-27/11	45	6	Old site reoccupied.
Eucla	28/11-1/12	87	4	New site. Old site re- occupied. Intermittent variograph fault.
Etadunna	5-7/12	50	3	Old site reoccupied. Intermittent variograph fault.
Oodnadatta	9-12/12	70	4	New site on airfield. Old site at Todmorden reoccupied. Intermittent variograph fault.

TABLE 2

ADOPTED SCALE VALUES

Station	H gammas/div.	D gammas/div.	D mins/div.	Z gammas/div.
Alpha	4.40	4 58	0.51	-4.72
Mackay	4.36	4.71	0.50	-4.98
Ingham	4.37	4.53	0.47	-4.94
Cooktown	4.32	4.51	0.45	-4.94
Weipa	4.35	4.46	0.43	-4.90
Croydon	4.50	4.87	0.50	-5.08
Wonarah	4.45	4.63	0.49	-5.04
Alice Springs	XXX	4.47	0.50	4.70
Ayers Rock	4.15	4.58	0.54	XXX
Giles	4.11	4.96	0.58	XXX
The Granites	4.14	4.99	0.53	XXX
Daly Waters	4.49	5.06	0.51	4.74
Darwin	4.32	5.05	0.48	5.64
Gove	XXX	XXX	XXX	XXX
Wyndham	4.32	5.20	0.52	5.01
Halls Creek	4.42	5.11	0.53	5.61
Derby	4.61	5.32	0.55	5.69
Swindells	4.57	5.58	0.61	5.71
Port Hedland	4.57	5.58	0.61	5.71
" "	3.89	-5.98	-0.65	XXX
Onslow	3.89	-5.98	-0.65	XXX
Meekatharra	3.86	-5.31	-0.67	-4.31
Carnegie	3.86	-5.31	-0.67	-4.31
Cue	3.86	-5.31	-0.67	-4.31
Mount Vernon	3.86	-5.31	-0.67	-4.31
Carnarvon	3.83	-5.26	-0.64	-4.49
Geraldton	3.92	-52.1	-0.70	-4.48

TABLE 2 (cont'd)

Station	H gammas/div.	D gammas/div.	D mins/div.	Z gammas/div.
Laverton	3.80	-5.54	-0.74	-4.51
Neale	3.80	-5.54	-0.74	-4.51
Zanthus	3.87	-5.65	-0.77	-4.32
Albany	3.91	-5.33	-0.83	-4.26
Esperance	3.97	-5.16	-0.76	-4.72
Eucla	3.88	-5.39	-0.76	-4.54
Etadunna	4.38	-5.33	-0.66	-4.14
Oodnadatta	4.00	-5.13	-0.64	XXX
SD of scale values from adopted values	± 0.10	± 0.12	± 0.01	± 0.11

1 div. = 1 mm in centre of recording chart
 XXX indicates no variograph record available

TABLE 3

ADOPTED BASELINE VALUES

Station	H gammas	D** °	Z gammas
Alpha	30930	8 10.6	42551
Mackay B	32308	8 29.5	39164
Ingham B	33238	7 09.8	36549
Cooktown C	34585	6 31.7	32197
Weipa	35976	5 26.7	29536
Croydon C	33533	6 13.7	36264
Wonarah	32539	5 11.6	39229
Alice Springs E	XXX	4 47.2	44330
Ayers Rock	29246	4 20.9	XXX
Giles	29168	3 22.4	XXX
The Granites C	32076	3 27.1	XXX
Daly Waters B	34364	4 17.3	34764
Darwin D	35696	3 36.5	29725
Gove	XXX	XXX	XXX
Wyndham C	34417	3 04.7	34456
Halls Creek C	33207	2 46.9	37988
Derby B	33431	2 33.1	37208
Swindells	31316	2 06.1	42044
Port Hedland D	31417	1 25.3	XXX
Onslow	30118	0 19.3	XXX
Meekatharra	27256	1 17.1 , RR	49024
Carnegie	28385	1 51.3	47488
Cue A	26775	-0 15.3	49264
Mount Vernon	28964	0 38.1	45868
Carnarvon C	28011	-1 11.6	46915
Geraldton C	25668	-1 58.1 RR	50772
Laverton B	25900	0 40.2 RR	49854

TABLE 3 (cont'd)

Station	H gammas	D** °	Z gammas
Neale	27112	2 18.0 RR	48218
Zanthus B	XXX	1 04.9	52627
Albany C	22079	-3 0.6	55941
Esperance	23148	-0 08.0	55432
Eucla C	24228	3 33.9 RR	53331
Etadunna	27753	6 34.8	49141
Oodnadatta	28401	5 14.6	XXX
SD of observed values from adopted baseline	+ 4 gammas	+ 0 5 min	+ 5 gammas

XXX indicates no result available

RR indicates reduced reliability ($\pm 2'$)

** declination baseline positive easterly,
negative westerly

TABLE 4

MEAN VALUES OF H, D, AND Z

Station	Latitude S °	Longitude E °	Date 1969	H gammas	D** °	Z gammas
Alpha	23 39.3	146 35.2	1/7	30911	8 10.2	42553
Mackay B	21 10.1	149 10.9	6/7	32311	8 24.5	39172
Ingham B	18 39.6	146 08.9	10/7	33232	7 11.2	36551
Cooktown C	15 26.8	145 11.2	16/7	34626	6 32.0	32183
Weipa	12 41.1	141 54.4	19/7	35948	5 26.9	29528
Croydon C	18 12.9	142 15.2	26/7	33529	6 13.0	36261
Wonarah	19 53.7	136 20 3	30/7	32533	5 07.5	39236
Alice Springs E	23 48.4	133 53.2	3/8	30430*	4 44.0	44318
Ayers Rock	25 20.9	131 03.7	9/8	29228	4 20.4	46556*
Giles	25 02.1	128 18.0	13/8	29171	3 23.8	46295*
The Granites C	20 33.6	130 21.3	20/8	32040	3 27.5	41219*
Daly Waters B	16 16.4	133 22.4	27/8	34327	4 20.3	34803
Darwin D	12 26.8	130 50.0	2/9	35683	3 36.2	29756
Gove	12 22.6	136 49.4	7/9	35948*	4 50.1*	28973*
Wyndham D	15 30.6	128 08.8	14/9	34386	3 03.4	34462
Halls Creek C	18 41.1	127 40.0	18/9	33221	2 45.2	38013
Derby B	17 22.1	123 39 6	22/9	33383	2 36.4	37233
Swindells	21 04.9	123 25.3	28/9	31281	2 13.2	42050
Port Hedland D	20 22.6	118 37.8	7/10	31393	1 31.0	41459*
Onslow	21 38.2	115 06.3	7/10	30094	0 25.0	43613*
Meekatharra	26 36.8	118 32.7	20/10	27237	1 18.7	49035
Carnegie	25 48.2	122 56.7	14/10	28389	1 52.7	47482
Cue B	27 25.3	117 53.0	18/10	26774	-0 14.2	49273
Mt. Vernon	24 13.8	118 14.2	20/10	28945	0 39.7	45878
Carnarvon C	24 52.9	113 39.9	25/10	27999	-1 09.9	46931
Geraldton C	28 48.0	114 42.0	31/10	25658	-1 59.2	50784
Laverton B	28 36.7	122 25.3	14/11	25884	0 34.0	49840

TABLE 4 (cont'd)

Station	Latitude °	Longitude °	Date 1969	H gammas	D** °	Z gammas
Neale	28 17.3	15 49.0	14/11	27097	2 11.9	48204
Zanthus B	31 02.2	123 34.1	19/11	25092*	1 08.8	52613
Albany C	34 56.8	117 48.3	23/11	22091	-2 58.3	55975
Esperance	33 41.0	121 49.2	25/11	23188	-0 09.0	55434
Eucla C	31 40.9	128 52.8	1/12	24226	3 35.4	53316
Etadunna	28 43.1	138 38.0	6/1	27713	6 39.7	49115
Oodnadatta	27 33.6	135 27.2	11/12	28357	5 19.8	48410*

* values determined without variometer control

** declination positive easterly, negative westerly

TABLE 5.

CORRECTIONS TO BE APPLIED TO SUBSIDIARY SITE OBSERVATIONS.

Station	Date 1969	H gammas	D minutes	Z gammas
Cooktown B	16/7	+34	+2.0	+64
Croydon A	26/7	+78*	+0.9	-40
Alice Springs D	3/8	-33*	+0.8	+86
The Granites B	20/8	+28	-0.5	+1004*
Port Hedland C	7/10	-4	+18.7*	-42*
Laverton A	14/11	-788	-25.5	-1012
Eucla B	1/12	-852*	+10 1*	+537*
Oodnadatta (Todmorden)	11/12	-238	+15.2	+532*

* indicates corrections obtained without variometer control

TABLE 6

MEAN VALUES OF H, D, AND Z AT SUBSIDIARY SITES

Station	Latitude S °	Longitude E °	Date 1969	H gammas	D** °	Z gammas
Cooktown B	15 28.5	145 15.0	16/7	34592	6 30.0	32119
Croydon A	18 12.7	142 14.4	26/7	33451*	6 12.1	36301
Alice SpringsD	23 46.5	133 51.4	3/8	30463*	4 43.2	44232
The Granites B	20 33.5	130 19.5	20/8	32012	3 28.0	40215*
Port Hedland C	20 18.8	118 36.7	7/10	31397	1 12.3*	41501*
Laverton A	28 25.5	122 24.7	14/11	26672	0 59.5	50852
Eucla B	31 42.9	128 53.4	1/12	25078*	3 25.3*	52779*
Oodnadatta (Todmorden)	27 08.4	134 45.2	11/12	28595	5 04.6	47878*

* values determined without variometer control

** declination positive easterly, negative westerly

TABLE 7

MAGNETIC DISTURBANCE PARAMETERS

Station	Date 1969	K-index Sum (Gnangara)	C-index (Gnangara)	Reported magnetic phenomena (Gnangara)		
				UT	event	
Alpha	1/7	20	1		-	
Mackay	6/7	6	0		-	
Ingham	10/7	15	0		-	
Cooktown	16/7	18	0		-	
Weipa	19/7	0	0		-	
Croydon	26/7	19	1	26/7/69	11.53	ssc*
Wonarah	30/7	17	0		-	
Alice Springs	3/8	21	1		-	
Ayers Rock	9/8	17	0		-	
Giles	13/8	16	0		-	
The Granites	20/8	13	0		-	
Daly Waters	27/8	23	1	26/8/69	04.38	ssc*
				27/8/69	15.50	bp
Darwin	2/9	2	0		-	
Gove	7/9	19	1		-	
Wyndham	14/9	15	0		-	
Halls Creek	18/9	23	1		-	
Derby	22/9	3	0		-	
Swindells	28/9	34	2	27/9/69	21.25	ssc*
Port Hedland	7/10	7	0		-	
Onslow	7/10	7	0		-	
Meekatharra	20/10	6	0		-	
Carnegie	14/10	6	0	14/10/69	16.38	pi2
Cue	18/10	11	0		-	
Mount Vernon	20/10	6	0		-	
Carnarvon	25/10	9	0		-	

TABLE 7 (cont'd)

Station	Date 1969	K-index Sum (Gnangara)	C-index (Gnangara)	Reported magnetic phenomena (Gnangara)	
				UT	event
Geraldton	31/10	11	0	-	
Laverton	14/11	4	0	-	
Neale	14/11	4	0	-	
Zanthus	19/11	13	0	-	
Albany	23/11	11	0	22/11/69 02.54	ssc*
Esperance	25/11	11	0	-	
Eucla	1/12	11	0	-	
Etadunna	6/12	24	1	-	
Oodnadatta	11/12	22	1	-	

TABLE 8

DISTORTION OF H, D, AND Z AT GNANGARA

Station	Date 1969	dH gamma	dD minutes	dZ gamma
Alpha	1/7	9	0.6	-4
Mackay	6/7	-5	0.4	3
Ingham	10/7	11	0.3	1
Cooktown	16/7	3	-0.4	2
Weipa	19/7	-1	0.1	2
Croydon	26/7	-2	0.8	0
Wonarah	30/7	4	-0.4	2
Alice Springs	3/8	4	0.2	4
Ayers Rock	9/8	6	0.2	-3
Giles	13/8	5	-0.3	-2
The Granites	20/8	7	0.3	-2
Daly Waters	27/8	21	0.2	-12
Darwin	2/9	-6	0.1	0
Gove	7/9	18	0.1	-8
Wyndham	14/9	3	0.7	0
Halls Creek	18/9	3	-0.2	-1
Derby	22/9	-1	0.3	0
Swindells	28/9	6	0.2	-3
Port Hedland	7/10	16	0.0	-3
Onslow	7/10	16	0.0	-3
Meekatharra	20/10	-8	0.6	-1
Carnegie	14/10	5	0.2	0
Cue	18/10	1	-0.3	-3
Mount Vernon	20/10	-8	0.6	-1
Carnarvon	25/10	-6	-0.2	3
Geraldton	31/10	2	-0.4	-6

TABLE 8 (cont'd)

Station	Date 1969	dH gamma	dD minutes	dZ gamma
Laverton	14/11	9	0.2	-5
Neale	14/11	9	0.2	-5
Zanthus	19/11	-6	-0.2	4
Albany	23/11	-4	1.0	6
Esperance	25/11	4	0.1	1
Eucla	1/12	24	-0.2	-1
Etadunna	6/12	24	0.3	-1
Oodnadatta	11/12	9	0.0	-4

$d = (\text{Numerical Monthly Mean for 5 Quiet Days}) - (\text{Numerical Daily Mean})$

TABLE 9

THIRD-ORDER STATIONS OCCUPIED DURING 1969 FIRST-ORDER SURVEY

STATION	LAT	LONG	Y	M	D	GHT	D	I	H	X	Y	Z	F			
69	1	-19 13.8	146	38.5	69	7	9	7	14.6	-48	10.3	33061	32797	4168	-36941	49575
69	2	-19 6.5	146	1275	69	7	9	7	28.8	-47	58.9	33143	32867	4267	-36786	49514
69	3	-18 59.2	146	1712	69	7	9	6	46.6	-47	47.6	33241	33009	3923	-36651	49480
69	4	-18 50.3	146	973	69	7	9	7	1.2	-47	39.1	33101	32853	4045	-36316	49138
69	5	-18 29.6	146	1075	69	7	9	6	58.2	-47	17.4	33462	33214	4061	-36249	49333
69	6	-18 21.7	146	470	69	7	9	6	51.6	-46	53.7	33482	33242	3999	-35774	48998
69	7	-18 14.3	145	5973	69	7	10	6	59.1	-47	4.9	33360	33117	4018	-35877	48990
69	8	-16 26.4	145	2370	69	7	10	6	41.2	-44	17.3	34271	34038	3991	-33431	47876
69	9	-16 33.0	145	28.8	69	7	10	6	34.0	-44	28.2	34213	33988	3912	-33586	47943
69	10	-16 40.8	145	3475	69	9	10	6	58.4	-44	39.7	34121	33874	4094	-33720	47972
69	11	-16 47.3	145	4076	69	7	13	6	54.7	-44	46.1	34147	33899	4109	-33872	48097
69	12	-16 57.2	145	4478	69	7	10	6	41.4	-45	4.9	34055	33823	3967	-34152	48230
69	13	-17 6.5	145	4870	69	7	10	6	46.0	-45	13.8	34017	33780	4008	-34291	48301
69	14	-17 13.4	145	5475	69	7	10	6	45.5	-45	22.1	33950	33714	3995	-34390	48324
69	15	-17 23.7	145	5473	69	7	11	6	36.4	-45	35.6	33910	33650	4106	-34620	48461
69	16	-17 33.2	146	271	69	7	11	6	32.8	-45	48.1	33883	33626	4156	-34844	48602
69	17	-17 42.9	146	275	69	7	11	7	6.3	-46	7.5	33679	33424	4137	-35027	48592
69	18	-17 52.4	145	5877	69	7	11	6	59.7	-46	14.3	33800	33548	4116	-35293	48867
69	19	-18 2.7	145	5570	69	7	11	7	10.4	-46	34.4	33651	33387	4202	-35592	48952
69	20	-16 39.8	145	1977	69	7	14	6	36.3	-44	45.2	34076	33849	3919	-33784	47984
69	21	-16 31.7	145	777	69	7	14	6	31.3	-44	31.8	34181	33959	3882	-33624	47947
69	22	-16 29.3	144	5475	69	7	14	6	30.6	-44	30.7	34193	33971	3877	-33616	47950
69	23	-15 40.7	145	1275	69	7	14	6	26.0	-43	6.8	34656	34438	3883	-32446	47474
69	24	-15 42.3	145	174	69	7	15	6	20.0	-43	20.0	34488	34277	3804	-32537	47414
69	25	-15 51.5	144	5273	69	7	15	6	18.8	-43	40.4	34386	34032	4922	-32830	47541
69	26	-16 19.8	144	4276	69	7	15	6	29.5	-44	16.5	34263	34043	3874	-33406	47853
69	27	-16 7.1	144	4677	69	7	15	6	22.6	-43	55.9	34350	34137	3815	-33093	47698
69	28	-15 47.7	144	4270	69	7	15	6	27.8	-43	27.8	34466	34247	3879	-32665	47486
69	29	-15 39.9	144	3472	69	7	15	6	22.7	-43	19.1	34492	34278	3832	-32523	47407
69	30	-15 33.7	144	2675	69	7	15	6	26.9	-42	39.4	34842	34621	3913	-32103	47376
69	31	-15 30.2	144	1770	69	7	15	7	14.7	-43	7.1	34582	34306	4362	-32382	47376
69	32	-15 23.2	144	772	69	7	15	6	19.5	-42	58.9	34609	34403	3773	-32292	47307
69	33	-15 15.9	143	4870	69	7	15	6	18.8	-42	47.4	34670	34468	3762	-32094	47244
69	34	-15 9.6	143	4975	69	7	15	6	18.9	-42	38.6	34722	34519	3749	-31977	47203
69	35	-15 1.6	143	3979	69	7	16	6	0.5	-42	27.5	34744	34553	3637	-31791	47093
69	36	-14 55.7	143	1778	69	7	16	5	17.1	-42	16.1	34812	34664	3207	-31641	47043
69	37	-15 21.0	144	2677	69	7	16	6	22.1	-42	48.0	34657	34444	3844	-32092	47234
69	38	-15 15.6	144	3473	69	7	16	6	18.1	-42	40.9	34678	34468	3817	-31980	47173
69	39	-15 1.5	144	4478	69	7	16	6	25.3	-42	43.7	34637	34420	3874	-31994	47153
69	40	-14 34.6	143	2577	69	7	17	6	5.8	-41	31.4	34891	34696	3685	-31442	46968
69	41	-14 9.1	143	1470	69	7	17	5	57.5	-41	42.1	35066	34876	3640	-31244	46966
69	42	-13 46.5	143	771	68	7	17	5	51.6	-40	36.5	35181	34997	3592	-30183	46341
69	43	-13 26.3	142	5675	69	7	18	5	38.9	-40	4.0	35307	35138	3455	-29696	46135
69	44	-13 10.9	142	4774	69	7	21	5	32.5	-39	32.5	35459	35177	3349	-29273	45981
69	45	-12 45.2	142	1873	69	7	18	5	35.0	-39	8.1	35478	35310	3452	-28868	45739
69	46	-12 44.2	142	675	69	7	19	5	30.3	-38	30.4	35532	35177	3412	-28780	45725
69	47	-12 41.3	142	2978	69	7	19	5	28.9	-38	59.2	35537	35177	3412	-28764	45719
69	48	-12 39.6	142	4019	69	7	19	5	36.1	-38	51.6	35525	35355	3468	-28625	45622
69	49	-12 26.0	142	3872	69	7	19	5	34.4	-38	28.9	35634	35465	3460	-28326	45520
69	50	-12 17.9	142	3574	68	7	19	5	55.2	-38	23.0	35637	35447	3676	-28229	45463
69	51	-12 6.0	142	3373	69	7	19	5	22.4	-38	7.5	35629	35473	3337	-27962	45291
69	52	-11 49.8	142	3070	69	7	20	5	35.2	-37	21.3	35765	35595	3482	-27300	44994
69	53	-11 39.2	142	2770	69	7	20	5	38.7	-37	17.7	35835	35666	3473	-27295	45046
69	54	-11 30.5	142	2577	69	7	20	5	34.7	-37	3.0	35882	35712	3488	-27089	44960
69	55	-12 50.6	142	4470	69	7	21	5	36.3	-39	13.2	35482	35312	3466	-26959	45799
69	56	-13 0.2	142	4571	69	7	21	5	46.9	-39	20.8	35469	35289	3573	-29079	45866
69	57	-13 36.0	143	276	69	7	22	5	52.9	-40	19.1	35232	35046	3611	-28898	46208
69	58	-14 18.8	143	1870	68	7	23	5	51.1	-41	21.6	35019	34836	3571	-30829	46656
69	59	-14 47.2	143	3071	68	7	23	5	59.1	-42	9.8	34833	34643	3632	-31470	46944

TABLE 9 (cont'd)

STATION	LAT	LONG	Y	M	D	GMT	D	I	H	X	Y	Z	F
69 60	-17 8.4	145 25.7	69	7	24		0 46.7	-46 10.9	33666	33433	3954	-35083	48623
69 61	-17 41.7	145 57.0	69	7	25		6 56.1	-46 39.1	33667	33622	4069	-85794	49277
69 62	-18 9.3	144 18.0	69	7	25		6 22.7	-47 0.9	33436	33229	3714	-35874	49040
69 63	-18 8.1	142 10.2	69	7	25		6 10.1	-47 8.5	33559	33365	3606	-36167	49339
69 64	-18 3.0	142 57.0	69	7	26		5 58.3	-47 2.6	33585	33403	3494	-36070	49285
69 65	-17 57.3	141 50.4	69	7	26		5 57.8	-46 56.3	33607	33425	3492	-35960	49219
69 66	-17 57.5	141 37.1	69	7	26		6 6.4	-46 58.2	33601	33411	3574	-85994	49241
69 67	-17 58.1	141 29.0	69	7	26		5 29.4	-46 58.2	33648	33463	3511	-36045	49309
69 68	-18 15.7	142 18.4	69	7	26		6 18.4	-47 18.9	33493	33297	3621	-36315	49402
69 69	-18 14.1	142 27.8	69	7	26		6 9.2	-47 17.5	33494	33301	3590	-36286	49381
69 70	-18 15.7	142 41.4	68	7	27		6 11.0	-47 20.4	33486	33291	3607	-36340	49416
69 71	-18 12.0	142 52.1	69	7	27		6 15.6	-47 13.5	33448	33246	3647	-36148	49249
69 72	-18 13.4	143 27.8	69	7	27		6 20.2	-47 7.9	33365	33161	3682	-35945	49044
69 73	-18 16.6	143 13.8	69	7	27		6 19.5	-47 22.4	33338	33135	3671	-36221	49228
69 74	-18 17.3	143 21.3	68	7	27		NO 088	-47 19.2	33353			-36171	49201
69 75	-18 37.5	143 32.3	69	7	27		NO 088	-47 17.7	33370			-36156	49201
69 76	-19 56.7	136 30.4	69	7	29		5 4.5	-50 23.4	32445	32317	2870	-39252	50926
69 77	-20 2.4	136 40.2	69	7	29		4 56.6	-50 29.5	32577	32456	2807	-39507	51206
69 78	-20 4.9	136 49.8	69	7	29		5 12.9	-50 31.4	32507	32372	2955	-39467	51130
69 79	-20 3.5	137 11.4	69	7	30		5 14.2	-50 26.9	32507	32372	2967	-39363	51051
69 80	-20 0.6	137 12.1	69	7	30		5 7.4	-50 26.6	32501	32371	2952	-39347	51035
69 81	-19 59.3	137 23.2	69	7	30		5 6.3	-50 27.6	32503	32374	2892	-39373	51055
69 82	-19 55.5	137 55.5	69	7	30		5 17.3	-50 8.1	32704	32565	3014	-39162	51022
69 83	-19 59.0	137 48.0	69	7	30		5 17.2	-50 14.6	32615	32477	3005	-39206	50999
69 84	-20 1.7	137 37.2	69	7	30		5 25.9	-50 23.0	32516	32370	3078	-39281	50994
69 85	-19 50.3	136 10.2	68	7	30		4 51.9	-50 15.4	32616	32499	2766	-39227	51015
69 86	-19 48.3	135 58.0	69	7	30		5 1.5	-50 11.4	32616	32491	2857	-39134	50944
69 87	-19 40.8	135 47.2	69	7	31		4 48.9	-49 55.1	32814	32700	2726	-38992	50962
69 88	-19 35.0	135 38.8	69	7	31		4 56.7	-49 53.4	32723	32601	2821	-38846	50792
69 89	-19 29.1	135 30.9	69	7	31		4 58.9	-49 55.3	32661	32538	2827	-38816	50729
69 90	-19 26.3	134 12.2	69	7	31		4 54.4	-49 59.4	32711	32591	2798	-38969	50878
69 91	-19 26.5	134 24.5	69	7	31		4 48.2	-49 48.5	32813	32702	2691	-38771	50792
69 92	-19 21.5	134 33.5	69	7	31		4 48.1	-49 33.4	32883	32772	2705	-38579	50692
69 93	-19 20.3	134 44.5	69	7	31		4 39.1	-49 35.0	32833	32725	2662	-38557	50642
69 94	-19 18.5	134 56.2	69	7	31		4 45.0	-49 35.7	32775	32662	2714	-38503	50564
69 95	-19 28.6	135 6.0	69	7	31		4 38.7	-49 33.7	32851	32743	2651	-38548	50647
69 96	-19 23.5	135 16.6	69	7	31		4 44.0	-49 51.2	32755	32643	2703	-38834	50803
69 97	-23 32.5	133 51.6	69	8	4		4 18.4	-55 20.6	30468	30386	2235	-44074	53580
69 98	-23 22.2	133 48.2	69	8	4		4 22.5	-55 21.4	30434			-44044	53536
69 99	-23 11.8	133 45.2	69	8	4		4 22.1	-54 49.3	30599			-43413	53113
69 100	-23 2.8	133 37.7	69	8	4		4 46.4	-54 24.2	31235	31167	2056	-43634	53662
69 101	-22 54.0	133 30.0	69	8	4		4 25.4	-54 16.8	31120	31028	2400	-43276	53304
69 102	-22 46.6	133 24.2	69	8	4		4 38.7	-54 18.2	30908	30845	1965	-43019	52971
69 103	-22 37.6	133 20.6	69	8	4		4 29.5	-54 14.0	31057	30961	2432	-43114	53135
69 104	-22 27.5	133 20.8	69	8	4		4 48.7	-54 14.0	30849	30781	2051	-42827	52781
69 105	-22 16.6	133 25.0	69	8	4		4 18.5	-53 43.1	31209	31125	2281	-42514	52739
69 106	-22 9.9	133 25.5	69	8	4		4 28.4	-53 26.0	31218	31129	2362	-42087	52401
69 107	-23 55.9	133 44.4	69	8	6		4 37.8	-55 43.1	30347	30248	2447	-44519	53578
69 108	-24 2.5	133 37.7	69	8	6		4 37.0	-55 50.2	30261	30162	2436	-44589	53588
69 109	-24 11.3	133 30.2	69	8	6		4 34.3	-56 1.1	30199	30103	2407	-44803	54030
69 110	-24 20.5	133 26.8	69	8	6		4 27.4	-56 13.0	30127	30035	2341	-45032	54180
69 111	-25 13.5	133 12.1	69	8	6		4 38.5	-57 11.8	29635	29538	2398	-45980	54703
69 112	-25 2.4	133 12.3	68	8	6		4 38.9	-57 2.0	29703	29608	2364	-45797	54586
69 113	-24 52.5	133 11.2	68	8	6		4 35.0	-56 50.1	29729	29634	2376	-45490	54343
69 114	-24 42.7	133 10.9	69	8	6		4 28.8	-56 43.4	29752	29665	2272	-45333	54224
69 115	-24 34.5	133 14.2	69	9	6		4 19.1	-56 42.6	29785	29700	2243	-45360	54264
69 116	-24 27.5	133 20.3	69	8	6		4 38.2	-56 26.6	30006	29911	2382	-45237	54284
69 117	-25 10.1	130 32.3	69	8	8		4 41.3	-57 42.8	29325	29264	1887	-46412	54900
69 118	-25 11.4	130 43.6	69	8	8		4 41.8	-57 41.9	29371	29310	1893	-46457	54963
69 119	-25 14.0	130 55.7	69	8	8		4 41.0	-57 41.6	29348	29276	2056	-46412	54912

TABLE 9 (cont'd)

STATION	LAT	LONG	Y	M	D	GMT	B	I	H	X	Y	Z	F.
69 120	-25 11.0	132 40:1	69	8	9		4 18:0	-57 21.8	29566	29487	2165	-46166	54822
69 121	-25 11.8	132 29:0	69	8	9		4 23:6	-57 22.8	29477	29390	2258	-46058	54683
69 122	-25 12.0	132 16:2	69	8	9		4 18:5	-57 18.6	29493	29410	2216	-45957	54607
69 123	-25 10.3	132 7:0	69	8	9		4 27:4	-57 20.1	29471	29382	2290	-45968	54605
69 124	-25 14.9	131 59:5	69	8	9		4 27:3	-57 25.5	29463	29374	2289	-46115	54724
69 125	-25 21.1	131 51:9	69	8	9		4 12:8	-57 36.6	29441	29361	2163	-46410	54960
69 126	-25 15.3	131 42:0	69	8	9		4 5:7	-57 30.5	29399	29321	2082	-46156	54721
69 127	-25 20.1	131 32:0	69	8	9		4 18:8	-57 34.4	29314	29234	2162	-46144	54668
69 128	-25 21.2	131 22:0	69	8	9		4 11:4	-57 34.7	29378	29300	2146	-46254	54795
69 129	-25 20.4	131 12:5	69	8	9		4 22:1	-57 47.8	29193	29108	2224	-46353	54780
69 130	-25 3.7	129 58:6	69	8	11		3 9:0	-57 47.5	29274	29230	1608	-46471	54922
69 131	-25 4.3	129 38:5	69	8	11		3 11:6	-57 29.7	29308	29262	1632	-45994	54538
69 132	-24 50.8	128 58:2	69	8	12		3 23:0	-57 26.7	29265	29214	1727	-45840	54385
69 133	-25 10.1	128 32:3	69	8	12		3 35:2	-57 47.8	29076	29019	1819	-46165	54559
69 134	-25 3.4	128 39:9	69	8	12		3 37:3	-57 42.8	29169	29111	1843	-46165	54608
69 135	-24 55.7	128 45:7	69	8	13		3 38:1	-57 37.4	29050	28994	1800	-45817	54250
69 136	-24 46.1	128 46:9	69	8	13		3 38:2	-57 28.4	29283	29229	1789	-45920	54462
69 137	-24 36.7	128 45:7	69	8	13		3 18:4	-57 17.6	29434	29385	1698	-45837	54473
69 138	-24 18.1	128 34:3	69	8	13		3 14:1	-56 52.9	29695	29648	1676	-45520	54349
69 139	-24 29.3	128 28:2	69	8	13		3 18:2	-57 5.6	29574	29528	1661	-45703	54438
69 140	-24 32.1	128 38:0	69	8	13		3 19:8	-57 12.8	29492	29443	1713	-45786	54462
69 141	-25 20.5	128 38:4	69	8	13		3 38:7	-57 48.9	29102	29048	1782	-46241	54637
69 142	-25 29.6	128 34:4	69	8	14		3 29:3	-57 48.4	29148	29094	1773	-46299	54710
69 143	-25 39.3	128 35:8	69	8	14		3 25:2	-58 23.4	29112	29060	1737	-47302	55543
69 144	-25 48.6	128 36:2	69	8	14		4 10:0	-58 4.9	29312	29230	2181	-47058	55440
69 145	-25 56.7	128 42:4	69	8	14		3 40:1	-58 3.9	29251	29191	1872	-46930	55300
69 146	-26 3.6	128 49:2	69	8	14		3 25:4	-59 9.2	28444	28394	1699	-47627	55475
69 147	-26 9.3	129 34:9	69	8	14		4 14:6	-58 40.3	28711	28633	2125	-47169	55220
69 148	-26 11.3	129 24:7	69	8	14		4 8:2	-58 46.1	28769	28697	2042	-47445	55466
69 149	-26 11.1	129 19:0	69	8	14		5 54:4	-58 38.8	28944	28791	2978	-47504	55627
69 150	-26 6.4	129 4:2	69	8	14		6 53:7	-60 6.2	27944	27742	3354	-48603	56063
69 151	-23 44.3	133 43:6	69	8	19		4 35:9	-55 30.6	30448	30350	2441	-44318	53770
69 152	-23 47.3	133 30:5	69	8	20		4 42:4	-55 36.8	30357	30255	2491	-44357	53750
69 153	-23 52.9	133 22:2	69	8	20		4 35:3	-55 42.2	30306	30208	2424	-44433	53784
69 154	-23 51.0	132 31:8	69	8	20		4 45:4	-55 55.5	30303	30199	2513	-44800	54086
69 155	-23 56.9	132 45:6	69	8	20		4 40:0	-55 56.0	30206	30106	2457	-44671	53925
69 156	-23 55.3	132 54:3	69	8	20		4 39:9	-55 48.7	30266	30166	2462	-44554	53862
69 157	-23 56.7	133 8:3	69	8	20		4 38:9	-55 49.9	30241	30143	2433	-44550	53844
69 158	-20 29.8	130 14:4	69	8	21		3 56:2	-51 46.8	32062	31986	2201	-40715	51823
69 159	-20 22.9	130 8:6	69	8	21		3 55:8	-51 29.6	32221	32145	2208	-40497	51752
69 160	-20 16.5	130 2:7	69	8	22		4 8:2	-51 21.2	32276	32192	2329	-40363	51681
69 161	-20 10.2	129 55:4	69	8	22		3 48:5	-51 16.6	32330	32261	2100	-40321	51682
69 162	-20 40.6	130 27:1	69	8	22		3 43:6	-52 1.2	31987	31920	2079	-40972	51980
69 163	-20 48.0	130 32:5	69	8	22		3 58:9	-52 36.8	31485	31409	2186	-41200	51853
69 164	-20 54.2	130 39:0	69	8	22		3 40:2	-52 31.2	31608	31543	2023	-41223	51946
69 165	-21 3.1	130 44:1	69	8	22		3 57:2	-52 28.8	31705	31630	2186	-41290	52059
69 166	-17 33.1	133 32:2	69	8	28		4 19:6	-47 23.3	33499	33403	2527	-36414	49479
69 167	-17 23.3	133 26:5	69	8	28		4 25:0	-47 19.9	33499	33400	2580	-36343	49427
69 168	-17 12.2	133 28:2	69	8	28		4 31:6	-47 3.2	33689	33584	2658	-36195	49447
69 169	-17 3.8	133 27:0	69	8	28		4 38:3	-46 46.4	33826	33715	2736	-35988	49389
69 170	-16 55.4	133 25:5	69	8	28		4 48:2	-46 32.2	33908	33791	2820	-35778	49293
69 171	-16 46.7	133 25:9	69	8	28		4 36:3	-46 17.8	33985	33876	2728	-35560	49188
69 172	-16 36.4	133 21:5	69	8	28		4 29:8	-46 2.0	34126	34021	2666	-35380	49156
69 173	-16 28.4	133 23:2	69	8	28		4 28:4	-45 49.7	34184	34080	2666	-35187	49058
69 174	-16 4.3	133 25:8	69	8	29		4 14:0	-44 29.9	34385	34291	2538	-34384	48627
69 175	-15 54.2	133 25:1	69	8	29		4 16:4	-44 45.8	34456	34361	2568	-34174	48529
69 176	-15 45.4	133 22:6	69	8	29		4 19:7	-44 35.7	34488	34389	2603	-34003	48432
69 177	-14 21.8	132 8:2	69	9	4		3 47:4		34913	34837	2307		NO OBS
69 178	-14 14.2	132 3:2	69	9	5		3 38:2		35137	35066	2228		NO OBS
69 179	-14 5.1	131 59:2	69	9	5		3 45:4		35068	34994	2277		NO OBS

TABLE 9 (cont'd)

STATION	LAT	LONG	Y	M	D	GMT	D	I	H	X	Y	Z	F
69 180	-13 56.3	131 54.4	69	9	5		3 47.8		35149	35072	2327		NO OBS
69 181	-13 49.1	131 48.9	69	9	5		3 17.4		35221	35142	2328		NO OBS
69 182	-13 42.0	131 41.7	69	9	5		3 38.1		35190	35121	2211		NO OBS
69 183	-13 38.1	131 33.3	69	9	5		3 59.3		35176	35091	2447		NO OBS
69 184	-13 32.8	131 23.6	69	9	5		3 22.5		35062	35002	2064		NO OBS
69 185	-13 29.7	131 11.1	69	9	5		3 48.0		35228	35155	2264		NO OBS
69 186	-12 28.4	130 58.9	69	9	6		3 37.0		35032	34962	2210		NO OBS
69 187	-12 37.5	131 47.3	69	9	7		3 52.8		35580	35498	2408		NO OBS
69 188	-12 46.5	131 61.1	69	9	7		3 17.8		35643	35584	2049		NO OBS
69 189	-13 0.2	131 77.0	69	9	7		3 19.2		35229	35170	2041		NO OBS
69 190	-13 9.8	131 61.3	69	9	7		-356 48.2		35396	35341	1974		NO OBS
69 191	-13 21.2	131 87.0	69	9	7		3 44.6		35370	35294	2309		NO OBS
69 192	-13 36.3	128 16.7	69	9	14		3 30.6		34438	34374	2109		NO OBS
69 193	-13 36.0	128 29.3	69	9	14		3 18.1		34422	34366	1962		NO OBS
69 194	-13 35.8	128 33.6	69	9	14		2 37.2		34438	34386	1874		NO OBS
69 195	-13 41.7	128 41.3	69	9	14		3 29.3		34355	34291	2090		NO OBS
69 196	-16 8.1	128 23.0	69	9	14		3 14.0		34288	34233	1934		NO OBS
69 197	-16 0.8	128 25.5	69	9	14		3 28.0		34215	34152	2069		NO OBS
69 198	-15 52.3	128 19.9	69	9	14		3 14.0		34298	34243	1935		NO OBS
69 199	-15 44.0	128 16.0	69	9	14		3 11.9		34389	34336	1919		NO OBS
69 200	-15 40.8	128 57.0	69	9	15		NO OBS		34322				NO OBS
69 201	-16 20.3	127 49.5	69	9	17		2 26.8		32941	32897	1693		NO OBS
69 202	-16 26.2	127 53.0	69	9	17		2 30.5		32843	32795	1723		NO OBS
69 203	-16 26.3	128 2.1	69	9	17		-356 35.7		32742	32682	1944		NO OBS
69 204	-16 21.5	128 29.2	69	9	17		3 28.2		33067	33005	2001		NO OBS
69 205	-16 25.0	128 14.3	69	9	17		3 18.0		32947	32893	1878		NO OBS
69 206	-16 19.6	127 33.8	69	9	17		3 15.4		32944	32892	1852		NO OBS
69 207	-16 28.0	127 35.0	69	9	17		3 19.1		32981	32931	1823		NO OBS
69 208	-16 35.8	127 39.5	69	9	17		3 19.2		32820	32769	1815		NO OBS
69 209	-16 6.2	127 46.2	69	9	18		2 48.6		33307	33270	1575		NO OBS
69 210	-17 57.5	127 17.5	69	9	18		3 28.2		33443	33386	1957		NO OBS
69 211	-17 47.4	127 48.0	69	9	18		2 38.0		33402	33352	1826		NO OBS
69 212	-17 35.1	127 48.8	69	9	18		2 30.3		33482	33418	1462		NO OBS
69 213	-17 29.8	127 55.6	69	9	18		3 48.5		33396	33324	2179		NO OBS
69 214	-18 11.7	127 30.2	69	9	19		2 48.7		33109	33065	1624		NO OBS
69 215	-18 26.0	127 29.5	69	9	19		3 15.4		32932	32879	1870		NO OBS
69 216	-18 31.6	127 18.2	69	9	19		3 7.3		32840	32791	1788		NO OBS
69 217	-18 34.3	127 9.2	69	9	19		3 21.2		32890	32833	1924		NO OBS
69 218	-18 38.5	127 17.6	69	9	19		3 4.3		32801	32754	1758		NO OBS
69 219	-17 30.8	123 41.2	69	9	23		2 32.0	-48 18.5	33347	33314	1474	-37439	50137
69 220	-17 51.6	122 26.9	69	9	23		2 12.8	-49 1.8	33027	33002	1275	-58032	50371
69 221	-17 49.7	122 37.5	69	9	23		2 26.4	-48 30.2	33042	33013	1388	-38016	50369
69 222	-17 46.7	122 51.7	69	9	23		2 31.2	-48 50.8	33133	33101	1457	-57909	50348
69 223	-17 41.3	123 47.3	69	9	23		2 29.1	-48 35.7	33219	33188	1440	-37674	50228
69 224	-17 39.2	123 14.3	69	9	23		2 35.4	-48 34.3	33203	33169	1500	-37624	50180
69 225	-17 40.5	123 23.7	69	9	23		2 22.5	-48 31.9	33246	33217	1377	-37618	50204
69 226	-20 53.8	123 13.4	69	9	29		2 7.1	-52 30.6	31438	31416	1162	-41735	52251
69 227	-20 48.4	123 77.4	69	9	29		2 15.4	-52 55.7	31472	31448	1239	-41607	52169
69 228	-20 45.9	122 59.5	69	9	29		2 18.4	-52 50.4	31508	31482	1268	-41570	52161
69 229	-20 41.8	122 51.4	69	9	29		2 11.4	-52 41.5	31606	31583	1208	-41475	52146
69 230	-20 33.7	122 32.5	69	9	29		2 8.2	-52 40.6	31673	31651	1181	-41543	52240
69 231	-20 31.1	122 23.3	69	9	29		2 58.4	-52 34.6	31640	31600	1595	-41347	52064
69 232	-20 28.7	122 14.9	69	9	29		1 56.0	-52 38.3	31535	31517	1064	-41303	51985
69 233	-20 23.5	122 5.6	69	9	29		2 7.7	-52 32.3	31618	31597	1175	-41263	51984
69 234	-20 20.4	121 54.4	69	9	30		2 28.4	-52 31.6	31776	31748	1325	-41451	52229
69 235	-20 15.7	121 44.2	69	9	30		0 49.3	-52 33.2	31536	31533	453	-41177	51866
69 236	-20 11.3	121 31.0	69	9	30		1 50.1	-52 17.6	31633	31617	1013	-40918	51719
69 237	-20 9.1	121 19.5	69	9	30		1 38.3	-52 12.8	31663	31640	1182	-40838	51675
69 238	-20 6.0	121 8.8	69	9	30		2 19.5	-52 10.1	31687	31665	1203	-40805	51664
69 239	-20 32.5	119 35.0	69	10	1		1 28.8	-52 31.8	32890	32879	850	-42909	54064

TABLE 9 (cont'd)

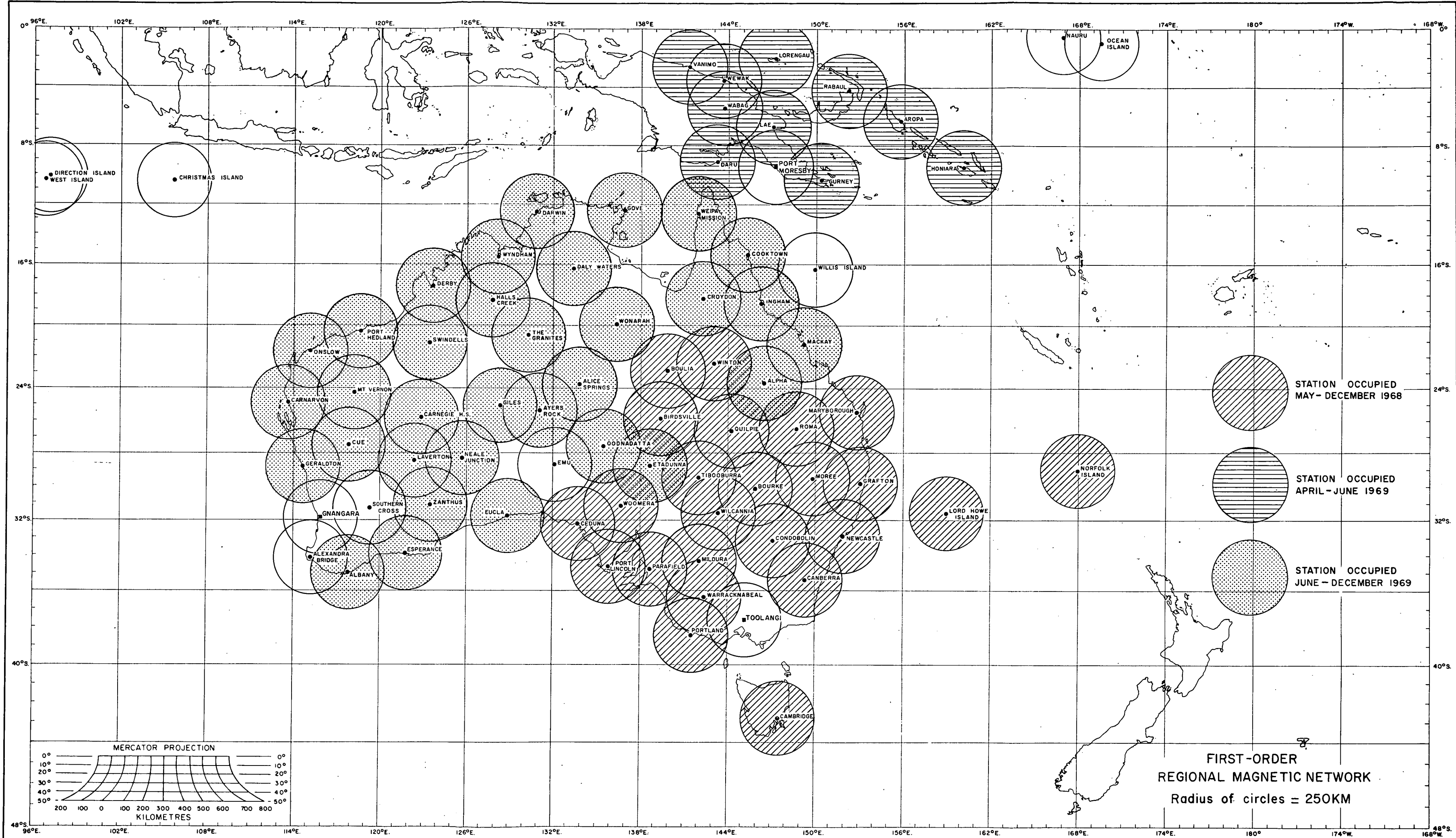
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69 241	-20 46.2	119 2912	69	10	1		0 48.0	-52 38.5	31620	31616	451	-41420	52109	
69 242	-20 41.0	119 170	69	10	1		1 28.5	-53 5.1	31252	31234	1077	-41602	52033	
69 243	-20 36.2	119 615	69	10	1		1 19.0	-53 2.5	31365	31357	721	-41686	52168	
69 244	-20 30.0	118 5816	69	10	1		1 38.9	-53 4.4	31263	31251	854	-41598	52036	
69 245	-20 23.4	118 4910	69	10	1		1 28.3	-52 49.3	31351	31343	733	-41336	51880	
69 246	-20 25.7	118 2715	69	10	3		0 52.0	-53 10.9	31334	31330	474	-41856	52285	
69 247	-20 27.9	118 2013	69	10	3		1 4.9	-53 4.5	31194	31189	589	-41509	51924	
69 248	-20 47.3	117 1211	69	10	3		2 46.5	-53 2.6	31738	31702	1518	-42185	52791	
69 249	-20 53.3	117 2112	69	10	3		1 59.5	-53 45.2	32015	31995	1113	-43667	54146	
69 250	-20 55.3	117 2913	69	10	3		1 21.8	-54 39.2	30310	30302	721	-42736	52393	
69 251	-20 52.0	117 3910	69	10	3		0 31.8	-53 18.6	31320	31318	290	-42033	52418	
69 252	-20 49.9	117 5013	69	10	3		1 27.5	-53 37.6	30956	30946	788	-42029	52199	
69 253	-20 41.8	117 5411	69	10	3		1 51.5	-53 25.7	31025	31019	591	-41818	52070	
69 254	-20 39.1	118 019	69	10	3		1 81.0	-53 16.0	31227	31222	572	-41845	52212	
69 255	-20 29.4	118 1011	69	10	3		1 19.1	-53 0.3	31295	31287	720	-41537	52007	
69 256	-21 46.7	115 1715	69	10	8		0 37.2	-55 22.8	30040	30038	325	-43513	52875	
69 257	-21 46.3	115 2810	69	10	8		0 28.3	-54 55.2	30284	30284	179	-43122	52694	
69 258	-21 50.5	115 3716	69	10	8		NO OBS	-55 10.5	30109			-43283	52725	
69 259	-20 54.4	118 2417	69	10	8		NO OBS	-52 47.7	31885			-41734	52399	
69 260	-20 52.5	116 3617	69	10	8			-50 24.0	34547			-41760	54197	
69 261	-20 49.9	116 4713	69	10	8		1 11.6	-53 23.1	31099	31092	647	-41852	52141	
69 262	-20 46.0	116 5615	69	10	8		0 59.3	-52 40.1	31082	31078	518	-40793	51253	
69 263	-26 34.6	118 4216	69	10	13		0 81.6	-60 24.5	27556	27556	-69	-48523	55802	
69 264	-25 46.7	122 4717	69	10	15		2 11.8	-58 57.4	28887	28865	1107	-47994	56016	
69 265	-25 48.4	122 3813	69	10	15		1 44.7	-59 6.2	28442	28429	866	-47531	55390	
69 266	-25 54.5	122 2810	69	10	15		1 29.7	-59 18.7	28331	28322	706	-47737	55511	
69 267	-25 54.5	122 1118	69	10	15		1 19.3	-59 19.2	28269	28262	635	-47649	55403	
69 268	-25 55.7	122 118	69	10	15		1 29.1	-59 20.1	28263	28254	699	-47667	55416	
69 269	-26 3.4	121 5612	69	10	15		0 49.5	-59 25.2	28151	28148	405	-47637	55333	
69 270	-26 15.8	121 5614	69	10	15		1 28.7	-59 38.5	28023	28014	706	-47845	55448	
69 271	-26 22.5	121 4815	69	10	15		1 28.3	-60 0.4	28002	27994	654	-48515	56016	
69 272	-26 30.5	121 4414	69	10	15		1 24.6	-60 1.7	27896	27888	686	-48372	55839	
69 273	-26 35.5	120 1014	69	10	16		0 14.0	-60 21.9	27473	27473	-112	-48292	55559	
69 274	-26 34.0	120 012	69	10	16		1 11.3	-60 10.3	27754	27750	495	-48405	55798	
69 275	-26 29.5	119 5014	69	10	16		0 41.6	-60 13.2	27631	27631	37	-48284	55631	
69 276	-26 29.1	119 4019	69	10	16		0 28.7	-60 15.2	27688	27687	215	-48449	55803	
69 277	-26 28.2	119 2710	69	10	16		0 9.0	-60 9.4	27856	27856	73	-48553	55976	
69 278	-26 25.9	119 1312	69	10	16		0 15.8	-60 6.1	27791	27791	128	-48333	55754	
69 279	-26 26.1	119 119	69	10	16			-60 6.7	27818			-48400	55825	
69 280	-26 30.4	118 5215	69	10	16		0 15.5	-60 12.3	27752	27752	125	-48469	55852	
69 281	-27 16.1	117 5817	69	10	18		0 28.0	-61 11.2	27013	27012	-220	-49108	56047	
69 282	-27 7.5	118 415	69	10	18			-62 12.1	26221			-49734	56223	
69 283	-27 0.8	118 1213	69	10	18		2 11.9	-61 11.7	26394	26374	1012	-47999	54777	
69 284	-26 53.1	118 2013	69	10	18		0 47.4	-60 41.9	27273	27270	-376	-48596	55725	
69 285	-26 44.1	118 2411	69	10	18		1 7.1	-60 22.0	27474	27468	536	-48296	55563	
69 286	-24 16.6	118 2218	69	10	21		0 28.0	-57 44.3	29000	28999	194	-45942	54329	
69 287	-24 19.1	118 3115	69	10	21		0 39.5	-57 38.4	29091	29089	334	-45911	54352	
69 288	-24 28.2	118 3219	69	10	21		0 22.6	-58 12.4	29013	29012	190	-46806	55068	
69 289	-24 37.4	118 3010	69	10	21		1 50.5	-58 31.7	28560	28545	917	-46658	54705	
69 290	-24 46.1	118 3010	69	10	21		-179 38.1	-58 34.0	28493	-28492	-223	-46619	54637	
69 291	-24 56.0	118 2619	69	10	22		0 36.0	-58 33.0	28516	28514	298	-46624	54653	
69 292	-25 6.2	118 1718	69	10	22		0 21.6	-58 38.0	28551	28551	179	-46836	54852	
69 293	-25 13.1	118 2117	69	10	22		0 17.1	-58 41.7	28546	28546	142	-46942	54940	
69 294	-25 22.0	118 2719	69	10	22		0 15.7	-58 53.4	28426	28426	-130	-47105	55018	
69 295	-25 29.0	118 3315	69	10	22		0 38.9	-59 6.2	28347	28346	255	-47371	55205	
69 296	-25 40.9	118 3616	69	10	22		0 22.9	-59 14.5	28028	28027	186	-47096	54805	
69 297	-25 49.9	118 3813	69	10	22		1 29.2	-59 24.1	28208	28198	732	-47701	55417	
69 298	-25 58.3	118 3919	69	10	22		0 29.3	-59 28.4	28091	28090	239	-47637	55303	
69 299	-26 8.2	118 4216	69	10	22		0 25.5	-59 40.7	28038	28037	208	-47939	55536	LP 142.

TABLE 9 (cont'd)

STATION	LAT	LONG	Y	M	D	GMT	D	I	H	X	Y	Z	F
69 300	-26 16.4	118 3914	69	10	22		0 52.4	-59 32.4	28375	28372	-432	-48249	59974
69 301	-26 27.1	118 3417	69	10	22		0 16.7	-60 20.2	27529	27528	134	-48334	59624
69 302	-24 43.7	113 4513	69	10	27		+1 12.9	-59 9.6	28075	28069	-595	-46897	54658
69 303	-23 49.0	114 016	69	10	27		0 54.4	-57 45.7	28827	28824	-456	-45709	54040
69 304	-23 57.3	114 113	69	10	27		0 48.6	-57 53.7	28741	28739	-339	-45808	54078
69 305	-24 6.7	114 218	69	10	27		0 39.7	-58 3.1	28706	28704	-332	-46033	54250
69 306	-24 16.0	114 213	69	10	27		0 37.2	-58 11.7	28657	28655	-310	-46211	54375
69 307	-24 27.8	113 5912	69	10	27		0 44.9	-58 30.7	28492	28489	-372	-46517	54549
69 308	-24 35.4	113 5418	69	10	27		0 47.4	-58 46.7	28334	28332	-391	-46746	54663
69 309	-25 1.1	113 4615	69	10	28		+1 1.7	-59 18.2	27977	27972	-502	-47123	54802
69 310	-25 9.9	113 5114	69	10	28		0 56.4	-59 28.1	27869	27865	-457	-47252	54859
69 311	-26 24.6	114 2716	69	10	28		0 51.5	-60 35.7	27245	27242	-48341	59490	
69 312	-26 14.8	114 2318	69	10	28		+1 15.6	-60 32.8	27226	27219	-599	-48214	55370
69 313	-26 3.7	114 1914	69	10	28		+1 12.7	-60 22.6	27350	27344	-576	-48100	55332
69 314	-25 54.4	114 1719	69	10	28		+1 17.4	-60 11.7	27497	27490	-619	-48001	55319
69 315	-25 45.3	114 1614	69	10	28		+1 9.4	-59 58.9	27626	27621	-558	-47814	55221
69 316	-25 34.4	114 915	69	10	28		+1 8.3	-59 45.5	27727	27722	-510	-47560	55052
69 317	-25 25.6	114 115	69	10	28		+1 0.4	-59 40.9	27733	27729	-487	-47424	54938
69 318	-25 18.4	113 5519	69	10	28		0 58.4	-59 34.6	27779	27775	-456	-47302	54856
69 319	-28 38.0	114 3715	69	10	30		+2 12.7	-62 59.5	25783	25764	-995	-50584	56777
69 320	-28 29.0	114 3716	69	10	30		+2 2.9	-62 56.0	25830	25813	-923	-50549	56766
69 321	-28 19.0	114 3718	69	10	30		+2 8.7	-62 41.0	25985	25966	-973	-50308	56623
69 322	-27 14.8	114 3611	69	10	30		+1 45.4	-61 32.6	26711	26698	-819	-49284	56057
69 323	-27 24.7	114 4010	69	10	30		+1 48.8	-61 42.0	26630	26618	-804	-49457	56171
69 324	-27 33.2	114 4211	69	10	30		+1 25.5	-61 52.7	26459	26450	-658	-49509	56135
69 325	-27 43.6	114 4013	69	10	30		178 9.7	-62 4.3	26335	-26321	860	-49678	56227
69 326	-27 53.9	114 4119	69	10	30		178 2.7	-62 16.7	26242	-26227	896	-49936	56412
69 327	-28 6.4	114 3914	69	10	30		177 59.3	-62 27.6	26077	-26061	916	-50008	56398
69 328	-28 51.7	114 4416	69	10	31		+2 5.1	-63 16.6	25619	25602	-932	-50888	56973
69 329	-29 3.0	114 5019	69	10	31		+2 18.3	-63 22.8	25547	25527	-990	-50970	57013
69 330	-29 12.1	114 5912	69	10	31		+2 12.8	-63 29.9	25465	25446	-984	-51071	57068
69 331	-29 13.3	115 517	69	10	31		+2 16.9	-63 27.4	25496	25475	-1015	-51040	57054
69 332	-28 33.5	115 2719	69	10	31		+2 48.1	-62 56.0	25876	25847	-1227	-50637	56868
69 333	-28 38.8	115 1910	69	10	31		+2 18.3	-62 56.2	25872	25853	-988	-50639	56865
69 334	-28 41.3	115 1017	69	10	31		+2 21.1	-63 0.7	25821	25799	-1059	-50703	56899
69 335	-28 43.0	115 018	69	10	31		+2 14.0	-63 4.0	25720	25701	-1002	-50626	56785
69 336	-28 44.5	114 5017	69	10	31		177 58.6	-62 37.0	26111	-26094	960	-50410	56771
69 337	-28 33.5	122 3513	69	11	12		NO OBS		26660				NO OBS
69 338	-31 1.6	123 2412	69	11	19		1 8.8	-64 33.7	25029	25024	501	-52621	58270
69 339	-31 1.5	123 1318	69	11	19		0 28.2	-64 35.2	25002	24997	365	-52622	58259
69 340	-31 1.4	123 214	69	11	19		1 9.7	-64 41.2	24948	24940	390	-52747	58350
69 341	-30 52.2	121 4414	69	11	19		0 36.6	-64 57.2	24698	24697	-135	-52854	58340
69 342	-30 54.3	121 5413	69	11	19		1 32.0	-64 28.2	25029	25020	663	-52403	58073
69 343	-30 55.1	122 318	69	11	19		0 44.8	-64 39.1	25001	24998	323	-52774	58396
69 344	-30 56.7	122 1418	69	11	19		0 38.0	-64 35.1	25218	25217	242	-53072	58759
69 345	-30 58.1	122 2513	69	11	19		0 38.1	-64 39.4	24990	24989	219	-52765	58384
69 346	-30 58.7	122 3519	69	11	19		0 48.7	-64 33.9	25069	25067	319	-52713	58371
69 347	-30 59.7	122 4813	69	11	19		0 59.3	-64 42.4	25013	25009	432	-52930	58543
69 348	-34 59.2	117 4013	69	11	22		+3 28.9	-68 28.2	22183	22142	-1347	-56229	60447
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69 351	-34 59.5	116 5312	69	11	22		+3 22.7	-68 45.1	21793	21742	-1474	-56046	60134
69 352	-34 59.2	117 610	69	11	22		NO OBS	-68 36.3	21949		-56024	60170	
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69 354	-34 53.4	118 010	69	11	23		+4 35.0	-68 36.2	22154	22083	-1770	-56540	60726
69 355	-34 49.8	118 2112	69	11	23		+3 16.7	-68 25.6	22142	22106	-1266	-55999	60218
69 356	-34 42.8	118 1912	69	11	23		+2 42.5	-68 51.9	21580	21556	-1020	-55823	59849
69 357	-34 36.1	118 2813	69	11	23		+2 20.5	-69 6.6	21759	21739	-946	-57014	61025
69 358	-33 56.3	118 5419	69	11	23		+1 39.2	-67 44.2	22709	22700	-642	-55474	59942
69 359	-34 7.1	118 5578	69	11	23		+1 4.3	-68 15.5	22873	22870	-413	-55382	59991

TABLE 9 (cont'd)

69	360	+34 15.4	116 49:9	69 11 23	+1 57:2	-68 9.9	22242	22229	-758	-95513	99803
69	361	+34 23.4	116 44:4	69 11 23	+2 14:3	-67 52.7	22596	22578	-883	-95588	99805
69	362	+31 48.0	126 25:2	69 11 29	3 29:3	-65 16.0	24717	24670	1475	-93657	99076
69	363	+31 49.6	126 13:2	69 11 29	2 34:2	-64 47.7	25133	25108	1127	-93399	99018
69	364	+31 55.0	127 31:5	69 11 29	2 30:2	-65 2.2	24896	24872	1088	-93480	98991
69	365	+31 53.7	127 41:7	69 11 29	2 19:1	-64 40.1	25166	25134	1237	-93169	98820
69	366	+31 52.5	127 52:3	69 11 29	2 16:8	-64 37.6	25205	25186	968	-93148	98822
69	367	+31 51.0	128 2:4	69 11 29	2 35:1	-64 36.0	25346	25321	1129	-93380	99092
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ALPHA

MACKAY

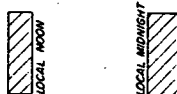
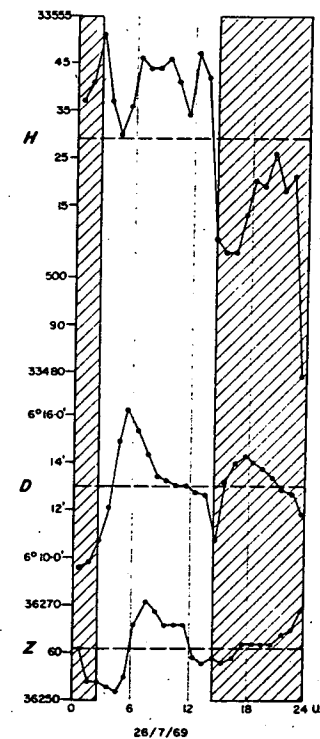
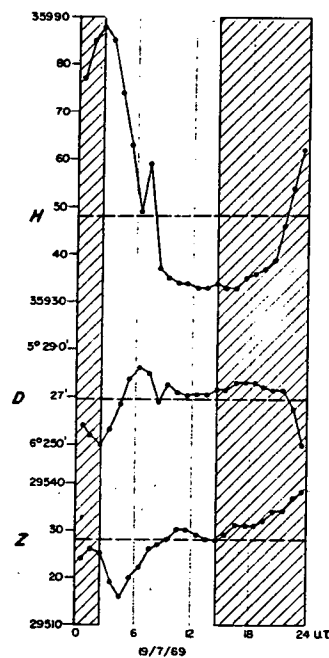
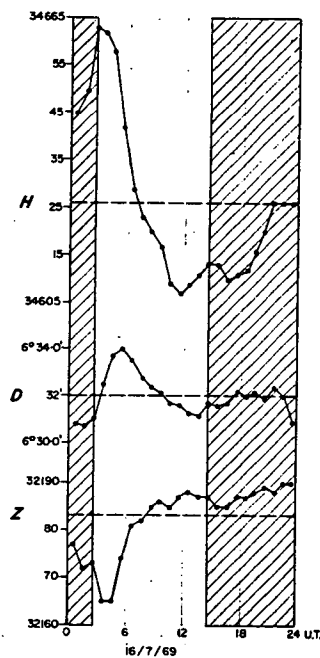
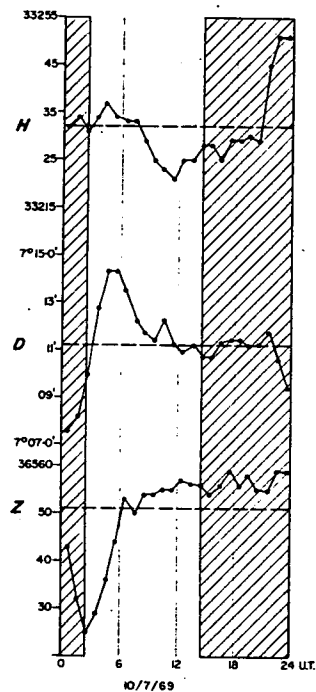
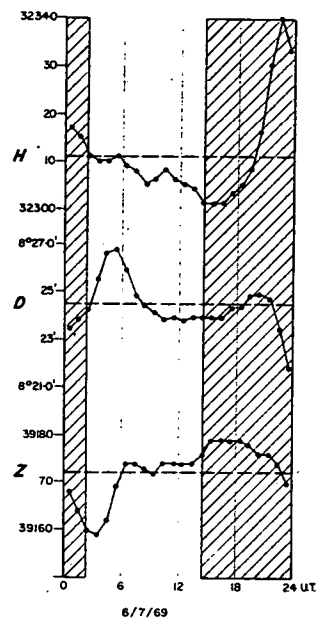
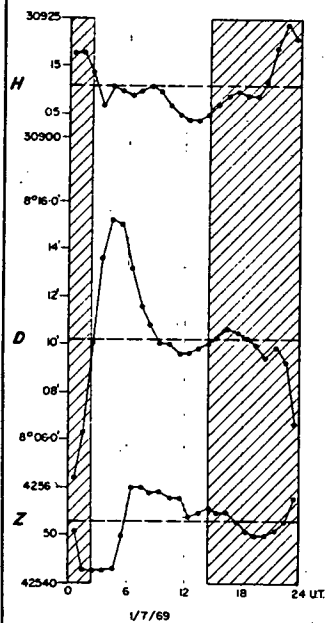
INGHAM

COOKTOWN

WEIPA

CROYDON

PLATE 2

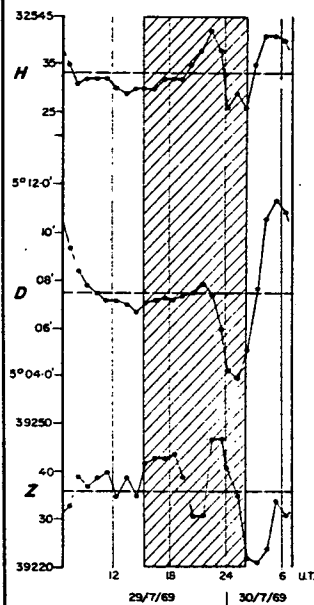


HOURLY MEAN VALUES OF H, D & Z

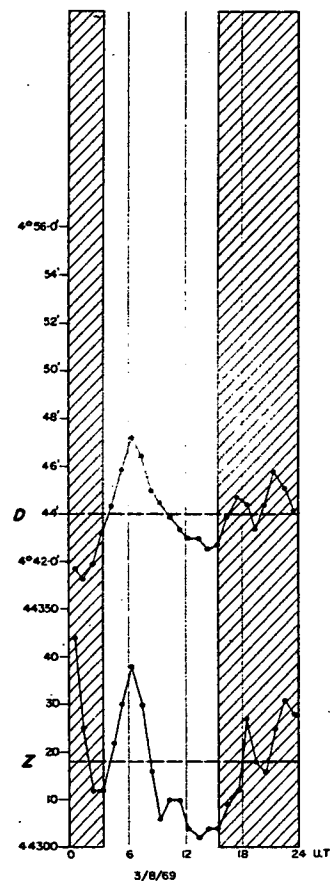
TO ACCOMPANY RECORD NO. 1871/23

696-395

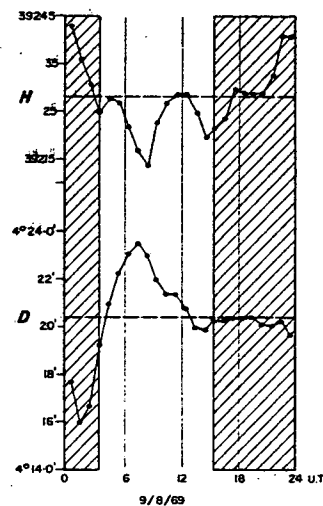
WONARAH



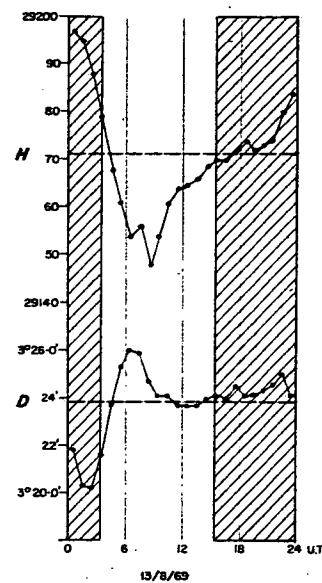
ALICE SPRINGS



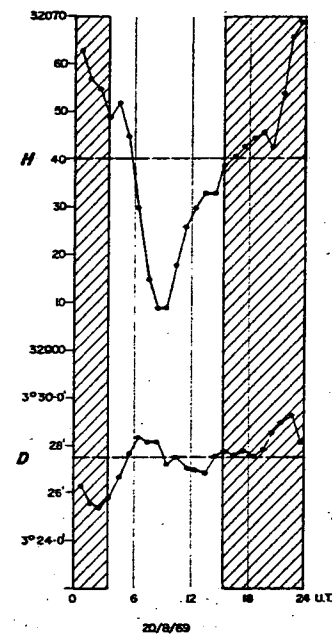
AYERS ROCK



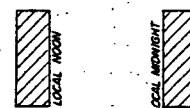
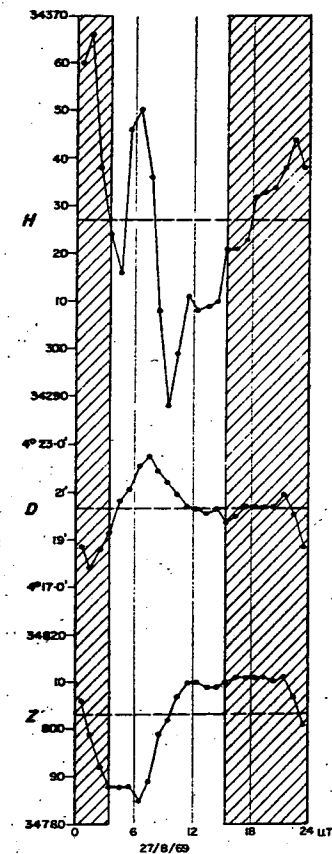
GILES



THE GRANITES



DAILY WATERS PLATE 3



HOURLY MEAN VALUES OF H, D & Z

TO ACCOMPANY RECORD NO 1971/25

696-396

DARWIN

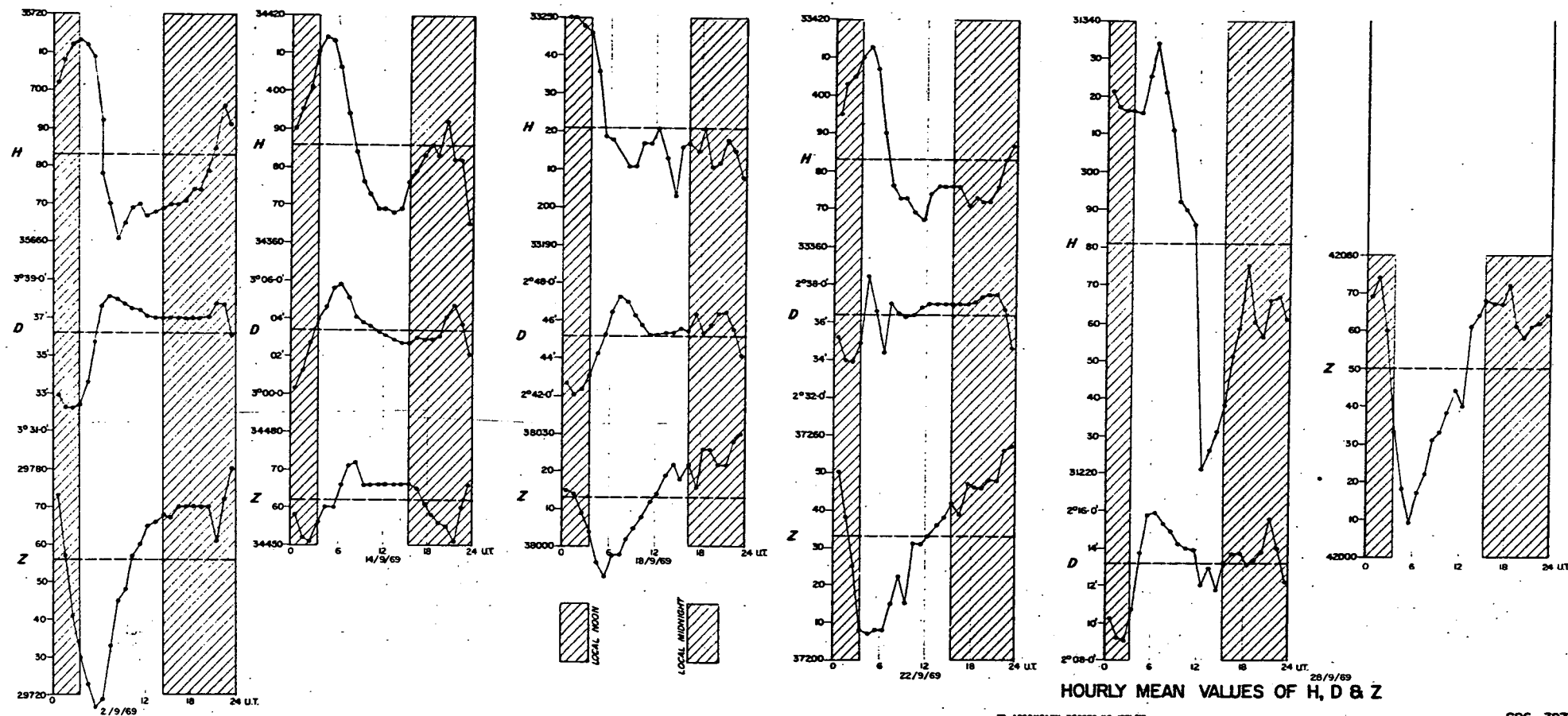
WYNDHAM

HALLS CREEK

DERBY

SWINDELLS

PLATE 4



PORT HEDLAND

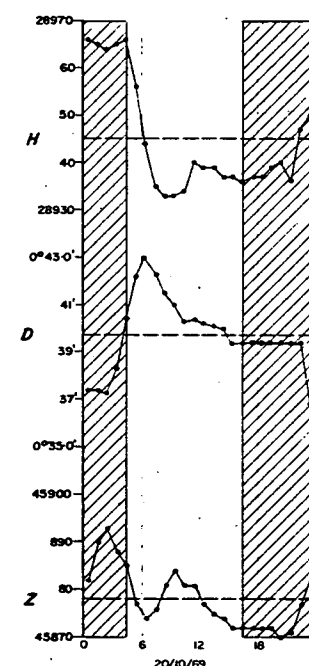
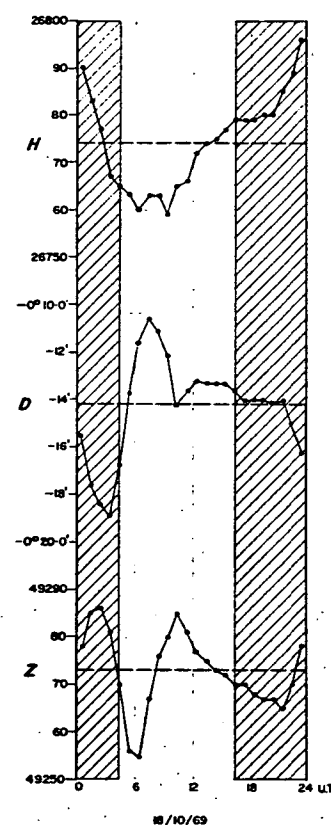
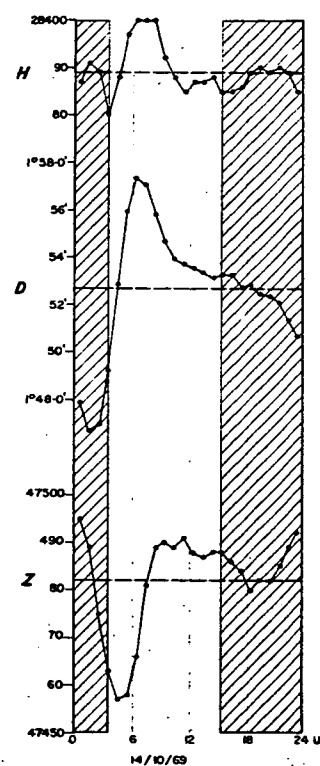
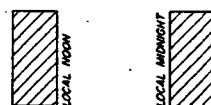
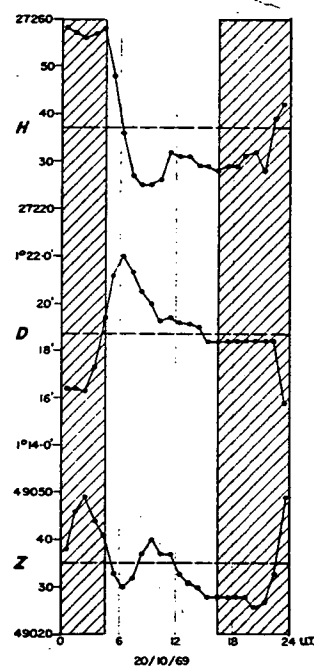
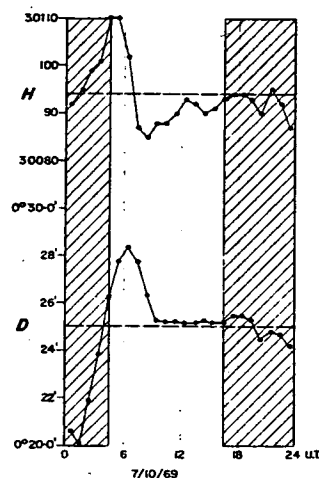
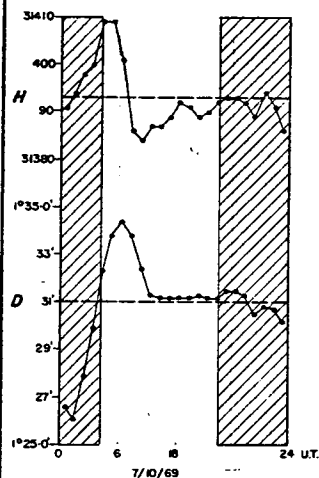
ONslow

MEEKATHARRA

CARNEGIE

CUE

MOUNT VERNON



HOURLY MEAN VALUES OF H, D & Z

TO ACCOMPANY RECORD NO 1871/28

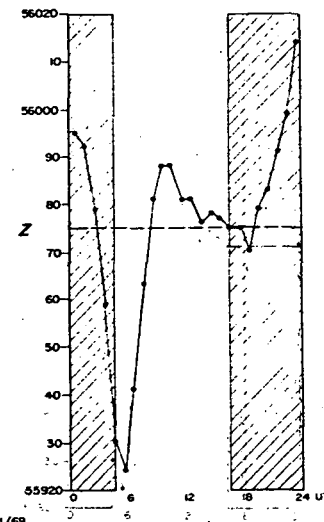
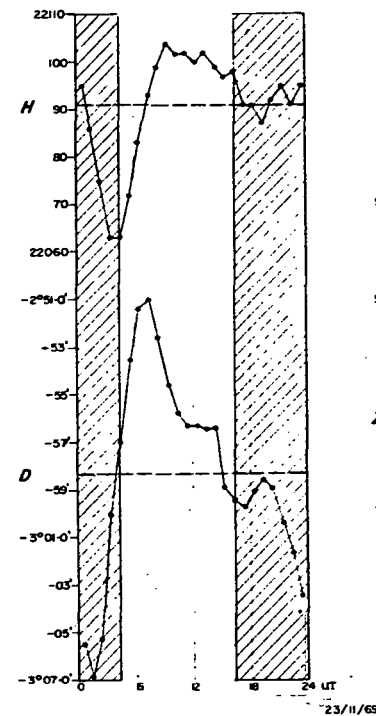
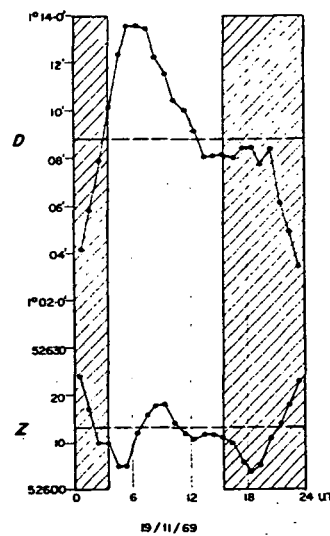
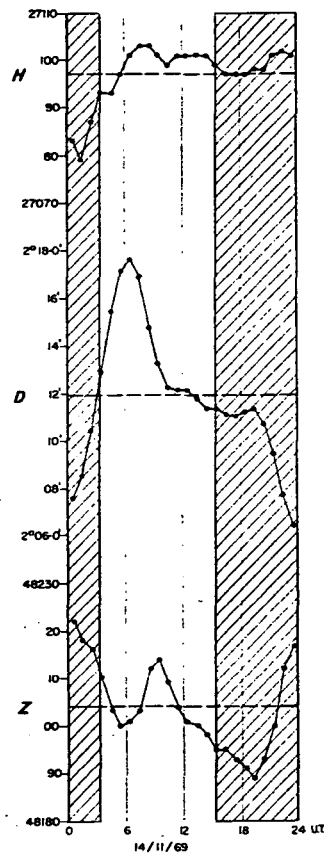
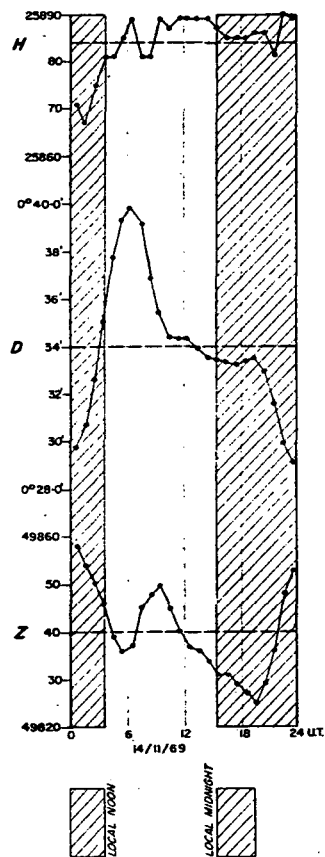
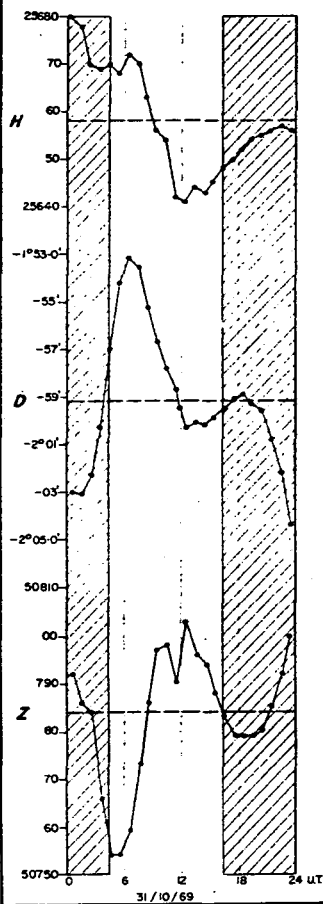
GERALDTON

LAVERTON

NEALE

ZANTHUS

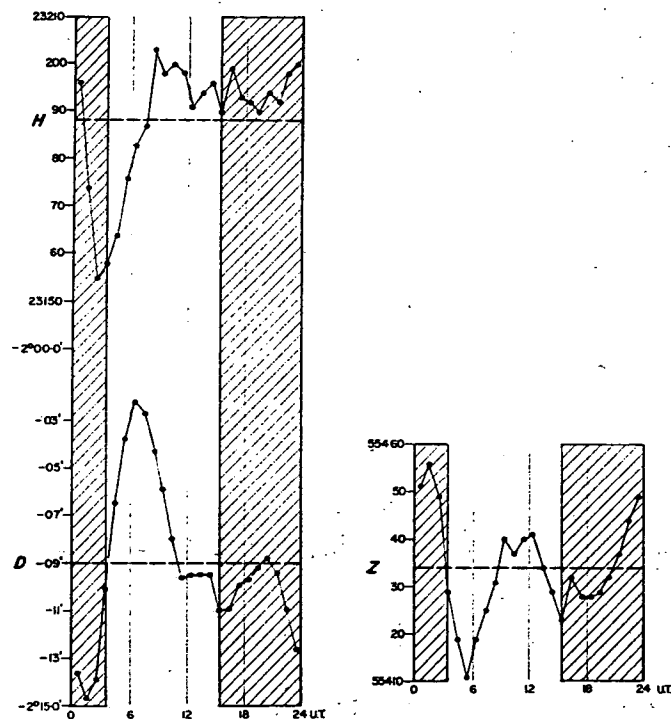
ALBANY



HOURLY MEAN VALUES OF H, D & Z

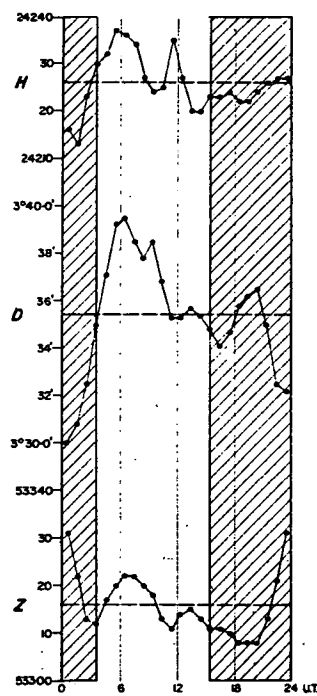
TO ACCOMPANY RECORD NO 1971/69

ESPERANCE

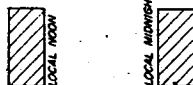


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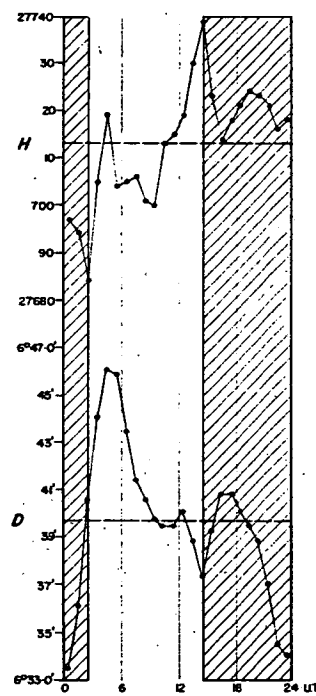
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1/12/69



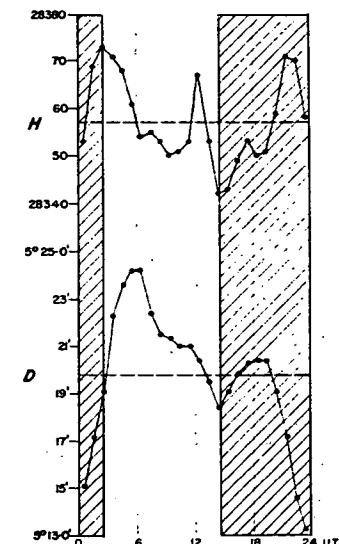
ETADUNNA



6/12/69

OODNADATTA

PLATE 7

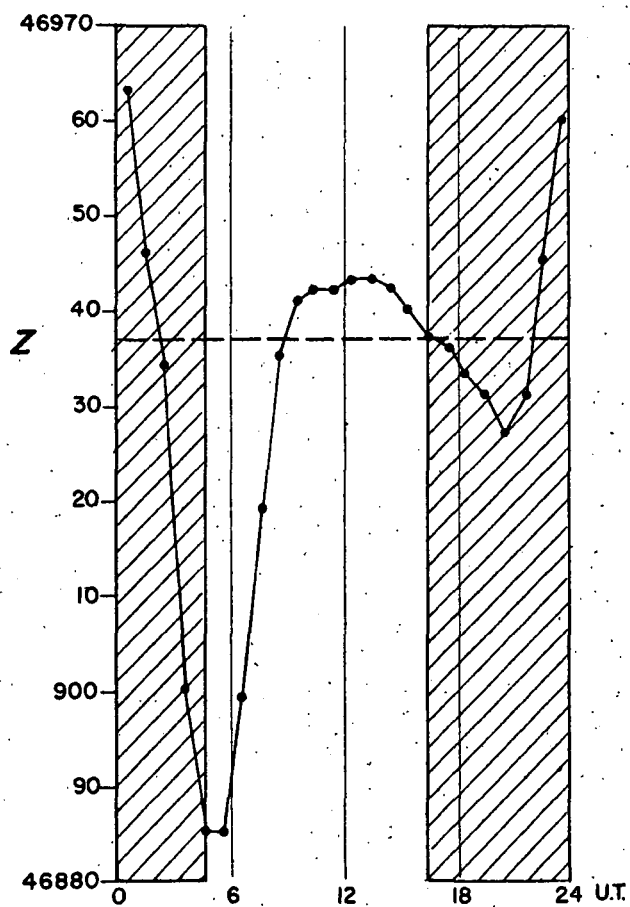
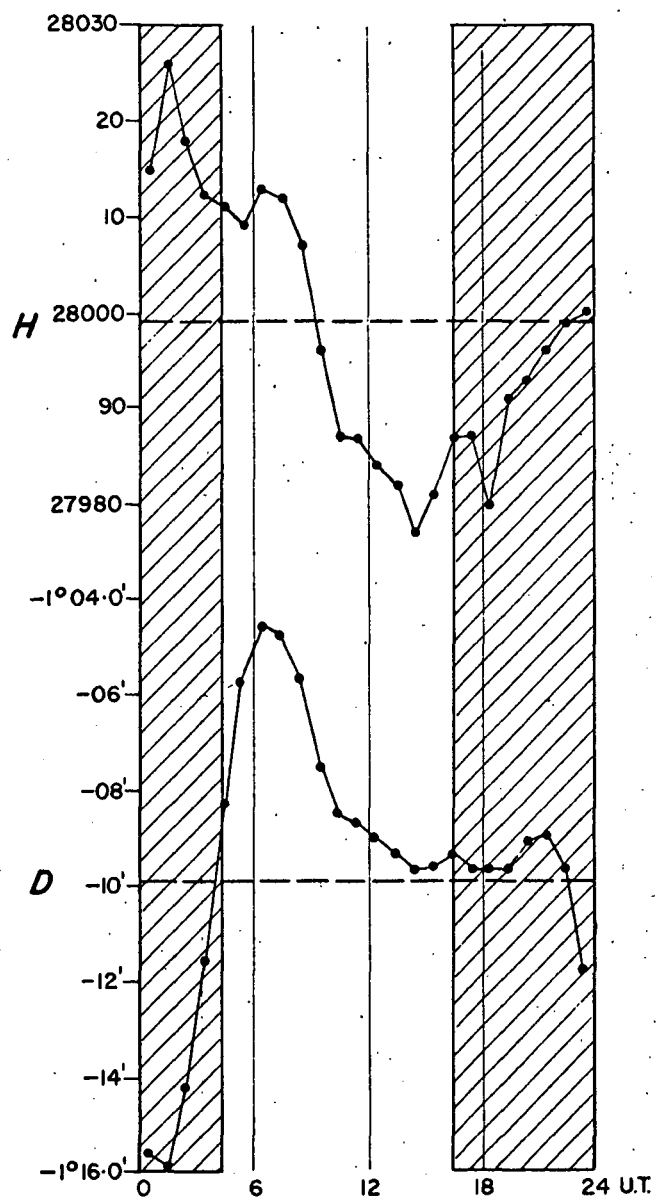


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HOURLY MEAN VALUES OF H, D & Z

TO ACCOMPANY RECORD NO 1871/25

696-400



HOURLY MEAN VALUES
OF H, D & Z

25/10/69

