

28/85

303001

AMOCO AUSTRALIA PETROLEUM COMPANY

REPORT

ON

POSITIONING OF RIG

GLOMAR ROBERT. F. BAUER

ON

LOCATION

"YOLLA NO. 1"

IN

BLOCK T-14-P

BASS STRAIT

AUSTRALIA

Dated: July, 1985.

Report No. K081/85/AM

OR-309A

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1 INTRODUCTION

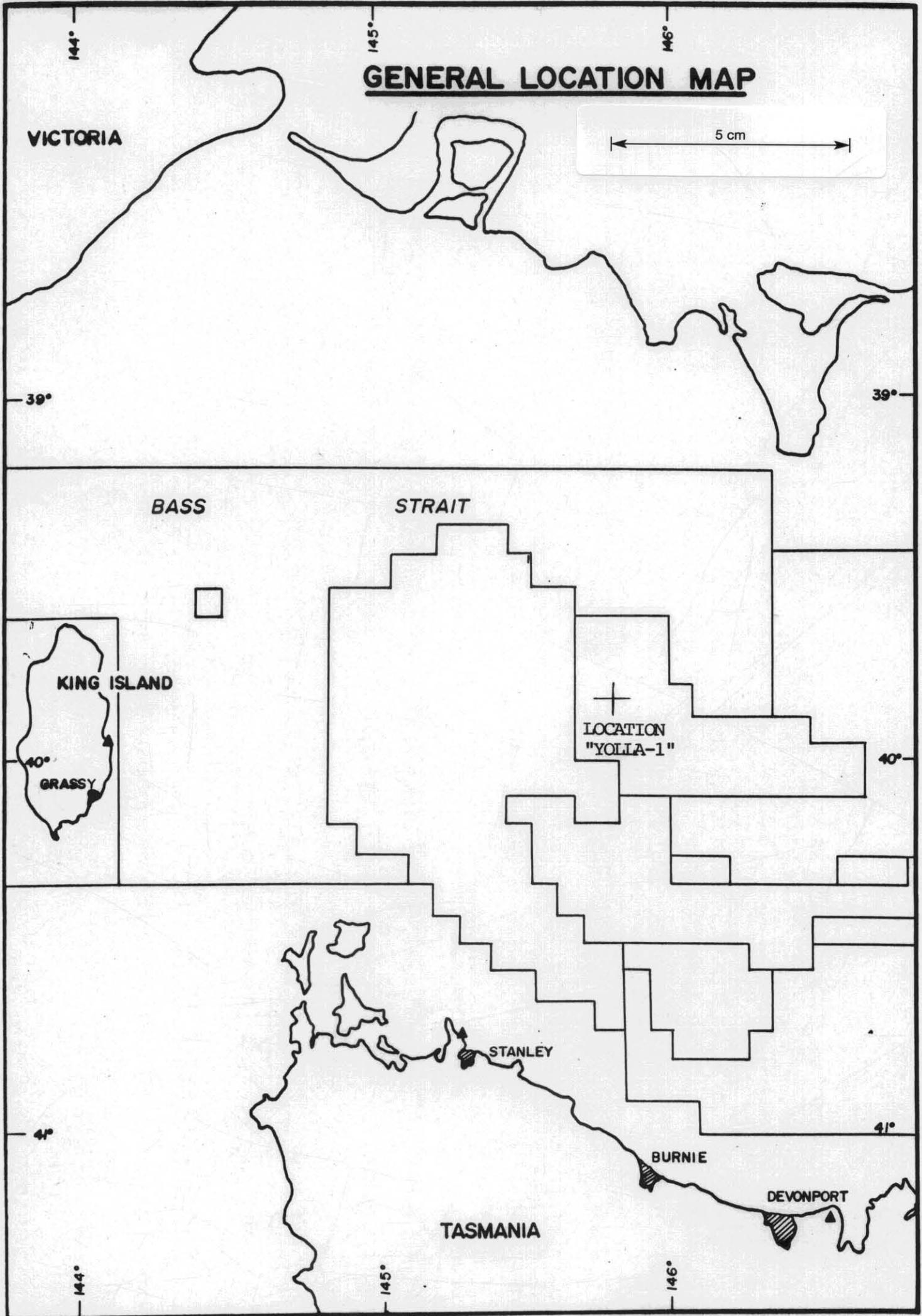
GEOMEX SURVEYS (AUSTRALIA) PTY. LTD. was contracted by AMOCO AUSTRALIA PETROLEUM COMPANY to position the drilling vessel 'GLOMAR ROBERT. F. BAUER' on location "YOLLA NO. 1" in permit area T-14P, in the Bass Strait, Australia.

Positioning was conducted using a Maxiran chain established in the area and a seabed acoustic system with Magnavox MX 1107 Satellite Receiver installed onboard.

The rig was positioned over location on the 7th June, 1985 with the final co-ordinates for the drill-stem being :
Latitude - 39° 50' 18.89" South
Longitude - 145° 48' 20.55" East

This position is 15.6 metres at 277° from the proposed location.

GENERAL LOCATION MAP



2 PERSONNEL, EQUIPMENT AND LOGISTICS SUPPORT

2.1 Personnel

The following personnel were engaged on this project:

Tony Cox	: Party Chief/Hydrographic Surveyor
Graham Harries	: Hydrographic Surveyor
Bruce Robinson	: Base Operator
William Gray	: Base Operator
Tim Moore	: Base Operator
Gary Dobson	: Base Operator
F. Renton	: Client Representative

2 PERSONNEL, EQUIPMENT AND LOGISTICS SUPPORT

2.2 Equipment

The following survey equipment was employed on this project:

The Maxiran Positioning System comprising:-

(A) Complete Mobile System plus backup

- Two - Monitors S/No.s 74, 78
- Two - Interrogators S/No.s 151, 114
Complete set of cables and connections
- Two - Sets of L.P.L. Antennas, omni-directional whips, Antenna rotators and Rotor Controls
- Two - Linear Amplifiers/Power Supply
- One - S.S.B. Radio
- Two - HP 9826 Computers
- Two - Scope III Interface units
- One - HP 2671G Printer
- One - HP 9872 Plotter

(B) Four Sets of Base Stations equipment plus backup

- Seven - Base Beacons/Beacon Control Box and L.P.L. Antennas
Complete set of cables, connections
- Four - Complete Base Stations comprising of:
Generator, Radio (S.S.B.), Tower Sections, and Auxillary Equipment.

Acoustic Positioning System comprising:-

- Two - HP 9836 Computers
- One - HP 2671G Printer
- One - Oceano RM201 Range Meter
- One - Oceano TT101 Telecommand Module
- One - Oceano IM100 Interface Module
- One - Oceano PS100 Power Supply

2 PERSONNEL, EQUIPMENT AND LOGISTICS SUPPORT

2.2 Equipment

Acoustic Positioning System comprising:- (Cont'd)

- One - Oceano Spares Kit
- One - AM121 Acoustic Module on 20 metres dunking cable
- One - AM121 Acoustic Module marked in a streamlined towfish
- One - Hand winch with towfish cable
- Eight - Oceano Acoustic Transponders (6 previously placed)
 - Deck cables, consumables
 - Velocimeter

Satellite Positioning System comprising:-

- One - Magnavox MX1107 Satellite Receiver
- One - Marine Antenna
 - Magnavox Spares Kit

2. PERSONNEL, EQUIPMENT AND LOGISTICS SUPPORT

2.3 Logistics Support

The equipment was stored in Devonport, Tasmania, following the "Seabed Investigation Survey" (See Report No. K071/85/AM) performed in April and May, 1985, and was mobilized onto the "M/V Yardie Creek" in Devonport on the 29th May, 1985. Upon completion of the 'rig move' the acoustic positioning system was left onboard the rig in case of bad weather forcing the vessel off location. The remaining equipment was re-stored in Devonport.

Onshore support was provided by the Maxiran Shore-based operators. Co-ordination and support also being provided by the Geomex base in Perth.

3 CHRONOLOGICAL RECORD OF EVENTSTuesday 28th May, 1985

- 08.00 Surveyor, Maxiran Engineer and three Base Station operators assembled in Devonport.
- 10.00 Supplies purchased for Base Station.
- 12.00 Base station operators departed to their respective base stations.

Wednesday 29th May, 1985

- 10.00 All base stations re-installed and operating.
- 12.00 Loading and installing mobile equipment onboard "M/V Yardie Creek".

Thursday 30th May, 1985

- 11.15 Surveyor's and Client Representative arrive in Devonport.
- 14.15 Vessel departs Devonport for survey area.
- 18.00 Crossed baseline The Nut - Point Sorell

Friday 31st May, 1985

- 09.00 Crossed baseline Naracoopa - Point Sorell
- 16.00 Crossed baseline Naracoopa - Liptrap
- 20.30 Crossed baseline Liptrap - The Nut
- 21.35 Vessel on location, commenced Maxiran and acoustic crosschecks.

Saturday 1st June, 1985

- Recorded wind, sea state and tidal current conditions for the client, while running further checks on Maxiran and Acoustics.

3 CHRONOLOGICAL RECORD OF EVENTSSunday 2nd June, 1985

- 10.14 Dropped 'anchor marker buoy' No. 4.
- 10.20 Dropped 'anchor marker buoy' No. 6.
- 10.37 Dropped 'anchor marker buoy' No. 5.
- 11.50 Dropped 'anchor marker buoy' No. 7.
- 12.45 Dropped 'anchor marker buoy' No. 3.
- 13.42 Dropped 'anchor marker buoy' No. 2.
- 14.06 Dropped location buoy.
- 15.06 Dropped 'anchor marker buoy' No. 1.
- 15.32 Dropped 'anchor marker buoy' No. 8.
- 16.00 Acoustic Fish retrieved, vessel steaming to King Island.

Monday 3rd June, 1985

- 18.00 Rendezvoused with rig 'Glomar Robert. F. Bauer', north of King Island.
- 20.15 Personnel and equipment transferred to rig.

Tuesday 4th June, 1985

- 03.00 Equipment set-up and operating.
- 03.30 Rig commenced approach to location, Anchor No. 8 dropped
- 09.05 No. 1 anchor dropped, Magnavox MX1107 arrived onboard rig.
- 14.18 No. 5 anchor dropped.
- 18.45 No. 4 anchor dropped.
- 21.48 No. 8 anchor dropped.
- 22.15 No. 8 anchor retrieved.

Wednesday 5th June, 1985

- Rig on standby due to weather

3 CHRONOLOGICAL RECORD OF EVENTSThursday 6th June, 1985

09.00 No. 8 anchor dropped.
11.35 No. 2 anchor dropped.
12.02 No. 4 anchor re-run.
13.17 No. 4 piggyback anchor dropped.
14.10 No. 1 anchor run.
14.40 No. 1 piggy back anchor dropped.
16.08 No. 6 anchor dropped.
16.20 Rig pulling onto location.
21.36 No. 7 anchor dropped.
22.00 No. 7 piggyback anchor dropped.
23.38 No. 1 anchor dropped.

Friday 7th June, 1985

09.20 Re-commenced manoeuvring onto location.
10.38 No. 8 anchor re-run, piggyback set.
14.53 No. 2 anchor re-run.
15.00 No. 4 anchor re-run.
15.20 No. 2 piggyback anchor dropped.
15.40 No. 4 piggyback anchor dropped.
17.27 No. 7 piggyback anchor dropped.
17.45 No. 8 anchor dragged out.
18.00 Rig positioned over location, commenced final
fixes.

Saturday 8th June, 1985

01.30 First pass of satellite confirmation.
13.00 Completed final Maxiran position fix.
16.00 Packed Maxiran positioning equipment into container.

3 CHRONOLOGICAL RECORD OF EVENTSSunday 9th June, 1985

- 10.00 Recorded last satellite pass. No. 24.
- 12.00 Packed Sat-Nav equipment.
- 13.15 Personnel departed rig by helicopter.

Monday 10th June, 1985

- Maxiran Base Stations de-rigged and equipment stored at their respective sites.

Tuesday 11th June, 1985

- Base Station operators returned to Devonport.
- Survey personnel departed Devonport after assisting with packing and storage of equipment. Only two Base operators remained.

Wednesday 12th June, 1985

- Two Base operators employed looking for alternative and better site for Sorell Station equipment.
- Base operators departed Devonport.

Thursday 13th June, 1985

- Re-mobilized Hydrographic Surveyor to Devonport after informed that rig was moved off location in bad weather.

CHRONOLOGICAL RECORD OF EVENTSFriday 14th June, 1985

- 13.00 Hydrographic Surveyor arrived onboard rig by helicopter.
- 14.00 Meeting with Rig Captain and Company man.
- 16.00 Transferred Survey equipment to "M/V Yardie Creek".
- 20.00 All equipment deployed on "M/V Yardie Creek".
- 21.50 Rigs anchor No. 2 re-laid.
- 23.00 Marked location for anchor No. 1.

Saturday 15th June, 1985

- 06.46 Rigs anchor No. 1 re-laid.
- 08.00 Waiting on weather to re-run anchor No. 2 which was dragged.

Sunday 16th June, 1985

- Rig waiting on the weather to improve.
- 23.45 Re-deployed acoustics towfish.

Monday 17th June, 1985

- 00.50 Re-laid anchor No. 1.
- 01.25 Re-laid anchor No. 1 piggyback.
- 04.37 Re-laid anchor No. 2.
- 05.20 Re-laid anchor no. 2 piggyback.
- 05.35 Checked position of anchor no. 8.
- 06.05 "M/V Yardie Creek" awaiting instructions from rig.
- 19.00 Vessel released to travel to Devonport.

Tuesday 18th June, 1985

- 08.30 Vessel docked in Devonport.
- 10.00 Equipment packed and stored.
- 18.00 Hydrographic Surveyor departed Devonport.

4 SURVEY METHODS AND PROCEDURES

4.1 Maxiran Positioning System and Calibration

4.1.1 Mode of Operation

MAXIRAN POSITIONING SYSTEM - This is a medium range positioning system operating between the frequencies of 420 to 450 MHz with a bandwidth of ± 1.8 MHz. A series of phase coded pulses emitted from the mobile unit installed onboard the vessel interrogates the beacons at co-ordinated points ashore, each replying to the mobile after synchronizing code generators with a unique coded pulse. The transmission cycle is repeated once every 200 milli-seconds. The mobile unit measures the time elapse allowing for propagation corrections and component delays to output the range to each beacon to a high standard of accuracy.

This system operating in its range/range mode will provide position accuracies of better than ± 10 m., in excess of 200 km. offshore.

The compact units and low power requirements of this system facilitates transportation and deployment in the field. The shore stations are each manned by one experienced operator who is responsible for the installation and 24 hour operation of his equipment. All units are in contact by SSB radio.

4 SURVEY METHODS AND PROCEDURES

4.1 Maxiran Positioning System and Calibration

4.1.2 Base Station Data

The Maxiran Positioning System set-up for the Site Survey of "Yolla No. 1" location on 24th April, 1985, was re-installed at the following Shore Base Stations :-

a. Point Sorell

Latitude : $41^{\circ} 07' 24.749''$ South
Longitude : $146^{\circ} 31' 41.905''$ East
Eastings : 460 403.85 m.
Northings : 5 447 405.45 m.
Antenna Height : 42 m.

Established with a 12 m. tower, offset 1.85 metres bearing 162° from marker ST 517.

b. The Nut

Latitude : $40^{\circ} 45' 50.244''$ South
Longitude : $145^{\circ} 18' 13.416''$ East
Eastings : 356 829.45 m.
Northings : 5 486 045.74 m.
Antenna Height : 155 m.

Established with a 12 m. tower, offset 1.0 metres bearing 239° from marker ST 674.

4 SURVEY METHODS AND PROCEDURES4.1 Maxiran Positioning System and Calibration.4.1.2 Base Station Data (Cont'd)c. Naracoopa

Latitude : 39^o 55' 29.05" South
 Longitude : 144^o 07' 39.03" East
 Eastings : 254 516.76 m.
 Northings : 5 576 629.84 m.
 Antenna Height : 53 m.

Erected with a 18 m. tower, offset
 307.95 metres, bearing 98^o 7' 14"
 from marker 281/150.

d. Liptrap

Latitude : 38^o 51' 05.64" South
 Longitude : 145^o 57' 54.98" East
 Eastings : 410 212.83 m.
 Northings : 5 699 171.44 m.
 Antenna Height : 183 m.

Erected with a 13 m. tower, offset
 4.0 metres bearing 140^o magnetic
 from Trig marker.

All co-ordinates refer to :-

Datum : Australian Geodetic
 Spheroid : Australian National
 Projection : UTM Zone 55
 C. Meridian : 147^o East

4 SURVEY METHODS AND PROCEDURES

4.1 Maxiran Positioning System and Calibration

4.1.3 Short Baseline Calibration

The Maxiran system was calibrated on 7th May, 1985 over a short baseline distance of 15,168 m. between "Point Sorell" station and the trig marker at "Mersey Bluff", Devonport. Land pass was negligible and conditions were clear and stable.

Both mobiles were calibrated against all seven (7) beacons, with and without linear amplifiers and using both OMNI and L.P.L. antennas. The monitors and beacons were connected for zero set, and the interrogators adjusted with calibration screws to set for equal delays, before recording observed ranges for each mobile using all combinations of primary and back-up equipment.

The mobiles were set-up at "Point Sorell" using two towers off-set from the trig marker, while the beacons were operated from the tower set-up at "Mersey Bluff". The calibration distances calculated as follows :

Calibration Distance 1

North Tower of Pt Sorell - "Mersey Bluff"-15158.9 m.

Calibration Distance 2

South Tower of Pt Sorell - "Mersey Bluff"-15158.3 m.

See appendix 1 for Results of Short Baseline Calibration

4 SURVEY METHODS AND PROCEDURES

4.1 Maxiran Positioning System and Calibration

4.1.4 Long Baseline Calibration

On 8th May, 1985 a long baseline calibration was carried out between the stations at "Point Sorell" and "The Nut". The equipment configuration and the weather remaining the same as for the short baseline calibration.

The two towers with the mobile equipment at "Point Sorell" were left standing and the different spheroidal distances over which the calibration was carried out were calculated as follows :-

Calibration Distance 1

North Tower of Point Sorell - The Nut = 110569.8 m.

Calibration Distance 2

South Tower of Point Sorell - The Nut = 110572.2 m.

See appendix 1 for results of long baseline calibration.

As part of the long baseline calibration, the mobiles were left interrogating one beacon over this long baseline distance from 15.30 hours on 8th May to 08.30 hours on 9th May, 1985 to monitor any directional variation in the propagation of the signal.

The result of this was that very little variation was seen throughout the period.

4 SURVEY METHODS AND PROCEDURES4.1 Maxiran Positioning System and Calibration4.1.5 Baseline Crossings

On the 30th and 31st May, 1985 whilst enroute to the prospect area, four baseline crossings were performed, with the equipment set-up on the "M/V Yardie Creek". Details of these crossings are as shown below :-

Baseline Crossing	:	Naracoopa - The Nut
Calculated Distance	:	136640.20 m.
Observed Distance	:	<u>136638.80 m.</u>
C - O	=	+1.40 m.

Baseline Crossing	:	Naracoopa - Liptrap
Calculated Distance	:	198141.35 m.
Observed Distance	:	<u>198142.80 m.</u>
C - O	=	-1.45 m.

Baseline Crossing	:	The Nut - Point Sorell
Calculated Distance	:	110579.04 m.
Observed Distance	:	<u>110577.40 m.</u>
C - O	=	+1.64 m.

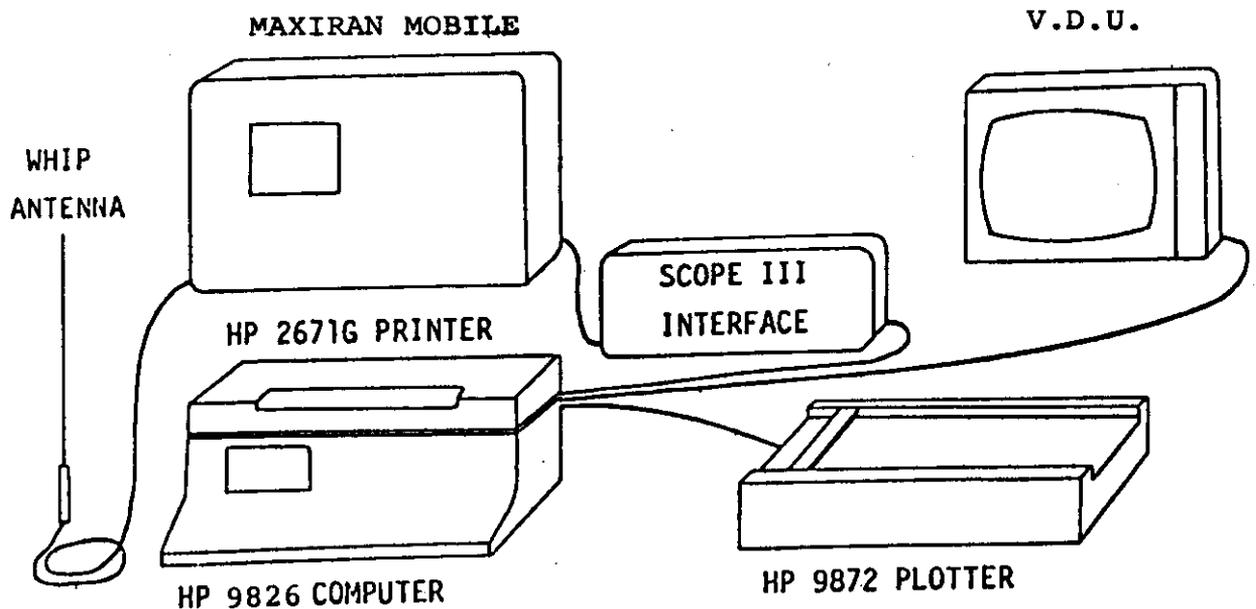
Baseline Crossing	:	The Nut - Liptrap
Calculated Distance	:	219760.26 m.
Observed Distance	:	<u>219762.90 m.</u>
C - O	=	-2.64 m.

4 SURVEY METHODS AND PROCEDURES4.1 Maxiran Positioning System and Calibration4.1.6 Navigation Tracking

The Maxiran was interfaced to a Navigation tracking system comprising of :-

HP 9826 Computer, Scope 26 Interfacing Unit, HP 2671G Printer and Plotter or V.D.U. displays.

The system was connected for normal operation, as illustrated :-



The Scope 26 System consists of an interfacing unit and software which is loaded into the HP9826 from a floppy disc. This converts the ranges to each of the shore stations displayed on the front of the mobile by a BCD output to a co-ordinate position on which a vessel or rig's positioning is conducted. The computer

4 SURVEY METHODS AND PROCEDURES

4.1 Maxiran Positioning System and Calibration

4.1.6 Navigation Tracking (Cont'd)

displays these co-ordinates together with any offset position, off-track and along-track distance, distance/bearings to targets, vessels speed, quality of positioning, etc.

Other facilities available to the user is the ability to fix and record raw data, convert readily between different spheroids and projections, draw charts on-line and compare position with a secondary navigation system, i.e. Acoustics. The HP 2671G line printer provides a permanent paper copy of all data in real time, while the VDU unit provides a constant visual aid for navigation.

This System together with the Mobile Maxiran equipment was installed at first on the standby vessel "M/V Yardie Creek" to check the position of the acoustic transponder away prior to the rigs arrival. It was then transferred to the rig on 3rd June, 1985 and set-up in the pilot house to guide the rig onto location.

Once the rig was on location with all anchors laid and tensioned, cross checks between Maxiran and Acoustic positions were run and a final Maxiran position for the drill-stem determined from the mean of readings recorded between 1900 hours on 7th June, 1985 and 1200 hours on 8th June, 1985.

4 SURVEY METHODS AND PROCEDURES

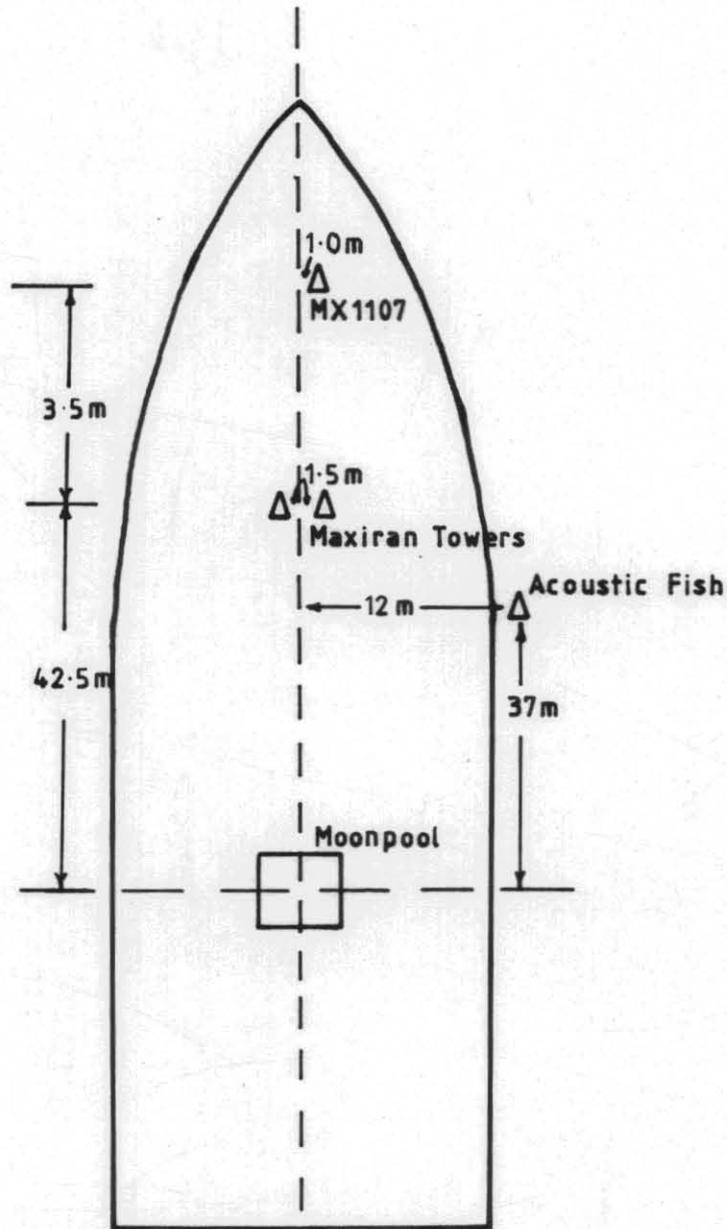
4.1 Maxiran Positioning System and Calibration

4.1.6 Navigation Tracking (Cont'd)

The dimensions of the rig showing the offset from the Maxiran Antenna to the drill-stem is provided in Fig. 2.

FIG. 2

OFFSET DIAGRAM OF RIG ROBERT F. BAUER



Not To Scale

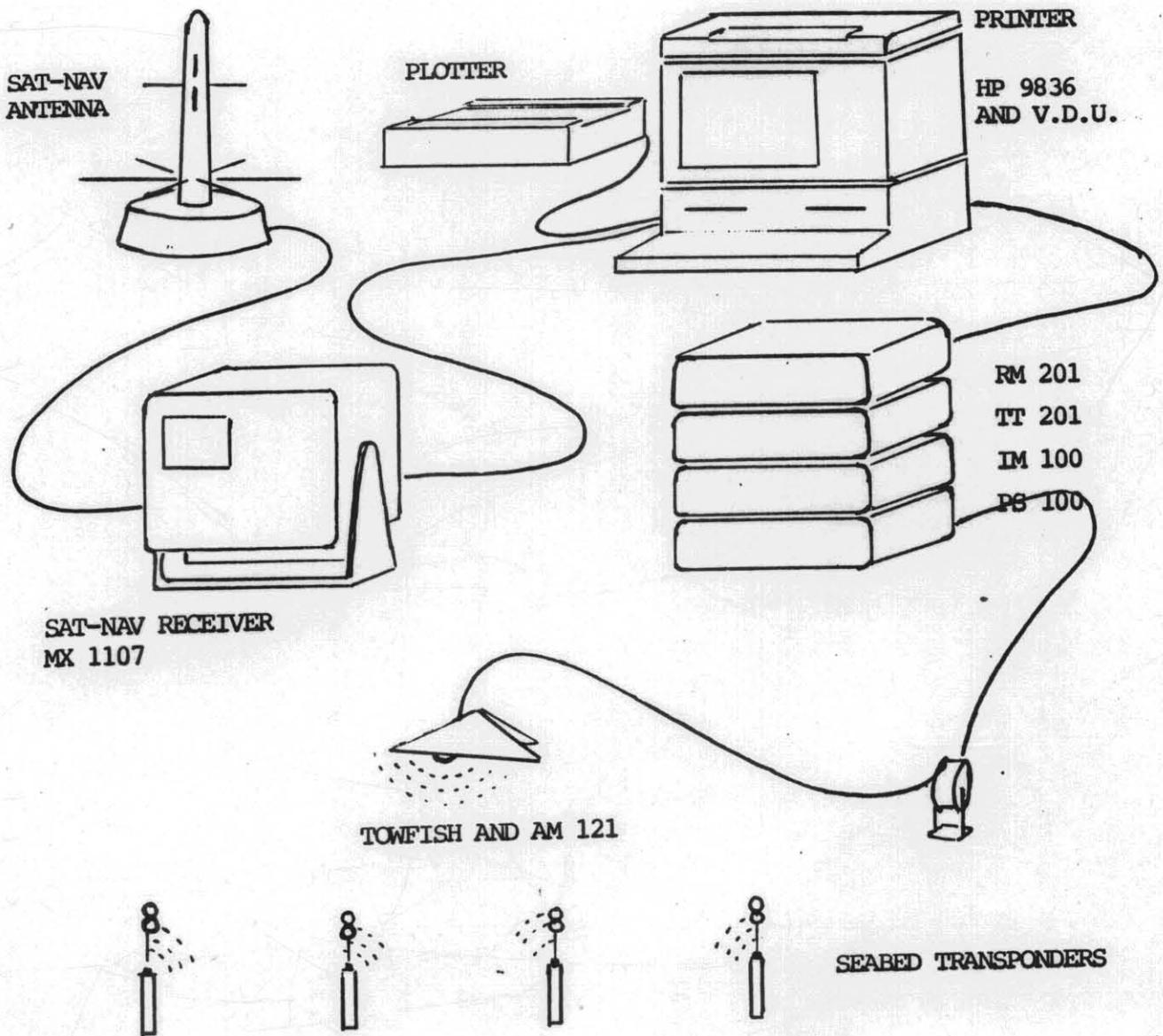
4 SURVEY METHODS AND PROCEDURES

4.2 Integrated Satellite-Acoustic Positioning System

4.2.1 Mode of Operation

The integrated satellite-acoustic positioning system employed on this project is manufactured by "OCEANO INSTRUMENTS" and comprises a low frequency long baseline acoustic system linked to a "MAGNAVOX" transit-satellite receiver, and integrated through a "HEWLETT PACKARD" desktop computer with V.D.U. displays for navigation.

The configuration of equipment is illustrated below :-



4 SURVEY METHODS AND PROCEDURES

4.2 Integrated Satellite-Acoustic Positioning System

4.2.1 Mode of Operation (Cont'd)

The acoustic system itself is made up of four (4) basic onboard units, a range meter, a telecommand unit, an interface module and a dedicated 24V D.C. power supply which controls the type and coding of interrogation signals emitted from an acoustic module mounted in a streamlined towfish and suspended over-the-side of the survey vessel. The transponder units laid in an array on the seabed receive the common interrogation frequency and reply on their own individual frequencies. These are received by the acoustic module and passed back to the onboard units where the time between signal transmission and reception is recorded, and processed to display the range in metres to each transponder.

The satellite navigation receiver is a MX1107 R.S. dual-channel survey receiver and with its marine antenna is a stand-alone system. The reason for its choice is its dead-reckoning facility through the entering of vessels course and speed, and its ability to display position in real-time. These facilities are enabled through a data-com interface and allow direct hand-shaking with the desk-top computer to assist with the positioning, and calibration of the acoustic transponder array on the seabed.

4 SURVEY METHODS AND PROCEDURES

4.2 Integrated Satellite-Acoustic Positioning System

4.2.1 Mode of Operation (Cont'd)

The desk-top computer is a HP 9836 with inbuilt V.D.U. display and sufficient memory and interface modules to communicate with the satellite receiver and acoustics range meter, for the software to perform the relative and absolute calibrations of the acoustic transponder array, the navigation and tracking of a vessel, the display and recording of position data, and all other functions that are required of a real-time Navigation Computer system.

4 SURVEY METHODS AND PROCEDURES

4.2 Integrated Satellite-Acoustic Positioning System

4.2.2 Calibration

The array of six acoustic seabed transponders laid at the time of undertaking the well site investigation survey, was checked from the standby vessel prior to the rig's arrival at location and found to be operating satisfactorily.

Details of the calibration of the transponder array are herewith given below :-

The relative calibration of the array was carried out between 18.00 hours and 22.00 hours, on the 28th April, 1985. This comprised the recording of temperature and salinity measurements, the recording of baseline distances by observing minimum ranges when steaming between transponders, and the recording of ranges at a number of points throughout the transponder network to check its rigidity and the assumed V.P. factor for the signal in water, by the solution of a number of least squares computations.

After completing the relative calibration, an absolute calibration was carried out on the transponder network by stationing the vessel at its centre and recording a total of 46 corresponding acoustic and maximum fixes simultaneously, which are used in a least squares program to find the rotational and transitional values for the network, and solve for the transponder co-ordinates.

4 SURVEY METHODS AND PROCEDURES4.2 Integrated Satellite-Acoustic Positioning System4.2.2 Calibration (Cont'd)

See Appendix 2 for calibration results of the seabed transponder array.

The final adjusted co-ordinates for the transponders are tabled as follows :-

T R A N S P O N D E R			P O S I T I O N	
NO.	SERIAL NO.	CODE	EASTINGS	NORTHINGS
1	552	14	399533.27	5589458.12
2	530	1	398425.68	5588623.00
3	551	9	397168.17	5587826.76
4	587	4	395892.45	5588963.09
5	650	15	397266.46	5590277.22
6	540	12	398461.37	5591128.21

The transponder network remaining on-site for the rig positioning, and subsequently to assist with the relocation of the rig should weather conditions cause interruptions to the rig's drilling operations. Repeatability of position with this network is expected to be approximately one (1) metre.

4 SURVEY METHODS AND PROCEDURES

4.2 Integrated Satellite-Acoustic Positioning System

4.2.3 Navigation Tracking

The Integrated Satellite-Acoustic positioning system was first installed onboard the standby vessel to check the Acoustic Transponder array and lay well location and anchor marker buoys prior to the rig's arrival on site.

The system then remained onboard to position the standby vessel as a visual guide and to assist with the centering of the rig over location and the siting of anchors.

Once the rig was on location on 7th June, 1985 the system was then transferred onboard, and a final fix of the rigs drill-stem positioned determined from the acoustics transducer lowered over the rigs starboard side. See Fig. 2.

This system was subsequently used on 15th to 17th June, 1985 to relocate the rig over location after one anchor cable parted and another anchor dragged, moving the rig off location in bad weather on 13th June, 1985.

4 SURVEY METHODS AND PROCEDURES

4.3 Satellite Positioning System

4.3.1 Mode of Operation

The Marine Satellite receiver used with the integrated Acoustic positioning system in a MAGNAVOX MX 1107 R.S. complete with antenna and cable.

This operates by monitoring the change in frequency, or doppler effect, of the 400 MHz and 150 MHz frequencies transmitted by each of the five transit satellites circling the earth in polar orbits.

Orbital data and time are received from each satellite with an up-dated message every two minutes. Interpolation of the satellite's position monitored with the change of received frequencies will provide a line of position on which the receiver lies. The recording of data from a number of satellites will therefore provide the position of the receiver. The greater the number of good satellite passes recorded, the greater the accuracy of the results.

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4 SURVEY METHODS AND PROCEDURES

4.3 Satellite Positioning System

4.3.2 Positioning

The MAGNAVOX MX 1107 receiver was used to provide a confirmation of the rig's drill-stem position, once on location.

This was carried out on the 7th to 9th July, 1985 with the receiver and antenna installed close to the rig's pilot house, and twenty-four (24) 3D Satellite passes recorded.

5 RESULTS

5.1 Acoustic Positioning

The final position for the derrick was determined using the seabed acoustic transponder network. All signals were steady and resulted of accuracies (i.e., Standard Deviations) of about 1.5 metres.

From this method the co-ordinates for the drill-stem was found to be :-

Latitude : 39^o 50' 18.89" South
Longitude : 145^o 48' 20.55" East
Easting : 397 814.2 m.
Northing : 5 589 460.9 m.

This position is 15.6 metres at 277^o from the intended location

5 RESULTS5.2 Maxiran Positioning

The derrick position was calculated hourly, from 1900 hours on 7th June, 1985 to 1200 hours on 8th June, 1985. The final position for the drill-stem was determined from a mean of 13 fixes, each resulting from monitoring the ranges for 15 minutes and is shown below :-

Latitude : $39^{\circ} 50' 19.09''$ South
 Longitude : $145^{\circ} 48' 20.85''$ East
 Easting : 397 821.6 m.
 Northing : 5 589 454.9 m.

The difference between the Final fix and the Maxiran fix is shown below :-

Maxiran Fix	397821.6 m.	5589454.9 m.
Final Fix	<u>397814.2 m.</u>	<u>5589460.9 m.</u>
	+7.4 m.	-6.0 m.

5 RESULTS5.3 Satellite Positioning

A further check of the position was made using the Magnavox MX1107 Satellite receiver. Twenty-four (24) passes were accepted by the MX1107 for 3D processing, to give the position of the drill-stem :-

Latitude : 39° 50' 19.51" South
Longitude : 145° 48' 20.19" East
Eastings : 397 806.0 m.
Northings : 5 589 441.7 m.

The difference between the Satellite fix and the Final fix is given below :-

Satellite Fix	:	397806.7 m.	5589441.7 m.
Final Fix	:	<u>397814.2 m.</u>	<u>5589460.9 m.</u>
		-7.5 m.	-19.2 m.

This position confirms that no gross error exist in either the Maxiran or Acoustic positions for the rig. The Acoustic position co-ordinates being accepted as consistant with seismic shot in the area and most representative of the rig's drill-stem position.

6 CONCLUSIONS

The drilling rig "Glomar Robert. F. Bauer" was positioned over location "YOLLA NO. 1" on the 7th June, 1985 with the final co-ordinates of the drill-stem being :-

Latitude : 39° 50' 18.89" South
Longitude : 145° 48' 20.55" East
Easting : 397 814.2 m.
Northing : 5 589 460.9 m.

This position being 15.6 metres at 277° from the intended location.

APPENDIX 1

MAXIRAN CALIBRATION INFORMATION

APPENDIX 1 - CALIBRATION INFORMATION

The two towers "N" and "S" with the mobile equipment installed on POINT SORRELL (ST 517) have the following co-ordinates:

POINT SORRELL (ST 517)

Latitude: 41° 07' 24.6921" South
Longitude: 146° 31' 41.8809" East
Northing: 5 447 407.233 metres
Easting: 460 403.278 metres

MOBILE TOWER 'N'

9.35 m. at 248° (Magnetic) from ST 517

Latitude: 41° 07' 24.7380" South
Longitude: 146° 31' 41.485" East
Northing: 5 447 405.770 metres
Easting: 460 394.043 metres

MOBILE TOWER 'S'

9.71 m. at 224° (Magnetic) from ST 517

Latitude: 41° 07' 24.8622" South
Longitude: 146° 31' 41.530 " East
Northing: 5 447 401.945 metres
Easting: 460 395.135 metres

The beacons were positioned at the MERSEY BLUFF at an offset from S.P.M. 200 (Please see station description - Appendix 3).

MERSEY BLUFF (S.P.M. 200)

Latitude: 41° 09' 37.3178" South
Longitude: 146° 21' 15.1429" East
Northing: 5 443 223.704 metres
Easting: 445 819.267 metres

Appendix 1 - Calibration Information (Cont'd)S.P.M. 200 (Offset)

10 m. at 61° (Magnetic) from S.P.M. 200

Latitude: 41° 09' 37.2331" South

Longitude: 146° 21' 15.557 " East

Northing: 5 443 226.39 metres

Easting: 445 828.90 metres

BASELINE CALIBRATION DISTANCES

Mobile Tower 'N' - 200 (Offset) = 15158.9 metres

Mobile Tower 'S' - S.P.M. 200 (Offset) = 15158.3 metres

Mobile Tower 'N' - The Nut (Maxiran Tower) = 110569.8 metres

Mobile Tower 'S' - The Nut (Maxiran Tower) = 110572.2 metres

Appendix 1 - Calibration Information (Cont'd)EQUIPMENT CONFIGURATION DURING CALIBRATIONS

Beacon No.	S/No.	Cable S/N	Control Box S/N
1	281	112	281
2	287	204	279
3	223	213	282
4A	284	207	232
4B	59	-	311
5	85	-	62
6	286	104	-

N.B. Gain Control on Beacon 6 sensitive.

<u>Tower 'N'</u>	<u>S/N</u>
Antennae (Loops)	
(omni)	411
Interrogator	151
Linear Amplifier	1450
Duplexer	3
Cable	105
Power Box	1450
Power Cable	1459

Appendix 1 - Calibration Information (Cont'd)Tower 'S'

	<u>S/N</u>
Antennae (Loops)	
(Omni)	402
Interrogator	114
Linear Amplifier	1193A
Duplexer	50
Cable	118
Power Box	1193A
Power Cable	

Appendix 1 - Calibration Information (Cont'd)SHORT BASELINE MOBILE S/N 78

(No Linear Amplifier)

Antenna Loops

Beacon	Tower	Raw Range	Zero Set	Calibrated Dist.
1	N	19932/33	4774	15158.5
	S	19932/33	4774	15158.5
2	N	19929/30	4771	15158.5
	S	19929	4771	15158.0
3	N	19934/35	4775	15159.0
	S	19933/34	4775	15158.0
4A	N	19929	4770	15159.0
	S	19928	4770	15158.0
4B	N	19923/24	4765	15159.0
	S	19923/22	4764 (4765)	15158.0
5	N	19923/24	4765	15159.0
	S	19923	4765	15158.0
6	N	19937	4778	15159.0
	S	19936/37	4778	15158.0

Appendix 1 - Calibration Information (Cont'd)SHORT BASELINE MOBILE S/N 78

(No Linear Amplifier)

Antenna - Omni - S/N 411 & 402

Beacon	Tower	Raw Range	Zero Set	Calibrated Dist.
1	N	19931	4772	15159
	S	19932	4774	15158
2	N	19931/30	4773	15159
	S	19931/32	4773	15159
3	N	19936	4777	15159
	S	19935	4777	15158
4A	N	19929/30	4771	15159
	S	19930/29	4771	15159
4B	N	19924/25	4766	15159
	S	19924/25	4766	15158
5	N	19924/25	4766	15159
	S	19924/25	4766	15158
6	N	19929/30	4771	19159
	S	19929	4771	19158

Appendix 1 - Calibration InformationSHORT BASELINE MOBILE S/N 78

(Linear Amplifier)

Antenna - Loops

Beacon	Tower	Raw Range	Zero Set	Calibrated Dist.
1	N	19948/49	4790	15159
	S	19947	4789	15158
2	N	19947/46	4787	15160
	S	19945/46	4787	15158
3	N	19946	4787	15159
	S	19945	4787	15158
4A	N	19945	4786	15159
	S	19943/44	4785	15158
4B	N	19941	4782	15159
	S	19940	4782	15158
5	N	19937/38	4778	15159
	S	19936/37	4778	15158
6	N	19945	4786	15159
	S	19943	4785	15158

Appendix 1 - Calibration Information (Cont'd)SHORT BASELINE MOBILE S/N 78

(Linear Amplifier)

Antenna : Omni

Beacon	Tower	Raw Range	Zero Set	Calibrated Dist.
1	N	19949/50	4791	15159
	S	19949	4791	15158
2	N	19948	4789/90	15159
	S	19948	4790	15158
3	N	19947	4788	15159
	S	19946/47	4788	15158
4A	N	19946/47	4788/89	15159
	S	19946/45	4787	15158
4B	N	19941/42	4783	15159
	S	19941	4783	15158
5	N	19939/38	4780	15159
		19938	4780	15158
6	N	19946/45	4787	15159
	S	19945	4787	15158

Appendix 1 - Calibration Information (Cont'd)SHORT BASELINE MOBILE S/N 74

(No linear amplifier)

Antenna : Loops

Beacon	Tower	Raw Range	Zero Set	Calibrated Dist.
1	N	19930/31	4772	15159
	S	19930/31	4772	15158
2	N	19929	4770	15159
	S	19928/29	4770	15158
3	N	19933/34	4776	15158
	S	19934/35	4776	15159
4A	N	19929	4770	15159
	S	19928	4770	15158
4B	N	19923/24	4765	15159
	S	19923/24	4765	15158
5	N	19923/24	4765	15159
	S	19923	4765	15158
6	N	19937	4778	15159
	S	19936/37	4778	15158

Appendix 1 - Calibration Information (Cont'd)SHORT BASELINE MOBILE S/N 74

(No linear amplifier)

Antenna : Omni

Beacon	Tower	Raw Range	Zero Set	Calibrated Dist.
1	N	19933/34	4775	15159
	S	19934/35	4776	15158
2	N	19930/31	4772	15159
	S	19931/32	4773	15159
3	N	19935/36	4777	15159
	S	19934/35	4776	15158
4A	N	19930	4771	15159
	S	19930	4772	15158
4B	N	19924/25	4766	15159
	S	19925	4767	15158
5	N	19924	4765	15159
	S	19924	4766	15158
6	N	19929/30	4771	15159
	S	19929	4771	15158

SHORT BASELINE MOBILE S/N 74

Antenna : Loops

Beacon	Tower	Raw Range	Zero Set	Calibrated Dist.
1	N	19947/48	4789	15159
	S	19945/46	4787	15158
2	N	19945/46	4787	15159
	S	19944/45	4786	15158
3	N	19946/45	4787	15159
	S	19945	4787	15158
4A	N	19945	4786	15159
	S	19944	4786	15158
4B	N	19940	4781	15159
	S	19939	4781	15158
5	N	19938	4779	15159
	S	19936/37	4778	15158
6	N	19945	4786	15159
	S	19944	4786	15158

Appendix 1 - Calibration Information (Cont'd)SHORT BASELINE MOBILE S/N 74

(Linear Amplifier)

Antenna : Omni

Beacon	Tower	Raw Ranges	Zero Set	Calibrated Dist.
1	N	19948	4789/90	15159
	S	19948	4790	15158
2	N	19947	4788	15159
	S	19947/48	4789	15158
3	N	19947	4788	15159
	S	19947	4789	15158
4A	N	19945	4786	15159
	S	19945/46	4787	15158
4B	N	19940/41	4782	15159
	S	19939/40	4781	15158
5	N	19939	4780	15159
	S	19939	4781	15158
6	N	19945/46	4787	15159
	S	19945	4787	15158

SHORT BASELINE MOBILE S/N 74

(Linear Amplifier)

Antenna : Omni

Beacon	Tower	Raw Ranges	Zero Set	Calibrated Dist.
1	N	19948	4789/90	15159
	S	19948	4790	15158
2	N	19947	4788	15159
	S	19947/48	4789	15158
3	N	19947	4788	15159
	S	19947	4789	15158
4A	N	19945	4786	15159
	S	19945/46	4787	15158
4B	N	19940/41	4782	15159
	S	19939/40	4781	15158
5	N	19939	4780	15159
	S	19939	4781	15158
6	N	19945/46	4787	15159
	S	19945	4787	15158

17 HOUR LONG BASELINE CALIBRATION DATE: 08/09-05-85

MOBILE S/N 78 BEACON 3 S/N 223

Tower (North) - No linear amplifier

Tower (South) - Linear Amplifier

N.B. "Raw Ranges"

Time	North Tower		South Tower	
	Loop	Omni	Loop	Omni
15.30	115346	115347	115362	115363
16.30	115348	115348	115364	115365
17.30	115347	115347	115363	115365
18.30	115347	115348	115364	115365
19.30	115346	115347	115362	115364
20.30	115347	115348	115362	115363
21.30	115346	115346	115362	115362
22.30	115346	115346	115365	115362
23.30	115348	115346	115367	115364
00.30	115347	115347	115365	115365
01.30	115347	115347	115362	115364
02.30	115348	115346	115363	115363
03.30	115346	115348	115364	115364
04.30	115346	115348	115362	115365
05.30	115346	115348	115362	115365
06.30	115347	115348	115364	115365
07.30	115348	115348	115364	115365
08.30	115347	115347	115363	115366
Mean	115347	115347	115363	115364
Z/Set	4775	4777	4787	4788
	110572	110570	110576	110576
Δ S-O	-2	0	-4	-4

17 HOUR LONG BASELINE CALIBRATION

DATE: 08-09/05/85

MOBILE S/N 74 BEACON 3 S/N 223

Tower (North) - No linear Amplifier

Tower (South) - Linear Amplifier

Time	North Tower		South Tower	
	Loop	Omni	Loop	Omni
15.30	115346	115347	115362	115363
16.30	115347	115348	115363	115364
17.30	115346	115348	115363	115364
18.30	115347	115347	115362	115363
19.30	115347	115347	115362	115363
20.30	115347	115347	115363	115364
21.30	115348	115346	115363	115365
22.30	115345	115347	115362	115365
23.30	115348	115348	115361	115364
00.30	115347	115347	115363	115363
01.30	115347	115348	115362	115363
02.30	115347	115347	115362	115364
03.30	115346	115348	115362	115363
04.30	115347	115348	115361	115363
05.30	115346	115347	115362	115364
06.30	115348	115348	115364	115363
07.30	115347	115348	115362	115363
08.30	115348	115347	115362	115364
Mean	115347	115347	115362	115364
Z/Set	4776	4777	4787	4789
	110571	110570	110575	110575
C-0	-1	-	-3	-3

APPENDIX 2

ACOUSTIC TRANSPONDER ARRAY

CALIBRATION RESULTS

RESULTS OF RELATIVE CALIBRATION

	Xp. 1	Xp. 2	Xp. 3	Xp. 4	Xp. 5	Xp. 6St	RMS
St. 1	3.4E-2	3.1E-1	4.1E-1	1.4E-1	2.4E-1	6.4E-2	2.4E-1
St. 2	3.0E-1	1.2E-1	1.9E-3	4.3E-2	4.1E-1	5.2E-1	3.0E-1
St. 3	2.2E-1	4.0E-1	1.3E-1	8.0E-2	4.7E-1	3.6E-1	3.1E-1
St. 4	2.0E-1	7.1E-2	3.2E-1	2.0E-1	5.3E-1	5.9E-1	3.7E-1
St. 5	4.1E-1	2.4E-1	8.3E-2	5.3E-2	4.7E-1	5.5E-1	3.6E-1
St. 6	8.2E-2	5.9E-2	2.0E-1	4.3E-1	2.6E-1	8.2E-2	2.3E-1
St. 7	4.0E-1	3.3E-1	1.6E-1	2.5E-1	2.1E-3	5.8E-1	3.4E-1
St. 8	1.6E-1	9.5E-1	*****	9.2E-1	9.0E-1	*****	8.0E-1
St. 9	8.3E-3	4.9E-1	6.2E-1	2.7E-1	8.4E-2	5.8E-2	3.4E-1
St.10	2.1E-1	1.4E-1	9.4E-2	1.4E-2	1.7E-1	1.6E-1	1.5E-1
St.11	1.8E-1	3.1E-1	3.2E-1	1.2E-1	1.6E-1	7.4E-2	2.1E-1
St.12	1.7E-1	1.4E-1	1.9E-1	7.8E-2	4.4E-1	1.8E-1	2.3E-1
St.13	5.3E-1	8.5E-1	2.1E-1	3.0E-1	4.9E-1	1.3E-1	4.8E-1
St.14	6.2E-3	1.9E-2	3.4E-2	5.2E-2	8.1E-2	3.9E-2	4.5E-2
St.15	2.4E-1	1.3E-1	1.1E-1	1.9E-1	5.7E-2	1.1E-1	1.5E-1
Xp RMS	2.6E-1	4.1E-1	2.6E-1	3.0E-1	3.9E-1	3.3E-1	

----- : distance not known

***** : distance rejected

List of the selected ranges

3600	2450	1559	168	1923	3369
2570	1903	2061	1438	484	1925
2603	1910	2032	1388	532	1975
2142	2457	3369	3054	1154	362
2155	2414	3293	2959	1058	451
384	1370	2812	3445	2067	1624
380	1300	2744	3394	2046	1656
1928	546	976	2258	2172	3056
1973	591	921	2237	2188	2948
3415	2033	552	1575	2747	3960
3483	2103	620	1575	2792	4017
3793	2584	1530	386	2212	3650
3868	2648	1549	467	2305	3743
1786	1082	1738	1924	948	1812
1835	1065	1663	1862	981	1889

relative position of the transponders

Xp01 :	0.00	0.00	70.00
Xp02 :	1401.11	0.00	70.00
Xp03 :	2894.02	-134.16	70.00
Xp04 :	3206.42	-1843.49	70.00
Xp05 :	1291.02	-2042.74	70.00
Xp06 :	-190.70	-1994.84	70.00

Square residum 5.94E+04 Valid dist 90 Variance : 2.57E+01

Results of the absolute calibration

303056

Rejected stations : ,11,15,21

fix	radio position	corrected acous. posit.	distance
1	396378.00 5588278.00	396366.05 5588261.40	20.46
2	396376.00 5588273.00	396363.02 5588257.42	20.28
3	396375.00 5588269.00	396359.97 5588250.44	23.88
4	396373.00 5588266.00	396357.95 5588247.45	23.89
5	396340.00 5588232.00	396353.92 5588243.48	18.04
6	396369.00 5588260.00	396352.91 5588242.49	23.78
7	396365.00 5588255.00	396351.89 5588238.50	21.08
8	396361.00 5588251.00	396346.84 5588232.53	23.27
9	396357.00 5588246.00	396341.81 5588227.57	23.89
10	396353.00 5588243.00	396339.79 5588225.58	21.86
11	*****,** *****,**	*****,** *****,**	*****,**
12	396346.00 5588236.00	396329.79 5588224.65	19.79
13	396344.00 5588233.00	396328.73 5588216.66	22.37
14	396341.00 5588228.00	396326.70 5588212.67	20.96
15	*****,** *****,**	*****,** *****,**	*****,**
16	399235.00 5590751.00	399245.94 5590756.90	12.43
17	399233.00 5590746.00	399241.89 5590750.93	10.17
18	399232.00 5590742.00	399243.86 5590745.92	12.49
19	399232.00 5590737.00	399244.82 5590740.91	13.40
20	399230.00 5590733.00	399241.79 5590736.93	12.43
21	*****,** *****,**	*****,** *****,**	*****,**
22	399226.00 5590723.00	399238.74 5590729.95	14.52
23	399225.00 5590720.00	399236.71 5590724.97	12.72
24	399223.00 5590716.00	399232.66 5590718.00	9.86
25	399222.00 5590713.00	399231.65 5590717.00	10.45
26	399219.00 5590708.00	399227.64 5590715.03	11.14
27	399218.00 5590705.00	399230.59 5590709.01	13.22
28	399215.00 5590701.00	399220.58 5590707.08	8.25
29	399212.00 5590696.00	399217.58 5590707.10	12.43
30	399209.00 5590692.00	399217.54 5590701.10	12.48
31	397712.00 5589525.00	397712.17 5589533.81	8.89
32	397708.00 5589522.00	397710.14 5589529.83	8.12
33	397705.00 5589519.00	397707.12 5589526.85	8.13
34	397702.00 5589517.00	397703.09 5589522.88	5.98
35	397699.00 5589513.00	397700.07 5589519.90	6.99
36	397695.00 5589511.00	397699.05 5589516.91	7.16
37	397694.00 5589507.00	397694.03 5589514.95	7.95
38	397691.00 5589503.00	397696.95 5589503.93	6.02
39	397689.00 5589500.00	397689.98 5589507.98	8.04
40	397687.00 5589496.00	397689.93 5589500.98	5.78
41	397685.00 5589492.00	397686.90 5589496.00	4.42
42	397683.00 5589488.00	397681.91 5589498.03	10.09
43	397680.00 5589485.00	397680.87 5589492.04	7.09
44	397679.00 5589481.00	397676.87 5589492.07	11.27
45	397677.00 5589477.00	397675.80 5589483.08	6.19
46	397676.00 5589473.00	397673.79 5589481.09	8.39

channel	position on file	new position
14	399529.60 5589462.30	399533.27 5589458.12
1	398428.00 5588619.30	398425.68 5588623.00
9	397176.20 5587814.10	397168.17 5587826.76
4	395892.40 5588941.30	395892.45 5588963.09
15	397257.00 5590265.20	397266.46 5590277.22
12	398445.80 5591124.70	398461.37 5591128.21

Mean Error : 14.61
 Acoustic rotation point : 397783.63 5589511.77
 Translation (east = +) : 4.07
 Translation (north = +) : 8.28
 Rotation : .41
 Heading of transponder 1 to transponder 2 : 232.98

APPENDIX 3

STATION DESCRIPTIONS

STATION: POINT SORELL (ST 517)

LOCATED: This station is located on the highest point of Point Sorell, Tasmania, Australia, which is 4.8 kilometres from Hawley Beach, 1 kilometre from Port Sorell, and approximately 26 kilometres by road east of the city of Devonport. On a clear day, Badger Head, on the eastern entrance of Port Sorell, is visible from the station.

The station marker is geographically located on a point, 150 metres from the water's edge (Bass Strait). Rocks lay about the station. Some of the rocks extend up to 1 foot above ground level. Vegetation in the area is mainly green grass and patches of tussock up to 1 metre high. On the landward side, the point slopes gradually with black soil pasture riddled with Mutton bird burrows. Once on the flats, which are very wet during winter, vegetation ranges from scattered trees to patches of dense woods.

On a clear day, the city of Devonport can be seen 20 miles away, at a bearing of 260°. Beach areas, seperated by rocks, are located 900 metres from the station, at a bearing of 200°. Small patches of trees are located 500 metres, at a bearing of 080° from the station. A 80-metre by 30-metre island is located offshore, approximately 800 metres, at a bearing of 060°, from the station.

ACCESS: In dry weather a regular two-wheel drive vehicle may be used but the grassy slopes on the approaches to the station site may become very slippery when wet and there are numerous boggy patches after heavy rains and a four-wheel drive vehicle is necessary.

STATION: POINT SORELL (ST 517)

ACCESS: If four-wheel vehicles are unavailable or it
(Cont'd) turns wet after the station is set, Roger Moncreiff has a tractor which is available to tow the vehicle to and from the station site. The tractor may also be required to tow even a four-wheel drive vehicle if it is heavily laden in extreme wet conditions.

From Devonport, drive on the Bass Highway towards Launceston for 2 kilometres past the East Devonport turnoff, and turn left at the Exeter/Port Sorell turnoff (B19), near the top of the rise. Follow this road towards Port Sorell (the Exeter road turns off to the right), for approximately 12 kilometres to a road intersection, located approximately 2 kilometres before entering Port Sorell. A wooden sign showing "Hawley Caravan Park" is on the left side of this intersection. Turn left at this intersection, and follow the road to Hawley Beach. Turn left at a "T" junction, located 50 metres before the Hawley Beach Store and Post Office. Just after making this left turn, a prominent sign to the right reads "Heavy Vehicles Only" (see sketch). Follow this sealed road to its end at a "T" junction with a chlorine station facing you on the other side of the road. Turn left at this junction. A right turn takes you on a foreshore track. Follow this road (it turns to gravel half-way along) for approximately 700 metres (passing a picnic spot and toilets on the right), to a white wooden gate. Immediately in front of the gate, the road veers to the right. A turn to the left is marked "LMC Private Road". Take this turn to the left (it is 3 kilometres to the station at this point). Follow this road for approximately 100 metres and turn to the right. Straight ahead at this point is the residence of Mr. Roger Moncreiff

STATION: POINT SORELL (ST 517)

ACCESS: the son of the station site landowner. Drive
(Cont'd) for approximately 300 metres to a locked gate. At this gate, a track leads to the right to the residence of Mr. Don Moncreiff, the station site landowner, located approximately 100 metres from this gate. Obtain a key for this gate, or if opened, follow the road straight ahead to double gates, near the council sewage pond, which are usually opened. The station marker will be visible from the double gates at a distance of approximately 2 kilometres. This is no defined road from this point to the marker. Seek the landowner's advice or follow the tracks shown on the sketch.

MARKER: The station marker, located on a hill, consists of a brass mushroom S.P.M., which is not numbered. The marker is embedded in concrete at ground level, with stones surrounding the marker.

The maxiran tower was erected 1 metre, at a bearing of 270° Magnetic, from the station marker. This offset was necessary due to a 3-metre high quadropod that is erected over the marker. The quadropod is painted white, and has a black disc, approximately 60 cm in diameter, attached to the top. Rocks covers each leg of the quadropod. Co-ordinates are listed in this description for the station marker and the Maxiran tower offset.

GENERAL: Labour can be provided by Mr. Roger Moncreiff, Labour can also be obtained in Devonport, approximately 22 km. from the station, or Latrobe, approximately 19 km. away. Fuel, oil, camping equipment and supplies are available in Devonport. Bulk fuel can be obtained from several depots located in Devonport. There is a service station in Port Sorell, and a reasonable selection of goods can be obtained at the Hawley Beach

STATION: POINT SORELL (ST 517)

GENERAL:
(Cont'd)

and Post Office. Drinking water can be obtained from the station property landowner or his son.

A caravan with heater is essential at this site. The winter months, June to September, can be very wet, windy and cold. Temperatures can range from several degrees below zero to a daily maximum of as low as 4° C. Extra rope and star stakes should be taken for tying down during this period. Penguins are very frequent visitors to the station site particularly at night.

Caravans are available from Devon Coastavans, 116, Nicholls Street, Devonport, telephone: Ian Finch, 004-242829. Mr. Finch will deliver and pick up the vans to the station sites for a nominal fee (In August 1984, Point Sorell was A\$20.00, Doctors Rocks was A\$40.00. This fee includes delivery and pick-up). The vans are well equipped, gas approximately 60-litre water tank (full on delivery), crockery, cutlery, fridge, etc. Mattresses are supplied, but there is no blankets, pillows or sheets. The vans can be locked. The caravans must be kept clean when vacanting.

Vehicles may be obtained from HERTZ, Oldaker Street, Deconport (tel: 004-241013). HERTZ representatives have been very helpful and can assist regarding fuel supplies from Mobil Devonport if required.

Four wheel drive vehicles may also be obtained from Regent Filling Station, 57, Marine Terrace, South Burnie. This is the Shell Service Station past the paper mill on the Bass Highway, as you approach Burnie from Devonport. The contact at

STATION: POINT SORELL (ST 517)

GENERAL: this palce is Mr. Wayne Cross. The service station telephone no. is 004-312131.
(Cont'd)

A 40 foot tower was erected at this site, although only a height of 20 ft. is required to clear surrounding obstructions. Clear vista is from 200° (through north) to 060°, Star stakes were used to secure the tower.

Permission to occupy the station must be obtained from the landowner, Mr. Don C. Moncreiff, Hawley Beach via Latrobe 7307, Tasmania. His telephone number is 004-286193. Mr. Moncreiff was paid a daily rental fee of A\$25.00 for the use of his land. If Don Moncreiff is absent, permission may be obtained from his son, Roger Moncreiff, tel: 004-286587. Roger lives approximately 1 kilometre from Don Moncreiff (see Sketch).

SKETCH: See next page.

Co-ordinates of the station marker were obtained from a Lands Department, Tasmania, Division of National Mapping summary sheet.

UTM PROJECTION, AUSTRALIAN NATIONAL SPHEROID
ZONE 55, C.M. 147° EAST - A.G.D.

MARKER CO-ORDINATES

Lat.	41° 07' 24.69" S	N = 5 447 407 m.
Long.	146° 31' 41.88" E	E = 460 403 m.
Elev.	30 m.	

STATION: POINT SORELL (ST 517)
(Cont'd)

The Maxiran tower was erected 1.85 m. on a bearing of 162° from the marker.

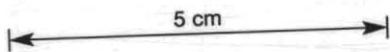
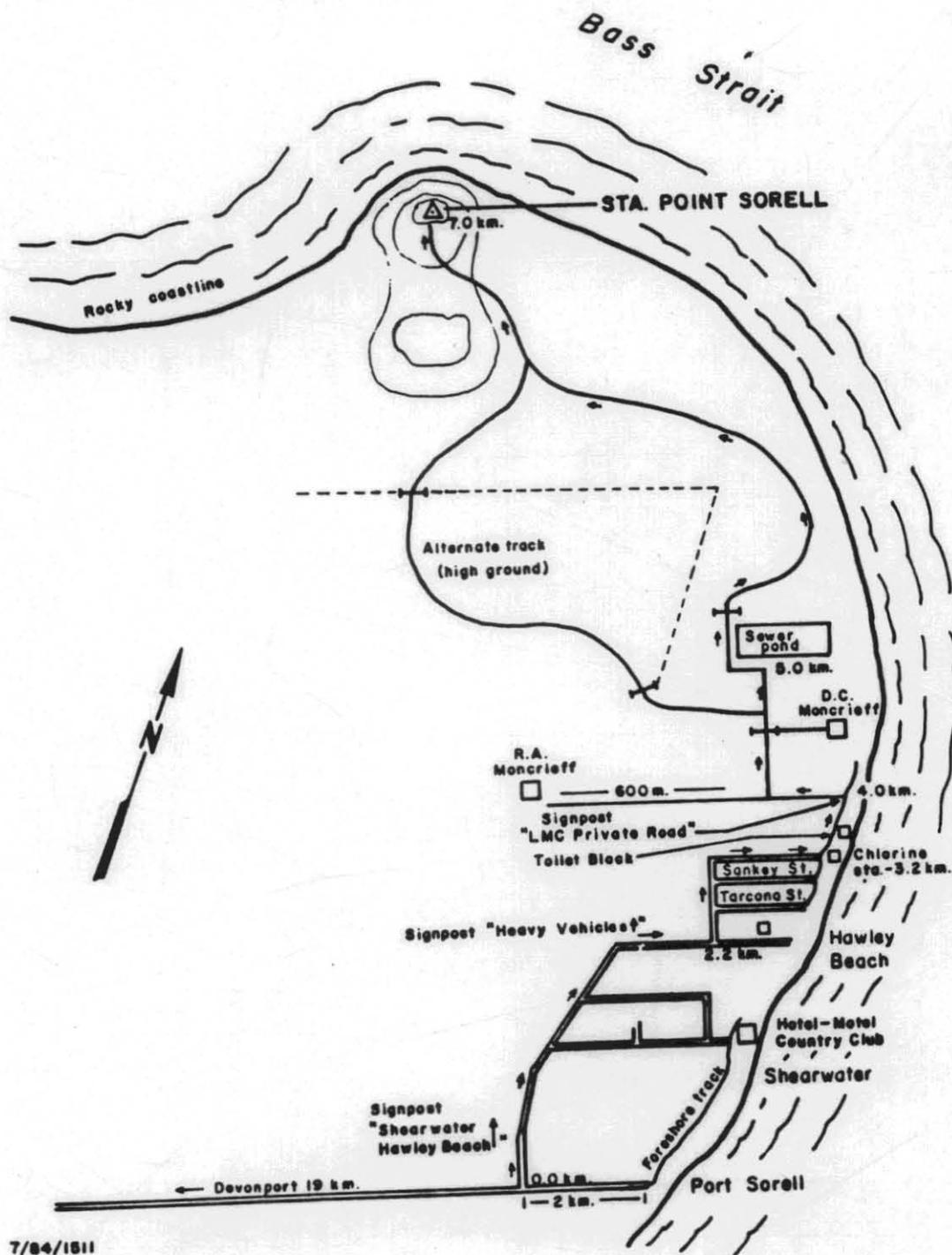
MAXIRAN CO-ORDINATES

Lat.	41° 07' 24.75" S	N =	5 447 405 m.
Long.	146° 31' 41.91" E	E =	460 404 m.
Elev.	42 m.		

STA. POINT SORELL (ST 517) — AUSTRALIA

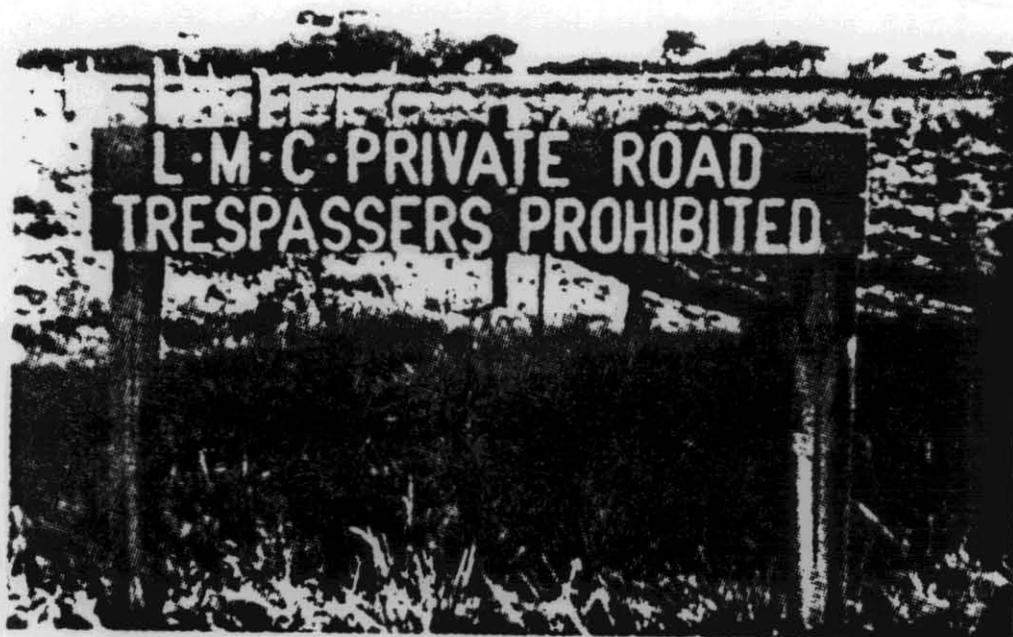
LAT. 41°07'24".69 S N 5,447,407 meters
LONG. 146°31'41".88 E (MARKER COORDS.) E 460,403 meters
ELEV. 30 meters

UTM PROJ. ——— AUST. NAT. SPHEROID
ZONE 55, C.M.147°E ——— A.G.D.

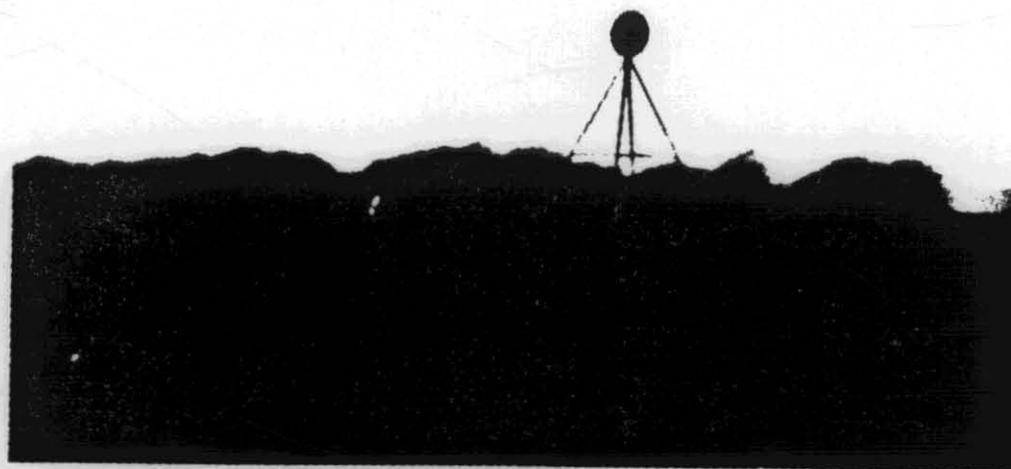


303065

STATION POINT SORELL



SIGN AT TURNOFF TO LEFT ENTERING ROAD TO DON MONCRIEFF PROPERTY. POINT IS ABOUT 3 KILOMETERS FROM STATION.



QUADROPOD OVER MARKER

303066

STATION POINT SORELL



SIGN AT TURNOFF FROM PORT SORELL ROAD. TURN LEFT TO REACH STATION, A DISTANCE OF APPROXIMATELY 7 KILOMETERS FROM THIS POINT.

STATION: THE NUT (ST 674)

LOCATED: This station is located on a hill overlooking the town of Stanley, on the north coast of Tasmania, Australia. The hill is named "The Nut" and its summit is flat to slightly rolling. This hill, as well as the historical town of Stanley, are very popular tourist attractions. The vegetation on this hill consists of grass and low native bushes. There is a tourist walk track around the perimeter of the top which is some 4 km. around. There are many mutton bird burrows along this track. The surrounding district, Circular Head, derives its name from the distinctive shaped "Nut" which juts into Bass Strait. The station marker is on the northern side of The Nut.

ACCESS: Access to the town of Stanley can be made from Burnie or Devonport. It must be noted that minor towns may not appear on road signs. When leaving Devonport, read "Smithton" for "Stanley". At times, only route numbers appear in lieu of town names. It is approximately 120 km. from Devonport to Stanley.

Drive north on the Bass Highway to the intersection with the Stanely Highway (B21). This intersection is 64 km. past Wynyard. Turn onto Stanley Highway and drive 7 km. to the town of Stanley. The Nut will be easily seen to the northeast of Stanley, right beside the town. The road to the hill is signposted "Nut". A vehicle can be taken as far as the car park on the slopes of The Nut. A zi-zag 1 m. wide cement track with centre hand rail leads from the car park to the summit. Take the left hand track at the fork on the top of the hill. The station marker is from 400-500 m. along this track. It is a walk of about 20-30 minutes (unburdened) from the base of the hill to the station.

STATION: THE NUT (ST 674) (Cont'd)

MARKER: The station marker consists of a brass mushroom S.P.M., which is not numbered. The marker is embedded in concrete which is at ground level. A 1.26 m. high stone cairn is built 2.5 m. W.N.W. of the marker.

A 3.86 m. high quadropod has been erected close to the marker. The quadropod has a 60 cm. diameter black disc attached to its top.

The Maxiran tower was erected 1.0 m. at a bearing of 239° Magnetic from the marker. Co-ordinates are listed in this description for the brass mushroom marker, and the Maxiran tower offset.

GENERAL: Food, fuel, oil and water is unavailable in Stanley. Fuel and oil can be obtained from W.T. House, Inc. BP Service Station. Mr. House can also assist in obtaining labour. Labour may also be obtained at the Union Hotel. Emergency water can be obtained from a tank near the old telecom hut, which is located alongside the lookout, approximately 700 m. from the station site.

Although limited camping equipment is available in Stanley, this should be purchased in larger centres, such as Burnie or Devonport.

Hotel accomodation are available at the Union Hotel in Stanley. The nearest airport to this station is in Smithton, approx. 20 miles away.

The station site is completely exposed to weather. This should be taken into consideration when erecting the station. Ample bedding, tent pegs, and spare rope should be taken. During the winter months (June through to September), the site is very cold and damp. A heater is

STATION: THE NUT (ST 674)

GENERAL: essential as temperatures frequently drops below
(Cont'd) zero.

A 40 ft tower was erected at this site. Star stakes were sufficient to secure the tower. Clear vista from 20 ft. up the tower is from 300° (through north) to 090°.

The station site is on land owned by the National Parks and Wildlife Service. Permission to occupy the site was obtained from Mr. P. Murrell, Director, in Sandy Bay, Tasmania 7005. His office address in Sandy Bay is Magnet Court or P.O. Box 210, Sandy Bay, Tasmania 7005. Telegrams addressed "TASPAWS", will be received by the director. No rent was paid for the use of this property. The local inspector is Mr. Rex Gatenby, Launceston tel: 003-415306.

The local ranger in charge is Mr. Brian Carson, tel: 004-581320. His resident is located near the rectory and old school in the old section of Stanley. Mr. Carson was very helpful in all matters. He can arrange for storage of empty equipment boxes at the car park house.

The site is to be kept clean and tidy during occupation. All rubbish is to be removed at the conclusion of a survey.

It will take 2-3 days with a 4 or 5 labourers to carry the equipment to the station site. An average round-trip from the car park to the station site, walking with a load and returning unburdened will take from 60 to 90 minutes, depending on the load. The cement track to the summit is very difficult to negotiate with heavy

STATION: THE NUT (ST 674)

GENERAL:
(Cont'd)

objects with the center hand rail. When possible, a helicopter should be used to mobilise and demobilise this station. The Stanley Football Ground is used as a lift-off and put-down point for the helicopter. Permission can be obtained to use the ground from the Football Club president, Mr. Graham Trenelly, Union Hotel, Stanley, tel: 004-581161. It is approx. a 5 minute flight from the football ground to the station site. It is approx. 50 km. from the Wynyard Airport to The Nut.

SKETCH: See next page.

Co-ordinates of the station marker were obtained from a Lands Department, Tasmania, Division of National Mapping summary sheet.

UTM PROJECTION, AUSTRALIAN NATIONAL SPHEROID
ZONE 55, C.M. 147° EAST - A.G.D.

MARKER CO-ORDINATES

Lat.	40° 45' 50.23" S	N =	5 486 046 m.
Long.	145° 18' 13.45" E	E =	356 830 m.
Elev.	143 m.		

The Maxiran tower was erected 1.0 m. on a bearing of 239° Magnetic, from the station marker.

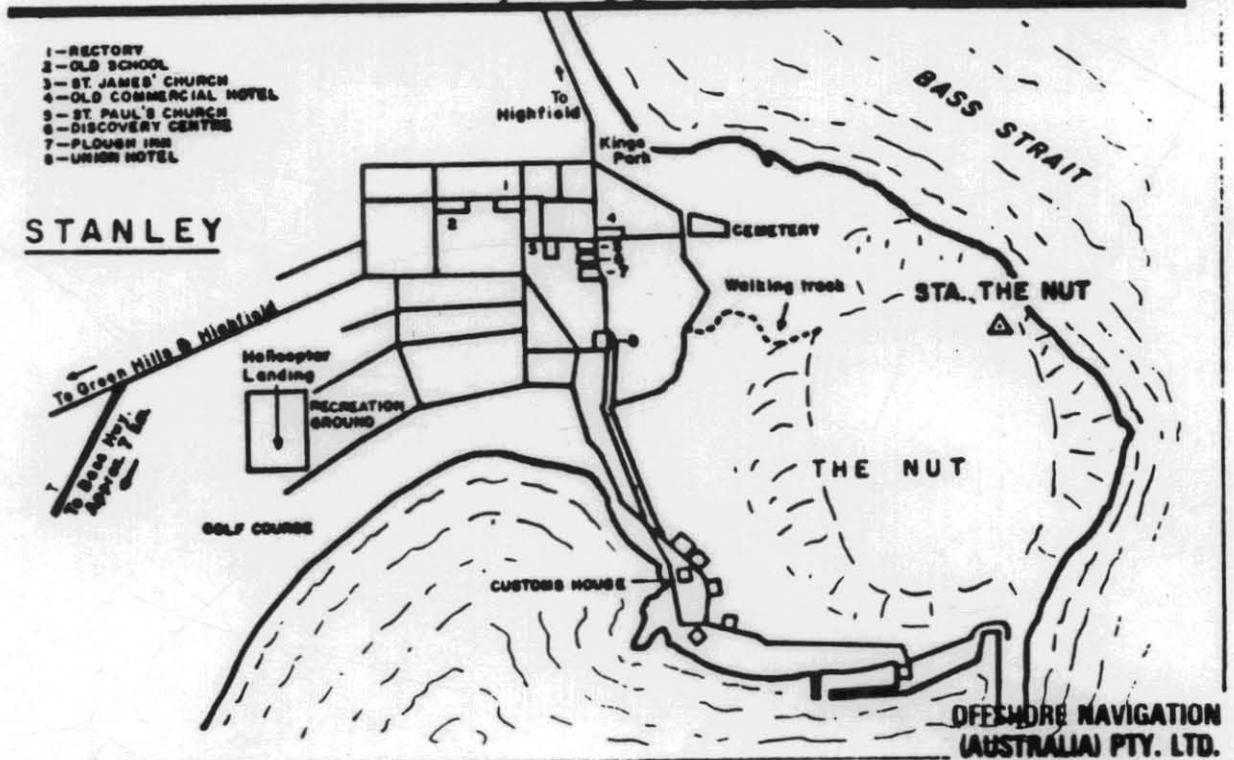
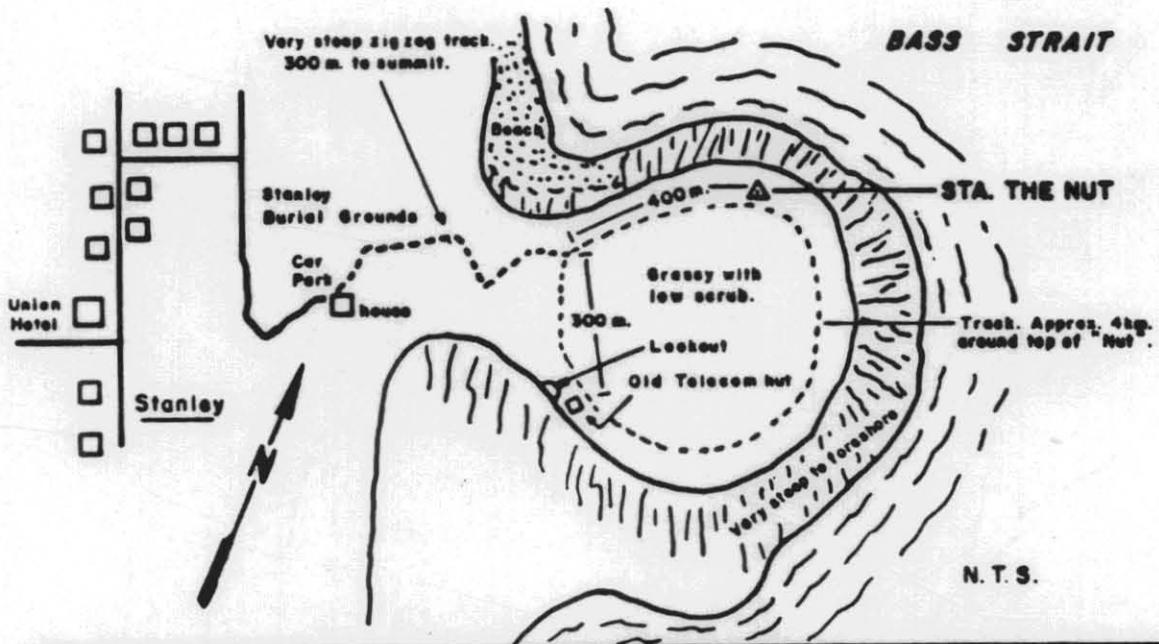
MAXIRAN CO-ORDINATES

Lat.	40° 45' 50.24" S	N =	5 486 046 m.
Long.	145° 18' 13.42" E	E =	356 829 m.
Elev.	143 m.		

STA. THE NUT (ST 674) ————— AUSTRALIA

LAT. 40°45'50".23 S (MARKER COORDS.) N 5,486,046 meters
 LONG. 145°18'13".45 E E 356,830 meters
 ELEV. 143 meters

UTM PROJ. ————— AUST. NAT. SPHEROID
 ZONE 55, C.M.147° E ————— A.G.D.



- 1-RECTORY
- 2-OLD SCHOOL
- 3-ST JAMES' CHURCH
- 4-OLD COMMERCIAL HOTEL
- 5-ST PAUL'S CHURCH
- 6-DISCOVERY CENTRE
- 7-PLOUGH INN
- 8-UNION HOTEL

5 cm

STATION THE NUT

FROM TURNOFF AT STANLEY BURIAL GROUND



FROM THE OUTSKIRTS OF STANLEY. NOTE ZIG-ZAG TRACK UP MOUNTAIN. THIS IS THE ONLY ACCESS ROUTE BY FOOT.

STATION: NARACOOPA

LOCATED: Station Naracoopa is located in a paddock in the village of Naracoopa, King Island, Tasmania, Australia. The station site overlooks the Mobil oil tanks and jetty. The paddock is of grass on top soil with an underfelt of clay. The two markers at this site are located on the north end of the paddock, on the edge of a hill.

ACCESS: Fraser Bluff is in the village of Naracoopa, approximately 20 km. from the main town of Curry on King Island. Just as you enter the village, there is an intersection with a signpost to the right towards "Millbrook". Turn onto Millbrook Road and drive 0.8 km. to a turn-off and gate to the left. Go through this gate and drive to the right around a small dam. Continue on through the scrub to the paddock. Drive through the paddock to the ridge and station site.

Heavy rain fall can be expected during June through September. In the event of a recent rainfall, a four-wheel drive vehicle or tractor will be needed to reach this site as the paddock can become very marshy. Tractors can be obtained from Mr. D. Spittle, whose telephone number is 004-611206. If the ground is marshy and no tractor or 4-wheel drive vehicle is available, it is a distance of approx. 250 yards from the staging area to the site.

MARKER: Two markers exist and consist of two brass plaques embedded in cement 3 inches below ground level. Both positions are marked by star pickets. One plaque is inscribed "ONI ARGO 1984" and the second is inscribed "GSI SYLEDIS 1984".

STATION: NARACOOPA (Cont'd)

GENERAL: Local labour is not available unless prior arrangements are made in the village. Ian Whitehouse, who transported the station to the site in 1984, can make arrangements for Labour from Curry.

All supplies for the site should be purchased in Curry. Websters Store has everything necessary in regard to hardware. Cars and caravans can also be obtained in Curry. A 4-wheel drive vehicle or tractor must be leased from private sources.

There is a cafe in Naracoopa that is owned by Mr. and Mrs. Hoopwood. Limited food supplies can be obtained from there.

During dry season, there is limited water on the island, and water must be purchased in Curry.

There is no electricity in the area. However, power will be available within 2 years.

Heavy winds can be expected at this site from all directions. Winds from the southwest and east are the stronger, and can reach from 40 to 80 knots. A tent at this site would most likely not survive, especially during the winter months.

In the event a tent or caravan cannot be placed at this site, the operator may be able to stay in an empty house 150 to 200 yards from the site. The house and out buildings nearby are owned by Mrs. Gail Henderson, who also owns the property on which the site is located. She lives in Curry.

STATION: NARACOOPA

GENERAL: Everyone on the island is helpful. However,
(Cont'd) prior arrangements must be made for any assistance that is required.

Permission to occupy the station site must be obtained from Mrs. Gail Henderson.

A 60 ft Maxiran tower was erected over the ARGO marker. A minimum tower height of 40 ft is required to clear surrounding obstructions. Clear Vista is from 120° to 340°. Star pickets were used to secure the towers. The anchors must be doubled and driven into the ground. Also, they must be taken out at the end of an operation as their remaining in the paddock will constitute a hazard for cattle and other livestock.

SKETCH: See next page.

Co-ordinates of this station were provided by ONA.

UTM PROJECTION, AUSTRALIAN NATIONAL SPHEROID
ZONE 55, C.M. 147° EAST - A.G.D.

MARKER CO-ORDINATES (281/150)

Lat.	39° 55' 27.64" S	N = 5 576 663 m.
Long.	144° 07' 26.23" E	E = 254 211 m.

The Maxiran tower was erected over the Argo marker, on an offset of 307.051 m., at an adjusted azimuth of 98.1204805551° from the (281/150) marker.

MAXIRAN TOWER CO-ORDINATES

Lat.	39° 55' 29.05" S	N = 5 576 630 m.
Long.	144° 07' 39.03" E	E = 254 517 m.
Elev.	53 metres.	

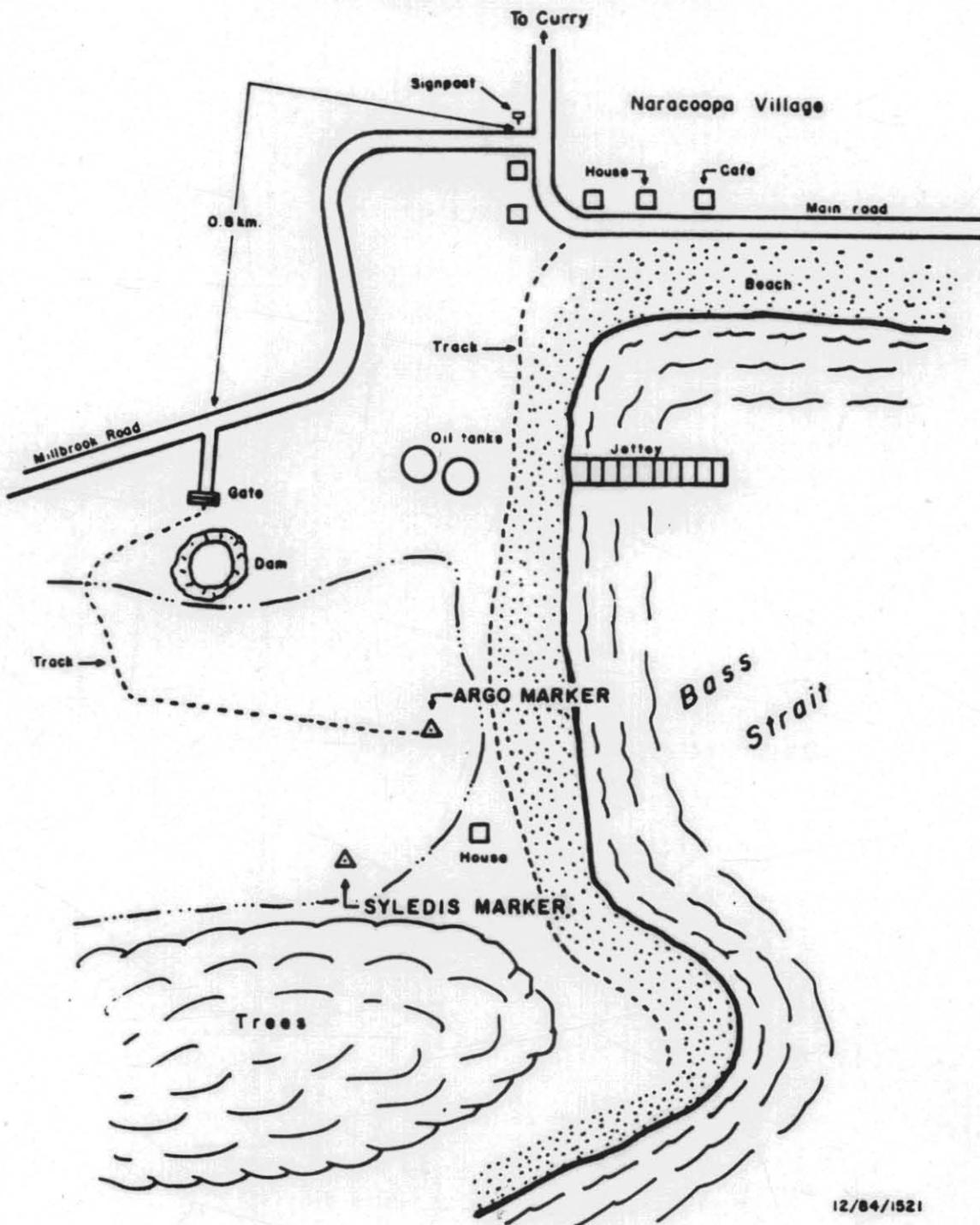
STA. NARACOOPA ————— AUSTRALIA

MARKER (281/150) COORDINATES

LAT. 39°55'27".64 S
 LONG. 144°07'26".23 E
 ELEV. Not reported

N 5,576,663 meters
 E 254,211 meters

UTM PROJ. ————— AUST. NAT. SPHEROID
 ZONE 55, C. M. 147° E ————— A. G. D.



5 cm

12/84/1521