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FIRST ORDER REGIONAL MAGNETIC SURVEY IN THE PRINCE CHARLES MOUNTAINS, ANTARCTICA AND AT HEARD ISLAND, 1992

by

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First Order Regional Magnetic Survey in the Prince Charles Mountains, Antarctica and at Heard Island, 1992

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SUMMARY

This report describes the results of geomagnetic measurements made at repeat stations in the northern Prince Charles Mountains (PCMs) in January 1992 and at Heard Island in February 1992. The PCM survey covered 7 of the 9 stations occupied by Crosthwaite in Jan/Feb 1990. The Heard Island work was a reoccupation of a previous magnetic station and observatory site. Multiple sets of DIF or HDF observations were made at each station and sunshots, pier differences and local F surveys were carried out at most stations for confirmation of the 1990 measurements. Variometer records for the 3-5 day occupation of each station were obtained using two portable fluxgate magnetometers developed by F Chamalaun, Flinders University. One was left installed at the first repeat station, the other was carried and reburied at each repeat station. The area covered by the survey was approximately 160 km by 130 km. Station descriptions based mainly on those provided by Crosthwaite are included to facilitate reoccupation. References to earlier geophysical and surveying occupations are given in Crosthwaite (1992).

The absolute observations were used to calibrate the variometer data at each station. Mean-hourly field values and graphs of 5 minute variometer data from each station are presented, along with the corresponding data from the fixed variometer and the Mawson observatory data, to allow a qualitative comparison of the spatial variation of the field. The data from the variometer stationed at Jetty Peninsula are very similar to those from the on-site variometer and one fixed variometer may be adequate for future reoccupation of the PCM stations. The Mawson variometer data shows more marked differences and more extended analysis is required to determine whether it is suitable for reducing PCM repeat station data.

An estimate of the quiet field values may be obtained from the data presented here by averaging PCM variometer data over the least-disturbed time intervals. One method of obtaining a quiet-day correction to these averages is to determine the difference between the Mawson quite-day field values and the Mawson data average for the same least-disturbed time intervals. Analysis by Crosthwaite (1992) indicate that the most suitable time interval is from 09 UT to 21 UT.

CHAPTER 1. INTRODUCTION

The Geophysical Observatories and Mapping Division of the Bureau of Mineral Resources, Geology and Geophysics (BMR) operates geomagnetic and seismological observatories at Mawson and Macquarie Island, a seismological observatory at Casey, assists in the operation and calibration of the Antarctic Division geomagnetic monitoring programs at Casey and Davis, and performs geophysical field work in Antarctica, as its contribution to the Australian National Antarctic Research Expeditions (ANARE). Logistic support is provided by the Australian Antarctic Division, Department of Arts, Sport, the Environment, Tourism and Territories.

The Mawson geophysical observatory was operated by myself from 8 December 1990 until 13 December 1991 when I was relieved by J.Jamieson. At this time preparations for the summer field work in the Prince Charles Mountains were finalised. All stations covered by this survey had been previously occupied, and in some cases established, by P.Crosthwaite in Jan-Feb 1990. Earlier occupations of these, and many other stations in the northern PCMs, have been carried out but documentation is scarce (see Crosthwaite 1992 for references). All field parties departed for the base camp at Dovers on 24 December 1991. I returned to Mawson on 5 February 1992 to await the arrival of MV Icebird on 14 February, departing on 18 February. The Icebird stopped at Heard Island to deploy the 1992 wintering party. The opportunity was taken to do magnetic observations at the Atlas Cove station. An ANARE was first set up there in 1947 and operated until 1955, during which a magnetic station was set up in 1947 and an observatory run from 1952 to 1954. There have been several short reoccupations since then and one extended visit in 1985 (see Hitchman 1988 for references). On this stopover observations were made from 22 to 27 February. The Icebird arrived in Australia on 9 March 1992. A summary of the field log covering the 1992 PCM and Heard Island occupations is given in Appendix A.

CHAPTER 2. SURVEY EQUIPMENT

2.1 Absolute Instruments

The instruments used in the PCM survey were:

DIM Elsec 810/208, Theodolite 312714	for D and I
PPM Elsec 770/206 in bolts down orientation	for F
PPM Elsec 770/193 in bolts down orientation	for F (pier differences and local F surveys)
QHM 302, Thermometer 1401, QHM circle 45, telescope 146	for H and D

An Askania Midget theodolite SN532345 was used for surveying and sunshots at some stations whilst the DIM theodolite was undergoing repair.

The instruments used at Heard Island were:

DIM Elsec 810/221, Theodolite 313887	for D and I
PPM Elsec 770/193 in bolts down orientation	for F

QHM 302 and thermometer 1401 parameters are given in the Mawson 1991 observatory report (de Deuge, 1992). Apart from the E770/193, the PCM instruments are all secondary Mawson instruments and their preliminary corrections with respect to the Mawson primary instruments are given in the Mawson 1991 observatory report. Their instrument corrections, with respect to the Australian standards, were determined via the primary instrument corrections and are listed in Table 1. E770/193 and DIM 810/221 were compared at the CMO on 14/5/92 and their preliminary corrections with respect to the Australian Standards are also listed.

Table 1. Instrument corrections for the PCM and Heard Island instruments

CMO Instrument A	Field Instrument B	Field component	Correction A-B
Ruska 4813	DIM 810/208	D	-0.4 ±0.9'
Ruska 4813	QHM 302	D	+1.1 ±0.9'
QHM 461/462	QHM 302	H	-3.4 ±1.8nT
MNS2.3X	PPM E770/206	F	+0.7 ±1.1nT
MNS2.3X	PPM E770/193	F	-1.7 ±0.1nT
Ruska 4813/lge	DIM 810/221	D	-0.5 ±0.2'
QHM 461/462, MNS2.3X	DIM 810/221	I	+0.1 ±0.04'

Instrument Performance

The DIM/PPM combination was used at the first four stations in the PCMs and at Heard Island, and the QHM/PPM combination was used at the last 3 PCM stations. The instruments were usually left at the observation site and put inside the survey tent overnight. This meant that they were always used at ambient temperature. While it was relatively warm, the instruments performed very well, but as the temperature dropped below -15°C, difficulties were encountered. Most commonly, the response of the liquid crystal displays on the DIM and PPM electronics boxes slowed down considerably. If the field was moderately active, the DIM display could not change quickly enough, and the tens and units digits of the display would appear as "8". An effective solution during the day was to face the LCD directly into the sun, thus maximising heat absorbed by it from the sun..

The batteries were significantly affected when the temperature dropped below -15°C, especially if they were becoming flat. On several occasions they were taken into the living tent to be rewarmed, but were frozen again after an hour or more back outside. The red cardboard-sheath Evereadies seemed to be less affected than other metal-sheathed batteries. The DIM had low power consumption and required only one set of batteries. The PPMs were high on power consumption, and in future three sets of batteries should be taken for the main observing PPM for the PCM survey. Depending on the amount of local F surveying done, the secondary PPM

requires 2-3 sets of batteries as well. When the batteries were cold or low, the PPM gave erratic readings and could not be tuned. Another problem encountered with the batteries was that the retainers in the DIM and PPM electronics boxers were too small to fit some brands of batteries, often resulting in dislodged batteries after moving the instruments.

At most of the stations occupied, wind of 10 knots or more was common. In these conditions, the vertical scale on the DIM vibrated and could only be read to 0.5', or worse. The problem was significantly alleviated after the second station occupation when an old polar pyramid tent, specifically designed as a survey tent with fold-down velcro flaps at shoulder height, was used. Although always partially open to the wind for mark sightings, it drastically improved working conditions and the quality of DIM VS readings and was well worth the effort of lugging it around. It is normally stored in the glacio store at Mawson.

The most serious problem encountered with the DIM was with the cable connecting the sensor head to the electronics box, as at -10°C and lower, the cable became hard and brittle. With the inherent movement and twisting of the cable involved in DIM observations, significant stress is put on the cable and connections. The first three stations occupied (Jetty Peninsula, Else Platform, Blustery Cliffs) were warm, but at the fourth station, Corry Massif, temperatures were lower, and at the start of the second day of observations, the DIM would no longer function. Attempts to fix it in the field and then at Dovers failed, and the instrument was returned to Mawson. A chip was destroyed during the examination at Dovers, the original problem was found to be a broken wire at the sensor connection. This was repaired, and the DIM returned to the PCMs in time for the last station, Mt Starlight. However the cable connection broke again after a day of observations at low temperatures. This problem was also encountered by Crosthwaite in 1990, although in that case, the cable did not break until after the survey. It appears that the DIM should be fitted with a longer cold-tolerant cable, preferably with thicker gauge wire if it is to be completely satisfactory for Antarctic field work. The PPM cables and connections gave no problems, although they have been reported in the past. The cable hardens and becomes as brittle as the DIM cable, and should also be replaced with a long cold-tolerant cable.

After the DIM broke down and was returned to Mawson, the secondary QHM 302 and a QHM circle was used to carry out absolute observations at Moore Pyramid, Mt Jacklyn and Mt Starlight. The main problem encountered with this instrument was in the use of the telescope used with QHM circles. The optical design of these is terrible, and getting enough light onto the QHM mirror required continual adjustment, which could affect the quality of the results. The problem was partially caused by the tent flaps blocking skylight, and these were occasionally fully opened with some improvement; QHM observations without the tent were considered inadvisable in the windy conditions, because of the risk of the tripod being blown over. A metal circle would have made QHM observations as relatively painless as DIM observations in the field.

Other minor problem were encountered with the QHM.

- Setting up the magnetic station took significantly longer with the QHM as a separate theodolite was required, and had to be set up first to confirm the station and azimuth mark. A different tripod was required for the QHM circle and had to be jacked up and stabilised with rocks on uneven ground to reach the instrument height of previous occupations.
- When starting observations in the morning on an overcast day, the temperature in the tent was below the limits of the QHM thermometer scale. As the day warmed the temperature rose sufficiently to allow observations. It would have been preferable to replace the thermometer at Mawson, with one calibrated to -20°C.
- At two stations, new azimuth marks were required because the vertical viewing angle of the telescope on the QHM circle is restricted, and could not be adjusted as this causes a rotation (ie a declination shift).
- There is a loss in accuracy using a QHM circle; in practical terms, the scale could only be read to ±0.5' compared to ±0.1' with the DIM theodolite.
- An Askania midget theodolite was used in place of the DIM Carl Zeiss theodolite for sunshots and round of angles. Although the precision of the scales was the same, the midget theodolite gave less accurate results.

No problems were experienced with the DIM and PPM at Heard Island (temperatures were mostly around 0° C). The only difficulty was the lack of shelter in the rain/hail/snow climate. These precipitations came in cycles of around 30 mins, so that observations were frequently interrupted to put a plastic bag over the DIM

whilst waiting for the weather to pass. A simple tent fly (with secure anchorage in the wind) would have made the work much more time efficient.

2.2 Fluxgate variometers

As a late addition to the program, two portable fluxgate magnetometers were sent to Mawson on V4, to enable a first order survey in the PCMs (earlier surveys had all been second or third order). The magnetometers were developed by Dr F Chamalaun of Flinders University, Adelaide. They are stand alone instruments using three orthogonal fluxgate sensors and a microprocessor to digitally record field variations. The data were recorded on EPROMs at 1 minute intervals. The magnetometers were powered by batteries with a working life of 3 months or more (in an Australian climate).

One magnetometer (#8) was installed in a fixed position at Jetty Peninsula for the whole of the 5 week survey in order to provide a stable source of variometer data. This location was chosen as it is roughly central in latitude to the survey area, being close to sea level it was expected to have a fairly mild climate, and a good set of observations had been obtained during the 1990 occupation by Crosthwaite. The second magnetometer (#55) was carried to each station and usually buried on arrival, allowing an overnight equilibrating period before absolutes were started. It was hoped that if the continual relocation (every 3-5 days) did not disturb the magnetometer significantly, then this arrangement would allow a study of the combined spatial and temporal variations in the magnetic field over the northern PCM region. Only magnetometer #55 was used at the Heard Island station.

There were several practical problems associated with using the variometers. For example, burying them to minimise temperature changes was sometimes difficult. #8 at Jetty Peninsula was relatively easily buried, as the ground consisted of loose pebbles, rocks and some dirt. At other stations however, the ground surface consisted only of rocks and small boulders. Wherever possible, a hole was dug (never amounting to more than 6" as the permafrost was almost impossible to penetrate further), the magnetometer was placed in it and covered with a layer of pebbles and rocks. A close-woven cotton bag was placed over this to exclude wind with a further layer of rocks and pebbles over this. Finally the whole mound was completely covered in snow if available. This appears to have restricted temperature changes to around ±0.5°C, which is as good as one might expect, given the possible 20°C changes in ambient temperature (with wind chill factor). Temperatures were recorded by the variometers approximately every hour, but no correction was included in the data analysis as temperature coefficients have not been satisfactorily determined, particularly below 0°C.

The variometers had not previously been tested in cold climates and the most significant problem was found to be with the batteries. Two 6V lead-acid motorcycle batteries are used in each and were affected by the cold, even at the relatively mild stations. The battery voltage dropped from 6.42V to 6.29V (#8) and from 6.42V to 6.24V (#55) over the duration of the survey. When rewarmed and tested on 7/5/92 the battery voltages were 5.9V and 4.7V for #8 and #55 respectively. In future. cold tolerant batteries should be used if possible. Similarly the batteries for the Canon handheld computer (used for interrogating the variometers) suffered in the cold, and spares should be carried. The Canon clock drifted by 1-3 s/day and was reset at each station.

Magnetometer #8 showed a minor malfunction once the acquisition program was started, as the magnetometer would not respond to the "TT" or "WW" wakeup interrupts. Because of this, the magnetometer clock could not be checked or reset, but the regular display of minute values indicated it was functioning. The clock in #55 drifted by less than 1s over the whole survey and was never reset. In general, magnetimeters were robust, easy to transport, easy to use and a valuable addition to the survey, providing the batteries last.

On return to Australia, problems were encountered with retrieving and converting the variometer data. Data could not be read using magnetometer #8 - the memory card was removed and installed in magnetometer #55 for reading, indicating a fault in magnetometer #8. Both data sets were retrieved several times and the different versions compared. Those from #8 were identical, but each version from #55 was corrupted in a different area, indicated a fault in memory card #55 (as all retrieval was done from the same magnetometer). The data were stored in 78 minute blocks; the absolute field was measured at the start of a block and the following 77 field values were recorded as increments to the previous value. The disadvantage to this system is that if the data is corrupted mid-block the following values are useless and more than an hour's data may be lost. This occurred several times in the data for each station, and more importantly during some absolute observations, which rendered them useless for calibration purposes. Nevertheless, satisfactory variometer data

and absolute calibrations were obtained for each station. It was not possible to tell which data corruptions were due to battery malfunction or to data retrieval problems.

CHAPTER 3. STATION OCCUPATION

3.1 Reoccupying Established Stations

No new stations were established on this survey; a sequence of operation for establishing new stations is given in Crosthwaite (1992). However, many of the establishment procedures were repeated to verify location, azimuths, field gradients and pier differences. The procedure developed for reoccupying each station is given below:

(a) Identifying the station.
It was very useful to scan the magnetic station from the helicopter before landing in order to choose the closest possible camping site (within a 100m quiet zone). Most magnetic stations were established within 50m of old survey stations, which could be identified from the air. The survey stations consisted of a station mark (eg. rock piton) with a beacon (usually a rock cairn or mast) placed over or within a few metres of the mark. Each magnetic station consisted of an M tripod site at which the main D, I and sunshot observations were done with the DIM (or QHM and theodolite), and an F tripod site at which the F observations were done with the PPM. During the 1990 occupation, the M site was marked with a 30cm cairn, topped by a rock-secured aluminium tag bearing the stamp "BMR MAG" on one side and "PCM <station letter>" on the reverse. The F site was not tagged but sometimes marked by a low cairn. No change were made to the stations except to replace the rock-secured aluminium tags with brass stakes carrying new aluminium tags stamped in the same way. The stakes protrude by only 2-3" and are sometimes obscured by the cairn. The rock-secured tags were placed on a cairn at the F site, except at Jetty Peninsula. Mt Wishart and Mt Woinarski were not occupied and are unchanged from 1990.
After landing and identifying the observing station, the azimuth marks were located, using a roughly set up theodolite if necessary (records of the elevations of marks were very useful in relocating them). This was done so that the survey tent could be positioned without the poles obscuring the marks, and so that the marks could be used in selecting a site for the variometer.

(b) Setting up at the magnetic station.
If possible, the variometer was buried soon after arrival to allow temperature stabilisation. At all stations, the variometer was positioned colinearly with (and usually between) the M tripod and one of the azimuth marks (usually the primary mark) at 20-30m distance from the M tripod. More detail is provided in the station description. In most cases the variometer was buried on rocky or gravelly ground; snow and ice were avoided as it was thought that the variometer might melt in slightly and disturb its vertical alignment. Using a hand compass, the variometer was aligned with X and Y axes approximately along geographic north and east; as the declination in the PCMs is around 70° this ensured that both components would be non-zero, thereby reducing relative errors in baseline determinations. Before being completely buried, the variometer output was checked and noted using the Canon computer. At the end of each occupation, the variometer was removed as late as possible to maximise the length of the variometer record.
The survey tent was then set up over the magnetic station M site, taking care to position the apex directly over the cairn. The tent restricts the distance at which the DIM electronics box can be placed from the sensor, so it is important to use Eveready cardboard-sheath batteries if possible. With these, the effect of the electronics box in a corner of the tent is 1nT or less. The DIM tripod was set up over the M site and the wooden tripod over the F site, in both cases burying the feet well in rocks. At one station, the PPM tripod was also guyed to a rock for extra security during gale force gusts overnight. The instrument heights quoted in the station descriptions are from the mean ground level at the pier to the mid-level of the instrument sensor. In future, this should be remeasured from the top of the brass stake at the M site for better accuracy.

(c) Magnetic observations
The absolute observations were given first priority as mark azimuths etc had already been determined by Crosthwaite. These were carried out when conditions allowed. The DIM observations were mostly half-sheet , as they were more useful, particularly during active periods. Full sheet observations can be processed as half sheet obs. Between observations, the tripods were left set up and overnight the DIM theodolite (or QHM and circle) and PPM sensor were returned to their cases. Everything was left at the station and secured against wind with rocks.

Two PPMs were provided for this PCM survey, so M-F pier differences could be accurately determined. This was done at the end of any day's absolutes, after the DIM was taken down. Local F surveys were also carried out when time and conditions permitted, but was considered low priority and not attempted until towards the end of the occupation. A pretagged ball of met string was used to mark out a 50m axial grid as the tape measure was unmanageable in winds over 20 knots.

(d) Station observations and description
Sunshots to verify the azimuths of the marks were done at any time when conditions allowed and after a recent radio time signal check on the stopwatches - the drift rate of the watches was variable, and worsened as they became colder. When the QHM was used, sunshots were delayed until the end of the occupation as the theodolite required a different tripod, for which the QHM setup had to be completely dismantled. Round of angles and elevation measurements of the secondary marks and prominent features were done at any convenient time.
The latitude and longitude of each station were derived by Crosthwaite by referencing to a nearby AUSLIG survey cairn. There were two stations where none were available and a position was derived by Crosthwaite by taking sightings on distant survey points and constraining them with altitude shots of the sun. Attempts were made to verify the adopted position using the helicopter GPS (Global Positioning System) whilst hovering over the mark. The somewhat unsuccessful results are given in the station description section. At any convenient time the dimensions of the station were measured and the station description updated if required.

3.2 Station Descriptions - Prince Charles Mountains

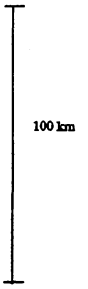
Figure 1 is a sketch map showing the relative locations of the PCM stations and Mawson. Seven of the nine stations occupied by Crosthwaite in 1990 were reoccupied in 1992. Mt Wishart and Mt Woinarski were omitted because of time restrictions; they were low priority because of Mt Wishart's proximity to Moore Pyramid (4-5 km) and Mt Woinarski's reputedly bad weather would make future reoccupations uncertain. The order of the 1992 occupation corresponds approximately to the recommended priority on future reoccupations:

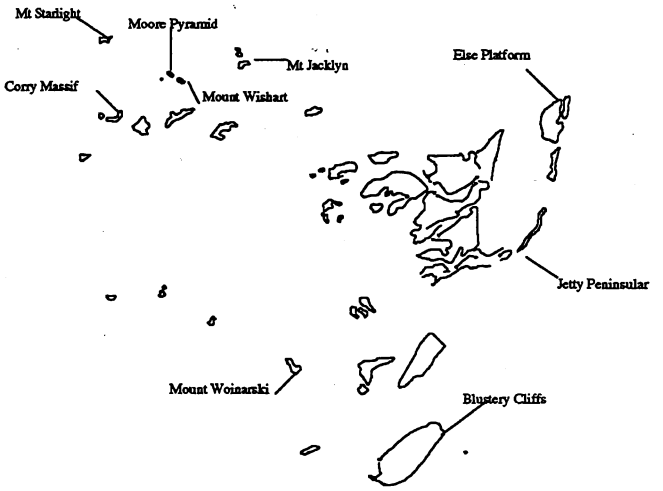
1.Jetty Peninsula (reasonable weather, very low field gradients, easy access)
2.Blustery Cliffs (good weather, SE extreme of the area, easy access)
3.Corry Massif (acceptable weather, near NW extreme of the area, reasonable access; local anomalies)
4.Else Platform (good weather, NE extreme of the area, easy access; small local anomalies)
5.Mt Jacklyn (moderate weather, close to Dovers, easy access by ground transport)
6.Moore Pyramid (variable weather, easy access)
7.Mt Starlight (at the NW extreme of the area; not very good weather conditions, not easy access)

The following descriptions are given in alphabetical order of station identification letter. They contain the station data determined by Crosthwaite unless otherwise noted. The mark azimuths and round of angles results obtained on this survey for verification of those data is presented in Appendix C. No contradictory results were obtained for the station data. The GPS fixes obtained for the two stations, Moore Pyramid and Mt Starlight, are given but should not be considered accurate; two test runs using the same GPS unit at the Dovers landing site showed differences in lat/long of 13"/5" which in distance, is about 390m/50m respectively. The accuracy depends on the number and position of available satellites, but this information was not recorded. For this reason the adopted coordinates of Crosthwaite were used at Moore Pyramid and Starlight as well. If a GPS is used in future to verify these two stations, several readings should be taken, and the number of satellites available at the time of reading should be noted.

Figure 1. The northern Prince Charles Mountains region relative to Mawson

The geographic coordinates for Mawson are 67° 36' 14.1"S 62° 52' 45.2"E
The geomagnetic coordinates for Mawson are 73.194°S 107.5466°E (IGRF 1990.0)





A. Mount Woinarski

Station Tag: "BMR MAG" / "PCM A".
Adopted coordinates: Lat = 71° 13' 08.3" S Long = 66° 26' 39.3" E Height = 1617m.
Not reoccupied. Mt Woinarski has notoriously bad weather and difficult access and camping. Not recommended for reoccupation. For station details see Crosthwaite (1992).

B. Blustery Cliffs

Station Tag: "BMR MAG" / "PCM B"
Adopted Coordinates: Lat = 71° 25' 20.6" S Long = 67° 52' 52.5" E Height = 1110m
Dates Occupied: 2 - 6 January 1992
Number of Obs: All DIF - 5 half obs (3rd); 5 half obs, 2 full obs (4th); 2 half obs (5th)
M-F Pier Difference: -14.5 nT (from 1992 occupation)
Magnetic Gradients: It appeared that gradients were of the order of 3 to 5 nT/m. The survey cairn was magnetic.
Weather: Usually light winds with frequent moderate gusts; moderate temperatures

Station Description: Easy access by helicopter; good campsites within a few hundred metres. The station is on a slightly sloping flat area covered with small boulders very near the 2m survey cairn close to the cliff edge. There were large artificial anomalies near the survey cairn.
Pier M is 6.1m at 2°24' from the survey cairn (in the direction of the reference mark). DI obs at a height of 1.6m.
Pier F is 5.6m at 245°40' from the M pier. F obs were at a height of 1.8m.
Variometer #55 buried 21.2m at 22°27' from pier M. It was roughly colinear with pier M and azimuth mark "V".

Nearest survey reference:
Survey Station NMS147: 71° 25' 20.8026" S 67° 52' 52.4446" E (WGS84) Height 1109.070m (MSL).
Established January 1969, ANARE. A station summary is available through AUSLIG
Station Mark: HF6 Meat Bar. Rock cairn over meat bar station. (2m high, 1.1m diameter)
Reference Mark: Rock piton in small cairn 7.65 ft from station towards NMS148 Fox Ridge.
Eccentric: Bamboo cane on snow dune (not sighted in 1992).

Azimuth Marks:
1. "V" - a natural feature (a vee) in a ridge line of Fisher Massif across a valley a few kilometers away. "V" is almost on the sky line, but just backed by a distant rock feature. This mark was always visible.
The adopted azimuth from M to "V" was 203° 09' 32". The measured elevation was -0°23.4'.

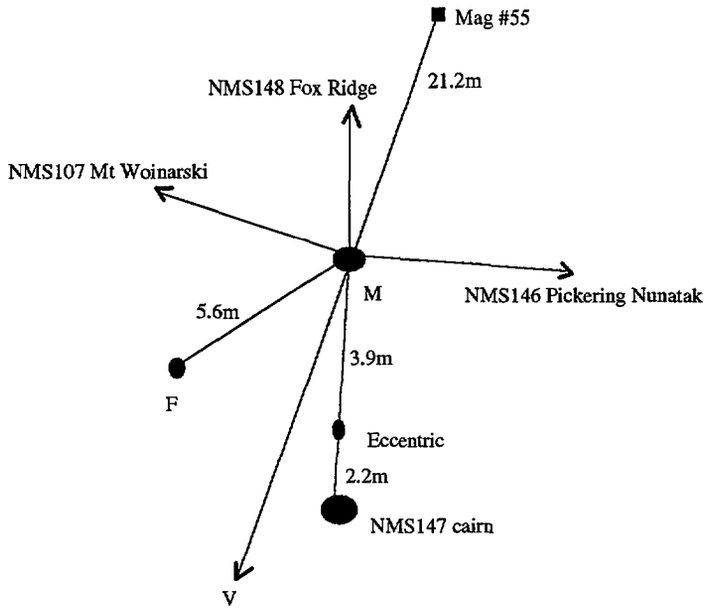
2. Mt Woinarski survey cairn NMS107. This mark was only visible occasionally due to heat haze and drift on Mt Woinarski. The computed geodetic azimuth from NMS147 to NMS107 (WGS84) is 293° 09' 01"; distance 56km. The derived geodetic azimuth from pier M to NMS107 is 293° 08' 40". The derived astronomical azimuth from pier M to NMS107 cairn from rounds of angles was 293° 09' 14". This indicates some problem of the order of tens of seconds of arc in azimuth. Its measured elevation is +13.4' (from 1992 occupation).

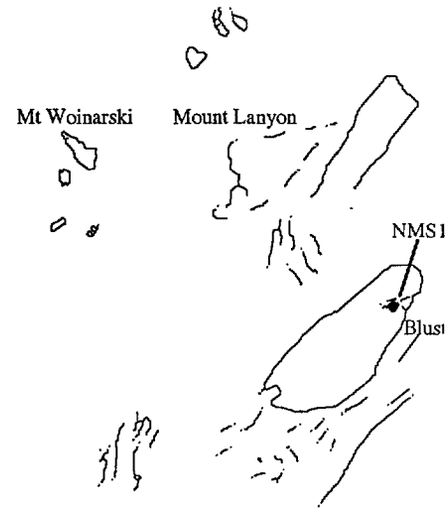
Rounds of angles: "V" to NMS107 cairn at M is 89° 59'42".

Notes: This is a good site with moderate weather conditions at the south east corner of the northern area of the Prince Charles Mountains. Reoccupation is recommended.

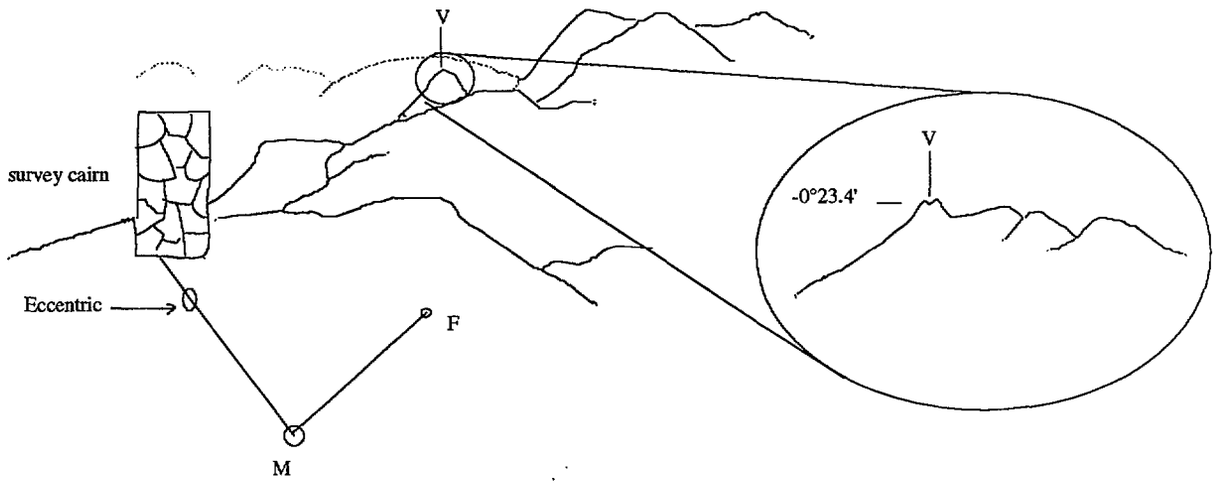
Figure 2. Blustery Cliffs

Station Location





Marks



C. Jetty Peninsula

Station Tag: "BMR MAG" / "PCM C"
Adopted Coordinates: Lat = 70° 48' 48.7" S Long = 68° 32' 45.5" E Height = 201m
Dates Occupied: 29 December 1991 - 2 January 1992
Number of Obs: All DIF- 2 half obs (30th); 5 half obs (31st); 3 half obs,2 full obs (1st); 2 half obs (2nd)
M-F Pier Difference: 0.0 nT (from 1992 occupation)
Magnetic Gradients: The area has very low gradients (very nearly 0nT over tens of meters); the only anomalies found were artificial ones in the vicinity of the survey beacon and fuel dumps for helicopter operations.
Weather: Continual moderate-strong winds and moderate temperatures not far below 0C

Station Description:
Often referred to as "205". Easy access by helicopter; good campsites on rock close to the observation site (choose a site near one of the water pools). A fuel dump is situated about 80m north of the station (5×44 gallon drums in '92).
Pier M is 42m at 99° from the survey peg AUSV23 on a rocky surface downhill from the peg. DI obs were at a height of 1.5m.
Pier F is 19m at 226° from the M pier. F observations were at a height of 1.7m.
Variometers # 8 and #55 were roughly colinear with pier M and AUSV23 and NMS148.
#8 was buried 10.9m from AUSV23 on the eastward side, #55 was buried 3.5m from AUSV23, westward side.

Nearest survey reference:
Survey Station AUSV23 70° 48' 48.5" S 68° 32' 41.5" E (WGS84) Height 201.898m (MSL).
Established 1968, M.J.Corry. A station summary is available through AUSLIG
Station mark: An old rock piton under a small rock cairn which is located on a low moraine and permafrost outcrop at the southernmost extremity of Jetty Peninsula.
Station beacon: An old 2' rock cairn with a collapsed stack of flour drums about 4m NE of the mark.
Station reference: A new reference rock piton, under another small rock cairn, was placed about 3m NW of the old cairn by glacios in 1988/89. An aluminium bolt was found embedded in a rock on the eastern side of AUSV23 about 7.6m away. Its origin is unknown.

Azimuth Marks:
1. Survey beacon NMS148 on Fox Ridge, McLeod Massif (24.687 km from AUSV23) was always visible.
The adopted astronomical azimuth from pier M to NMS148 was 278° 43' 59"
The derived geodetic azimuth from AUSV23 to NMS148 is 278° 44' 00.9 ". There is no correction for the azimuth from pier M as M, AUSV23 and NMS148 are colinear.

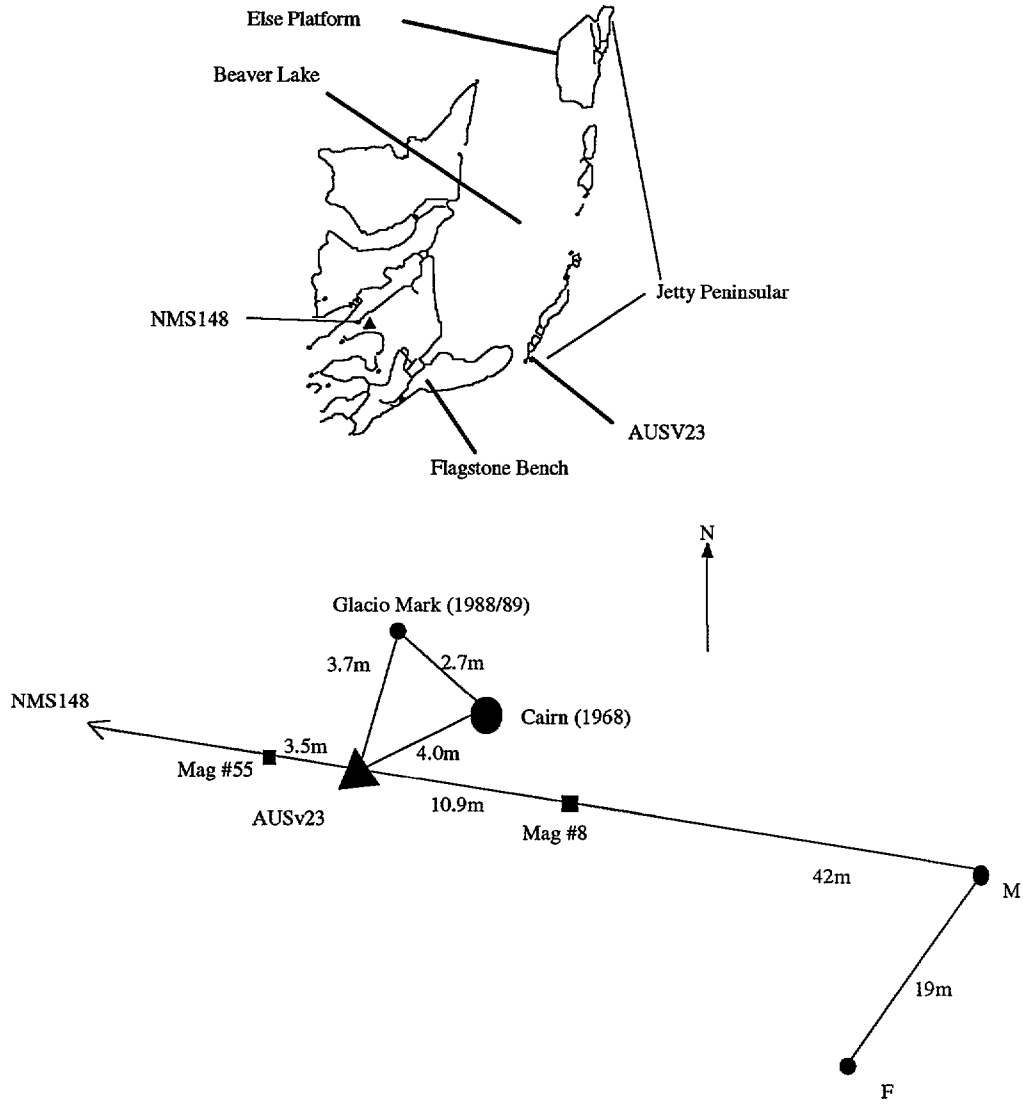
2. Rock: A nondescript "Rock" 600m distant was given as a secondary reference for low visibility (it was not satisfactorily identified and not used in 1992). The derived astronomical azimuth from pier M to Rock was 12° 43' 20". The measured elevation was -0°43'45".

Rounds of angles: NMS148 to Rock at M is 93° 59' 21".

Notes: The site has very low field gradients and is well documented as a survey station; it has good weather conditions and is near the north east corner of the northern area of the Prince Charles Mountains. Reoccupation is highly recommended.

Figure 3. Jetty Peninsular

Station Location



D. Else Platform

Station Tag: "BMR MAG" / "PCM D"
Adopted Coordinates: Lat = 70° 20' 05.2" S Long = 68° 47' 38.8" Height = 173m
Dates Occupied: 6 - 9 January 1992
Number of Obs: All DIF - 10 half obs (7th); 2 half obs, 2 full obs (8th)
M-F Pier Difference: -1.3 nT (from 1992 occupation)
Magnetic Gradients: The area has fairly low gradients, although there are many bands of magnetic rock producing small scale low anomalies. The survey cairn knoll has a local F high value of 5-10nT. The M pier has an F value typical of the area.

Weather: Usually light winds and moderate temperatures not far below 0°C.

Station Description:
Easy access by helicopter; good campsites on rock abound with the nearest melt lake a few hundred metres away. There are vast numbers of Russian built cairns and drums in the area. There is a band of magnetic rock quite close to the M and F piers.
Pier M is 27.5m at 224°13' from survey cairn AUS072 on a sloping broken rock surface below the cairn. DI obs were at a height of 1.6m;
Pier F is 8.0m at 157°01' from the M pier. F obs were at a height of 1.8m.
Variometer #55 buried 30.4m at 156°36' from the M pier. It was roughly colinear with pier M and pier F.

Nearest survey reference:
Survey Station AUS072 70° 20' 04.6227" S 68° 47' 40.5952" E (WGS84) Height = 173.130m (MSL).
Established February 1969, ANARE. Previously known as NMS150 Manning Platform. A station summary is available through AUSLIG
Station Mark: 6" piton covered by 2 foot rock cairn. The survey cairn is surrounded by 3 eye bolts and is very near the edge of the Platform.
Eccentric: Nil placed.

Azimuth Marks:
1. "Cairn" - A Russian cairn on the skyline which is 1°30' to the left of the F pier was quoted as the primary mark but not used in 1992. The adopted azimuth from M to "Cairn" was 155° 31' 09". The elevation to the base of the cairn was measured as +1°40' (1990) and +0°14.4' (1992).

2. "Sandilands" - A vee in what was thought to be Sandilands Nunatak was quoted as a reference if visibility allowed. It was visible at all times.
The adopted azimuth from M to "Sandilands" was 244° 49' 38". Its elevation is +20.8' (from 1992 occupation).

Rounds of angles: "Cairn" to "Sandilands" at M is 89° 18' 28".

Notes: The site has several areas of magnetic rock; it has moderate weather conditions and is at the north east corner of the northern area of the Prince Charles Mountains. Reoccupation is recommended.

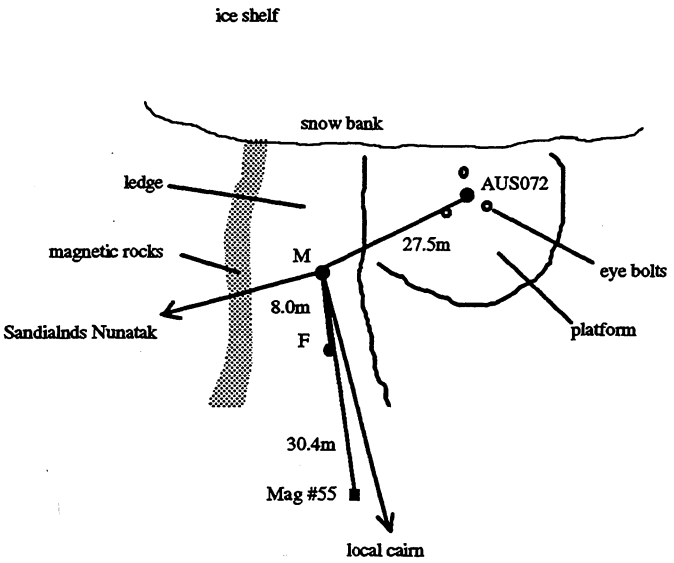
E. Mount Wishart

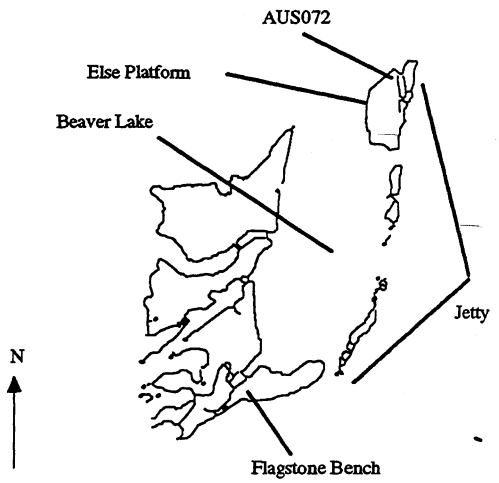
Station Tag: "BMR MAG" / "PCM E".
Adopted Coordinates: Lat = 70° 19' 05.2" S Long = 65° 13' 14.3" E Height = 1640m

Mt Wishart was not reoccupied. The campsite is about 1km from the exposed magnetic station, no helicopter access to the magnetic station. Mt Wishart is only 5 km from Moore Pyramid and reoccupation is not recommended. For further station details see Crosthwaite (1992).

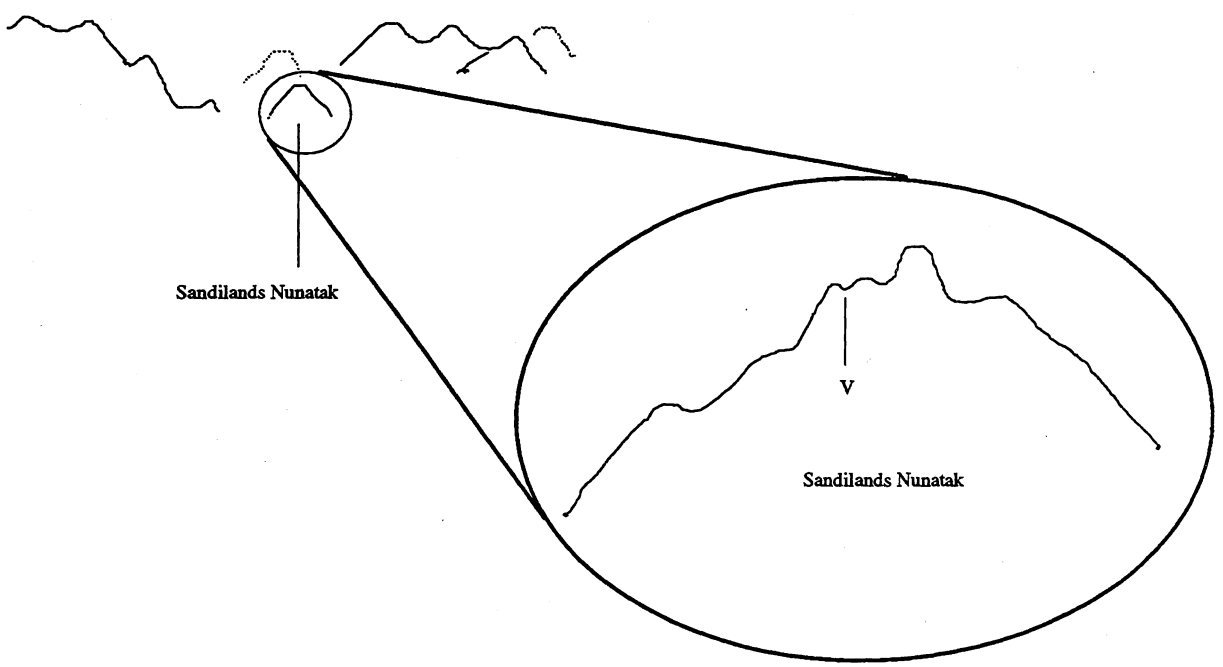
Figure 4. Else Platform

Station Location





Marks



F. Moore Pyramid

Station Tag: "BMR MAG" / "PCM F"
Adopted Coordinates: Lat = 70° 18' 06" S Long = 65° 09' 49" E Height = nominally 1525m, derived from a relative height of -117m from NMS120, an assumed distance of 2827m and a measured elevation of 2°38'03".
Dates Occupied: 17 - 23 January 1992
Number of Obs: All HDF - 1 obs (18th); 10 obs (19th); 6 obs (20th).
M-F Pier Difference: -10.2 nT (from 1992 occupation)
Magnetic Gradients: About 1nT/m in the local area.
Weather: The observation site was disappointingly gusty compared to the nearby campsite a few hundred meters to the east. The area is in the lee of Moore Pyramid and subject to unpredictable 30 to 40 knot gusts from eddies. Temperatures were -15°C to -20°C.

Station Description:
Easy access by helicopter; good campsites on flat blue ice east of the observation site. A campsite between the Pyramid and the moraine line was used in 1992, but note that wind comes from both directions along the Pyramid.
Pier M is 4.7m at 118°19' from the gravity station. DI obs were at a height 1.6m (1990), HDF obs at 1.5m (1992)
Pier F is 9.5m at 96°54' from the M pier, F observations were at a height of 1.5m.
Variometer #55 buried 24.2m at 131°04' from pier M. It was colinear with pier M and survey mast NMS120 on Mt Wishart. Buried in snow, as there were no local gravel or rock beds.

Nearest survey reference:
Gravity Station 7105.0020, located at the base of Moore Pyramid, northern side (the actual tag recorded was 7105.002, the final 0 is assumed from records).
The station is marked by a brass plate near a small cairn on top of a flat boulder on the moraine line. It has been documented as 70°18.10'S 65°14.00'E (unknown elevation). This is certainly incorrect, as digitising one of the original maps gave a position of 70°18'01"S 65°09'23"E which is an error of about 2.7km in longitude.

The location of the magnetic station was refined by taking sightings on the known Mt Wishart survey beacon and constraining the results with altitude shots of the sun. The adopted location (70°18'06"S 65°09'49"E, height 1525m) should be accurate to within a few hundred metres. A GPS reading of the gravity station was taken from a hovering helicopter (HBA) in 1992 but the result is of unknown accuracy. The recorded position was 70°17'57"S 65°09'21", height -1450m, which is within 180m latitude and 280m longitude of the adopted position.

Nearby 7015.0001 (the radio hut of the Moore Pyramid base camp of 69/70, a few km away) is recorded as 70°18.45'S 65°12.80'E, elevation 1468m. (Cooke, 1975). Moore Pyramid NMS111, located near the peak of Moore Pyramid, is a survey station whose position has only been determined from intersection methods and its documented position is 70°18'20.9"S 65°08'18.7"E at 1930m, which when corrected to WGS84 is 70°18'13.4"S 65°08'13.1"E. The location of the summit (not necessarily the survey station) was digitised from the map as 70°18'10"S 65°08'07"E.

Azimuth Marks:
1. The Mt Wishart survey beacon NMS120 was the only reference. Its beacon is a 10' pole with 3' diamond shaped vanes, guyed. The adopted azimuth from M to "Wishart" was 131° 03' 38". The elevation to the base of the beacon was +2°38.1'.
The Wishart beacon was just out of vertical range of the QHM. The following new marks were used for 1992 obs:
2."V Moonie" - a "vee" in a mountain peak just west of Mt Moonie was used during good visibility.
The measured (and adopted) astronomical azimuth from M to "V Moonie" was 344°35'48". The measured elevation was 1° 18.2'.
3. "Bond" - A vertical rock feature on the easternmost side of Bond Ridge was used during bad visibility.

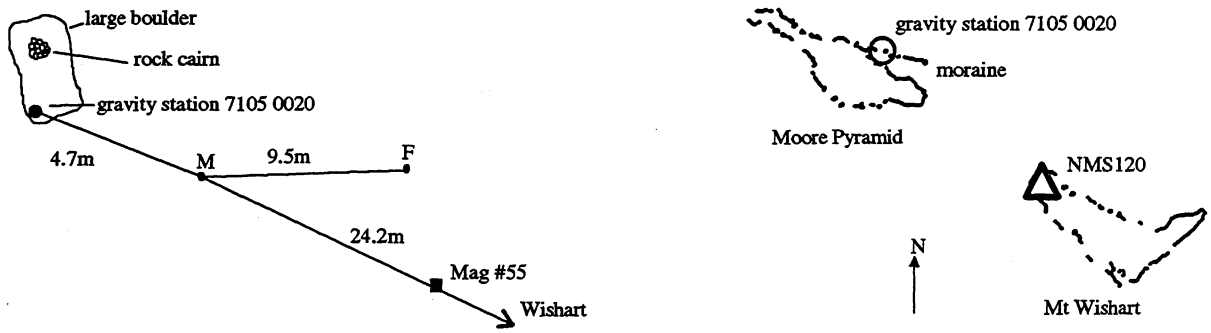
From round of angles, the derived azimuth from M to "Bond" was 54°28'48". The measure elevation was 39.7'

Round of Angles: "V Moonie" to NMS120 Mt Wishart from M is 146°28.1' (from 1992 occupation)
"V Moonie" to "Bond" from M is 69°53.0' (from 1992 occupation)

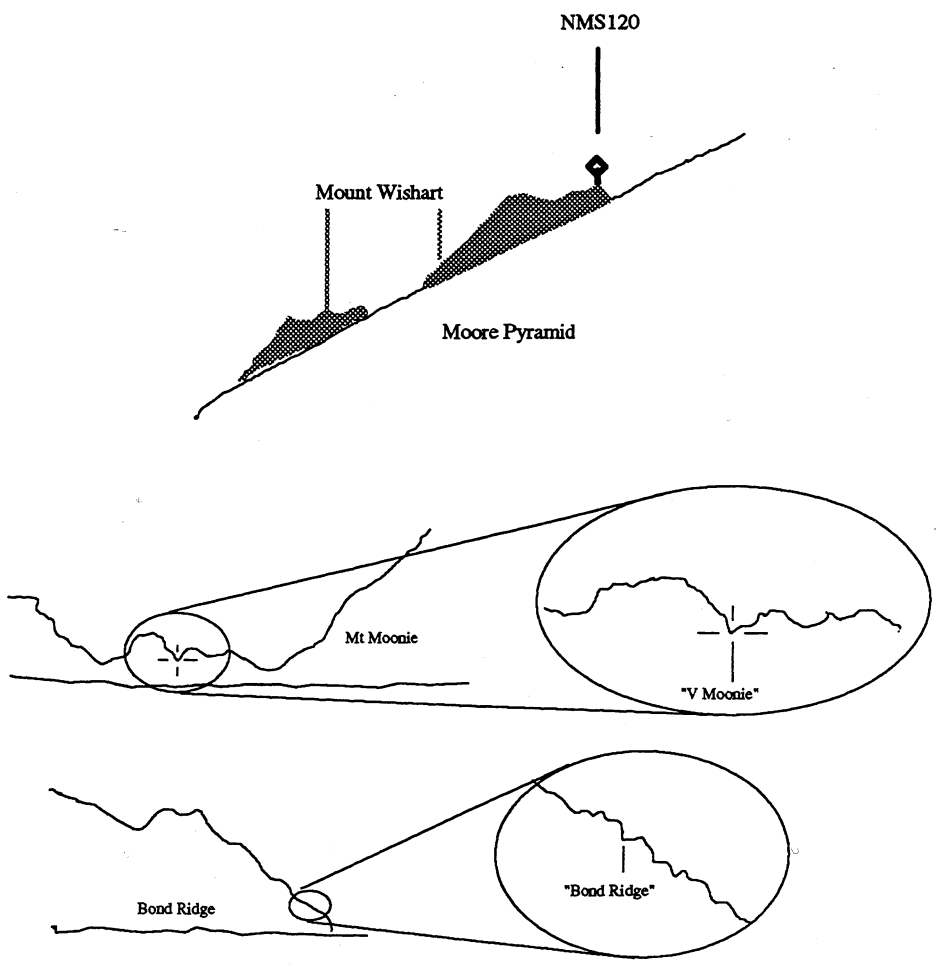
Notes: Reoccupation is recommended in preference to the more difficult nearby station at Mt Wishart.

Figure 5. Moore Pyramid

Station Location



Marks



G. Mount Starlight

Station Tag: "BMR MAG" / "PCM G"
Adopted Coordinates: Lat = 70° 12' 17" S Long = 64° 29' 23" E Height = nominally 2145m, derived from a relative height of -5m from NMS133, an assumed distance of 376m and a measured elevation of 0°45'09". The distance from NMS133 is likely to be an underestimate.
Dates Occupied: 26 -31 January 1992
Number of Obs: DIF obs: 1 half obs (27th); 1 half obs(28th); HDF obs: 4 obs (28th); 6 obs (29th)
M-F Pier Difference: -2.5 nT (from 1992 occupation)
Magnetic Gradients: Appears to be low in the area.
Weather: Temperatures were about -20°C and winds gusting to 40 or 50 knots.

Station Description:
Reasonable access by helicopter to an acceptable but windy campsite on a snow platform about 200m to the west of and lower down than the magnetic site on the western peak. There is a small snow platform about half way up to the magnetic site which is not suitable for camping but could possibly be used to offload the observing gear.
Mt Starlight is blessed with two survey cairns, both on the edge of the south facing cliff line. From the helicopter the one with the closest reasonable campsite was chosen (the western cairn) which of course is not NMS133 (the eastern cairn). It is possible to traverse across a tricky slippery saddle to NMS133 from the western cairn with safety ropes, but the effort is not warranted.

The magnetic station is about 100m north of the "No.2" (western) cairn, near the north facing cliffs overlooking a valley with distinctive moraine features. It is NOT one of the piers. The M and F piers lie between and on the line joining cairn "C" and the "No. 2" cairn. Both piers are on a rocky westward sloping surface. They are slightly protected from the wind but still subject to severe erratic gusts.
Pier M is 5.4m away and at 164° from cairn "C". DI obs were at a height of 1.6m; HD obs were also at 1.6m
Pier F is 9m and at 164° from the M pier. F observations were at a height of 1.8m.
Variometer #55 buried 36.4m at 164° from the M pier.
Cairn C, pier M, pier F and the variometer were all roughly colinear.

Nearest survey reference:
Survey station NMS133 70°12'17.8961"S 64°29'58.8360"E (WGS84) Height 2150.000m (MSL).
Established November, December, 1966. A station summary is available through AUSLIG
Station Mark: The surveyors description has notes about cairns on "No. 1" (the eastern) and "No. 2" (the western) peaks. A 3 ft rock cairn on the summit of the eastern peak was assumed to be NMS133. The magnetic station was set up on the western peak.

The location of the magnetic station was refined by taking sightings on the known Mt Starlight NMS133 survey beacon and constraining the results with altitude shots of the sun and dubious rounds of angles to Moore Pyramid survey beacon NMS111 and Mt Bechervaise survey beacon NMS132. The adopted location (70°12'17"S 64°29'23"E) should be accurate to within a few hundred metres.
A GPS reading of the gravity station was taken from a hovering helicopter (HBA) in 1992 but the result is of unknown accuracy. The recorded position was 70°12'28"S 64°31'14"E which is obviously incorrect as it places the magnetic station east of the survey cairn NMS133.

Azimuth Marks:
1."Trig" - The survey cairn NMS133 on "No. 1" peak was used as the primary reference. In its 1990 manifestation, the cairn had a sharp rock on top to provide a good reference.
The adopted azimuth from M to "Trig" was 94° 17' 09". The elevation to the base of the beacon was +0°45'09".

2. The survey cairn on "No. 2" peak may be useful as a locator, although it is too broad for an azimuth reference. Its elevation was +2°53'. The derived astronomical azimuth from M to the cairn is 163°53'.

3. A feature that may have been Mt Bechervaise NMS132 survey beacon was observed at an elevation of +0°18'18". The derived geodetic azimuth from NMS133 to NMS132 is 84°09'41.55"; distance 11.537km. The derived astronomical azimuth from M to the feature is 84°35'33".

4. A feature that may have been Moore Pyramid NMS111 survey beacon was observed at an elevation of -0°34'54". The derived geodetic azimuth from NMS133 to NMS111 is 114°55'11.95"; distance 26.442km. The derived astronomical azimuth from M to the feature is 114°42'33".

5. A natural feature apparently on Moore Pyramid was observed at an elevation of -0°37'12". The derived astronomical azimuth from M to the feature is 114°54'51".

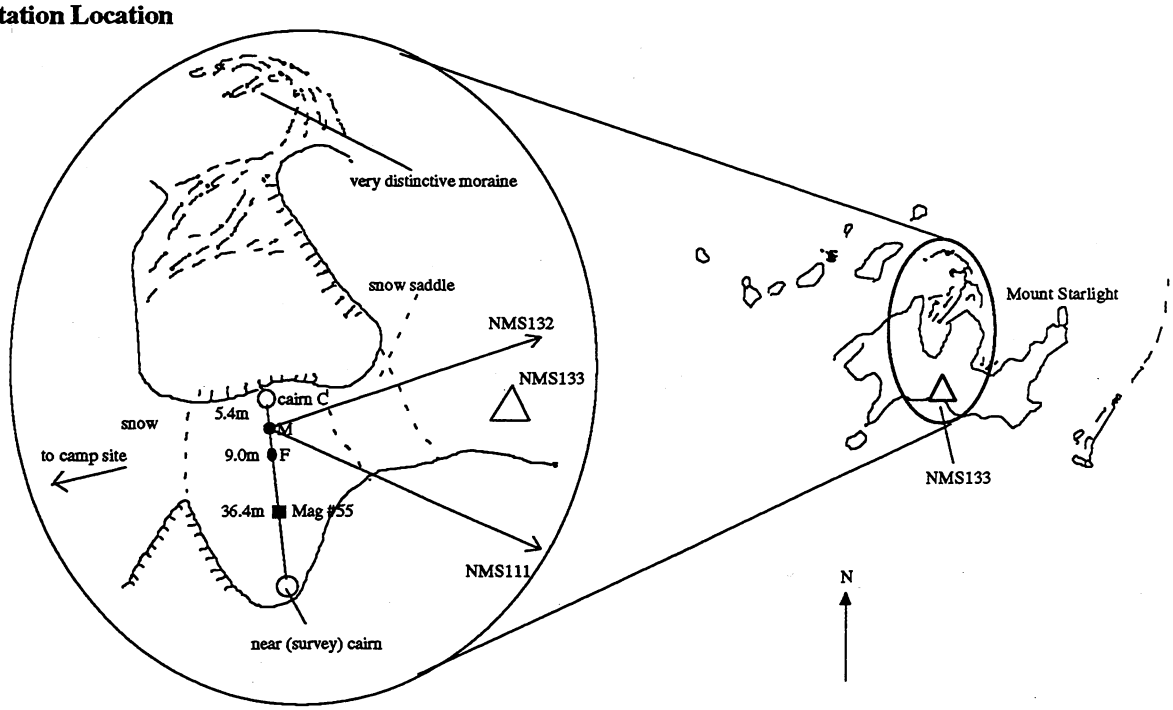
Rounds of angles:

The angle at pier M between Trig and:	No. 2 cairn is	69°36'.
	NMS132? is	-9°41'36".
	NMS111? is	20°25'24".
	Moore? feature	20°37'42".

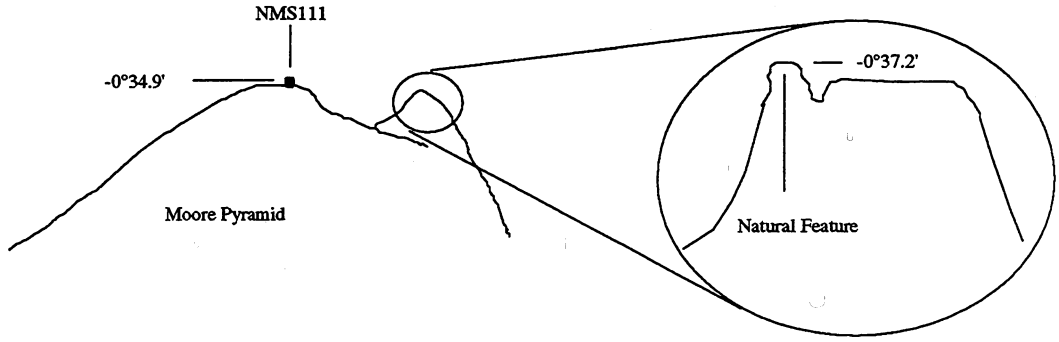
Notes: Reoccupation is recommended as a low priority; nearby Corry Massif is an easier station to work.

Figure 6. Mount Starlight

Station Location



Marks



H. Corry Massif

Station Tag: "BMR MAG" / "PCM H"
Adopted Coordinates: Lat = 70° 26' 57.5" S Long = 64° 39' 26.0" E Height = 2065m
Dates Occupied: 9 - 15 January 1992
Number of Obs: All DIF: 8 half obs (10th)
M-F Pier Difference: +2.5 nT (from 1992 occupation)
Magnetic Gradients: The area has fairly low gradients on the whole, although there are many bands of magnetic rock producing anomalies of 100 to 150nT. The M and F piers were situated in an area away from the anomalies in an unfortunately windy spot.
Weather: Moderate - strong winds and temperatures of -15 to -20°C.

Station Description:
Easy access by helicopter, with rock or snow campsites on the summit - rock surface is fairly bouldery. Survey cairn on SE corner of summit is easily visible from the air.
Pier M is 37.5m at 267°38' from the survey cairn NMS176 on flat broken rock surface. DI obs at a height of 1.5m.
Pier F is 12.5m at 87°38' from the M pier, back towards the survey cairn. F obs were at a height of 1.8m.
Variometer #55 buried 22.3m at 03°05' from the M pier. It was roughly colinear with pier M and Mt Lacey.

Nearest survey reference:
Survey Station NMS176 70° 26' 57.5513" S 64° 39' 29.6199" E (WGS84) Height 2065.000m (MSL).
A station summary is available through AUSLIG (it consists of only a pair of aerial photographs).
Station beacon: A rock cairn built around two fuel drums. There is an eccentric station nearby.

Azimuth Marks:
1."Hill" - The quoted primary reference mark was a small-scale near-vertical section of rock near the top of a hill on Corry Massif, a few hundred metres west of the station. It was not used in 1992, as identification was uncertain.
The adopted azimuth from M to "Hill" was 267° 57' 59". It was at an elevation of -0°13' from M.

2."Nunatak" - the secondary mark quoted by Crosthwaite was described as a nunatak, but identified as Mt Lacey during the 1992 occupation. The peak of Mt Lacey was used as a mark. No survey beacon was observed, although NMS119 is shown on the maps (approximately 28km away).
From rounds of angles its derived azimuth is 3° 26' 53" and its elevation is -0°10.9'.

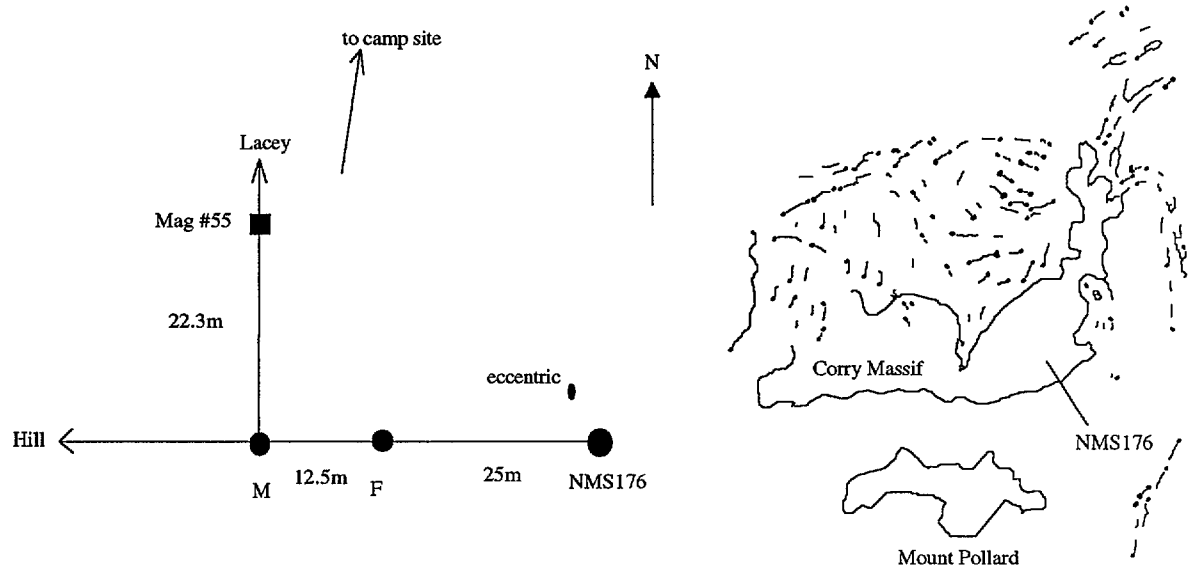
Because of some uncertainty about these marks, a new mark was selected for the 1992 observations:
3. "V Giddings" - a natural vee in the profile of Giddings Peak (between Mt Lacey and Mt Bechervaise at the same distance) was used for all observations.
The measured (and adopted) azimuth from M to "V Giddings" is 5° 51' 47". Its measured elevation is -25.0'.

Rounds of angles: "Hill" to "Nunatak" at M is 95° 28' 54".
"Hill" to "V Giddings" at M is 97° 53' 33" (from 1992 occupation)
"Hill" to Mt Wishart at M is approximately 147° 03.4'.
"Hill" to NMS176 Cairn at M is approximately179° 40.2'.
(The survey cairn NMS176, F, M and Hill are roughly colinear.)

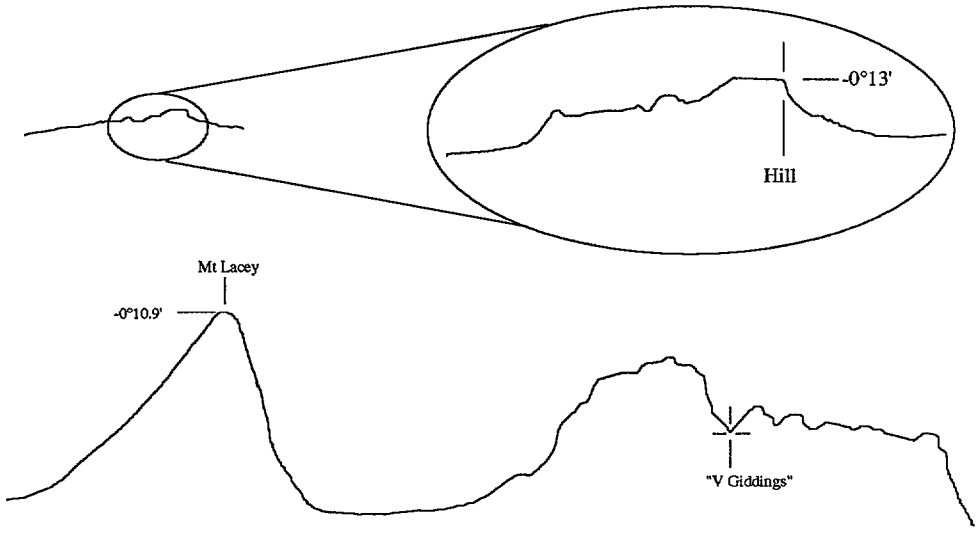
Notes: The site has several areas of magnetic rock; it has moderate weather conditions for the high altitude western region and is at the north west corner of the northern area of the Prince Charles Mountains. Reoccupation is recommended.

Figure 7. Corry Massif

Station Location



Marks



I. Mount Jacklyn

Station Tag: "BMR MAG" / "PCM I"
Adopted Coordinates: Lat = 70° 15' 13.2" S Long = 65° 50' 53.8" E Height = 1109m
Dates Occupied: 23 -26 January 1992
Number of Obs: All HDF: 10 obs (24th); 4 obs (25th)
M-F Pier Difference: -1.7 nT (from 1992 occupation)
Magnetic Gradients: Low
Weather: Better conditions than Dovers which was usually in drift. Temperatures around -10°C.

Station Description:
The station is located at the northern base of Mt Jacklyn East Peak, on a large flat rock between several large boulders. Access is a easy 2.7km drive across the ice from Dovers Base Camp. The survey station was difficult to locate without local knowledge. Unfortunately the AUSLIG map on the station summary is of little value and the station is not marked on most available maps (at 1990). From Dovers it is necessary to go down a steepish ice slope to get to a rocky slope heading up towards Jacklyn East. The station is a considerable distance up the slope which eventually ends in a ridge between two of Jacklyn's peaks, overlooking a large hollow. Backsightings on the Mt Farley mark may be useful (and even altitude sights) if locating the mark proves difficult. An air reconnaissance is recommended.
Pier M is 25m at 220°52' from the survey station AUS016 on a flat soil surface. DI obs were at a height of 1.6m; HD obs were also at 1.6m (1992).
Pier F is 17m at 76°12' from the M pier (about 15m from AUS016). F obs were at a height of 1.8m.
Variometer #55 buried 25.1m at 279°35' from pier M. It was roughly colinear with pier M and the mark "nunatak"

Nearest survey reference:
Survey Station AUS016 "Dovers" 70° 15' 12.5433" S 65° 50' 55.4088" E (WGS84) Height 1109.600m (WGS84).
Established December 1988, AUSLIG. A station summary is available through AUSLIG.
Station Mark: Galvanised iron eye bolt set in a large flat rock, surrounded by a ring of rocks. To help locate the station mark, a 1m high rock cairn has been built on a high rock boulder nearby. A small brass plate (0.025x0.075m) stamped with the station number is affixed to rock nearby.
Beacon: Nil.
Reference Marks: Nil.
Survey Station "Jacklyn" NMS158 70° 16' 14.8018" S 65° 47' 19.6772" E (WGS84) Height 1557.000m (MSL) was not used because of difficulty of access.

Azimuth Marks:
Two reference marks were used depending on visibility.
1."Nunatak" - The primary reference mark was a vertical section of rock on the left of a nunatak to the west. The adopted azimuth from M to "Nunatak" was 279° 15' 36". The elevation was +2°36'.

2."Farley" - The secondary reference mark was a vee in the rock to the left of Mt Farley peak.
The measured astronomical azimuth from M to "Farley" was 307° 24' 18". The elevation was +5°21'.

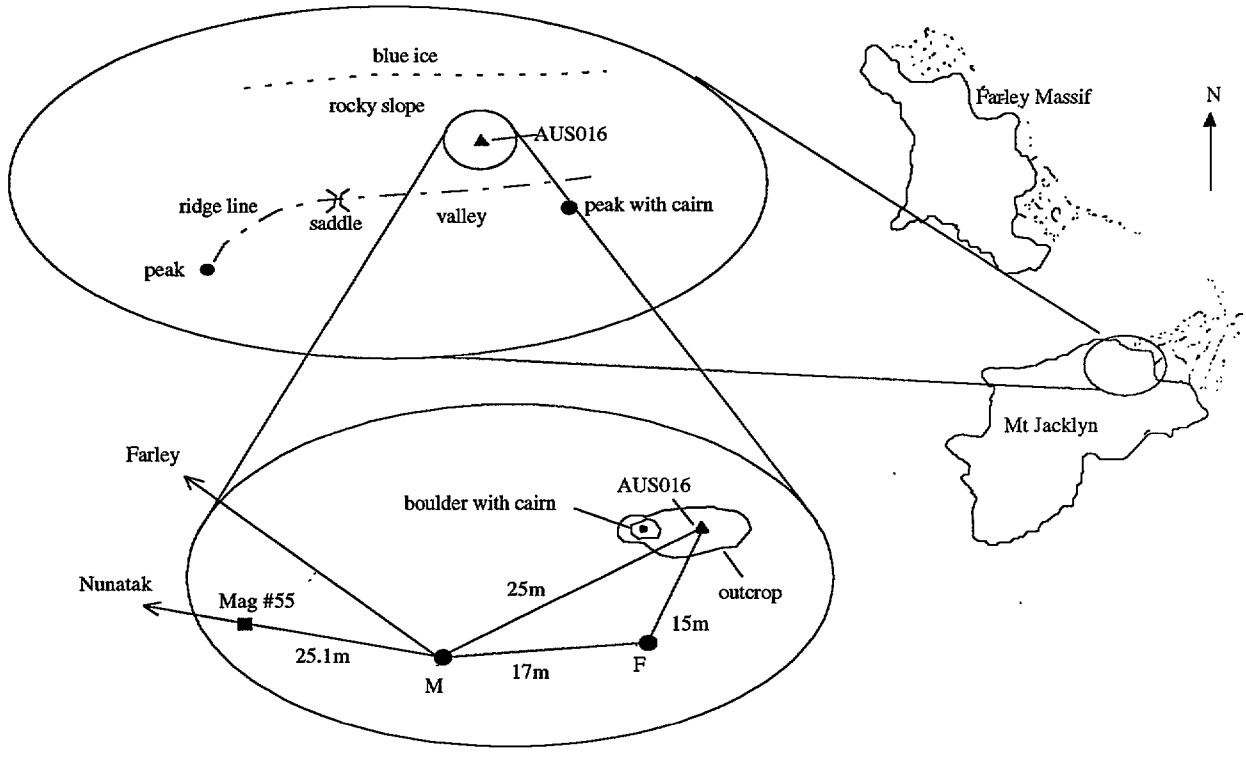
These marks were beyond the vertical range of the QHM, so an alternative mark was used for the 1992 obs:
3. "Cairn" - a distinctive join between two rocks on the RHS of the nearby survey reference cairn AUS016 was used as a mark.
Its measured (and adopted) astronomical azimuth from M is 39°47'57", and its measured elevation is 2°30.9'.

Rounds of angles: "Nunatak" to "Farley" at M is 28° 08' 50"
"Nunatak" to "Cairn" at M is 120° 32.75'

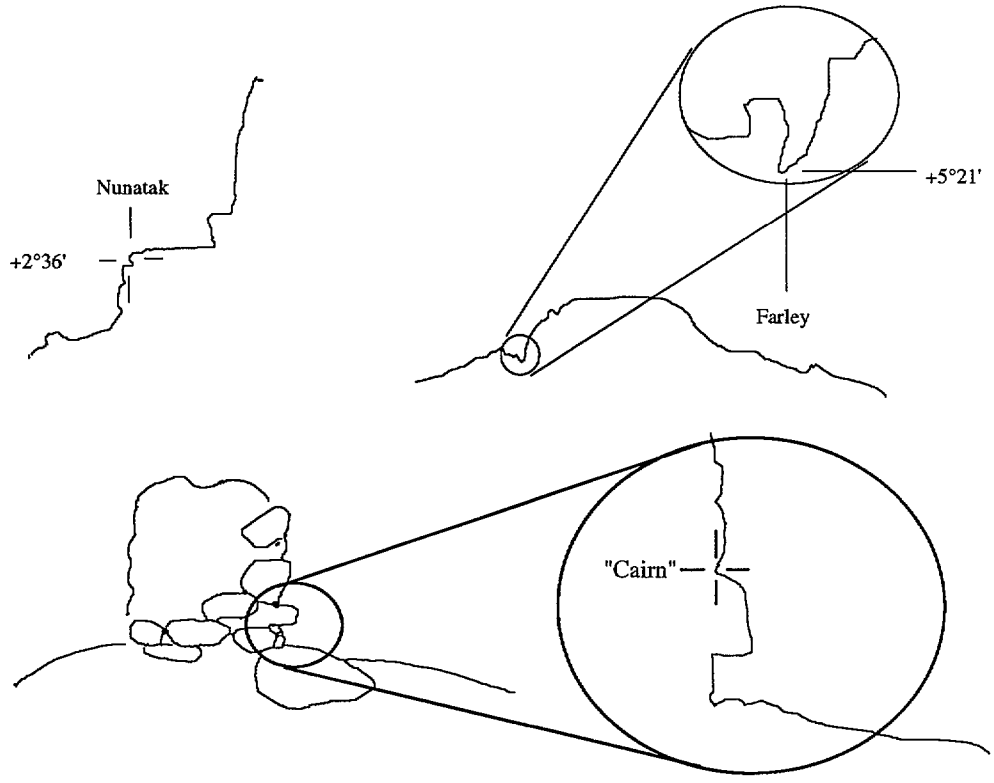
Notes: Reoccupation is recommended only because of ease of access.

Figure 8. Mount Jacklyn

Station Location



Marks



3.3 Station Descriptions - Heard Island

The Atlas Cove station on Heard Island is situated about 2km from the old ANARE station at the southern end of West Bay. The site of the 1952-54 absolute hut is easily identified by 2 upright wooden piers about 2m apart surrounded by a few remaining floor planks. The floorboard and clay pipe remains of the variometer hut lie to the NW about 50m away. The 1947 magnetic station is approximately 108m at 294° from the absolute hut remains. The 1947 station, the hut remains and the Mt Drygalski mark are roughly colinear. Due to an inadequate station description, I could not initially locate the 1947 station, and was unsure of exact position of previous reoccupations of the absolute hut. Therefore the initial DI observations were carried out on a tripod between the two piers of the old absolute hut. When the 1947 station mark was found the following day, it was assumed to be the required reoccupation station and all subsequent DI observations were carried out over this mark. Subsequent F observations were carried out at a point closer to the 1947 station. The two stations are described separately below. The variometer was not moved during the change between stations.

IMPORTANT NOTE: During the 1985 occupation by Hitchman the two wooden pillars were used as the observation piers, and should be used again in future occupations (NOT the tripod sites described below). The taller pier (on the RHS as one faces West Bay) is pier A and the shorter pier (on the LHS as one faces West Bay) is pier D; pier A is slightly tilted to the south. Hitchman carried out DI measurements on pier A and F measurements on pier D.

A. Atlas Cove - Old absolute hut

Adopted Coordinates: Lat = 53° 01.9' S Long = 73° 21.9' E Height = 3m
Dates Occupied: 23 February 1992
Number of Obs: 3 DIF half obs
M-F Pier Difference: +16.3 nT (1992 tripod sites)
Weather: Precipitation on all days of occupation; rain, hail and snow in cycles of 30 mins or more, except when it rained all day. Wind 10-30 knots. Temperature 0-5°C. Only one appearance of the sun of longer than 5 mins, which precluded any useful sunshots.

Station description:
Pier M: DIM tripod erected on the ground between the two wooden pillars, centre at a distance of 1.0m from the centre of the pillar used as pier A by Hitchman. Located over a brass screw in a block of concrete dug in at ground level. DI obs were at a height of 1.6m.
Pier F: Wooden tripod erected over a wooden stake approx half way between the remains of the absolute hut and the variometer hut. F observations were at a height of 1.8m.
Variometer #55 buried 25.5m at 47°11' from the wooden pier A. The wooden pier, the variometer and Corinth Head were roughly colinear.

Azimuth marks:
1. "MTD" - A pillar atop Mt Drygalski to the southeast installed by NatMap in 1980. This was used as the main reference mark although it may sometimes be obscured by low cloud. Quoted azimuth from wooden pier A to "MTD" was 113° 09.00' (Hitchman 1988).
This mark and adopted azimuth were used for the station A observations in 1992. However the observations at station A were offset by 1m from those done by Hitchman, which would result in a small error in azimuth. A declination correction of approximately -2.0' should be applied to the 1992 station A observations to account for the offset (derived from a measured offset of 1m and an estimated distance of 1600m between the absolute hut and the Mt Drygalski mark).

2."Cor" - In the east a NatMap pillar near the high right hand edge of Corinth Head may be used. Quoted azimuth from wooden pier A to "Cor" was 47° 10.40' (Hitchman, 1988).

3."AWS" - The automatic weather station was used in 1985, but moved during the 1992 visit and not resurveyed.

4.The 1947 magnetic station to the NNW may be used as a mark. From pier A it is possible to sight directly onto the brass plaque. Quoted azimuth from wooden pier A to 1947 station was 293° 47.10' (Hitchman 1988).

B. Atlas Cove - 1947 Magnetic Station

Adopted Coordinates: Lat = 53° 01.9' S Long = 73° 21.9' E Height = 3m
Dates Occupied: 24 - 26 February 1992
Number of Obs: All DIF: 7 half obs (24th); 7 half obs (25th)
M-F Pier Difference: -7.3nT (from 1992 tripod sites)

Station description:
Pier M: DIM tripod erected over the 1947 station mark which was a 3" brass plaque set flush with the surface and surrounded by a ring of small rocks. On it was inscribed "ANARE 1947-1948 Magnetic Station". DI obs were at a height of 1.6m.
Pier F: Wooden tripod erected 10.2 at 113°13' from pier M. Pier M, pier F, the absolute hut and the Mt Drygalski mark were roughly colinear. F observations were at a height of 1.65m.
Variometer #55 was not moved from the station A location.

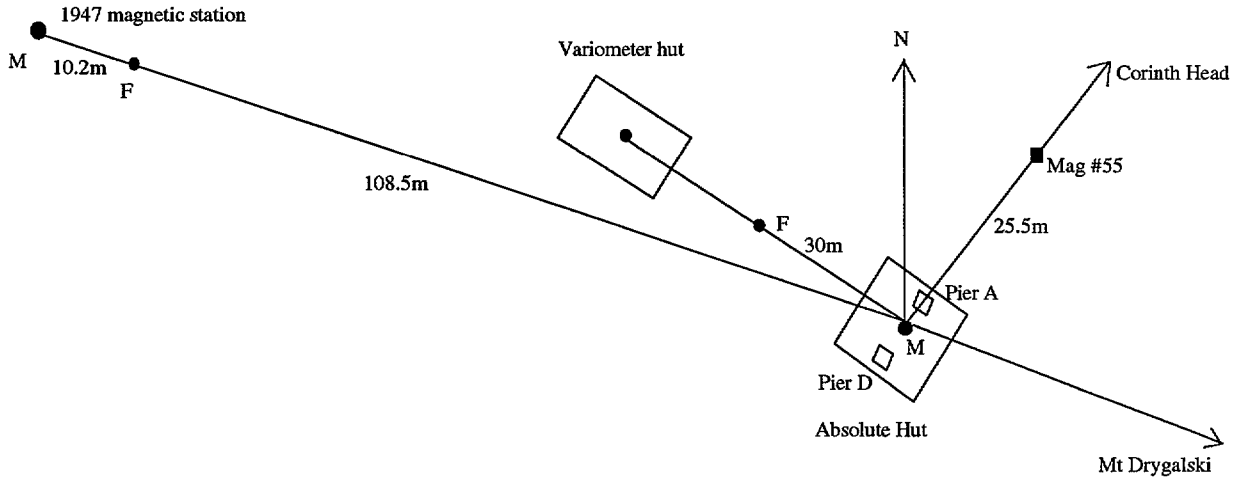
Azimuth marks:
The following azimuth marks are taken from the site map in the report by Chamberlain (1952) describing his establishment and occupation of the 1947/48 station.
1. Mt Drygalski - the bearing from the plaque to the northenmost peak of Mt Drygalski is labelled as 113° 13.3'.
The pillar on Mt Drygalski was used for all 1992 observations from the 1947 magnetic station. It was thought to be the original and Chamberlain's azimuth was used in calculations. From the one sunshot made during the 1992 occupation, the bearing from the plaque to the Mt Drygalski mark was 113°14.5'.

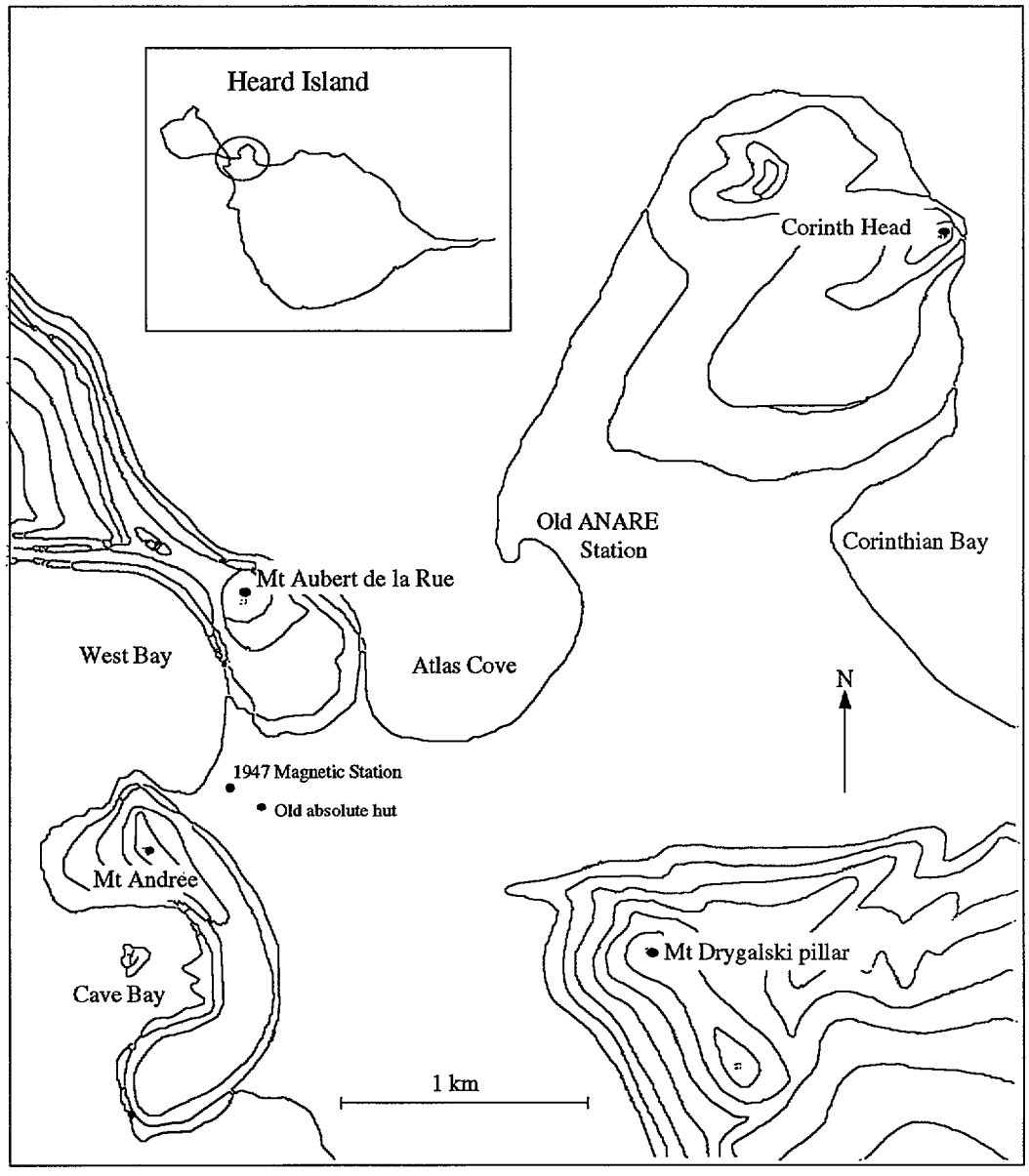
2. Corinth head - the bearing from the plaque to the easternmost peak of Corinth Head is labelled as 48°45.7'. No mark was visible from the magnetic station in 1992 but Auslig surveyors reerected a cairn in this area during the 1992 visit. It was not resurveyed.

3. Peg - The bearing from the plaque to a "peg" at 200yds is labelled as 253° 51.6'. It was not located in 1992.

Round of angles:
From 1992 occupation - Corinth Head to Mt Drygalski from the plaque is 64° 29.3'
From Chamberlain's map bearings - Corinth Head to Mt Drygalski from the plaque is 64° 27.6'

Figure 9. Heard Island (Atlas Cove station)





CHAPTER 4. RESULTS OF MAGNETIC OBSERVATIONS

4.1. Absolute Magnetic Measurements

The following tables list the results of the Prince Charles Mountains and Heard Island absolute observations. Where observations were carried out with a DIM, the DIF components are listed; where observations were carried out with a QHM, the DHF components are listed. The averages of each set are given. Time is in hours, minutes, seconds, D and I are in decimal degrees and H and F are in nT. No instrument corrections or pier differences have been applied to these absolute data.

Table 2. Blustery Cliffs absolute observations

Date	Start Time	Stop time	D	I	Start time	F
3 Jan 92	111830	113430	288.231	-70.357	114000	52885
	132230	133630	288.248	-70.065	134500	52488
	135930	141530	288.188	-70.109	141900	52459
	165630	171130	288.391	-70.348	171600	52679
	174230	175830	288.471	-70.277	180200	52685
4 Jan	041830	043530	288.638	-70.274	044000	52992
	051730	053430	288.416	-70.584	054000	53148
	061230	062630	287.934	-70.307	055700	53165
	062730	064330	288.233	-70.296	064800	53014
	100930	102430	288.572	-70.455	100300	52689
	102530	104030	288.447	-70.445	104400	52689
	110830	112330	288.517	-70.388	112700	52663
	124830	130530	288.273	-70.403	131000	52740
	132830	134330	288.492	-70.364	134800	52727
5 Jan	045930	051630	288.649	-70.335	052000	52915
	053130	054930	288.357	-70.488	055400	52976
Average			**288.3786**	**-70.3434**		**52807.13**

Table 3. Jetty Peninsula absolute observations

Date	Start time	Stop time	D	I	Start time	F
30 Dec 91	154000	160000	288.775	-69.941	152600	52174
					160500	
	164100	170200	288.789	-69.93	163300	52257
					170800	
31 Dec	075600	081700	288.632	-69.961	074100	52257
	091500	093400	288.759	-70.009	094000	52257
	101200	103100	288.723	-70	095400	52259
	105200	110700	288.867	-69.962	103800	52313
	141900	143400	288.801	-69.967	140000	52249
1 Jan 92	052400	504700	288.227	-70.054	055400	52243
	065930	072130	287.991	-70.096	072700	52221
	080930	082630	288.63	-70.016	083200	52303
	095030	100730	288.579	-69.967	094300	52274
	100830	102430	288.695	-69.97	103100	52303
	110530	112130	288.611	-69.872	105000	52333
	112230	113730	288.646	-69.737	114300	52484
2 Jan	002330	004130	289.067	-69.774	005200	52280
	011730	013530	289.39	-69.713	014000	52403
Average:			**288.6989**	**-69.9356**		**52288.13**

Table 4. Else Platform absolute observations

Date	Start time	Stop time	D	I	Start time	F
7 Jan 92	043830	045330	288.375	-69.795	050400	52290
	051430	052930	288.429	-69.796	053300	52304
	082630	084230	288.377	-70.089	084600	52215
	085330	090930	288.642	-69.949	091300	52186
	095630	101230	288.744	-69.964	101800	52143
	102630	104030	288.589	-69.918	104400	52152
	110730	112230	288.751	-69.935	112600	52205
	113230	114830	288.78	-69.916	115200	52213
	120830	122330	288.755	-69.949	122700	52212
	123930	125230	288.789	-69.957	125600	52202
8 Jan	060630	062130	288.758	-69.754	064100	52376
	062230	063830	288.612	-69.776	064100	52376
	065430	071230	288.435	-69.753	071700	52374
	074130	075830	288.523	-69.794	073200	52402
	075930	081330	288.778	-69.763	081700	52424
	082830	084130	288.411	-70.274	084600	52493
Average			**288.6093**	**-69.8989**		**52285.44**

Table 5. Moore Pyramid absolute observations

Date	Start time	Stop time	D	H	Start time	F
18 Jan 92	132830	140230	292.386	18230.3		
19 Jan	045920	051850	291.835	18120.9	054000	51219.2
	055350	061310	291.911	18112.7	061900	51169.2
	080230	081805	292.384	18208.8	082500	51201
	083300	084920	292.327	18216	085800	51181.3
	092800	094430	292.335	18213.6	101000	51216.7
	101825	103440	292.373	18237.6	104100	51238.3
	105650	111225	292.365	18207.1	112300	51216
	112725	114400	292.375	18252.2	115000	51232
	120750	122350	292.494	18260.3	123000	51248.3
	123800	125410	292.421	18274.8	125900	51231.2
20 Jan	054505	060015	291.884	18198.6	060700	51352.5
	062140	063920	291.447	18042.4	064600	51215.7
	065820	071210	291.436	18025.2	071900	51150
	073050	074400	291.759	18089.8	075100	51122.5
	084155	085600	291.97	18129.5	090300	51210.2
	091200	092605	291.941	18222.5	093200	51288.5
Average:			**292.0966**	**18178.96**		**51218.29**

Table 6. Corry Massif absolute observations

Date	Start time	Stop time	D	I	Start time	F
10 Jan 92	074130	075330	291.764	-69.142	080600	50917
	081730	083330	291.81	-69.146	083800	50976
	114530	120130	292.02	-68.924	120600	50944
	122330	124030	291.861	-68.971	124500	50835
	131630	133330	291.911	-68.996	133700	50792
	134430	140430	292.132	-68.998	141000	50814
	142430	144030	292.133	-68.964	144400	50883
	152230	153630	292.338	-68.932	154000	50821
Average:			**291.9961**	**-69.0091**		**50872.75**

Table 7. Mt Starlight absolute observations

Date	Start time	Stop time	D	I/H	Start time	F
27 Jan 92	130030	132830	292.4388	-68.9711	133500	50875.8
28 Jan	072930	075230	291.9345	-69.0333	080600	50825.5
	Average			**-69.0022**		
28 Jan	122110	124300	292.3303	18381.3	125500	50896.2
	132530	134250	292.3003	18430.2	135200	50781.5
	141000	142255	292.3106	18411.2	143000	50777.8
	143700	145040	292.3685	18376.4	150000	50797.2
29 Jan	072250	073515	292.2279	18195.7	083200	51008.7
	085200	090605	292.4042	18233.8	091300	50971.2
	092905	094250	292.2448	18225.7	095000	50900.3
	100000	101320	292.3148	18263.5	102000	50860.3
	103350	104730	292.3303	18281.8	105400	50894.5
	110245	111600	292.379	18301	112200	50891
	Average		**292.2987**	**18310.06**		**50873.33**

Table 8. Mt Jacklyn absolute observations

Date	Start time	Stop time	D	H	Start time	F
24 Jan 92	072330	074130	290.93	18175.5	075000	51237
	075925	081600	290.9635	18169.6	082600	51243.2
	092010	093420	291.0348	18187.8	094200	51260
	094825	100155	291.123	18182	100700	51270.5
	103300	104720	291.1999	18167.3	105300	51277.5
	105910	111410	291.2996	18214.6	112100	51277.3
	113405	114805	291.2479	18169.6	115400	51273.7
	120005	121445	291.2671	18169.3	122000	51271.5
	124330	125740	291.2921	18191.5	130300	51278.5
	130820	132255	291.2979	18185.2	132900	51282
25 Jan	044430	050000	291.1165	18351.2	050700	51478.5
	051710	053140	290.9624	18288.2	053800	51444.5
	055430	060845	291.074	18226	061500	51314.2
	063505	065000	291.0157	18153.5	065600	51269.5
Average			**291.1303**	**18202.24**		**51298.42**

Table 9. Heard Island absolute observations

Date	Start time	Stop time	D	I	Start time	F
23 Feb 92	091230	093530	302.78	-69.172	094000	50124
	102930	104630	302.799	-69.172	105200	50130
	111030	112630	302.793	-69.182	113100	50126
	Old Absolute hut: Average:		**302.7907**	**-69.1753**		**50126.67**
24 Feb	045530	051030	302.724	-69.199	051800	50251
	063630	065130	302.736	-69.232	065700	50253
	072430	073930	302.721	-69.288	074400	50226
	084030	085630	302.839	-69.376	074400	50226
	102830	104630	302.928	-69.288	105200	50269
	111730	113530	302.947	-69.268	114100	50284
	120630	122330	302.962	-69.244	122800	50277
25 Feb	063930	065230	302.758	-69.229	065700	50277
	071430	072830	302.78	-69.227	073600	50272
	074730	080230	302.769	-69.221	080700	50269
	084130	085730	302.989	-69.152	090200	50333
	091330	092830	302.983	-69.182	093400	50348
	100930	102430	303.077	-69.172	102900	50398
	103630	104930	303.173	-69.154	105300	50435
	1947 Magnetic Station: Average:		**302.8847**	**-69.2309**		**50294.14**

4.2. Variometer Records

Data were obtained from variometer #55 at all stations in the Prince Charles Mountains and at Heard Island. The records were calibrated by an average of 14 magnetic absolute measurements at each station, but due to the data corruption problems mentioned earlier, 1-3 observations per station were useless for calibration and were discarded. However, there remained sufficient for each station to allow multilinear regression of the absolute measurements of the field with the corresponding XYZ digital data; no temperature or time dependence was included in this analysis. The resulting baseline values and (interdependent) x, y and z scale values were used in the variometer matrix model described by Crosthwaite (1991) to calculate values of the field from the variometer data for the duration of each station occupation. Table 10 lists the average baseline values determined for each station along with the standard deviations of the residuals of the absolutes, as an indication of the precision obtainable with these data. The number of observations used in each determination is also given. Note that the baseline values for the old absolute hut site at Heard Island were determined by adopting the scale values calculated for the 1947 magnetic station and then choosing baseline values to minimise the residuals of the absolutes done at the absolute hut site. The difference between the two sets of baseline values is a measure of the vector pier difference between the stations.

Table 10. XYZ baseline values determined for the variometer data at each station

Station	# of obs	X blv (nT)	Y blv (nT)	Z blv (nT)
Jetty (mag #8)	13	5384.2 ±8.1	-16092.3 ±6.0	-48810.8 ±4.7
Jetty (mag #55)	13	5672.9 ±8.1	-16491.7 ±5.4	-48534.7 ±3.3
Blustery Cliffs	16	4969.8 ±4.3	-16281.9 ±3.8	-48846.2 ±6.3
Else Platform	14	5397.7 ±3.5	-16367.8 ±4.4	-48568.3 ±2.3
Corry Massif	8	7180.0 ±2.9	-15636.9 ±2.4	-48579.8 ±1.8
Moore Pyramid	17	6181.7 ±6.8	-15833.5 ±5.6	-48813.7 ±4.4
Mt Jacklyn	12	6193.3 ±6.8	-15871.1 ±3.1	-48572.1 ±1.2
Mt Starlight	7	6413.2 ±3.0	-15901.9 ±1.3	-48594.4 ±1.3
Heard Island (old abs.hut)	3	3366.9 ±2.0	-16612.4 ±0.8	-48527.9 ±0.6
Heard Island (1947 station)	10	3386.0 ±1.1	-16581.7 ±1.9	-48686.4 ±0.9

The variometer data are summarised in the following tables as uncorrected mean-hourly values of H, D and Z for the duration of each station occupation (no instrument corrections or pier diferences have been applied). Average values for the total occupation period are quoted at the bottom of each table. The data sets begin approximately one hour after the variometer was buried at the site and end approximately one hour before it was retrieved. Following the tables are graphs of 5 minute averages of the data for each station.

Variometer #8, based at Jetty Peninsula for the entire PCM survey, provided a backup record. The data from #8 was analysed in the same way using the absolute observations performed at Jetty Peninsula at the start of the survey, and the corresponding data from #8 is presented with the data summary for each station (except at Heard Island, where it was not used). Unfortunately pressures on logistics and time did not allow absolute calibrations at Jetty at the end of the survey, so no measurement of the time drift on this data set was possible.

The corresponding digital variometer data for Mawson observatory was included for Mt Starlight and Blustery Cliffs which are geographically, the closest and furthest stations from Mawson. They provide a qualitative indication of the difference in the field values between these stations. The 1991 variometer parameters of de Deuge (1992) were used in calculating field values from the Mawson variometer data. No instrument corrections have been applied to these data.

Table 11. Blustery Cliffs - Uncorrected mean-hourly values of HDZ

Date	Start of UT hour	H (nT)			D (degrees)			Z (nT)		
		Blustery	Jetty	Mawson	Blustery	Jetty	Mawson	Blustery	Jetty	Mawson
2 Jan 92	19:00	17672.11	17974.06	18524.01	-71.548	-71.0759	-64.472	-49615.8	-49065.1	-45903.5
	20:00	17693.56	17990.24	18539.09	-71.5811	-71.1048	-64.4813	-49620.5	-49068.4	-45910.7
	21:00	17660.12	18000.14	18547.53	-71.4679	-71.0512	-64.4506	-49579.3	-49067.3	-45917.1
	22:00	17660.59	18011.83	18540.97	-71.4062	-70.9689	-64.3818	-49627.2	-49072.1	-45938.1
	23:00	17742.97	18040.09	18570.86	-71.3898	-70.8956	-64.326	-49635.1	-49083	-45957.1
3Jan	0:00	17735.92	18035.28	18567.79	-71.4003	-70.9008	-64.2899	-49626.8	-49071.3	-45956.5
	1:00	17793.19	18088.63	18539.2	-71.2504	-70.743	-64.3127	-49661.9	-49113.6	-46025.5
	2:00	17741.46	18035.75	18428.4	-71.3632	-70.9135	-64.4799	-49820.9	-49288.1	-46132.3
	3:00	17651.71	17961.69	18247.46	-71.2327	-70.7931	-64.7256	-49910.8	-49414.3	-46145.5
	4:00	17804.74	18080.4	18323.02	-71.5652	-71.1385	-64.9951	-49884.1	-49388.5	-46254.2
	5:00	17776.19	18048.73	18491.39	-71.8321	-71.3673	-64.9375	-49866.2	-49223.6	-46141.3
	6:00	17767.31	18030.99	18447.53	-71.9264	-71.4428	-64.993	-49759.4	-49212	-46030.2
	7:00	17664.89	17927.38	18341.44	-71.9417	-71.6811	-65.0524	-50015.7	-49511.7	-45903.9
	8:00	17584.63	17867.8	18369.43	-72.1956	-71.7657	-64.7815	-49877.5	-49364.6	-45907.8
	9:00	17498.25	17841.54	18459.53	-71.7937	-71.2618	-64.4	-49669.1	-49113	-45923.9
	10:00	17680.07	17991.22	18539.94	-71.7533	-71.2411	-64.437	-49635.7	-49093.3	-45945.1
	11:00	17814.9	18100.7	18570.22	-71.7845	-71.2962	-64.4352	-49789.6	-49252.5	-46030.6
	12:00	17930.1	18195.24	18677.89	-71.719	-71.2281	-64.4158	-49677.8	-49130.9	-46021.5
	13:00	17909.79	18172.65	18796.12	-71.8046	-71.2741	-64.4164	-49433.6	-48850	-45887.1
	14:00	17916.02	18179.41	18801.44	-71.7077	-71.1598	-64.4056	-49380	-48796.1	-45850.5
	15:00	17774.41	18066.57	18601.58	-71.6242	-71.125	-64.4812	-49582	-49020.6	-45899.5
	16:00	17718.32	18021.67	18561.32	-71.6028	-71.1178	-64.4867	-49599.7	-49043.4	-45894.1
	17:00	17756.34	18052	18575.34	-71.5599	-71.0753	-64.4806	-49602.4	-49051.3	-45912.8
	18:00	17823.93	18054.59	18593.28	-71.4793	-70.8429	-64.381	-49543.9	-49031.1	-45888
	19:00	17672.86	17987.87	18510.36	-71.2224	-70.6971	-64.1551	-49593.1	-49038	-45865.3
	20:00	17728.58	18049.34	18578.02	-71.1128	-70.6076	-64.0558	-49602.4	-49027.8	-45912.3
	21:00	17736.69	18060.2	18549.13	-71.0781	-70.5763	-64.1268	-49667.8	-49086.5	-45981.8
	22:00	17685.36	18024.87	18492.45	-70.9636	-70.4422	-64.028	-49661.4	-49104.9	-45953.8
	23:00	17814.39	18123.85	18584.18	-71.0971	-70.5787	-64.0913	-49653.2	-49098.7	-46019.2
4 Jan	0:00	17858.9	18158.92	18564.47	-71.1703	-70.6577	-64.1875	-49697.2	-49149.8	-46107.4
	1:00	17806.01	18107.26	18518.72	-71.2359	-70.7514	-64.3672	-49746.5	-49205.4	-46032.2
	2:00	17854.76	18147.26	18566.78	-71.3099	-70.7945	-64.3223	-49682.7	-49139.7	-46074.5
	3:00	17860.05	18154.73	18658.59	-71.3045	-70.7997	-64.2295	-49660.6	-49112.2	-46043.7
	4:00	17790.46	18081.22	18478.13	-71.4854	-71.0281	-64.6154	-49778.3	-49240.8	-46047.2
	5:00	17673.48	17960.53	18284.89	-71.7101	-71.3442	-65.131	-49978.2	-49476	-46037.6
	6:00	17881.96	18143.24	18297.01	-71.7338	-71.3068	-65.1863	-49921.4	-49430.1	-46192.5
	7:00	17721.21	17998.27	18418.95	-71.6149	-71.2132	-64.7459	-49921.7	-49404.1	-45977.5
	8:00	17614.71	17936.93	18520.75	-71.7419	-71.2612	-64.5144	-49695.8	-49139.1	-45923.6
	9:00	17603.72	17936.73	18495.99	-71.6475	-71.1488	-64.4803	-49649.8	-49096	-45919.5
	10:00	17623.09	17962.11	18498.55	-71.4942	-70.9859	-64.3649	-49647.1	-49095.6	-45940.4
	11:00	17678.95	18002.92	18526.79	-71.5581	-71.0533	-64.4029	-49600.8	-49043.1	-45914.9
	12:00	17689.2	18010.38	18526.21	-71.6046	-71.1318	-64.4613	-49658.6	-49107.5	-45947
	13:00	17716.35	18035.53	18549.88	-71.5728	-71.1027	-64.4271	-49666.5	-49117.9	-45964.5
	14:00	17792.51	18093.5	18607.71	-71.6248	-71.1411	-64.451	-49618.9	-49064.5	-45948.4
	15:00	17788.5	18092.07	18610.1	-71.5273	-71.0524	-64.4199	-49601.3	-49043.5	-45940.7
	16:00	17745.94	18054.58	18623.39	-71.4905	-71.0197	-64.446	-49553.7	-48992.3	-45885.1
	17:00	17768.39	18077.68	18603.26	-71.4485	-70.9751	-64.3895	-49563.1	-49002.8	-45900.9
	18:00	17782.41	18093.88	18619.63	-71.3224	-70.8462	-64.3118	-49568.6	-49008.1	-45894
	19:00	17720.72	18043.22	18512.17	-71.2721	-70.8017	-64.3078	-49646.9	-49087.1	-45943.5
	20:00	17737.1	18056.46	18563.16	-71.2958	-70.8001	-64.283	-49577.6	-49014.6	-45886.2
	21:00	17731.97	18067.77	18523.63	-70.9936	-70.4831	-64.086	-49612.6	-49055.1	-45980.5
	22:00	17746.68	18080.14	18544.77	-71.0417	-70.5343	-64.0833	-49623.5	-49067.2	-45974.3
	23:00	17746.31	18072.64	18532.85	-71.2334	-70.748	-64.2261	-49640.6	-49080.9	-46001.6
5 Jan	0:00	17755.6	18079.01	18506.49	-71.1886	-70.6745	-64.1734	-49631.5	-49070.9	-46010.6
	1:00	17840.2	18143.6	18568.76	-71.3648	-70.9069	-64.3634	-49695.6	-49145.4	-46069.1
	2:00	17801.01	18109.98	18559.94	-71.3973	-70.9562	-64.3967	-49733.6	-49193.1	-46076.3
	3:00	17911.95	18200.13	18651.62	-71.4428	-71.0097	-64.5187	-49737.3	-49199.1	-46105.8
	4:00	17892.16	18167.57	18593.38	-71.6837	-71.2682	-64.7519	-49757.6	-49218.2	-46121.3
	5:00	17724.86	18019.76	18385.14	-71.5481	-71.1697	-64.8653	-49871	-49344.5	-46008.2
	6:00	17653.76	17933.19	18353.85	-72.0315	-71.7188	-65.0886	-49939.9	-49409.7	-45919.4
	7:00	17608.28	17910.68	18457.63	-72.0647	-71.6756	-64.75	-49805.4	-49245.4	-45875.8
	8:00	17549.22	17888.75	18487.1	-71.9153	-71.4433	-64.5474	-49735.3	-49164.8	-45901.4
	9:00	17589.73	17934.33	18517.22	-71.7418	-71.2972	-64.4323	-49716.4	-49155.5	-45935.8
	10:00	17700.51	18030.11	18547.87	-71.6035	-71.132	-64.403	-49665	-49111	-45956.2
	11:00	17689.37	18020.25	18551.53	-71.6038	-71.1393	-64.4133	-49620.8	-49062.7	-45928
	12:00	17733.68	18055.49	18572.45	-71.6174	-71.15	-64.4239	-49598.6	-49039	-45922.5
	13:00	17769.5	18084.76	18580.06	-71.613	-71.159	-64.4475	-49625.3	-49068	-45940.6

	14:00	17787.07	18102.86	18662.46	-71.5368	-71.0579	-64.363	-49497	-48925	-45908.4
	15:00	17751.89	18064.34	18622.76	-71.5201	-71.0487	-64.4104	-49480.8	-48919.8	-45862.6
	16:00	17718.95	18023.09	18621.66	-71.3818	-70.8291	-64.1989	-49480.7	-48883.3	-45813.7
	17:00	17604.17	17952.97	18539.88	-71.4358	-70.9706	-64.3333	-49481.7	-48901.1	-45751.2
	18:00	17605.26	17964.04	18536.18	-71.2185	-70.7416	-64.1751	-49493.7	-48917.2	-45758.8
	19:00	17694.43	18028.32	18560.89	-71.436	-70.9784	-64.3524	-49514.7	-48943.3	-45820.7
	20:00	17710.99	18038.94	18549	-71.4663	-71.0126	-64.3737	-49568	-49004.2	-45881.2
	21:00	17694.55	18031.82	18542.02	-71.4162	-70.9674	-64.3173	-49593	-49029.8	-45918.3
	22:00	17773.22	18093.66	18580.77	-71.4562	-71.0287	-64.408	-49621.5	-49063.5	-45954.9
	23:00	17811.64	18123.82	18618.94	-71.4681	-71.0242	-64.3799	-49624.2	-49065.4	-45970.5
6 Jan	0:00	17794.84	18118.18		-71.3068	-70.8372	0	-49638.2	-49076.2	
	average	**17737.3**	**18044.9**	**18534.84**	**-71.5038**	**-71.0326**	**-63.6257**	**-49667.1**	**-49115.5**	**-45961**

Table 12. Jetty Peninsula - Uncorrected mean-hourly values of HDZ

Date	Start of UT hour	H (nT)		D (degs)		Z (nT)	
		Jetty #55	Jetty #8	Jetty #55	Jetty #8	Jetty #55	Jetty #8
30 Dec 91	11:00	18074.35	17918.45	-70.6573	-71.221	-48964.5	-49052.9
	12:00	17993.59	17934.09	-71.1228	-71.2394	-49045.6	-49088
	13:00	18010	18006.22	-71.2891	-71.2654	-49024.1	-49025.2
	14:00	17986.03	17981.79	-71.2179	-71.1989	-48974.7	-48969.6
	15:00	17911.75	17912.44	-71.2986	-71.2927	-48993.2	-48991.3
	16:00	17905.45	17909.44	-71.2362	-71.2397	-49041.4	-49044.6
	17:00	17928.82	17933.21	-71.2242	-71.2325	-49086.4	-49095
	18:00	17932.23	17935.46	-71.2043	-71.2152	-49101	-49111.3
	19:00	17945.72	17947.15	-71.176	-71.1859	-49107.6	-49118.3
	20:00	17961.85	17962.85	-71.1207	-71.1355	-49134	-49146.3
	21:00	17965.27	17931.49	-70.9274	-71.1509	-49075.6	-49082
	22:00	17952.73	17944.03	-71.0209	-71.0684	-49098.5	-49105.7
	23:00	17937.42	17934.4	-71.0884	-71.1001	-49124	-49133.3
31 Dec	0:00	17979.52	17970.92	-71.2362	-71.2488	-49144.4	-49156
	1:00	17945.64	17937.48	-71.2416	-71.2521	-49131.2	-49140.9
	2:00	17975.1	17964.94	-71.2404	-71.2508	-49141.4	-49151.4
	3:00	17967.24	17958.34	-71.2761	-71.286	-49161.3	-49172.9
	4:00	17958.33	17942.02	-71.4452	-71.448	-49110.8	-49118
	5:00	17911.35	17900.95	-71.4588	-71.4615	-49139.8	-49149.3
	6:00	17905.2	17890.4	-71.4709	-71.4671	-49091	-49094.6
	7:00	17910.37	17897.19	-71.3744	-71.3681	-49087.7	-49089.3
	8:00	17882.89	17875	-71.4575	-71.4555	-49133.6	-49140.2
	9:00	17890.05	17884.47	-71.3062	-71.3055	-49130.4	-49135.9
	10:00	17897.06	17891.74	-71.2919	-71.2919	-49132.2	-49137.3
	11:00	17957.99	17949.55	-71.1599	-71.1563	-49111.1	-49111.7
	12:00	17953.02	17940.66	-71.2249	-71.2181	-49061.4	-49057.1
	13:00	17924.94	17917.79	-71.1977	-71.2009	-49080.1	-49077.1
	14:00	17927.72	17921.6	-71.147	-71.1548	-49068.7	-49063.9
	15:00	17972.11	17962.96	-71.0566	-71.062	-49040.2	-49031.1
	16:00	17977.54	17963.2	-71.0636	-71.0637	-48982.6	-48966.2
	17:00	17941.58	17933.66	-71.0608	-71.0702	-49013.9	-49001
	18:00	17951.88	17943	-71.0312	-71.0383	-49005	-48990.4
	19:00	17947.9	17946.55	-70.781	-70.7881	-49021.1	-49005.8
	20:00	17934.34	17932.35	-70.8627	-70.8678	-49025.4	-49010.9
	21:00	18002.8	17994.5	-70.9631	-70.9668	-49032.3	-49017.9
	22:00	18012.21	18014.64	-70.7026	-70.7105	-49095.7	-49085.2
	23:00	18022.78	18023.57	-70.8621	-70.8732	-49127.8	-49121.8
1 Jan 92	0:00	18023.4	18028.47	-70.977	-70.9963	-49200.8	-49203.5
	1:00	18052.18	18048.95	-71.1741	-71.1887	-49176.5	-49177.5
	2:00	18046.98	18041.99	-71.3133	-71.3262	-49178.7	-49180.8
	3:00	17973.79	17969.55	-71.4955	-71.5066	-49159.9	-49162
	4:00	17816	17820.6	-71.7916	-71.8094	-49177.6	-49185.3
	5:00	17829.48	17828.8	-71.7779	-71.7871	-49124.6	-49125.7
	6:00	17827.24	17827.93	-71.7426	-71.7443	-49113.5	-49112.4
	7:00	17800.48	17803	-71.8228	-71.8262	-49122.6	-49123.7
	8:00	17891.02	17898.49	-71.3689	-71.3685	-49137.7	-49135.3
	9:00	17903.28	17906.99	-71.4494	-71.4441	-49112.9	-49107.8
	10:00	17915.29	17925.86	-71.2609	-71.2585	-49148.3	-49144.9
	11:00	18083.16	18080.99	-71.3845	-71.382	-49175.3	-49185.6
	12:00	18170.11	18154.66	-71.3781	-71.3607	-49081.6	-49077.6
	13:00	18105.89	18093.85	-71.2911	-71.2654	-49014.6	-48994.6
	14:00	17972.98	17965.57	-71.108	-71.0697	-48890	-48855.3
	15:00	17996.51	17995.96	-71.1593	-71.1336	-48993.3	-48969.3
	16:00	17942.51	17955.86	-71.0945	-71.0834	-49079.9	-49065.6
	17:00	17962.98	17973.71	-70.9795	-70.9568	-49025.2	-49003.3
	18:00	17951.76	17965.93	-71.0413	-71.0228	-49058.2	-49040.7
	19:00	17948.04	17961.27	-71.1053	-71.083	-49056.3	-49038.6
	20:00	17959.04	17973.31	-71.1038	-71.0792	-49066.5	-49049.3
	21:00	17974.67	17989.66	-71.0969	-71.0691	-49076.5	-49059.7
	22:00	18009.35	18032.24	-70.7822	-70.7543	-49083.6	-49067.9
	23:00	18025.73	18063.59	-70.8595	-71.0531	-48991.5	-49097
2 Jan	0:00	18127.43	18094.02	-70.9808	-71.0263	-49018.8	-49056.8
	1:00	18093.75	18117.37	-70.7277	-70.6728	-49100.9	-49119.3
	Average:	**17962.82**	**17957.57**	**-71.1867**	**-71.2035**	**-49082.6**	**-49084.6**

Table 13. Else Platform - Uncorrected mean-hourly values of HDZ

Date	Start of UT hour	H (nT)		D (degs)		Z (nT)	
		Else	Jetty	Else	Jetty	Else	Jetty
6 Jan 92	12:00	17932.33	18022.62	-71.4161	-71.2765	-48952.7	-49008.6
	13:00	18031.35	18107.14	-71.4423	-71.3404	-48922.1	-48979.2
	14:00	18045.67	18136.92	-71.2164	-71.0999	-48953.1	-48999.5
	15:00	17976.13	18074.08	-71.1222	-71.0094	-48844	-48875.6
	16:00	17908.94	18015.66	-71.2988	-71.1796	-48878.6	-48916.6
	17:00	17931.34	18038.53	-71.2854	-71.1829	-48944.4	-48993.6
	18:00	17939.55	18048.11	-71.2344	-71.1406	-48967.9	-49018.7
	19:00	17921.13	18035.01	-71.174	-71.0767	-48994.1	-49045
	20:00	17853.22	17986.1	-70.8548	-70.7024	-49139.9	-49193.6
	21:00	18036.72	18072.97	-70.983	-71.2823	-49111.4	-49270.8
	22:00	17863.1	17991.3	-71.0438	-70.9348	-49007.8	-49052
	23:00	17898.05	18018.81	-71.1128	-71.0173	-49030.7	-49076.1
7 Jan	0:00	17943.82	18055.25	-71.1618	-71.0781	-49045.2	-49096.9
	1:00	17994.11	18099.04	-71.1905	-71.1056	-49064.5	-49117.1
	2:00	18064.14	18165.33	-71.0957	-71.0287	-49076.9	-49128.2
	3:00	18087.62	18186.39	-71.1238	-71.0628	-49119.8	-49177.9
	4:00	18137.81	18208.16	-71.3639	-71.2939	-49161.5	-49213.5
	5:00	18071.91	18131.13	-71.5165	-71.4584	-49114.1	-49138.5
	6:00	17996.36	18126.67	-71.2206	-71.1279	-49172.1	-49221.9
	7:00	17839.36	17978.41	-71.5422	-71.4392	-49168.3	-49271.9
	8:00	17802.99	17923.01	-71.6085	-71.5585	-49098.6	-49201.6
	9:00	17899.6	18015.84	-71.2988	-71.2408	-49024.9	-49074.7
	10:00	17905.74	18018.15	-71.3435	-71.2964	-48984.4	-49030.2
	11:00	17918.11	18037.46	-71.26	-71.2084	-49037.7	-49089.1
	12:00	17891.71	18019.86	-71.2154	-71.1548	-49046.9	-49097.1
	13:00	17949.39	18069.78	-71.2137	-71.1752	-49041.8	-49090.9
	14:00	17978.35	18094.45	-71.2397	-71.2062	-49004.6	-49051.1
	15:00	18003.84	18118.35	-71.1824	-71.1443	-48964.8	-49000.5
	16:00	18008.34	18124.51	-71.1522	-71.1119	-48941.9	-48974.1
	17:00	17991.99	18114.12	-71.0473	-70.9924	-48940	-48966.9
	18:00	17942.91	18079.45	-70.9357	-70.8707	-48958.8	-48984.6
	19:00	17919.39	18056.74	-70.9609	-70.89	-48987.6	-49019.8
	20:00	17872.42	18021.35	-70.9113	-70.8391	-49014.6	-49043
	21:00	17958.41	18096.28	-70.9147	-70.8645	-49025	-49053.4
	22:00	17980.52	18106.1	-71.0511	-71.006	-49019.9	-49056.2
	23:00	17955.08	18074.83	-71.2312	-71.2038	-48993.8	-49038.3
8 Jan	0:00	17995.05	18117.22	-71.0362	-71.006	-49007.3	-49044.1
	1:00	18020.27	18146.63	-70.9217	-70.8783	-49120.1	-49163.9
	2:00	18052.11	18172.83	-70.8853	-70.8707	-49111.8	-49154
	3:00	18175.47	18267.22	-71.2111	-71.209	-49104.5	-49168.2
	4:00	18107.31	18212.01	-71.0413	-71.0361	-49029.5	-49070.4
	5:00	18078	18185.84	-71.243	-71.2419	-49048	-49097.3
	6:00	18105.36	18206.04	-71.3311	-71.3408	-49101.6	-49154.8
	7:00	18069.76	18165.81	-71.5121	-71.5399	-49142.3	-49209.5
	8:00	17843.54	17982.95	-71.5769	-71.5921	-49342.5	-49444.4
	9:00	17701.8	17856.79	-71.5939	-71.6197	-49273.8	-49362.8
	10:00	17899.09	18005.99	-71.6268	-71.6434	-49052.8	-49115.2
	11:00	17966.67	18070.24	-71.5493	-71.5508	-48971.8	-49029.6
	12:00	18055.48	18141.7	-71.5104	-71.5199	-48781.5	-48804.2
	13:00	18186.48	18268.84	-71.3549	-71.3804	-48891.6	-48931.2
	14:00	18055.79	18156.89	-71.3293	-71.3085	-48752.8	-48770.6
	15:00	17991.66	18116.54	-71.1328	-71.0943	-48788.1	-48800.4
	16:00	17941.3	18082.35	-70.9091	-70.8594	-48839.5	-48841.6
	17:00	17881.17	18039.58	-70.8113	-70.7511	-48918.3	-48923.7
	18:00	17821.48	17993.34	-70.6683	-70.5826	-48998	-49009
	19:00	17813.31	17985.47	-70.6935	-70.6202	-48955.4	-48960.8
	20:00	17931.69	18080.01	-70.8499	-70.8093	-48975.9	-48996
	21:00	17964.81	18098.44	-71.0061	-70.9766	-49012.4	-49032.6
	22:00	17973.28	18126.29	-70.9707	-70.9754	-48977	-49081
	23:00	18006.23	18131.95	-71.0856	-71.0771	-49014.5	-49054.3
9 Jan	0:00	18033.16	18154.76	-71.0458	-71.0414	-49006.6	-49043.3
	Average:	**17969.21**	**18085.8**	**-71.1781**	**-71.1332**	**-49015.9**	**-49062.8**

Table 14. Moore Pyramid - Uncorrected mean-hourly values of HDZ

Date	Start of UT hour	H (nT)		D (degs)		Z (nT)	
		Moore	Jetty	Moore	Jetty	Moore	Jetty
17 Jan 92	16:00	18217.31	18052.06	-67.5214	-71.1721	-47763.2	-48892.5
	17:00	18169.37	18031.43	-67.5237	-71.1524	-47781.9	-48934.4
	18:00	18180.05	18012.17	-67.3209	-71.0677	-47774.4	-48928.2
	19:00	18145.08	17995.5	-67.45	-71.0446	-47795.9	-48968.3
	20:00	18202.93	18065.94	-67.5091	-71.1228	-47845.8	-48997.2
	21:00	18236.37	18099.91	-67.5022	-71.1185	-47909.9	-49035.8
	22:00	18301.13	18168.48	-67.5912	-71.1918	-48021.2	-49122.2
	23:00	18177.68	18060.01	-67.4274	-71.0159	-47941.6	-49081.8
18 Jan	0:00	18197.66	18072.4	-67.5	-71.0944	-47942	-49083.3
	1:00	18214.95	18061.61	-67.6944	-71.3105	-47920.3	-49091.3
	2:00	18442.7	17955.56	-67.9219	-71.3946	-47746.7	-49195.1
	3:00	18055.08	17928.87	-68.0812	-71.7365	-47994.3	-49191.3
	4:00	18126.62	17973.23	-68.1258	-71.8501	-47935.8	-49121.3
	5:00	18089.43	17965.84	-68.2096	-71.8533	-47992.4	-49200.3
	6:00	18073.9	17932.27	-68.2051	-71.9459	-47975.7	-49193.3
	7:00	18156.49	17975.23	-67.9987	-71.7966	-47814	-48969.1
	8:00	18163.62	17987.93	-67.9433	-71.7272	-47826.7	-48986.6
	9:00	18191.82	18024.57	-67.8481	-71.6294	-47836.7	-48957.5
	10:00	18226.8	18073.34	-67.7049	-71.4207	-47852.5	-48965.2
	11:00	18306.2	18146.44	-67.6919	-71.3903	-47849.4	-48964.8
	12:00	18266.79	18111.68	-67.6601	-71.3135	-47868.8	-48989.8
	13:00	18227.71	18081.7	-67.6257	-71.252	-47882.3	-49016.3
	14:00	18220.56	18073.8	-67.6646	-71.2903	-47888.3	-49031.2
	15:00	18214.83	18070.45	-67.6651	-71.2885	-47889.9	-49035.7
	16:00	18224.95	18077.23	-67.6607	-71.2878	-47883	-49026.5
	17:00	18228.97	18079.08	-67.6334	-71.2569	-47878.7	-49018.9
	18:00	18234.57	18080.46	-67.6449	-71.2712	-47877.3	-49017.1
	19:00	18237.41	18082.57	-67.6319	-71.2601	-47872.7	-49016.6
	20:00	18239.77	18085.1	-67.6504	-71.2771	-47865.3	-49005.5
	21:00	18233.21	18086.95	-67.518	-71.275	-47830.5	-49011
	22:00	18223.88	18056.3	-67.6142	-71.2425	-47829.9	-49030.1
	23:00	18219.14	18067.89	-67.6743	-71.2928	-47885.4	-49034.1
19 Jan	0:00	18242.28	18080.05	-67.6762	-71.3205	-47871.8	-49022.5
	1:00	18227.26	18076.63	-67.7066	-71.3586	-47897	-49054.6
	2:00	18230.55	18082.79	-67.6012	-71.2223	-47913.9	-49063
	3:00	18238.42	18091.78	-67.7278	-71.3322	-47971.9	-49117.7
	4:00	18182.17	18046.62	-68.0366	-71.6883	-48018.8	-49171.1
	5:00	18125.67	17965.49	-68.0883	-71.8208	-47921.3	-49110.3
	6:00	18143.25	17964.04	-68.0558	-71.8445	-47829.8	-48994.2
	7:00	18169.09	17994.78	-67.8974	-71.6512	-47827.6	-48978.5
	8:00	18213.48	18060.65	-67.6639	-71.3239	-47848.2	-48988.5
	9:00	18227.87	18071	-67.6649	-71.3472	-47843.9	-48982.6
	10:00	18226.7	18076.27	-67.6491	-71.3299	-47883.3	-49032.3
	11:00	18237.25	18088.72	-67.6116	-71.2872	-47867.4	-48984.6
	12:00	18263.4	18121.58	-67.5457	-71.1816	-47878.2	-49006.8
	13:00	18215.26	18097.88	-67.5705	-71.2332	-47899.2	-49024
	14:00	18252.44	18102.1	-67.6054	-71.2269	-47880.9	-49013.4
	15:00	18305.86	18140.15	-67.4887	-71.0872	-47861.1	-48983.7
	16:00	18261.33	18092.91	-67.6213	-71.25	-47838	-48966.3
	17:00	18246.34	18084.42	-67.6002	-71.2248	-47852.1	-48981.8
	18:00	18250.69	18093.31	-67.5674	-71.1807	-47862.2	-48999.9
	19:00	18245.87	18088.22	-67.58	-71.2016	-47855	-48997.5
	20:00	18237.89	18079.75	-67.5767	-71.1984	-47850.1	-48989.3
	21:00	18230.2	18068.54	-67.5819	-71.2014	-47832.5	-48985.7
	22:00	18235.71	18080.12	-67.5365	-71.1573	-47838	-48990
	23:00	18236.14	18074.55	-67.4986	-71.1342	-47845.3	-49000.3
20 Jan	0:00	18232.07	18088.88	-67.4351	-71.0083	-47901.9	-49038.8
	1:00	18250.92	18105.45	-67.5203	-71.1162	-47953.7	-49081.9
	2:00	18191.53	18085.35	-67.6413	-71.1834	-48061.2	-49193.6
	3:00	18202.38	18082.53	-67.7373	-71.3377	-48067	-49239.6
	4:00	18211.11	18082.41	-67.6362	-71.2729	-48075.2	-49227.2
	5:00	18157.74	18028.99	-67.9015	-71.4905	-48091.1	-49245
	6:00	18069.37	17903.91	-68.496	-72.2731	-48018.5	-49220.9
	7:00	18063.66	17876.56	-68.3373	-72.2344	-47845.1	-49051.5
	8:00	18122.81	17943.46	-68.1032	-71.9676	-47850.5	-49042.4
	9:00	18266.93	18096.42	-67.9957	-71.7818	-47922.4	-49068.9
	10:00	18242.35	18065.82	-67.8948	-71.6604	-47880.3	-49040.9

	11:00	18315.49	18075.34	-67.8303	-71.6164	-47735.4	-48859.5
	12:00	18327.29	18077.14	-67.7518	-71.5077	-47681.3	-48832
	13:00	18384.02	18172.98	-67.5815	-71.2444	-47753.3	-48851.7
	14:00	18296.34	18087.06	-67.6204	-71.313	-47672.3	-48818.9
	15:00	18199.69	18023.91	-67.5298	-71.2027	-47696.7	-48851.3
	16:00	18149.38	17954.9	-67.433	-71.1103	-47646.2	-48815.1
	17:00	18248.86	18068.1	-67.2968	-70.9359	-47655.4	-48799.5
	18:00	18287.28	18108.91	-67.5099	-71.1485	-47753	-48872.1
	19:00	18280.44	18120.07	-67.4831	-71.1044	-47833	-48961.5
	20:00	18255.33	18082.37	-67.42	-70.9966	-47772.3	-48969.3
	21:00	18217.05	18063.01	-67.4593	-71.0767	-47838.6	-48995.2
	22:00	18191.93	18052.67	-67.4759	-71.1048	-47852.3	-49004
	23:00	18217.99	18087.48	-67.4191	-71.0204	-47935.7	-49083.6
21 Jan	0:00	18218.73	18095.27	-67.5452	-71.1556	-47985.1	-49138.3
	1:00	18228.35	18091.62	-67.6717	-71.2787	-47956.8	-49122.7
	2:00	18251.28	18091.37	-67.763	-71.4162	-47940.2	-49095.4
	3:00	18196.36	18033.3	-67.9937	-71.6748	-47928.3	-49108.8
	4:00	18210.6	18041.19	-68.044	-71.7567	-47882.2	-49065
	5:00	18218.27	18039.72	-67.9133	-71.6675	-47839.4	-49002.9
	6:00	18220.03	18040.65	-67.8248	-71.5511	-47827.7	-48973.9
	7:00	18226.31	18055.86	-67.7523	-71.4463	-47839.3	-48980.7
	8:00	18199.29	18039.85	-67.652	-71.3203	-47855.3	-49000.4
	9:00	18203.08	18043.94	-67.6206	-71.2774	-47858.1	-49004.7
	10:00	18211.27	18054.15	-67.607	-71.2629	-47860.6	-49008.4
	11:00	18215.81	18060.41	-67.5861	-71.237	-47866.1	-49012.7
	12:00	18285.78	18127.09	-67.585	-71.2502	-47861.7	-48990.5
	13:00	18353.42	18155.33	-67.5907	-71.2717	-47797.8	-48874.1
	14:00	18349.53	18133.32	-67.5484	-71.2231	-47730	-48847.4
	15:00	18272.48	18069.04	-67.4879	-71.1637	-47695.9	-48836.7
	16:00	18291.77	18107.61	-67.5586	-71.2133	-47783.4	-48902.4
	17:00	18251.54	18090.3	-67.4652	-71.078	-47845.5	-48981
	18:00	18236.6	18062.7	-67.4049	-71.0119	-47776.4	-48911.2
	19:00	18219.73	18050.3	-67.5315	-71.1536	-47781.1	-48929
	20:00	18261.09	18091.83	-67.5811	-71.2237	-47838.8	-48971.5
	21:00	18271.07	18103.12	-67.4161	-71.0187	-47835.6	-48973.5
	22:00	18252.72	18106.17	-67.3268	-70.919	-47909.2	-49038.9
	23:00	18236.62	18096.71	-67.2665	-70.8411	-47927.7	-49061.9
22 Jan	0:00	18225.88	18078.96	-67.427	-71.0207	-47934.4	-49068.9
	1:00	18240.8	18092.54	-67.5411	-71.1419	-47954.3	-49090.8
	2:00	18244.09	18089.99	-67.6337	-71.2547	-47966.8	-49109.3
	3:00	18230.8	18064.45	-67.9417	-71.6463	-47973.1	-49139.7
	4:00	18220.71	18042.49	-68.1006	-71.8189	-47969.7	-49130.6
	5:00	18188.42	18003.21	-68.2486	-72.0387	-47878.3	-49059.5
	6:00	18180.05	17990.29	-68.0076	-71.8053	-47808.1	-48964.3
	7:00	18174.39	17989.97	-67.8959	-71.6568	-47801.8	-48951
	8:00	18142.54	17966.33	-67.8635	-71.6275	-47854.2	-49037
	9:00	18186.22	18012.52	-67.7613	-71.5121	-47817.7	-48953
	10:00	18242.06	18106.53	-67.6229	-71.3316	-47920.6	-49083.1
	11:00	18356.21	18207.56	-67.6958	-71.4318	-47938.2	-49055.6
	12:00	18380.03	18154.04	-67.8245	-71.549	-47757.4	-48862.6
	13:00	18289.11	18061.55	-67.6315	-71.3785	-47597.8	-48744.1
	14:00	18366.63	18132.47	-67.4489	-71.1641	-47640.2	-48748.9
	15:00	18345.65	18126.59	-67.3145	-70.9926	-47674.7	-48769.4
	16:00	18319.27	18126.22	-67.4319	-71.0649	-47750.8	-48859
	17:00	18297.2	18122.8	-67.5466	-71.1744	-47819.3	-48946.4
	18:00	18260.84	18096.15	-67.6044	-71.2472	-47851.6	-48986.5
	19:00	18241.09	18081.2	-67.6076	-71.2551	-47874.3	-49016.5
	20:00	18242.26	18083.57	-67.5917	-71.2382	-47881.9	-49028.6
	21:00	18244.26	18082.57	-67.5691	-71.2078	-47875.3	-49020.5
	22:00	18254.47	18091.19	-67.5604	-71.1937	-47870.8	-49011.3
	23:00	18256.64	18096.44	-67.5075	-71.1236	-47868.1	-49007.6
23 Jan	0:00	18263.99	18099.45	-67.5076	-71.1294	-47876.1	-49019.5
	1:00	18265.88	18103.45	-67.5437	-71.1731	-47900.4	-49055.5
	Average:	**18230.89**	**18065.96**	**-67.6711**	**-71.3342**	**-47861**	**-49009.7**

Table 15. Corry Massif - Uncorrected mean-hourly values of HDZ

Date	Start of UT hour	H (nT)		D (degs)		Z (nT)	
		Corry	Jetty	Corry	Jetty	Corry	Jetty
9 Jan 92	19:00	18186.43	18020.44	-67.826	-71.2711	-47621.5	-49019.5
	20:00	18180.35	18034.73	-67.8478	-71.3288	-47616	-49031.5
	21:00	18193.5	18041.74	-67.8345	-71.2961	-47631.2	-49030.7
	22:00	18202.06	18050.54	-67.7328	-71.1831	-47645.9	-49036.5
	23:00	18259.13	18109.55	-67.569	-70.9963	-47661.9	-49052.6
10 Jan	0:00	18241.03	18090.62	-67.5977	-71.0426	-47694.6	-49071.3
	1:00	18176.96	18053.78	-67.5809	-71.0141	-47769.6	-49134.2
	2:00	18222.56	18067.22	-67.7061	-71.22	-47708	-49166.8
	3:00	18132.95	17906.66	-67.8143	-71.5013	-47717.3	-49321.4
	4:00	18053.36	17901.69	-68.3295	-71.8727	-47751.5	-49208.2
	5:00	18059.98	17886.76	-68.5449	-72.0853	-47717.1	-49185.6
	6:00	18059.19	17862.31	-68.6155	-72.2434	-47611.7	-49069.6
	7:00	18099.69	17905.28	-68.3395	-71.9162	-47564.3	-48988.3
	8:00	18143.63	17972.95	-68.1474	-71.695	-47617.6	-49032.2
	9:00	18232.58	18078.75	-67.9075	-71.4421	-47676.7	-49078.2
	10:00	18295.27	18115.57	-67.9935	-71.5542	-47640.5	-49020.2
	11:00	18308.25	18071.33	-68.0403	-71.5788	-47535.6	-48887.7
	12:00	18256.51	18010.84	-68.1188	-71.6017	-47478.9	-48889.7
	13:00	18208.92	17970.53	-68.0062	-71.4904	-47418.7	-48827.1
	14:00	18238.93	18008.6	-67.8489	-71.3136	-47455.6	-48820.1
	15:00	18260.84	18031.48	-67.6609	-71.0844	-47428.3	-48763
	16:00	18196.53	18016.6	-67.7125	-71.156	-47470.9	-48858.7
	17:00	18181.17	18017.75	-67.6711	-71.0879	-47488.4	-48877.9
	18:00	18180.19	18017	-67.7692	-71.1717	-47513.6	-48896.6
	19:00	18225.36	18065.82	-67.7307	-71.1394	-47533.9	-48912.6
	20:00	18238.12	18080.24	-67.757	-71.1754	-47587.5	-48966.7
	21:00	18230.88	18074.68	-67.7012	-71.109	-47605.5	-48986.1
	22:00	18164.76	18036.79	-67.5117	-70.9	-47640.2	-49025.6
	23:00	18127.25	18003.87	-67.5482	-70.9423	-47661.4	-49045
11 Jan	0:00	18186.18	18054.99	-67.4915	-70.8914	-47656.8	-49036.3
	1:00	18191.99	18050.68	-67.6588	-71.062	-47655.3	-49041.5
	2:00	18194.1	18051.29	-67.7281	-71.1456	-47686	-49080
	3:00	18195.02	18066.91	-67.8633	-71.2526	-47790.8	-49177.2
	4:00	18009.81	17969.05	-68.1581	-71.5124	-48017.9	-49468.6
	5:00	17910.03	17863.95	-68.6603	-72.1721	-48119.1	-49644.3
	6:00	17784.5	17634.78	-69.0324	-72.7259	-47787.5	-49373.7
	7:00	17962.02	17777.05	-68.7989	-72.5036	-47633.3	-49108.3
	8:00	18070.28	17913.86	-68.5906	-72.2422	-47688.4	-49142.8
	9:00	18142.99	17952.34	-68.4682	-72.0897	-47635.7	-49075.4
	10:00	18181.86	17998.88	-68.4396	-72.0077	-47617.8	-49032.5
	11:00	18114.47	17928.31	-68.447	-71.9587	-47537	-48959.6
	12:00	18068.36	17892.25	-68.3717	-71.837	-47488.8	-48914.1
	13:00	18025.55	17883.8	-68.1276	-71.5692	-47460.6	-48871.4
	14:00	18021.14	17878.97	-67.9568	-71.3555	-47451.8	-48841.5
	15:00	18020.15	17871.91	-67.8574	-71.2626	-47423.8	-48805.5
	16:00	18098.27	17956.05	-67.641	-70.9973	-47465.5	-48827.2
	17:00	18041.4	17915.96	-67.313	-70.673	-47504	-48884.9
	18:00	18100.44	18003.2	-66.8508	-70.4819	-47573.3	-48938.1
	19:00	18100.04	18005.13	-67.3149	-70.6586	-47554.3	-48940.1
	20:00	18156.67	18051.08	-67.2783	-70.6464	-47606.1	-48974.9
	21:00	18195.3	18076.1	-67.3121	-70.6688	-47609.2	-48983.9
	22:00	18198.37	18072.89	-67.4206	-70.7842	-47613.1	-48993.2
	23:00	18199.31	18070.14	-67.5007	-70.8583	-47620.6	-49002.5
12 Jan	0:00	18180.68	18046.67	-67.5359	-70.8937	-47650	-49012.6
	1:00	18167.35	18034.24	-67.6057	-70.9698	-47663.7	-49036.1
	2:00	18119.78	18019.53	-67.7067	-71.0392	-47759.5	-49166.2
	3:00	17930.97	17820.79	-68.1608	-71.561	-47782.1	-49264
	4:00	18024.58	17882.46	-68.4834	-71.9726	-47808.1	-49257.6
	5:00	18065.14	17855.56	-68.7782	-72.2916	-47718.6	-49224.7
	6:00	17972.05	17696.26	-69.045	-72.6802	-47625.5	-49121.5
	7:00	18115.69	17946.43	-68.3369	-71.8504	-47614.3	-49013.9
	8:00	18171.58	18013.11	-68.069	-71.5018	-47613.4	-49005.6
	9:00	18236.81	18096.46	-67.9442	-71.3746	-47626.9	-49011
	10:00	18296.65	18115.26	-67.9944	-71.4708	-47539.9	-48859.9
	11:00	18431.13	18184.64	-67.9076	-71.3141	-47395.6	-48578.1
	12:00	18315.39	18130.09	-67.8886	-71.2798	-47504.8	-48788.6
	13:00	18216.44	18077.88	-67.7814	-71.1749	-47606.8	-48973.3

	14:00	18210.17	18078.14	-67.7591	-71.16	-47615.2	-48976.8
	15:00	18223.49	18086.84	-67.732	-71.1336	-47624.8	-48985
	16:00	18235.24	18097.45	-67.7086	-71.1116	-47625.2	-48990.6
	17:00	18286.86	18131.99	-67.5481	-70.9212	-47576	-48933.1
	18:00	18208.2	18064.4	-67.6911	-71.0836	-47564.9	-48933
	19:00	18175.6	18029.11	-67.6985	-71.0889	-47545.1	-48922.7
	20:00	18247.94	18116.62	-67.684	-71.1104	-47599.2	-48992
	21:00	18298.46	18159.63	-67.6925	-71.1186	-47631.5	-49015.8
	22:00	18341.58	18191.8	-67.4447	-70.7819	-47597.4	-49069.3
	23:00	18228.29	18126.67	-67.5881	-70.9801	-47656.9	-49077.8
13 Jan	0:00	18358.98	18227.41	-67.4906	-70.8752	-47679.7	-49050.6
	1:00	18301.95	18132.44	-67.946	-71.3767	-47664.8	-49037.6
	2:00	18298.51	18164.03	-67.6827	-71.1381	-47720	-49096.8
	3:00	18457.68	18293.02	-67.683	-71.1343	-47710.9	-49093.7
	4:00	18227.35	18116.1	-67.9846	-71.3766	-47801.7	-49209.6
	5:00	17981.82	18082.6	-67.9936	-71.5732	-48242.1	-49742.5
	6:00	18288.36	18156.27	-68.3058	-71.848	-48008.5	-49402.3
	7:00	18280.83	18147.94	-68.3282	-71.7498	-47833	-49272.5
	8:00	18295.1	18162.92	-68.2878	-71.7846	-47810.4	-49213.9
	9:00	18318.12	18155.42	-68.3005	-71.8903	-47784.9	-49149.1
	10:00	18316.61	18125.81	-68.3844	-71.9875	-47685.3	-49054.1
	11:00	18282.01	18036.87	-68.5232	-72.0311	-47469.9	-48847.8
	12:00	18180.02	17993.41	-68.2671	-71.8037	-47487.3	-48893.1
	13:00	18275.57	18084.59	-67.9634	-71.4464	-47451.8	-48835.8
	14:00	18167.53	18024.68	-67.906	-71.3882	-47474.5	-48881.6
	15:00	18178.87	18035.09	-67.793	-71.2599	-47504.2	-48890.4
	16:00	18130.94	18015.85	-67.5728	-71.0233	-47541.4	-48937.1
	17:00	18020.15	17949.7	-67.4428	-70.8829	-47542.9	-48971.8
	18:00	18227.34	18074.22	-67.5449	-71.0206	-47489.6	-48877.8
	19:00	18232.32	18072.92	-67.7387	-71.1874	-47535.4	-48903
	20:00	18226.04	18079.11	-67.7433	-71.2122	-47587.2	-48965.3
	21:00	18238.97	18106.96	-67.6217	-71.079	-47590.9	-48970.7
	22:00	18266.45	18130.7	-67.6198	-71.1161	-47629.4	-49004.4
	23:00	18242.8	18125.01	-67.4359	-70.9235	-47714	-49078.8
14 Jan	0:00	18338.79	18201.35	-67.4971	-70.9999	-47685.2	-49051.8
	1:00	18406.18	18248.8	-67.6547	-71.1761	-47704.7	-49073.7
	2:00	18340.46	18186.11	-67.779	-71.3311	-47735	-49126.3
	3:00	18361.15	18188.35	-68.0473	-71.6211	-47709.8	-49089.7
	4:00	18284.69	18131.81	-68.0137	-71.5225	-47715.9	-49122.2
	5:00	18191.85	18079.21	-68.095	-71.5563	-47775.2	-49221.1
	Average:	**18188.24**	**18037.14**	**-67.8988**	**-71.364**	**-47634.5**	**-49033.6**

Table 16. Mt Starlight - Uncorrected mean-hourly values of HDZ

Date	Start of UT hour	H (nT)			D (degrees)			Z (nT)		
		Starlight	Jetty	Mawson	Starlight	Jetty	Mawson	Starlight	Jetty	Mawson
27 Jan 92	9:00	18225.12	18025.24	18498.67	-67.7517	-71.3812	-64.5048	-47441.6	-49038.2	-45877
	10:00	18242.26	18040.49	18507.5	-67.6958	-71.3072	-64.4809	-47434.5	-49003.4	-45885.3
	11:00	18247.38	18044.26	18504.25	-67.663	-71.2678	-64.4642	-47421.3	-48963.3	-45885.8
	12:00	18233.52	18042.11	18494.51	-67.6261	-71.2424	-64.4384	-47462.5	-49034	-45917.4
	13:00	18253.38	18062.49	18506.28	-67.5954	-71.226	-64.4405	-47480.2	-49054	-45934.8
	14:00	18281.81	18081.11	18522.63	-67.6381	-71.2434	-64.4784	-47480.4	-49038.6	-45934.6
	15:00	18324.94	18112.37	18564.15	-67.6378	-71.2365	-64.4764	-47464	-49009.5	-45931.8
	16:00	18316.74	18106.44	18559.46	-67.5995	-71.1817	-64.4487	-47453.2	-48997.7	-45913.8
	17:00	18324.9	18112.34	18573.64	-67.591	-71.1607	-64.4464	-47443.9	-48991.9	-45908.7
	18:00	18312.2	18106.29	18563.28	-67.3357	-70.8678	-64.2721	-47407.4	-48975.9	-45907.3
	19:00	18285.08	18110.58	18533	-67.3694	-70.9067	-64.293	-47469.5	-49038.4	-45898.1
	20:00	18327.7	18153.56	18536.85	-67.5099	-71.1002	-64.4834	-47567.6	-49128.5	-45993.9
	21:00	18356.2	18167.68	18573.9	-67.4199	-70.9989	-64.3145	-47532.2	-49086	-45990.9
	22:00	18340.53	18138.29	18570.39	-67.3577	-70.8936	-64.2451	-47465	-49006	-45936.4
	23:00	18372.9	18184.27	18597.24	-67.2941	-70.8377	-64.2041	-47489.6	-49028.8	-45956.8
28 Jan	0:00	18417.04	18205.76	18644.37	-67.4742	-71.0529	-64.3248	-47466.5	-49006.6	-45939.4
	1:00	18344.84	18171.01	18517.21	-67.219	-70.7532	-64.1649	-47552.9	-49075.2	-46055.8
	2:00	18421.69	18244.91	18528.77	-67.289	-70.8443	-64.293	-47643.6	-49138.2	-46190.9
	3:00	18420.81	18267.18	18486.32	-67.264	-70.7902	-64.3198	-47715.9	-49205	-46244.2
	4:00	18533.09	18322.77	18656.38	-67.5846	-71.177	-64.5683	-47700.7	-49215.3	-46241.1
	5:00	18495.8	18265.14	18704.95	-67.5546	-71.1701	-64.3583	-47518.1	-49052.2	-46049.8
	6:00	18434.33	18232.64	18575.05	-67.5711	-71.0687	-64.6712	-47573.3	-49108.8	-46021.4
	7:00	18256.07	18057.6	18517.44	-68.0293	-71.6962	-64.7638	-47541.7	-49208.4	-45888
	8:00	18258.61	18007.84	18532.5	-67.7885	-71.5925	-64.5191	-47411.2	-48989.1	-45858.7
	9:00	18215.58	17997.82	18485.25	-67.7525	-71.3962	-64.5301	-47432.6	-49020.1	-45874.4
	10:00	18224.15	18023.61	18488.35	-67.7488	-71.397	-64.527	-47467	-49069.5	-45900.4
	11:00	18281.11	18098.1	18521.13	-67.6472	-71.3115	-64.4547	-47527.2	-49150.2	-45967.3
	12:00	18369.21	18161.1	18593.92	-67.6653	-71.315	-64.4466	-47486	-49040.5	-45957.3
	13:00	18411.43	18171.05	18653.61	-67.6977	-71.347	-64.4314	-47413.6	-48937.3	-45918.3
	14:00	18393.18	18133.19	18661.8	-67.658	-71.2545	-64.4239	-47345.1	-48858.1	-45849.9
	15:00	18294.1	18072.54	18548	-67.6833	-71.2702	-64.512	-47410.8	-48949.1	-45863
	16:00	18305.86	18092.71	18554.04	-67.5673	-71.1449	-64.4234	-47431.5	-48973.9	-45898.2
	17:00	18297.44	18085.05	18563.47	-67.571	-71.1339	-64.4275	-47399.7	-48960.6	-45843.2
	18:00	18275.77	18060.26	18544	-67.6473	-71.2043	-64.5001	-47391.6	-48949.9	-45824
	19:00	18294.11	18079.56	18548.71	-67.6642	-71.2515	-64.5026	-47432.9	-48976	-45878.3
	20:00	18292.09	18086.91	18538.47	-67.6052	-71.1912	-64.4555	-47448	-49005.8	-45897.3
	21:00	18322.5	18119.94	18556.78	-67.5592	-71.1382	-64.3989	-47455.8	-49006.4	-45917.4
	22:00	18334.9	18130.26	18569.86	-67.567	-71.1586	-64.427	-47470.6	-49019.9	-45933.9
	23:00	18342.72	18142.31	18558.31	-67.508	-71.0924	-64.3841	-47508.5	-49051.8	-45992.2
29 Jan	0:00	18280.93	18131.05	18409.55	-67.2485	-70.7535	-64.3061	-47603.4	-49129.8	-46063.1
	1:00	18207.43	18099.66	18361.64	-67.3138	-70.7955	-64.3294	-47666.8	-49241	-46088.3
	2:00	18330.61	18218.37	18425.09	-67.2199	-70.7275	-64.2708	-47733	-49259.9	-46221.9
	3:00	18265.85	18111.99	18413.21	-67.521	-71.083	-64.4509	-47657.8	-49248.4	-46116.5
	4:00	18300.61	18119.59	18479.83	-67.8009	-71.3533	-64.8198	-47647.9	-49234.3	-46020
	5:00	18328.89	18174.43	18459.53	-67.7601	-71.3285	-65.0176	-47754.1	-49350.5	-46133.2
	6:00	18252.06	18094.18	18457.77	-67.8886	-71.4188	-64.8311	-47639.4	-49281.1	-45977.3
	7:00	18217.44	18059.81	18476.29	-67.8822	-71.412	-64.6513	-47569.4	-49240.9	-45931.8
	8:00	18208.74	18175.04	18433.6	-67.751	-71.2002	-64.6142	-47698.6	-49357.3	-45995.6
	9:00	18217.7	18089.86	18477.04	-67.6875	-71.2602	-64.4849	-47587.7	-49272.3	-45965.1
	10:00	18263.46	18058.25	18516.2	-67.6984	-71.3354	-64.4771	-47483.9	-49067.2	-45918.3
	11:00	18296.06	18096.39	18537.76	-67.6169	-71.2349	-64.4305	-47374.1	-49057.5	-45934.4
	12:00	18290.79	18122.17	18557.23	-67.6378	-71.3364	-64.4772	-47430.5	-49042.5	-45945.2
	13:00	18381.08	18148.28	18607.48	-67.6659	-71.2946	-64.4546	-47444.4	-48965.9	-45929.3
	14:00	18433.46	18153.45	18690.3	-67.6305	-71.2596	-64.3768	-47344.9	-48850.6	-45877.4
	15:00	18357.25	18126.86	18599.97	-67.6525	-71.2483	-64.464	-47410	-48938	-45883.2
	16:00	18306.31	18094	18544.8	-67.6419	-71.2338	-64.4788	-47450.1	-48994.4	-45905.1
	17:00	18304.16	18094.69	18544.92	-67.6007	-71.1842	-64.4504	-47456.4	-49004.4	-45911.8
	18:00	18285.05	18081.09	18538.98	-67.5216	-71.0909	-64.3876	-47429.5	-48994.8	-45868.3
	19:00	18291.11	18088.75	18525.3	-67.5408	-71.1098	-64.4159	-47455.4	-49008	-45899
	20:00	18238.86	18083.14	18442.13	-67.2895	-70.8191	-64.2027	-47516	-49060.6	-45960.2
	21:00	18257.75	18094.78	18507.52	-67.2754	-70.8346	-64.1238	-47484.4	-49054.1	-45920.7
	22:00	18345.04	18146.17	18575.34	-67.4346	-71.016	-64.2897	-47480.9	-49027.7	-45953.7
	23:00	18346.97	18138.6	18573.25	-67.588	-71.17	-64.4236	-47402.9	-49024	-45933.9
30 Jan	0:00	18364.08	18165.81	18584.73	-67.3791	-70.9446	-64.2263	-47461.9	-49018.3	-45982.5
	1:00	18409.19	18206.87	18605.08	-67.3806	-70.9537	-64.2669	-47527.6	-49057.6	-46046.6
	2:00	18413.8	18220.66	18549.19	-67.2995	-70.8756	-64.2797	-47602	-49121.5	-46141.9
	3:00	18345.35	18171.73	18464.42	-67.3875	-70.9258	-64.4614	-47644.6	-49161.7	-46171.7

4:00	18448.12	18264.62	18547.24	-67.4686	-71.0491	-64.4464	-47680.3	-49193.1	-46253.1
5:00	18302.1	18186.32	18417.77	-67.7476	-71.2534	-64.7507	-47767.1	-49322.5	-46164.9
Average	**18318.42**	**18126.57**	**18535.91**	**-67.5642**	**-71.1465**	**-64.4417**	**-47509.6**	**-49071.6**	**-45970.9**

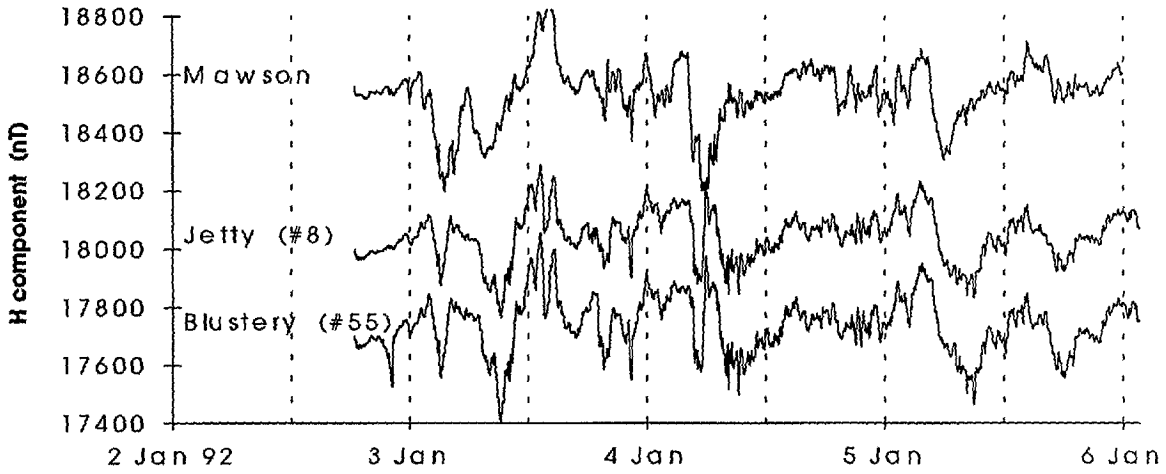
Table 17. Mt Jacklyn - Uncorrected mean-hourly values of HDZ

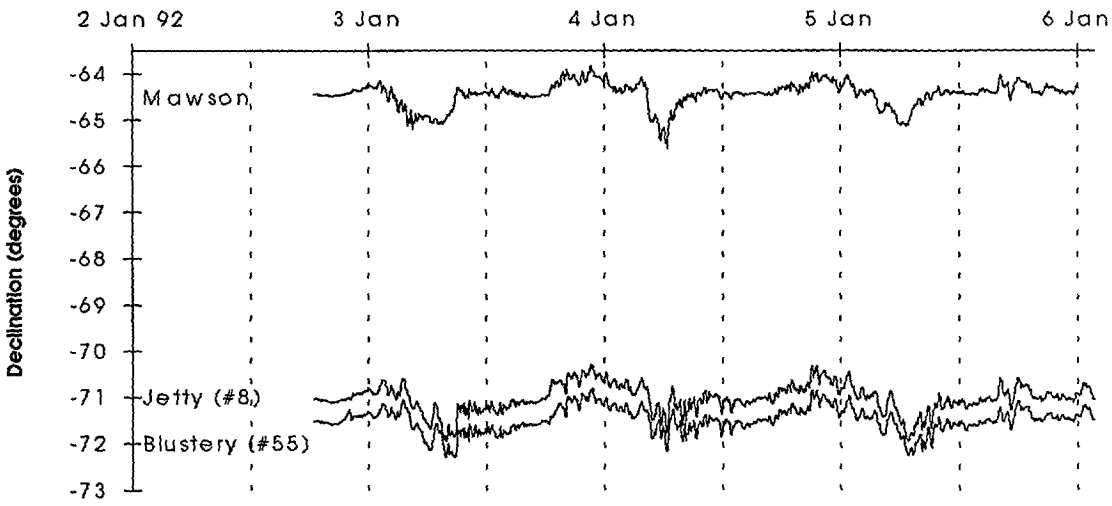
Date	Start of UT hour	H (nT) Jacklyn	H (nT) Jetty	D (degs) Jacklyn	D (degs) Jetty	Z (nT) Jacklyn	Z (nT) Jetty
23 Jan 92	12:00	18199.09	18076.65	-68.7225	-71.2568	-47953.5	-49025.5
	13:00	18201.96	18077.88	-68.7018	-71.2376	-47956.8	-49028
	14:00	18288.36	18144.39	-68.5357	-71.1676	-47924.7	-48957.4
	15:00	18260.74	18119.32	-68.6314	-71.224	-47931.4	-48982.4
	16:00	18222.11	18086.56	-68.6988	-71.2494	-47944	-49008.3
	17:00	18218.31	18085.3	-68.6821	-71.2292	-47947.5	-49015.3
	18:00	18225.13	18090.36	-68.6664	-71.2215	-47945.9	-49013.1
	19:00	18224.97	18092.19	-68.6284	-71.1859	-47940.8	-49006.2
	20:00	18194.26	18065.23	-68.6413	-71.1747	-47929.8	-48996.5
	21:00	18206.81	18072.23	-68.6504	-71.2034	-47930.6	-49000.6
	22:00	18206.73	18077.05	-68.6555	-71.2041	-47948	-49021.1
	23:00	18214.11	18086.86	-68.5761	-71.1345	-47963	-49035.9
24 Jan	0:00	18216.53	18088.08	-68.6076	-71.1625	-47969.9	-49045.1
	1:00	18252.18	18113.8	-68.7384	-71.3024	-48011.5	-49082.8
	2:00	18226.79	18097.63	-68.9797	-71.4709	-48031	-49115.7
	3:00	18199.42	18052.4	-69.1785	-71.6616	-47972.5	-49077
	4:00	18230.14	18064.99	-69.0424	-71.5964	-47914.9	-48990.4
	5:00	18215.96	18056.34	-69.0231	-71.5574	-47904.7	-48973.1
	6:00	18205.73	18051.21	-69.0012	-71.5274	-47902.9	-48968.9
	7:00	18179.92	18032.69	-69.0391	-71.5389	-47909.5	-48979.9
	8:00	18166.98	18028.34	-68.94	-71.4333	-47912.9	-48980.2
	9:00	18179.39	18044.44	-68.9003	-71.4165	-47924.6	-48993
	10:00	18178.33	18048.38	-68.816	-71.3358	-47944.5	-49015.2
	11:00	18188.11	18059.93	-68.7419	-71.2733	-47942	-49009.2
	12:00	18185.28	18061.46	-68.6966	-71.2249	-47942.2	-49008
	13:00	18195.08	18071.47	-68.6663	-71.206	-47947.1	-49010.9
	14:00	18204.04	18077.97	-68.6722	-71.2178	-47949.9	-49009.8
	15:00	18222.34	18090.03	-68.6228	-71.1851	-47947.7	-49004.6
	16:00	18240.58	18095.95	-68.6059	-71.1907	-47920.6	-48971.3
	17:00	18227.5	18085.42	-68.6474	-71.2144	-47926.9	-48986.5
	18:00	18221.6	18083.67	-68.6998	-71.2561	-47940.8	-49004
	19:00	18218.96	18082.4	-68.688	-71.2417	-47944.5	-49010.6
	20:00	18216.24	18081.38	-68.6908	-71.2406	-47947.2	-49018.4
	21:00	18236.1	18098.94	-68.691	-71.2613	-47951.6	-49020.5
	22:00	18255.14	18118.11	-68.5958	-71.1876	-47947.7	-49010.7
	23:00	18268.89	18140.81	-68.435	-71.0474	-47969.4	-49035.4
25 Jan	0:00	18357.48	18215.96	-68.2632	-70.9749	-47985.7	-49036.5
	1:00	18363.39	18227.16	-68.2492	-70.9402	-48048.8	-49101.4
	2:00	18367.39	18232.52	-68.4521	-71.1181	-48087.2	-49132.6
	3:00	18345.87	18209.97	-68.75	-71.3705	-48168.6	-49244.3
	4:00	18353.01	18200.28	-68.8559	-71.4606	-48109.3	-49168.3
	5:00	18279.04	18160.16	-68.9933	-71.4553	-48087.8	-49169.8
	6:00	18181.12	18044.7	-68.957	-71.452	-47971.4	-49082.7
	7:00	18174.45	18033.76	-68.8691	-71.3998	-47927.1	-49005.8
	8:00	18184.56	18048.73	-68.769	-71.2969	-47930.5	-48996.6
	9:00	18191.05	18058.39	-68.7699	-71.3005	-47945.7	-49010.7
	10:00	18170.4	18043.43	-68.7777	-71.2796	-47965.1	-49044.7
	11:00	18197.55	18069.55	-68.714	-71.2542	-47962.7	-49033.8
	12:00	18258.79	18123.92	-68.6564	-71.2712	-47968.7	-49027.6
	13:00	18260.63	18124.37	-68.648	-71.2518	-47960.7	-49016.4
	14:00	18260.9	18127.71	-68.6143	-71.2122	-47963.6	-49015.1
	15:00	18250.44	18114.02	-68.6432	-71.225	-47964	-49017.7
	16:00	18224.66	18089.99	-68.706	-71.2589	-47963.3	-49025.6
	17:00	18235.49	18098.47	-68.6532	-71.2195	-47957.9	-49019.2
	18:00	18236.67	18096.9	-68.666	-71.2336	-47947.9	-49012
	19:00	18234.44	18092.85	-68.7093	-71.2732	-47942.2	-49004.4
	20:00	18236.63	18098.1	-68.6273	-71.2005	-47939.3	-48998.4
	21:00	18234.83	18099.69	-68.6146	-71.192	-47950.9	-49013.8
	22:00	18228.92	18094.19	-68.6423	-71.2146	-47952.2	-49015.3
	23:00	18235.57	18114.33	-68.6022	-71.2092	-47958.1	-49024.5
26 Jan	0:00	18188.53	18132.68	-68.6724	-71.1833	-47982.9	-49020.3
	1:00	18285.16	18152.12	-68.5617	-71.1757	-48001.6	-49053.7
	2:00	18268.45	18148.35	-68.6159	-71.1839	-48036.7	-49101.7
	3:00	18236.03	18114.44	-68.9125	-71.4159	-48056.2	-49139.1
	4:00	18201.3	18066.02	-69.1003	-71.5655	-47991.5	-49090.4
	5:00	18205.61	18050.59	-68.9403	-71.4702	-47928.5	-49015
	Average:	**18230.94**	**18096.72**	**-68.7199**	**-71.2772**	**-47964.4**	**-49031**

Table 18. Heard Island - Uncorrected mean-hourly values of HDZ

Date	Start of UT hour	H (nT) Station A	H (nT) Station B	D (degs) Station A	D (degs) Station B	Z (nT) Station A	Z (nT) Station B
23 Feb 92	8:00	17818.6	17803.16	-57.2169	-57.1117	-46839.4	-46997.9
	9:00	17821.8	17806.36	-57.2193	-57.1141	-46846.3	-47004.8
	10:00	17825.53	17810.1	-57.1988	-57.0937	-46852	-47010.5
	11:00	17816.11	17800.68	-57.2055	-57.1003	-46853.1	-47011.6
	12:00	17818.06	17802.63	-57.2041	-57.0989	-46845.3	-47003.8
	13:00	17835.32	17819.89	-57.2107	-57.1056	-46842.3	-47000.8
	14:00	17853.41	17837.98	-57.1971	-57.0921	-46843.2	-47001.7
	15:00	17856.15	17840.72	-57.1932	-57.0882	-46857.3	-47015.8
	16:00	17858.03	17842.61	-57.195	-57.09	-46858	-47016.5
	17:00	17863.91	17848.48	-57.1904	-57.0855	-46858.9	-47017.4
	18:00	17867.28	17851.85	-57.2073	-57.1024	-46863	-47021.5
	19:00	17855.59	17840.14	-57.2354	-57.1305	-46850.7	-47009.2
	20:00	17762.67	17747.1	-57.4618	-57.3565	-46815.1	-46973.6
	21:00	17665.7	17649.94	-57.7757	-57.6701	-46846.8	-47005.3
	22:00	17569.78	17554.04	-57.7333	-57.6271	-46837.8	-46996.3
	23:00	17715.35	17699.79	-57.4235	-57.3179	-46733.6	-46892.1
24 Feb	0:00	17825.34	17809.84	-57.3247	-57.2196	-46758.4	-46916.9
	1:00	17870.56	17855.1	-57.2646	-57.1597	-46806	-46964.5
	2:00	17831.37	17815.85	-57.3627	-57.2577	-46829.7	-46988.2
	3:00	17831.32	17815.78	-57.396	-57.2911	-46813.2	-46971.7
	4:00	17858	17842.47	-57.3764	-57.2716	-46813.8	-46972.3
	5:00	17861.79	17846.26	-57.3651	-57.2603	-46821.6	-46980.1
	6:00	17841.53	17826	-57.3759	-57.271	-46830.5	-46989
	7:00	17797.59	17782.09	-57.3361	-57.2309	-46828.4	-46986.9
	8:00	17812.02	17796.58	-57.2284	-57.1232	-46831.2	-46989.7
	9:00	17797.32	17781.89	-57.1972	-57.0919	-46845.1	-47003.6
	10:00	17791.8	17776.39	-57.1658	-57.0604	-46855.3	-47013.8
	11:00	17817.48	17802.08	-57.1542	-57.049	-46866.9	-47025.4
	12:00	17837.64	17822.26	-57.1162	-57.011	-46856.1	-47014.6
	13:00	17871.74	17856.43	-56.9994	-56.8944	-46859.7	-47018.2
	14:00	17946.27	17931	-56.9126	-56.8079	-46917.4	-47075.9
	15:00	17925.57	17910.24	-57.0358	-56.9311	-46932.7	-47091.2
	16:00	17895.42	17880.04	-57.1109	-57.0061	-46903.3	-47061.8
	17:00	17923.24	17907.91	-57.0215	-56.9168	-46874	-47032.5
	18:00	17922.32	17906.98	-57.0294	-56.9247	-46783.9	-46942.4
	19:00	17807.94	17792.47	-57.2815	-57.1763	-46817.6	-46976.1
	20:00	17717.46	17701.87	-57.4879	-57.3823	-46902.2	-47060.7
	21:00	17526.67	17510.78	-57.9993	-57.8931	-47080.9	-47239.4
	22:00	17579.49	17563.69	-57.8525	-57.7465	-46860.3	-47018.8
	23:00	17588.51	17572.68	-57.9066	-57.8007	-46965.8	-47124.3
25 Feb	0:00	17345.43	17329.44	-58.1992	-58.092	-47034.2	-47192.7
	1:00	17343.45	17327.43	-58.2485	-58.1413	-46806.3	-46964.8
	2:00	17827.21	17810.89	-58.7792	-58.6754	-46294.9	-46453.4
	3:00	17949.39	17933.31	-58.3433	-58.2398	-46785	-46943.5
	4:00	17571.93	17555.85	-58.3509	-58.2452	-46832.5	-46991
	5:00	17836.04	17820.45	-57.4846	-57.3797	-46795.7	-46954.2
	6:00	17852.88	17837.35	-57.3714	-57.2666	-46837.7	-46996.2
	7:00	17852.03	17836.54	-57.3006	-57.1956	-46850	-47008.5
	8:00	17895.79	17880.32	-57.2778	-57.1731	-46852.6	-47011.1
	9:00	17954.38	17938.99	-57.134	-57.0295	-46889.6	-47048.1
	10:00	17962.76	17947.46	-56.9703	-56.8658	-46934.9	-47093.4
	11:00	17992.84	17977.59	-56.8923	-56.7879	-46937.8	-47096.3
	12:00	17865.99	17850.62	-57.0987	-56.9937	-46919	-47077.5
	13:00	17852.39	17836.96	-57.2039	-57.0989	-46907	-47065.5
	14:00	17873.12	17857.69	-57.2021	-57.0972	-46894.6	-47053.1
	15:00	17908.12	17892.68	-57.2146	-57.1099	-46892.8	-47051.3
	16:00	17898.82	17883.43	-57.1403	-57.0355	-46907.2	-47065.7
	17:00	17865.72	17850.29	-57.203	-57.0981	-46868.7	-47027.2
	18:00	17861.02	17845.57	-57.2312	-57.1263	-46853.3	-47011.8
	19:00	17708.29	17692.69	-57.4981	-57.3925	-46863.1	-47021.6
	20:00	17643.92	17628.18	-57.7456	-57.6399	-46832.9	-46991.4
	21:00	17733.88	17718.3	-57.4717	-57.3663	-46803.2	-46961.7
	22:00	17603.68	17587.9	-57.821	-57.7151	-46954.1	-47112.6
	23:00	17661.08	17645.39	-57.6624	-57.5567	-46760.9	-46919.4
26 Feb	0:00	17724	17708.37	-57.5557	-57.4503	-46782.6	-46941.1
	1:00	17747.03	17731.46	-57.4429	-57.3375	-46830.6	-46989.1
	Average	**17797.16**	**17781.63**	**-57.3941**	**-57.289**	**-46848.8**	**-47007.3**

Figure 10. Blustery Cliffs Occupation - H,D and Z for Blustery, Jetty and Mawson





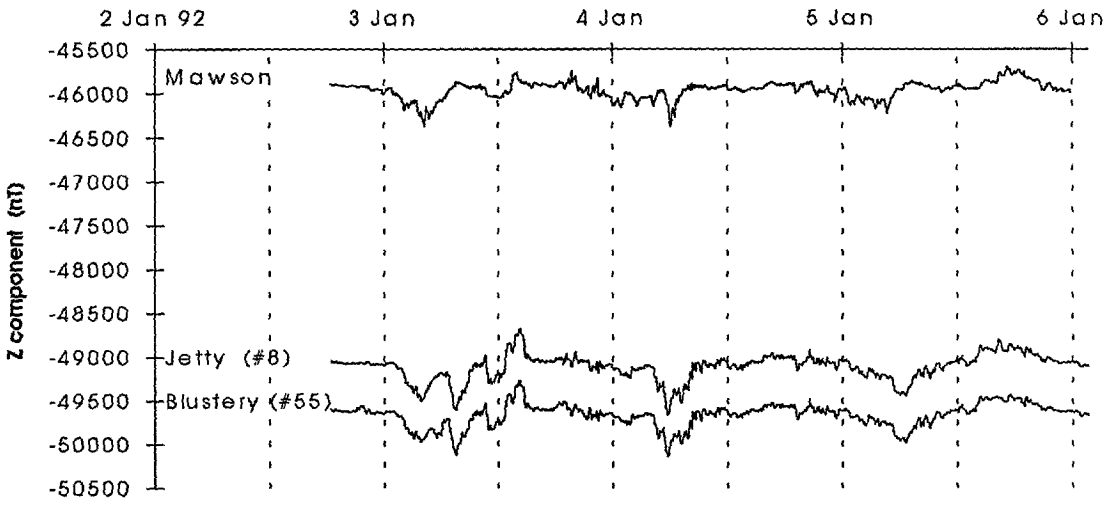


Figure 11. Jetty Peninsula Occupation - H, D and Z for magnetometers #55 and #8

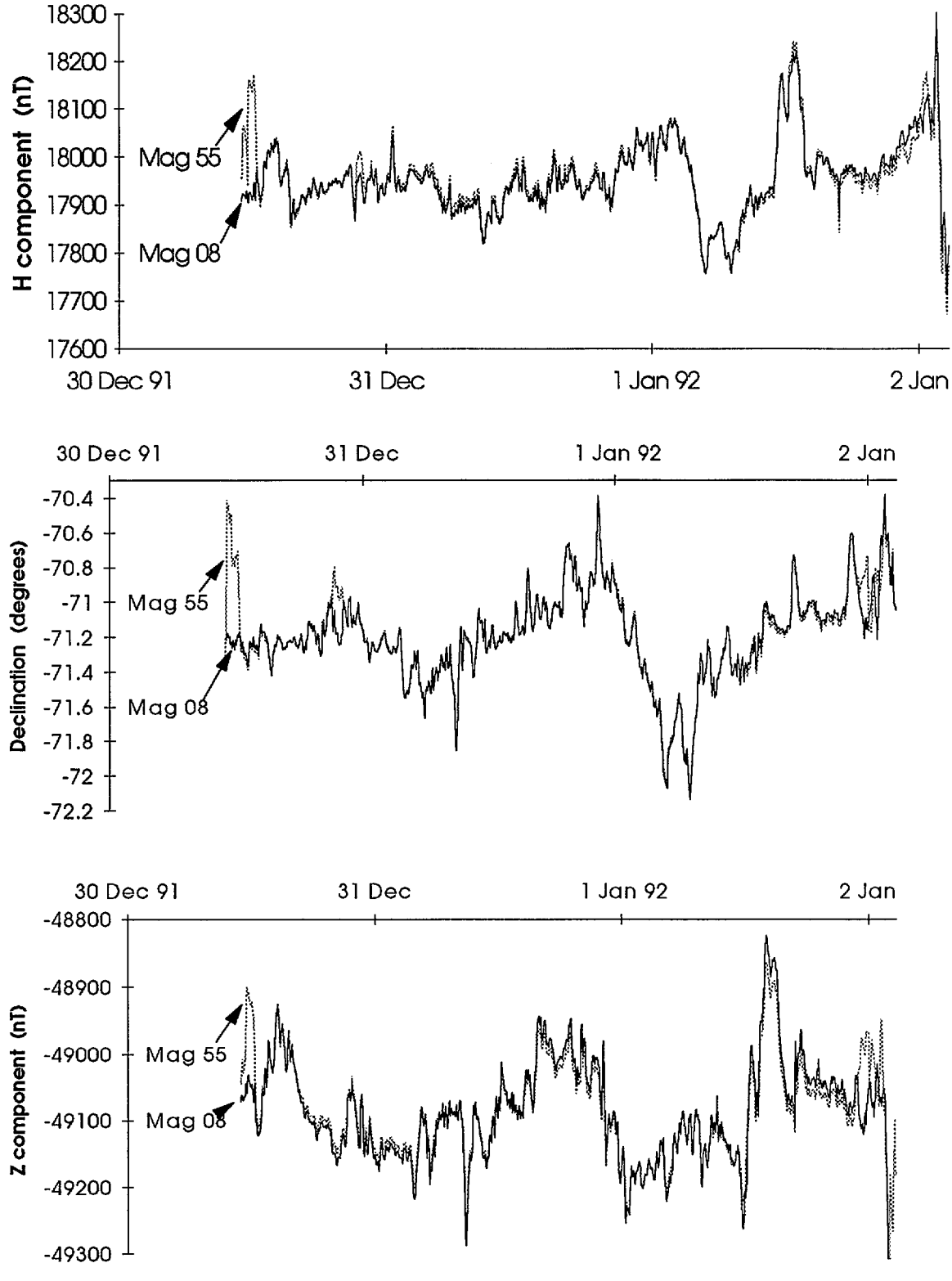


Figure 12. Else Platform Occupation - H, D and Z for Else and Jetty

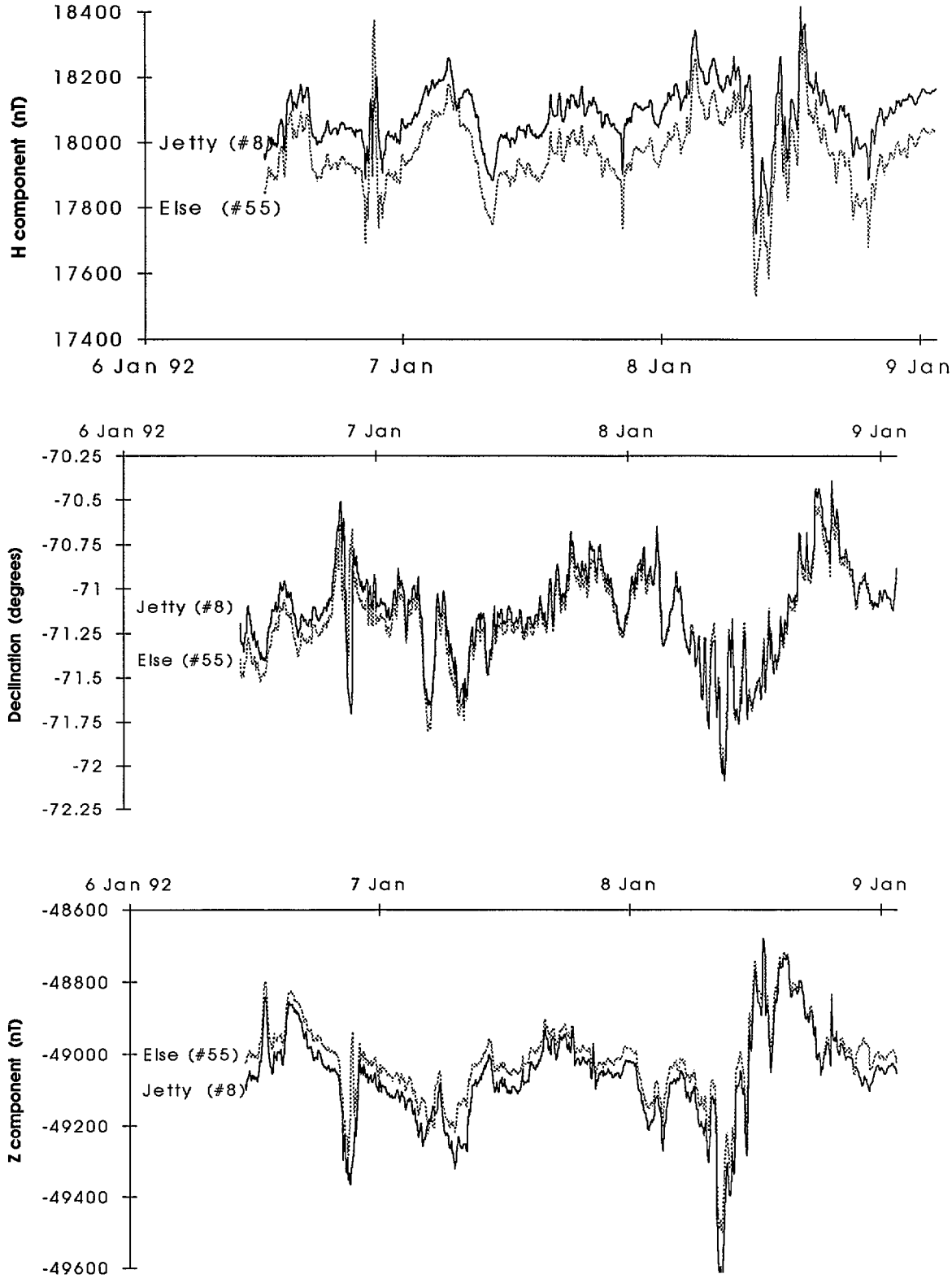


Figure 13. Moore Pyramid Occupation - H, D and Z for Moore and Jetty

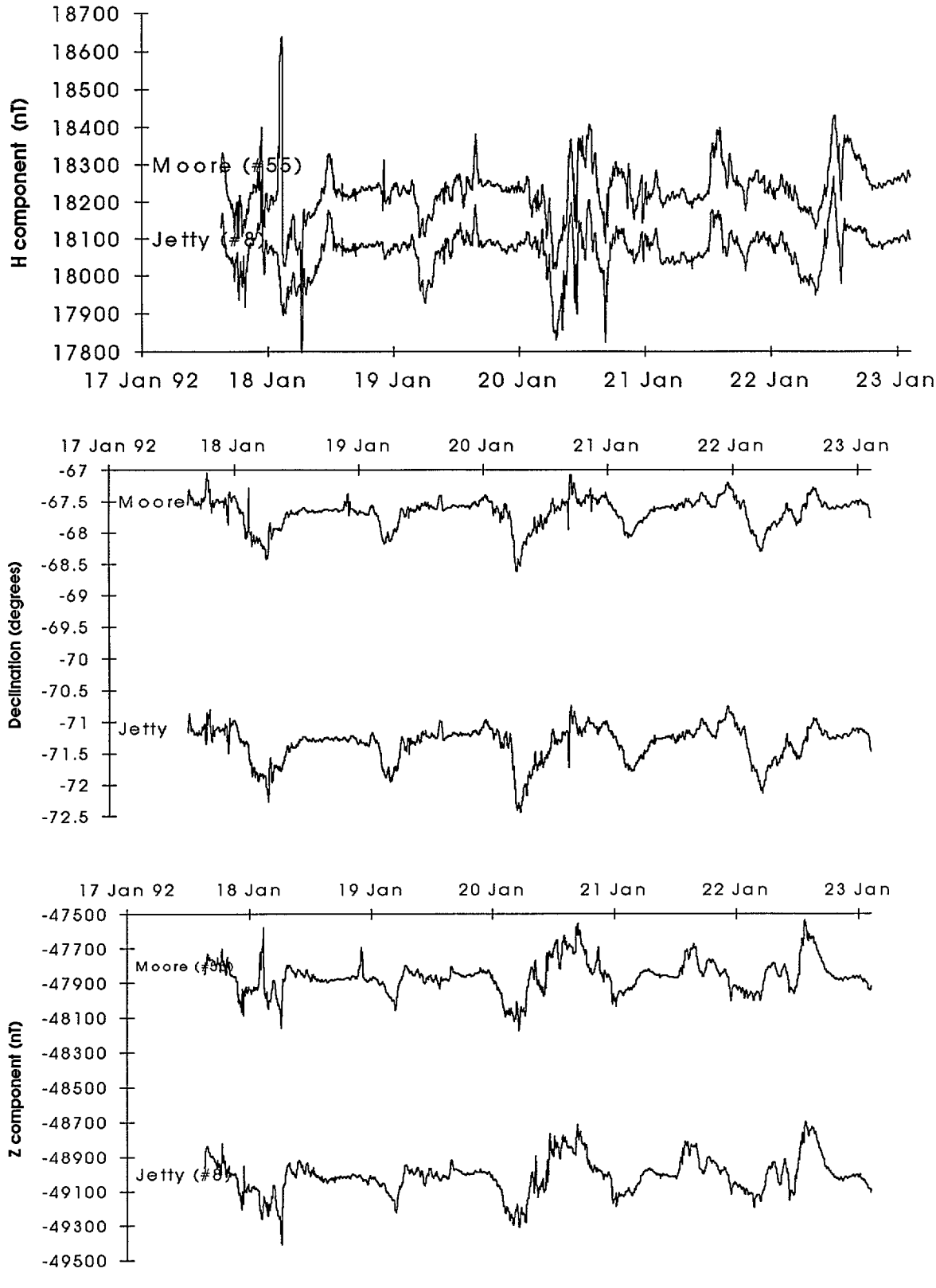


Figure 14. Corry Massif Occupation - H, D and Z for Corry and Jetty

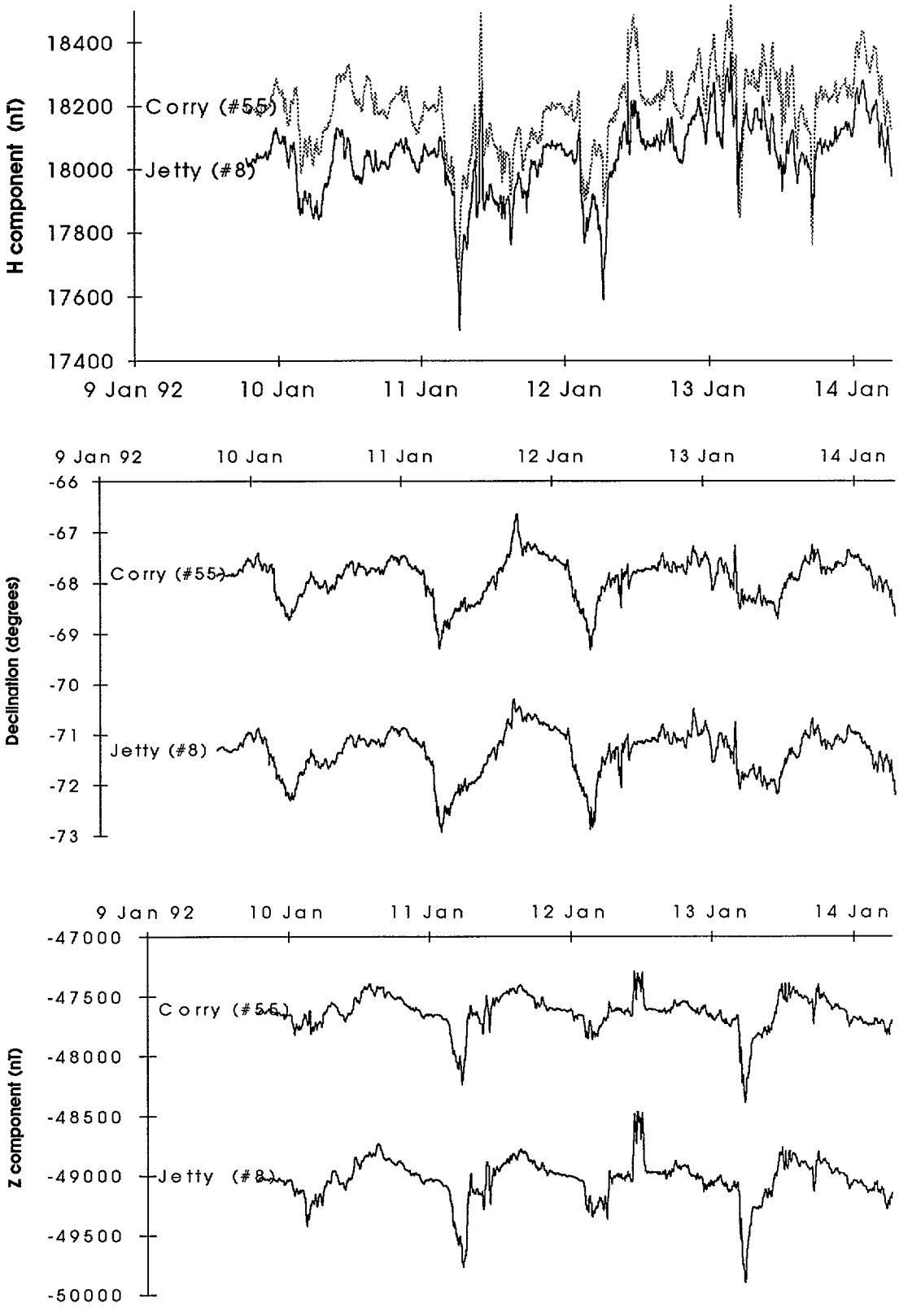


Figure 15. Mt Starlight Occupation - H, D and Z for Mt Starlight, Jetty and Mawson

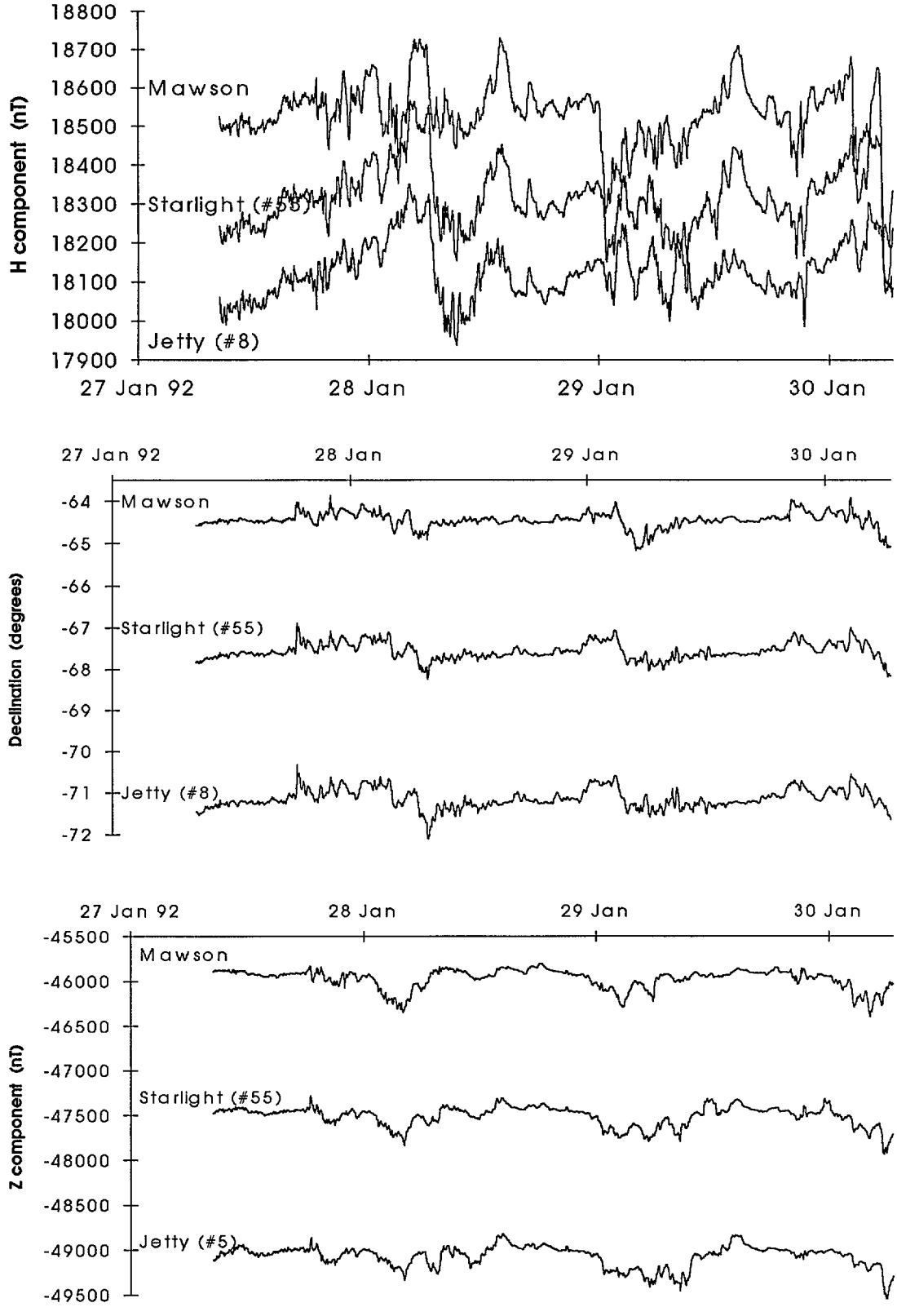


Figure 16. Mt Jacklyn Occupation - H, D and Z for Mt Jacklyn and Jetty

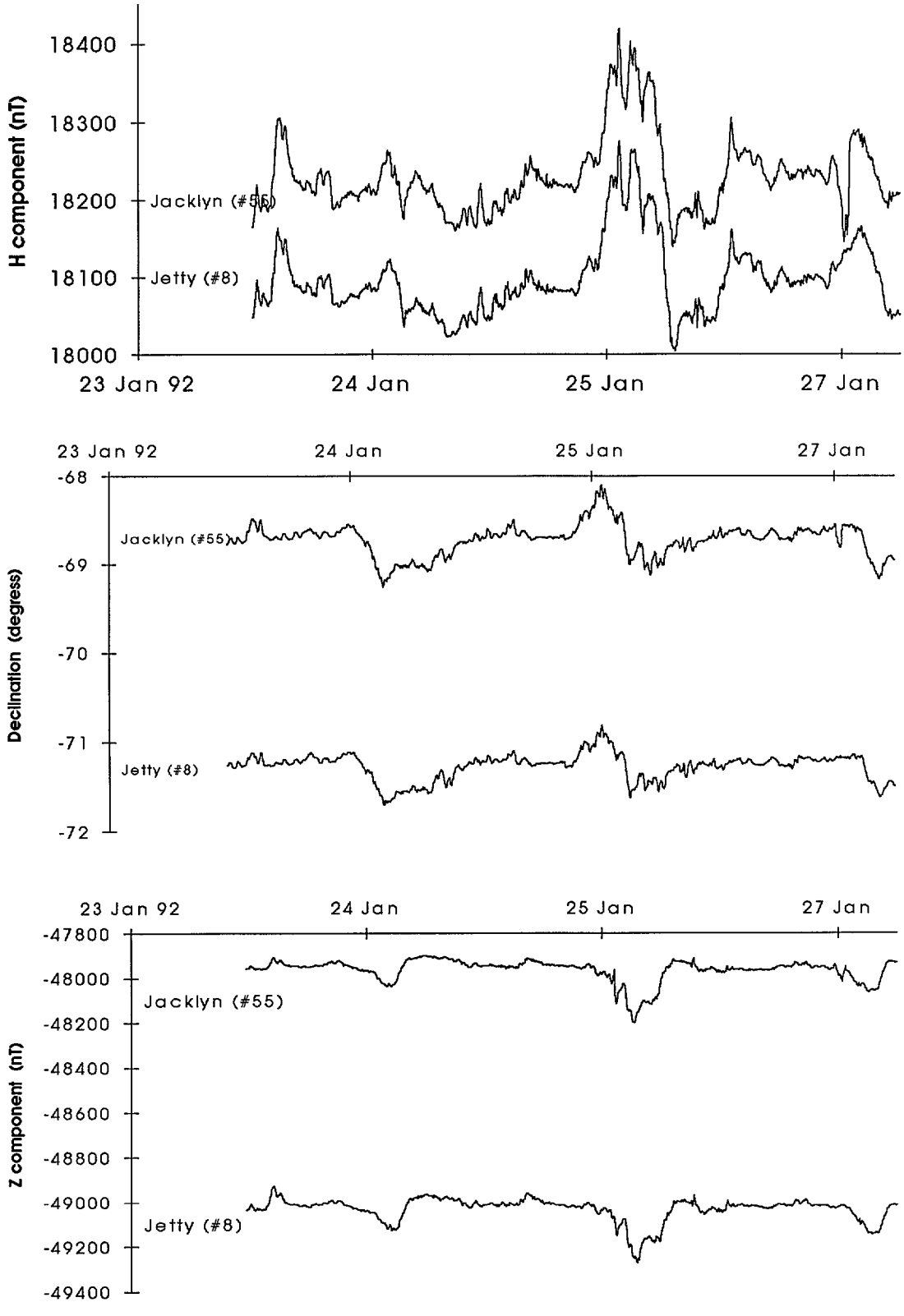
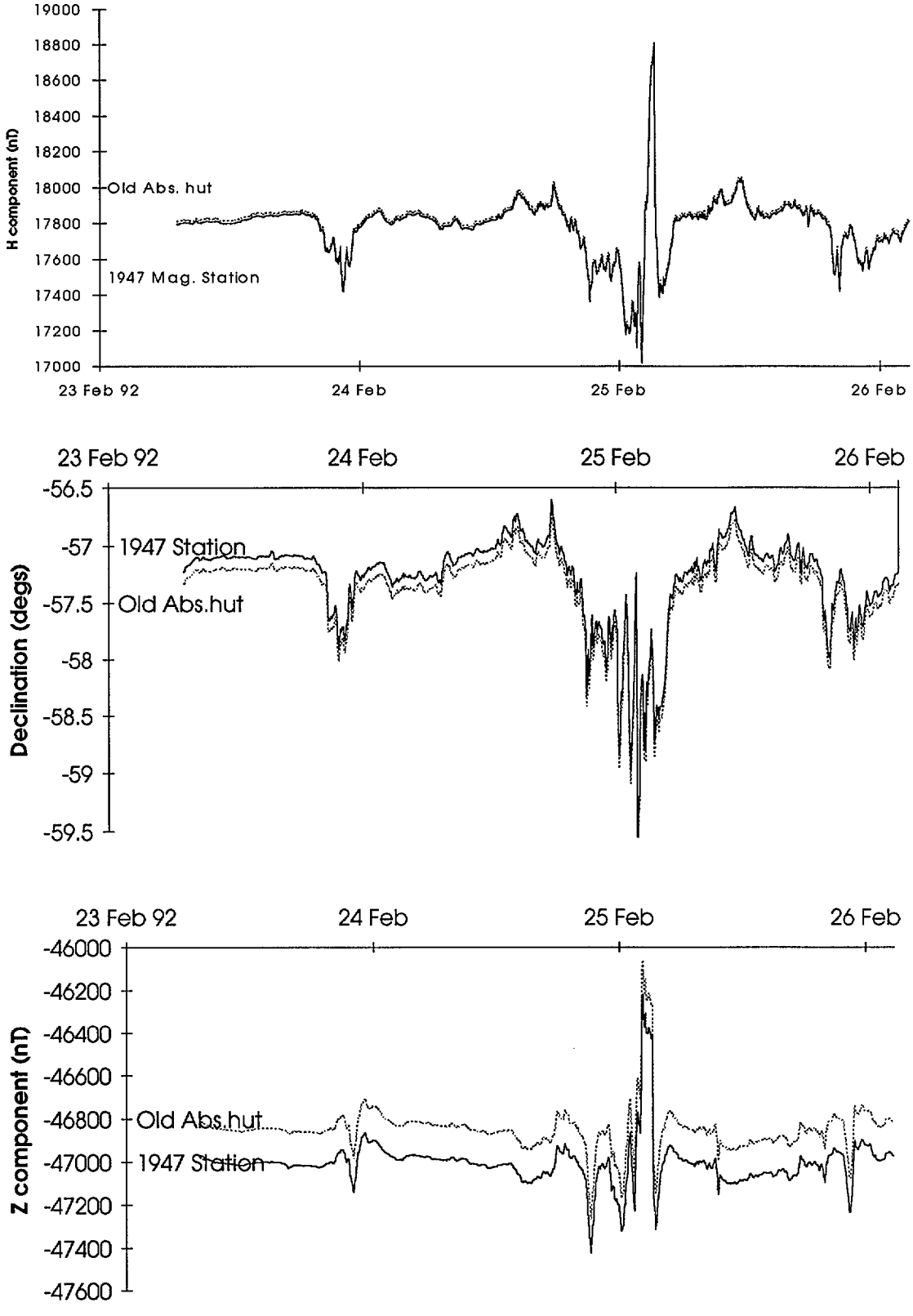


Figure 17. Heard Island Occupation- H,D and Z for the Atlas Cove Station



CHAPTER 5. CONCLUSIONS AND RECOMMENDATIONS

The use of fluxgate magnetometers to provide variometer data on the Prince Charles Mountains and Heard Island survey was successful. The performance and reliability of the variometers may be improved by the use of more cold-tolerant batteries, and by an increase in available memory to allow storage of each field value, rather than incremental values.

With the time available on return to Australia, analysis of the PCM and Heard Island field data was limited to reduction of the absolute observations, determination of baselines for the variometer data and calculation of the field values for the data set. These are presented as mean-hourly values so that future analysis can easily be carried out to determine the mean level of the quiet field at each station, for the eventual purpose of estimating the secular variation. It is unlikely that the geomagnetic field level was quiet during all station occupations, so that some estimate must be made of how much the field varied from quiet levels at the time of occupation. One way of achieving this is to choose time intervals over which the field is least disturbed and obtain an average value of the field at Mawson and at the station for these time intervals. The difference between the Mawson "least-disturbed" average and the Mawson "quiet-field value" can be used as a "quiet-day variation" correction to the station average. This assumes that the difference between the least-disturbed filed and the quiet field does not change over the 300-400km distance between the two regions.

The choice of time intervals over which to take "least-disturbed" averages is important; the less disturbed the field the closer it is to the value to be estimated and hence has less scope for error due to the spatial assumption. Recent analysis by Crosthwaite (1992) indicates that there is a significant diurnal variation in the quiet field at Mawson over the summer months, but little over the winter months. However there are certain hours of the summer day over which the level of the quiet field is close to that of winter, namely 09 UT to 21 UT. This time interval is recommended for the analysis described above. The choice of the Mawson "quiet field value" is also significant. Monthly quiet-day means show some scatter about the annual mean, so that a best estimate of the quiet field value is most likely obtained from an interpolation between two or more annual means, to the month of interest. For this data set, an interpolated value could only be obtained after analysis of the Mawson 1992 data.

It may be interesting to investigate spatial and possibly temporal differences in the magnetic field between each station, the Jetty Peninsula station, and Mawson. Qualitative comparisons indicate that the Jetty Peninsula record is very close to those from the individual stations. In future reoccupations it may be possible to locate a variometer at only one station, and to carry out one-day absolute measurements at the remaining stations. This would significantly reduce logistic and time requirements for a repeat survey of the PCM area. The logical extension of this is to consider using Mawson variometer data to reduce PCM repeat station data if no on-site variometer is used. Although the major features of the PCM variometer data also occur in the Mawson data, short-term differences between the two may cause large inaccuracies if Mawson data were used as a reference for the PCM stations. This analysis must be carried out before a reasonable estimate of the inaccuracy can be made.

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ACKNOWLEDGEMENTS.

Contributions from many expeditioners were essential in making all 1991/92 field programs in the Prince Charles Mountains possible. In particular, the 1991 traverse party did an excellent job of preparing Dovers for our arrival and the personnel at Dovers Base carried out the support operations admirably. Personal thanks to my field assistants Pete Sullivan, Garry Sugrue and Nic Deka who not only contributed to the field work, but provided essential moral support in trying conditions.

Logistics support in the Prince Charles Mountains and at Heard Island was provided by the Australian Antarctic Division. On-site organisation was very capably carried out by Louise Crossley (PCM field leader) and James Shevlin (voyage leader).

APPENDIX A. SUMMARY OF FIELD WORK LOG

Date/ Time	UTC	Log Summary
17/12/91		AWAGS magnetometers #8 and #55 arrived on V4 with JLJ
19/12/91		Tested mags and started #55 at 04:28 and #8 at 05:21 in lab
24/12/91		Flew out to Dovers, departed 07:00, arrived 09:30 UT
		Weather clear, 30 knots, -6C
26/12/91		AWAGS mags put outside apple
29/12/91		Estimated temp of snow to be -8C
		Flew Dovers to Jetty Peninsula, dep 16 arr 17UT, with Pete Sullivan as fieldie
30/12/91		Buried mags #8 and #55 at 06:50and11:00UT resp.
		Set up DIM, PPM; did 2 sets of half-DIM obs
31/12/91		Did 5 sets half-DIM obs, 4 sunshots; measured M-F pier difference
1/1/92		Did 3 sets half-DIM obs, 2 full obs; did F-survey around pier M
2/1/92		Did 2 sets half-DIM obs, round of angles, elevation measurements
		Removed mag #55 at 05:40UT
		Flew Jetty to Blustery Cliffs, dep 09:40 arr 10:30UT, with Gary Sugrue as fieldie
		Buried mag #55 at 17:10 UT; set up camp.
3/1/92		Did 4 half-DIM obs, 4 sunshots; had trouble with levelling in wind gusts
4/1/92		Did 5 half-DIM obs, 2 full obs; measured distances in site setup.
		Chopper arrived with new Codan battery, during which I dislocated right shoulder.
5/1/92		Did 2 half-DIM obs; trouble with levelling and sore shoulder
		Did round of angles and elevations, local F survey; measured M-F pier difference.
6/1/92		Packed up, removed mag #55
		Flew Blustery to Else Platform, dep 05:30 arr 06:45, going via Jetty to refuel from 06:10 to 06:25UT. Set up camp and mag site.
		Buried mag #55 at 09:50UT
		Tested survey tent - poles, aluminium pegs, s/steel valance & guy hooks all non-magnetic
7/1/92		Did 10 half-DIM obs, much easier in survey tent, out of wind and sun
		Checked and realigned optical/magnetic axis of DIM after second obs
8/1/92		Did 2 half-DIM obs and 2 full obs; 6 sunshots; round of angles and elevations; measured M-F pier difference; did local F survey.
9/1/92		Packed up, including mag #55 at 05:15UT
		Flew Else to Corry Massif, dep 08:10 arr 09UT. Set up camp and mag site.
		Buried mag #55 at 17:20UT, Cannon AA batteries needed replacing.
10/1/92		Did 8 half-DIM obs, spent hours checking/confirming azimuth marks.
		Noticed secondary stopwatch was 1 minute slow exactly.
11/1/92		Attempted obs, but DIM had broken. radioed for assistance on evening sked
		Did M-F pier difference, local F survey; did round of angles between assumed marks and new mark on Mt Giddings; measured distances in site setup.
12/1/92		Choppers dropped off soldering iron, and exchanged Gary for Simon. No luck fixing DIM, requested return to Dovers.
13/1/92		Overcast, no flying today; did another round of angles
14/1/92		Overcast, no flying. Packed up mag site, including mag #55 at 10:30UT
15/1/92		Clear skies, yippee. Flew Corry to Dovers dep 10:30 UT
		Attempts to fix DIM at Dovers unsuccessful
16/1/92		Flew Dover to Mawson with DIM. JJ could not locate the problem, so flew back to Dovers with QHM 302, QHM circle, BMZ tripod and Askania midget theodolite as replacement
17/1/92		Windy, flying delayed. Flew Dovers to Moore Pyramid dep 09UT with Nic Deka as fieldie.
		Asked chopper HBA to hover over gravity station to get GPS fix.
		Set up camp, survey tent. Buried mag #55 at 13:50 UT.

18/1/92	Set up mag site, took hours using replacement instruments. Needed a lower mark to suit QHM. Did one QHM obs in fading light, then neither PPMs would work. Gave up. Nic had a glorious day of skiing.
19/1/92	Did 10 QHM obs, using new marks.
20/1/92	Did 6 QHM obs, 6 sunshots, and round of angles in sub-human conditions. Measured M-F pier difference, measured distances of site setup.
21/1/92	Overcast and late snow, no flying today. Climbed Moore Pyramid.
22/1/92	Found survey tent blown down and ripped in 90 knot gusts. Repaired rips. Snowing, windy all day, no flying, skiing no fun.
23/1/92	Packed up, departed approx 05:30 UT, flew to Mt Starlight but wouldn't land, flew to Dovers, landing gear at Mt Jacklyn site first. Rode quikes to Mt Jacklyn, set up mag site. Buried mag #55 at 10:30UT, measured site setup.
24/1/92	Did 10 QHM obs, using new lower marks for QHM.
25/1/92	Did 4 QHM obs, 6 sunshots, round of angles, measured M-F pier difference
26/1/92	Packed up mag site and mag #55 at 09:30 UT, while choppers flew to Mawson to pick up traverse crew and the DIM which JJ and radio tech had fixed. Flew Dovers to Mt Starlight arr 13:30 UT. Set up camp and survey tent.
27/1/92	Buried mag #55 at 07:10UT Did one half-DIM obs, but DIM cold and response is sluggish; suspect alignment is out..
28/1/92	Adjusted DIM alignment, did 2 obs and DIM broke again; appears to be the same problem. Reluctantly set up the QHM instead, did 4 obs.
29/1/92	Did 6 QHM obs, after much trouble warming tent so QHM thermometer was on scale. Measured M-F pier difference, attempted F survey - PPM malfunctioning due to cold batteries
30/1/92	Attempted another F survey but replacement batteries also gave up, attempted sunshots but too much cloud cover, so I gave up. Given an hour's notice to pack up on afternoon sked (08:30UT), so took down campsite and mag site in a panic. When only 5 mins away from us, choppers turned back for Dovers. Reset the tent, and waited. And waited until 9pm, when we were told to stay for the night. Unpacked and flopped into bed.
31/1/92	Waiting and skeds all day. Flew Mt Starlight to Dover at 15:30 UT. Asked HBA to hover over cairn for GPS fix on Mt Starlight site.
1/2/92	Due to panic about getting everyone back to Mawson, no more field work in remote sites allowed. Waiting for flight to Radok Lake...
2//2/92	Flew Dovers to Radok Lake at 03:30 UT, via Jetty Peninsula to pick up mag #8 at 04:30 UT. No time allowed for observations at Jetty. At Radok, attempted to reach Beaver Lake astro station via Pagadroma Gorge. Stopped by cliffs
3/2/92	Bad weather restricted movements, no flying
4/2/92	Packed up, flew Radok to Dovers at 03:30 UT. Attempted flight to Mawson at 04:30, turned back due to cloud on horizon.
5/2/92	Flew Dovers to Mawson at 16:00UT. Had a long hot shower and FT
7/2/92	Checked AWAGs magnetometers - both still outputting numbers (in the warmth of the lab).

APPENDIX B. EQUIPMENT CHECKLIST

General

- DIM electronics box, service and user manual.
- DIM theodolite and matching tripod (with securing bolt); theodolite tool kit (including brass screw driver for adjustment to the fluxgate sensor orientation) and sunfilters for sun observations.
- PPM electronics box, PPM head, extension poles, service and user manual.
- Extra wooden tripod for supporting the PPM.
- Ample supply of batteries for the DIM and PPM (at least 3 spare sets)
- Foam support boxes for the DIM and PPM electronics.
- DIF observations forms. Sunshot observation form. Station and azimuth mark description proformas.
- Thermometer and barometer (or hand held altimeter) for determining atmospheric corrections to altitude observations of the sun.
- Hand held magnetic compass.
- Programmable calculator and manual; a sun almanac program. Nautical almanac as backup.
- Two multifunction time pieces (time of day/stop watch). If the stop/reset buttons on the watches are too easily operated, then a they should be modified to accept a "securing pin" to prevent accidental operation. Most time pieces are unfortunately magnetic - non magnetic units would be far better.
- A radio, spare batteries, manual and long wire/dipole aerials (Codan type) for time signal reception. The Sony ICF-2001D AIR/FM/LW/MW/SW PLL synthesised receiver worked very well in the Prince Charles Mountains.
- Maps and previous station descriptions.
- Field note books, at least 2.
- HB pencils and pens which work in the cold and don't run when wet. Several "permanent" markers.
- A nonmagnetic clip board with ample supply of elastic bands to secure observations forms in extremely windy conditions.
- 30m tape measure for station descriptions.
- Nonmagnetic stakes (about 10mm diameter, 200mm long) for marking new or unmarked observation stations. Nonmagnetic TAGS for attaching to stakes, preferably premarked with station and pier name. Brass hammer optional
- Ball of string with 1, 2, 3, 4, 5, 10, 15, 20, 25, 50m....etc positions premarked for local F surveys - tape measures are very difficult to handle in strong wind.
- Silk inner gloves, kidskin leather gloves, or Damart thermalactyl gloves; "fold back" woollen mittens that allow use of the fingers when necessary.
- Tape, string, stationary, torch, batteries, map reading items such as rulers, protractors etc.
- basic repair materials, eg sidecutters, Scotchlock quick cable repairers, etc
- Survey tent with nonmagnetic poles. A tent was found in the glacio hut with aluminium poles and custom-made fold-down flaps on all sides at about shoulder height. It was found to be invaluable in doing observations - not only was it far more comfortable, but it also significantly decreased vibration of the DIM vertical scale. It can be erected at all stations covered by this report, although it is more difficult in some of the bouldery sites. Pegs are of no use as all sites are on rock or gravel. The valance should be well secured with rocks. Care must be taken to situate the apex of the tent directly over the observation station, otherwise headroom around the DIM is restricted. The tent is the old-style full-size green polar pyramid and should be checked for rips before use. The canvas "cap" used to secure the 4 poles at the apex was missing and synthetic cord was used instead. This was too loosely secured on one occasion and eventually wore through in strong winds, causing the tent to blow down. A replacement is required.

With portable variometers:

- variometer(s) with wooden carry case - make sure it is solid and fastens, otherwise take a buckled strap to secure it during transport. Installation and operating instructions, record sheets.
- Canon X07 handheld computer with manual
- Interface cable with 5-pin DIN-type connector at one end, 9-pin RS232-type connector at the other end
- DIN shorting plug
- 4×AA spare batteries for Canon
- small jar of vaseline or grease

- spares - brass screws, rubber seals for entry holes, fuses (5A 240V)
- cotton bivvy bag or other form of windproofing
- screwdriver, spade, mattock

With QHM observations:

- QHM with thermometer rated to -25°C
- Metal circle if available, or QHM Circle if you're unlucky
- BMZ tripod (fits QHM circle, check with metal circle)
- Askania midget theodolite and matching tripod.
- cork with magnetised needle inserted
- non-magnetic magnifying eyepiece
- plumbob
- torch, nonmagnetic if possible
- HDF observation forms
- patience

APPENDIX C. MARK AZIMUTHS AND ROUND OF ANGLES

Table 19. Comparison of mark azimuths determined in 1990 and 1992 PCM surveys
Standard errors are given for values determined from sunshots; those without are derived from round of angles.
All azimuths from pier M at each station.

Station	Mark	Azimuth 1990	Determination 1992
Blustery Cliffs	"V"	203° 09' 32" ±13"	203° 09' 14" ±9"
	NMS107 Mt Woinarski	293° 09' 14"	293° 07' 38"
Jetty Peninsula	"Rock"	12° 43' 20"	12° 43' 48"
	NMS148 Fox Ridge	278° 43' 59" ±16"	278° 43' 41" ±16"
Else Platform	Russian Cairn	155° 31' 09" ±10"	155° 30' 45"
	"Sandilands"	244° 49' 38" ±2"	244° 49' 33" ±13"
Moore Pyramid	NMS120 Mt Wishart	131° 03' 38" ±9"	131° 03' 54"
	"V Moonie"	not used	344° 35' 48" ±46"
	"Bond"	not used	54° 28' 48"
Mt Starlight	"Trig"	94° 17' 09" ±10"	none made
	NMS132 Mt Bechervaise	84° 35' 33"	none made
	NMS111 Moore Pyramid	114° 42' 33"	none made
	"Moore feature"	114° 54' 51"	none made
Corry Massif	"Hill"	267° 57' 59" ±3"	267° 58' 14"
	"Nunatak" (Mt Lacey)	3° 26' 53"	3° 26' 56"
	"V Giddings"	not used	5° 51' 47" ±9"
Mt Jacklyn	"Nunatak"	279° 15' 36" ±10"	279° 15' 12"
	"Farley"	307° 24' 18"	307° 24' 36"
	"Cairn" AUS016	not used	39° 47' 57" ±27"

Table 20. Comparisons of round of angles results from 1990 and 1992 PCM surveys
From pier M at each station.

Station	Marks	Measured 1990	Difference 1992
Blustery Cliffs	"V" - NMS107	89° 59' 42"	89° 58' 24"
Jetty Peninsula	NMS148 - "Rock"	93° 59' 21"	94° 00' 07"
Else Platform	Cairn - "Sandilands"	89° 18' 28"	89° 18' 48"
Moore Pyramid	"V Moonie" - NMS120	not used	146° 28.1'
	"V Moonie" - "Bond"	not used	69° 53.0'
Mt Starlight	"Trig" - No 2 cairn	69° 36'	not done
	"Trig" - NMS132	-9° 41' 36"	-9° 41' 30"
	"Trig" - NMS111	20° 25' 24"	20° 25' 18"
	"Trig" - Moore feature	20° 37' 42"	20° 37' 42"
Corry Massif	"Hill" - "Nunatak"	95° 28' 54"	95° 28' 38"
	"Hill" - "V Giddings"	not used	97° 53' 33"
Mt Jacklyn	"Nunatak" - "Farley"	28° 08' 50"	28° 09.4'
	"Nunatak" - "Cairn"	not used	120° 32.75'