

169001



OPERATIONS REPORT  
MARINE SEISMIC SURVEY  
BASS STRAIT  
BBS-81 (TAS T.18P)

FOR

BASS STRAIT OIL AND GAS  
153 DORCAS STREET,  
SOUTH MELBOURNE. VIC. 3205

CLIENT REPRESENTATIVE

J. NEEDHAM

BY

GEOPHYSICAL SERVICES INTERNATIONAL  
P.O. BOX 106, NORTH RYDE, N.S.W. 2113

PARTY 2931 : M/V "EUGENE McDERMOTT II"

RECORDING DATES: FEBRUARY 11 - FEBRUARY 21, 1981

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SECTION I

INTRODUCTION

A Marine Seismic Survey was conducted by Geophysical Services Incorporated using the M/V "Eugene McDermott II" in the Bass Strait area for Bass Strait Oil and Gas, between February 11 and February 21, 1981.

The survey consisted of 730.925 kilometres of 48 fold reflection coverage utilizing a 2400 metre streamer under continuous tow in conjunction with a Pneumatic Acoustic Energy Source (AIRGUNS). Operations were generally conducted 24 hours a day.

Recordings were made using one set of DFSV instruments with two tape transports. Records were made on 12.7 mm magnetic tape in 9 track 1600 BPI Seg. B. digital format (see Section II Instruments).

The ships location was determined by Maxiran, a precise radio location system, owned and operated by O.N.I. (see Section II - Survey).



A. SURVEY VESSEL

M.V. "EUGENE McDERMOTT II"

Flag	Panama
Homeport	Panama
Trade	Foreign Going-Seismic Exploration
Owners	Geophysical Service Inc.
Call Sign	HO 9376
Length	52.73 metres L.O.A.
Breadth	12.19 metres
Depth	4.27 metres
Draft	3.05-3.24 metres
Official Number	7062 - PEXT - 1
Gross Tonnage	929.89 tonnes
Net Tonnage	249.09 tonnes
Engine Power	2 x 839.25 HP engines





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SECTION I

## B. KEY PERSONNEL

February 11 - February 21, 1981

Client Representative	J. Needham	
Australia Marine Manager	R. Miles	
Party Manager	C. Orr	
Vessel Controller	A. Welfare	
Jr. Geophysicist	W. Lloyd	
	A. Cairns	
Instrument Engineers	F. Hemmings	
	D. Kenny	
Junior Observers	J. Anheuser	
	T. Hess	
Survey Operators	I. Johnson )	} CMS II
	J. Hennessey )	
	D. Taylor )	} ONI
	A. Hennessey )	
Compressor Mechanics	W. Jenkins (Dallas)	
	J. Simmons	
Airgun Mechanics	P. Ferrier	
	P. Harris	
	D. Mercadante	
	P. Stephanovich	
	M. Clark	



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SECTION I

## B. KEY PERSONNEL (Contd.)

Captain	M. Gusterson
First Mate	G. Nilsen
Boat Manager	J. Stanton
Administrator	L. Williams



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SECTION 11

## EQUIPMENT

## A. INSTRUMENTS

One Texas Instruments DFS V system consisting of two analog modules, a control module and two ½ inch tape transports was used for this survey. Recordings were made in SEG. B format (see Plate 2A, B, C) at 1600 BPI.

Prior to beginning the survey, on January 27th a full calibration and set of instrument tests as recommended by Texas Instruments were performed on the DFS V instruments by onboard G.S.I. personnel. These tests, recorded on both magnetic tape and paper camera records, were couriered to the G.S.I. processing centre in Sydney for immediate analysis by their TIMAP system. The instrument tests included, converter linearity, dynamic range determination, equivalent input noise, gain accuracy, harmonic distortion, crossfeed and skew. All tests met with both Texas Instruments and client standards.

The DFS V instruments were calibrated for 96 channel, 2 ms sampling rate with 128HZ @ 72db/octave high-cut filter and low-cut filters switched out.

Instrument tests were performed each day and the results examined in analog form onboard. These tests consisted of: dynamic range determination, amplifier noise, automatic gain control, tape speed and skew checks.

The only termination which occurred as a result of an instrument malfunction occurred on line BBS81-17 when after 4 shotpoints were missed as a result of a transport hang-up, further bad errors occurred as a result of bad tape.



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SECTION 11

A. INSTRUMENTS (contd.)

Tapes recorded on each transport were frequently replayed on the other transport as a confirmation of readability.



SECTION II

A. INSTRUMENTS (contd.)

Instrument Details

Recording System	:	DFS V Serial Number 306
Tape Transports	:	Two, T.I. DFS V 10 inch, 9 track
Tape Format	:	SEG B, phase encoded 1600 BPI
Tape Speed	:	79.375 ips
No. Words/Data Scan	:	127
No. Words/Header	:	114 (+16 from extender header)
Channels Seismic	:	1 - 96
Waterbreaks	:	Aux. channel 1+2
Recording method	:	IFP
Sample Period	:	2 ms
Record Length	:	5 seconds
Gain Control Mode	:	P.G.C.
Gain Constant	:	24 db
Final Gain	:	108 db
Dynamic Range		
(referred to input noise)	:	84 db
Filters		
High-cut	:	128HZ @ 72 db / octave
Low-cut	:	Switched Out



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SECTION II

B. ANCILLARY EQUIPMENT

SERVO PROFILER

Manufacturer : EPC Labs Inc.

Model : 4600 Graphic Recorder

Serial Number : 371

Source : Trace number 94

Record Length : 4 seconds

Gain Mode : AGC

Filters

High-cut : 128 HZ @ 72 db / octave

Low-cut : Switched Out

NOTE:

The graphic recorder input is from the analog reproduce section of the DFS V.

The profiler was marked approximately every kilometre along all lines.



SECTION II

B. ANCILLARY EQUIPMENT (cont.)

FATHOMETER

Manufacturer	:	Simrad
Model	:	EA
Conversion Frequency	:	1478 m/sec
Operating Frequency	:	38 kHz
Transducer relating to Maxiran Antenna (see Antenna Positions Plate 7	:	6.6 m fwd and 1.1 m to stbd
Instrument correction for draft	:	3.7 m
Scale	:	On Chart Paper
Calibrated	:	14 February 1980 at Launceston, Tasmania

The Simrad Model EA has both a paper and digital output. The display chart scale is completely adjustable to suit depth and rate of depth changes.

The scale selected is automatically written on the proper display by the unit. Plate No. 8 shows scale ranges.

The digital output was interfaced with the GSI CMS II System for automatic logging on magnetic tape at every shotpoint.



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SECTION 11

B. ANCILLARY EQUIPMENT (cont.)

FATHOMETER (cont.)

The analog chart was marked approximately every kilometre along all lines.

The only defect that occurred with the Fathometer was when 2 styli required replacement in a matter of about 6 hours on February 15th.



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SECTION 11

## B. ANCILLARY EQUIPMENT (contd.)

CAMERA

Manufacturer	:	S.I.E.
Model	:	10C
Number of Channels	:	64
Polarity	:	GSI Normal
		Positive Pressure =
		Downbreak

The Camera worked well throughout the survey with only one defect which occurred on 18th February when the paper drive gears became stripped. The unit was in operative for about half an hour and after the new gears were fitted, functioned correctly.



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## SECTION II

### C. STREAMER

A G.S.I. Manufactured, 2400 metre streamer was utilized during this survey. This consisted of 48, 50 metre "live" sections, connected together with quick-coupling plugs. Each "live" section consisted of two independent 25 metre length groups (see plate number 4).

Generally there were seven nylon stretch sections located between group 96 and the vessel. These were used to attenuate the ships generated noise. There were five nylon stretch sections connected after group one, these sections were connected to the tailbuoy by 115 metres of nylon rope.

Each "live" group contained 15 acceleration cancelling hydrophones, which were connected in parallel to produce one group. These hydrophones are used to reduce the low frequency noise which is caused predominantly by boat noise propagated along the streamer, tailbuoy noise and cable strumming.

Six depth transducer sections were positioned along the streamer at regular intervals. They were calibrated to the required streamer depth of 40 feet before the streamer was reeled into the sea.



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SECTION II

C. STREAMER (contd.)

Each transducer section contains a single hydrophone which is used as a waterbreak detector. Waterbreak returns from detector number six, located between group 96 and the first front end stretch, and detector number five, located between groups 81 and 80 were recorded on both magnetic tape and camera records. The time measurement of the return was also recorded on the CMS tape and printer logs.

Waterbreak number six was used to determine the streamer offset, (centre of group 96 to the centre of airgun array). The offset was determined manually by the time measurement explained on plate number 6.

The offset was also calculated by the CMS. The CMS streamer offset sensor fires a single airgun between the DFS records. The sensor then measures the arrival time of waterbreaks number six and five and uses this time to calculate the offset value which was recorded on both CMS tape and printed logs.

The streamer offset would change during the line by  $\pm$  one or two metres, a result of varying sea states and currents which caused slight variations in the stretched length of the nylon rope sections.

Due to ship speed changes made to maintain airgun operating pressure, on occasions, as noted on all observer logs and reports, the offset had to be changed between



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SECTION 11

C. STREAMER (contd.)

lines, in order to maintain correct streamer ballast.

The average offset used during this survey was 220 metres, the offset varied between a maximum of 263 metres to a minimum of 197 metres.

Tailbuoy bearings were checked and logged at regular intervals to ensure that feathering angle did not exceed the specified limits.

The average streamer noise during this survey was 7 microvolts. No consistently noisy traces were observed but prop noise was evident on the near traces whenever shooting with or into the swells.

Because the tail end depths were erratic on the first few lines, it was decided on February 11th to bring the cable in and re-ballast it in this area. This operation was delayed because the cable reel brake would not release. Whenever starting the reel moving in either direction it was necessary to manually start the brake releasing.

Although the resultant delay was not excessive a fair degree of inconvenience was caused.

The weather deteriorated on February 12th and as no significant improvement was anticipated for some 48 hours it was decided to return to Devonport to carry out some compressor repairs. On return to the prospect, laying of the cable was impossible as the Hydraulic Pump starter control fuses blew whenever starting was attempted.



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C. STREAMER (contd.)

The ship returned to Devonport, anchoring outside the harbour to enable the defect to be investigated by an electrician. The fault was traced to a short circuited relay in the starter. The defect was a result of an ingress of salt water which entered the engine room through the remote control cable stuffing tube, the end of which, is above the starter cabinet.

On 18th February, Depth Meter No. 2 was giving inconsistent readings and was considered to be in error. Replacement could only be made with an uncalibrated unit so was not done.

During a line change in calm weather on 19th February a front and stretch section parted. Recovery of the tailbuoy was achieved quite soon afterwards but it was some 8 hours before the cable was completely on board - back to front.

With the front end secured and buoyed, the cable was then let out again to bring it right way round. Once this was done, the broken stretch section was replaced, the entire cable reeled in and depth controllers fitted and depth transducers re-calibrated as it was re-laid. A total of 16 hours was lost about an hour of which was while the engineers carried out maintenance on the ships propellers sternlands before commencing re-laying.

Elimination of bad leakage on Trace 86 was achieved by changing out one of the front end stretch sections on 20th February.



SECTION II

C. STREAMER (cont.)

STREAMER DETAILS

Length Centre to Centre	:	2395 metres
Number of groups	:	96
Group Interval	:	25 metres
Live Section Length	:	50 metres
Number of Hydrophones/group:		15
Hydrophone Interval	:	1.67 metres
Hydrophone Type	:	T.I. - A.C.H.
Number of Nylon Stretch		
Sections in Front End	:	7
Tail End	:	5
Skin Type	:	Tropical
Location of Depth		
Transducers	:	Between Groups; 2/3, 20/21, 40/41, 60/61, 80/81, 96/FE.
Source of Waterbreaks	:	In Depth Transducers sections between Groups: 80/81, 96/FE
Location of Control Fins	:	On all Depth Transducers
Near Group	:	Number 96
Streamer Sensitivity	:	5.15 uv/u bar

SECTION II

## D. ENERGY SOURCE

An Electro-Pneumatic Acoustic Energy Source known as "Airguns" was used for reflection work. The Airgun has basically two moving parts, the shuttle and solenoid. Compressed air is supplied to this unit at a pressure of 13789 kPa (2000 psi). The shuttle is forced to close on initial application of pressure. Compressed air fills the reservoir chamber through a central orifice in the shuttle. To discharge the gun an electrical current activates the solenoid and retracts a plunger, thus enabling compressed air to pass through a port hole to the underside of a flange at the shuttle. The pressure difference above and below the shuttle then thrusts it open. The air from the chamber then escapes through four port holes near the centre of the gun and expands rapidly through the water, producing a single bubble and resultant shock wave. The air bubble collapses in a manner similar to that caused by explosives with one notable exception in that its period is controlled and is placed in the desired seismic frequency band.

The energy source used by M/V "McDERMOTT II" was a tuned airgun array of 2000 cubic inches total capacity, designed for deep penetration and good resolution. This array has a broadband frequency output that extends below the normal low frequency band for seismic energy source.

Good primary to bubble ratio is obtained by using a wide variety of airgun barrel sizes.

SECTION II

## D. ENERGY SOURCE (cont.)

Attached, Plate 5, is the diagram showing gun utilization and spacings.

Average pressure obtained from the array is 55 bars at 1 metre, with an average primary-to-bubble ratio of 8:1 at the designed operating depth of 21 feet. Normal operating pressure 2000 psi, with a minimum allowable pressure of 1600 psi.

The array includes 4 low pressure open-ended air lines so that the depth of the array could be monitored at all times by means of static air pressure measurements.

TIGER, the Texas Instruments Automatic Airgun Controller, monitors the firing of each airgun in the array. Individual gun firing times are continuously controlled to give phasing within + or -1 millisecond for maximum pulse amplitude and front to back ratio.

The TIGER also performs a quality control function, by indicating with individual gun L.E.D. (light emitting diode) displays, the status of a gun if not operating correctly, either no fire or self fire. This is also logged on printer and magnetic tape, along with changes to the total gun array status (on/off line). TIGER operates in conjunction with the CMS-11 (Configurable Marine System) that is onboard the M/V "McDERMOTT II".



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SECTION 11

D. ENERGY SOURCE (cont.)

The guns were maintained by the GSI personnel on line changes, so that throughout the survey the gun array was up to specifications. No malfunctions outside the range normally encountered, were experienced.

The "McDERMOTT" uses a combination of three Le Roi screw compressor combination with three Norwalk reciprocating compressor.

The Le Roi machines output a low pressure 150 psi air to the Norwalks which then increase this to the working pressure of 2000 psi.

The system is designed so that any two Le Roi and any two Norwalk machines need to be running at one time to maintain ample working pressure at a shooting speed of 5 knots.

However this newly designed Norwalk system has been plagued with troubles and because of this only two machines have been able to be kept running, and on occasions this has been reduced to one Norwalk machine. When this was the case the shooting speed was kept down to a maximum of 4.5 knots. This speed resulted in an approximate shotpoint time interval of 12 seconds. which was enough time for the single Norwalk to maintain 1800 + psi.



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SECTION 11

D. ENERGY SOURCE (contd.)

The airguns performed well throughout the survey and no defects outside the scope of those normally experienced were encountered.

On approach to line BBS81-6 shortly after the start of the survey No. 5, the only Norwalk operational, failed. Almost an hour elapsed before the machine was running again and a short time later, No. 4 was operational. This was short lived and No. 4 failed again after only half an hour. Production continued with only No. 5 compressor running.

Line BBS81-8 (16th February) was terminated when compressor No. 5 clutch seal failed. The second stage carrier rings were removed from No. 6 and fitted in No. 4 thus enabling it to be run. This operation took some three hours.

During a line change on 17th February, oil from a burst oil line sprayed on the exhaust manifold of No. 1 (Le Roi) compressor. The resultant dense smoke was thought to be a fire and was then treated as such. The situation was quickly brought under control before any damage was caused.

Before production could be resumed, the Norwalks failed again and a period of some 12 hours passed between end of line BBS81-1 and start of line BBS81-1 when Compressors No. 4 and 5 were again operational in the early hours of 18th February.



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SECTION 11

## D. ENERGY SOURCE (Contd.)

Although at times, only one Norwalk was functional, production was continued - sometimes slowly and with reduced airgun array capacity until the survey was completed on 21st February.

2000 CUBIC INCH - AIRGUN ARRAY

Operating Volume	:	2000 cubic inches
Total Spare Volume	:	520 cubic inches
Operating Pressure	:	1800 - 2000 psi
Operating Depth	:	6 ± 0.5 M
Timing Control	:	TIGER Serial Number 7
Firing Delay	:	51.2 msec
Compressors	:	3-Type - LeRoi Screw 3-Type - Norwalk Reciprocating

Distance from Maxiran antenna to Array Centre (Refer to Antenna Positions Plate 7)	:	51.1 metres
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Distance from stern of vessel to Array Centre	:	25.7 metres.
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## SECTION II

### E. SURVEY

The prime navigation system used was Maxiran, a precise range/range system owned and operated by Offshore Navigation Inc. (O.N.I.).

The Maxiran equipment was calibrated onshore before the start of the survey. The accuracy of the survey net was verified at sea by baseline crossings and three way fixes.

O.N.I. will submit a separate full report.

The Maxiran mobile monitor was interfaced to G.S.I.'s Configural Marine System II (CMS II). The CMS II System consisted of a Texas Instruments 980B computer, a system co-ordinator, TIGER Airgun Controller, automatic data logger, satellite receiver, two Houston Instruments trackplotters (one each located in instrument room and bridge) and two Digi-Data, 800 bpi, ½ inch tape transports. The CMS II function was survey control and navigation data recording. It used the input Maxiran raw ranges to calculate, by two or three way fixes the vessels velocity and position.

Shotpoint positioning was done in the "distance" mode with the CMS II triggering the DFS V instruments and also the TIGER unit to fire the airguns at every 25 metres of travel along the preplotted survey lines. Occasional changes to "time" mode were made when real time shotpoints became displaced with respect to the pre-plotted shotpoint.



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SECTION 11

E. SURVEY (cont.)

The CMS 11 satellite navigation system was utilized as an onboard Q.C. check of the Maxiran positioning, this satellite data was also recorded on the CMS Magnetic tape.

Three way fixes were manually calculated at the start and end of every line, using a TI-59 calculator and "Three-Way Fix by Iteration" programme.

During the survey, the CMS doppler sonar was used as the velocity source and the system gyro provided Azimuth information.

At the start of the survey Maxiran signals were erratic so it was decided to conduct a test line. This test gave good results so the survey was commenced with line BBS81-14 which was terminated after 16 shotpoints because of bad signals. The next line attempted was BBS81-06. A considerable number of shotpoints were missed and the line was eventually terminated at SP621 when Nav signals were lost. This line was resumed as BBS81-61A and again a considerable number of shotpoints was missed. The line was again terminated and although this was not due to signals, when continued as BBS81-6B, and again a considerable number of shotpoints was missed.

The survey was resumed on 15th February after a spell of bad weather. From then until line BBS81-02, few shotpoints were missed. On line BBS81-02 however, signals from Cape Schank became erratic causing a jump in CMS shotpoint numbering and hence a discrepancy of 2 between CMS and Pre-plot numbers until the end of line.



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SECTION 11

E. SURVEY (cont.)

Line BBS81-01 was terminated as a result of bad Nav. signals.

The CMS idled twice, once on Line BBS81-02 and again on BBS-01A. On both occasions only a few shotpoints were missed. The reason for these idles has not yet been positively established.



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SECTION 111

OPERATIONS

A. OPERATION DISCUSSION

Because of erratic Maxiran signals, a test line was conducted before start of production. Although this was successful, the first line attempted was terminated because of poor signals. Poor Maxiran signals accounted for a large percentage of missed shotpoints throughout the survey as well as another termination (line BBS81-01) later in the survey.

Inclement weather caused the survey to be suspended early on 12th February and because no significant improvement was expected for some 48 hours the ship returned to Devonport to enable work to be carried out on the compressors.

The ship returned to the prospect on 14th February but was unable to lay the cable because of a defective hydraulic pump starter. Another return to Devonport was necessary before the defect was cleared and the survey was resumed on 15th February.

Because the survey area was close to the shipping lane between Melbourne and Devonport, regular traffic was encountered. On most occasions, radio contact was established and co-operation of the ships involved enabled production to continue with only slight interference. However, on three occasions, noise was excessive and lines has to be terminated.



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SECTION 111

OPERATIONS

A. OPERATION DISCUSSION (Contd.)

Data was monitored in R.A.W. form on board during production enabling strict quality control to ensure that a high standard was maintained throughout the survey.



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SECTION 111

## B. OPERATIONS SUMMARY

10th February 1981

0715 Sailed from Devonport  
1015 - 1445 Laying cable  
1530 - 1605 Test Line  
Line BBS81-14 Terminated due to bad nav. signals.  
Not to be processed.

11th February 1981

Line BBS81-06 Start delayed due to compressor problems.  
Terminated due to bad nav signals. To  
be completed.  
0345 - 0925 Cable re-ballasted  
Line BBS81-06A Terminated due to excessive ships noise.  
To be completed.  
Line BBS81-06B Complete

12th February 1981

Line BBS81-04 Terminated due to excessive noise caused  
by bad weather. Not to be processed.  
0200 - 1000 Down for weather  
1000 - 1200 Cable brought on board - Headed for Devonport.  
2140 Arrived Devonport

13th February 1981

At Devonport



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## B. OPERATIONS SUMMARY (contd.)

14th February 1981

0945	Sailed from Devonport
1300	Unable to lay cable due to defective hydraulic Pump starter - returning to Devonport.
2130	Defect recitified. Returning to Prospect.

15th February 1981

0025 - 0300	Laying cable
Line BBS81-14A	Complete
Line BBS81-12	Complete

16th February 1981

Line BBS81-17	Terminated due to excessive bad records To be completed.
Line BBS81-17A	Complete
Line BBS81-15	Complete
Line BBS81-13	Complete
Line BBS81-15A	Complete
Line BBS81-08	Terminated due to compressor problems . To be completed.

17th February 1981

Line BBS81-07	Terminated due to excessive ship noise. To be completed.
Line BBS81-07A	Complete
Line BBS81-02	Bad Maxiran Signals caused SP numbering error - complete.
Line BBS81-01	Terminated due to bad Maxiran signals- to be completed



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## B. OPERATIONS SUMMARY (Contd.)

18th February 1981

Line BBS81-1A	Complete
Line BBS81-10	Complete
Line BBS81-03	Complete
Line BBS81-05	Terminated due to excessive ship noise. To be completed.

19th February 1981

Line BBS81-04	Complete
Line BBS81-05A	Complete
1739	Streamer Parted

20th February 1981

1040	Streamer repairs completed.
1040 - 2025	Shooting lines of Cue Survey (BCS81)
Line BBS81-09	Shot as a dog leg of BCS 81-03 - complete

21st February 1981

Line BBS81-11	Complete
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<u>DATE</u>	<u>LINE</u>	<u>DIR</u>	<u>SP RANGE</u>	<u>TOT S.P.</u>	<u>CHARGEABLE KM</u>	<u>COMMENTS</u>	<u>DAILY TOTAL</u>
11th Feb	BBS81-06	324 <sup>o</sup>	0001 - 0621	621	15.525	Terminated T B C	
	BBS81-06A	324 <sup>o</sup>	0622 - 2121	1500	37.5	Terminated T B C	
	BBS81-06B	325 <sup>o</sup>	2122 - 3751	1630	40.75	Complete	93.775
15th Feb	BBS81-14A	310 <sup>o</sup>	0001 - 4502	4502	112.55	Complete	
	BBS81-12	128 <sup>o</sup>	0001 - 1871	1871	46.775	Complete	159.325
16th	BBS81-17	223 <sup>o</sup>	0001 - 0450	450	11.25	Terminated T B C	
	BBS81-17A	223 <sup>o</sup>	0451 - 0751	301	7.525	Complete	
	BBS81-15	057 <sup>o</sup>	0001 - 1031	1031	25.775	Complete	
	BBS81-13	057 <sup>o</sup>	0001 - 0951	951	23.775	Complete	
	BBS81-15A	236 <sup>o</sup>	0001 - 0481	481	12.025	Complete	
	BBS81-08	327 <sup>o</sup>	0001 - 0489	489	12.225	Complete	92.575
17th	BBS81-07	052 <sup>o</sup>	0001 - 0721	721	18.025	Terminated T B C	
	BBS81-07A	052 <sup>o</sup>	0722 - 0973	252	6.3	Complete	
	BBS81-02	315 <sup>o</sup>	0001 - 2110	2110	52.75	Complete	
	BBS81-01	235 <sup>o</sup>	0001 - 0540	540	13.5	Terminated T B C	90.575



<u>DATE</u>	<u>LINE</u>	<u>DIR</u>	<u>SP RANGE</u>	<u>TOT S.P.</u>	<u>CHARGEABLE KM</u>	<u>COMMENTS</u>	<u>DAILY TOTAL</u>
18th Feb	BBS81-01A	235 <sup>0</sup>	0541 - 2555	2015	50.375	Complete	
	BBS81-10	128 <sup>0</sup>	0001 - 0650	650	16.250	Complete	
	BBS81-03	051 <sup>0</sup>	0001 - 2592	2592	64.8	Complete	131.425
19th Feb	BBS81-05	229 <sup>0</sup>	0001 - 0280	280	7.0	Terminated TBC	
	BBS81-04	137 <sup>0</sup>	0001 - 0811	811	20.275	Complete	
	BBS81-05A	229 <sup>0</sup>	0281 - 3477	3197	79.925	Complete	107.2
20th Feb	BBS81-09	237 <sup>0</sup>	1153 - 2450	1298	32.45	Midnight S.O.	32.45
21st Feb	BBS81-09	237 <sup>0</sup>	2451 - 2811	361	9.025	Complete	
	BBS81-11	057 <sup>0</sup>	0001 - 0583	583	14.575	Complete	23.6





SECTION 111

D. STATISTICS

Prospect	:	Bass Strait BBS 81 (TAS T.18P)
Operation Period	:	February 11th - February 21st 1981
Number of Lines	:	25
Total Production	:	730.925
Field Tapes Used	:	475
Production Shotpoints	:	29237
Unusable shot percentage of total shot points	:	1.17
Seismic Data shipped to	:	G.S.I. - Sydney
Navigation Data shipped to	:	G.S.I. - Dallas

169036



E. PERMITTING

The Marine Operations Centre, Canberra, was advised as to the ship's location throughout the survey to enable the necessary navigation warning to mariners to be issued.

SECTION 111

## F. FIELD TAPE INVENTORY

<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
10 FEB 81	157304	BBS81-14	001 - 016
11 FEB 81	157305	BBS81-06	001 - 062
	157306	"	063 - 129
	158307	"	130 - 199
	158308	"	200 - 267
	157309	"	268 - 331
	157310	"	332 - 397
	157311	"	398 - 467
	157312	"	471 - 533
	157313	"	534 - 597
	157314	"	598 - 621
	157315	BBS81 - 06A	561 - 633
	157316	"	624 - 688
	157317	"	689 - 755
	157318	"	756 - 822
	157319	"	823 - 890
	157320	"	892 - 957
	157321	"	958 - 1023
	157322	"	1024 - 1080
	157323	"	1091 - 1155
	157324	"	1156 - 1220
	157325	"	1221 - 1286
	157326	"	1287 - 1352
	157327	"	1353 - 1417
	157328	"	1418 - 1482
	157329	"	1483 - 1547



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
11 FEB	157363	BBS81-6B	3520 - 3585
	157364	"	3586 - 3652
	157365	"	3653 - 3717
	157366	"	3718 - 3751
12 FEB	157367	DO NOT PROCESS	
	157368	"	
15 FEB	157369	BBS81-14A	001 - 062
	157370	"	063 - 127
	157371	"	128 - 192
	157372	"	193 - 257
	157373	"	258 - 322
	157374	"	323 - 387
	157375	"	388 - 752
	157376	"	753 - 517
	157377	"	518 - 582
	157378	"	583 - 647
	157379	"	648 - 712
	157380	"	713 - 777
	157381	"	778 - 841
	157382	"	842 - 906
	157383	"	907 - 971
	157384	"	972 - 1036
	157385	"	1037 - 1102
	157386	"	1103 - 1167
	157387	"	1168 - 1232
	157388	"	1133 - 1297
	157389	"	1298 - 1362
	157390	""	1363 - 1428
	157391	"	1429 - 1492
	157392	"	1493 - 1557
	157393	"	1558 - 1622



<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
11 FEB	157330	BBS81 - 06A	1548 - 1560
	157331	"	1565 - 1629
	157332	"	1630 - 1694
	157333	"	1695 - 1759
	157334	"	1760 - 1824
	157335	"	1825 - 1889
	157336	"	1890 - 1954
	157337	"	1955 - 2019
	157338	"	2020 - 2084
	157339	"	2085 - 2149
	157340	"	2150 - 2184
	157341	BBS81-6B	2061 - 2124
	157342	"	2125 - 2191
	157343	"	2192 - 2258
	157344	"	2259 - 2323
	157345	"	2324 - 2389
	157346	"	2390 - 2457
	157347	"	2458 - 2525
	157348	"	2526 - 2590
	157349	"	2656 - 2721
	157350	"	2656 - 2721
	157351	"	2722 - 2787
	157352	"	2788 - 2855
	157353	"	2856 - 2922
	157354	"	2923 - 2988
	157355	"	2989 - 3055
	157356	"	3056 - 3121
	157357	"	3122 - 3187
	157358	"	3188 - 3253
	157359	"	3254 - 3318
	157360	"	3319 - 3386
	157361	"	3387 - 3452
	157362	"	3453 - 3519



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
11 FEB	157363	BBS81-6B	3520 - 3585
	157364	"	3586 - 3652
	157365	"	3653 - 3717
	157366	"	3718 - 3751
12 FEB	157367	DO NOT PROCESS	518 - 582
	157368	"	
15 FEB	157369	BBS81-14A	001 - 062
	157370	"	063 - 127
	157371	"	128 - 192
	157372	"	193 - 257
	157373	"	258 - 322
	157374	"	323 - 387
	157375	"	388 - 652
	157376	"	753 - 517
	157377	"	518 - 582
	157378	"	583 - 647
	157379	"	648 - 712
	157380	"	713 - 777
	157381	"	778 - 841
	157382	"	842 - 906
	157383	"	907 - 971
	157384	"	972 - 1036
	157385	"	1037 - 1102
	157386	"	1103 - 1167
	157387	"	1168 - 1232
	157388	"	1133 - 1297
	157389	"	1298 - 1362
	157390	"	1363 - 1428
	157391	"	1429 - 1492
	157392	"	1493 - 1557
	157393	"	1558 - 1622



<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
15 FEB	157394	BBS81-14A	1623 - 1687
	157395	"	1688 - 1751
	157396	"	1752 - 1817
	157397	"	1818 - 1881
	157398	"	1882 - 1946
	157399	"	1947 - 2011
	157400	"	2012 - 2078
	157401	"	2079 - 2143
	157402	"	2144 - 2208
	157403	"	2209 - 2273
	157404	"	2279 - 2338
	157405	"	2339 - 2403
	157406	"	2404 - 2709
	157407	"	2410 - 2474
	157408	"	2475 - 2539
	157409	"	2540 - 2604
	157410	"	2608 - 2672
	157411	"	2673 - 2737
	157412	"	2738 - 2801
	157413	"	2806 - 2870
	157414	"	2871 - 2935
	157415	"	2936 - 3000
	157416	"	3001 - 3065
	157417	"	3066 - 3130
	157418	"	3131 - 3195
	157419	"	3196 - 3260
	157420	"	3261 - 3325
	156421	"	3326 - 3390
	156422	"	3391 - 3455
	156423	"	3456 - 3520



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
15 FEB	157424	BBS81-14A	3521 - 3585
	157425	"	3586 - 3650
	157426	"	3651 - 3715
	157427	"	3716 - 3780
	157428	"	3781 - 3745
	157429	"	3846 - 3910
	157430	"	3911 - 3975
	157431	"	3976 - 4040
	157432	"	4041 - 4009
	157433	"	4100 - 4164
	157434	"	4165 - 4229
	157435	"	4230 - 4295
	157436	"	4296 - 4359
	157437	"	4360 - 4424
	157438	"	4425 - 4489
	157439	"	4490 - 4502
	157440	BBS81 - 12	0001 - 0062
	157441	"	0066 - 0130
	157442	"	0131 - 0195
	157443	"	0196 - 0264
	157444	"	0265 - 0330
	157445	"	0331 - 0395
	157446	"	0396 - 0460
	157447	"	0461 - 0525
	157448	"	0526 - 0590
	157449	"	0591 - 0655
	157450	"	0656 - 0720
	156451	"	0721 - 0785
	157452	"	0786 - 850
	157453	"	851 - 951



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
15 FEB	157454	BBS81 - 12	916 - 980
	157455	"	981 - 1045
	157456	"	1046 - 1110
	157457	"	1111 - 1175
	157458	"	1176 - 1240
	157459	"	1241 - 1305
	157460	"	1306 - 1370
	157461	"	1371 - 1435
	157462	"	1436 - 1500
	157463	"	1501 - 1565
	157464	"	1566 - 1630
	157465	"	1631 - 1695
	157466	"	1696 - 1760
	157467	"	1761 - 1825
	157468	"	1826 - 1871
16 FEB	157469	BBS81-17	001 - 060
	157470	"	061 - 125
	157471	"	126 - 190
	157472	"	191 - 255
	157473	"	256 - 320
	157474	"	321 - 385
	157475	"	386 - 450
	157476	"	455 - 461
	157477	"	462 - 507
	157478	BBS81-17A	391 - 449
	157479	"	450 - 514
	157480	"	515 - 579
	157481	"	580 - 644
	157482	"	645 - 709
	157483	"	710 - 751



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
16 FEB	157484	BBS81-15	001 - 061
	157485	"	062 - 126
	157486	"	127 - 190
	157487	"	191 - 255
	157488	"	256 - 320
	157489	"	321 - 385
	157490	"	386 - 450
	157491	"	451 - 515
	157492	"	516 - 580
	157493	"	581 - 645
	157494	"	646 - 710
	157495	"	711 - 775
	157496	"	776 - 840
	157497	"	841 - 905
	157498	"	906 - 970
	157499	"	971 - 1013
	157500	BBS81-13	001 - 060
	157501	"	061 - 125
	157502	"	126 - 190
	157503	"	191 - 255
	157504	"	256 - 320
	157505	"	321 - 385
	157506	"	386 - 450
	157507	"	451 - 515
	157508	"	516 - 580
	157509	"	581 - 645
	157510	"	646 - 709
	157511	"	710 - 773
	157512	"	779 - 843
	157513	"	844 - 908



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>	
16 FEB	157514	BBS81-13	909-951	
	157515	BBS81-154	001 - 061	
	157516	"	062 - 126	
	157517	"	127 - 191	
	157518	"	192 - 256	
	157519	"	257 - 321	
	157520	"	322 - 387	
	157521	"	388 - 446	
	157522	"	447 - 481	
	157523	BBS81-8	001 - 061	
	157524	"	062 - 126	
	157525	"	127 - 191	
	157526	"	192 - 256	
	157527	"	257 - 321	
	157528	"	322 - 386	
	157529	"	390 - 454	
	157530	"	455 - 489	
	17 FEB	157531	BBS81-7	001 - 061
		157532	"	061 - 127
157533		"	128 - 192	
157534		"	193 - 257	
157535		"	258 - 322	
157536		"	323 - 387	
157537		"	388 - 451	
157538		"	452 - 516	
157539		"	518 - 582	
157540		"	583 - 647	
157541		"	648 - 712	
157542		"	712 - 772	
157543		"	661 - 722	



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
17 FEB	157544	BBS81-7A	723 - 787
	157545	"	788 - 852
	157546	"	853 - 917
	157547	"	918 - 973
	157548	BBS82-02	001 - 059
	157549	"	060 - 126
	157550	"	127 - 192
	157551	"	193 - 257
	157552	"	258 - 324
	157553	"	325 - 389
	157554	"	390 - 454
	157555	"	455 - 519
	157556	"	520 - 584
	157557	"	585 - 649
	157558	"	650 - 714
	157559	"	715 - 780
	157560	"	781 - 846
	157561	"	847 - 911
	157562	"	912 - 976
	157563	"	977 - 1041
	157564	"	1042 - 1107
	157565	"	1108 - 1175
	157566	"	1176 - 1240
	157567	"	1241 - 1306
	157568	"	1309 - 1373
	157569	"	1374 - 1438
	157570	"	1439 - 1503
	157571	"	1504 - 1569
	157572	"	1570 - 1634
	157573	"	1635 - 1699



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
17 FEB	157574	BBS81-02	1700 - 1764
	157575		1765 - 1829
	157576		1830 - 1894
	157577		1895 - 1959
	157578		1960 - 2026
	157579		2027 - 2091
	157580		2092 - 2110
	157581	BBS81-1	001 - 060
	157582		061 - 125
	157583		126 - 190
	157584		191 - 255
	157585		256 - 320
	157586		321 - 385
	157587		386 - 450
	157588		451 - 515
	157589		516 - 588
	157590		589 - 603
18 FEB	157591	BBS81-1A	481 - 540
	157592		545 - 609
	157593		610 - 674
	157594		675 - 739
	157595		740 - 804
	157596		805 - 869
	157597		870 - 934
	157598		935 - 1000
	157599		1001 - 1065
	157600		1066 - 1130
	157601		1131 - 1195
	157602		1196 - 1260
	157603		1261 - 1325



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
18 FEB 81	157604	BBS81-1A	1326 - 1391
	157605	"	1392 - 1456
	156606	"	1457 - 1529
	156607	"	1530 - 1594
	156608	"	1596 - 1661
	156609	"	1662 - 1726
	155610	"	1727 - 1791
	155611	"	1792 - 1856
	155612	"	1857 - 1922
	155613	"	1925 - 1987
	155614	"	1988 - 2052
	155615	"	2053 - 2116
	155616	"	2117 - 2181
	155617	"	2182 - 2231
	155618	"	2232 - 2310
	155619	"	2311 - 2375
	155620	"	2376 - 2440
	155621	"	2441 - 2505
	155622	"	2506 - 2555
	155623	BBS81-10	001 - 060
	155624	"	061 - 125
	155625	"	126 - 190
	155626	"	191 - 255
	155627	"	256 - 320
	155628	"	321 - 386
	155629	"	387 - 450
	155630	"	451 - 516
	155631	"	517 - 581
	155632	"	582 - 623
	155633	"	624 - 650



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
18 FEB	157634	BBS81-3	001 - 061
	157635	"	062 - 126
	157636	"	127 - 191
	157637	"	192 - 255
	157638	"	256 - 322
	157639	"	323 - 387
	157640	"	388 - 452
	157641	"	453 - 517
	157642	"	518 - 582
	157643	"	583 - 646
	157644	"	647 - 711
	157645	"	713 - 775
	157646	"	776 - 841
	157647	"	842 - 906
	157648	"	907 - 971
	157649	"	972 - 1036
	157650	"	1037 - 1101
	157651	"	1012 - 1167
	157652	"	1168 - 1233
	157653	"	1234 - 1300
	157654	"	1301 - 1366
	157655	"	1367 - 1431
	157656	"	1432 - 1498
	157657	"	1499 - 1563
	157658	"	1564 - 1629
	157659	"	1630 - 1695
	157560	"	1696 - 1760
	157561	"	1761 - 1825
	157562	"	1826 - 1891
	157563	"	1892 - 1956



<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
18 FEB	157664	BBS81-3	1957 - 2021
	157665	"	2021 - 2086
	157666	"	2087 - 2151
	157667	"	2152 - 2218
	157668	"	2219 - 2283
	157669	"	2284 - 2348
	157670	"	2353 - 2417
	157671	"	2418 - 2481
	157672	"	2482 - 2546
	157673	"	2547 - 2592
19 FEB	157674	BBS81-05	001 - 059
	157675	"	060 - 124
	157676	"	125 - 189
	157677	"	190 - 254
	157678	"	255 - 319
	157679	"	320 - 323
	157680	BBS81-04	001 - 061
	157681	"	062 - 126
	157682	"	127 - 191
	157683	"	192 - 257
	157684	"	258 - 322
	157685	"	323 - 387
	157686	"	388 - 452
	157687	"	453 - 517
	157688	"	518 - 582
	157689	"	583 - 646
	157690	"	647 - 711
	157691	"	712 - 776
	157692	"	777 - 811
	157693	BBS81-05A	221 - 281



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
19 FEB 81	157694	BBS81-05A	282 - 346
	157695	"	347 - 410
	157696	"	411 - 475
	157697	"	476 - 539
	157698	"	540 - 604
	157699	"	605 - 669
	157700	"	670 - 734
	157701	"	735 - 799
	157702	"	800 - 865
	157703	"	866 - 930
	157704	"	931 - 995
	157705	"	996 - 1059
	157706	"	1960 - 1124
	157707	"	1125 - 1189
	157708	"	1190 - 1253
	157709	"	1254 - 1318
	157710	"	1319 - 1384
	157711	"	1385 - 1451
	157712	"	1452 - 1517
	157713	"	1518 - 1582
	157714	"	1583 - 1647
	157715	"	1648 - 1711
	157716	"	1712 - 1777
	157717	"	1778 - 1842
	157718	"	1843 - 1907
	157719	"	1908 - 1972
	157720	"	1973 - 2037
	157721	"	2038 - 2102
	157722	"	2103 - 2167
	157723	"	2168 - 2231



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
19 FEB 81	157724	BBS81-5A	2232 - 2296
	157725	"	2297 - 2360
	157726	"	2361 - 2425
	157727	"	2426 - 2490
	157728	"	2491 - 2555
	157729	"	2556 - 2620
	157730	"	2621 - 2685
	157731	"	2686 - 2750
	157732	"	2751 - 2815
	157733	"	2816 - 2880
	157734	"	2881 - 2945
	157735	"	2946 - 3010
	157736	"	2011 - 3077
	157737	"	3078 - 3142
	157738	"	3143 - 3207
	157739	"	3208 - 3272
	157740	"	3273 - 3337
	157741	"	3338 - 3402
	157742	"	3403 - 3472
	157743	"	3473 - 3477



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
20 FEB	157777	BBS81-9	1153 - 1217
	157778	"	1218 - 1283
	157779	"	1284 - 1348
	157780	"	1349 - 1413
	157781	"	1414 - 1480
	157782	"	1481 - 1545
	157783	"	1546 - 1610
	157784	"	1611 - 1675
	157785	"	1676 - 1740
	157786	"	1741 - 1805
	157787	"	1806 - 1870
	157788	"	1871 - 1935
	157789	"	1936 - 2000
	157790	"	2001 - 2065
	157791	"	2066 - 2131
	157792	"	2134 - 2198
	157793	"	2199 - 2264
	157794	"	2265 - 2328
	157795	"	2329 - 2393
21 FEB	157796	"	2394 - 2459
	157797	"	2458 - 2522
	157798	"	2523 - 2588
	157799	"	2589 - 2653
	157800	"	2654 - 2718



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<u>DATE</u>	<u>TAPE NO.</u>	<u>LINE NO.</u>	<u>SHOTPOINTS</u>
21 FEB	157801	BBS81-9	2719 - 2783
	157802	"	2784 - 2811
	157803	BBS81-11	001 - 064
	157804	"	065 - 129
	157805	"	130 - 194
	157806	"	195 - 259
	157807	"	260 - 325
	157808	"	326 - 390
	157809	"	391 - 454
	157810	"	455 - 519
	157811	"	523 - 583

169056

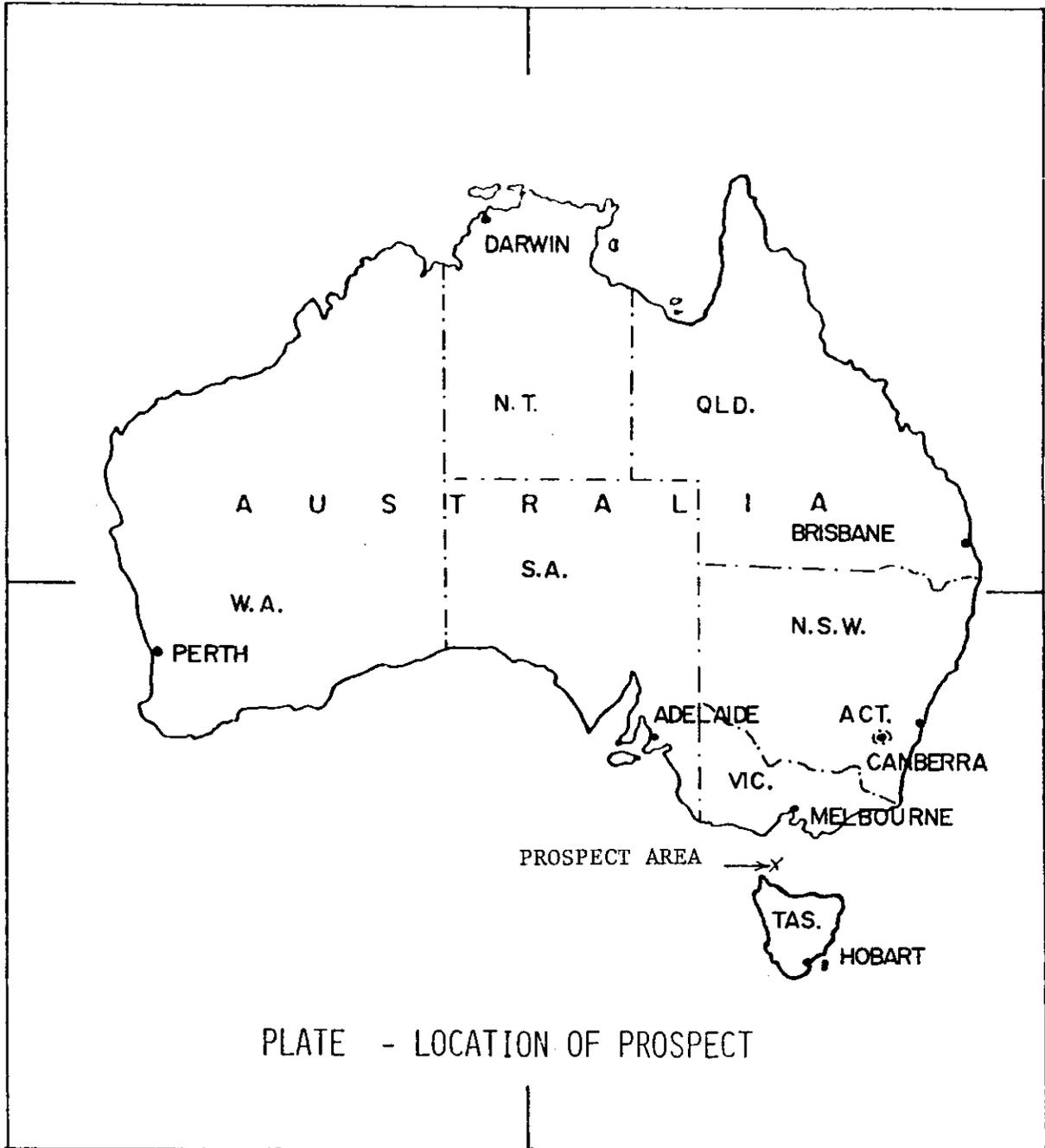


PLATE - LOCATION OF PROSPECT

5 cm



**LEGEND**

- F<sub>1</sub>-F<sub>4</sub>** File number - 4 BCD digits
- Y<sub>1</sub>-Y<sub>4</sub>** Format Code - 4 BCD digits 0200 for SEG-B (with no header extension)
- K<sub>1</sub>-K<sub>12</sub>** General constants entered from panel switches - 12 BCD digits
- B<sub>1</sub>-B<sub>3</sub>** Bytes per multiplexer scan in data block - 3 BCD digits. Bytes per scan = 2.5 x no. of channels + 14
- M<sub>3</sub>-M<sub>6</sub>** Instrument serial number - 6 BCD digits.
- R<sub>1</sub>,R<sub>2</sub>** Record length in multiples of 1.024 seconds. 00 if manual stop is selected.
- J** Amplifier gain control mode -1001 is recorded to designate floating point gain control system.
- LC<sub>1</sub>,LC<sub>2</sub>** Low-cut filter frequency (Hz) - 2 BCD digits. 00 (out), 03, 05, 08, 12, 18, or 27.  
NOTE: 03 is actually 3.56Hz.  
05 is actually 5.33Hz.
- LS** Low-cut filter slope in multiples of 6 dB/octave - 1 BCD digit. Normally 3, (18dB octave) for DFS-V.
- S<sub>1</sub>,S<sub>2</sub>** Notch (rejection) filter frequency - 2 BCD digits. 00 (out) 50, or 60 (for 60 or 16 2/3).
- A** Alias filter frequency:  
1 - 256Hz      4 - 64Hz  
2 - 128Hz      8 - 32Hz
- D** Channel identification code:  

BIT			TYPE
0	1	2	CHANNEL
0	0	0	Unused channel
1	0	0	Waterbreak channel
0	1	0	Timebreak channel
0	0	1	Seis channel
0	1	1	Uphold channel
1	0	1	Time counter
1	1	1	Other
- Z** Record type:  
8 - normal shot 4 } Not used  
2 - test record 1 }
- W<sub>N</sub>** Ones recorded for normal field timebreak recording. Zeros record if system operated from internal timebreak.

- T<sub>1</sub>-T<sub>4</sub>** 14 bit binary timing word  
  - T<sub>1,4</sub> - 1 millisecond
  - T<sub>1</sub> - 8,192 seconds
- Q<sub>N</sub>** Digitized output of A/D converter  
  - Q<sub>s</sub> - sign (note 4)
  - Q<sub>1</sub> - 4096 millivolts
  - Q<sub>14</sub> - 0.50 millivolt
- G<sub>N</sub>** Binary gain code for channel N. Least significant bit (6dB) is always 0 for quaternary coded I/F gain.
- P** Vertical (byte) parity. Bit P is one if bits 0 - 7 of the same byte contains an even number of ones.
- CH** Number of channels. Bit 6 of the four sync group bytes, indicates number of seismic data channels.  

BYTE	1	2	3	4
24 CH	0	0	0	0
36 CH	0	1	0	0
48 CH	0	0	0	1
Other	1	1	1	1

See B, bytes per scan.  
No. of data channels =  

$$\frac{\text{Bytes per scan}-14}{2.5}$$

Format conforms to the SEG standard specific values shown, such as filter settings, etc, are those of the DFS-V.

- I** Sample interval recorded according to the following table:  

BIT				SAMPLE
4	5	6	7	INTERVAL
0	0	0	1	1 millisecond
0	0	1	0	2 milliseconds
0	1	0	0	4 milliseconds
1	0	0	0	8 milliseconds
1	0	0	1	0.5 milliseconds
1	0	1	0	1 millisecond
1	1	0	0	2 milliseconds

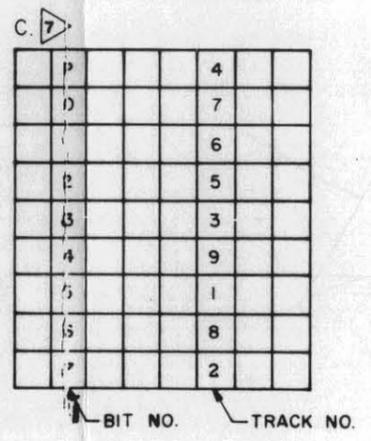
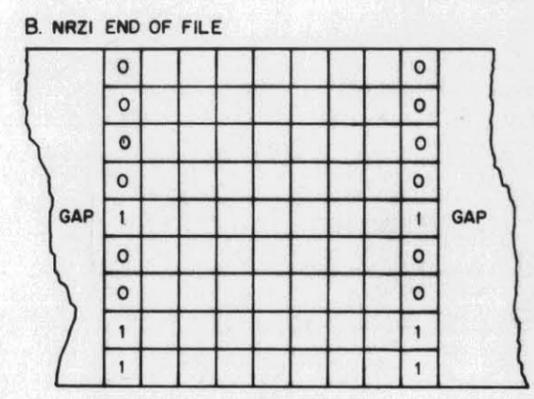
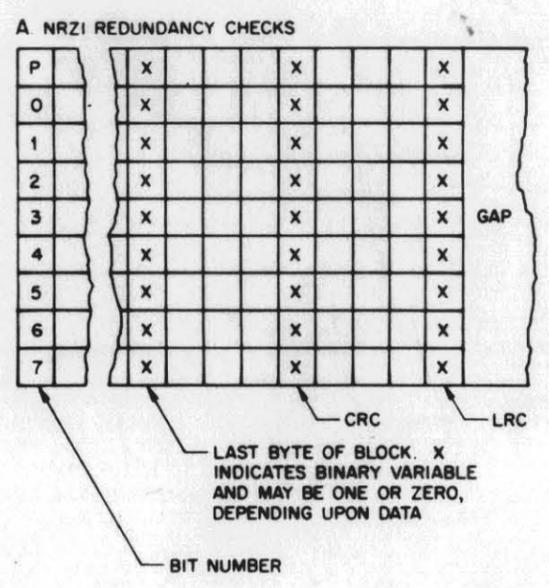
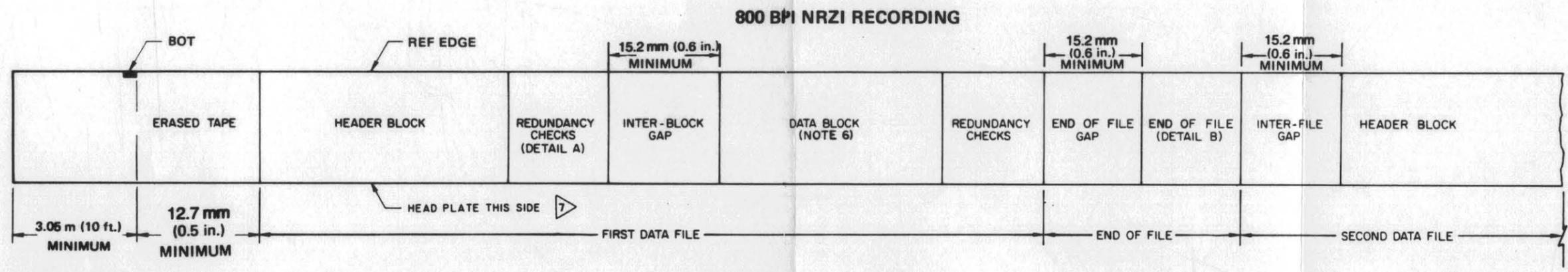
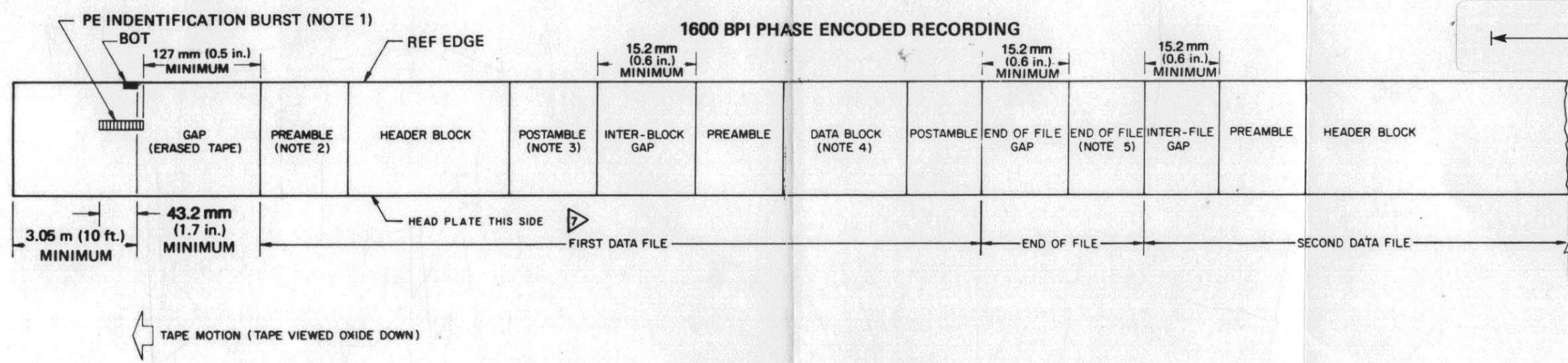
All zeros for other sample intervals
- GC** Gain constant (fixed gain) recorded as a 4 - bit binary code. The most significant bit has a gain value of 2<sup>3</sup> (48dB); the least significant bit has a gain value of 2<sup>1</sup> (6dB). The least significant bit is recorded as a zero for the DFS-V.
- GW** Gain word recorded as a 4-bit binary code. 0000 is recorded when operating in floating point gain control. When operating in manual gain control, the most significant bit has a gain value of 2 (48dB) and the least significant bit has a gain value of 2<sup>1</sup> (6dB). The least significant bit is recorded as a zero for the DFS-V.

**NOTES**

- 1 - Auxiliary channel identification code assignments are as follows unless otherwise specified:  

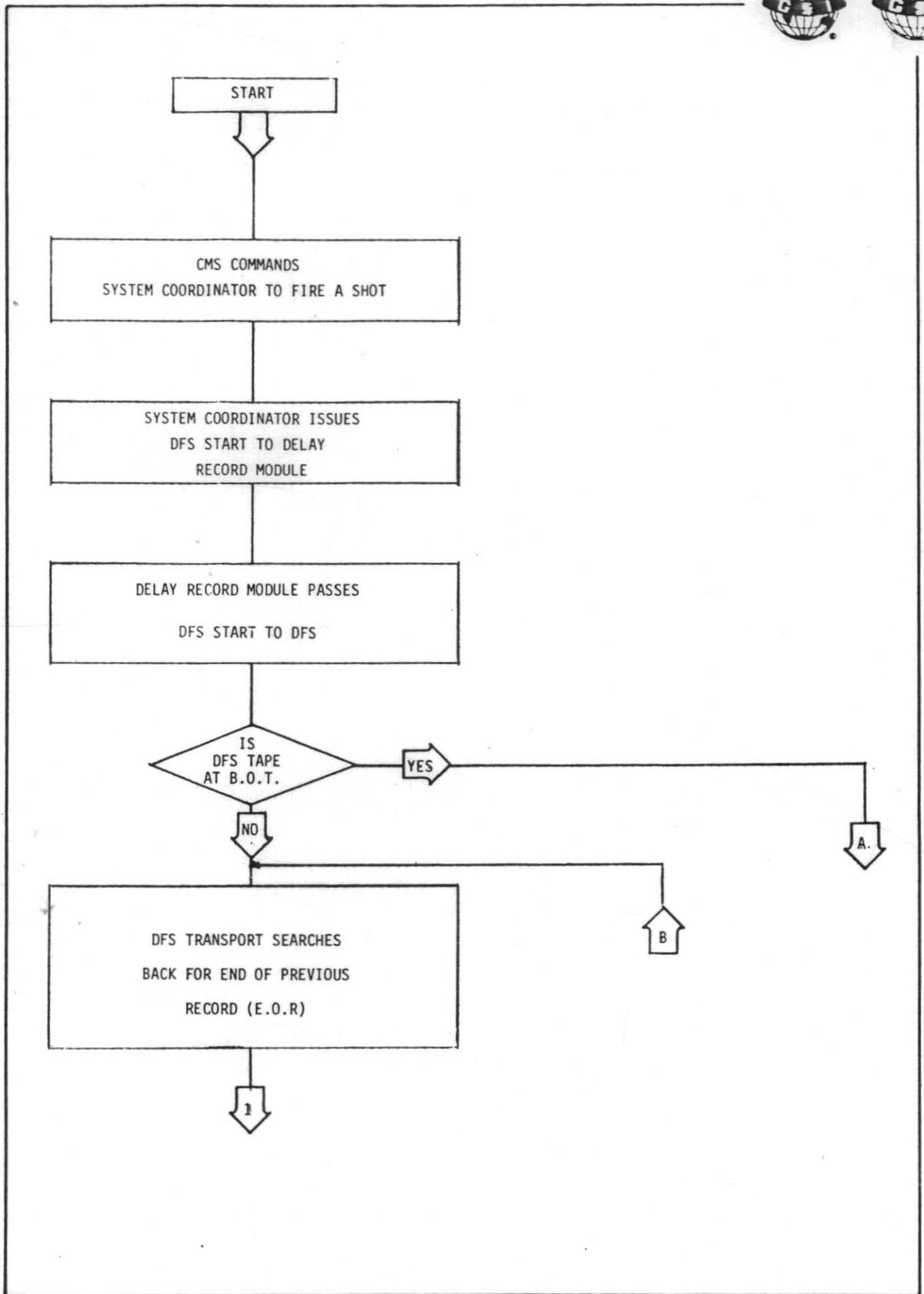
AUX 1 will always be the timing counter.	28 or 60 Seis channels	Number of seis Channels other than 28 or 60
AUX 2 unused	AUX 2 uphole	
AUX 3 unused	AUX 3 timebreak	
AUX 4 uphole	AUX 4 unused	
AUX 5 timebreak	AUX 5 unused	

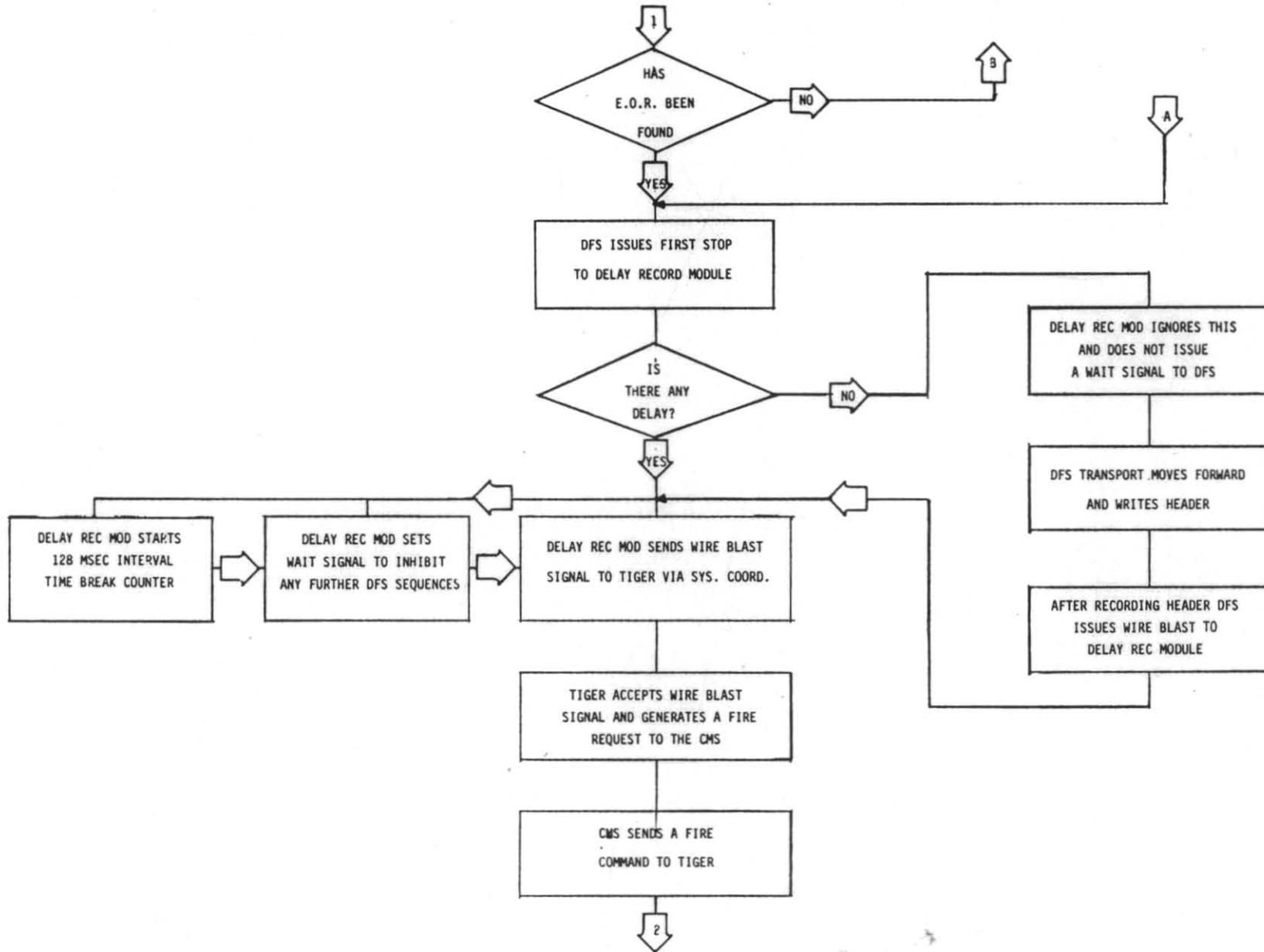
  - These AUX channels are not available for data and will always be recorded as zero in the data record.
- 2 - Additional externally supplied digital data may be recorded in the header block following byte 36+2n.
- 3 - Negative values are recorded in 1's complement code (standard) or 2's complement (optional).

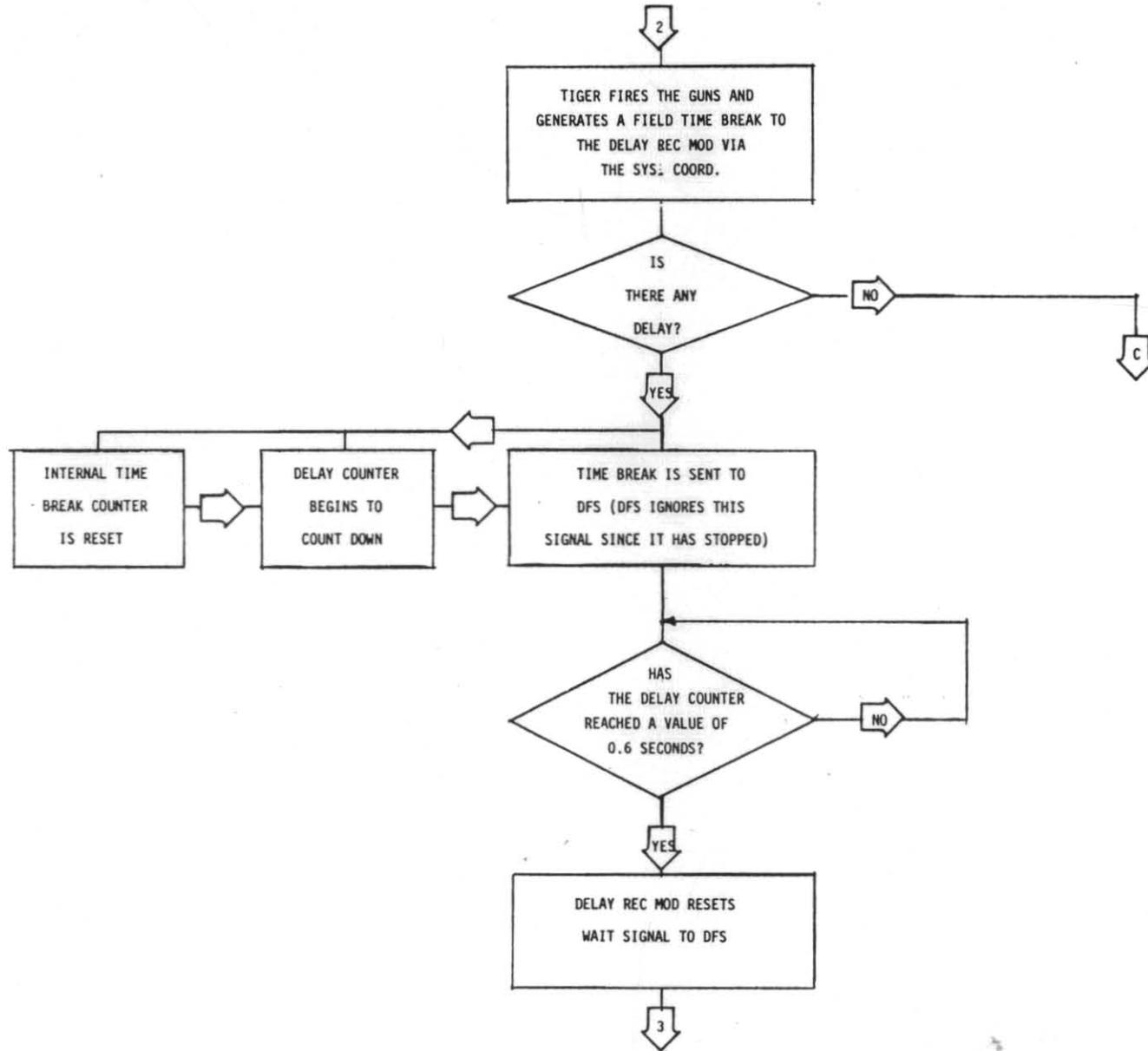


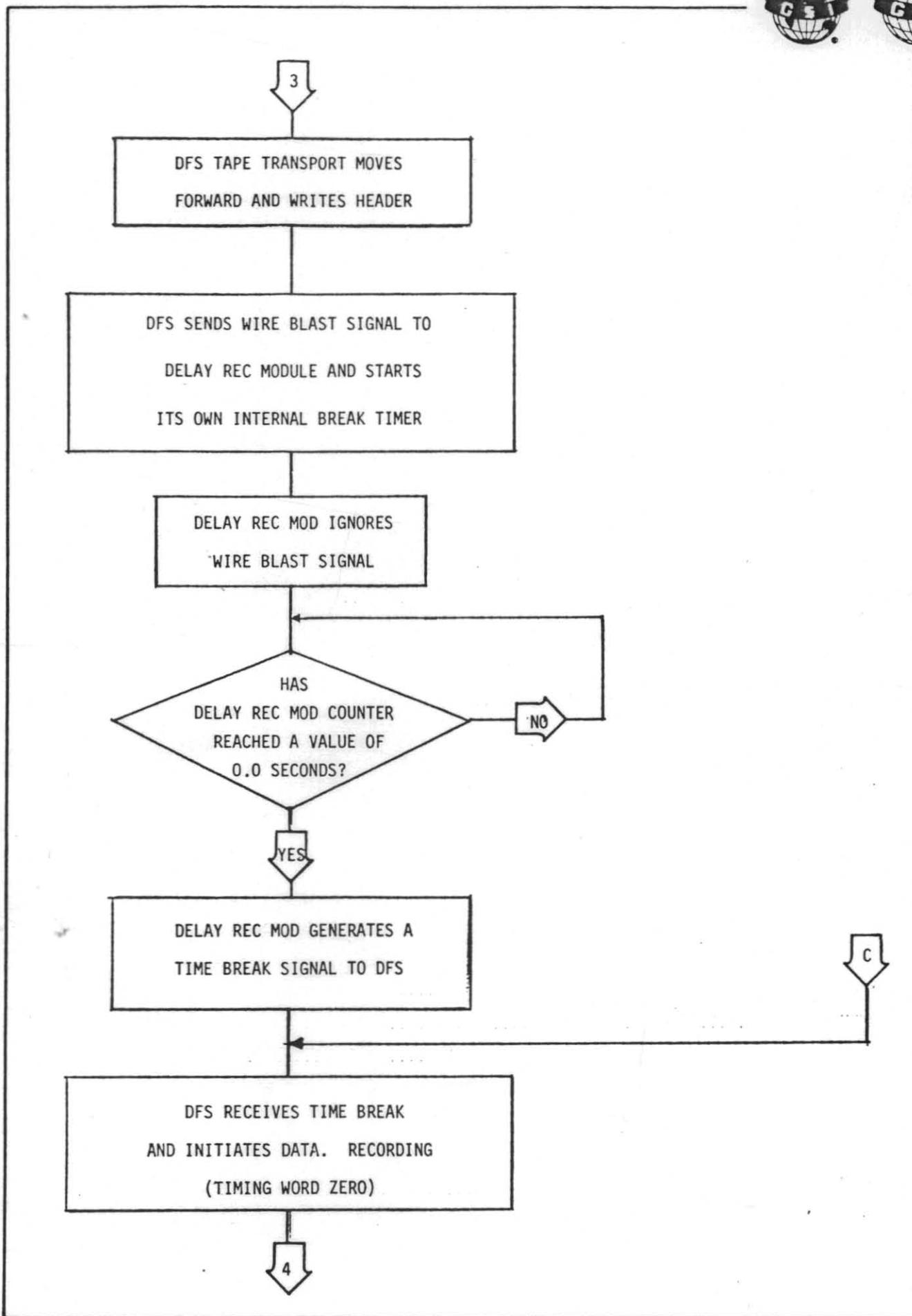
- #### NOTES
- 1 - PE identification burst consists of 1600 flux reversals per inch in track P, all other tracks dc erased.
  - 2 - Preamble consists of forty characters with 0-bits in all tracks followed by one character with 1-bits in all tracks. (Includes the parity track).
  - 3 - Postamble consists of one character with 1-bits in all tracks followed by forty characters with 0-bits in all tracks. (Includes the parity track).
  - 4 - Synchronous recording, inter-block gap is extended until timebreak is received. Data is stored in a buffer memory while the preamble is being written. First start of scan is written immediately after the preamble.
  - 5 - PE end of file consists of 80 flux reversals at 3200 FCI in bits P, 0, 2, 5, 6, and 7. Bits 1, 3, and 4 are dc-erased.
  - 6 - Synchronous data recording: inter-block gap is erased until timebreak. First start of scan is then written.
- Order and location of tracks on tape, direction of magnetization and all other applicable specifications in accordance with IBM file S360-19, form A22-6862-4. The track number for each bit is shown in detail C. Track numbers are the same for 800 BPI NRZI and 1600 BPI PE. Tracks are numbered consecutively with track 1 the maximum distance from the head plate and track 9 adjacent to the head plate. See C below.

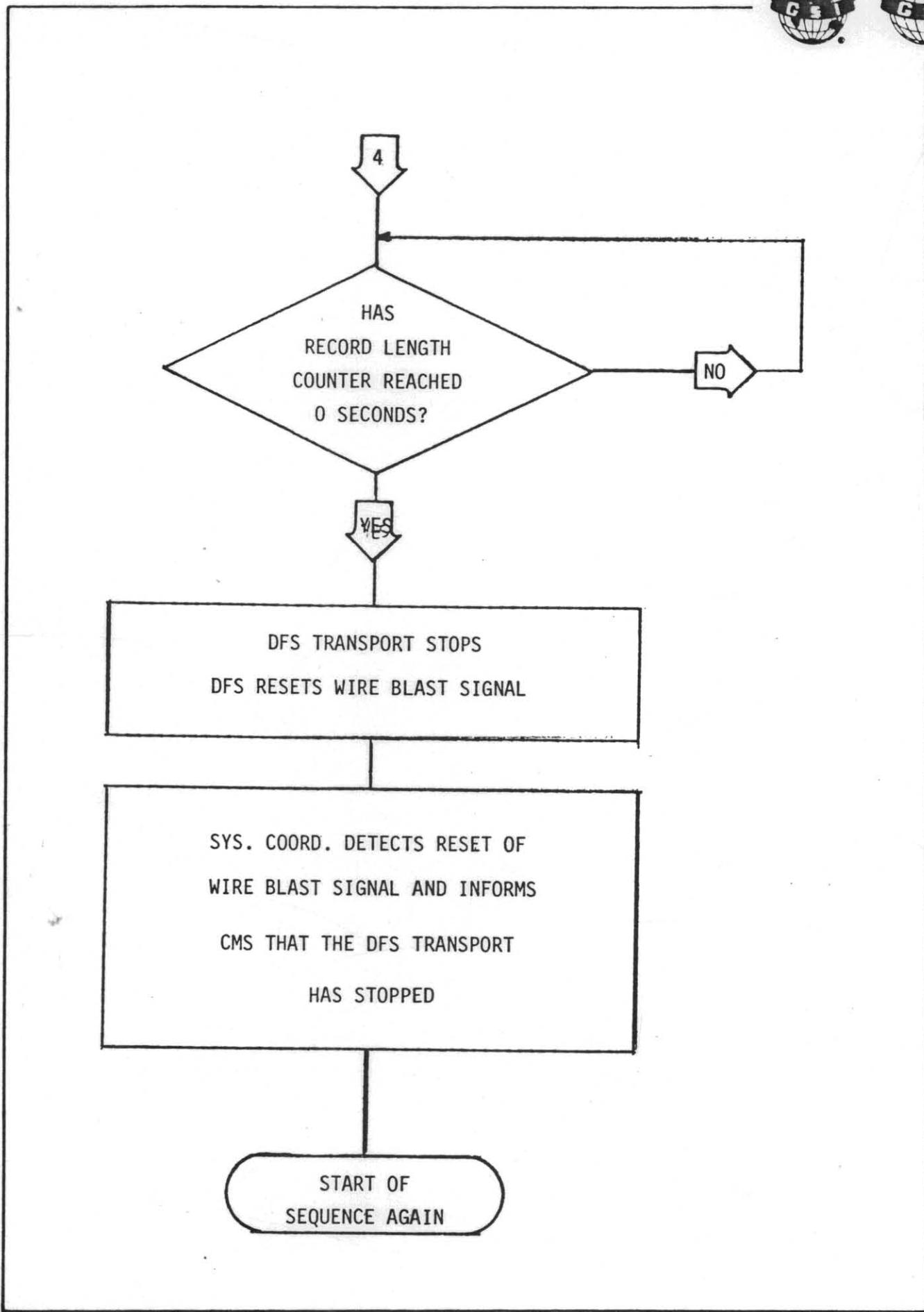
169060

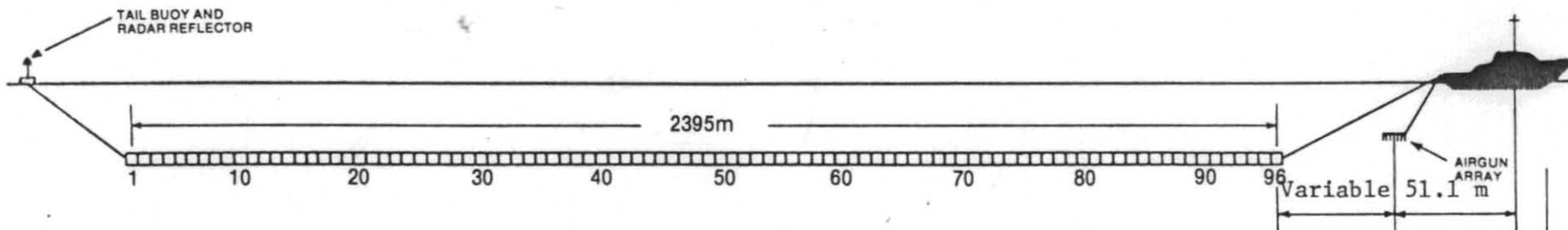












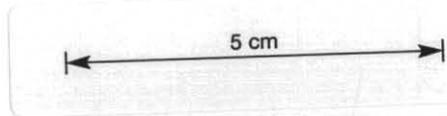
WATER BREAKS FROM IN FRONT SEIS GROUPS	96	80				
RECORDED IN DIGITAL CHANNELS	Aux 1	Aux 2				
DISPLAYED ON SEISMOGRAPH TRACES	61	62	/	/	/	/

DEPTH TRANSDUCER NUMBERS	1	2	3	4	5	6
AT/NEAR SEIS GROUP NUMBERS	2	20	40	60	80	96
	3	21	41	61	81	FF

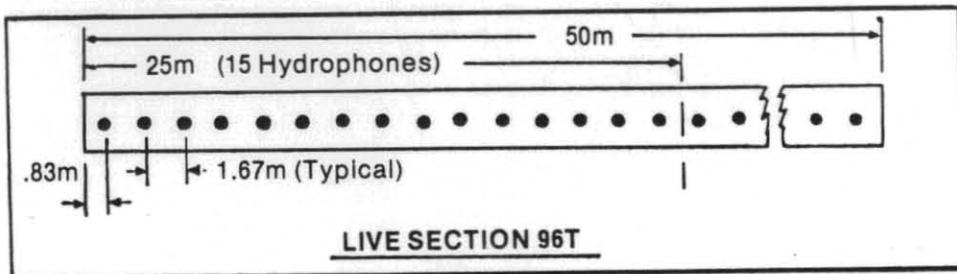
DEPTH CONTROLLER AT SEIS GROUP NUMBERS	-	-	-	-	-	-
--	---	---	---	---	---	---

(On Depth Controllers)

NYLON STRETCH	7 (FRONT) + 5 (TAIL)
PIG SECTIONS	None



6 TRANSDUCER SECTIONS 4M LONG



**MARINE CABLE DIAGRAM**  
 2400 METRES  
 (OFFEND SPREAD — 96 GROUPS)  
 G.S.I. PARTY: 2931  
 SHIP: M.V. EUGENE McDERMOTT 11  
 CLIENT: Bass Strait Oil & Gas  
 AREA: Bass Strait  
 DATE: 10th February - 21st February  
 1981.





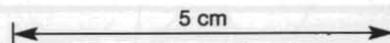
STERN OF VESSEL

2000 Cu In TUNED AIR GUN ARRAY

PORT STRING			STARBOARD STRING		
GUN No.	SIZE (Cu in)	SEPARATION (In)	GUN No.	SIZE (Cu in)	SEPARATION (in)
1.	120	● 18	19.	120	● 18
2.	120	● 18	20.	120	● 18
3. (spare)	120	○ 18	21.	120	● 18
		65	22. (spare)	120	○ 18
					65
4.	100	● 18	23.	100	● 18
5.	100	● 18	24. (spare)	100	○ 18
6. (spare)	100	○ 18			62
		62			
7.	80	● 18	25.	100	●
8.	80	● 18			62
9. (spare)	80	○ 18	26.	80	●
		65			58
10.	120	●	27.	40	●
		65			51
11.	100	●	28.	40	●
		62			51
12.	80	●	29.	40	●
		58			51
13.	40	●	30.	40	●
		51			51
14.	40	●	31.	20	●
		51			41
15.	40	●	32.	20	●
		51			41
16.	40	●	33.	20	●
		51			41
17.	20	●	34.	20	●
		41			41
18.	20	●	35.	10	●
					33.
			36.	10	●

TOTAL LENGTH 60ft 10 in

TOTAL LENGTH 60ft





## PLATE 6

OFFSET DETERMINATION (EXAMPLE ONLY)

## PHYSICAL MEASUREMENT

1. Length of stretch sections with : 200 metres + 18 metres  
9% stretch factor (4 x 50m) = 218 metres
2. Distance two bracket to stern : +2.0 metres
3. Total length of Transducer : 2 metres  
sections in front of #96
4. Distance from boat to near : 238.5 metres  
group centre  
(1+2+3+12.5 metres)
5. Distance from boat to centre : 24.1 metres  
of source
6. Offset (5-4) : 214.4 metres

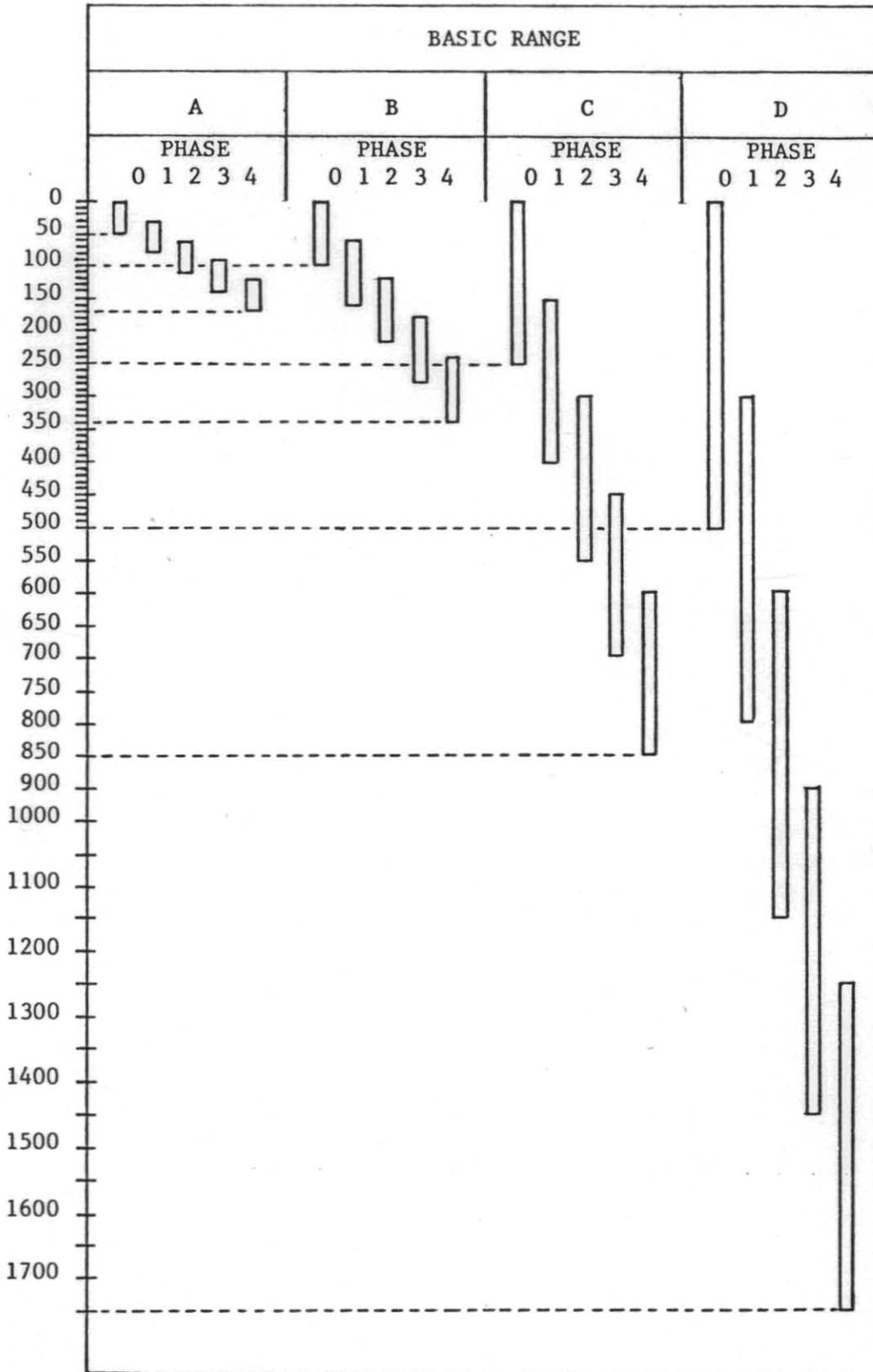
## TIME MEASUREMENT

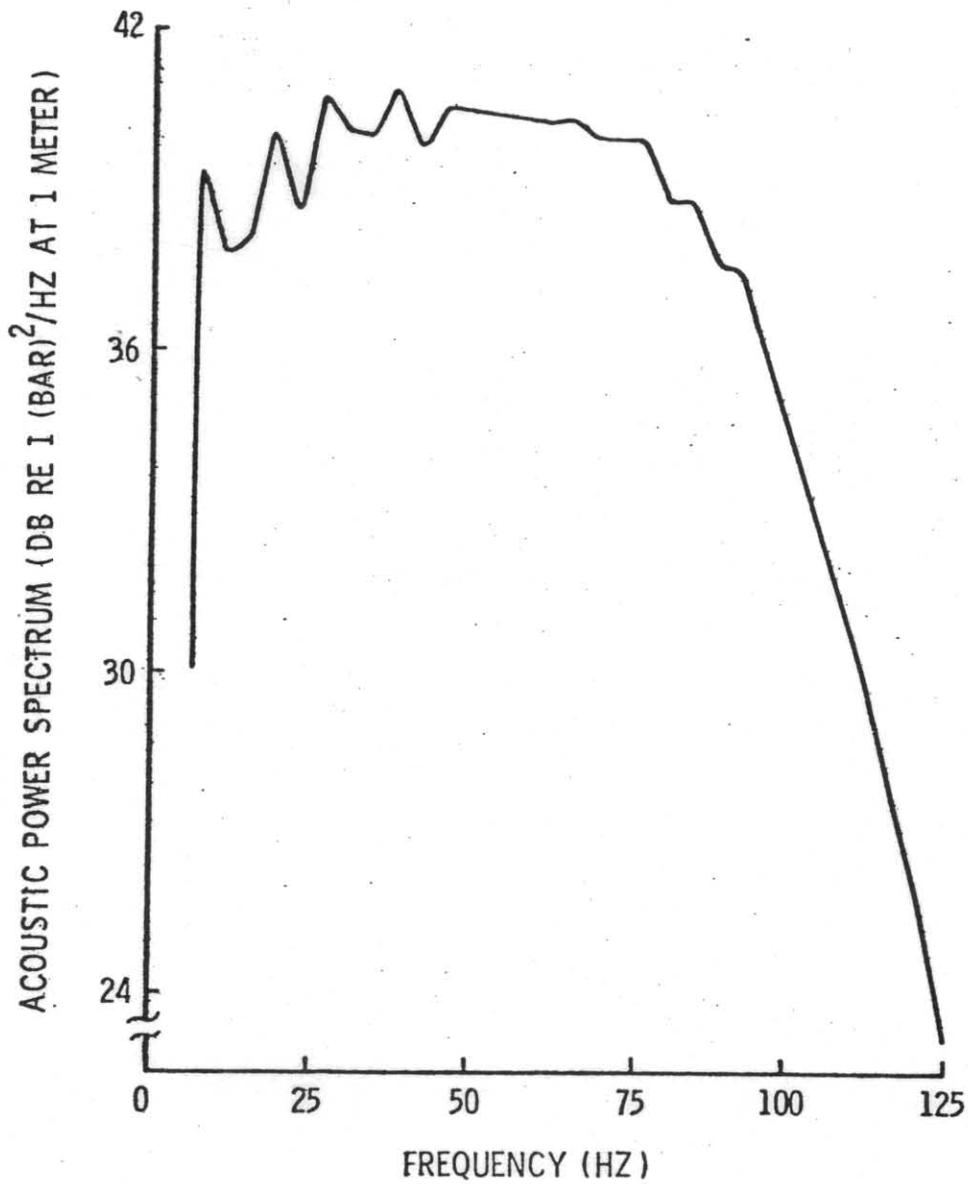
As computed by the CMS-11 computer ADL, STS Systems. Typically  
210 - 214 metres (computed on all lines).





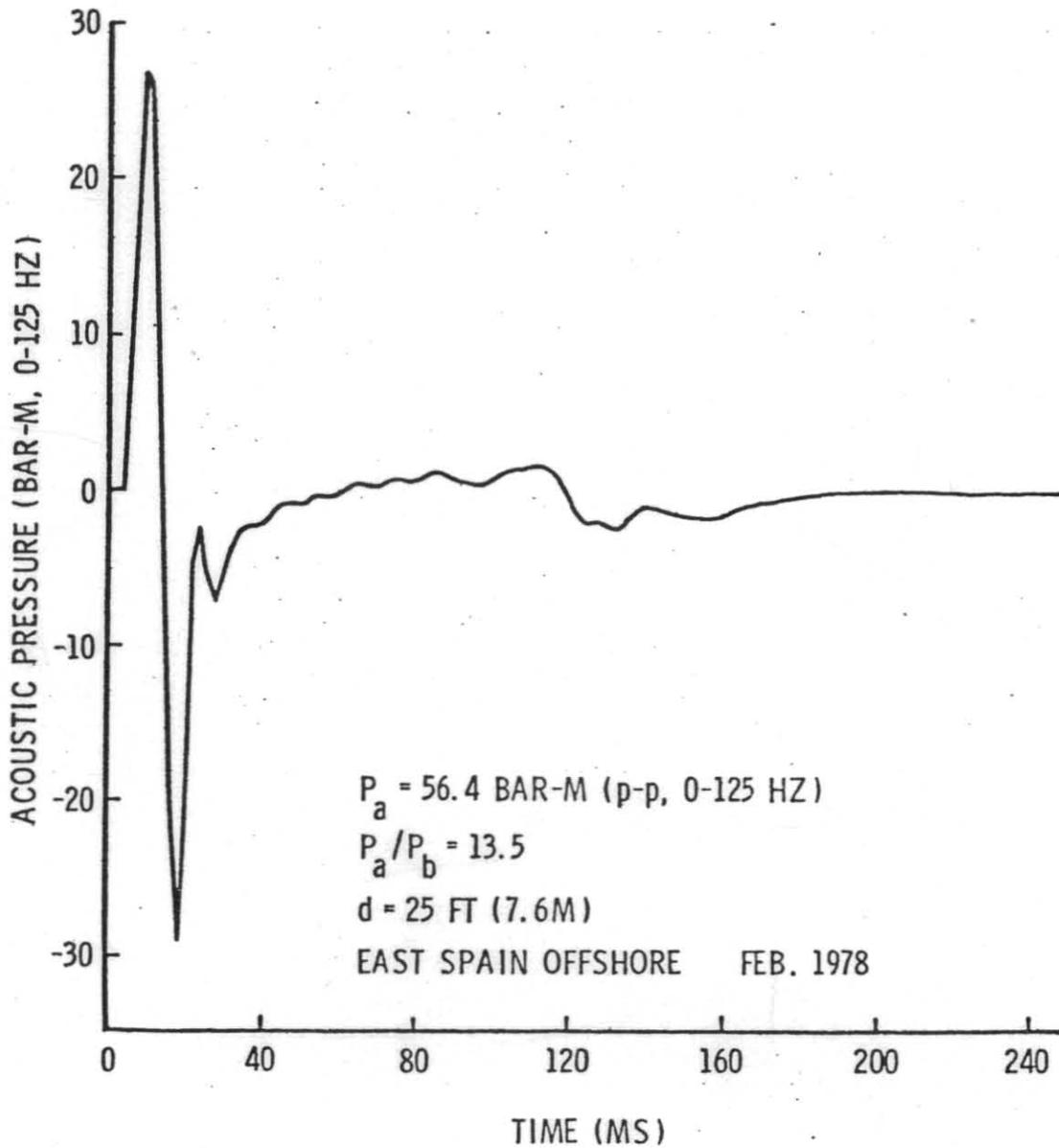
SIMRAD MODEL EA FATHOMETER SCALE





Power spectrum of 2000 cu. in. tuned air gun array

5 cm



Farfield signature of 2000 cu. in. tuned air gun array

