



FINAL OPERATIONS REPORT
2-D MARINE SEISMIC SURVEY

CLIENT : SHELL AUSTRALIA LTD
CONTRACTOR : HALLIBURTON GEOPHYSICAL SERVICES, INC.
VESSEL : M/V "PACIFIC TITAN"
SURVEYS : BS90B, BS90A, OS90A
PERMITS : T/18P, T/14P, VIC/P28
DATES : 18 FEBRUARY 1990 - 16 MARCH 1990

TPR



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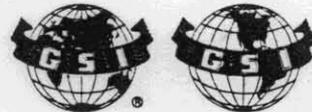
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INTRODUCTION

A marine seismic survey was conducted by Halliburton Geophysical Services, Inc., (HGS) for Shell Australia between the 22nd February 1989 and the 16th March 1989. The survey was conducted in Australian petroleum permit areas T/18P, T/14P and VIC/P28.

The purpose of the following report is to provide the reader with an insight into methods and equipment used by HGS to collect the data and also to highlight any problems that were encountered during the survey period.



SECTION I

VESSEL AND PERSONNEL



SECTION II
INITIALISATION PARAMETERS



i. KEY SURVEY PARAMETERS

STREAMER PARAMETERS

Dual or Single	Single
Groups/Streamer	300
Streamer Spread	N/A
Group Interval	12.5 Metres
Streamer Offset	100 Metres
Streamer Depth	8 Metres
Nominal Depth Interval	300 Metres
Streamer Tracking (Yes/No)	Yes
Nominal Compass Interval	300 Metres
Maximum Feather Angle Specification	10 Degrees
Bin Width	N/A

INSTRUMENT PARAMETERS

Sample Interval	2 Milliseconds
Record Length	6 Seconds
Hi-cut Filter	128Hz/72dB/Octave
Lo-cut Filter	8Hz/18dB/Octave

SOURCE PARAMETERS

Array Volume	2180 Cu In
Array Depth	6.5 Metres
Array Length	14 Metres
Array Spread	3 X 10 Metres
Array Formation	Parallel
Number of Strings	4
Nominal Pressure	1900 psi

NAVIGATION PARAMETERS

Shotpoint Interval	25 Metres
Line Begin Extension	-7 SP
Line End Extension	+7 SP
Primary Navigation (BS90B & BS90A)	Argo
Primary Navigation (OS90A)	Syledis
Secondary Navigation	Nil
Spheroid	A.N.S.
Semi Major Axis	6378160
Reciprocal Flattening	298.25
Mag Dec (Correction) (BS90B/BS90A)	11.9 deg E
Mag Dec (Correction) (OS90A)	11.1 deg E



iv. FIELD COMPUTER SYSTEM III

Recording System Field Computer System III

Software Version GSISYS29

Tape Format SEG D. 2.5 Byte Group Coded
Recording 6250 b.p.i.

Tape Speed 125 i.p.s.

Channels (on tape) 312 (includes 12 auxiliary)

Sample Interval 2000 uSec

Record Length 6 Sec

Dynamic Range 115 dB (referred to input noise)

Polarity Positive pressure gives negative
number on tape as per SEG
convention



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vi. CONFIGURABLE MARINE SYSTEM III

CMS III Control Computer..... TI 980 B
 Manufacturer..... Texas Instruments
 Software Version..... CMS 903.06

The following options of the CMS III were active during the survey.

Magnetic Tape Subsystem..... Yes
 Great Circle Navigation..... Yes
 Sonar Subsystem..... No
 Gyro Subsystem..... Yes
 Tiger Subsystem..... Yes
 Titan 1000 Subsystem..... Yes
 Streamer Tracking..... Yes
 CDP Steering..... No
 Offset Sensor..... No
 Fathometer System..... Yes
 Magnetometer Subsystem..... No *
 Gravity Subsystem..... No *
 XQC Subsystem..... No
 Time Reference..... GMT

* Magnetometer and Gravity sub-systems were not interfaced to the CMS and are not present on CMS mag tape. Magnetics and Gravity were recorded separately for survey BS90A on Edcon system.



vii. 990 NAVIGATION SYSTEM

(a) BS90B AND BS90A SURVEYS

Navigation Computer..... TI 990

Manufacturer..... Texas Instruments

Software Version..... NAVSYS Ver 3.5

Slot Assignments

Slot #	Base	Format
1	Pt. Sorrel	Argo
2	North Point	Argo
3	Naracoopa	Argo
4	Pt. Sorrel	Syledis
5	North Point	Syledis
6	....	.....
7	Naracoopa	Syledis
8	....	.....
9	....	.....
10	....	.....
11	....	.....
12	....	.....

Spheroid in use..... A.N.S.

Semi major axis..... 6378160

Reciprocal flattening..... 298.25

WGS-72 TO ANS CONVERSION

SPECIFICATION

Delta X	122
Delta Y	41
Delta Z	-146

These transformation parameters are used solely to transfer WGS-72 satellite fixes into the local spheroid.

Base station coordinates were entered as listed in subsections viii and ix.



vii. 990 NAVIGATION SYSTEM (Cont.)

(b) OS90A SURVEY

Navigation Computer..... TI 990
 Manufacturer..... Texas Instruments
 Software Version..... NAVSYS Ver 3.5

Slot Assignments

Slot #	Base	Format
1	....	.....
2	Teddy's Lookout	Syledis
3	Ingoldsby	Syledis
4	Barwon Head	Syledis
5	Cape Schanck	Syledis
6	....	.....
7	St. Paul's	Syledis
8	....	.....
9	....	.....
10	....	.....
11	....	.....
12	....	.....

Spheroid in use..... A.N.S.
 Semi major axis..... 6378160
 Reciprocal flattening..... 298.25

WGS-72 TO ANS CONVERSION	SPECIFICATION
Delta X	122
Delta Y	41
Delta Z	-146

These transformation parameters are used solely to transfer WGS-72 satellite fixes into the local spheroid.

Base station coordinates were entered as listed in subsection ix.



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viii. ARGO SYSTEM

Mode Range - Range
 Frequency 1620 KHz
 Survey Company O.N.A.
 Antenna Height (above sea level) 25 Metres
 Antenna Location from C.N.P. 0.30m @ 90 deg
 CNP to Stern 46.5 Metres

BASE STATION LOCATIONS - ARGO

Spheroid ANS
 Semi major axis 6378160
 Reciprocal flattening 298.25
 Argo
 Partial

NORTH POINT	Lat	040 42 52.15 S	Elev	5.5m	30.0 m
	Lon	145 15 30.28 E	Offset	None	
NARACOOPA	Lat	039 55 29.05 S	Elev	55.9m	27.0 m
	Lon	144 07 39.04 E	Offset	None	
POINT SORREL	Lat	041 07 23.63 S	Elev	30m	40.0 m
	Lon	146 31 42.35 E	Offset	None	

NOTE

The Argo partials were entered into the CMS and not into the Argo receiver as per custom.



ix. SYLEDIS SYSTEM

Mode Range - Range
 Frequency (Mobile #333) 427.06 MHz
 (Mobile #122) 427.06 MHz
 Survey Company H.G.S.
 Antenna Height (above sea level) 20 Metres
 Antenna Location from C.N.P. 2.0m @ 228 deg
 CNP to Stern 46.5 Metres

BASE STATION LOCATIONS - SYLEDIS

						Static Delays	
						Mobile #	
						333	122
NORTH POINT	Lat	040 42 51.40 S	Elev	5.5m	-228.5		
	Lon	145 15 31.31 E	Offset	None			
NARACOOPA	Lat	039 55 29.95 S	Elev	56.0m	-225.9		
	Lon	144 07 39.47 E	Offset	None			
POINT SORREL	Lat	041 07 24.73 S	Elev	30m	-225.8		
	Lon	146 31 41.93 E	Offset	None			
TEDDY'S LKOUT	Lat	038 33 18.99 S	Elev	120m	-228.6	-233.8	
	Lon	143 58 41.48 E	Offset	1.0m			
INGOLDSBY	Lat	038 24 44.00 S	Elev	121m	-225.8	-232.3	
	Lon	144 09 23.18 E	Offset	1.5m			
BARWON HEADS	Lat	038 17 30.58 S	Elev	33m	-228.5	-234.6	
	Lon	144 29 54.04 E	Offset	None			
CAPE SCHANCK	Lat	038 29 39.31 S	Elev	70m	-228.0	-234.9	
	Lon	144 53 07.11 E	Offset	1.5m			
ST. PAUL'S	Lat	038 21 28.65 S	Elev	55m	-225.9	-232.1	
	Lon	144 44 35.16 E	Offset	0.5m			



x. STREAMER TRACKING SYSTEM III

The following data describes the streamer and airgun configuration to the STS III to allow it to perform its streamer track function.

BIRD SEQ#	BIRD SER#	CMS BCU#	DEPTH ASSIGN	COMPASS ASSIGN	OFFSET (Mtrs)
1	4102	65	01	01	3675
2	4135	66	02		3375
3	4205	67	03	02	3075
4	3231	68			2775
5	3758	69	04	03	2475
6	4265	70	05		2175
7	3096	71	06	04	1875
8	3250	72	07		1575
9	4263	73	08	05	1275
10	2730	74			975
11	4257	75	09	06	675
12	3222	76	10		375
13	4435	77	11	07	150
14	3078	78	12	08	0

Streamer length	3750
Number of Traces	300
Line Spacing	n/a
Bin Width	n/a
Spec Depth	8
Spec Depth Range	+/- 1
Max Change in Heading per 100 Mtrs	5

Tow Point to Near BCU Distance	213	Mtrs
Common Nav Point (CNP) to Stern	46.5	Mtrs
Stern to Airgun Distance (Centre) <0 if wide tow>	77	Mtrs
Tow Point to Near Group Distance (Centre)	177	Mtrs
Tow Fixture Available	No	
Wide Tow Option	No	
Steering Parameter (CofG, Near, Dist frm Towpt)	n/a	
Gyro Correction	-2.0	Deg
Yaw Correction	0	
Magnetic Declination (BS90B & BS90A)	11.9	Deg E
Magnetic Declination (OS90A)	11.1	Deg E

Software version used in the STS III was STS v 7.2



SECTION III
RECORDING SYSTEM



i. OVERVIEW

The Titan 1000 recording system comprises three subsystems; the Digital Fiber Optic Streamer (DFOS), the Streamer Control System (SCS), and the Field Computer System III (FCS III).

The DFOS is the in-water portion of the system while the SCS and the FCS III comprise the onboard instrumentation. Each of these subsystems are functionally described and their key features high-lighted in the following sections of this report.



ii. DIGITAL FIBRE OPTIC STREAMER

The 480 Channel Digital Fibre Optic streamer consists of four major in water elements; Live Sections, Programme Plugs, Streamer Electronic Modules (SEM) and Repeater Modules. The M/V "Pacific Titan's" streamer was configured as shown on the streamer diagram appended to this report.

The three major components making up each "cluster" are a SEM positioned between a Live I and a Live II, with each Live section containing 6 separate 12.5 metre groups. Each group, or trace, contains 32 acceleration-cancelling "dish" type hydrophones. The Programme Plug, positioned midway in every Live section, has a twofold function. Firstly it determines whether the Live section is a Live I or a Live II, depending on which of the two types of plug is installed in the section. Secondly it determines the trace "mix" (1:1, 3:1 or 5:1) of the particular cluster.

A diagram illustrating a typical live cluster is appended to this report.

Signal processing in the streamer is performed by the SEMs. Each SEM receives six groups of analog data from the LIVE section in front of it (LIVE I) and six groups of analog data from the LIVE section behind it (LIVE II) to form a 12 group configuration. Signal processing consists of preamplifying, filtering, multiplexing, gain ranging and analog to digital conversion. The analog data is always sampled by the SEM at a 1 millisecond sample rate and preamplified with a low noise charge amplifier. Each channel may be filtered with a choice of low cut filters and then applied to a fixed 256 Hz, 72db/octave anti alias filter. It is then multiplexed, gain adjusted with a quaternary gain instantaneous floating point amplifier and converted to digital form by a 14-bit plus sign, successive approximation, A/D converter. The digital data is added to the incoming data stream, from the previous SEMs, for transmission by one of two optical fibres to the next SEM. Each optical fibre is capable of handling 252 seismic channels at 1 millisecond sample rate. Besides seismic data, four channels of SEM auxiliary data containing depth, test oscillator and DC offset information (one channel is grounded to provide further crossfeed isolation for the DC offset channel) are digitized and added to the data stream.

Configuration and control of the SEMs is provided by the streamer control system via the command bus. Power for the streamer is provided by the streamer power system via the power bus.



iii. STREAMER CONTROL SYSTEM

The Streamer Control System provides the means of controlling the streamer, acquiring the the streamer data and formatting the data into a form suitable for the FCS III.

The SCS comprises three major sub-assemblies; the DMI chassis and two identical chassis containing the digital filter hardware for signal processing. The SCS is considered as one unit in the following functional description.

The SCS is composed of several functional blocks. They are the streamer interface, data I/O interface, signal processing reproduce data, status processing and control functions.

The streamer interface allows the streamer control system to receive data from a conventional analog streamer or from a digital streamer. The streamer interface may also receive test data from a streamer test unit via optical fibre and simulated data patterns from a streamer simulator. The streamer interface sorts and distributes the input data onto two 8-bit input data buses.

The seismic data I/O port (SIDIOP) receives raw data from the streamer interface via the input data bus, embeds a timing signal into the data and pipelines serial data to the signal processing function. It receives the serial, filtered, data back from the signal processing function, converts it to parallel data, and passes it to one of the two data buses.

The signal processing function receives raw SEM data from the data I/O interface, prepares the data for the digital filters, applies digital high-cut and DC offset filters, converts the data back to serial form and transmits the data to the FCS III. The data are also returned to the I/O interface, converted to parallel format and placed on the output bus for access by the reproduce function.

The reproduce data function allows the user to select input data received as raw, unfiltered data from the streamer interface and filtered data from the data I/O interface. It provides optional reproduce processing of selected input data and outputs to four display devices. Two multiplexed displays, each with 312 channel capacity, are provided to a dual channel oscilloscope for real time quality control of the entire streamer. The observer may select raw data from a portion of the streamer to be displayed in conjunction with the same data channels of filtered data.

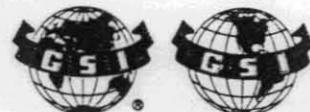


iii. STREAMER CONTROL SYSTEM (Cont.)

Reproduce data may be transmitted to a digital camera for a paper display of up to 512 data channels. Two user selectable single trace display outputs can be sent to a single trace profiler. User configurable, high cut and low cut filters, specifically for single trace displays, may be selected. Seismic data or streamer noise data is output to a spectrum analyzer for real time frequency domain analysis.

The status processing function receives status and error information from the streamer interface via parallel data bus. The status and data bits are displayed on an LED display panel.

The control function allows operator commands and configuration to be input via video display terminal. It maintains the system software that controls the application of the configuration commands to the streamer interface, data I/O interface, reproduce data, streamer simulator and status processing functions via control bus. Configuration and control of the signal processing function are provided via an RS-232 serial link. The display terminal is also connected to the control function via an RS-232 interface. The control function provides an interface to a Winchester hard disk unit to facilitate storage and control of system software. A floppy disk unit is provided to back up the Winchester and download new software releases. A line printer provides hard copies of configuration disk files.



iv. FIELD COMPUTER SYSTEM III

The FCS III is the final subsystem of the TITAN 1000. The FCS III receives serial data from the SCS and records it to tape.

The FCS III provides trace sequential recording of up to 480 channels of seismic data at a 1 millisecond sample rate. It contains the necessary circuitry to receive, store, format, write to magnetic tape, digitally check and reproduce read-after-write records.

The FCS III is divided into five major rack mounted subsystems plus peripherals. They are the Gould 32/2705 Computer, Gould I/O Expansion, Zitel Mass Memory, Amplifier Controller and Read After Write Monitor/Digital Data Checker.

The recording system receives the seismic data from the Streamer Control System (SCS) via Ethernet links. The data may then be resampled to 2 or 4 milliseconds, if required, prior to formatting and demultiplexing. Trace headers are applied prior to writing data from mass memory to tape. The recorder initiates recording by first writing the record header and then pulling the seismic data trace sequentially from mass memory and writing these to tape. The mass memory stores data in one buffer while data is extracted from the other and recorded on tape.

Three StorageTek 1950, 6250 BPI tape transports are used with the computer automatically switching transports when a tape is full or an error condition develops. These units operate in a fully read after-write mode permitting quality checking of the data all the way to tape. The recorder selects and displays two channels for scope display. A single read-after-write scope display of all channels being written to tape is also available. A C.Itoh CI-800Q graphics band printer is used to produce the single trace profile during data recording.

An OYO GS-622 multi-trace plotter is interfaced via the Fastbox subsystem to the recording system. It gives a permanent visual display of all the traces of a selected recorded file, when requested by the Titan operator.



SECTION IV

AUXILIARY INSTRUMENTS



i.(a) FATHOMETER DETAILS

Manufacturer Simrad
Model EA
Water Velocity Value 1485 m/sec.
Transducer Position 14.31 m aft
(with respect to CNP)
Draft Correction 3.3 m.

i.(b) FATHOMETER DESCRIPTION

The Simrad EA Hydrographic Echosounder is capable of precision depth measurements in waters ranging from the extremely shallow, down to approximately 1000 - 1200 metres. (Extreme range 1700 metres.)

It has an 8 inch dry paper recorder which records scale lines and bottom echo simultaneously. The recorder has four basic ranges of 50, 100, 250 and 500 metres, each with four phased ranges for recording from 0 - 1700 metres.

The sounder is also equipped with a digital depth display, and has an external plug connection to allow transfer of depth data to the CMS for logging purposes.



iii. GRAVITY AND MAGNETICS

A total of 750.0 kilometres of gravity and 712.3 kilometres of magnetic data were acquired by EDCON, Inc., for HGS on the M/V "Pacific Titan" in the Bass Strait offshore Australia from 24th February 1990 through 3rd March 1990. These data were acquired over block T/14-P.

A separate report describing the operation, calibration and performance of this equipment has been submitted to Shell Australia.

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SECTION V

ENERGY SOURCE



i. AIRGUN ARRAY

The Versatile Source Array (VSX) incorporates a new type of airgun; the sleeve gun.

The sleeve gun incorporates a new concept in airgun design in that the shuttle is an external sleeve that produces a full 360 degree port. This allows a more efficient acoustical pulse than the traditionally ported airgun.

Three chambers control the movement of the shuttle. These are the air-spring return chamber, the firing chamber and the main chamber.

The air-spring chamber is constantly fed by the air supply through the fill passage. Its purpose is two fold: first, it holds the shuttle closed when the gun is not firing and second, it provides a spring return, or recoil, to return the shuttle to its firing position.

The firing chamber controls the firing of the airgun. It is fed by a solenoid valve which is normally in the closed position. When an electrical pulse is sent to the solenoid valve, the valve opens and supplies air to the firing chamber. This creates a force imbalance that opens the shuttle. Once the shuttle is completely open, small exhaust ports in the firing chamber dump the air pressure. Once this chamber and the main chamber have exhausted, the shuttle returns to the closed position.

The main air chamber is exhausted very rapidly to create an explosion or acoustic blast. This chamber also contributes a majority of the opening force on the shuttle, causing the shuttle to open quickly. As soon as the firing chamber has moved the shuttle far enough to break the face seal between the shuttle and the chamber sleeve, the high pressure air rushes under the shuttle flange, thus exposing a much greater area to the chamber pressure. This is by far the greatest force acting on the shuttle.

After the shuttle has opened fully, there is no longer any pressure in the main chamber or the firing chamber. The pressure in the air-spring chamber is sufficient to close the shuttle.

To ensure accurate timing, the sleeve gun incorporates a ring of magnets in the top of the shuttle. As the shuttle moves



i. AIRGUN ARRAY (Cont.)

towards the timing coil, located in the cap of the gun, an electrical pulse, termed the shuttle pulse, is generated and returned to the Texas Instruments Airgun Controller for timing control.

The VSX source comprised four strings of sixteen sleeve guns each. The composition of each string is diagrammed in plate 5a and the array geometry is shown in plate 5b appended to this report.

Each sub-array included three low pressure ended air lines so that the depth could be monitored by means of static air pressure at all times. The arrays were floated with the use of plastic Norwegian buoys. This enabled the sub-arrays to ride at the contract specified depth.

The operating air volume for the energy source was produced in a two stage system consisting of two separate compressor types. The first stage being two 0-300 psi SULLAIR 2 stage rotary screw compressors. The output of these was delivered through a common manifold incorporating a water separator then input to a single LMF 2 stage, double acting piston which had a maximum output pressure of 2000 psi.

The system described above was normal operations mode. To complement this were another 2 SULLAIR compressors and a single LMF compressor which maintained a 100% backup for the air system throughout the survey.



ii.(a) TIGER II SYSTEM DETAILS

Manufacturer Texas Instruments
Model Tiger II
Max channels 64
Timing delay 51.2 mS
Firmware release Version 1.3

ii.(b) TIGER II SYSTEM DESCRIPTION

The Texas Instruments Airgun Controller (TIGER II) is a microprocessor controlled unit that supervises all timing, firing, and control functions for an airgun array of up to 64 airguns.

The Tiger II monitors the shuttle pulse of each airgun and continuously adjusts individual gun firing times to synchronise the array within a 1 millisecond standard deviation for optimum pulse amplitude and front-to-back ratio of the array.

A fire sequence is initiated on receipt of wire blast from the recording instruments. The Tiger II returns Field Time Break (FTB) to the recording instruments and fires the guns 51.2 mS later. When used with a GSI digital streamer, the Tiger II synchronises FTB with the digital streamer data. This synchronisation function is called "multiplex streamer mode".

The Tiger II maybe operated independently in stand-alone mode or it may be operated in computer mode via a link to the CMS III. Stand-alone mode enables all normal gun control functions to be implemented from the front panel keyboard. The air gun array is unaffected by the selection of stand-alone mode insofar as actual performance is concerned, however performance monitoring is limited.

The computer mode link to the CMS III facilitates data logging of individual gun performance in real time as well as the production of graphically presented performance statistics at the end of the line.



SECTION VI
NAVIGATION SYSTEMS
PART I
OVERVIEW



i. OVERVIEW

The navigation function on the BS90B and BS90A surveys was performed by a combination of HGS and Offshore Navigation Australia's equipment.

Offshore Navigation supplied the primary Radio Positioning System providing raw navigation ranges for input to the HGS Configurable Marine System (CMS). The CMS uses the RPS raw data to navigate in real time, perform all line control functions and record the raw navigation data to magnetic tape.

HGS supplied the secondary Radio Positioning System which was used to calibrate the primary system and maintain position in the event of the primary system failing.

Provision of the primary navigation system for the OS90A survey was the sole responsibility of HGS.

Further details concerning more specific aspects of the RPS and CMS systems are set out in other sections of this report.



SECTION VI
NAVIGATION SYSTEMS
PART II
RADIO POSITIONING SYSTEMS



i. ARGO SYSTEM

ARGO is a medium-frequency, phase-comparison system operating at 1.6 to 2.0 MHz. The network comprised one mobile station and three shore stations operating in the active mode (all stations transmitting and receiving). An interrogation burst of RF is transmitted by the Mobile Station. The fixed stations receive this signal, correct the phase to that of the original transmission and, in sequence, broadcast reply bursts. The phase of these signals received by the mobile station are compared to the phase of the original transmission. This phase difference is used in the computation process to determine the distance between the shore station and the mobile.



ii. SYLEDIS SYSTEM

The SYLEDIS is a circular or hyperbolic coordinate position finding system operating in the UHF frequency band between 420 and 450 MHz. It uses the very widespread principle of measuring the distances between a mobile point and two or three points on land. In the simplest case, the mobile station transmits interrogation signals which are received, filtered and re-transmitted by two or three responders. The distances are determined by measuring the propagation time between a characteristic instant of the interrogation and the characteristic instants of arrival of the different responses on board the mobile station.



SECTION VI
NAVIGATION SYSTEMS
PART III
SATELLITE POSITIONING SYSTEM



i.(a) TRANSIT SATELLITE SYSTEM DESCRIPTION

Transit satellites, which are maintained by the United States Navy, are continuously orbiting the Earth, transmitting data that describes their current position. The MX 1107 Satellite Receiver acquires all satellite information automatically. When two or more satellite signals are available at the same time, the MX 1107 tracks the one offering the best signal.

The MX 1107 receives two signals from the satellite (150 and 400 Mhz) which it in turn converts to digital form. This information is sent to a processor which calculates the ships present position based on the data received and the doppler shift as the satellite passes.

Between satellite passes (approximately 35 to 100 minutes), the processor continually calculates and displays ships position by dead reckoning, based from the last satellite fix position update and the ships speed and heading. The satellite also transmits Greenwich Mean Time (GMT) which is stored by the processor until it gets updated by the next satellite update from a good pass.

After each usable satellite pass the MX 1107 automatically and continuously displays updated data comprising the vessel's latitude and longitude and will continue dead reckoning until the next good satellite pass.



i.(b) TRANSIT SATELLITE SYSTEM DETAILS

MAGNAVOX MX 1107 Satellite Receiver

Manufacturer..... Magnavox
Model MX 1107
Type Transit Sat Recv
Receiver frequencies 150 and 400 Mhz
Antenna height 25 m.
Antenna Location from CNP..... 2.6 Mtrs @ 158.2 Deg
Sensitivity -145 dBm
Tuning Automatic/programmed

The MX 1107 receiver was interfaced directly into the 990 NAV computer for the purposes of navigation quality control.

Satellite data was not used for survey navigation. All satellite fixes were recorded to magnetic tape and printed out on the ADL printout (Automatic Data Log printout).



SECTION VI
NAVIGATION SYSTEMS
PART IV
CONFIGURABLE MARINE SYSTEM



i. OVERVIEW

The Configurable Marine System (CMS III) is at the centre of data collection operations. Although the most visible function of the CMS III is survey control and navigation data recording, the system also collects and records data from a variety of sources.

The CMS III comprises a central TI 980B mini-computer networked to 3 TI 990 based sub systems. Various peripheral systems are interfaced directly to the 980B computer or to one of its 990 subsystems.

The major functions of the 980B central computer are: record all ancillary data on its peripheral tape transports, provide seismic line control, provide data to the ADL log for realtime quality control, provide selectable data over an external Quality Control link (XQC) and drive a graphical plotter for steering guidance.

The 980B computer has an operator interface provided by the 990 QC subsystem. The operator interface is used to enter line control parameters and prospect level parameters. A subset of the data recorded to tape are routinely passed to the 990 QC and displayed on a VDU, the same data are passed to the Automatic Data Logger for quality control. Additionally the 990 QC allows the operator to interrogate the 980B at any time for additional data.

A second 990 based subsystem is the 990 NAV system. Dedicated to navigation, the 990 NAV subsystem provides the 980 B with filtered navigation data for use by the line control programme as well as raw data for recording on magnetic tape. The 990 NAV system is described more fully in a later section.

The third 990 based subsystem is the OBB/STS/TIGER system. This 990 based mini computer runs under the DX10 multi-tasking operating system which allows the computer to perform its three major tasks as though they were running on separate machines. The three functions are; streamer tracking, realtime binning and TIGER II quality control. These three functions are described more fully in a later section.



ii. 990 NAVIGATION SYSTEM

The 990 NAV sub-system of the CMS III performs all navigation tasks. The system navigates in real time from raw range data supplied by external Radio Positioning Systems. The raw, unfiltered ranges are passed by the 990 NAV system to the 980B for recording on magnetic tape and for printing on the ADL printer. Filtered position and velocity data are also passed to the 980B for use by the line control task.

The 990 NAV hardware is configured with 12 x 32 bit parallel interfaces called multisensors. The multisensor interfaces provide the system with the capability of reading up to 12 ranges simultaneously. The 990 NAV system is also capable of using satellite, gyro and sonar data.

The 990 NAV navigation software comprises five major building blocks; range processing, system definition, n-way fix computation, dead reckoning and fix/dead reckoning integration.

Range processing software is used to filter each range and derive a velocity for each range. Each range is processed independently, in accordance with a set of 12 masks entered by the operator. This allows filter characteristics to be individually tailored to each range independently of the other ranges. The range processing software also produces statistical quality control data with respect to each range.

The system definition part of the programme allows the operator to define navigation systems. A system in 990 NAV terms is defined by selecting any combination of 2 - 4 ranges. The selected ranges are usually from the same physical navigation equipment but a 990 NAV system could easily use 4 ranges from four different navigation systems if required. Up to three such systems may be defined.

The filtered ranges are passed to the n-way fix algorithm which generates fixes for each defined system along with statistical quality control data. Fixes are computed continuously.

The range velocity data are passed to the dead reckoning routines which compute filtered velocities and azimuths for each defined system.



ii. 990 NAVIGATION SYSTEM (Cont.)

The operator defines the primary and secondary navigation from the previously defined systems by selecting a source for fixes, velocity and azimuth. Additionally, the operator may select GPS or Transit satellite as a fix source, Sonar for velocity and Gyro for azimuthal information. The Primary and secondary navigation may use any combination of available sources.

The integration routines put the several separate packages together by integrating the available fixing sources and dead reckoning data. The Integration software applies dead reckoning updates, each second, to the last known position for the primary and secondary systems. At intervals determined by the operator, the dead reckoned position is updated by the selected fix source.

Fix intervals may be as frequent as every few seconds in the case of RPS systems or as infrequent as every few hours in the case of satellite fixing.

Quality control data from the 990 NAV include; range variances, missed ranges, range spikes, fix CEP and fix residuals. Additionally, the 990 NAV computes the range C-0 values from the primary position to all initialised base station ranges.



iii. STREAMER TRACKING SYSTEM III

The Streamer Tracking System (STS III) is a marine data gathering system that acquires and processes magnetic heading and streamer depth data from digital compasses and depth transducers located on the streamer. Processed streamer tracking data are combined with other navigation data and displayed on video terminals in a combined graphical and text format. Raw streamer tracking data are transmitted to the CMS III for recording on magnetic tape for subsequent post mission processing. The raw data are also printed on the ADL terminal for quality control in real time.

A number of parameters are entered into the system to define the streamer and source configuration. The parameters are used in real time for streamer tracking, and they are also written to tape for post processing. The key parameters are listed in Section II of this report.



iv.(b) STREAMER DEPTH CONTROL NETWORK DESCRIPTION

The Digiscan system, as used on the M/V "Pacific Titan", consists of a model 293a Operator Station and modem board. Model 396 compass/depth controllers were attached to the streamer at regularly spaced intervals. A brief description of each functional unit follows.

The model 293a operator station is a 16 bit micro-computer containing 192 Kilobytes of memory. It acts as the system controller for communications with the host computer, the units on the streamer (compass/depth controllers) and the Digiscan graphics package.

The modem board is an independant microprocessor based unit that physically resides within the operator station. The modem board facilitates communication down the streamer in two modes, the 293 control mode and the modem control mode. In the 293 control mode the modem board is transparent on the streamer and the 293 communicates "directly" with an individual sensor. This mode requires the complete attention of the operator station and thus is reserved for initialisation procedures, diagnostic routines and housekeeping functions. In the modem control mode the operator station instructs the modem board to collect data from several units on the streamer, continues to perform other functions during the communications phase and returns to retrieve a batch of data from the modem memory. System configuration parameters are stored in memory on the modem board while the system is powered down. Each modem board is dedicated to a single streamer, thus extra boards can be added for additional streamers.

The Model 396 compass/depth controller is a microprocessor based depth controller device, externally mounted on the streamer. A Model 321 heading sensor (compass) is also contained within the body of the unit. This allows depth, temperature and heading data, plus depth keeping ability, to be derived from one externally mounted device.

Communications with a maximum of 63 devices occur over a single twisted pair transmission line, using traditional inductive coupling techniques in a 27 KHz FSK communications link. Each live section within the streamer contains a communications coil, located 12.5 metres forward of the end coupling, over which a depth controller can be located.



iv.(b) STREAMER DEPTH CONTROL NETWORK DESCRIPTION (Cont.)

Each unit supports a variety of functions, including:-

- * Setting streamer running depth
- * Reporting current depth, heading and temperature
- * Reporting battery usage in hours and minutes
- * Reporting wing angle with a resolution of 0.01 degrees

Using a seawater port in the tail, the controller monitors depth over a range of 0 to 61 metres, with a resolution of 0.03 metres. Once programmed with an operating depth, the controller operates autonomously to apply sufficient force to the externally mounted wings to control the streamer depth. In addition, the control algorithm parameters may be altered under software control to respond to changing environmental or operational conditions. These changes may be made while the controller is either in or out of the water. Emergency surface and dive facilities are provided in the 293 operator station.



v. SONAR SYSTEM

The sonar system was not operational during the course of this survey.



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vi.(a) GYROCOMPASS DETAILS

Manufacturer Sperry Marine Systems

Model Mark 227 Mod 0 Gyrocompass

vi.(b) GYROCOMPASS DESCRIPTION

The Mark 227 Gyrocompass provided an accurate true north azimuth reference system. The synco outputs of the MK 227 Gyrocompass were connected directly to synco-to-digital converters in the CMS III.

The gyrocompass contains a gyroscope controlled in a manner to make it seek and continually align itself with the meridian. An external gimbal system mounts the gyrocompass binnacle to provide a pendulously stabilized horizontal reference plane for azimuth data. The gyrocompass consists of two major assemblies: the Master Compass and the Pedestal. The Master Compass comprises an oil filled hermetically sealed binnacle containing the sensitive element. Mechanical and electronic systems compensate the gyrocompass for errors associated with latitude and speed. A servo follow up system maintains the phantom yoke aligned with the gyrosphere. The Pedestal serves as a support for the Master Compass and provides a housing for the electronic control assemblies and power supplies.



SECTION VII

LOGGING



Various manual and machine generated logs were produced during the survey. The content of each log or print-out is described below so that any questions arising from this survey may be resolved as quickly as possible.

The intended destination of each of the various logs is detailed in the Operations section of this report under "Shipment details".

i. MANUAL LOGS

These are the various logs, completed by instrument room personnel, and shipped with the Seismic and Navigation data tapes to the designated processing centres.

The following is a list of the information on each log.

OBSERVER'S LOG (produced for every line)

This log is produced by the Titan 1000 operators while the line is in progress and is the primary source of information for Seismic processing.

Each page of the log contains the following Prospect and line information:

date, client, vessel, party no., prospect, line no. and i.d., operator, direction of line, record length, sample rate & number of traces recorded.

Pre and post line quality control records are annotated in the comments column. These annotations cover noise and offset records. In the case of offset shots, details of guns used, their timing delay and raw time to onset of the near trace are also entered in the log. Traces considered bad for the entire line are also entered in the comments column.

The body of the log is annotated each 50 shotpoints with the following information: record number, shotpoint number, water depth, local time, cable depths and feather angle.

The body of the log is further annotated at each tape change with the following data: tape number, transport number, first & last shotpoint and record numbers of each tape.



i. MANUAL LOGS (Cont.)

The routine entries each 50 shots and at each tape change are supplemented with further quality control comments as and when they are relevant. These supplementary entries cover isolated events such as; bad or missed records, bad traces, swell bursts etc.

TITAN COVER SHEET (attached to the observers log)

The cover sheet is produced in a standard format by the person assigned to Quality Control. Although the cover sheet duplicates some of the information already on the observers log, its intent is to act as a cross check and as a supplement to the observers log.

The following information may be found on the cover sheet:

name of client, prospect, area, party number, line number & date, first & last shotpoint & record number, total shotpoint considered chargeable, total kilometres considered chargeable, first and last reels of line, total number of reels used, record length, record delay sample rate filters (high cut & low cut), packing density, preamp gain, record gain mode, reproduce mode direction of line, airgun type, airgun spread, airgun array volume, airgun pressure, air gun depth, timing, delay, streamer type, skin type, streamer length, group interval, shotpoint interval, offset calculated for every line, streamer depth, total number of channels, total number of aux channels, total number of data channels, trace mix, leveller/compass/depth location (trace #), primary navigation system, frequency, secondary navigation system, traces to edit from the line, records to edit from line, compasses to be excluded, line status at end of shooting that line and any other relevant comments.

Q.C. LOG (separate one for every line)

The Q.C. Log is produced in standard formats by the person assigned to Quality Control. The QC log covers all activities of the operational aspects of the survey at hand. This commands different formats for logging online and offline situations. The following is a list of factual data describing day to day events in numerical order as each logsheet is filled:



i. MANUAL LOGS (Cont.)

FORMAT ONE

BOL (Beginning of line) - date, client, prospect, (area and name), vessel, party number, page number, time, line number, line identity, first and last shotpoint and record numbers, water depth, sea state, feather angle, ships speed, average streamer depth, average streamer noise, gun array volume, air pressure, gun status, trace status. Any relevant events are entered as they occur, usually at the shotpoint number.

EOL (end of line), time, line number, last shotpoint number, last record number, water depth, average streamer depth, offset, end of line noise, feather angle, chargeable shotpoints, kilometres, chargeable magnetometer shotpoints (if used), chargeable gravity shotpoints (if used), number of next line.

FORMAT TWO

Q.C. LOG (offline) client, prospect, vessel, party number, page number, date, log of events in local time.

CMS LOG (recorded on a day to day basis)

The CMS Log is completed by the CMS operator to give a statement of events that occurred on the Navigation data tape. Also contained on the same document are a number of areas where different data is entered and these areas are titled and listed below with contents contained within:

Header Block (at top of the form) client, prospect, area, party number, operator name, Julian date, setback to center of guns from stern, primary navigation, secondary navigation, base number and name (for all bases used and slot locations), latitude and longitude of bases, lane width (if applicable), navigation programme and patches used, spheroid in use, type of streamer used, mark if magnetometer or gravity is used, cable length, number of groups, pop interval, percent coverage.

Navigation Tape Data and Satellite Information cms navigation tape number, line number, line identity, first shotpoint number, last shotpoint number, latitude and longitude of start and end position of CNP. (actual) times in gmt, fix system in use during line, velocity system in use, satellite



i. MANUAL LOGS (Cont.)

Line Status Log (appended to this report)

angle of elevation, distance from last satellite fix, heading from ships gyro, water depth, status, status of lines, comments.

The Line Status Log is entered with the line information on line completion, as follows:

date, line number, direction of line, shotpoint range, shotpoint range to process, chargeable shotpoint range, chargeable kilometres and line status.

TAPE INVENTORY (appended to this report)

The Tape Inventory is updated on completion of each tape having recorded its data, and is annotated as follows:

date, first and last shotpoint and record number of every tape, box number that relevant tapes are in, first recorded tape of the day, and any comments. eg. "D.N.P." - means do not process.



ii. PRINTED LOGS

These are the logs that are generated by the various computers with the applicable data to help in processing the seismic and navigation data tapes. The logs are shipped to the processing centers responsible. The following is a list of the information on each log.

ADL PRINTOUT (automatic data logger)

Line 1

sp #*latitude*longitude*time*azimuth*sonar wd*sp time int
 range 01*range 02*range 03*range 04*range 05*range 06
 range 07*range 08*range 09*range 10*range 11*range 12
 fath depth*fath water vel*sonar depth*sonar water vel*

ALS DATA LINE

FCS:*record number*reel number*record delay*
 SOS: not used
 AIR: *tiger delay*total volume*array depth*
 *guns enabled*guns auto-firing*guns not firing*

STREAMER SENSOR DATA

sensor BCU number and id and raw reading for all
 streamer sensors (compass and depth)
 see STS details for identification
 SHPOFF: COGOFF: FTHANG: NTRP: FTRP: PLTD:
 shpoff-vessel dist offline cogoff-c of g offline
 fthang-feather angle ntrp-near trace position
 ftrp-far trace position pltd-primeline trace dens

SYSTEM DATA ENTRY LOG

Page One.....Contains a general header with the following:

vessel name, date, line number and area.
 The page also contains the Line Parameters entered into the Titan computer for the line to be shot. These include similar details to the general header and also tape reel number, first record number, first shotpoint number, shotpoint increment number and line direction. The parameters for the single fold plot are also printed on this page.



ii. PRINTED LOGS (Cont.)

SYSTEM DATA ENTRY LOG Cont.

Page Two.....Contains the Recording Parameters which include the data format, number of traces, sample interval and record length. The page also contains the SEM Configuration information which includes their positions in the streamer, preamp gain, low cut filtering and gain mode. Digital Filter Configuration is also shown on this page detailing the offsets, mode, trace mix settings and anti alias filter setup.

Page Three.....Contains descriptions of the streamer configuration, primary and secondary navigation systems, auxiliary systems and tape transport system.

Page Four, and covering as many pages as required, is the Single Fold Plot printout.

The Next Page, and covering as many pages as required, is the FCS-III Error Report which gives details of tape errors, bad traces, rewrites and the relevant tape drive number. A summary of the Error Report is given at the end of the number of errors reported and the performance of the system.

The Following Pages contain the Computer Generated Operator's Report or more commonly called, the GSI List. This is a list of all the records recorded, giving the following details:-

reel number, shotpoint number, record number, error status, time, shotpoint time interval, tape deck used, ambient noise, water depth and recording delay for every shotpoint. A summary of reel boundaries is given at the end of the list.

The Final Pages contain firstly the Offset programme results which are used to determine the average Offset. Following that is DC Offset and Noise Analysis for the BOL and EOL Noise Records. These are presented in the form of two lists giving the DC Offsets and Noise levels for each trace. At the end of each list, the overall average for the DC Offset and Noise Levels are given.



SECTION VIII

OPERATIONS SUMMARIES



i. SYNOPSIS

The vessel departed Barrys Beach at 2025 hours on the 18th of February and headed for the prospect area.

The cable was deployed on the following day, while waiting for a full complement of navigation base stations to be erected, so that any bad sections could be replaced and monthly tests and offset shots analysed.

On the 20th, the streamer was retrieved to enable baseline crossings of the Syledis base stations and calibration of the Argo base stations against the Syledis to be conducted. Details of these can be found under the appropriate headings in this section of the report.

The streamer was redeployed on the 21st of February and a test line shot while waiting on the last of the navigation chain to come on line.

Shooting began on the first production line of T/18P shortly after 0400 hours on the 22nd of February, after having been delayed for approximately seven hours due to the loss of all navigation signals. During this time the vessel steamed towards the shore to try and recover stronger signals. Navigation signals returned when the vessel was 22 kilometres from the line.

Swell noise was evident on most lines in this prospect. Although the swell magnitude was only in the order of 1 to 1.5 metres, the client representative found it necessary to set the cable depth to nine metres after only four lines had been shot to offset it's effect.

Intermittent signal processing unit failures in the SCS and the first of many shark bites were other problems encountered on this prospect. The table below list those lines either aborted on run-in or terminated abnormally and the reason for doing so.

LINE	ACTION TAKEN	DATE	REASON
BS90B-01	Terminated	22/02/90	Shark Bite
BS90B-03	Aborted	23/02/90	Navigation
BS90B-07	Terminated	23/02/90	Instruments
BS90B-09	Terminated	23/02/90	Instruments

The prospect was completed on the 24th of February, and shooting began on area T/14P later the same day.



i. SYNOPSIS (Cont.)

Swell noise was less of a problem on the T/14P prospect than T/18P and the cable was set back to its specified depth of eight metres during the first line, BS90A-12.

Loss of navigation signals on an almost nightly basis and numerous shark attacks on the cable were the primary problems faced on this portion of the survey.

Navigation has been dealt with separately in the following subsection.

In addition to the loss of approximately ten sections as a result of shark bites, on two occasions sharks severed the tail stretch section, causing the loss of one tailbuoy and the releasing of another which was later recovered. This resulted in compass/bird #1 behaving erratically on occasions, being excluded completely for the last five lines. These were BS90A-35A, BS90A-41, BS90A-37, BS90A-43 and BS90A-45.

Undetermined seismic interference, thought to be acoustic transmissions from a submarine, was noticed on line BS90A-31 from around Sp 2300 to E.O.L. This phenomenon was also noticed on the last line of the prospect, BS90A-45.

Many of the sections holed by sharks were changed out between lines, and the following table of lines aborted on run-in or terminated abnormally does not accurately reflect the number of these attacks.

LINE	ACTION TAKEN	DATE	REASON
BS90A-16	Aborted	24/02/90	Navigation
BS90A-10	Aborted	25/02/90	Shark Bite
BS90A-14	Terminated	25/02/90	Navigation
BS90A-08	Terminated	25/02/90	Navigation
BS90A-02	Terminated	26/02/90	Navigation
BS90A-02A	Terminated	27/02/90	Shark Bite
BS90A-02B	Terminated	27/02/90	Instruments
BS90A-15	Terminated	27/02/90	Navigation
BS90A-27	Terminated	28/02/90	Navigation
BS90A-35	Terminated	02/03/90	Shark Bite

This prospect was completed on the 3rd of March and, after retrieval of airguns and streamer, the vessel headed for VIC/P28 to cut baselines before proceeding to port at Geelong for Gravity calibration, arriving alongside at 0915 on the 5th of March.



i. SYNOPSIS (Cont.)

The vessel sailed six hours later and further baseline calibration was conducted enroute to VIC/P28. Some changes were made to base station coordinates, details of which are dealt with in the Navigation summary.

Streamer deployment began at 0100 hours on the 6th of March and shooting of the first line, OS90A-12, at 1015 hours.

The line was terminated after only 900 shotpoints as swell noise became excessive. Only one line was completed on the 6th, but production gradually returned to normal on the following day as the swell abated. Shooting was uninterrupted through to the 10th of March when weather conditions once again deteriorated, and production halted.

During the above interval, several lines were terminated approximately one kilometre short of their programmed length to avoid traversing foul ground. These lines were considered complete and are listed in the table below.

Further baseline crossings were conducted while on weather downtime on the 11th of March, and production resumed at 0700 hours on the 12th of March.

South to Southwesterly swells were a constant problem for the duration of shooting on this block and the cable was consequently set at a depth of nine metres for the majority of lines, the exception being some lines shot on the 8th, 9th, 14th and 15th of March. When possible on those days, the streamer was raised to the specified depth of eight metres.

In addition to weather, occasional delays were experienced with in transit cargo vessels and fishing boats operating in close proximity to the lines.

Intermittent problems with the recording instruments were responsible for four line terminations on the 14th and 15th of March. The Recording Instrument summary deals more fully with this problem.



i. SYNOPSIS (Cont.)

A table of lines aborted on run-in or terminated abnormally on the OS90A portion of the survey follows:-

LINE	ACTION TAKEN	DATE	REASON
OS90A-12	Terminated	06/03/90	Swell Noise
OS90A-23	Aborted	06/03/90	Swell Noise
OS90A-25	Aborted	06/03/90	Swell Noise
OS90A-18	Aborted	06/03/90	Swell Noise
OS90A-39	Aborted	06/03/90	Swell Noise
OS90A-22	Aborted	07/03/90	Swell Noise
OS90A-53	Terminated	09/03/90	Foul Ground
OS90A-51	Terminated	09/03/90	Shipping
OS90A-51A	Terminated	09/03/90	Foul Ground
OS90A-49	Terminated	09/03/90	Foul Ground
OS90A-47	Terminated	10/03/90	Foul Ground
OS90A-14	Terminated	10/03/90	Swell Noise
OS90A-17	Aborted	12/03/90	Swell Noise
OS90A-20	Terminated	12/03/90	Shipping
OS90A-22	Terminated	12/03/90	Fishing Vessel (considered complete)
OS90A-19	Terminated	14/03/90	Instruments
OS90A-19A	Terminated	14/03/90	Instruments
OS90A-11	Terminated	15/03/90	Instruments
OS90A-11A	Terminated	15/03/90	Instruments
OS90A-11B	Terminated	15/03/90	Test Line
OS90A-09	Aborted	15/03/90	Swell Noise
OS90A-11C	Aborted	15/03/90	Swell Noise
OS90A-07	Terminated	16/03/90	Swell Noise
OS90A-07A	Terminated	16/03/90	Swell Noise

The prospect was completed on the 16th of March and several baselines were recut for verification prior to the vessel leaving the area at approximately 0130 hours on the 17th of March.



ii. NAVIGATION

During the survey two navigation systems were utilised. ARGO was the prime navigation system for T/14P and T/18P. SYLEDIS was used only for ARGO calibration purposes and confirming lane count. The ARGO antenna was located on the vessel C.N.P. and the SYLEDIS was offset from the C.N.P. by 2m at a heading of 228 degrees

The following navigation base stations were used for areas T/18P & T/14P.

POINT SORELL	ARGO/SYLEDIS
NORTH POINT	ARGO/SYLEDIS
NARACOOPA	ARGO/SYLEDIS

An initial calibration was carried out on the SYLEDIS chain prior to the vessel arriving in the prospect area. Results of these baseline crossings are listed in the section entitled Syledis Baseline Crossings.

The ARGO system was calibrated to the Syledis system on February 20-21 using a method that has proved accurate when stations are on the same site but not necessarily co-located.

An explanation of the method used and results obtained can be found at the end of this section of the report.

The ARGO system performed well during daylight hours but was affected by severe skywaves at approximately 1930 hrs every evening. The intensity of the skywaves caused station lock to be lost and lasted for approximately four hours. This caused several lines to be terminated or line changes to be extended. These are well documented in the CMS logs.

SYLEDIS was the primary navigation system for the VIC/P28 survey. The antenna was offset from the C.N.P. by 2 m, at a heading of 228 degrees.

The following stations were used:

Teddy's Lookout	SYLEDIS
Ingoldsby	SYLEDIS
Barwon Head	SYLEDIS
Cape Schanck	SYLEDIS
St. Paul's	SYLEDIS



ii. NAVIGATION (Cont.)

Calibration of the system was done on the 4th & 5th of March 1990, using delays provided by HGS shoreside calibrations for Mobile 333. The results were unacceptable and further calibration was done using the same delays, but with a corrected position for Cape Schanck. These results may be found in a following section of this report.

On the 8th of March corrections to station positions Teddy's Lookout and Ingoldsby, of 1 m at 000 degrees and 1.5 m at 120 degrees respectively, were applied. These are well documented in the CMS and QC logs.

St. Pauls was added to the system on the 9th of March but not used until calibrations were carried out on the 11th of March. During the calibration, Mobile 333 was changed with Mobile 122, when 333 began tracking the same station on two slots. Using delays provided by HGS for Mobile 122, baseline crossings were done to prove the new mobile as well as calibrate St. Pauls. The results may also be found under Syledis Baseline Crossings.

On the 16th & 17th of March, baselines were crossed to confirm survey calibrations. The results may be found under Syledis Baseline Crossings.



iii. ARGO SYSTEM CALIBRATION

The following describes the method used to calibrate the Argo system against the Syledis system. A diagram showing the configuration referred to has been included as Plate 8 of the report.

Point A was the Syledis station location, Point C was the Argo station location, Point B was the midpoint between A & C, and Point D was the vessel location. Point D was selected to be between 30 - 60 km from the stations to insure good quality Syledis signals. The following is a table of formulae used in the initial setup.

Dist AC	= distance Point A to Point C
Azim AC	= forward azimuth from Point A to Point C
Dist BD	= distance Point B to Point D
Dist BD	= forward azimuth from Point B to Point D
Angle DBC	= Azim BD - Azim AC
Delta Y	= Dist AC * Cos(Angle DBC)
Cos(Angle DBC)	= (1/2 * Delta Y) / (1/2 * Dist AC)

Argo partials were set to zero and the approximate Argo lane count was applied before proceeding. Four passes were made at Point D, each +90 degrees opposed to the previous heading. Every pass was approximately 1 km long, with Point D as the centre of the line entered in the CMS. The CMS was configured to output raw Argo and Syledis ranges every 10 seconds.

Fifteen samples were selected from each pass, centred on Point D, and tabulated to provide values Argo Rr and Syledis Rr respectively. An Argo propagation constant of .924904 was used for all calibrations. The Syledis station delay was provided by HGS from shoreside calibrations. Every Argo Rr tabulated was multiplied by the Argo propagation constant and retabulated as Argo Rp. The same was done for the Syledis Rr, using the syledis delay as the static addition, and called Syledis Rc. By subtracting Argo Rp from it's paired Syledis Rc, the difference Delta R was obtained for each sample.

The fifteen Delta R were averaged and the result was called Delta R'. Delta R' from each of the four passes was then averaged and called Delta R''. The Argo partial was determined in meters by subtracting Delta Y from Delta R'' and converted to lanes by dividing by the Argo lanewidth (92.49043m). The Argo partial was then applied for that station in the CMS and confirmed by a single pass through Point D.

The results of the Argo calibration are detailed in the following pages of this report.



iv. ARGO CALIBRATION RESULTS

(a) NARACOOPA ARGO/SYLEDIS CALIBRATION SHEET ONE

Syledis Station - Naracoopa Delay -225.9

Argo Propagation 0.924904

Distance AC = 29.58 Metres Distance BD = 53513.90 Metres
 Azimuth AC = 339.80 Degrees Azimuth BD = 89.91 Degrees
 Angle DBC = -249.89 Degrees Delta Y = -10.17

PASS ONE

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
57775.00	53671.70	53436.35	53445.80	9.45
57713.00	53616.60	53379.00	53390.70	11.70
57653.00	53562.20	53323.51	53336.30	12.79
57595.00	53507.00	53269.86	53281.10	11.24
57539.00	53455.20	53218.07	53229.30	11.23
57482.00	53402.50	53165.35	53176.60	11.25
57428.00	53352.70	53115.40	53126.80	11.40
57373.00	53300.80	53064.53	53074.90	10.37
57319.00	53250.60	53014.59	53024.70	10.11
57263.00	53198.80	52962.79	52972.90	10.11
57208.00	53147.50	52911.93	52921.60	9.67
57153.00	53096.70	52861.06	52870.80	9.74
57097.00	53045.40	52809.26	52819.50	10.24
57043.00	52995.20	52759.32	52769.30	9.98
56987.00	52943.60	52707.52	52717.70	10.18

Delta R' = 10.63

Standard Deviation = 0.89

PASS TWO

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
57203.00	53157.20	52907.30	52931.30	24.00
57256.00	53205.70	52956.32	52979.80	23.48
57307.00	53254.10	53003.49	53028.20	24.71
57360.00	53301.70	53052.51	53075.80	23.29
57413.00	53350.80	53101.53	53124.90	23.37
57466.00	53399.20	53150.55	53173.30	22.75
57517.00	53445.30	53197.72	53219.40	21.68
57569.00	53493.10	53245.82	53267.20	21.38
57621.00	53538.40	53293.91	53312.50	18.59
57672.00	53587.40	53341.08	53361.50	20.42
57724.00	53635.60	53389.18	53409.70	20.52
57777.00	53682.10	53438.20	53456.20	18.00
57828.00	53731.00	53485.37	53505.10	19.73

Delta R' = 21.69

Standard Deviation = 2.04



iv. ARGO CALIBRATION RESULTS (Cont.)

(a) NARACOOPA ARGO/SYLEDIS CALIBRATION SHEET TWO

PASS THREE

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
57013.00	52979.20	52731.57	52753.30	21.73
57011.00	52977.00	52729.72	52751.10	21.38
57011.00	52976.00	52729.72	52750.10	20.38
57009.00	52972.70	52727.87	52746.80	18.93
57009.00	52975.50	52727.87	52749.60	21.73
57010.00	52975.60	52728.79	52749.70	20.91
57011.00	52973.40	52729.72	52747.50	17.78
57010.00	52973.80	52728.79	52747.90	19.11
57013.00	52977.10	52731.57	52751.20	19.63
57014.00	52979.10	52732.49	52753.20	20.71
57015.00	52976.30	52733.42	52750.40	16.98
57015.00	52982.20	52733.42	52756.30	22.88
57016.00	52978.50	52734.34	52752.60	18.26
57015.00	52979.50	52733.42	52753.60	20.18
57015.00	52981.40	52733.42	52755.50	22.08

Delta R' = 20.18

Standard Deviation = 1.65

PASS FOUR

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
57162.00	53113.00	52869.38	52887.10	17.72
57168.00	53116.10	52874.93	52890.20	15.27
57173.00	53122.20	52879.55	52896.30	16.75
57179.00	53130.10	52885.10	52904.20	19.10
57185.00	53133.80	52890.65	52907.90	17.25
57192.00	53135.20	52897.13	52909.30	12.17
57197.00	53145.10	52901.75	52919.20	17.45
57204.00	53148.10	52908.23	52922.20	13.97
57210.00	53154.60	52913.78	52928.70	14.92
57217.00	53161.40	52920.25	52935.50	15.25
57223.00	53165.60	52925.80	52939.70	13.90
57229.00	53170.40	52931.35	52944.50	13.15
57236.00	53176.30	52937.82	52950.40	12.58
57242.00	53185.80	52943.37	52959.90	16.53
57248.00	53194.90	52948.92	52969.00	20.08

Delta R' = 15.74

Standard Deviation = 2.28

Delta R'' = 17.06

Argo Partial for Naracoopa 27.23 = 0.29 Lanes



iv. ARGO CALIBRATION RESULTS (Cont.)

(a) NARACOOPA ARGO/SYLEDIS CALIBRATION SHEET THREE

Syledis Station - North Point Delay -228.5

Argo Propagation 0924904

Distance AC = 33.46 Metres Distance BD = 69786.25 Meters
 Azimuth AC = 226.26 Degrees Azimuth BD = 93.53 Degrees
 Angle DBC = -132.73 Degrees Delta Y = -22.70

PASS ONE

ARGO R	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
75452.00	70036.30	69785.88	69807.88	21.92
75495.00	70069.90	69825.65	69841.40	15.75
75538.00	70114.80	69865.42	69886.30	20.88
75581.00	70146.50	69905.19	69918.00	12.81
75624.00	70191.70	69944.96	69963.20	18.24
75667.00	70232.60	69984.73	70004.10	19.37
75710.00	70277.80	70024.50	70049.30	24.80
75752.00	70312.30	70063.35	70083.80	20.45
75796.00	70341.60	70104.05	70113.10	9.05
75840.00	70388.40	70144.74	70159.90	15.16
75884.00	70434.70	70185.44	70205.20	20.76
75926.00	70478.20	70224.28	70249.70	25.42
75970.00	70512.90	70264.98	70284.40	19.42
76014.00	70547.30	70305.68	70318.80	13.12
76055.00	70589.10	70343.60	70360.60	17.00

Delta R' = 18.28

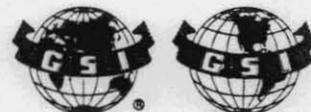
Standard Deviation = 4.37

PASS TWO

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
75776.00	70322.10	70085.55	70093.60	8.05
75823.00	70365.40	70129.02	70136.90	7.88
75870.00	70411.70	70172.49	70183.20	10.71
75914.00	70446.80	70213.19	70218.30	5.11
75955.00	70487.60	70251.11	70259.10	7.99
75994.00	70523.80	70287.18	70295.30	8.12
76035.00	70564.50	70325.10	70336.00	10.90
76076.00	70607.10	70363.02	70378.60	15.58
76121.00	70642.90	70404.64	70414.40	9.76
76165.00	70677.40	70445.34	70448.90	3.56
76207.00	70719.50	70484.18	70491.00	6.82
76249.00	70755.50	70523.03	70527.00	3.97
76289.00	70798.90	70560.02	70570.40	10.38

Delta R' = 8.37

Standard Deviation = 3.11



iv. ARGO CALIBRATION RESULTS (Cont.)

(a) NARACOOPA ARGO/SYLEDIS CALIBRATION SHEET FOUR

PASS THREE

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
76200.00	70714.50	70477.71	70486.00	8.29
76158.00	70670.70	70438.86	70442.20	3.34
76116.00	70632.60	70400.02	70404.10	4.08
76075.00	70593.60	70362.09	70365.10	3.01
76032.00	70556.10	70322.32	70327.690	5.28
75987.00	70524.30	70280.70	70295.80	15.10
75944.00	70458.960	70240.93	70230.10	-10.83
75901.00	70430.60	70201.16	70202.10	0.94
75858.00	70393.10	70161.396	70164.60	3.21
75816.00	70351.30	70122.54	70122.80	0.26
75772.00	70313.20	70081.85	70084.70	2.85
75728.00	70279.40	70041.15	70050.60	9.45
75686.00	70235.10	70002.31	70006.60	4.29
75662.00	70215.30	69980.11	69986.80	6.69
75599.00	70154.10	69921.84	69925.60	3.76

Delta R' = 3.98

Standard Deviation = 5.34

PASS FOUR

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
75837.00	70372.70	70141.97	70144.20	2.23
75792.00	70331.90	7000.35	70103.40	3.05
75745.00	70289.60	70056.88	70061.10	4.22
75700.00	70243.40	70015.26	70014.90	-0.36
75659.00	70209.60	69977.33	69981.10	3.77
75620.00	70172.70	69941.26	69944.20	2.94
75579.00	70130.50	69903.34	69902.00	-1.34
75535.00	70090.80	69862.65	69862.30	-0.35
75491.00	70049.50	69821.95	69821.00	-0.95
75447.00	70009.40	69781.25	69780.90	-0.35
75405.00	69972.50	69742.41	69744.00	1.59
75361.00	69929.90	69701.71	69701.40	-0.31
75319.00	69895.10	69662.87	69666.60	3.73
75277.00	69856.70	69624.02	69628.20	4.18
75212.00	69798.70	69563.90	69570.20	6.30

Delta R' = 1.89

Standard Deviation = 2.28

Delta R' = 8.13

Argo Partial for Northpoint 30.83 = 0.33 Lanes



iv. ARGO CALIBRATION RESULTS (Cont.)

(b) NORTH POINT ARGO/SYLEDIS CALIBRATION SHEET ONE

Syledis Station - North Point Delay -228.5

Argo Propagation 0.924904

Distance AC = 33.46 Metres Distance BD = 62559.87 Metres
 Azimuth AC = 226.26 Degrees Azimuth BD = 82.42 Degrees
 Angle DBC = -143.84 Degrees Delta Y = -27.02

PASS ONE

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
68040.00	63155.10	62930.49	62926.60	-3.89
67978.00	63099.40	62873.14	62870.90	-2.24
67921.00	63045.80	62820.42	62817.30	-3.12
67862.00	62992.90	62765.86	62764.40	-1.46
67804.00	62939.20	62712.21	62710.70	-1.51
67746.00	62883.90	62658.57	62655.40	-3.17
67685.00	62829.30	62602.15	62600.80	-1.35
67628.00	62774.80	62549.43	62546.30	-3.13
67571.00	62720.50	62496.71	62492.00	-4.71
67512.00	62666.30	62442.14	62437.80	-4.34
67456.00	62612.20	62390.34	62383.70	-6.64
67395.00	62558.00	62333.93	62329.50	-4.43
67333.00	62503.10	62276.58	62274.60	-1.98
67277.00	62451.50	62224.79	62223.00	-1.79
67214.00	62398.10	62166.52	62169.60	3.08

Delta R' = -2.71

Standard Deviation = 2.11

PASS TWO

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
67323.00	62504.40	62267.33	62275.90	8.57
67389.00	62564.20	62328.38	62335.70	7.32
67519.00	62682.60	62448.61	62454.10	5.49
67578.00	62740.30	62503.18	62511.80	8.62
67643.00	62799.70	62563.30	62571.20	7.90
67709.00	62860.50	62624.35	62632.00	7.65
67773.00	62921.10	62683.54	62692.60	9.06
67836.00	62980.90	62741.81	62752.40	10.59
67900.00	63040.80	62801.00	62812.30	11.30
67967.00	63100.50	62862.97	62872.00	9.03
68033.00	63159.80	62924.01	62931.30	7.29
68162.00	63278.80	63043.33	63050.30	6.97
68224.00	63339.10	63100.67	63110.60	9.93

Delta R' = 8.44

Standard Deviation = 1.52



iv. ARGO CALIBRATION RESULTS (Cont.)

(b) NORTH POINT ARGO/SYLEDIS CALIBRATION SHEET TWO

PASS THREE

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
66998.00	62201.10	61966.74	61972.60	5.86
66993.00	62200.20	61962.11	61971.70	9.59
66994.00	62200.30	61963.04	61971.80	8.76
66997.00	62198.10	61965.81	61969.60	3.79
66999.00	62197.40	61967.66	61968.90	1.24
66996.00	62195.30	61964.89	61966.80	1.91
66996.00	62194.40	61964.89	61965.90	1.01
66992.00	62194.10	61961.19	61965.60	4.41
66990.00	62193.50	61959.34	61965.00	5.66
66988.00	62194.00	61957.49	61965.50	8.01
66996.00	62194.10	61964.89	61965.60	0.71
66994.00	62193.20	61963.04	61964.70	1.66
66995.00	62193.80	61963.96	61965.30	1.34
66992.00	62192.30	61961.19	61963.80	2.61
66990.00	62193.20	61959.34	61964.70	5.36

Delta R' = 4.13

Standard deviation = 2.88

PASS FOUR

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
67011.00	62203.60	61978.76	61975.10	-3.66
67010.00	62202.40	61977.84	61973.90	-3.94
67010.00	62202.60	61977.84	61974.10	-3.74
67003.00	62202.20	61971.36	61973.70	2.34
67009.00	62203.50	61976.91	61975.00	-1.91
67005.00	62204.40	61973.21	61975.90	2.69
67008.00	62206.40	61975.99	61977.90	1.91
67013.00	62207.90	61980.61	61979.40	-1.21
67012.00	62209.60	61979.69	61981.10	1.41
67014.00	62209.50	61981.54	61981.00	-0.54
67010.00	62209.20	61977.84	61980.70	2.86
67013.00	62209.90	61980.61	61981.40	0.79
67015.00	62210.50	61982.46	61982.00	-0.46
67013.00	62212.70	61980.61	61984.20	3.59

Delta R' = 0.27

Standard Deviation = 2.62

Delta R'' = 2.53

Argo Partial For Northpoint 29.55 = 0.32 Lanes



iv. ARGO CALIBRATION RESULTS (Cont.)

(b) NORTH POINT ARGO/SYLEDIS CALIBRATION SHEET THREE

Syledis Station - Point Sorrel Delay -225.8

Argo Propagation 0.924904

Distance AC = 35.98 Metres Distance BD = 67690.14 Metres
 Azimuth AC = 16.19 Degrees Azimuth BD = 318.32 Degrees
 Angle DBC = 302.13 Degrees Delta Y = 19.14

PASS ONE

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
72908.00	67719.70	67432.92	67493.90	60.98
72942.00	67750.20	67464.37	67524.40	60.03
72976.00	67781.40	67495.82	67555.60	59.78
73008.00	67811.00	67525.41	67585.20	59.79
73039.00	67840.40	67554.09	67614.60	60.51
73070.00	67867.40	67582.76	67641.60	58.84
73098.00	67895.60	67608.65	67669.80	61.15
73130.00	67922.70	67638.25	67696.90	58.65
73160.00	67954.30	67666.00	67728.50	62.50
73195.00	67983.20	67698.37	67757.40	59.03
73226.00	68013.40	67727.04	67787.60	60.56
73260.00	68044.50	67758.49	67818.70	60.21
73292.00	68073.80	67788.09	67848.00	59.91
73377.00	68152.80	67866.70	67927.00	60.30
72894.00	67702.70	67419.97	67476.90	56.93

Delta R' = 59.94

Standard Deviation = 1.23

PASS TWO

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
73287.00	68065.50	67783.46	67839.70	56.24
73250.00	68027.50	67749.24	67801.70	52.46
73171.00	67959.80	67676.17	67734.00	57.83
73133.00	67927.40	67641.03	67701.60	60.57
73095.00	67891.40	67605.88	67665.60	59.72
73053.00	67851.50	67567.03	67625.70	58.67
73021.00	67819.20	67537.44	67593.40	55.96
72983.00	67782.40	67502.29	67556.60	54.31
72947.00	67748.40	67468.99	67522.60	53.61
72903.00	67713.70	67428.30	67487.90	59.60
72866.00	67677.20	67394.08	67451.40	57.32
72828.00	67644.70	67358.93	67418.90	59.97
72791.00	67607.90	67324.71	67382.10	57.39

Delta R' = 57.20

Standard Deviation = 2.48



iv. ARGO CALIBRATION RESULTS (Cont.)

(b) NORTH POINT ARGO/SYLEDIS CALIBRATION SHEET FOUR

PASS THREE

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
73810.00	68547.60	68267.19	68321.80	54.61
73763.00	68500.70	68223.72	68274.90	51.18
73710.00	68455.60	68174.70	68229.80	55.10
73661.00	68410.50	68129.38	68184.70	55.32
73616.00	68365.10	68087.75	68139.30	51.55
73563.00	68318.60	68038.74	68092.80	54.06
73517.00	68272.00	67996.19	68046.20	50.01
73462.00	68226.40	67945.32	68000.60	55.28
73413.00	68180.80	67900.00	67955.00	55.00
73363.00	68134.50	67853.75	67908.70	54.95
73316.00	68086.90	67810.28	67861.10	50.82
73262.00	68042.70	67760.34	67816.90	56.56
73215.00	67995.70	67716.87	67769.90	53.03
73165.00	67950.80	67670.62	67725.00	54.38
73119.00	67902.80	67628.08	67677.00	48.92

Delta R' = 53.39

Standard Deviation = 2.23

PASS FOUR

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
73102.00	67906.00	67612.35	67680.20	67.85
73156.00	67952.80	67662.30	67727.00	64.70
73204.00	67998.20	67706.69	67772.40	65.71
73260.00	68044.70	67758.49	67818.90	60.41
73299.00	68088.20	67794.56	67862.40	67.84
73352.00	68132.70	67843.58	67906.90	63.32
73402.00	68176.60	67889.83	67950.80	60.97
73440.00	68220.70	67924.97	67994.90	69.93
73493.00	68265.10	67973.99	68039.30	65.31
73544.00	68309.20	68021.16	68083.40	62.24
73590.00	68355.20	68063.71	68129.40	65.69
73686.00	68445.20	68152.50	68219.40	66.90
73737.00	68489.40	68199.67	68263.60	63.93
73781.00	68534.40	68240.36	68308.60	68.24
73828.00	68578.00	68283.83	68352.20	68.37

Delta R' = 65.43

Standard Deviation = 2.75

Delta R'' = 58.99

Argo Partial for Point Sorrel 39.85 = 0.43 Lanes



iv. ARGO CALIBRATION RESULTS (Cont.)

(b) POINT SORREL ARGO/SYLEDIS CALIBRATION SHEET ONE

Syledis Station - Point Sorrel Delay -225.8

Argo Propagation 0.924904

Distance AC = 35.98 Metres Distance BD = 55894.51 Metres
 Azimuth AC = 16.19 Degrees Azimuth BD = 317.75 Degrees
 Angle DBC = 301.56 Degrees Delta Y = 18.83

PASS ONE

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
60378.00	56118.50	55843.87	55892.70	48.83
60317.00	56063.80	55787.45	55838.00	50.55
60256.00	56007.70	55731.03	55781.90	50.87
60195.00	55951.70	55674.61	55725.90	51.29
60135.00	55895.60	55619.12	55669.80	50.68
60074.00	55839.30	55562.70	55613.50	50.80
60014.00	55783.20	55507.21	55557.40	50.19
59953.00	55728.60	55450.79	55502.80	52.01
59892.00	55670.80	55394.37	55445.00	50.63
59831.00	55613.10	55337.95	55387.30	49.35
59770.00	55559.00	55281.53	55333.20	51.67
59709.00	55503.20	55225.11	55277.40	52.29
59648.00	55444.80	55168.69	55219.00	50.31
59588.00	55391.40	55113.20	55165.60	52.40
59527.00	55334.90	55056.78	55109.10	52.32

Delta R' = 50.95

Standard Deviation = 1.03

PASS TWO

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
59810.00	55608.80	55318.53	55383.00	64.47
59870.00	55664.70	55374.02	55438.90	64.88
59930.00	55727.70	55429.51	55501.90	72.39
59991.00	55777.60	55485.93	55551.80	65.87
60051.00	55831.90	55541.43	55606.10	64.67
60113.00	55888.30	55598.77	55662.50	63.73
60172.00	55945.90	55653.34	55720.10	66.76
60233.00	56003.30	55709.76	55777.50	67.74
60295.00	56058.00	55767.10	55832.20	65.10
60354.00	56115.40	55821.67	55889.60	67.93
60415.00	56169.90	55878.09	55944.10	66.01
60476.00	56226.00	55934.51	56000.20	65.69
60537.00	56282.40	55990.93	56056.60	65.67

Delta R' = 66.22

Standard Deviation = 2.13



iv. ARGO CALIBRATION RESULTS (Cont.)

(b) POINT SORREL ARGO/SYLEDIS CALIBRATION SHEET TWO

PASS THREE

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
59726.00	55519.80	55240.83	55294.00	53.17
59721.00	55518.60	55236.21	55292.80	56.59
59721.00	55515.60	55236.21	55289.80	53.59
59714.00	55510.30	55229.74	55284.50	54.76
59713.00	55514.40	55228.81	55288.60	59.79
59715.00	55513.70	55230.66	55287.90	57.24
59716.00	55514.90	55231.59	55289.10	57.51
59714.00	55513.00	55229.74	55287.20	57.46
59710.00	55509.80	55226.04	55284.00	57.96
59709.00	55507.50	55225.11	55281.70	56.59
59707.00	55505.40	55223.26	55279.60	56.34
59707.00	55507.80	55223.26	55282.00	58.74
59709.00	55505.00	55225.11	55279.20	54.09
59721.00	55519.30	55236.21	55293.50	57.29
59708.00	55509.00	55224.19	55283.20	59.01

Delta R' = 56.68

Standard Deviation = 1.92

PASS FOUR

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
59546.00	55360.00	55074.35	55134.20	59.85
59542.00	55358.90	55070.65	55133.10	62.45
59540.00	55356.60	55068.80	55130.80	62.00
59541.00	55359.10	55069.73	55133.30	63.57
59546.00	55363.50	55074.35	55137.70	63.35
59555.00	55371.00	55082.68	55145.20	62.52
59560.00	55376.60	55087.30	55150.80	63.50
59565.00	55380.10	55091.92	55154.30	62.38
59567.00	55381.70	55093.77	55155.90	62.13
59571.00	55383.60	55097.47	55157.80	60.33
59576.00	55388.70	55102.10	55162.90	60.80
59582.00	55394.00	55107.65	55168.20	60.55
59587.00	55396.60	55112.27	55170.80	58.53
59592.00	55403.00	55116.90	55177.20	60.30
59595.00	55405.30	55119.67	55179.50	59.83

Delta R' = 61.47

Standard Deviation = 1.50

Delta R'' = 58.83

Argo Partial for Point Sorrel 40.00 = 0.43 Lanes



iv. ARGO CALIBRATION RESULTS (Cont.)

(b) POINT SORREL ARGO/SYLEDIS CALIBRATION SHEET THREE

Syledis Station - North Point Delay -228.5

Argo Propagation 0.924904

Distance AC = 33.46 Metres Distance BD = 69786.25 Metres
 Azimuth AC = 226.26 Degrees Azimuth BD = 93.53 Degrees
 Angle DBC = -132.73 Degrees Delta Y = -22.70

PASS ONE

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
75452.00	70036.30	69785.88	69807.80	21.92
75495.00	70069.90	69825.65	69841.40	15.75
75538.00	70114.80	69865.42	69886.30	20.88
75581.00	70146.50	69905.19	69918.00	12.81
75624.00	70191.70	69944.96	69963.20	18.24
75667.00	70232.60	69984.73	70004.10	19.37
75710.00	70277.80	70024.50	70049.30	24.80
75752.00	70312.30	70063.35	70083.80	20.45
75796.00	70341.60	70104.05	70113.10	9.05
75840.00	70388.40	70144.74	70159.90	15.16
75884.00	70434.70	70185.44	70206.20	20.76
75926.00	70478.20	70224.28	70249.70	25.42
75970.00	70512.90	70264.98	70284.40	19.42
76014.00	70547.30	70305.68	70318.80	13.12
76055.00	70589.10	70343.60	70360.60	17.00

Delta R' = 18.28

Standard Deviation = 4.37

PASS TWO

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
75776.00	70322.10	70085.55	70093.60	8.05
75823.00	70365.40	70129.02	70136.90	7.88
75870.00	70411.70	70172.49	70183.20	10.71
75914.00	70446.80	70213.19	70218.30	5.11
75955.00	70487.60	70251.11	70259.10	7.99
75994.00	70523.80	70287.18	70295.30	8.12
76035.00	70564.50	70325.10	70336.00	10.90
76076.00	70607.10	70363.02	70378.60	15.58
76121.00	70642.90	70404.64	70414.40	9.76
76165.00	70677.40	70445.34	70448.90	3.56
76207.00	70719.50	70484.18	70491.00	6.82
76249.00	70755.50	70523.03	70527.00	3.97
76289.00	70798.90	70560.02	70570.40	10.38

Delta R' = 8.37

Standard Deviation = 3.11



iv. ARGO CALIBRATION RESULTS (Cont.)

(b) POINT SORREL ARGO/SYLEDIS CALIBRATION SHEET FOUR

PASS THREE

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
76200.00	70714.50	70477.71	70486.00	8.29
76158.00	70670.70	70438.86	70442.20	3.34
76116.00	70632.60	70400.02	70404.10	4.08
76075.00	70593.60	70362.09	70365.10	3.01
76032.00	70556.10	70322.32	70327.60	5.28
75987.00	70524.30	70280.70	70295.80	15.10
75944.00	70458.60	70240.93	70230.10	-10.83
75901.00	70430.60	70201.16	70202.10	0.94
75858.00	70393.10	70161.39	70164.60	3.21
75816.00	70351.30	70122.54	70122.80	0.26
75772.00	70313.20	70081.85	70084.70	2.85
75728.00	70279.10	70041.15	70050.60	9.45
75686.00	70235.10	70002.31	70006.60	4.29
75662.00	70215.30	69980.11	69986.80	6.69
75599.00	70154.10	69921.84	69925.60	3.76

Delta R' = 3.98

Standard Deviation = 5.34

PASS FOUR

ARGO Rr	SYLEDIS Rr	ARGO Rp	SYLEDIS Rc	DELTA R
75837.00	70372.70	70141.97	70144.20	2.23
75792.00	70331.90	70100.35	70103.40	3.05
75745.00	70289.60	70056.88	70061.10	4.22
75700.00	70243.40	70015.26	70014.90	-0.36
75659.00	70209.60	69977.33	69981.10	3.77
75620.00	70172.70	69941.26	69944.20	2.94
75579.00	70130.50	69903.34	69902.00	-1.34
75535.00	70090.80	69862.65	69862.30	-0.35
75491.00	70049.50	69821.95	69821.00	-0.95
75447.00	70009.40	69781.25	69780.90	-0.35
75405.00	69972.50	69742.41	69744.00	1.59
75361.00	69929.90	69701.71	69701.40	-0.31
75319.00	69895.10	69662.87	69666.60	3.73
75277.00	69856.70	69624.02	69628.20	4.18
75212.00	69798.70	69563.90	69570.20	6.30

Delta R' = 1.89

Standard Deviation = 2.28

Delta R'' = 8.13

Argo Partial for North Point 30.83 = 0.33 Lanes



v. SYLEDIS BASELINE CROSSINGS

A baseline crossing of the NORTH POINT/POINT SORREL navigation stations was carried out on the 20th - 21st of February 1990, prior to starting the BS90B survey. Four passes were made and results are as follows:-

Baseline	Pass	Computed	Observed	Diff.
North Pt/Pt Sorrel	1	116205.3	116206.1	-0.8
	2	116205.3	116205.1	+0.2
	3	116205.3	116206.6	-1.3
	4	116205.3	116208.5	-3.2

Baseline crossings for the OS90A survey were carried out on the 4th - 5th of March and results are as follows:-

Baseline	Pass	Computed	Observed	Diff.
T Lookout/C Schanck	1	79393.0	79387.4	+5.6
	2	79393.0	79388.9	+4.1
	3	79393.0	79388.7	+4.3
	4	79393.0	79387.9	+5.1
	5	79393.0	79386.7	+6.3
Ingoldsby/C Schanck	1	64270.9	64267.7	+3.2
	2	64270.9	64267.8	+3.1
	3	64270.9	64267.7	+3.2
	4	64270.9	64266.4	+4.5
Barwon Hd/C Schanck	1	40592.3	40585.2	+7.1
	2	40592.3	40585.2	+7.1
	3	40592.3	40587.1	+5.2
	4	40592.3	40587.2	+5.1
	5	40592.3	40586.5	+5.8



v. SYLEDIS BASELINE CROSSINGS (Cont.)

While conducting further baseline crossings on the 11th of March, to coincide with the St Paul's base becoming available, the Syledis mobile on board developed a fault. The unit was swapped out for the standby unit (Ser.#122) and the following baselines cut.

Baseline	Pass	Computed	Observed	Diff.
T/Lookout/St Pauls	1	70266.3	70259.5	+6.8
	2	70266.3	70264.2	+2.1
	3	70266.3	70262.5	+3.8
Ingoldsby/St Pauls	1	51608.9	51605.6	+3.3
	2	51608.9	51606.4	+2.5
Ingoldsby/C Schanck	1	64269.6	64269.1	+0.5
	2	64269.6	64269.9	-0.3
T Lookout/C Schanck	1	79392.9	79390.6	+2.3

Prior to leaving the area the following baselines were recrossed to confirm previous results.

Baseline	Pass	Computed	Observed	Diff.
Ingoldsby/C Schanck	1	64269.6	64270.4	-0.8
T/Lookout/St Paul's	1	70266.3	70264.5	+1.8
Ingoldsby/St Paul's	1	51608.9	51610.0	-1.1
Barwon Hd/C Schanck	1	40592.3	40590.1	+2.2



vi. RECORDING INSTRUMENTS

(a) DIGITAL STREAMER

One 50 metre stretch section was deployed between the vessel and the first active section to attenuate any front end jerk. It was not found necessary to weight the front end of the stretch section with lead to provide additional ballast.

Streamer depth was maintained by correct ballasting and the use of Digicourse, Model 396 compass/birds. Bird depths were constantly monitored throughout the survey.

No problems were encountered, other than those outlined previously in the survey synopsis.

(b) STREAMER CONTROL SYSTEM

Intermittent problems were experienced with both signal processing units dropping out while on line. Lines BS90B-07 and BS90B-09 were both terminated for this reason.

The problem with SPU B was rectified, but intermittent dropouts of SPU A, causing the loss of approximately three shotpoints at a time continued to occur throughout the survey. These are well documented on the QC and Observer's logs.

(c) FIELD COMPUTER SYSTEM

A problem developed with the FCS in the closing stages of the survey, first manifesting itself on the 14th of March, which resulted in only every second shotpoint being written to tape. After four lines were terminated because of this, it was determined that the problem appeared to be associated with output of the single fold plot.

The Line Printer controller board in the Gould mini-computer was changed out on the 15th and the above symptoms did not recur for the remainder of the survey.

(d) TAPE TRANSPORTS

From time to time a bad portion of tape was encountered and a changeover of transports was automatically initiated. In this case, no double EOF is written to the last record on the first tape, and no general header is generated prior to the first record of the new reel. Both records are annotated in the Observer's log as bad records.



vii, AUXILIARY INSTRUMENTS

(a) FATHOMETER

At 50 shotpoint intervals an event mark was logged to the fathometer strip chart with the relevant shotpoint number and water depth annotated. On any occasion where it became necessary to change the fathometer scale, the shotpoint number and new scale was logged on the chart.

The fathometer was operational for all recorded seismic lines.

(b) MULTI-TRACE PLOTTER

During normal "On-Line" operation, plots were produced every 50 shotpoints. These records included a header label which provided the following information:- Record number, UTC Time and field tape number. The fields available for line number, crew number and Julian date are not currently supported by the Westren software. The line number was manually entered into the comments field prior to starting each line.

Various display parameters, including Overall Gain and Programmed Gain Control values, were adjusted from time to time to provide the best display characteristics.



viii. ENERGY SOURCE

The Airgun array and the associated Tiger II timing system performed within specifications throughout the survey.

Routine compressor and airgun maintenance was required from time to time during the survey and was carried out by HGS personnel during line change periods and therefore no downtime was accumulated from the energy source.



ix. CONFIGURABLE MARINE SYSTEM III

(a) CMS III

No problems were experienced with the CMS III system during the survey.

(b) 990 NAVIGATION SYSTEM

No problems were experienced with the 990 NAV system during the survey.

(c) STREAMER TRACKING SYSTEM III

No problems were experienced with the Streamer Tracking System during the survey.

(d) STREAMER DEPTH CONTROL NETWORK

During the survey, fourteen compass/depth controllers were positioned on the streamer. However, the CMS III can only include a maximum of twelve per streamer in the automatic data logger.

Streamer depths and heading were constantly monitored throughout the survey and recorded on the Observer's logs and automatic data log at regular intervals.

(e) GYROCOMPASS

The gyro performed continuously throughout the whole prospect with no problems.



SECTION IX

MISCELLANEOUS



i. OFFSET CALCULATION

The offset was determined by firing a single gun from each of the four sub arrays and recording the data on tape. Offset recordings were made at the beginning and end of every line and may be found on the first and last tape of each recorded line.

The offset gun chosen from each sub array was located at the centre of the gun string. These were gun #9 on port outer string, gun #25 on port inner string, gun #41 on starboard outer string and gun #57 on starboard inner string. The gun numbers and record numbers were recorded on the observer's log.

The onset time of the first break of each of the four shots to the near trace was determined from the offset programme resident in the Titan 1000 software. The programme simply determines the onset time of the first arrivals at a nominated trace. The hard copy printouts of the offset analysis software were kept with the single fold plots and shipped to the processing centre. The raw onset time in milli-seconds were also recorded on the observers log.

An example of one of the four offset calculations is shown below:

$$\text{OFFSET} = (\text{onset} - \text{gun delay}) \times \text{water sound vel.} \\ + (\text{length of group}/2)$$

$$\text{e.g.} = (114 - 51.2) \times 1.5 + 6.25$$

$$= 100.45$$

Each of the four offset measurements was evaluated in this way and the results were recorded in the observers log.

Physical Offset Measurement

OFFSET = Lead-in	+116.00 metres
Tow Fixture	n/a
Stretch Section Length	+ 50.00 metres
Stretch Factor (10%)	+ 5.00 metres
1/2 Group Length	+ 6.25 metres
Stern to Centre of Gun Array	- 77.00 metres

	OFFSET = 100.25 metres



ii. INSTRUMENT TESTS

Throughout the prospect, instrument tests were periodically carried out. These were the Monthly and the Daily Instrument Tests.

The Daily Instrument Tests included the following:

- Converter Dynamic Range Determination (set of two)
- Amplifier Harmonic Distortion Test (set of two)
- Inwater Streamer Dynamic Range Determination
- General Purpose Noise/DC Offset Test

The Monthly Instrument Tests included the following:

- Converter Dynamic Range Determination (set of nine)
- Equivalent Input Noise Test (set of two)
- Filter Pulse Test
- Crossfeed Check (odds and evens)
- Amplifier Harmonic Distortion (set of four)

The analyses were performed in the FCS and the results checked against the set specifications.

The instruments were constantly maintained to specification and hard copies of the test results were made available to the Client Representative.



iii. STATISTICS

T/18P

First recording day 22nd February 1990
Last recording day 24th February 1990
Number of processable line segments. 12
Number of chargeable kilometres 200.35
Number of non-chargeable kilometres. 21.425
Number of chargeable shotpoints 8020
Number of non-chargeable shotpoints. 183
Average kilometres per Recording day 66.78

T/14P

First recording day 24th February 1990
Last recording day 3rd March 1990
Number of processable line segments. 34
Number of chargeable kilometres 733.25
Number of non-chargeable kilometres. 17.125
Number of chargeable shotpoints 29330
Number of non-chargeable shotpoints. 685
Average kilometres per Recording day 91.66

VIC/P28

First recording day 6th March 1990
Last recording day 16th March 1990
Number of processable line segments. 47
Number of chargeable kilometres 1185.75
Number of non-chargeable kilometres. 29.45
Number of chargeable shotpoints 47430
Number of non-chargeable shotpoints. 1178
Average kilometres per Recording day 107.8



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iv. SHIPMENT DETAILS

SEISMIC DATA SHIPMENTS

Data shot between - 2931-005-MIS-90
22 Feb 90 - 24 Feb 90

Data shot between - 2931-006-MIS-90
24 Feb 90 - 03 Mar 90

Data shot between - 2931-010-MIS-90
06 Mar 90 - 16 Mar 90

Seismic data shipped to - DIGICON BRISBANE
54-56 BROOKE ST
BOWEN HILLS
BRISBANE
QLD 4006

NAVIGATION DATA SHIPMENTS

Data shot between - 2931-005-SIN-90
22 Feb 90 - 24 Feb 90

Data shot between - 2931-006-SIN-90
24 Feb 90 - 03 Mar 90

Data shot between - 2931-007-SIN-90
06 Mar 90 - 16 Mar 90

Navigation data shipped to - TAN ENG TECK
NAVIGATION PROCESSING
GEOPHYSICAL SERVICE INC.
LAM SOON INDUSTRIAL BUILDING
63 HILLVIEW AVE #08-23
SINGAPORE 2366



v. NAVIGATION TAPE INVENTORY

TAPE #	LINE #s	DATE
890049	BS90B-04	21 FEB 90
	BS90B-15	"
	BS90B-02	22 FEB 90
	BS90B-01	"
890050	BS90B-03	22 FEB 90
	BS90B-01A	23 FEB 90
	BS90B-07	"
	BS90B-07A	"
	BS90B-13	"
	BS90B-09	"
	BS90B-09A	"
	BS90B-11	"
	BS90B-05	"
END OF SHIPMENT 2932-005 SIN 90		
890051	BS90A-12	24 FEB 90
	BS90A-16	"
	BS90A-14	25 FEB 90
	BS90A-14A	"
	BS90A-10	"
	BS90A-08	"
	BS90A-08A	26 FEB 90
	BS90A-06	"
890052	BS90A-04	26 FEB 90
	BS90A-02	"
	BS90A-02A	27 FEB 90
	BS90A-02B	"
	BS90A-02C	"
	BS90A-09	"
	BS90A-01	"
	BS90A-13	"
	BS90A-05	"
	BS90A-15	"
	BS90A-15A	"
BS90A-07	28 FEB 90	
890053	BS90A-19	28 FEB 90
	BS90A-17	"
	BS90A-03	"
	BS90A-11	"
	BS90A-27	"
	BS90A-27A	01 MAR 90
BS90A-23	"	



v. NAVIGATION TAPE INVENTORY (Cont.)

TAPE #	LINE #s	DATE
890054	BS90A-29	01 MAR 90
	BS90A-25	"
	BS90A-31	"
	BS90A-21	02 MAR 90
	BS90A-33	"
890055	BS90A-39	02 MAR 90
	BS90A-35	"
	BS90A-35A	03 MAR 90
	BS90A-41	"
	BS90A-37	"
	BS90A-43	"
	BS90A-45	"
END OF SHIPMENT 2931-006-SIN-90		
890056	OS90A-12	06 MAR 90
	OS90A-27	"
	OS90A-24	07 MAR 90
	OS90A-39	"
	OS90A-35	"
	OS90A-29	"
890057	OS90A-25	07 MAR 90
	OS90A-06	08 MAR 90
	OS90A-01	"
	OS90A-05	"
	OS90A-03	"
	OS90A-12A	"
890058	OS90A-55	08 MAR 90
	OS90A-57	09 MAR 90
	OS90A-53	"
	OS90A-45	"
	OS90A-51	"
	OS90A-51A	"
	OS90A-41	"
OS90A-49	"	
890059	OS90A-37	10 MAR 90
	OS90A-47	"
	OS90A-43	"
	OS90A-33	"
	OS90A-31	"



v. NAVIGATION TAPE INVENTORY (Cont.)

TAPE #	LINE #s	DATE
890060	OS90A-14	10 MAR 90
	OS90A-20	12 MAR 90
	OS90A-20A	"
	OS90A-22	"
	OS90A-18	"
	OS90A-16	"
	OS90A-14A	13 MAR 90
890061	OS90A-10	"
	OS90A-08	"
	OS90A-04	"
	OS90A-02	"
	OS90A-21	14 MAR 90
**	OS90A-23	"
890062	** OS90A-23	"
	OS90A-19	"
	OS90A-19A	"
	OS90A-19B	"
	OS90A-17	"
	OS90A-15	15 MAR 90
890063	OS90A-13	"
	OS90A-11	"
	OS90A-11A	"
	OS90A-11B	"
	OS90A-11C	16 MAR 90
	OS90A-07	"
	OS90A-07A	"
OS90A-07B	"	

END OF SHIPMENT 2931-007-SIN-90



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LINE SUMMARY (SHELL AUST.) T/18P

DATE	LINE	DIR	SP RANGE	RN RANGE	COMMENTS
22/02/90	BS90B-04	325.3	1001-2275	1001-2275	COMPLETE
22/02/90	B990B-15	234.1	1001-1581	1001-1581	COMPLETE
22/02/90	BS90B-02	144.6	1001-1876	1001-1874	COMPLETE
22/02/90	BS90B-01	052.7	1001-1674	1001-1664	T. B. R.
23/02/90	BS90B-03	233.2	1001-1999	1001-1999	COMPLETE
23/02/90	BS90B-01A	052.7	1001-1857	1001-1857	COMPLETE
23/02/90	BS90B-07	233.3	1001-1738	1000-1737	T. B. C.
23/02/90	BS90B-07A	233.3	1651-1937	1651-1937	COMPLETE
23/02/90	BS90B-13	053.3	1001-1755	1001-1753	COMPLETE
23/02/90	BS90B-09	233.2	1001-1321	1001-1317	COMPLETE
24/02/90	BS90B-09A	233.2	1231-1573	1231-1573	COMPLETE
24/02/90	BS90B-11	053.7	1001-1574	1001-1574	COMPLETE
24/02/90	BS90B-05	233.5	1001-1591	1001-1591	COMPLETE

COMPLETION OF SURVEY T/18P



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LINE SUMMARY (SHELL AUST.) T/14P

DATE	LINE	DIR	SP RANGE	RN RANGE	COMMENTS
24/02/90	BS90A-12	112.0	1001-2570	1001-2570	COMPLETE
25/02/90	BS90A-16	291.6	1001-1715	1001-1715	COMPLETE
25/02/90	BS90A-14	111.2	1001-1148	1001-1148	T. B. R.
25/02/90	BS90A-14A	111.2	1001-1680	1001-1680	COMPLETE
25/02/90	BS90A-10	291.5	1001-1747	1001-1747	COMPLETE
25/02/90	BS90A-08	111.5	1001-1058	1001-1058	T. B. R.
26/02/90	BS90A-08A	111.5	1001-2238	1001-2238	COMPLETE
26/02/90	BS90A-06	291.7	1001-1673	1001-1673	COMPLETE
26/02/90	BS90A-04	111.7	1001-2602	1001-2602	COMPLETE
26/02/90	BS90A-02	291.6	1001-1845	1001-1845	T. B. C.
27/02/90	BS90A-02A	291.7	1761-2221	1761-2221	T. B. C.
27/02/90	BS90A-02B	291.7	2141-2151	2141-2151	T. B. R.
27/02/90	BS90A-02C	291.7	2141-2571	2141-2571	COMPLETE
27/02/90	BS90A-09	022.1	1001-1558	1001-1558	COMPLETE
27/02/90	BS90A-01	201.9	1001-1391	1001-1391	COMPLETE
27/02/90	BS90A-13	021.5	1001-1476	1001-1476	COMPLETE
27/02/90	BS90A-05	200.5	1001-1462	1001-1462	COMPLETE
27/02/90	BS90A-15	022.5	1001-1088	1001-1088	T. B. R.
28/02/90	BS90A-15A	022.5	1001-1477	1001-1477	COMPLETE
28/02/90	BS90A-07	201.0	1001-1476	1001-1476	COMPLETE
28/02/90	BS90A-19	023.0	1001-1492	1001-1492	COMPLETE
28/02/90	BS90A-17	230.1	1001-2054	1001-2054	COMPLETE
28/02/90	BS90A-03	021.0	1001-2503	1001-2503	COMPLETE
28/02/90	BS90A-11	212.0	1001-2340	1001-2340	COMPLETE



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LINE SUMMARY (SHELL AUST.) T/14P

DATE	LINE	DIR	SP RANGE	RN RANGE	COMMENTS
28/02/90	BS90A-27	022.6	1001-1096	1001-1096	T. B. R.
01/03/90	BS90A-27A	022.6	1001-1999	1001-1999	COMPLETE
01/03/90	BS90A-23	202.5	1001-1879	1001-1879	COMPLETE
01/03/90	BS90A-29	023.0	1001-2005	1001-2005	COMPLETE
01/03/90	BS90A-25	203.3	1001-1855	1001-1855	COMPLETE
01/03/90	BS90A-31	022.6	1001-2604	1001-2604	COMPLETE
02/03/90	BS90A-21	202.8	1001-2471	1001-2471	COMPLETE
02/03/90	BS90A-33	022.2	1001-2007	1001-2007	COMPLETE
02/03/90	BS90A-39	203.3	1001-2047	1001-2047	COMPLETE
02/03/90	BS90A-35	022.6	1001-1437	1001-1436	COMPLETE
03/03/90	BS90A-35A	022.6	1341-1942	1341-1942	COMPLETE
03/03/90	BS90A-41	203.1	1001-1956	1001-1956	COMPLETE
03/03/90	BS90A-37	022.8	1001-1939	1001-1939	COMPLETE
03/03/90	BS90A-43	202.4	1001-1799	1001-1799	COMPLETE
03/03/90	BS90A-45	022.7	1001-1802	1001-1802	COMPLETE

COMPLETION OF SURVEY T/14P



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LINE SUMMARY (SHELL AUST.) VIC/P28

DATE	LINE	DIR	SP RANGE	RN RANGE	COMMENTS
06/03/90	OS90A-12	077.6	1001-1900	1001-1900	T. B. C.
06/03/90	OS90A-27	347.4	1001-2060	1001-2060	COMPLETE
07/03/90	OS90A-24	076.8	1001-1708	1001-1708	COMPLETE
07/03/90	OS90A-39	347.5	1001-1390	1001-1390	COMPLETE
07/03/90	OS90A-35	167.6	1001-2405	1001-2402	COMPLETE
07/03/90	OS90A-29	347.5	1001-2411	1001-2411	COMPLETE
07/03/90	OS90A-25	167.5	1001-2079	1001-2079	COMPLETE
08/03/90	OS90A-06	257.6	1001-2026	1001-2026	COMPLETE
08/03/90	OS90A-01	347.8	1001-1971	1001-1971	COMPLETE
08/03/90	OS90A-05	167.8	1001-2258	1001-2258	COMPLETE
08/03/90	OS90A-03	347.7	1001-2027	1001-2027	COMPLETE
08/03/90	OS90A-12A	077.4	1821-2977	1821-2977	COMPLETE
08/03/90	OS90A-55	347.6	1001-1879	1001-1879	COMPLETE
09/03/90	OS90A-57	167.5	1001-1818	1001-1818	COMPLETE
09/03/90	OS90A-53	347.6	1001-1560	1001-1560	COMPLETE
09/03/90	OS90A-45	167.7	1001-2116	1001-2116	COMPLETE
09/03/90	OS90A-51	347.8	1001-1629	1001-1625	COMPLETE
09/03/90	OS90A-51A	347.9	1471-1851	1471-1851	COMPLETE
09/03/90	OS90A-41	167.9	1001-2115	1001-2115	COMPLETE
09/03/90	OS90A-49	347.7	1001-1851	1001-1851	COMPLETE
10/03/90	OS90A-37	167.7	1001-2038	1001-2038	COMPLETE
10/03/90	OS90A-47	347.8	1001-1890	1001-1890	COMPLETE



LINE SUMMARY (SHELL AUST.) VIC/P28

DATE	LINE	DIR	SP RANGE	RN RANGE	COMMENTS
10/03/90	OS90A-43	167.7	1001-2712	1001-2712	COMPLETE
10/03/90	OS90A-33	347.7	1001-2039	1001-2039	COMPLETE
10/03/90	OS90A-31	167.2	1001-2055	1001-2055	COMPLETE
10/03/90	OS90A-14	077.4	1001-1039	1001-1039	T. B. R.
12/03/90	OS90A-20	077.6	1001-1341	1001-1341	T. B. C.
12/03/90	OS90A-20A	077.5	1221-2196	1221-2196	COMPLETE
12/03/90	OS90A-22	257.4	1001-2151	1001-2151	COMPLETE
12/03/90	OS90A-18	077.5	1001-2230	1001-2230	COMPLETE
13/03/90	OS90A-16	257.3	1001-2237	1001-2236	COMPLETE
13/03/90	OS90A-14A	077.4	1001-2237	1001-2237	COMPLETE
13/03/90	OS90A-10	257.2	1001-2976	1001-2976	COMPLETE
13/03/90	OS90A-08	077.8	1001-2103	1001-2101	COMPLETE
13/03/90	OS90A-04	257.6	1001-1956	1001-1955	COMPLETE
13/03/90	OS90A-02	077.9	1001-1895	1001-1895	COMPLETE
14/03/90	OS90A-21	347.6	1001-2407	1001-2403	COMPLETE
14/03/90	OS90A-23	167.8	1001-2531	1001-2531	COMPLETE
14/03/90	OS90A-19	347.6	1001-1786	1001-1772	T. B. C.
14/03/90	OS90A-19A	347.7	1681-2171	1681-2171	T. B. C.
14/03/90	OS90A-19B	347.6	2061-2411	2061-2411	COMPLETE
14/03/90	OS90A-17	167.8	1001-2404	1001-2404	COMPLETE
15/03/90	OS90A-15	347.8	1001-2326	1001-2325	COMPLETE
15/03/90	OS90A-13	167.7	1001-2318	1001-2318	COMPLETE
15/03/90	OS90A-11	347.6	1001-2125	1001-2117	T. B. C.



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LINE SUMMARY (SHELL AUST.) VIC/P28

DATE	LINE	DIR	SP RANGE	RN RANGE	COMMENTS
15/03/90	OS90A-11A	347.6	2021-2066	2021-2059	T. B. R.
15/03/90	OS90A-11B	347.6	2021-2275	2021-2267	T. B. R.
16/03/90	OS90A-11C	347.6	2021-2300	2020-2299	COMPLETE
16/03/90	OS90A-07	167.8	1001-1006	1001-1006	T. B. R.
16/03/90	OS90A-09	347.6	1001-2257	1001-2257	COMPLETE
16/03/90	OS90A-07A	167.8	1001-1150	1001-1150	T. B. R.
16/03/90	OS90A-07B	347.8	1001-2259	1001-2259	COMPLETE



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
22/02/90	00811AA	BS90B-04	1001 - 1080	1001 - 1080	01
	00812AA	BS90B-04	1081 - 1165	1081 - 1165	
	00813AA	BS90B-04	1166 - 1250	1166 - 1250	
	00814AA	BS90B-04	1251 - 1335	1251 - 1335	
	00815AA	BS90B-04	1336 - 1420	1336 - 1420	
	00816AA	BS90B-04	1421 - 1505	1421 - 1505	
	00817AA	BS90B-04	1506 - 1590	1506 - 1590	
	00818AA	BS90B-04	1591 - 1675	1591 - 1675	
	00819AA	BS90B-04	1676 - 1685	1676 - 1685	
	00820AA	BS90B-04	1686 - 1770	1686 - 1770	
22/02/90	00821AA	BS90B-04	1771 - 1855	1771 - 1855	02
	00822AA	BS90B-04	1856 - 1859	1856 - 1859	
	00823AA	BS90B-04	1860 - 1944	1860 - 1944	
	00824AA	BS90B-04	1945 - 2029	1945 - 2029	
	00825AA	BS90B-04	2030 - 2114	2030 - 2114	
	00826AA	BS90B-04	2115 - 2199	2115 - 2199	
	00827AA	BS90B-04	2200 - 2275	2200 - 2275	
	00828AA	BS90B-15	1001 - 1080	1001 - 1080	
	00829AA	BS90B-15	1081 - 1165	1081 - 1165	
	00830AA	BS90B-15	1166 - 1250	1166 - 1250	
22/02/90	00831AA	BS90B-15	1251 - 1335	1251 - 1335	03
	00832AA	BS90B-15	1336 - 1420	1336 - 1420	
	00833AA	BS90B-15	1421 - 1436	1421 - 1436	
	00834AA	BS90B-15	1437 - 1521	1437 - 1521	
	00835AA	BS90B-15	1522 - 1581	1522 - 1581	
	00836AA	BS90B-02	1001 - 1080	1001 - 1080	
	00837AA	BS90B-02	1081 - 1165	1081 - 1165	
	00838AA	BS90B-02	1166 - 1180	1166 - 1180	
	00839AA	BS90B-02	1181 - 1265	1181 - 1265	
	00840AA	BS90B-02	1266 - 1350	1266 - 1350	
22/02/90	00841AA	BS90B-02	1351 - 1435	1351 - 1435	04
	00842AA	BS89B-02	1436 - 1520	1436 - 1520	
	00843AA	BS89B-02	1521 - 1605	1521 - 1605	
	00844AA	BS89B-02	1606 - 1690	1606 - 1690	
	00845AA	BS90B-02	1691 - 1775	1691 - 1775	
	00846AA	BS90B-02	1776 - 1862	1776 - 1860	
	00847AA	BS90B-02	1863 - 1871	1861 - 1869	
	00848AA	BS90B-02	1872 - 1876	1870 - 1874	
	00849AA	BS90B-01	D.N.P.	D.N.P.	
	00850AA	BS90B-01	D.N.P.	D.N.P.	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP.RANGE	RECORD NOS.	BOX
22/02/90	00851AA	BS90B-01	D.N.P.	D.N.P.	05
	00852AA	BS90B-01	D.N.P.	D.N.P.	
	00853AA	BS90B-01	D.N.P.	D.N.P.	
	00854AA	BS90B-01	D.N.P.	D.N.P.	
	00855AA	BS90B-01	D.N.P.	D.N.P.	
	00856AA	BS90B-01	D.N.P.	D.N.P.	
	00857AA	BS90B-03	1001 - 1080	1001 - 1080	
	00858AA	BS90B-03	1081 - 1165	1081 - 1165	
	00859AA	BS90B-03	1166 - 1250	1166 - 1250	
	00860AA	BS90B-03	1251 - 1335	1251 - 1335	
23/02/90	00861AA	BS90B-03	1336 - 1420	1336 - 1420	06
	00862AA	BS90B-03	1421 - 1505	1421 - 1505	
	00863AA	BS90B-03	1506 - 1590	1506 - 1590	
	00864AA	BS90B-03	1591 - 1675	1591 - 1675	
	00865AA	BS90B-03	1676 - 1760	1676 - 1760	
	00866AA	BS90B-03	1761 - 1845	1761 - 1845	
	00867AA	BS90B-03	1846 - 1930	1846 - 1930	
	00868AA	BS90B-03	1931 - 1999	1931 - 1999	
	00869AA	BS90B-01A	1001 - 1080	1001 - 1080	
	00870AA	BS90B-01A	1081 - 1165	1081 - 1165	
23/02/90	00871AA	BS90B-01A	1166 - 1250	1165 - 1250	07
	00872AA	BS90B-01A	1251 - 1335	1251 - 1335	
	00873AA	BS90B-01A	1336 - 1420	1336 - 1420	
	00874AA	BS90B-01A	1421 - 1505	1421 - 1505	
	00875AA	BS90B-01A	1506 - 1590	1506 - 1590	
	00876AA	BS90B-01A	1591 - 1675	1591 - 1675	
	00877AA	BS90B-01A	1676 - 1760	1676 - 1760	
	00878AA	BS90B-01A	1761 - 1845	1761 - 1845	
	00879AA	BS90B-01A	1846 - 1857	1846 - 1857	
	00880AA	BS90B-07	1001 - 1078	1000 - 1077	
23/02/90	00881AA	BS90B-07	1079 - 1163	1078 - 1162	08
	00882AA	BS90B-07	1164 - 1248	1163 - 1247	
	00883AA	BS90B-07	1249 - 1333	1248 - 1332	
	00884AA	BS90B-07	1334 - 1418	1333 - 1417	
	00885AA	BS90B-07	1419 - 1503	1418 - 1502	
	00886AA	BS90B-07	1504 - 1588	1503 - 1587	
	00887AA	BS90B-07	1589 - 1673	1588 - 1672	
	00888AA	BS90B-07	1674 - 1738	1673 - 1737	
	00889AA	BS90B-07A	1651 - 1730	1651 - 1730	
	00890AA	BS90B-07A	1731 - 1815	1731 - 1815	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP.RANGE	RECORD NOS.	BOX
23/02/90	00891AA	BS90B-07A	1816 - 1900	1816 - 1900	09
	00892AA	BS90B-07A	1901 - 1937	1901 - 1937	
	00893AA	BS90B-13	1001 - 1080	1001 - 1080	
	00894AA	BS90B-13	1081 - 1165	1081 - 1165	
	00895AA	BS90B-13	1166 - 1250	1166 - 1250	
	00896AA	BS90B-13	1251 - 1335	1251 - 1335	
	00897AA	BS90B-13	1336 - 1420	1336 - 1420	
	00898AA	BS90B-13	1421 - 1507	1421 - 1505	
	00899AA	BS90B-13	1508 - 1592	1506 - 1590	
	00900AA	BS90B-13	1593 - 1677	1591 - 1675	
23/02/90	00901AA	BS90B-13	1678 - 1744	1676 - 1742	10
	00902AA	BS90B-13	1745 - 1755	1743 - 1753	
	00903AA	BS90B-09	1001 - 1080	1001 - 1080	
	00904AA	BS90B-09	1081 - 1165	1081 - 1165	
	00905AA	BS90B-09	1166 - 1250	1166 - 1250	
	00906AA	BS90B-09	1251 - 1321	1251 - 1317	
24/02/90	00907AA	BS90B-09A	1231 - 1310	1231 - 1310	
	00908AA	BS90B-09A	1311 - 1395	1311 - law5	
	00909AA	BS90B-09A	1396 - 1480	1396 - 1480	
	00910AA	BS90B-09A	1481 - 1565	1481 - 1565	
24/02/90	00911AA	BS90B-09A	1566 - 1573	1566 - 1573	11
	00912AA	BS90B-11	1001 - 1080	1001 - 1080	
	00913AA	BS90B-11	1081 - 1165	1081 - 1165	
	00914AA	BS90B-11	1166 - 1250	1165 - 1250	
	00915AA	BS90B-11	1251 - 1335	1251 - 1335	
	00916AA	BS90B-11	1336 - 1420	1336 - 1420	
	00917AA	BS90B-11	1421 - 1505	1421 - 1505	
	00918AA	BS90B-11	1506 - 1574	1506 - 1574	
	00919AA	BS90B-05	1001 - 1080	1001 - 1080	
	00920AA	BS90B-05	1081 - 1167	1081 - 1165	
24/02/90	00921AA	BS90B-05	1168 - 1252	1166 - 1250	12
	00922AA	BS90B-05	1253 - 1337	1251 - 1335	
	00923AA	BS90B-05	1338 - 1422	1336 - 1420	
	00924AA	BS90B-05	1423 - 1507	1421 - 1505	
	00925AA	BS90B-05	1508 - 1591	1506 - 1591	

END OF SHIPMENT 2931-005-MIS-90



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP.RANGE	RECORD NOS.	BOX
24/02/90	00926AA	BS90A-12	1001 - 1080	1001 - 1080	01
	00927AA	BS90A-12	1081 - 1165	1081 - 1165	
	00928AA	BS90A-12	1166 - 1250	1166 - 1250	
	00929AA	BS90A-12	1251 - 1335	1251 - 1335	
	00930AA	BS90A-12	1336 - 1420	1336 - 1420	
	00931AA	BS90A-12	1421 - 1456	1421 - 1456	
	00932AA	BS90A-12	1457 - 1541	1457 - 1541	
	00933AA	BS90A-12	1542 - 1626	1542 - 1626	
	00934AA	BS90A-12	1627 - 1711	1627 - 1711	
	00935AA	BS90A-12	1712 - 1796	1712 - 1796	
24/02/90	00936AA	BS90A-12	1797 - 1881	1797 - 1881	02
	00937AA	BS90A-12	1882 - 1966	1882 - 1966	
	00938AA	BS90A-12	1967 - 2054	1967 - 2054	
	00939AA	BS90A-12	2055 - 2136	2055 - 2136	
	00940AA	BS90A-12	2136 - 2221	2136 - 2221	
	00941AA	BS90A-12	2222 - 2306	2222 - 2306	
	00942AA	BS90A-12	2307 - 2391	2307 - 2391	
	00943AA	BS90A-12	2392 - 2476	2392 - 2476	
	00944AA	BS90A-12	2477 - 2561	2477 - 2561	
	00945AA	BS90A-12	2562 - 2570	2562 - 2570	
25/02/90	00946AA	BS90A-16	1001 - 1080	1001 - 1080	03
	00947AA	BS90A-16	1081 - 1165	1081 - 1165	
	00948AA	BS90A-16	1166 - 1250	1166 - 1250	
	00949AA	BS90A-16	1251 - 1335	1251 - 1335	
	00950AA	BS90A-16	1336 - 1420	1336 - 1420	
	00951AA	BS90A-16	1421 - 1505	1421 - 1505	
	00952AA	BS90A-16	1506 - 1590	1506 - 1590	
	00953AA	BS90A-16	1591 - 1675	1591 - 1675	
	00954AA	BS90A-16	1675 - 1690	1676 - 1690	
	00955AA	BS90A-16	1691 - 1715	1691 - 1715	
25/02/90	00956AA	BS90A-14	D.N.P.	D.N.P.	04
	00957AA	BS90A-14	D.N.P.	D.N.P.	
	00958AA	BS90A-14A	1001 - 1080	1001 - 1080	
	00959AA	BS90A-14A	1081 - 1165	1081 - 1165	
	00960AA	BS90A-14A	1166 - 1250	1166 - 1250	
	00961AA	BS90A-14A	1251 - 1335	1251 - 1335	
	00962AA	BS90A-14A	1336 - 1420	1336 - 1420	
	00963AA	BS90A-14A	1421 - 1505	1421 - 1505	
	00964AA	BS90A-14A	1506 - 1590	1506 - 1590	
	00965AA	BS90A-14A	1591 - 1669	1591 - 1669	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
25/02/90	00966AA	BS90A-14A	1670 - 1679	1670 - 1679	05
	00967AA	BS90A-14A	1680 - 1680	1680 - 1680	
	00968AA	BS90A-10	1001 - 1165	1001 - 1165	
	00969AA	BS90A-10	1166 - 1250	1166 - 1250	
	00970AA	BS90A-10	1251 - 1335	1251 - 1335	
	00971AA	BS90A-10	1336 - 1420	1336 - 1420	
	00972AA	BS90A-10	1421 - 1505	1421 - 1505	
	00973AA	BS90A-10	1506 - 1590	1506 - 1590	
	00974AA	BS90A-10	1591 - 1675	1591 - 1675	
	00975AA	BS90A-10	1676 - 1735	1676 - 1735	
25/02/90	00976AA	BS90A-10	1736 - 1737	1736 - 1737	06
	00977AA	BS90A-10	1738 - 1747	1738 - 1747	
	00978AA	BS90A-08	D. N. P.	D. N. P.	
26/02/90	00979AA	BS90A-08A	1001 - 1080	1001 - 1080	
	00980AA	BS90A-08A	1081 - 1165	1081 - 1165	
	00981AA	BS90A-08A	1166 - 1250	1166 - 1250	
	00982AA	BS90A-08A	1251 - 1287	1251 - 1287	
	00983AA	BS90A-08A	1288 - 1372	1288 - 1372	
	00984AA	BS90A-08A	1373 - 1457	1373 - 1457	
	00985AA	BS90A-08A	1458 - 1542	1458 - 1542	
26/02/90	00986AA	BS90A-08A	1543 - 1627	1543 - 1627	07
	00987AA	BS90A-08A	1628 - 1712	1628 - 1712	
	00988AA	BS90A-08A	1713 - 1797	1713 - 1797	
	00989AA	BS90A-08A	1798 - 1882	1798 - 1882	
	00990AA	BS90A-08A	1883 - 1967	1883 - 1967	
	00991AA	BS90A-08A	1968 - 2052	1968 - 2052	
	00992AA	BS90A-08A	2053 - 2137	2053 - 2137	
	00993AA	BS90A-08A	2138 - 2222	2138 - 2222	
	00994AA	BS90A-08A	2223 - 2238	2223 - 2238	
	00995AA	BS90A-06	1001 - 1080	1001 - 1080	
26/02/90	00996AA	BS90A-06	1081 - 1165	1081 - 1165	08
	00997AA	BS90A-06	1166 - 1250	1166 - 1250	
	00998AA	BS90A-06	1251 - 1335	1251 - 1335	
	00999AA	BS90A-06	1336 - 1420	1336 - 1420	
	01000AA	BS90A-06	1421 - 1505	1421 - 1505	
	01001AA	BS90A-06	1506 - 1590	1506 - 1590	
	01002AA	BS90A-06	1591 - 1660	1591 - 1660	
	01003AA	BS90A-06	1661 - 1673	1661 - 1673	
	01004AA	BS90A-04	1001 - 1080	1001 - 1080	
	01005AA	BS90A-04	1081 - 1165	1081 - 1165	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
26/02/90	01006AA	BS90A-04	1166 - 1250	1166 - 1250	09
	01007AA	BS90A-04	1251 - 1335	1251 - 1335	
	01008AA	BS90A-04	1336 - 1420	1336 - 1420	
	01009AA	BS90A-04	1421 - 1505	1421 - 1505	
	01010AA	BS90A-04	1506 - 1590	1506 - 1590	
	01011AA	BS90A-04	1591 - 1675	1591 - 1675	
	01012AA	BS90A-04	1676 - 1760	1676 - 1760	
	01013AA	BS90A-04	1761 - 1845	1761 - 1845	
	01014AA	BS90A-04	1846 - 1930	1846 - 1930	
	01015AA	BS90A-04	1931 - 2015	1931 - 2015	
26/02/90	01016AA	BS90A-04	2016 - 2100	2016 - 2100	10
	01017AA	BS90A-04	2101 - 2185	2101 - 2185	
	01018AA	BS90A-04	2186 - 2270	2186 - 2270	
	01019AA	BS90A-04	2271 - 2355	2271 - 2355	
	01020AA	BS90A-04	2356 - 2440	2356 - 2440	
	01021AA	BS90A-04	2441 - 2525	2441 - 2525	
	01022AA	BS90A-04	2526 - 2526	D. N. P.	
	01023AA	BS90A-04	2527 - 2589	2527 - 2589	
	01024AA	BS90A-04	2590 - 2602	2590 - 2602	
	01025AA	BS90A-02	1001 - 1080	1001 - 1080	
26/02/90	01026AA	BS90A-02	1081 - 1165	1081 - 1165	11
	01027AA	BS90A-02	116aw- 1250	1166 - 1250	
	01028AA	BS90A-02	1251 - 1335	1251 - 1335	
	01029AA	BS90A-02	1336 - 1420	1336 - 1420	
	01030AA	BS90A-02	1421 - 1505	1421 - 1505	
	01031AA	BS90A-02	1506 - 1590	1506 - 1590	
	01032AA	BS90A-02	1591 - 1675	1591 - 1675	
	01033AA	BS90A-02	1676 - 1696	1676 - 1696	
	01034AA	BS90A-02	1697 - 1781	1697 - 1781	
	01035AA	BS90A-02	1782 - 1845	1782 - 1845	
27/02/90	01036AA	BS90A-02A	1761 - 1840	1761 - 1840	12
	01037AA	BS90A-02A	1841 - 1925	1841 - 1925	
	01038AA	BS90A-02A	1926 - 2010	1926 - 2010	
	01039AA	BS90A-02A	2011 - 2095	2011 - 2095	
	01040AA	BS90A-02A	2096 - 2180	2096 - 2180	
	01041AA	BS90A-02A	2181 - 2242	2181 - 2242	
	01042AA	BS90A-02B	D. N. P	D. N. P.	
	01043AA	BS90A-02C	2141 - 2220	2141 - 2220	
	01044AA	BS90A-02C	2221 - 2305	2221 - 2305	
	01045AA	BS90A-02C	2306 - 2390	2306 - 2390	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
27/02/90	01046AA	BS90A-02C	2391 - 2475	2391 - 2475	13
	01047AA	BS90A-02C	2476 - 2aw0	2476 - 2560	
	01048AA	BS90A-02C	2561 - 2571	2561 - 2571	
	01049AA	BS90A-09	1001 - 1080	1001 - 1080	
	01050AA	BS90A-09	1081 - 1165	1081 - 1165	
	01051AA	BS90A-09	1166 - 1250	1166 - 1250	
	01052AA	BS90A-09	1251 - 1335	1251 - 1335	
	01053AA	BS90A-09	1336 - 1420	1336 - 1420	
	01054AA	BS90A-09	1421 - 1505	1421 - 1505	
	01055AA	BS90A-09	1506 - 1558	1506 - 1558	
27/02/90	01056AA	BS90A-01	1001 - 1080	1001 - 1080	14
	01057AA	BS90A-01	1081 - 1165	1081 - 1065	
	01058AA	BS90A-01	1166 - 1250	1166 - 1250	
	01059AA	BS90A-01	1251 - 1335	1251 - 1335	
	01060AA	BS90A-01	1336 - 1391	1336 - 1391	
	01061AA	BS90A-13	1001 - 1080	1001 - 1080	
	01062AA	BS90A-13	1081 - 1165	1081 - 1165	
	01063AA	BS90A-13	1166 - 1250	1166 - 1250	
	01064AA	BS90A-13	1251 - 1335	1251 - 1335	
	01065AA	BS90A-13	1336 - 1420	1336 - 1420	
27/02/90	01066AA	BS90A-13	1421 - 1476	1421 - 1476	15
	01067AA	BS90A-13	1001 - 1080	1001 - 1080	
	01068AA	BS90A-13	1081 - 1165	1081 - 1165	
	01069AA	BS90A-13	1166 - 1250	1166 - 1250	
	01070AA	BS90A-13	1251 - 1335	1251 - 1335	
	01071AA	BS90A-13	1336 - 1420	1336 - 1420	
	01072AA	BS90A-13	1421 - 1462	1421 - 1462	
	01073AA	BS90A-15	D.N.P.	D.N.P.	
	01074AA	BS90A-15	D.N.P.	D.N.P.	
	01075AA	BS90A-15A	1001 - 1080	1001 - 1080	
27/02/90	01076AA	BS90A-15A	1081 - 1165	1081 - 1165	16
	01077AA	BS90A-15A	1166 - 1181	1166 - 1181	
28/02/90	01078AA	BS90A-15A	1182 - 1266	1182 - 1266	
	01079AA	BS90A-15A	1267 - 1351	1267 - 1351	
	01080AA	BS90A-15A	1352 - 1436	1352 - 1436	
	01081AA	BS90A-15A	1437 - 1477	1437 - 1477	
	01082AA	BS90A-07	1001 - 1079	1001 - 1079	
	01083AA	BS90A-07	1080 - 1164	1080 - 1164	
	01084AA	BS90A-07	1165 - 1249	1165 - 1249	
	01085AA	BS90A-07	1250 - 1334	1250 - 1334	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
28/02/90	01086AA	BS90A-07	1335 - 1419	1335 - 1419	17
	01087AA	BS90A-07	1420 - 1476	1420 - 1476	
	01088AA	BS90A-19	1001 - 1080	1001 - 1080	
	01089AA	BS90A-19	1081 - 1165	1081 - 1165	
	01090AA	BS90A-19	1166 - 1171	1166 - 1171	
	01091AA	BS90A-19	1172 - 1256	1172 - 1256	
	01092AA	BS90A-19	1257 - 1341	1257 - 1341	
	01093AA	BS90A-19	1342 - 1426	1342 - 1426	
	01094AA	BS90A-19	1427 - 1492	1427 - 1492	
	01095AA	BS90A-17	1001 - 1080	1001 - 1080	
28/02/90	01096AA	BS90A-17	1081 - 1165	1081 - 1165	18
	01097AA	BS90A-17	1166 - 1250	1166 - 1250	
	01098AA	BS90A-17	1251 - 1335	1251 - 1335	
	01099AA	BS90A-17	1336 - 1420	1336 - 1420	
	01100AA	BS90A-17	1421 - 1505	1421 - 1505	
	01101AA	BS90A-17	1506 - 1590	1506 - 1590	
	01102AA	BS90A-17	1591 - 1675	1591 - 1675	
	01103AA	BS90A-17	1676 - 1760	1676 - 1760	
	01104AA	BS90A-17	1761 - 1845	1761 - 1845	
	01105AA	BS90A-17	1846 - 1930	1846 - 1930	
28/02/90	01106AA	BS90A-17	1931 - 2015	1931 - 2015	19
	01107AA	BS90A-17	2016 - 2054	2016 - 2054	
	01108AA	BS90A-03	1001 - 1080	1001 - 1080	
	01109AA	BS90A-03	1081 - 1165	1081 - 1165	
	01110AA	BS90A-03	1166 - 1250	1166 - 1250	
	01111AA	BS90A-03	1251 - 1335	1251 - 1335	
	01112AA	BS90A-03	1336 - 1420	1336 - 1420	
	01113AA	BS90A-03	1421 - 1505	1421 - 1505	
	01114AA	BS90A-03	1506 - 1590	1506 - 1590	
	01115AA	BS90A-03	1591 - 1675	1591 - 1675	
28/02/90	01116AA	BS90A-03	1676 - 1760	1676 - 1760	20
	01117AA	BS90A-03	1761 - 1845	1761 - 1845	
	01118AA	BS90A-03	1846 - 1930	1846 - 1930	
	01119AA	BS90A-03	1931 - 1941	1931 - 1941	
	01120AA	BS90A-03	1942 - 2026	1942 - 2026	
	01121AA	BS90A-03	2027 - 2111	2027 - 2111	
	01122AA	BS90A-03	2112 - 2196	2112 - 2196	
	01123AA	BS90A-03	2197 - 2281	2197 - 2281	
	01124AA	BS90A-03	2282 - 2366	2282 - 2366	
	01125AA	BS90A-03	2367 - 2951	2367 - 2951	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
28/02/90	01126AA	BS90A-03	2452 - 2503	2452 - 2503	21
	01127AA	BS90A-11	1001 - 1080	1001 - 1080	
	01128AA	BS90A-11	1081 - 1165	1081 - 1165	
	01129AA	BS90A-11	1166 - 1227	1166 - 1227	
	01130AA	BS90A-11	1228 - 1312	1228 - 1312	
	01131AA	BS90A-11	1313 - 1397	1313 - 1397	
	01132AA	BS90A-11	1398 - 1482	1398 - 1482	
	01133AA	BS90A-11	1483 - 1567	1483 - 1567	
	01134AA	BS90A-11	1568 - 1652	1568 - 1652	
	01135AA	BS90A-11	1653 - 1737	1653 - 1737	
	28/02/90	01136AA	BS90A-11	1738 - 1822		1738 - 1822	22
01137AA		BS90A-11	1823 - 1907	1823 - 1907	
01138AA		BS90A??	1908 - 1992	1908 - 1992	
01139AA		BS90A-11	1993 - 2077	1993 - 2077	
01140AA		BS90A-11	2078 - 2162	2078 - 2162	
0114??		BS90A-11	2163 - 2247	2163 - 2247	
01142AA		BS90A-11	2248 - 2332	2248 - 2332	
01143AA		BS90A-11	2333 - 2340	2333 - 2340	
01144AA		BS90A-27	D.N.P.	D.N.P.	
01145AA		BS90A-27	D.N.P.	D.N.P.	
01/03/90	01146AA	BS90A-27A	1001 - 1080	1001 - 1080	23
	01147AA	BS90A-27A	1081 - 1165	1081 - 1165	
	01148AA	BS90A-27A	1166 - 1250	1166 - 1250	
	01149AA	BS90A-27A	1251 - 1335	1251 - 1335	
	01150AA	BS90A-27A	1336 - 1420	1336 - 1420	
	01151AA	BS90A-27A	1421 - 1505	1421 - 1505	
	01152AA	BS90A-27A	1505 - 1590	1505 - 1590	
	01153AA	BS90A-27A	1591 - 1675	1591 - 1675	
	01154AA	BS90A-27A	1676 - 1760	1676 - 1760	
	01155AA	BS90A-27A	1761 - 1845	1761 - 1845	
01/03/90	01156AA	BS90A-27A	1846 - 1930	1846 - 1930	24
	01157AA	BS90A-27A	1931 - 1999	1931 - 1999	
	01158AA	BS90A-23	1001 - 1080	1001 - 1080	
	01159AA	BS90A-23	1081 - 1165	1081 - 1165	
	01160AA	BS90A-23	1166 - 1250	1166 - 1250	
	01161AA	BS90A-23	1251 - 1335	1251 - 1335	
	01162AA	BS90A-23	1336 - 1420	1336 - 1420	
	01163AA	BS90A-23	1421 - 1505	1421 - 1505	
	01164AA	BS90A-23	1506 - 1590	1506 - 1590	
	01165AA	BS90A-23	1591 - 1675	1591 - 1675	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
01/03/90	01166AA	BS90A-23	1676 - 1760	1676 - 1760	25
	01167AA	BS90A-23	1761 - 1845	1761 - 1845	
	01168AA	BS90A-23	1846 - 1879	1846 - 1879	
	01169AA	BS90A-29	1001 - 1080	1001 - 1080	
	01170AA	BS90A-29	1081 - 1165	1081 - 1165	
	01171AA	BS90A-29	1166 - 1250	1166 - 1250	
	01172AA	BS90A-29	1251 - 1335	1251 - 1335	
	01173AA	BS90A-29	1336 - 1420	1336 - 1420	
	01174AA	BS90A-29	1421 - 1505	1421 - 1505	
	01175AA	BS90A-29	1506 - 1590	1506 - 1590	
	01/03/90	01176AA	BS90A-29	1591 - 1675		1591 - 1675	26
01177AA		BS90A-29	1676 - 1760	1676 - 1760	
01178AA		BS90A-29	1761 - 1845	1761 - 1845	
01179AA		BS90A-29	1846 - 1930	1846 - 1930	
01180AA		BS90A-29	1931 - 2005	1931 - 2005	
01181AA		BS90A-25	1001 - 1080	1001 - 1080	
01182AA		BS90A-25	1081 - 1165	1081 - 1165	
01183AA		BS90A-25	1166 - 1178	1166 - 1178	
01184AA		BS90A-25	1179 - 1263	1179 - 1263	
01185AA		BS90A-25	1264 - 1348	1264 - 1348	
01/03/90		01186AA	BS90A-25	1349 - 1433	1349 - 1433	27
	01187AA	BS90A-25	1434 - 1518	1434 - 1518	
	01188AA	BS90A-25	1519 - 1603	1519 - 1603	
	01189AA	BS90A-25	1604 - 1688	1604 - 1688	
	01190AA	BS90A-25	1689 - 1773	1689 - 1773	
	01191AA	BS90A-25	1774 - 1855	1774 - 1855	
	01192AA	BS90A-31	1001 - 1080	1001 - 1080	
	01193AA	BS90A-31	1081 - 1165	1081 - 1165	
	01194AA	BS90A-31	1166 - 1250	1166 - 1250	
	01195AA	BS90A-31	1251 - 1335	1251 - 1335	
	01/03/90	01196AA	BS90A-31	1336 - 1420	1336 - 1420		28
01197AA		BS90A-31	1421 - 1505	1421 - 1505	
01198AA		BS90A-31	1506 - 1590	1506 - 1590	
01199AA		BS90A-31	1591 - 1675	1591 - 1675	
01200AA		BS90A-31	1676 - 1760	1676 - 1760	
01201AA		BS90A-31	1761 - 1845	1761 - 1845	
01202AA		BS90A-31	1846 - 1930	1846 - 1930	
01203AA		BS90A-31	1931 - 2015	1931 - 2015	
01204AA		BS90A-31	2016 - 2100	2016 - 2100	
01205AA		BS90A-31	2101 - 2185	2101 - 2185	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
01/03/90	01206AA	BS90A-31	2186 - 2270	2186 - 2270	29
	01207AA	BS90A-31	2271 - 2355	2271 - 2355	
	01208AA	BS90A-31	2356 - 2440	2356 - 2440	
	01209AA	BS90A-31	2441 - 2525	2441 - 2525	
	01210AA	BS90A-31	2526 - 2604	2526 - 2604	
02/03/90	01211AA	BS90A-21	1001 - 1080	1001 - 1080	
	01212AA	BS90A-21	1081 - 1165	1081 - 1165	
	01213AA	BS90A-21	1166 - 1250	1166 - 1250	
	01214AA	BS90A-21	1251 - 1335	1251 - 1335	
	01215AA	BS90A-21	1336 - 1420	1336 - 1420	
02/03/90	01216AA	BS90A-21	1421 - 1435	1421 - 1435	30
	01217AA	BS90A-21	1436 - 1520	1436 - 1520	
	01218AA	BS90A-21	1521 - 1605	1521 - 1605	
	01219AA	BS90A-21	1606 - 1620	1606 - 1620	
	01220AA	BS90A-21	1621 - 1705	1621 - 1705	
	01221AA	BS90A-21	1706 - 1790	1706 - 1790	
	01222AA	BS90A-21	1791 - 1875	1791 - 1875	
	01223AA	BS90A-21	1876 - 1960	1876 - 1960	
	01224AA	BS90A-21	1961 - 2045	1961 - 2045	
	01225AA	BS90A-21	2046 - 2130	2046 - 2130	
02/03/90	01226AA	BS90A-21	2131 - 2215	2131 - 2215	31
	01227AA	BS90A-21	2216 - 2300	2216 - 2300	
	01228AA	BS90A-21	2301 - 2385	2301 - 2385	
	01229AA	BS90A-21	2386 - 2459	2386 - 2459	
	01230AA	BS90A-21	2460 - 2471	2460 - 2471	
	01231AA	BS90A-33	1001 - 1080	1001 - 1080	
	01232AA	BS90A-33	1081 - 1165	1081 - 1165	
	01233AA	BS90A-33	1166 - 1250	1166 - 1250	
	01234AA	BS90A-33	1251 - 1335	1251 - 1335	
	01235AA	BS90A-33	1336 - 1420	1336 - 1420	
02/03/90	01236AA	BS90A-33	1421 - 1505	1421 - 1505	32
	01237AA	BS90A-33	1506 - 1590	1506 - 1590	
	01238AA	BS90A-33	1591 - 1675	1591 - 1675	
	01239AA	BS90A-33	1676 - 1760	1676 - 1760	
	01240AA	BS90A-33	1761 - 1845	1761 - 1845	
	01241AA	BS90A-33	1846 - 1930	1846 - 1930	
	01242AA	BS90A-33	1931 - 1934	1931 - 1934	
	01243AA	BS90A-33	1935 - 2007	1935 - 2007	
	01244AA	BS90A-39	1001 - 1080	1001 - 1080	
	01245AA	BS90A-39	1081 - 1165	1081 - 1165	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
02/03/90	01246AA	BS90A-39	1166 - 1250	1166 - 1250	33
	01247AA	BS90A-39	1251 - 1335	1251 - 1335	
	01248AA	BS90A-39	1336 - 1420	1336 - 1420	
	01249AA	BS90A-39	1421 - 1432	1421 - 1432	
	01250AA	BS90A-39	1433 - 1517	1433 - 1517	
	01251AA	BS90A-39	1518 - 1523	1518 - 1523	
	01252AA	BS90A-39	1524 - 1608	1524 - 1608	
	01253AA	BS90A-39	1609 - 1693	1609 - 1693	
	01254AA	BS90A-39	1694 - 1778	1694 - 1778	
	01255AA	BS90A-39	1779 - 1810	1779 - 1810	
02/03/90	01256AA	BS90A-39	1811 - 1895	1811 - 1895	34
	01257AA	BS90A-39	1896 - 1980	1896 - 1980	
	01258AA	BS90A-39	1981 - 2047	1981 - 2047	
	01259AA	BS90A-35	1001 - 1080	1001 - 1080	
	01260AA	BS90A-35	1081 - 1165	1081 - 1165	
	01261AA	BS90A-35	1166 - 1250	1166 - 1250	
	01262AA	BS90A-35	1251 - 1335	1251 - 1335	
	01263AA	BS90A-35	1336 - 1420	1336 - 1420	
	01264AA	BS90A-35	D.N.P.	D.N.P.	
03/03/90	01265AA	BS90A-35A	1341 - 1420	1341 - 1420	
03/03/90	01266AA	BS90A-35A	1421 - 1505	1421 - 1505	35
	01267AA	BS90A-35A	1506 - 1590	1506 - 1590	
	01268AA	BS90A-35A	1591 - 1675	1591 - 1675	
	01269AA	BS90A-35A	1676 - 1760	1676 - 1760	
	01270AA	BS90A-35A	1761 - 1845	1761 - 1845	
	01271AA	BS90A-35A	1846 - 1930	1846 - 1930	
	01272AA	BS90A-35A	1931 - 1942	1931 - 1942	
	01273AA	BS90A-41	1001 - 1080	1001 - 1080	
	01274AA	BS90A-41	1081 - 1165	1081 - 1165	
	01275AA	BS90A-41	1166 - 1250	1166 - 1250	
03/03/90	01276AA	BS90A-41	1251 - 1335	1251 - 1335	36
	01277AA	BS90A-41	1336 - 1420	1336 - 1420	
	01278AA	BS90A-41	1421 - 1505	1421 - 1505	
	01279AA	BS90A-41	1506 - 1590	1506 - 1590	
	01280AA	BS90A-41	1591 - 1675	1591 - 1675	
	01281AA	BS90A-41	1676 - 1760	1676 - 1760	
	01282AA	BS90A-41	1761 - 1845	1761 - 1845	
	01283AA	BS90A-41	1846 - 1930	1846 - 1930	
	01284AA	BS90A-41	1931 - 1956	1931 - 1956	
	01285AA	BS90A-37	1001 - 1080	1001 - 1080	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
03/03/90	01286AA	BS90A-37	1081 - 1165	1081 - 1165	37
	01287AA	BS90A-37	1166 - 1250	1166 - 1250	
	01288AA	BS90A-37	1251 - 1335	1251 - 1335	
	01289AA	BS90A-37	1336 - 1420	1336 - 1420	
	01290AA	BS90A-37	1421 - 1505	1421 - 1505	
	01291AA	BS90A-37	1506 - 1590	1506 - 1590	
	01292AA	BS90A-37	1591 - 1675	1591 - 1675	
	01293AA	BS90A-37	1676 - 1760	1676 - 1760	
	01294AA	BS90A-37	1761 - 1845	1761 - 1845	
	01295AA	BS90A-37	1846 - 1930	1846 - 1930	
03/03/90	01296AA	BS90A-37	1931 - 1939	1931 - 1939	38
	01297AA	BS90A-43	1001 - 1080	1001 - 1080	
	01298AA	BS90A-43	1081 - 1165	1081 - 1165	
	01299AA	BS90A-43	1166 - 1250	1166 - 1250	
	01300AA	BS90A-43	1251 - 1335	1251 - 1335	
	01301AA	BS90A-43	1336 - 1420	1336 - 1420	
	01302AA	BS90A-43	1421 - 1435	1421 - 1435	
	01303AA	BS90A-43	1436 - 1520	1436 - 1520	
	01304AA	BS90A-43	1521 - 1605	1521 - 1605	
	01305AA	BS90A-43	1606 - 1611	1606 - 1611	
03/03/90	01306AA	BS90A-43	1612 - 1696	1612 - 1696	39
	01307AA	BS90A-43	1697 - 1781	1697 - 1781	
	01308AA	BS90A-43	1782 - 1788	1782 - 1788	
	01309AA	BS90A-43	1789 - 1799	1789 - 1799	
	01310AA	BS90A-45	1001 - 1080	1001 - 1080	
	01311AA	BS90A-45	1081 - 1165	1081 - 1165	
	01312AA	BS90A-45	1166 - 1250	1166 - 1250	
	01313AA	BS90A-45	1251 - 1335	1251 - 1335	
	01314AA	BS90A-45	1336 - 1420	1336 - 1420	
01315AA	BS90A-45	1421 - 1505	1421 - 1505		
03/03/90	01316AA	BS90A-45	1506 - 1590	1506 - 1590	40
	01317AA	BS90A-45	1591 - 1675	1591 - 1675	
	01318AA	BS90A-45	1676 - 1698	1676 - 1698	
	01319AA	BS90A-45	1699 - 1783	1699 - 1783	
	01320AA	BS90A-45	1784 - 1802	1784 - 1802	

END OF SHIPMENT 2931-006-MIS 90



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
06/03/90	01321AA	OS90A-12	1001 - 1079	1001 - 1079	01
	01322AA	OS90A-12	1080 - 1164	1080 - 1164	
	01323AA	OS90A-12	1165 - 1249	1165 - 1249	
	01325AA	OS90A-12	1335 - 1419	1335 - 1419	
	01326AA	OS90A-12	1420 - 1504	1420 - 1504	
	01327AA	OS90A-12	1505 - 1589	1505 - 1589	
	01328AA	OS90A-12	1590 - 1674	1590 - 1674	
	01329AA	OS90A-12	1675 - 1759	1675 - 1759	
	01330AA	OS90A-12	1760 - 1844	1760 - 1844	
06/03/90	01331AA	OS90A-12	1845 - 1900	1845 - 1900	02
	01332AA	OS90A-27	1001 - 1070	1001 - 1080	
	01333AA	OS90A-27	1081 - 1165	1081 - 1165	
	01334AA	OS90A-27	1166 - 1250	1166 - 1250	
	01335AA	OS90A-27	1251 - 1335	1251 - 1335	
	01336AA	OS90A-27	1336 - 1349	1336 - 1349	
	01337AA	OS90A-27	1350 - 1434	1350 - 1434	
	01338AA	OS90A-27	1435 - 1519	1435 - 1519	
	01339AA	OS90A-27	1520 - 1604	1520 - 1604	
	01340AA	OS90A-27	1605 - 1689	1605 - 1689	
06/03/90	01341AA	OS90A-27	1690 - 1774	1690 - 1774	03
	01342AA	OS90A-27	1775 - 1859	1775 - 1859	
	01343AA	OS90A-27	1860 - 1944	1860 - 1944	
	01344AA	OS90A-27	1950 - 2029	1950 - 2029	
	01345AA	OS90A-27	2030 - 2060	2030 - 2060	
07/03/90	01346AA	OS90A-24	1001 - 1080	1001 - 1080	
	01347AA	OS90A-24	1081 - 1165	1081 - 1165	
	01348AA	OS90A-24	1166 - 1250	1166 - 1250	
	01349AA	OS90A-24	1251 - 1335	1251 - 1336	
01350AA	OS90A-24	1336 - 1420	1336 - 1420		
07/03/90	01351AA	OS90A-24	1421 - 1505	1421 - 1505	04
	01352AA	OS90A-24	1506 - 1537	1506 - 1537	
	01353AA	OS90A-24	1538 - 1622	1538 - 1622	
	01354AA	OS90A-24	1623 - 1690	1623 - 1690	
	01355AA	OS90A-24	1691 - 1708	1691 - 1708	
	01356AA	OS90A-39	1001 - 1080	1001 - 1080	
	01357AA	OS90A-39	1081 - 1165	1081 - 1165	
	01358AA	OS90A-39	1166 - 1250	1166 - 1250	
	01359AA	OS90A-39	1251 - 1335	1251 - 1335	
	01360AA	OS90A-39	1336 - 1390	1336 - 1390	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP.RANGE	RECORD NOS.	BOX
07/03/90	01361AA	OS90A-35	1001 - 1083	1001 - 1080	05
	01362AA	OS90A-35	1084 - 1168	1081 - 1165	
	01363AA	OS90A-35	1169 - 1253	1166 - 1250	
	01364AA	OS90A-35	1254 - 1265	1251 - 1262	
	01365AA	OS90A-35	1266 - 1350	1263 - 1347	
	01366AA	OS90A-35	1351 - 1356	1348 - 1353	
	01367AA	OS90A-35	1357 - 1368	1354 - 1365	
	01368AA	OS90A-35	1369 - 1453	1366 - 1450	
	01369AA	OS90A-35	1454 - 1538	1451 - 1535	
	01370AA	OS90A-35	1539 - 1623	1536 - 1620	
07/03/90	01371AA	OS90A-35	1624 - 1708	1621 - 1705	06
	01372AA	OS90A-35	1709 - 1793	1706 - 1790	
	01373AA	OS90A-35	1794 - 1878	1791 - 1875	
	01374AA	OS90A-35	1879 - 1890	1876 - 1887	
	01375AA	OS90A-35	1891 - 1975	1888 - 1972	
	01376AA	OS90A-35	1976 - 2060	1973 - 2057	
	01377AA	OS90A-35	2061 - 2145	2058 - 2142	
	01378AA	OS90A-35	2146 - 2230	2143 - 2227	
	01379AA	OS90A-35	2231 - 2315	2228 - 2312	
	01380AA	OS90A-35	2316 - 2334	2313 - 2331	
07/03/90	01381AA	OS90A-35	2335 - 2405	2332 - 2402	07
	01382AA	OS90A-29	1001 - 1080	1001 - 1080	
	01383AA	OS90A-29	1081 - 1165	1081 - 1165	
	01384AA	OS90A-29	1166 - 1250	1166 - 1250	
	01385AA	OS90A-29	1251 - 1335	1251 - 1335	
	01386AA	OS90A-29	1336 - 1420	1336 - 1420	
	01387AA	OS90A-29	1421 - 1505	1421 - 1505	
	01388AA	OS90A-29	1506 - 1590	1506 - 1590	
	01389AA	OS90A-29	1591 - 1675	1591 - 1675	
	01390AA	OS90A-29	1676 - 1760	1676 - 1760	
07/03/90	01391AA	OS90A-29	1761 - 1845	1761 - 1845	08
	01392AA	OS90A-29	1846 - 1930	1846 - 1930	
	01393AA	OS90A-29	1931 - 1945	1931 - 1945	
	01394AA	OS90A-29	1946 - 2030	1946 - 2030	
	01395AA	OS90A-29	2031 - 2041	2031 - 2041	
	01396AA	OS90A-29	2042 - 2061	2042 - 2061	
	01397AA	OS90A-29	2062 - 2146	2062 - 2146	
	01398AA	OS90A-29	2147 - 2231	2147 - 2231	
	01399AA	OS90A-29	2232 - 2316	2232 - 2316	
	01400AA	OS90A-29	2317 - 2323	2317 - 2323	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
07/03/90	01401AA	OS90A-29	2324 - 2396	2324 - 2396	09
	01402AA	OS90A-29	2397 - 2411	2397 - 2411	
	01403AA	OS90A-25	1001 - 1080	1001 - 1080	
	01404AA	OS90A-25	1081 - 1165	1081 - 1165	
	01405AA	OS90A-25	1166 - 1250	1166 - 1250	
	01406AA	OS90A-25	1251 - 1335	1251 - 1335	
	01407AA	OS90A-25	1336 - 1420	1336 - 1420	
	01408AA	OS90A-25	1421 - 1505	1421 - 1505	
	01409AA	OS90A-25	1506 - 1590	1506 - 1590	
	01410AA	OS90A-25	1591 - 1675	1591 - 1675	
07/03/90	01411AA	OS90A-25	1676 - 1760	1676 - 1760	10
	01412AA	OS90A-25	1761 - 1845	1761 - 1845	
	01413AA	OS90A-25	1846 - 1930	1846 - 1930	
	01414AA	OS90A-25	1931 - 1942	1931 - 1942	
	01415AA	OS90A-25	1943 - 2027	1943 - 2027	
	01416AA	OS90A-25	2028 - 2079	2028 - 2079	
08/03/90	01417AA	OS90A-06	1001 - 1080	1001 - 1080	
	01418AA	OS90A-06	1081 - 1165	1081 - 1165	
	01419AA	OS90A-06	1166 - 1250	1166 - 1250	
	01420AA	OS90A-06	1251 - 1335	1251 - 1335	
08/03/90	01421AA	OS90A-06	1336 - 1420	1336 - 1420	11
	01422AA	OS90A-06	1421 - 1505	1421 - 1505	
	01423AA	OS90A-06	1506 - 1590	1506 - 1590	
	01424AA	OS90A-06	1591 - 1675	1591 - 1675	
	01425AA	OS90A-06	1676 - 1760	1676 - 1760	
	01426AA	OS90A-06	1761 - 1845	1761 - 1845	
	01427AA	OS90A-06	1846 - 1930	1846 - 1930	
	01428AA	OS90A-06	1931 - 2015	1931 - 2015	
	01429AA	OS90A-06	2016 - 2026	2016 - 2026	
	01430AA	OS90A-01	1001 - 1080	1001 - 1080	
08/03/90	01431AA	OS90A-01	1081 - 1165	1081 - 1165	12
	01432AA	OS90A-01	1166 - 1250	1166 - 1250	
	01433AA	OS90A-01	1251 - 1335	1251 - 1335	
	01434AA	OS90A-01	D. N. P.	D. N. P.	
	01435AA	OS90A-01	1337 - 1421	1337 - 1421	
	01436AA	OS90A-01	1422 - 1506	1422 - 1506	
	01437AA	OS90A-01	1507 - 1591	1507 - 1591	
	01438AA	OS90A-01	1592 - 1676	1592 - 1676	
	01439AA	OS90A-01	1677 - 1761	1677 - 1761	
	01440AA	OS90A-01	1762 - 1846	1762 - 1846	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP.RANGE	RECORD NOS.	BOX
08/03/90	01441AA	OS90A-01	1847 - 1851	1847 - 1851	13
	01442AA	OS90A-01	1851 - 1936	1851 - 1936	
	01443AA	OS90A-01	1937 - 1971	1937 - 1971	
	01444AA	OS90A-05	1001 - 1080	1001 - 1080	
	01445AA	OS90A-05	1081 - 1165	1081 - 1165	
	01446AA	OS90A-05	1166 - 1250	1166 - 1250	
	01447AA	OS90A-05	1251 - 1335	1251 - 1335	
	01448AA	OS90A-05	1336 - 1420	1336 - 1420	
	01449AA	OS90A-05	1421 - 1425	1421 - 1425	
	01450AA	OS90A-05	1426 - 1510	1426 - 1510	
08/03/90	01451AA	OS90A-05	1511 - 1595	1511 - 1595	14
	01452AA	OS90A-05	1596 - 1680	1596 - 1680	
	01453AA	OS90A-05	1681 - 1765	1681 - 1765	
	01454AA	OS90A-05	1766 - 1850	1766 - 1850	
	01455AA	OS90A-05	1851 - 1860	1851 - 1860	
	01456AA	OS90A-05	1861 - 1945	1861 - 1945	
	01457AA	OS90A-05	1946 - 2030	1946 - 2030	
	01458AA	OS90A-05	2031 - 2051	2031 - 2051	
	01459AA	OS90A-05	2052 - 2136	2052 - 2136	
	01460AA	OS90A-05	2137 - 2221	2137 - 2221	
08/03/90	01461AA	OS90A-05	D. N. P.	D. N. P.	15
	01462AA	OS90A-05	2223 - 2236	2223 - 2236	
	01463AA	OS90A-05	2237 - 2258	2237 - 2258	
	01464AA	OS90A-03	1001 - 1080	1001 - 1080	
	01465AA	OS90A-03	1081 - 1165	1081 - 1165	
	01466AA	OS90A-03	1166 - 1250	1166 - 1250	
	01467AA	OS90A-03	1251 - 1335	1251 - 1335	
	01468AA	OS90A-03	1336 - 1420	1336 - 1420	
	01469AA	OS90A-03	1421 - 1505	1421 - 1505	
	01470AA	OS90A-03	1506 - 1590	1506 - 1590	
08/03/90	01471AA	OS90A-03	1591 - 1675	1591 - 1675	16
	01472AA	OS90A-03	1676 - 1760	1676 - 1760	
	01473AA	OS90A-03	1761 - 1814	1761 - 1814	
	01474AA	OS90A-03	1815 - 1899	1815 - 1899	
	01475AA	OS90A-03	1900 - 1984	1900 - 1984	
	01476AA	OS90A-03	1985 - 2027	1985 - 2027	
	01477AA	OS90A-12A	1821 - 1900	1821 - 1900	
	01478AA	OS90A-12A	1901 - 1985	1901 - 1985	
	01479AA	OS90A-12A	1986 - 2070	1986 - 2070	
	01480AA	OS90A-12A	2071 - 2155	2071 - 2155	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
08/03/90	01481AA	OS90A-12A	2156 - 2240	2156 - 2240	17
	01482AA	OS90A-12A	2241 - 2325	2241 - 2325	
	01483AA	OS90A-12A	2326 - 2410	2326 - 2410	
	01484AA	OS90A-12A	2411 - 2495	2411 - 2495	
	01485AA	OS90A-12A	2496 - 2524	2496 - 2524	
	01486AA	OS90A-12A	2525 - 2537	2525 - 2537	
	01487AA	OS90A-12A	2538 - 2622	2538 - 2622	
	01488AA	OS90A-12A	2623 - 2630	2623 - 2630	
	01489AA	OS90A-12A	2631 - 2644	2631 - 2644	
	01490AA	OS90A-12A	2645 - 2729	2645 - 2729	
08/03/90	01491AA	OS90A-12A	2730 - 2814	2730 - 2814	18
	01492AA	OS90A-12A	2815 - 2830	2815 - 2830	
	01493AA	OS90A-12A	2831 - 2915	2831 - 2915	
	01494AA	OS90A-12A	2916 - 2931	2916 - 2931	
	01495AA	OS90A-12A	2932 - 2977	2932 - 2977	
	01496AA	OS90A-55	1001 - 1080	1001 - 1080	
	01497AA	OS90A-55	1081 - 1165	1081 - 1165	
	01498AA	OS90A-55	1166 - 1192	1166 - 1192	
	01499AA	OS90A-55	1193 - 1277	1193 - 1277	
	01500AA	OS90A-55	1278 - 1362	1278 - 1362	
08/03/90	01501AA	OS90A-55	1363 - 1374	1363 - 1374	19
	01502AA	OS90A-55	1375 - 1459	1375 - 1459	
	01503AA	OS90A-55	1460 - 1544	1460 - 1544	
	01504AA	OS90A-55	1545 - 1629	1545 - 1629	
	01505AA	OS90A-55	1630 - 1714	1630 - 1714	
	01506AA	OS90A-55	1715 - 1799	1715 - 1799	
	01507AA	OS90A-55	1800 - 1879	1800 - 1879	
09/03/90	01508AA	OS90A-57	1001 - 1080	1001 - 1080	
	01509AA	OS90A-57	1081 - 1165	1081 - 1165	
	01510AA	OS90A-57	1166 - 1250	1166 - 1250	
09/03/90	01511AA	OS90A-57	1251 - 1335	1251 - 1335	20
	01512AA	OS90A-57	1336 - 1420	1336 - 1420	
	01513AA	OS90A-57	1421 - 1449	1421 - 1449	
	01514AA	OS90A-57	1450 - 1534	1450 - 1534	
	01515AA	OS90A-57	1535 - 1619	1535 - 1619	
	01516AA	OS90A-57	1620 - 1704	1620 - 1704	
	01517AA	OS90A-57	1705 - 1789	1705 - 1789	
	01518AA	OS90A-57	1790 - 1818	1790 - 1818	
	01519AA	OS90A-53	1001 - 1080	1001 - 1080	
	01520AA	OS90A-53	1081 - 1114	1081 - 1114	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
09/03/90	01521AA	OS90A-53	1115 - 1199	1115 - 1199	21
	01522AA	OS90A-53	1200 - 1284	1200 - 1284	
	01522AA	OS90A-53	1285 - 1369	1285 - 1369	
	01524AA	OS53A-53	1370 - 1397	1370 - 1397	
	01525AA	OS90A-53	1398 - 1482	1398 - 1482	
	01526AA	OS90A-53	1483 - 1560	1483 - 1560	
	01527AA	OS90A-45	1001 - 1080	1001 - 1080	
	01528AA	OS90A-45	1081 - 1165	1081 - 1165	
	01529AA	OS90A-45	1166 - 1250	1166 - 1250	
	01530AA	OS90A-45	1251 - 1335	1251 - 1335	
	09/03/90	01531AA	OS90A-45	1336 - 1420		1336 - 1420	22
01532AA		OS90A-45	1421 - 1505	1421 - 1505	
01533AA		OS90A-45	1506 - 1510	1506 - 1510	
01534AA		OS90A-45	1511 - 1595	1511 - 1595	
01535AA		OS90A-45	1596 - 1599	1596 - 1599	
01536AA		OS90A-45	1600 - 1684	1600 - 1684	
01537AA		OS90A-45	1685 - 1769	1685 - 1769	
01538AA		OS90A-45	1770 - 1778	1770 - 1778	
01539AA		OS90A-45	1779 - 1863	1779 - 1863	
01540AA		OS90A-45	1864 - 1948	1864 - 1948	
09/03/90		01541AA	OS90A-45	1949 - 1958	1949 - 1958	23
	01542AA	OS90A-45	1959 - 2043	1959 - 2043	
	01543AA	OS90A-45	2044 - 2116	2044 - 2116	
	01544AA	OS90A-51	1001 - 1080	1001 - 1080	
	01545AA	OS90A-51	1080 - 1165	1080 - 1165	
	01546AA	OS90A-51	1166 - 1250	1166 - 1250	
	01547AA	OS90A-51	1251 - 1335	1251 - 1335	
	01548AA	OS90A-51	1336 - 1420	1336 - 1420	
	01549AA	OS90A-51	1421 - 1505	1421 - 1505	
	01550AA	OS90A-51	1506 - 1591	1506 - 1590	
	09/03/90	01551AA	OS90A-51	1592 - 1629	1591 - 1625		24
01552AA		OS90A-51A	1471 - 1550	1471 - 1550	
01553AA		OS90A-51A	1551 - 1635	1551 - 1635	
01554AA		OS90A-51A	1636 - 1720	1636 - 1720	
01555AA		OS90A-51A	1721 - 1805	1721 - 1805	
01556AA		OS90A-51A	1806 - 1851	1806 - 1851	
01557AA		OS90A-41	1001 - 1080	1001 - 1080	
01558AA		OS90A-41	1081 - 1165	1081 - 1165	
01559AA		OS90A-41	1166 - 1250	1166 - 1250	
01560AA		OS90A-41	1251 - 1335	1251 - 1335	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
09/03/90	01561AA	OS90A-41	1336 - 1420	1336 - 1420	25
	01562AA	OS90A-41	1421 - 1505	1421 - 1505	
	01563AA	OS90A-41	1506 - 1590	1506 - 1590	
	01564AA	OS90A-41	1591 - 1675	1591 - 1675	
	01565AA	OS90A-41	1676 - 1760	1676 - 1760	
	01566AA	OS90A-41	1761 - 1845	1761 - 1845	
	01567AA	OS90A-41	1846 - 1930	1846 - 1930	
	01568AA	OS90A-41	1931 - 2015	1931 - 2015	
	01569AA	OS90A-41	2016 - 2100	2016 - 2100	
	01570AA	OS90A-41	2101 - 2115	2101 - 2115	
09/03/90	01571AA	OS90A-49	1001 - 1060	1001 - 1060	26
	01572AA	OS90A-49	1061 - 1145	1061 - 1145	
	01573AA	OS90A-49	1146 - 1230	1146 - 1230	
	01574AA	OS90A-49	1231 - 1315	1231 - 1315	
	01575AA	OS90A-49	1316 - 1326	1316 - 1326	
	01576AA	OS90A-49	1327 - 1342	1327 - 1342	
	01577AA	OS90A-49	1343 - 1427	1343 - 1427	
	01578AA	OS90A-49	1428 - 1512	1428 - 1512	
	01579AA	OS90A-49	1513 - 1597	1513 - 1597	
	01580AA	OS90A-49	1598 - 1682	1598 - 1682	
09/03/90	01581AA	OS90A-49	1683 - 1767	1683 - 1767	27
	01582AA	OS90A-49	1768 - 1851	1768 - 1851	
10/03/90	01583AA	OS90A-37	1001 - 1080	1001 - 1080	
	01584AA	OS90A-37	1081 - 1165	1081 - 1165	
	01585AA	OS90A-37	1166 - 1250	1166 - 1250	
	01586AA	OS90A-37	1251 - 1335	1251 - 1335	
	01587AA	OS90A-37	1336 - 1420	1336 - 1420	
	01588AA	OS90A-37	1421 - 1505	1421 - 1505	
	01589AA	OS90A-37	1506 - 1590	1506 - 1590	
	01590AA	OS90A-37	1590 - 1675	1590 - 1675	
10/03/90	01591AA	OS90A-37	1676 - 1760	1676 - 1760	28
	01592AA	OS90A-37	1761 - 1845	1761 - 1845	
	01593AA	OS90A-37	1846 - 1930	1846 - 1930	
	01594AA	OS90A-37	1931 - 2015	1931 - 2015	
	01595AA	OS90A-37	2016 - 2038	2016 - 2038	
	01596AA	OS90A-47	1001 - 1080	1001 - 1080	
	01597AA	OS90A-47	1081 - 1165	1081 - 1165	
	01598AA	OS90A-47	1166 - 1250	1166 - 1250	
	01599AA	OS90A-47	1251 - 1335	1251 - 1335	
	01600AA	OS90A-47	1336 - 1420	1336 - 1420	



FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
10/03/90	01601AA	OS90A-47	1421 - 1505	1421 - 1505	29
	01602AA	OS90A-47	1506 - 1590	1506 - 1590	
	01603AA	OS90A-47	1591 - 1675	1591 - 1675	
	01604AA	OS90A-47	1676 - 1760	1676 - 1760	
	01605AA	OS90A-47	1761 - 1845	1761 - 1845	
	01606AA	OS90A-47	1846 - 1890	1846 - 1890	
	01607AA	OS90A-43	1001 - 1080	1001 - 1080	
	01608AA	OS90A-43	1081 - 1165	1081 - 1165	
	01609AA	OS90A-43	1166 - 1250	1166 - 1250	
	01610AA	OS90A-43	1251 - 1335	1251 - 1335	
	10/03/90	01611AA	OS90A-43	1336 - 1420		1336 - 1420	30
01612AA		OS90A-43	1421 - 1425	1421 - 1425	
01613AA		OS90A-43	1426 - 1443	1426 - 1443	
01614AA		OS90A-43	1444 - 1528	1444 - 1528	
01615AA		OS90A-43	1529 - 1534	1529 - 1534	
01616AA		OS90A-43	1535 - 1619	1535 - 1619	
01617AA		OS90A-43	1620 - 1704	1620 - 1704	
01618AA		OS90A-43	1705 - 1789	1705 - 1789	
01619AA		OS90A-43	1790 - 1874	1790 - 1874	
01620AA		OS90A-43	1875 - 1959	1875 - 1959	
10/03/90		01621AA	OS90A-43	1960 - 2044	1960 - 2044	31
	01622AA	OS90A-43	2045 - 2129	2045 - 2129	
	01623AA	OS90A-43	2130 - 2214	2130 - 2214	
	01624AA	OS90A-43	2215 - 2229	2215 - 2229	
	01625AA	OS90A-43	2230 - 2314	2203 - 2314	
	01626AA	OS90A-43	2315 - 2396	2315 - 2396	
	01627AA	OS90A-43	2397 - 2481	2397 - 2481	
	01628AA	OS90A-43	2482 - 2566	2482 - 2566	
	01629AA	OS90A-43	2567 - 2651	2567 - 2651	
	01630AA	OS90A-43	2652 - 2712	2652 - 2712	
10/03/90	01631AA	OS90A-33	1001 - 1080	1001 - 1080	32
	01632AA	OS90A-33	1081 - 1165	1081 - 1165	
	01633AA	OS90A-33	1166 - 1250	1166 - 1250	
	01634AA	OS90A-33	1251 - 1335	1251 - 1335	
	01635AA	OS90A-33	1336 - 1420	1336 - 1420	
	01636AA	OS90A-33	1421 - 1429	1421 - 1429	
	01637AA	OS90A-33	1430 - 1514	1430 - 1514	
	01638AA	OS90A-33	1515 - 1599	1515 - 1599	
	01639AA	OS90A-33	1600 - 1684	1600 - 1684	
	01640AA	OS90A-33	1685 - 1769	1685 - 1769	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
10/03/90	01641AA	OS90A-33	1770 - 1854	1770 - 1854	33
	01642AA	OS90A-33	1855 - 1939	1855 - 1939	
	01643AA	OS90A-33	1940 - 2024	1940 - 2024	
	01644AA	OS90A-33	2025 - 2039	2025 - 2039	
	01645AA	OS90A-31	1001 - 1080	1001 - 1080	
	01646AA	OS90A-31	1081 - 1165	1081 - 1165	
	01647AA	OS90A-31	1166 - 1250	1166 - 1250	
	01648AA	OS90A-31	1251 - 1335	1251 - 1335	
	01649AA	OS90A-31	1336 - 1420	1336 - 1420	
	01650AA	OS90A-31	1421 - 1505	1421 - 1505	
10/03/90	01651AA	OS90A-31	1506 - 1590	1506 - 1590	34
	01652AA	OS90A-31	1591 - 1675	1591 - 1675	
	01653AA	OS90A-31	1676 - 1760	1676 - 1760	
	01654AA	OS90A-31	1761 - 1745	1761 - 1845	
	01655AA	OS90A-31	1846 - 1930	1746 - 1930	
	01656AA	OS90A-31	1931 - 2015	1931 - 2015	
	01657AA	OS90A-31	2016 - 2055	2016 - 2055	
	01658AA	OS90A-14	D.N.P.	D.N.P.	
12/03/90	01659AA	OS90A-20	1001 - 1080	1001 - 1080	
	01660AA	OS90A-20	1081 - 1165	1081 - 1165	
12/03/90	01661AA	OS90A-20	1166 - 1250	1166 - 1250	35
	01662AA	OS90A-20	1251 - 1335	1251 - 1335	
	01663AA	OS90A-20	1336 - 1341	1336 - 1341	
	01664AA	OS90A-20A	1221 - 1300	1221 - 1300	
	01665AA	OS90A-20A	1301 - 1385	1301 - 1385	
	01666AA	OS90A-20A	1386 - 1470	1386 - 1470	
	01667AA	OS90A-20A	1471 - 1555	1471 - 1555	
	01668AA	OS90A-20A	1556 - 1640	1556 - 1640	
	01669AA	OS90A-20A	1641 - 1725	1641 - 1725	
	01670AA	OS90A-20A	1726 - 1810	1726 - 1810	
12/03/90	01671AA	OS90A-20A	1811 - 1895	1811 - 1895	36
	01672AA	OS90A-20A	1896 - 1980	1896 - 1980	
	01673AA	OS90A-20A	1981 - 2065	1981 - 2065	
	01674AA	OS90A-20A	2066 - 2150	2066 - 2150	
	01675AA	OS90A-20A	2151 - 2196	2151 - 2196	
	01676AA	OS90A-22	1001 - 1080	1001 - 1080	
	01677AA	OS90A-22	1081 - 1165	1081 - 1165	
	01678AA	OS90A-22	1166 - 1250	1166 - 1250	
	01679AA	OS90A-22	1251 - 1335	1251 - 1335	
	01680AA	OS90A-22	1336 - 1420	1336 - 1420	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP.RANGE	RECORD NOS.	BOX
12/03/90	01681AA	OS90A-22	1421 - 1505	1421 - 1505	37
	01682AA	OS90A-22	1506 - 1590	1506 - 1590	
	01683AA	OS90A-22	1591 - 1675	1591 - 1675	
	01684AA	OS90A-22	1676 - 1760	1676 - 1760	
	01685AA	OS90A-22	1761 - 1845	1761 - 1845	
	01686AA	OS90A-22	1846 - 1930	1846 - 1930	
	01687AA	OS90A-22	1931 - 2002	1931 - 2002	
	01688AA	OS90A-22	2003 - 2087	2003 - 2087	
	01689AA	OS90A-22	2088 - 2151	2088 - 2151	
	01690AA	OS90A-18	1001 - 1080	1001 - 1080	
12/03/90	01691AA	OS90A-18	1081 - 1165	1081 - 1165	38
	01692AA	OS90A-18	1166 - 1242	1166 - 1242	
	01693AA	OS90A-18	1243 - 1327	1243 - 1327	
	01694AA	OS90A-18	1328 - 1412	1328 - 1412	
	01695AA	OS90A-18	1413 - 1416	1413 - 1416	
	01696AA	OS90A-18	1417 - 1501	1417 - 1501	
	01697AA	OS90A-18	1502 - 1586	1502 - 1586	
	01698AA	OS90A-18	1587 - 1592	1587 - 1592	
	01699AA	OS90A-18	1593 - 1603	1593 - 1603	
	01700AA	OS90A-18	1604 - 1688	1604 - 1688	
12/03/90	01701AA	OS90A-18	1689 - 1773	1689 - 1773	39
	01702AA	OS90A-18	1774 - 1858	1774 - 1858	
	01703AA	OS90A-18	1859 - 1943	1859 - 1943	
	01704AA	OS90A-18	1944 - 2028	1944 - 2028	
	01705AA	OS90A-18	2029 - 2113	2029 - 2113	
	01706AA	OS90A-18	2114 - 2198	2114 - 2198	
	01707AA	OS90A-18	2199 - 2230	2199 - 2230	
	01708AA	OS90A-16	1001 - 1080	1001 - 1080	
	01709AA	OS90A-16	1081 - 1165	1081 - 1165	
	01710AA	OS90A-16	1166 - 1169	1166 - 1169	
12/03/90	01711AA	OS90A-16	1170 - 1254	1170 - 1254	40
	01712AA	OS90A-16	1255 - 1339	1255 - 1339	
	01713AA	OS90A-16	1340 - 1355	1340 - 1355	
	01714AA	OS90A-16	1356 - 1440	1356 - 1440	
	01715AA	OS90A-16	1441 - 1525	1441 - 1525	
	01716AA	OS90A-16	1526 - 1536	1526 - 1536	
	01717AA	OS90A-16	1537 - 1621	1537 - 1621	
	01718AA	OS90A-16	1622 - 1706	1622 - 1706	
	01719AA	OS90A-16	1707 - 1791	1707 - 1791	
	01720AA	OS90A-16	1792 - 1876	1792 - 1876	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
13/03/90	01721AA	OS90A-16	1877 - 1961	1877 - 1961	41
	01722AA	OS90A-16	1962 - 2046	1962 - 2046	
	01723AA	OS90A-16	2047 - 2131	2047 - 2131	
	01724AA	OS90A-16	2132 - 2139	2132 - 2139	
	01725AA	OS90A-16	2141 - 2225	2140 - 2224	
	01726AA	OS90A-16	2226 - 2237	2225 - 2236	
	01727AA	OS90A-14A	1001 - 1080	1001 - 1080	
	01728AA	OS90A-14A	1081 - 1165	1081 - 1165	
	01729AA	OS90A-14A	1166 - 1170	1166 - 1170	
	01730AA	OS90A-14A	1171 - 1255	1171 - 1255	
13/03/90	01731AA	OS90A-14A	1256 - 1340	1256 - 1340	42
	01732AA	OS90A-14A	1341 - 1425	1341 - 1425	
	01733AA	OS90A-14A	1426 - 1429	1426 - 1429	
	01734AA	OS90A-14A	1430 - 1514	1430 - 1514	
	01735AA	OS90A-14A	1515 - 1599	1515 - 1599	
	01736AA	OS90A-14A	1600 - 1684	1600 - 1684	
	01737AA	OS90A-14A	1685 - 1769	1685 - 1769	
	01738AA	OS90A-14A	1770 - 1854	1770 - 1854	
	01739AA	OS90A-14A	1855 - 1939	1855 - 1939	
	01740AA	OS90A-14A	1940 - 2024	1940 - 2024	
13/03/90	01741AA	OS90A-14A	2025 - 2109	2025 - 2109	43
	01742AA	OS90A-14A	2110 - 2194	2110 - 2194	
	01743AA	OS90A-14A	2195 - 2237	2195 - 2237	
	01744AA	OS90A-10	1001 - 1080	1001 - 1080	
	01745AA	OS90A-10	1081 - 1165	1081 - 1165	
	01746AA	OS90A-10	1166 - 1250	1166 - 1250	
	01747AA	OS90A-10	1251 - 1335	1251 - 1335	
	01748AA	OS90A-10	1336 - 1420	1336 - 1420	
	01749AA	OS90A-10	1421 - 1505	1421 - 1505	
	01750AA	OS90A-10	1506 - 1590	1506 - 1590	
13/03/90	01751AA	OS90A-10	1591 - 1675	1591 - 1675	44
	01752AA	OS90A-10	1676 - 1760	1676 - 1760	
	01753AA	OS90A-10	1761 - 1845	1761 - 1845	
	01754AA	OS90A-10	1846 - 1930	1846 - 1930	
	01755AA	OS90A-10	1931 - 2015	1931 - 2015	
	01756AA	OS90A-10	2016 - 2100	2016 - 2100	
	01757AA	OS90A-10	2101 - 2185	2101 - 2185	
	01758AA	OS90A-10	2186 - 2270	2186 - 2270	
	01759AA	OS90A-10	2271 - 2355	2271 - 2355	
	01760AA	OS90A-10	2356 - 2440	2356 - 2440	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP.RANGE	RECORD NOS.	BOX
13/03/90	01761AA	OS90A-10	2441 - 2525	2441 - 2525	45
	01762AA	OS90A-10	2526 - 2610	2526 - 2610	
	01763AA	OS90A-10	2611 - 2695	2611 - 2695	
	01764AA	OS90A-10	2696 - 2780	2696 - 2780	
	01765AA	OS90A-10	2781 - 2865	2781 - 2865	
	01766AA	OS90A-10	2866 - 2950	2866 - 2950	
	01767AA	OS90A-10	2951 - 2976	2951 - 2976	
	01768AA	OS90A-08	1001 - 1080	1001 - 1080	
	01769AA	OS90A-08	1081 - 1165	1081 - 1165	
	01770AA	OS90A-08	1166 - 1250	1166 - 1250	
13/03/90	01771AA	OS90A-08	1251 - 1335	1251 - 1335	46
	01772AA	OS90A-08	1336 - 1420	1336 - 1420	
	01773AA	OS90A-08	1421 - 1505	1421 - 1505	
	01774AA	OS90A-08	1506 - 1590	1506 - 1590	
	01775AA	OS90A-08	1591 - 1677	1591 - 1675	
	01776AA	OS90A-08	1678 - 1762	1676 - 1760	
	01777AA	OS90A-08	1763 - 1847	1761 - 1845	
	01778AA	OS90A-08	1848 - 1932	1846 - 1930	
	01779AA	OS90A-08	1933 - 2017	1931 - 2015	
	01780AA	OS90A-08	2018 - 2090	2016 - 2088	
13/03/90	01781AA	OS90A-08	2091 - 2103	2089 - 2101	47
	01782AA	OS90A-08	1001 - 1080	1001 - 1080	
	01783AA	OS90A-08	1081 - 1165	1081 - 1165	
	01784AA	OS90A-08	1166 - 1250	1166 - 1250	
	01785AA	OS90A-08	1251 - 1335	1251 - 1335	
	01786AA	OS90A-08	1336 - 1420	1336 - 1420	
	01787AA	OS90A-08	1421 - 1505	1421 - 1505	
	01788AA	OS90A-08	1506 - 1590	1506 - 1591	
	01789AA	OS90A-08	1592 - 1676	1591 - 1675	
	01790AA	OS90A-08	1677 - 1761	1676 - 1760	
13/03/90	01791AA	OS90A-08	1762 - 1846	1761 - 1845	48
	01792AA	OS90A-08	1847 - 1931	1846 - 1930	
	01793AA	OS90A-08	1932 - 1956	1931 - 1955	
	01794AA	OS90A-02	1001 - 1080	1001 - 1080	
	01795AA	OS90A-02	1081 - 1165	1081 - 1165	
	01796AA	OS90A-02	1166 - 1250	1166 - 1250	
	01797AA	OS90A-02	1251 - 1335	1251 - 1335	
	01798AA	OS90A-02	1336 - 1420	1336 - 1420	
	01799AA	OS90A-02	1421 - 1428	1421 - 1428	
	01800AA	OS90A-02	1429 - 1513	1429 - 1513	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
13/03/90	01801AA	OS90A-02	1514 - 1598	1514 - 1598	49
	01802AA	OS90A-02	1599 - 1609	1599 - 1609	
	01803AA	OS90A-02	1610 - 1694	1610 - 1694	
	01804AA	OS90A-02	1695 - 1779	1695 - 1779	
	01805AA	OS90A-02	1780 - 1787	1780 - 1787	
	01806AA	OS90A-02	1788 - 1872	1788 - 1872	
	01807AA	OS90A-02	1873 - 1895	1873 - 1895	
	14/03/90	01808AA	OS90A-21	1001 - 1080		1001 - 1080
01809AA		OS90A-21	1081 - 1165	1081 - 1165	
01810AA		OS90A-21	1166 - 1250	1166 - 1250	
14/03/90	01811AA	OS90A-21	1251 - 1335	1251 - 1335	50
	01812AA	OS90A-21	1336 - 1420	1336 - 1420	
	01813AA	OS90A-21	1421 - 1505	1421 - 1505	
	01814AA	OS90A-21	1506 - 1590	1506 - 1590	
	01815AA	OS90A-21	1591 - 1675	1591 - 1675	
	01816AA	OS90A-21	1676 - 1760	1676 - 1760	
	01817AA	OS90A-21	1761 - 1845	1761 - 1845	
	01818AA	OS90A-21	1846 - 1930	1846 - 1930	
	01819AA	OS90A-21	1931 - 2015	1931 - 2015	
	01820AA	OS90A-21	2016 - 2100	2016 - 2100	
14/03/90	01821AA	OS90A-21	2101 - 2109	2101 - 2109	51
	01822AA	OS90A-21	2114 - 2198	2110 - 2194	
	01823AA	OS90A-21	2199 - 2283	2195 - 2279	
	01824AA	OS90A-21	2284 - 2368	2280 - 2364	
	01825AA	OS90A-21	2369 - 2407	2365 - 2403	
	01826AA	OS90A-23	1001 - 1080	1001 - 1080	
	01827AA	OS90A-23	1081 - 1165	1081 - 1165	
	01828AA	OS90A-23	1166 - 1250	1166 - 1250	
	01829AA	OS90A-23	1251 - 1335	1251 - 1335	
	01830AA	OS90A-23	1336 - 1420	1336 - 1420	
14/03/90	01831AA	OS90A-23	1421 - 1505	1421 - 1505	52
	01832AA	OS90A-23	1506 - 1590	1506 - 1590	
	01833AA	OS90A-23	1591 - 1675	1591 - 1675	
	01834AA	OS90A-23	1676 - 1760	1676 - 1760	
	01835AA	OS90A-23	1761 - 1845	1761 - 1845	
	01836AA	OS90A-23	1846 - 1930	1846 - 1930	
	01837AA	OS90A-23	1931 - 2015	1931 - 2015	
	01838AA	OS90A-23	2016 - 2100	2016 - 2100	
	01839AA	OS90A-23	2101 - 2185	2101 - 2185	
	01840AA	OS90A-23	2186 - 2270	2186 - 2270	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
14/03/90	01841AA	OS90A-23	2271 - 2281	2271 - 2281	53
	01842AA	OS90A-23	2282 - 2366	2282 - 2366	
	01843AA	OS90A-23	2367 - 2373	2367 - 2373	
	01844AA	OS90A-23	2374 - 2458	2374 - 2458	
	01845AA	OS90A-23	2459 - 2531	2459 - 2531	
	01846AA	OS90A-19	1001 - 1080	1001 - 1080	
	01847AA	OS90A-19	1081 - 1165	1081 - 1165	
	01848AA	OS90A-19	1166 - 1250	1166 - 1250	
	01849AA	OS90A-19	1251 - 1335	1251 - 1335	
	01850AA	OS90A-19	1336 - 1420	1336 - 1420	
	14/03/90	01851AA	OS90A-19	1421 - 1505		1421 - 1505	54
01852AA		OS90A-19	1506 - 1590	1506 - 1590	
01853AA		OS90A-19	1591 - 1675	1591 - 1675	
01854AA		OS90A-19	1676 - 1760	1676 - 1760	
01855AA		OS90A-19	1761 - 1772	1761 - 1766	
01856AA		OS90A-19	D.N.P.	D.N.P.	
01857AA		OS90A-19A	1681 - 1760	1681 - 1760	
01858AA		OS90A-19A	1761 - 1845	1761 - 1845	
01859AA		OS90A-19A	1846 - 1883	1846 - 1883	
01860AA		OS90A-19A	1884 - 1968	1884 - 1968	
14/03/90		01861AA	OS90A-19A	1969 - 2053	1969 - 2053	55
	01862AA	OS90A-19A	2054 - 2138	2054 - 2138	
	01863AA	OS90A-19A	2139 - 2171	2139 - 2153	
	01864AA	OS90A-19B	2061 - 2140	2061 - 2140	
	01865AA	OS90A-19B	2041 - 2225	2041 - 2225	
	01866AA	OS90A-19B	2226 - 2310	2226 - 2310	
	01867AA	OS90A-19B	2311 - 2395	2311 - 2395	
	01868AA	OS90A-19B	2396 - 2411	2396 - 2411	
	01869AA	OS90A-17	1001 - 1080	1001 - 1080	
	01870AA	OS90A-17	1081 - 1165	1081 - 1165	
	14/03/90	01871AA	OS90A-17	1166 - 1250	1166 - 1250		56
01872AA		OS90A-17	1251 - 1335	1251 - 1335	
01873AA		OS90A-17	1336 - 1420	1336 - 1420	
01874AA		OS90A-17	1421 - 1505	1421 - 1505	
01875AA		OS90A-17	1506 - 1590	1506 - 1590	
01876AA		OS90A-17	1591 - 1675	1591 - 1675	
01877AA		OS90A-17	1676 - 1760	1676 - 1760	
01878AA		OS90A-17	1761 - 1845	1761 - 1845	
01879AA		OS90A-17	1846 - 1930	1846 - 1930	
01880AA		OS90A-17	1931 - 2015	1931 - 2015	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP.RANGE	RECORD NOS.	BOX
14/03/90	01881AA	OS90A-17	2016 - 2100	2106 - 2100	57
	01882AA	OS90A-17	2101 - 2185	2101 - 2185	
	01883AA	OS90A-17	2186 - 2270	2186 - 2270	
	01884AA	OS90A-17	2271 - 2355	2271 - 2355	
	01885AA	OS90A-17	2356 - 2404	2356 - 2404	
15/03/90	01886AA	OS90A-15	1001 - 1080	1001 - 1080	
	01887AA	OS90A-15	1081 - 1165	1081 - 1165	
	01888AA	OS90A-15	1166 - 1250	1166 - 1250	
	01889AA	OS90A-15	1251 - 1335	1251 - 1335	
	01890AA	OS90A-15	1336 - 1420	1336 - 1420	
15/03/90	01891AA	OS90A-15	1421 - 1505	1421 - 1505	58
	01892AA	OS90A-15	1506 - 1590	1506 - 1590	
	01893AA	OS90A-15	1591 - 1675	1591 - 1675	
	01894AA	OS90A-15	1676 - 1693	1676 - 1693	
	01895AA	OS90A-15	1694 - 1778	1694 - 1778	
	01896AA	OS90A-15	1779 - 1787	1779 - 1787	
	01897AA	OS90A-15	1788 - 1791	1788 - 1791	
	01898AA	OS90A-15	1793 - 1877	1792 - 1876	
	01899AA	OS90A-15	1878 - 1962	1877 - 1961	
	01900AA	OS90A-15	1963 - 2047	1962 - 2046	
15/03/90	01901AA	OS90A-15	2048 - 2060	2047 - 2059	59
	01902AA	OS90A-15	2061 - 2145	2060 - 2144	
	01903AA	OS90A-15	2146 - 2165	2145 - 2164	
	01904AA	OS90A-15	2166 - 2179	2165 - 2178	
	01905AA	OS90A-15	2180 - 2264	2179 - 2263	
	01906AA	OS90A-15	2265 - 2326	2264 - 2325	
	01907AA	OS90A-13	1001 - 1080	1001 - 1080	
	01908AA	OS90A-13	1081 - 1165	1081 - 1165	
	01909AA	OS90A-13	1166 - 1250	1166 - 1250	
	01910AA	OS90A-13	1251 - 1335	1251 - 1335	
15/03/90	01911AA	OS90A-13	1336 - 1420	1336 - 1420	60
	01912AA	OS90A-13	1421 - 1505	1421 - 1505	
	01913AA	OS90A-13	1506 - 1590	1506 - 1590	
	01914AA	OS90A-13	1591 - 1675	1591 - 1675	
	01915AA	OS90A-13	1676 - 1689	1676 - 1689	
	01916AA	OS90A-13	1690 - 1774	1690 - 1774	
	01917AA	OS90A-13	1775 - 1859	1775 - 1859	
	01918AA	OS90A-13	1860 - 1871	1860 - 1871	
	01919AA	OS90A-13	1872 - 1956	1872 - 1956	
	01920AA	OS90A-13	1957 - 2041	1957 - 2041	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP. RANGE	RECORD NOS.	BOX
15/03/90	01921AA	OS90A-13	2042 - 2126	2042 - 2126	61
	01922AA	OS90A-13	2127 - 2211	2127 - 2211	
	01923AA	OS90A-13	2212 - 2296	2212 - 2296	
	01924AA	OS90A-13	2297 - 2318	2297 - 2318	
	01925AA	OS90A-11	1001 - 1079	1001 - 1079	
	01926AA	OS90A-11	1080 - 1164	1080 - 1164	
	01927AA	OS90A-11	1165 - 1249	1165 - 1249	
	01928AA	OS90A-11	1250 - 1334	1250 - 1334	
	01929AA	OS90A-11	1335 - 1419	1335 - 1419	
	01930AA	OS90A-11	1420 - 1480	1420 - 1480	
	15/03/90	01931AA	OS90A-11	1481 - 1565		1481 - 1565	62
01932AA		OS90A-11	1566 - 1650	1566 - 1650	
01933AA		OS90A-11	1651 - 1735	1651 - 1735	
01934AA		OS90A-11	1736 - 1820	1736 - 1820	
01935AA		OS90A-11	1821 - 1905	1821 - 1905	
01936AA		OS90A-11	1906 - 1990	1906 - 1990	
01937AA		OS90A-11	1991 - 2075	1991 - 2075	
01938AA		OS90A-11	2076 - 2125	2076 - 2117	
01939AA		OS90A-11A	D.N.P.	D.N.P.	
16/03/90		01940AA	OS90A-11C	2021 - 2101	2020 - 2100
16/03/90	01941AA	OS90A-11C	2102 - 2186	2101 - 2185	63
	01942AA	OS90A-11C	2187 - 2271	2186 - 2270	
	01943AA	OS90A-11C	2272 - 2286	2271 - 2285	
	01944AA	OS90A-11C	2287 - 2300	2286 - 2299	
	01945AA	OS90A-07	1001 - 1006	1001 - 1006	
	01946AA	OS90A-09	1001 - 1080	1001 - 1080	
	01947AA	OS90A-09	1081 - 1165	1081 - 1165	
	01948AA	OS90A-09	1166 - 1250	1166 - 1250	
	01949AA	OS90A-09	1251 - 1335	1251 - 1335	
	01950AA	OS90A-09	1336 - 1420	1336 - 1420	
16/03/90	01951AA	OS90A-09	1421 - 1505	1421 - 1505	64
	01952AA	OS90A-09	1506 - 1590	1506 - 1590	
	01953AA	OS90A-09	1591 - 1675	1591 - 1675	
	01954AA	OS90A-09	1676 - 1760	1676 - 1760	
	01955AA	OS90A-09	1761 - 1845	1761 - 1845	
	01956AA	OS90A-09	1846 - 1930	1846 - 1930	
	01957AA	OS90A-09	1931 - 2015	1931 - 2015	
	01958AA	OS90A-09	2016 - 2100	2016 - 2100	
	01959AA	OS90A-09	2101 - 2185	2101 - 2185	
	01960AA	OS90A-09	2186 - 2257	2186 - 2257	



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FIELD TAPE INVENTORY

DATE	TAPE NO.	LINE NO.	SP.RANGE	RECORD NOS.	BOX
16/03/90	01961AA	OS90A-07A	D. N. P.	D. N. P.	65
	01962AA	OS90A-07A	D. N. P.	D. N. P.	
	01963AA	OS90A-07B	1001 - 1080	1001 - 1080	
	01964AA	OS90A-07B	1081 - 1165	1081 - 1165	
	01965AA	OS90A-07B	1166 - 1250	1166 - 1250	
	01966AA	OS90A-07B	1251 - 1335	1251 - 1335	
	01967AA	OS90A-07B	1336 - 1420	1336 - 1420	
	01968AA	OS90A-07B	1421 - 1505	1421 - 1505	
	01969AA	OS90A-07B	1506 - 1590	1506 - 1590	
	01970AA	OS90A-07B	1591 - 1675	1591 - 1675	
16/03/90	01971AA	OS90A-07B	1676 - 1760	1676 - 1760	66
	01972AA	OS90A-07B	1761 - 1845	1761 - 1845	
	01973AA	OS90A-07B	1846 - 1930	1846 - 1930	
	01974AA	OS90A-07B	1931 - 2015	1931 - 2015	
	01975AA	OS90A-07B	2016 - 2100	2016 - 2100	
	01976AA	OS90A-07B	2101 - 2185	2101 - 2185	
	01977AA	OS90A-07B	2186 - 2199	2186 - 2199	
	01978AA	OS90A-07B	2200 - 2259	2200 - 2259	

END OF 2931-010-MIS-90 SHIPMENT VIC P28 PERMIT



- C1 -

LINE STATUS LOG - SHELL 2D BS90B SURVEY (T/18P)

DATE	LINE #	DIR.	SP RANGE	PROCESS SP RANGE	CHARGEABLE SP RANGE	KMS	COMMENTS
22/02/90	BS90B-01	052.7	1001-1676				T. B. R.
23/02/90	BS90B-01A	052.7	1001-1857	1001-1857	1001-1857	21.425	COMPLETE
22/02/90	BS90B-02	144.6	1001-1876	1001-1876	1001-1876	21.900	COMPLETE
23/02/90	BS90B-03	233.2	1001-1999	1001-1999	1001-1999	24.975	COMPLETE
22/02/90	BS90B-04	325.3	1001-2275	1001-2275	1001-2275	31.875	COMPLETE
24/02/90	BS90B-05	233.5	1001-1591	1001-1591	1001-1591	14.775	COMPLETE
23/02/90	BS90B-07	233.3	1001-1738	1005-1728	1005-1728	18.100	T. B. C.
23/02/90	BS90B-07A	233.3	1651-1937	1651-1937	1651-1937	07.175	COMPLETE
23/02/90	BS90B-09	233.2	1001-1321	1001-1311	1001-1311	07.775	T. B. C.
24/02/90	BS90B-09A	233.2	1231-1573	1231-1573	1312-1573	06.55	COMPLETE
24/02/90	BS90B-11	053.7	1001-1574	1001-1574	1001-1574	14.35	COMPLETE
23/02/90	BS90B-13	053.3	1001-1755	1001-1755	1001-1755	18.875	COMPLETE
22/02/90	BS90B-15	234.1	1001-1581	1001-1581	1001-1581	14.525	COMPLETE

END OF PROSPECT T/18P



LINE STATUS LOG - SHELL 2D BS90A SURVEY (T/14P)

DATE	LINE #	DIR.	SP RANGE	PROCESS SP RANGE	CHARGEABLE SP RANGE	KMS	COMMENTS
27/02/90	BS90A-01	201.9	1001-1391	1001-1391	1001-1391	9.775	COMPLETE
26/02/90	BS90A-02	291.6	1001-1845	1001-1844	1001-1844	21.100	T. B. C.
27/02/90	BS90A-02A	291.7	1761-2242	1761-2221	1845-2221	9.425	T. B. C.
27/02/90	BS90A-02B	291.7	2141-2151				T. B. R.
27/02/90	BS90A-02C	291.7	2141-2571	2141-2571	2141-2571	8.750	COMPLETE
28/02/90	BS90A-03	021.0	1001-2503	1001-2503	1001-2503	37.575	COMPLETE
26/02/90	BS90A-04	111.7	1001-2602	1001-2602	1001-2602	40.050	COMPLETE
27/02/90	BS90A-05	200.5	1001-1462	1001-1462	1001-1462	11.500	COMPLETE
26/02/90	BS90A-06	291.7	1001-1673	1001-1673	1001-1673	16.825	COMPLETE
28/02/90	BS90A-07	201.0	1001-1476	1001-1476	1001-1476	11.900	COMPLETE
25/02/90	BS90A-08	111.5	1001-1058				T. B. R.
26/02/90	BS90A-08A	111.5	1001-2238	1001-2238	1001-2238	30.950	COMPLETE
27/02/90	BS90A-09	022.1	1001-1558	1001-1558	1001-1558	13.950	COMPLETE
25/02/90	BS90A-10	291.5	1001-1747	1001-1747	1001-1747	18.675	COMPLETE
28/02/90	BS90A-11	212.0	1001-2340	1001-2340	1001-2340	33.500	COMPLETE
24/02/90	BS90A-12	112.0	1001-2570	1001-2570	1001-2570	39.250	COMPLETE
27/02/90	BS90A-13	021.5	1001-1476	1001-1476	1001-1476	11.900	COMPLETE
24/02/90	BS90A-14	111.2	1001-1148				T. B. R.
24/02/90	BS90A-14A	111.2	1001-1680	1001-1680	1001-1680	17.000	COMPLETE
27/02/90	BS90A-15	022.5	1001-1088				T. B. R.
28/02/90	BS90A-15A	022.5	1001-1477	1001-1477	1001-1477	11.925	COMPLETE
25/02/90	BS90A-16	291.6	1001-1715	1001-1715	1001-1715	17.875	COMPLETE
28/02/90	BS90A-17	203.1	1001-2054	1001-2054	1001-2054	26.35	COMPLETE



- C3 -

LINE STATUS LOG - SHELL 2D BS90A SURVEY (T/14P)

DATE	LINE #	DIR.	SP RANGE	PROCESS SP RANGE	CHARGEABLE SP RANGE	KMS	COMMENTS
28/02/90	BS90A-19	023.0	1001-1492	1001-1492	1001-1492	12.300	COMPLETE
02/03/90	BS90A-21	202.8	1001-2471	1001-2471	1001-2471	36.775	COMPLETE
01/03/90	BS90A-23	202.5	1001-1879	1001-1879	1001-1879	21.975	COMPLETE
01/03/90	BS90A-25	203.3	1001-1855	1001-1855	1001-1855	21.375	COMPLETE
28/02/90	BS90A-27	022.6	1001-1096				T. B. R.
01/03/90	BS90A-27A	022.6	1001-1999	1001-1999	1001-1999	24.975	COMPLETE
01/03/90	BS90A-29	023.0	1001-2005	1001-2005	1001-2005	25.125	COMPLETE
01/03/90	BS90A-31	022.6	1001-2604	1001-2604	1001-2604	40.100	COMPLETE
02/03/90	BS90A-33	022.2	1001-2007	1001-2007	1001-2007	25.175	COMPLETE
02/03/90	BS90A-35	022.6	1001-1437	1001-1418	1001-1418	10.45	T. B. C.
03/03/90	BS90A-35A	022.6	1341-1942	1341-1942	1419-1942	13.100	COMPLETE
03/03/90	BS90A-37	022.8	1001-1939	1001-1939	1001-1939	23.475	COMPLETE
02/03/90	BS90A-39	203.3	1001-2047	1001-2047	1001-2047	26.175	COMPLETE
03/03/90	BS90A-41	203.1	1001-1956	1001-1956	1001-1956	23.900	COMPLETE
03/03/90	BS90A-43	202.4	1001-1799	1001-1799	1001-1799	19.975	COMPLETE
03/03/90	BS90A-45	022.7	1001-1802	1001-1802	1001-1802	20.05	COMPLETE

END OF PROSPECT T/14P



- C4 -

LINE STATUS LOG - SHELL 2D OS90A SURVEY (VIC/P28)

DATE	LINE #	DIR.	SP RANGE	PROCESS SP RANGE	CHARGEABLE SP RANGE	KMS	COMMENTS
08/03/90	OS90A-01	347.8	1001-1971	1001-1971	1001-1971	24.275	COMPLETE
13/03/90	OS90A-02	077.9	1001-1895	1001-1895	1001-1895	22.375	COMPLETE
08/03/90	OS90A-03	347.7	1001-2027	1001-2027	1001-2027	25.675	COMPLETE
13/03/90	OS90A-04	257.6	1001-1956	1001-1956	1001-1956	23.900	COMPLETE
08/03/90	OS90A-05	167.8	1001-2258	1001-2258	1001-2258	31.45	COMPLETE
08/03/90	OS90A-06	257.6	1001-2026	1001-2026	1001-2026	25.65	COMPLETE
16/03/90	OS90A-07	167.8	1001-1006				T. B. R.
16/03/90	OS90A-07A	167.8	1001-1150				T. B. R.
16/03/90	OS90A-07B	347.8	1001-2259	1001-2259	1001-2259	31.475	COMPLETE
10/03/90	OS90A-08	077.8	1001-2103	1001-2103	1001-2103	27.575	COMPLETE
16/03/90	OS90A-09	347.6	1001-2257	1001-2257	1001-2257	31.425	COMPLETE
13/03/90	OS90A-10	257.2	1001-2976	1001-2976	1001-2976	49.400	COMPLETE
15/03/90	OS90A-11	347.6	1001-2125	1001-2103	1001-2103	27.575	T. B. C.
15/03/90	OS90A-11A	347.6	2021-2066				T. B. R.
15/03/90	OS90A-11B	347.6	2021-2275				T. B. R.
16/03/90	OS90A-11C	347.6	2021-2300	2021-2300	2104-2300	4.925	COMPLETE
06/03/90	OS90A-12	77.6	1001-1900	1001-1900	1001-1900	22.500	T. B. C.
08/03/90	OS90A-12A	77.4	1821-2977	1821-2977	1901-2977	26.925	COMPLETE
15/03/90	OS90A-13	167.7	1001-2318	1001-2318	1001-2318	32.95	COMPLETE
10/03/90	OS90A-14	077.4	1001-1039				T. B. R.
13/03/90	OS90A-14A	077.4	1001-2237	1001-2237	1001-2237	30.925	COMPLETE
15/03/90	OS90A-15	347.8	1001-2326	1001-2326	1001-2326	33.150	COMPLETE
13/03/90	OS90A-16	257.3	1001-2237	1001-2237	1001-2237	30.925	COMPLETE



- C5 -

LINE STATUS LOG - SHELL 2D OS90A SURVEY (VIC/P28)

DATE	LINE #	DIR.	SP RANGE	PROCESS SP RANGE	CHARGEABLE SP RANGE	KMS	COMMENTS
14/03/90	OS90A-17	167.8	1001-2404	1001-2404	1001-2404	35.1	COMPLETE
12/03/90	OS90A-18	077.5	1001-2230	1001-2230	1001-2230	30.750	COMPLETE
14/03/90	OS90A-19	347.6	1001-1786	1001-1761	1001-1761	19.025	T. B. C.
14/03/90	OS90A-19A	347.7	1681-2171	1681-2140	1762-2140	9.475	T. B. C.
14/03/90	OS90A-19B	347.6	2061-2411	2061-2411	2141-2411	6.775	COMPLETE
12/03/90	OS90A-20	077.6	1001-1341	1001-1301	1001-1301	7.525	T. B. C.
12/03/90	OS90A-20A	077.5	1221-2196	1221-2196	1221-2196	22.375	COMPLETE
14/03/90	OS90A-21	347.6	1001-2407	1001-2407	1001-2407	35.175	COMPLETE
12/03/90	OS90A-22	257.4	1001-2151	1001-2151	1001-2151	28.775	COMPLETE
14/03/90	OS90A-23	167.8	1001-2531	1001-2531	1001-2531	38.275	COMPLETE
07/03/90	OS90A-24	076.8	1001-1708	1001-1708	1001-1708	17.7	COMPLETE
07/03/90	OS90A-25	167.5	1001-2079	1001-2079	1001-2079	26.975	COMPLETE
06/03/90	OS90A-27	347.4	1001-2060	1001-2060	1001-2060	26.50	COMPLETE
07/03/90	OS90A-29	347.5	1001-2411	1001-2411	1001-2411	35.275	COMPLETE
10/03/90	OS90A-31	167.2	1001-2055	1001-2055	1001-2055	26.375	COMPLETE
10/03/90	OS90A-33	347.7	1001-2039	1001-2039	1001-2039	25.975	COMPLETE
07/03/90	OS90A-35	167.6	1001-2405	1001-2405	1001-2405	35.05	COMPLETE
10/03/90	OS90A-37	167.7	1001-2038	1001-2038	1001-2038	25.95	COMPLETE
07/03/90	OS90A-39	347.5	1001-1390	1001-1390	1001-1390	9.75	COMPLETE
09/03/90	OS90A-41	167.9	1001-2115	1001-2115	1001-2115	27.875	COMPLETE
10/03/90	OS90A-43	167.7	1001-2712	1001-2712	1001-2712	42.80	COMPLETE
09/03/90	OS90A-45	167.7	1001-2116	1001-2116	1001-2116	27.90	COMPLETE
10/03/90	OS90A-47	347.8	1001-1890	1001-1890	1001-1890	22.25	COMPLETE

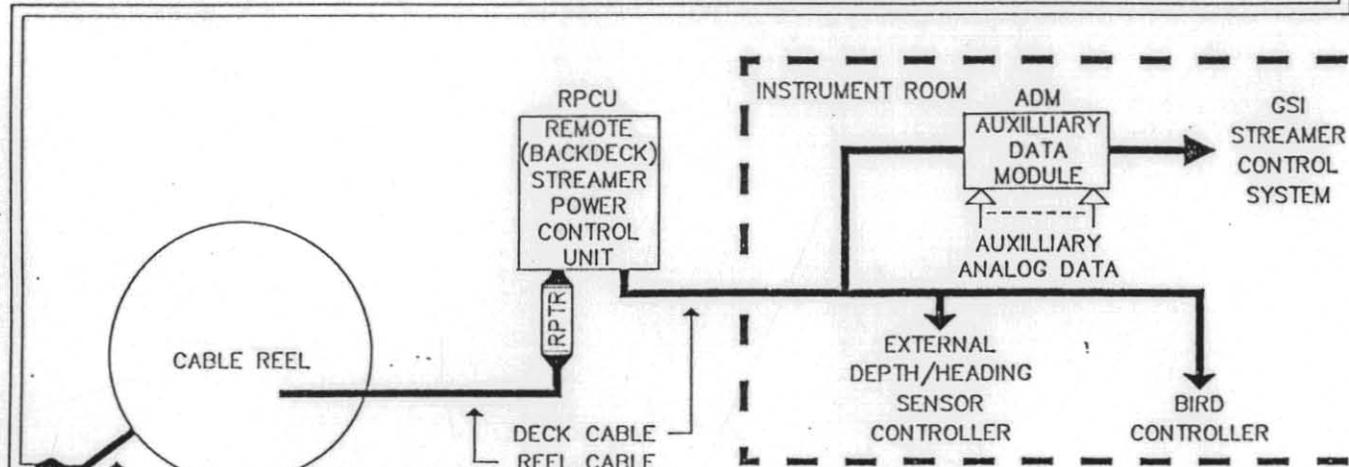
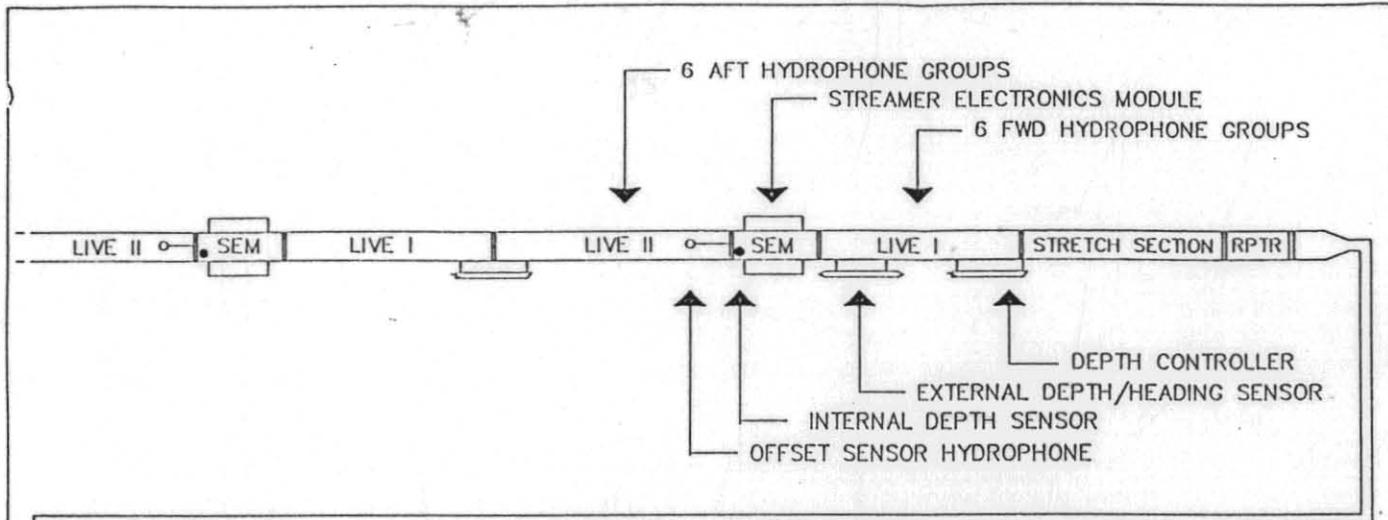


- C6 -

LINE STATUS LOG - SHELL 2D OS90A SURVEY (VIC/P28)

DATE	LINE #	DIR.	SP RANGE	PROCESS SP RANGE	CHARGEABLE SP RANGE	KMS	COMMENTS
09/03/90	OS90A-49	347.7	1001-1851	1001-1851	1001-1851	21.275	COMPLETE
09/03/90	OS90A-51	347.8	1001-1629	1001-1551	1001-1551	13.775	T. B. C.
09/03/90	OS90A-51A	347.9	1471-1851	1471-1851	1552-1851	7.500	COMPLETE
09/03/90	OS90A-53	347.6	1001-1560	1001-1560	1001-1560	14.000	COMPLETE
08/03/90	OS90A-55	347.6	1001-1879	1001-1879	1001-1879	21.975	COMPLETE
09/03/90	OS90A-57	167.5	1001-1818	1001-1818	1001-1818	20.45	COMPLETE

END OF VIC P28 OS90A SURVEY



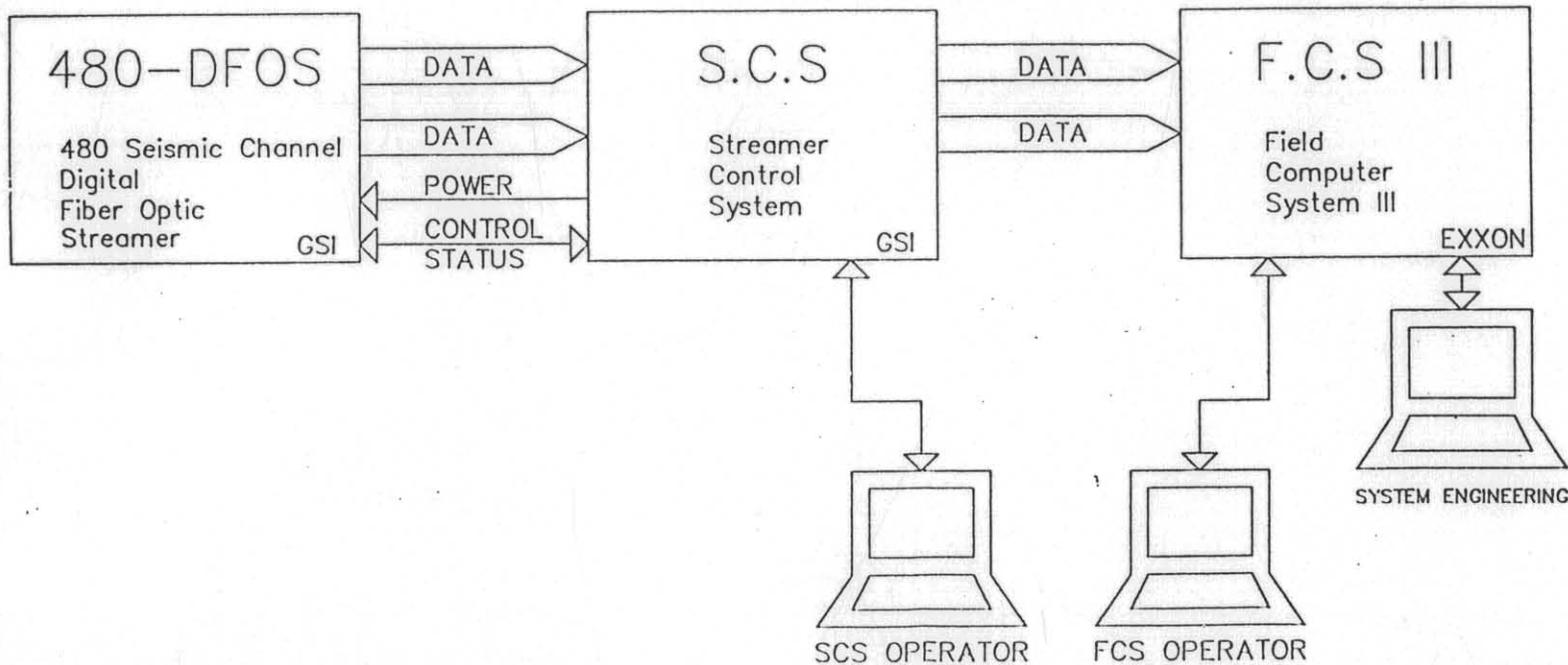
GSI 480 CHANNEL STREAMER SYSTEM

STREAMER CONTROL SYSTEM

PLATE 1

244135



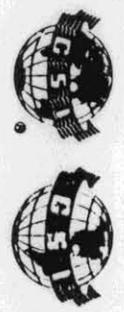


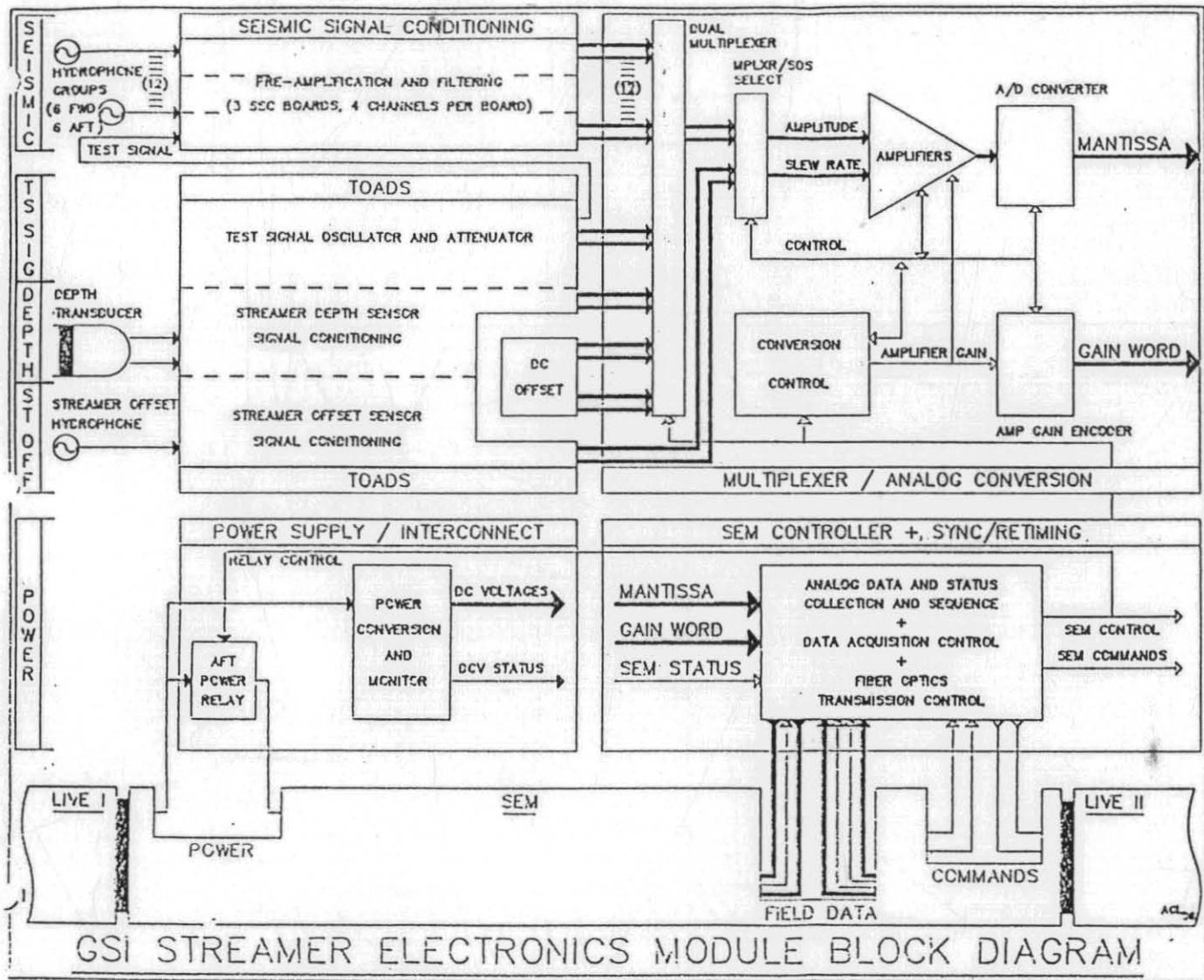
FCS III DIAGRAM

PLATE 2

GSI 480 CHANNEL DIGITAL FIBER-OPTIC STREAMER SYSTEM

244136





GSI STREAMER ELECTRONICS MODULE BLOCK DIAGRAM

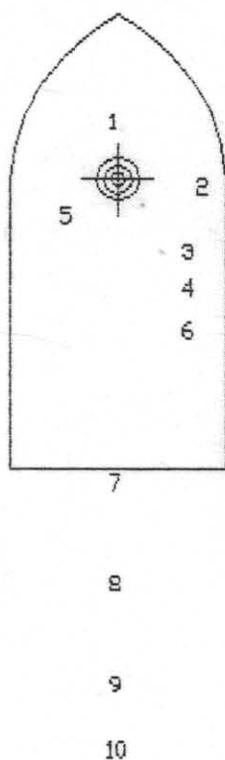
STREAMER ELECTRONICS MODULE

PLATE 3

244137



PLATE #4
 M/V PACIFIC TITAN
 ANTENNAE LOCATION DIAGRAM
 CLIENT: SHELL AUST AREA: T/18P, T/14P
 DATE: FEB/MAR 1990 VIC\P28



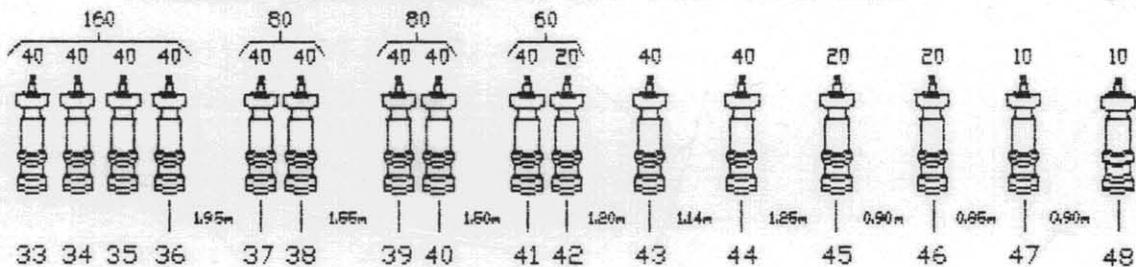
KEY		
LOCATION	OFFSET FROM CNP	
	X (+ STB)	Y (+ FWD)
1 CNP - ARGO ANTENNA	0.0 m	0.0 m
2 TRANSIT SATELLITE ANTENNA	1.0 m	-2.5 m
3 FATHOMETER TRANSDUCER	2.0 m	-4.2 m
4 SONAR TRANSDUCER	2.0 m	-14.3 m
5 SYLEDIS PORT ANTENNA	-2.0 m	-2.4 m
6 GRAVITY SENSOR	2.0 m	-18.05 m
7 CENTRE-STERN	0.0 m	-46.5 m
8 CENTRE OF SOURCE	0.0 m	-123.5 m
9 CENTRE OF NEAR GROUP	0.0 m	-223.5 m
10 NEAR COMPASS (BCU)	0.0 m	-279.8 m
11 MAGNETOMETER	-23.0 m	-256.5 m

NB: THE COMMON NAV POINT (CNP) IS THE REFERENCE POINT FOR SHOT CONTROL.

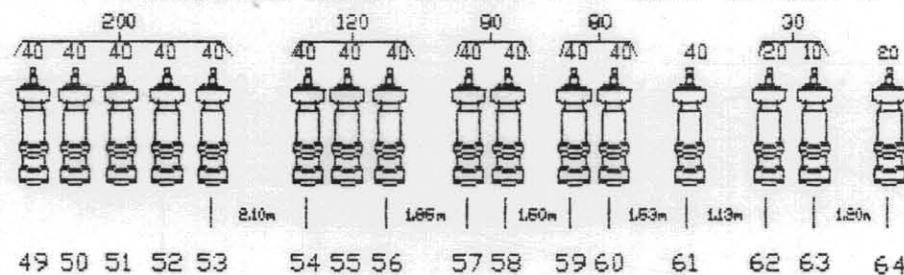
5 cm

PLATE #5A
M/V PACIFIC TITAN
2180 CUBIC-INCH SLEEVE AIRGUN ARRAY
CLIENT: SHELL AUST AREA: T/18P, T/14P
DATE: 18Feb90 - 16Mar90 VIC/P28

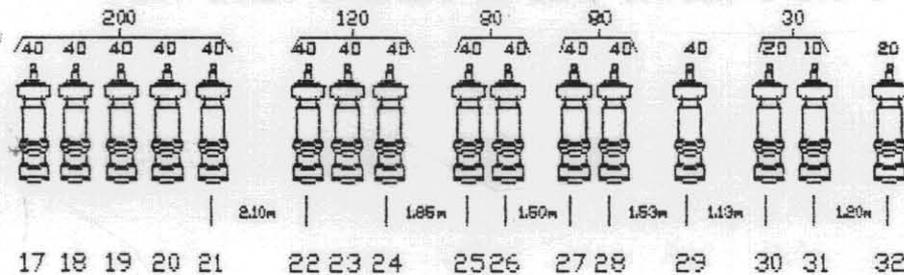
STARBOARD OUTER STRING (16 GUNS 14.21m @ 520 cubic in.)



STARBOARD INNER STRING (16 GUNS 13.765m @ 570 cubic in.)



PORT INNER STRING (16 GUNS 13.765m @ 570 cubic in.)



PORT OUTER STRING (16 GUNS 14.21m @ 520 cubic in.)

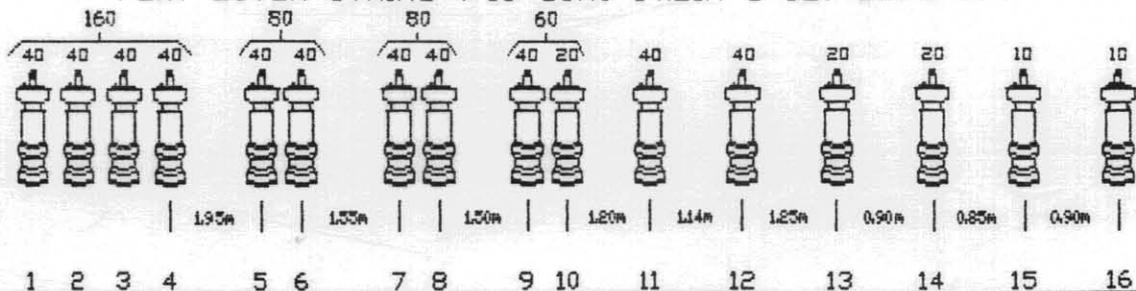


PLATE #5B

M/V PACIFIC TITAN

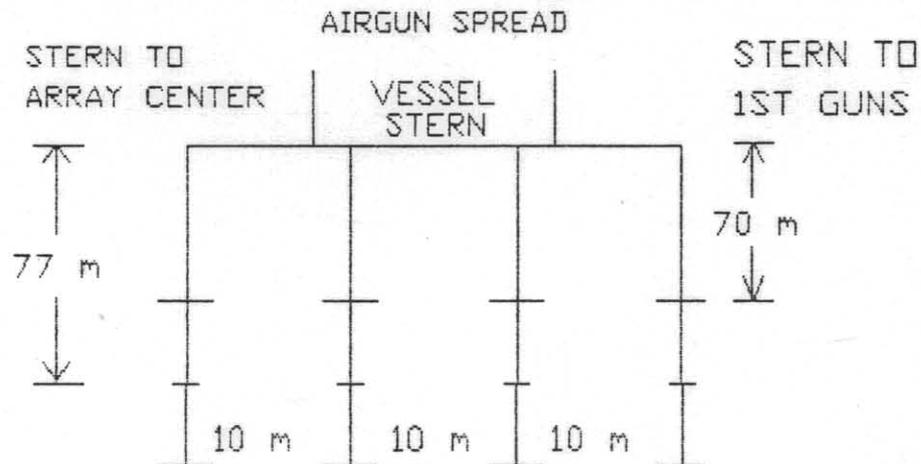
2180 CUBIC-INCH SLEEVE AIRGUN ARRAY

CLIENT: SHELL AUST AREA: T/18P, T/14P

DATE: 18Feb90 - 16Mar90

VIC/P28

WIDE TOW ARRAY



NOTES

1. GUN SIZE IN CUBIC INCHES
2. CENTERLINE TO CENTERLINE SPACING OF ALL COALESCED GUNS IS 0.495m
3. PREDICTED AVERAGE PERFORMANCE PER SUB-ARRAY
 $P_a = 25$ BAR-M (P-P, 0-250 Hz)
 TOTAL APPROXIMATE 100 BAR-M
4. DEPTH INDICATORS ARE SITUATED WITH GUNS # 2,15,18,31,34,47,50,63.

ARRAY CLUSTER COMPOSITION

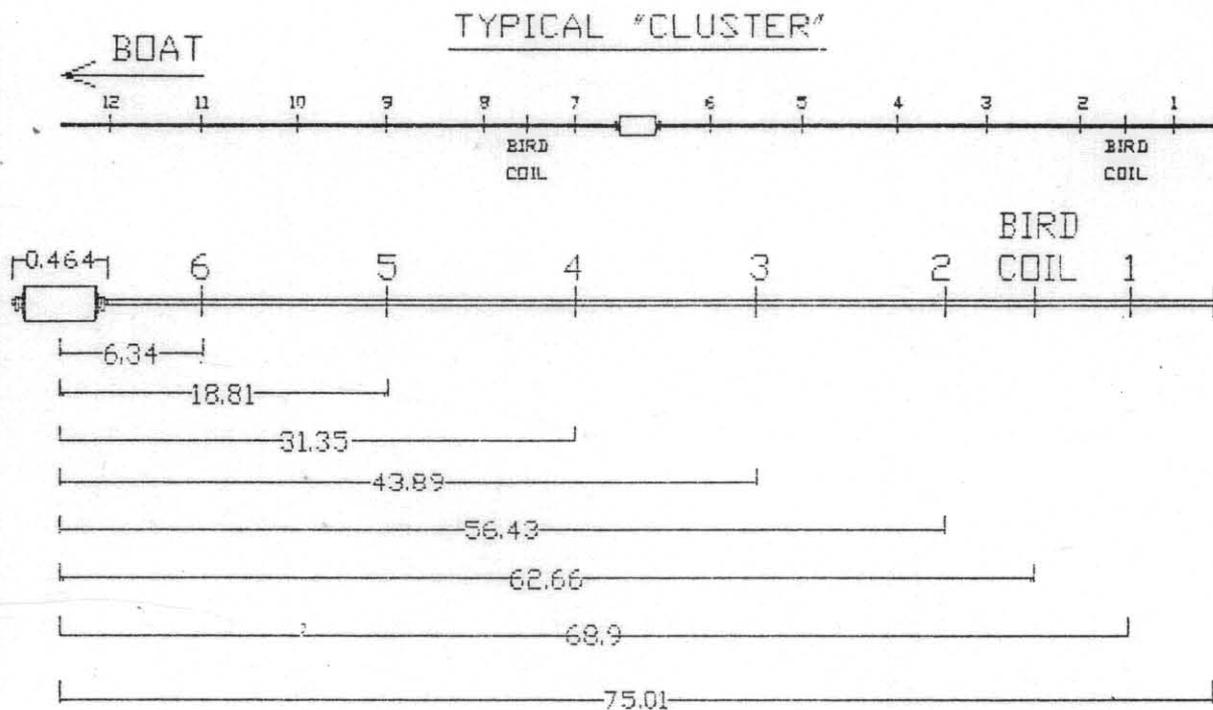
2 X 200	2 X 30
2 X 160	6 X 40 SINGLE
2 X 120	6 X 20 SINGLE
8 X 80	4 X 10 SINGLE
2 X 60	

5 cm

PLATE #7

M/V PACIFIC TITAN

SECTION DIAGRAM



NOTE: ALL DISTANCES IN METERS AND REFERENCED
TO THE CENTER OF THE SEM.
DISTANCES ARE TO THE CENTER OF THE GROUP

5 cm



ARGO CALIBRATION FIGURE

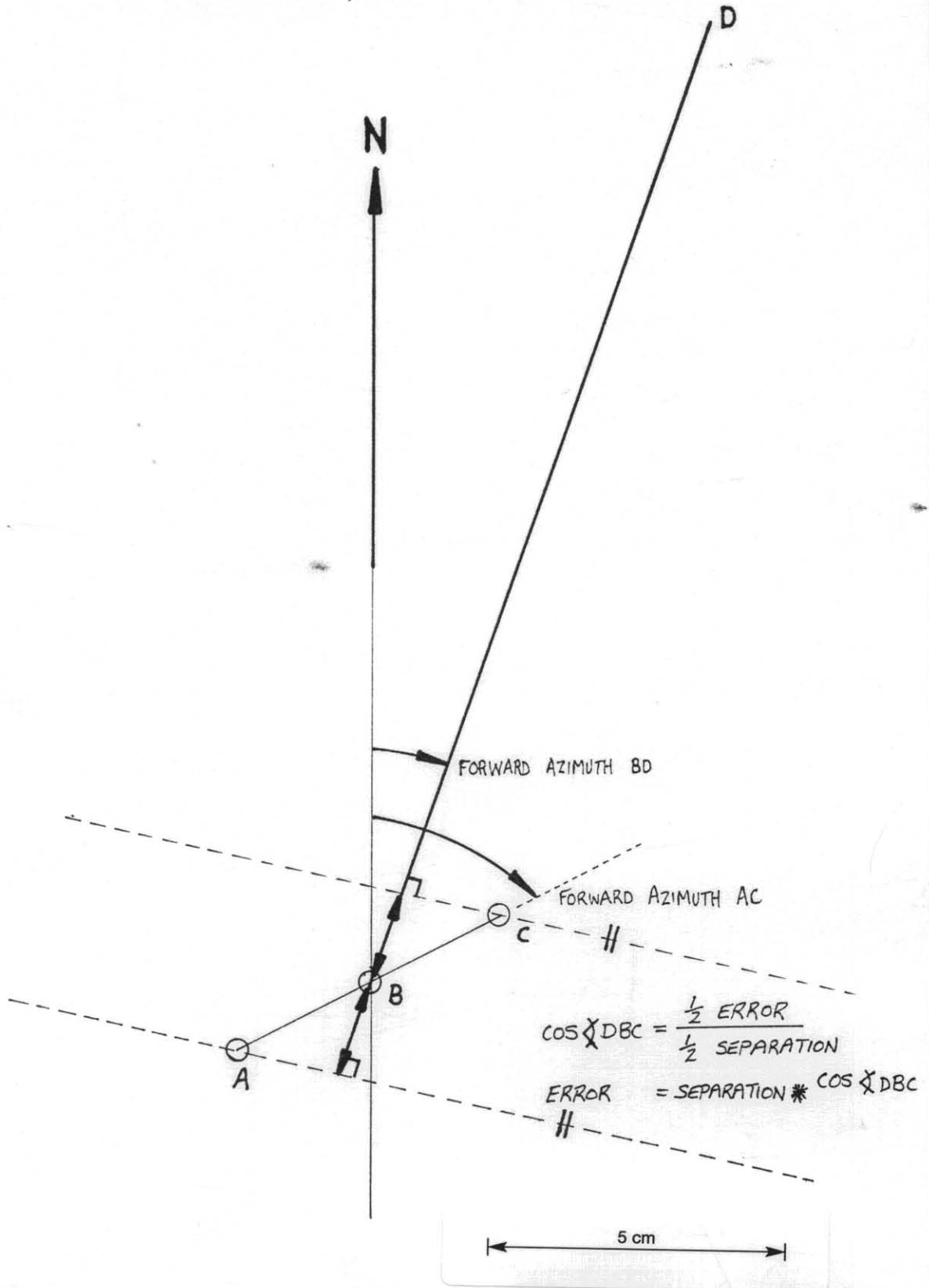
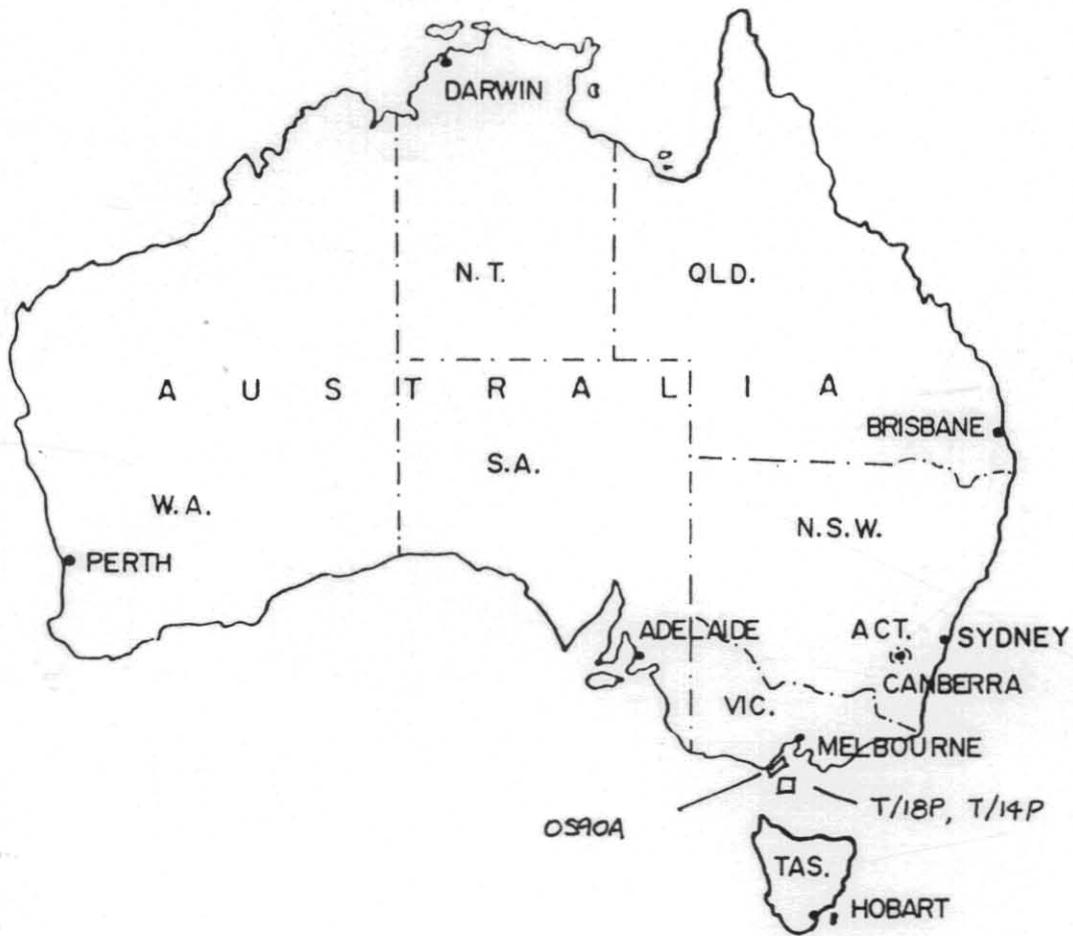




PLATE 9



LOCATION OF PROSPECT

