G200

PEP 109
GHG 85A ROSEDALE SEISMIC SURVEY

Hartogen Energy Limited

G200

PEP 109

FINAL REPORT

GHG 85A ROSEDALE SEISMIC SURVEY

COMPILED BY S.R. GREAVES

HARTOGEN ENERGY LIMITED

MAY 1986

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INTRODUCTION

The GHG 85A Rosedale Seismic Survey was recorded in the onshore portion of the Gippsland Basin in Petroleum Exploration Permit 109 from 2 January 1985 to 21 February 1985.

Two hundred and seventy-two kilometres (272 km) of 85 fold, 512 channel Vibroseis data was recorded in the central and southern areas of PEP 109.

Data were processed by Geophysical Services International in Sydney, and data quality is very good.

The GHG 85A Rosedale Seismic Survey was programmed to provide control over the Seaspray and North Seaspray fault trends, and the regionally dominant Baragwanath Anticline.

The GHG 85A Rosedale Seismic Survey was operated by Hartogen Energy Limited on behalf of a consortium comprising:-

Hartogen Energy Limited
Cluff Oil (Pacific) Limited
Plymouth Petroleum N.L.
Poseidon Oil Pty Ltd

REGIONAL GEOLOGY AND STRATIGRAPHY

PEP 109 is located on the north west margin of the onshore portion of the Gippsland Basin. The Gippsland Basin is a wedge-shaped east to west trending basin. It is bounded to the north by the Victorian Ranges and to the south by the Bassian Rise, narrowing westward towards the Mornington Penninsula while it opens to the east towards the Tasman Sea. The Gippsland Basin has a high degree of north-south symmetry but in an east-west direction is asymmetrical with sediments thinning towards Mesozoic outcrops along its western margins and thickening eastwards in an offshore direction.

1. Structure

Structuring may be divided into two distinct periods: pre-Middle Eocene which consisted of extensional tectonics with normal faulting predominant. These features tended to trend north west to south east with throw down to the north east. The second phase of structuring is post-Middle Eocene with the main phase of structural activity being Middle Miocene to Recent and is caused by a compressional force acting from the south east. This has resulted in a series of north east to south west trending asymmetrical anticlines.

2. Stratigraphy

Basement consists of low grade metamorphics of Early to Middle Palaeozoic age intruded by Ordovician and Early Devonian granites. However, economic basement in petroleum exploration has normally been considered to be the Early Cretaceous Strzelecki Group. Strzelecki sediments were deposited on a rapidly but steadily subsiding fluvial plain. They consist predominantly of graywackes, subgraywackes, arkoses, chloritic mudstones, occasional coal, with local conglomerates, lavas and pyroclastic rocks. The sandstones are texturally mature but mineralogically immature and mostly impermeable. They are chloritic, feldspathic, volcanolithic, and of uniform fine to medium grain size with chloritic, kaolinitic, calcareous and sometimes pyritic cement. The shales have characteristic grey-green colour and are micaceous and slightly carbonaceous with silt laminae.

The Strzelecki Group is overlain by the Latrobe Group of Late Cretaceous to Late Eocene age. The Latrobe Group consists predominantly of fine to very coarse grained, poorly cemented quartzose sandstone with subordinate coal and grey or brown claystone and siltstone. The environment of deposition is interpreted to be fluviatile, deltaic, lacustrine ranging to marginal marine. It thickens significantly to the east in the offshore area where it is estimated to reach up to 16,000 ft (5000 m) thick. The Latrobe Group contains prolific oil and gas accumulations in the offshore Gippsland Basin. The reservoir characteristics of the sandstones in the Latrobe are excellent with very high porosity and permeability sandstones. The hydrocarbon source for these accumulations is believed to be the lower part of the Latrobe, that is, Late Cretaceous and Early Paleocene. A regional seal to the Latrobe reservoir section is provided by the overlying Lakes Entrance Formation which consists of green, brown and grey calcareous claystone (marl) with thin limestone intercalations. The Gippsland Limestone consists of interbedded limestone and calcareous claystone or marl.

PREVIOUS EXPLORATION

Petroleum exploration in the area of PEP 109 commenced in the early 1960's and continued into the early 1970's, conducted mainly by Woodside and Arco. This exploration originally had as its main objective the Strzelecki Group with the emphasis moving to the Latrobe Group later in this period.

Early exploration provided only a sparse grid of poor-fair quality, mainly single fold seismic, and several wells. Upon reviewing all previous seismic, it is probable that none of the wells were located within closure at top Latrobe level and as such there is not a valid test of the Latrobe Group in the area.

Previous exploration has provided enough data to show that productive reverse fault trends offshore continue onshore with top Latrobe seals and excellent quality Latrobe Group reservoirs.

FIELD OPERATIONS

(A) Permitting, Line Clearing and Fencing

All permitting and property owner liaison was performed by K. Morrison of Hartogen Energy. In general few problems were encountered and good rapport was maintained between Hartogen's operations, property owners, local councils and the fire authorities.

Dozing was only required in areas of heavy growth and in some areas of the pine plantations. Use was made of the road network in PEP 109 to minimize access onto private property. The majority of clearing was accomplished by the use of a tractor-mounted slasher. Local contractors within the survey area were used for clearing, fencing and restoration work.

(B) Data Collection

The data collection contract was awarded to Geosystems Pty Ltd based in Perth.

Comparison recording between Litton LR5311 buggy-mounted vibrators and tractor-mounted Y600 vibrators was undertaken at the northern end of Line 85-07. The vibrators were used in the production array as well as singly over various frequency ranges.

The tractor-mounted vibrators demonstrated equivalent respone at the Top Latrobe Group and Top Lakes Entrance reflectors (0.65 seconds and 0.35 seconds respectively), and increased resolution of shallow reflectors (0.2 to 0.3 seconds).

Hydraulic and electronic problems precluded the use of the tractor-mounted vibrators on a production basis.

A comprehensive report on the experimental and production recording is included as Appendix 1.

(C) Static Control

The long wavelength static profile was obtained by the drilling of upholes. The drilling was contracted to Fletcher Drilling Services Pty Ltd. Upholes were drilled at the beginning and end of all lines, at each intersection and at approximately 3 km intervals.

Poorly consolidated Quarternary sands and strata of brown coal caused occasional lost circulation and sticking problems. In all, 106 upholes were recorded in the prospect.

Uphole interpretation and static computations were performed by K.M. Frankcombe, consultant, and Geophysical Services Inc.

DATA PROCESSING

Data processing of the GHG 85A Rosedale Seismic Survey was performed by Geophysical Services International at their Sydney centre between March and June 1985.

A full programme of tests were produced and optimum parameters were selected prior to production processing of the data. A processing report by the contractor is included as Appendix 2, describing in detail the processes used.

INTERPRETATION

Mapping has been conducted at 1:25,000 scale on the near Top Lakes Entrance Formation and Near Top Latrobe Group reflectors. Ties were made to the Colliers Hill No. 1 well, which is the only well in the survey area to have a velocity survey. Other wells possessed a sonic log only and were integrated into the seismic where possible.

The Top Latrobe Group and Top Lakes Entrance Formation are the dominant reflectors on the data and can be readily followed over the area surveyed. The seismic reflector corresponding to the top Latrobe Group corresponds with a thick coal bed immediately beneath the Lakes Entrance Formation shales.

Carrs Creek No. 1 in the south east of PEP 109 encountered a medium grained, glauconitic sand between the top coal and Lakes Entrance shales. The edge of this sand can be seen on several of the GHG 85A lines and may form the basis of a stratigraphic trap across the Baragwanath Anticline. The sand is absent at North Seaspray No. 1.

The Strzelecki Group cannot be readily identified or mapped on the seismic. Most lines show a series of discontinuous, steeply dipping events beneath the known thickness of Latrobe Group sediments at the wells.

The major structural feature is the Baragwanath Anticline which exhibits a series of reverse faults on the northern limit. Plunging rapidly to the east, closure is not developed on the feature. Colliers Hill No. 1 was drilled on the axis and encountered the Latrobe Group sediments at 1800 ft. Both the Lakes Entrance and Top Latrobe Group subcrop beneath Quarternary sediments on the anticline in the north west corner of the survey area.

Regional dip to the south is seen between the Baragwanath Anticline and the North Seaspray feature. No evidence of structure is evident in the north eastern portion of the survey area.

The Seaspray and North Seaspray faults are two parallel reverse faults located in the southern portion of PEP 109. All major faulting revealed by the survey trends in an east-west direction. Movement on these faults appears to have occurred during the Eocene. The Seaspray and North Seaspray faults change direction to a north east-south west trend in the vicinity of Line 85A-16. Closure is developed on the upthrown side of both faults at the change of azimuth.

North Seaspray No. 1 tested the northern closure without encountering significant shows of hydrocarbons. The southern closure on the Seaspray fault exhibits smaller area and is not faulted at the Top Lakes Entrance Formation. This closure is now known as Burong.

Burong is presented as a four-way time closure at Top Latrobe Group level with approximately 450 acres (1.8 sq km) of fault-independent closure and 35 milliseconds of vertical time closure.

Of the wells in PEP 109 which possess a sonic log, a velocity inversion is apparent within the Lakes Entrance Formation (8300 ft/sec to 6600 ft/sec). Thickening of the Lakes Entrance Formation on the downthrown side of the North Seaspray and Seaspray faults leads to the possibility of distortion of the Top Latrobe Group time maps.

CONCLUSIONS AND RECOMMENDATIONS

The data produced from the GHG 85A Rosedale Seismic Survey was the first comprehensive grid of multifold data acquired in PEP 109. Resolution and continuity is superior to previous vintages of seismic data and has enabled detailed mapping of the main structural features in PEP 109.

Burong has been identified as a prospect and is considered to be mature for drilling.

Further seismic and/or gravity surveys should examine the northern part of PEP 109 and the possibility of a Top Latrobe Group stratigraphic play in the east. The swamp and lake conditions in the northern part of the Permit dictate the use of specialized equipment for any future work.

S.R. Greaves
May 1986

APPENDIX 1

ROSEDALE SEISMIC SURVEY 1985

GIPPSLAND BASIN

FINAL REPORT - OPERATIONS

BY

F.R. O'SULLIVAN, B. MATTHES AND P. COOK

OF

PARTY 204

GEO SYSTEMS PTY. LTD.

A wholly owned subsidiary of Geophysical
Systems Corporation of Pasadena, California

for

HARTOGEN ENERGY LTD.
15 YOUNG STREET
SYDNEY NSW 2000

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1. INTRODUCTION

The Rosedale Seismic Survey was carried out by Party 204 of Geo Systems of Carlisle, Western Australia for Hartogen Energy Ltd., Sydney, N.S.W. 272.55 kilometres approximately of 85 fold, 512-channel reflection profiling was recorded between 3rd January, 1985 and 21st February, 1985.

This report covers various field operations relating to line clearing, experimental survey, chaining and survey crews, recording and processing.

1.1 GEOGRAPHIC AREA

The Rosedale Prospect was located in the Gippsland Basin, Victoria, in Permit PEP.94 which is operated by Hartogen Energy Ltd. of Sydney, N.S.W. The approximate area is marked on the 1:100,000 Map Sheet (See Plate "A").

1.2 WEATHER

The weather conditions were generally fine and warm. The temperature ranged between 15° and 32°. There were a few overcast days and rain fell occasionally.

1.3 TERRAIN

The Survey Area was situated approximately 20 kms South-East of Sale. Large areas of the prospect were flat open grazing country (sheep, cattle and wheat production). Some parts were covered with pine tree plantations. The area around Boundary Creek in the North-West was hilly in parts, and areas along the coast line were swampy. The soils in the area were predominantly sandy.

1.4 LOGISTICS

The crew was accommodated at the Ambassador Motor Hotel in Sale. Supplies were obtained in Sale and Perth.

1.4 LOGISTICS (Cont'd)

Access to the area was along seismic lines and good existing roads.

Daily communications were by telephone to Geo Systems' Perth office.

1.5 RECORDING

Experimental parameter testing was conducted on the 2nd January, 1985 on Line 85-07. Production recording commenced on the 3rd January, 1985. A total of 272.55 kms of multifold seismic data was recorded. The programme consisted of 21 lines, which were oriented as follows:

1 Bearing North to South
7 Bearing North-West to South-East
2 Bearing North-East to South-West
11 Bearing approx. North-South

There were 368.75 recording hours, 33.00 hours daily testing, 49.00 hours travel time and 41.75 hours equipment downtime and/or lost recording time, for a total of 492.50 hours. The average rate of production was 0.553 kms per hour or 5.53 kms for a 10 hour production day. This rate includes travel, daily testing, daily downtime and line change.

2. SURVEYING

2.1 SUMMARY

The Rosedale Seismic Survey was undertaken on the 28th December, 1984 for Hartogen Energy. The total length of the prospect was 273.49 kms surveyed on seismic lines and approx. 60 kms was surveyed for traverse to and from Trig Stations and old PM's. The survey area was situated approx. 20 kms at centre point South-East of Sale, Victoria.

Datum take off was Colliers Hill Trig Station. Ties were made to other trignometrical stations within the prospect.

Surveying was by Reciprocal Angle Levelling to ensure accurate vertical control. Sun shots were used for horizontal control. All closures within our work (Vert. = $0.05 \sqrt{kms}$, Horizontal = $0.25 \sqrt{kms}$) are in tolerance. (See Loop Closure Map). Permanent Markers were placed at start, finish, at bends, intersections and approx. 5 km intervals along lines. These consist of an Iron Picket driven to ground level with a witness post, both set in concrete, with aluminium tags attached. All stations occupied (turning points) were marked by a 30 centimetre peg placed at ground level. Stations were marked and chained at 30 metre intervals by a 50 centimetre peg and intermediate stns of 10 metres by flagging.

Survey Equipment Used:

1 Wild T16 Instrument
1 Wild T1A Instrument
2 Sokkisha Red 1A EDM's
2 HP 41CX Calculators
1 Printer
Various tripods and prisms
2 Toyota Pick Up Trucks

2.2 LINE CLEARING

Line cutting was by a local contractor from Sale, hired by Hartogen Energy Ltd. Equipment used:

1 D6 Cat
1 D3 Cat

55.0 kms of seismic lines were bulldozed, mainly through pine forest plantations (See Appendix "B" for details).

3. PERMITTING AND PUBLIC RELATIONS

All permitting had been completed by a representative of Hartogen Energy Ltd. prior to commencement of the seismic survey.

4. RECORDING

4.1 EXPERIMENTAL

Experimental testing of recording parameters was carried out on VP #515, line 85-07 on 2nd January, 1985 using the following line parameters:

- 512 channels live
- 10 m geophone group interval
- 6 geophones per group at 1.67 m intervals
- split spread 2560 - 0 - 2560 m

The following are the tests undertaken:

Test	Vibe Type	N° of Vibes	Frequency Range	N° of Comps	Sweep Length	Move-Up	% Drive
1	Buggy	3	8-90	6	8 sec	None	30
2	"	"	10-90	"	"	"	"
3	"	"	12-90	"	"	"	"
4	"	"	14-90	"	"	"	"
5	"	"	16-90	"	"	"	"
6	"	"	18-90	"	"	"	"
7	"	"	20-90	"	"	"	"
8	"	"	8-90	"	"	4 m	"
9	"	"	10-90	"	"	"	"
10	"	"	12-90	"	"	"	"
11	"	"	12-96	"	"	"	"
12	"	"	12-100	"	"	"	"
13	"	"	12-110	"	"	"	"
14	"	"	8-64, 8-76, 10-80, 10-90, 12-96, 12-96	"	"	"	"
15	Tractor	1 (N° 1)	12-96	1	"	None	"

4.1 EXPERIMENTAL (Cont'd)

Test	Vibe Type	N° of Vibes	Frequency Range	N° of Comps	Sweep Length	Move-Up	% Drive
16	Tractor	1 (N° 2)	12-96	1	8 sec	None	30
17	"	2 (N° 1&2)	"	6	"	4 m	"
18	Buggy	1 (N° 4)	"	1	"	None	"
19	"	1 (N° 2)	"	"	"	"	"
20	"	2 (N° 2&4)	"	6	"	4 m	"
21	"	1 (N° 1)	"	1	"	None	"
22	"	3	"	6	"	4 m	"
23	Tractor	1 (N° 4)	"	1	"	None	"
24	"	3	"	6	"	4 m	"

SUMMARY

Tests 1-7 were run to try and ascertain the optimum low end of the frequency range by keeping the top end constant (at 90 Hz). Test 3, 12-90 Hz, was considered the best in this series.

Tests 8-10 tested the use of move-ups as compared to the stationary sources used initially. These were superior in that the use of 4 m move-ups helped to reduce the amount of destructive noise generated. The three vibrators were 10 m apart from each other (pad to pad distance).

Keeping the low end constant at 12 Hz, Tests 11-13 tested increased the high end of the frequency range to try and increase the width of the input bandwidth. However, no significant improvement was seen by going above 96 Hz.

Test 14 tested a varisweep designed around the results of the previous tests.

SUMMARY (Cont'd)

The remaining tests (15-24) tested the use of the tractor vibes as compared to the buggy vibes. The data resulting from the use of the buggies was deemed to be superior and the buggy vibes were used throughout the contract.

The final parameters chosen from testing and implemented as the production parameters were as follows:

Number of Vibrators:	Three
Number of Composites:	Six
Sweep Length:	Eight seconds
Sweep Frequencies:	12-76; 12-80; 13-84; 13-88; 14-92; 14-96 Hz
Move-up Between Sweeps:	4 m
Drive Level:	30%
Listen Time:	5 seconds
Sample Rate:	2 ms

4.2 RECORDING PARAMETERS

Energy Source:	3 Vibrators on Line
Vibrator Station Interval:	30 m
Vibrator Array:	40 m
Receivers:	6 Mark L21A 10 Hz geophones per string
Receiver Interval:	6 phones over 10 m
Receiver Array:	10 m in line
Sweep Length:	8 sec.
Number of Composites:	6
Sweep Type:	Linear Up Sweep
Varisweep Frequencies:	12-76 Hz
	12-80 Hz
	13-84 Hz
	13-88 Hz
	14-92 Hz
	14-96 Hz
Vibrator Drive Level:	30%
Spread Geometry:	512 Split Spread
Offset Range:	2560 - 0 - 2560
Record Length:	5 sec.
Acquisition Sample Rate:	2 mls

4.3 RECORDING STATISTICS

ROSEDALE

LINE NUMBER	85-07	85-8	85-10	85-10A	85-10B	85-9
VP TO VP (a)	260 - 1511	162 - 1059	206 - 1847	100 - 898	100 - 823	27 - 675
GEOPHONE TO GEOPHONE (b)	260 - 1511	150 - 1060	200 - 1848	100 - 899	100 - 825	27 - 675
Nº PROFILES	409	296	543	260	236	215
Nº PROFILES SKIPPED	9	29	7	10	6	7
TOTAL KMS (a)	12.510	8.970	16.410	7.980	7.230	6.480
(b)	12.510	9.100	16.480	7.990	7.250	6.480
RECORD HOURS	19.50	15.00	25.625	15.750	11.125	11.250
TEST TIME	7.50	1.50	1.75	1.00	1.25	0.75
DOWN TIME	7.00	3.00	1.25	2.25	0.25	1.25
OTHER TIME	5.50	7:375	4.375	3.250	2.250	3.00
DATES RECORDED	3, 4, 5, 6 Jan. 1985	7, 8, 9 Jan. 1985	9, 10, 11, 12 Jan. 1985	12, 13, 14 Jan. 1985	14-15 Jan. 1985	16-17 Jan. 1985

4.3 RECORDING STATISTICS

ROSEDALE

LINE NUMBER	85-6	85-16	85-5	85-4	85-3	85-11
VP TO VP (a)	106 - 1972	829 - 100	2083 - 100	100 - 2077	2065 - 100	2050 - 94
GEOPHONE TO GEOPHONE (b)	103 - 1972	830 - 100	2086 - 100	100 - 2077	2065 - 100	2050 - 94
Nº PROFILES	622	240	661	658	653	646
Nº PROFILES SKIPPED	7	10	14	5	16	6
TOTAL KMS (a) (b)	18.660 18.690	7.290 7.300	19.830 19.860	19.770 19.770	19.650 19.650	19.560 19.560
RECORD HOURS	26.750	10.750	28.000	25.000	28.125	23.875
TEST TIME	2.750	0.50	2.00	1.50	2.00	1.75
DOWN TIME	4.50	1.00	4.25	3.25	3.00	1.625
OTHER TIME	5.00	1.00	5.50	4.00	4.125	5.375
DATES RECORDED	17-20 Jan. 1985	21 Jan. 1984	22-25 Jan. 1985	26-28 Jan. 1985	29, 30, 31 Jan & 1 Feb. 1985	1, 2, 3, 4 Feb. 1985

4.3 RECORDING STATISTICS

ROSEDALE

LINE NUMBER	85-2	85-14	85-15	85-13	85-19	85-17
VP TO VP (a)	10 - 2053	103 - 1315	100 - 1111	1462 - 100	100 - 1051	820 - 100
GEOPHONE TO GEOPHONE (b)	10 - 2053	100 - 1315	100 - 1111	1465 - 100	100 - 1051	823 - 100
Nº PROFILES	675	403	335	455	317	242
Nº PROFILES SKIPPED	6	3	1	1	1	0
TOTAL KMS (a) (b)	20.430 20.430	12.120 12.120	10.110 10.110	13.620 13.650	9.510 9.510	7.200 7.230
RECORD HOURS	23.375	14.750	12.625	18.000	7.250	7.875
TEST TIME	1.50	1.00	0.75	1.625	0.750	0.250
DOWN TIME	0.625	0.50	1.00	2.875	0.625	0
OTHER TIME	6.250	4.375	3.375	4.50	1.750	2.750
DATES RECORDED	4, 5, 6, 7 Feb. 1985	7, 8, 9 Feb. 1985	9-10 Feb. 1985	11, 12, 13 Feb. 1985	13-14 Feb. 1985	14-15 Feb. 1985

4.3 RECORDING STATISTICS

ROSEDALE

LINE NUMBER	85-18	85-12	85-1			
VP TO VP (a)	700 - 322	1351 - 100	1942 - 85			
GEOPHONE TO GEOPHONE (b)	700 - 322	1351 - 100	1942 - 85			
Nº PROFILES	127	416	614			
Nº PROFILES SKIPPED	0	2	5			
TOTAL KMS (a) (b)	3.780 3.780	12.510 12.510	18.570 18.570			
RECORD HOURS	7.375	15.375	21.375			
TEST TIME	0.375	0.875	1.625			
DOWN TIME	0.125	0.375	3.00			
OTHER TIME	3.250	5.750	11.000			
DATES RECORDED	15-16 Feb. 1985	16, 17, 18 Feb. 1985	18, 19, 20, 21 Feb. 1985			

5. FIELD PROCESSING

5.1 PROCESSING OBJECTIVES

1) To provide quality control of all Vibroseis acquired seismic data;
2) To provide quality control of all survey data;
3) To provide a brute stack of raw Vibroseis data on a daily basis for the client, and to provide a completed raw field stack section with the completion of each line.

5.2 PROCESSING REVIEW

Geosystems' processing of the 1985 Rosedale Seismic Survey was limited to field processing on a nightly basis, with in-house processing being performed by Geophysical Services Inc. For this reason field processing concentrated on the quality of the field stacks and fulfilling any requests made by the client, Mr. Claus Kuball, with no testing for in-house processing parameters

During the contract the listed proposals were largely fulfilled. Co-ordinate tapes were created for Lines GHG85A-03, 05, 06, 07, 08, 09, 10, 10A, 10B and 16 as survey data was made available. These co-ordinate tapes contained ground co-ordinate and elevation information and were used to check the quality of survey data by producing a hard copy dump of the co-ordinates for each shot/ receiver point on a line, as well as a survey map and elevation profile of each line.

Processing parameters (front mutes and velocity functions) were chosen as often as processing time allowed, with the interval between new sets of parameters approximately 6 km.

Using the chosen parameters, the raw Vibroseis data and, when available, co-ordinate/elevation data, each line was stacked to a two-way time of 3 seconds. Lines GHG85A- 05, 06, 09, 10, 10A and 10B were stacked with real co-ordinates and elevations, which

5.2 PROCESSING REVIEW (Cont'd)

allowed elevation statics to be applied to these lines, but all other lines were stacked with dummy co-ordinates, so no correction could be made for elevation variations.

Processing Results

In general all stacked lines showed high resolution of seismic reflectors from depths of 0.1 - 0.2 to 1.0 - 1.5 seconds, displaying strong coherency of high frequency data. An area of poor quality data was encountered in the North-West of the prospect and this badly affected sections of data on Lines GHG85A-01, 02, 03 and 11.

In the case of Line GHG85A-02, the sudden marked change in data quality resulted in a front mute being too wide, allowing refraction data into the stack over a range of approximately thirty C.D.P.'s. To remove this, velocity filter tests were run and a velocity of 1900 m/sec was chosen to filter the line. The result was complete removal of the refractions and slight enhancement of shallow reflectors on the line.

In an attempt to enhance data in the North of line GHG85A-01, tests were run using the Differential Field Sum Program (DFS). This program allows a small geophone array to be used during acquisition and a longer array to be synthesised by the Geocor IV, while at the same time applying a partial NMO correction to the data to compensate for offset differences. The use of a small receiver array in the field allows more accurate static correction calculation, as well as attenuating short wavelength coherent noise, while longer computer simulated arrays are more competent at removing longer wavelength noise such as groundroll. The overall effect is enhanced coherency of seismic reflectors and the breakdown of noise interference.

After the tests had been run, 8 x 3 D.F.S. (80 metre synthesised array) was chosen and applied to field files 480 to 600. These

Processing Results (Cont'd)

files were then stacked to a depth of 2 seconds with 15 metre C.D.P. intervals. Unfortunately, there was negligable improvement of data in the poor quality data region, although there was improvement of reflector coherency to the far North of the line where data quality was already good.

5.3 SUMMARY

The results of field processing were generally very encouraging with the raw field stacks giving a clear indication of the geological structure of the survey area. This resulted in the inclusion of several extra survey lines, GHG85A-12, 13, 14, 15, 17, 18 and 19 in order to increase coverage of interesting structural features.

6. PERSONNEL MOVEMENTS

6.1 PERSONNEL

2 Party Managers	-	P. Jamieson, H. Athorn
1 Assistant Party Manager	-	S. Barbour
2 Processors	-	C. Luxton, B. Hipkiss
2 Observers	-	R. Permann, H. Hume
1 Junior Observer	-	S. Jeyaseelan
3 Surveyors	-	J. Meggitt, T. Newmair, R. Losier
2 Vibrator Technicians	-	P. Kilpatrick, B. Grimes
1 Mechanic	-	G. Rafferty
5 Vibe Operators	-	B. Darch, L. Dean, J. Fing, B. Wilgosh, S. Whalley
24 Field Assistants		

6.2 CLIENT AND NON-BASIC FIELD CREW PERSONNEL

2	January	-	F. O'Sullivan arrives
4	"	-	" " leaves
18	"	-	F. O'Sullivan arrives
17	"	-	Dan Scanlon arrives
20	"	-	Dan Scanlon leaves
25	"	-	J. Rae arrives
30	"	-	S. Greaves, Hartogen, arrives
31	"	-	J. Rae, D. Scanlon leave

APPENDIX "A"

TECHNICAL EQUIPMENT

- Two hundred and one (201) geophone cables, each eight hundred and eighty (880) feet long with takeouts spaced at one hundred and ten (110) feet.
- Sixteen (16) jumper cables two hundred (200) feet long.
- Fourteen hundred and one (1401) geophone strings with six (6) Mark L-21A 10 hz geophones per string spaced at thirty (30) foot intervals.
- Assorted test equipment such as Techtronic scope, Geophone tester and simulator, cable checkers, line simulator, volt meters and etc.
- Twelve (12) Motorola radios for communications.
- Eight (8) repeater terminals.
- Array terminal repair station.
- One hundred and seven (107) array terminals, and necessary amount of battery chargers.
- Two (2) Wild T16 Theodolites.
- Two (2) Sokkisha Auto Ranger Systems.
- Geocor IV 1024 channel seismic data acquisition and processing system. Mounted within an air-conditioned cab on an F-700 four wheel drive truck.
- Four (4) Litton LRS 311 vibrators mounted on International Paystar 5000 six-wheel trucks equipped with Pelton vibrator electronics.
- One vibrator service Isuzu four wheel drive unit.
- Two cable and geophone Isuzu four wheel drive units.
- Two array terminal Toyota vehicles.
- Seven field Toyotas.
- One Isuzu, six-wheel truck mounted with fire fighting equipment.
- Three Isuzu four wheel transport trucks.
- One 12 channel OYO McSeis 1500 refraction system.
- One 24 channel TR7 Field-ographs uphole refraction system.
- One 1340, 24 channel Field-ograph uphole refraction system.
- Two Toyota four wheel drive shooting/preloading vehicles.

APPENDIX "B"

SURVEY STATISTICS

LINE Nº:	GHG 85A-01
TERRAIN:	Undulating - Pine Plantations, 4.0 kms
START OF LINE:	VP 85
END OF LINE:	VP 1942
TOTAL KMS:	18.57
TOTAL PM's:	3
SURVEY PROCEDURE:	Start of survey VP 85 - traverse North to South end of survey VP 1942.
UNUSUAL OCCURRENCES:	4.0 kms was cut through Pine Plantations by D-6 Dozer.

LINE Nº:	GHG 85A-02
TERRAIN:	Undulating - Pine Plantations 5.0 kms
START OF LINE:	VP 10
END OF LINE:	VP 2053
TOTAL KMS:	20.43
TOTAL PM's:	6
SURVEY PROCEDURE:	Start of survey VP 10 traverse North to South, end of survey VP 2053.
UNUSUAL OCCURRENCES:	5.0 kms was cut through Pine Plantations by D-6 Dozer.

SURVEY STATISTICS (Cont'd)

LINE N°:	GHG 85A-03
TERRAIN:	Undulating, pine plantations and some forrest 4.0 kms
START OF LINE:	VP 100
END OF LINE:	VP 2065
TOTAL KMS:	19.65
TOTAL PM's:	4
SURVEY PROCEDURE:	Start of survey VP 100 traverse North to South end of survey VP 2065 tie to Line 85A-04 VP 2077.
UNUSUAL OCCURRENCES:	4.0 kms was cut through pine plantation and forrest by D-6 Dozer.

LINE N°:	GHG 85A-04
TERRAIN:	Mostly flat, some parts heavy trees and pine plantation 3.0 kms
START OF LINE:	VP 100
END OF LINE:	VP 2077
TOTAL KMS:	19.77
TOTAL PM's:	3
SURVEY PROCEDURE:	Start of survey VP 100 traverse North to South end of survey VP 2077.
UNUSUAL OCCURRENCES:	3.0 kms was cut by D-6 Dozer through heavy trees and pine forrest.

SURVEY STATISTICS (Cont'd)

LINE N°:	GHG 85A-05
TERRAIN:	Flat with some clearing through forrest and scrub 5.0 kms
START OF LINE:	VP 100
END OF LINE:	VP 2086
TOTAL KMS:	19.86
TOTAL PM's:	5
SURVEY PROCEDURE:	Start of survey VP 100 traverse North to South end of survey VP 2086.
UNUSUAL OCCURRENCES:	5.0 kms was cut by D-6 Dozer through rain forrest and pine plantations.

LINE N°:	GHG 85A-06
TERRAIN:	Mostly flat, pine forrest and rain forrest to the South 8.0 kms
START OF LINE:	VP 103
END OF LINE:	VP 1972
TOTAL KMS:	18.69
TOTAL PM's:	4
SURVEY PROCEDURE:	Start of survey VP 103 traverse North to South end of survey VP 1972 tie to Line 16 VP 797 + 4.
UNUSUAL OCCURRENCES:	Dozer cut 8.0 kms through rain forrest and pine plantations.

SURVEY STATISTICS (Cont'd)

LINE Nº:	GHG 85A-07
TERRAIN:	Mostly flat - rain forrest and pine plantations 5.5 kms
START OF LINE:	VP 262
END OF LINE:	VP 1511
TOTAL KMS:	12.49
TOTAL PM's:	3
SURVEY PROCEDURE:	Start of survey VP 262 traverse North to South end of survey VP 1511.
UNUSUAL OCCURRENCES:	5.5 kms was cut by D-6 Dozer through pine plantations and rain forrest.

LINE Nº:	GHG 85A-08
TERRAIN:	Flat open country, marsh flats to the North
START OF LINE:	VP 150
END OF LINE:	VP 1060
TOTAL KMS:	9.10
TOTAL PM's:	2
SURVEY PROCEDURE:	Start of survey VP 150 traverse North to South to VP 1060 E.O.L.
UNUSUAL OCCURRENCES:	None.

SURVEY STATISTICS (Cont'd)

LINE N°:	GHG 85A-09
TERRAIN:	Marshes to the North and South, flat open ground medium scrub
START OF LINE:	VP 27
END OF LINE:	VP 675
TOTAL KMS:	6.48
TOTAL PM's:	4
SURVEY PROCEDURE:	Surveyed from Line 10B to the South to VP 675 E.O.L. from VP 466 + 5 to the North to VP 27 S.O.L.
UNUSUAL OCCURRENCES:	4.5 kms cleared with D-3 Dozer.

LINE N°:	GHG 85A-10
TERRAIN:	Mostly flat follows Longford Road
START OF LINE:	VP 200
END OF LINE:	VP 1848 + 8
TOTAL KMS:	16.56
TOTAL PM's:	4
SURVEY PROCEDURE:	Start of survey VP 200 traverse West to East to VP 1848 + 8 E.O.L.
UNUSUAL OCCURRENCES:	None.

SURVEY STATISTICS (Cont'd)

LINE N°:	GHG 85A-10A
TERRAIN:	Undulating with marshes to the East and middle of line
START OF LINE:	VP 100
END OF LINE:	VP 900
TOTAL KMS:	8.00
TOTAL PM's:	3
SURVEY PROCEDURE:	Start of survey VP 100 traverse West to East to VP 900 E.O.L.
UNUSUAL OCCURRENCES:	None.

LINE N°:	GHG 85A-10B
TERRAIN:	Flat with marshes along the line
START OF LINE:	VP 100
END OF LINE:	VP 825
TOTAL KMS:	7.25
TOTAL PM's:	4
SURVEY PROCEDURE:	Start of survey VP 100 traverse West to East to VP 825 E.O.L.
UNUSUAL OCCURRENCES:	Dozed 1.0 kms with D-3 Dozer.

SURVEY STATISTICS (Cont'd)

LINE N°:	GHG 85A-11
TERRAIN:	Undulating to very hilly at Boundary Creek area
START OF LINE:	VP 94
END OF LINE:	VP 2050
TOTAL KMS:	19.56
TOTAL PM's:	5
SURVEY PROCEDURE:	Start of survey VP 2050 E.O.L. traverse East to West to VP 94 S.O.L.
UNUSUAL OCCURRENCES:	6.0 kms dozing with D-6 through hills.

LINE N°:	GHG 85A-12
TERRAIN:	Mostly undulating
START OF LINE:	VP 100
END OF LINE:	VP 1351
TOTAL KMS:	12.51
TOTAL PM's:	2
SURVEY PROCEDURE:	Start of survey VP 1351 E.O.L. traverse East to West to VP 100 S.O.L.
UNUSUAL OCCURRENCES:	1.0 kms cleared with D-6 Dozer.

SURVEY STATISTICS (Cont'd)

LINE N°:	GHG 85A-13
TERRAIN:	Undulating - pine plantation rain forrest
START OF LINE:	VP 100
END OF LINE:	VP 1465
TOTAL KMS:	13.65
TOTAL PM's:	2
SURVEY PROCEDURE:	Surveyed from VP 100 S.O.L. traversed West to East to VP 1465 E.O.L.
UNUSUAL OCCURRENCES:	Line cleared for 2.0 kms D-6.

LINE N°:	GHG 85A-14
TERRAIN:	Partly flat to undulating
START OF LINE:	VP 100
END OF LINE:	VP 1315
TOTAL KMS:	12.15
TOTAL PM's:	5
SURVEY PROCEDURE:	Surveyed West to East from VP 100 S.O.L. to VP 1315 E.O.L.
UNUSUAL OCCURRENCES:	Dozed 1.0 kms D-6.

SURVEY STATISTICS (Cont'd)

LINE N°:	GHG 85A-15
TERRAIN:	Undulating to flat in parts.
START OF LINE:	VP 100
END OF LINE:	VP 1111
TOTAL KMS:	10.11
TOTAL PM's:	4
SURVEY PROCEDURE:	Start of survey VP 1111 E.O.L. traverse East to West to VP 100 E.O.L.
UNUSUAL OCCURRENCES:	Dozed 1.0 kms through forrest.

LINE N°:	GHG 85A-16
TERRAIN:	Undulating to flat in parts
START OF LINE:	VP 100
END OF LINE:	VP 830
TOTAL KMS:	7.30
TOTAL PM's:	2
SURVEY PROCEDURE:	Start VP 100 traverse North - South to VP 830 E.O.L.
UNUSUAL OCCURRENCES:	3.5 kms dozed through pine plantation D-6.

SURVEY STATISTICS (Cont'd)

LINE N°:	GHG 85A-17
TERRAIN:	Flat follows fenceline
START OF LINE:	VP 100
END OF LINE:	VP 823
TOTAL KMS:	7.23
TOTAL PM's:	4
SURVEY PROCEDURE:	Surveyed from VP 100 North - South to VP 823 E.O.L.
UNUSUAL OCCURRENCES:	None.

LINE N°:	GHG 85A-18
TERRAIN:	Undulating with marshes to the South E.O.L.
START OF LINE:	VP 322
END OF LINE:	VP 700
TOTAL KMS:	3.78
TOTAL PM's:	1
SURVEY PROCEDURE:	Survey starts at VP 322 S.O.L. North - South to VP 700 E.O.L.
UNUSUAL OCCURRENCES:	Dozed 0.5 kms with D-6.

SURVEY STATISTICS (Cont'd)

LINE N°:	GHG 85A-19
TERRAIN:	Flat open grazing land
START OF LINE:	VP 100
END OF LINE:	VP 1051
TOTAL KMS:	9.51
TOTAL PM's:	3
SURVEY PROCEDURE:	Start of survey VP 100 S.O.L. from West to East to VP 1051 E.O.L.
UNUSUAL OCCURRENCES:	None.

APPENDIX "C"

LIST OF PERMANENT MARKERS

GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG 85A-1

PARTY 204 SURVEYOR DATE 16-2-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON ~~XX~~/LINE	REMARKS
245+8	5 774 748·06	510 045·57	41·66			FENCE	LETTS BEACH ROAD
1324	5 764 076·09	508 636·66	51·03			FENCE	DOZER TRACK
1942	5 757 955·67	507 846·69	26·54				E.O.L.

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GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG 85A-2

PARTY 204 SURVEYOR DATE 1-2-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON XR/LINE	REMARKS
44	5 777 254.14	512 170.81	5.62				NEAR IRRIGATION CHANNEL
381	5 773 919.49	511 672.88	51.51			FENCE	LETTS BEACH ROAD
774+6	5 770 039.36	511 052.99	70.36			FENCE	REFINERY ROAD
976+5	5 768 039.97	510 762.17	54.54			FENCE	POST SEASPRAY RD.
1853	5 759 366.61	509 617.03	39.98			FENCE	STRADBROKE ROAD
2053	5 757 355.62	509 389.63	22.67				23 M SOUTH OF E.O.L.

FORM CP 87

GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN **LINE** GHG 85A-3

PARTY 204 SURVEYOR DATE 4-2-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON ~~OFF~~/LINE	REMARKS
147	5,775,944.99	513,942.44	9.68			FENCE	
311+6	5,774,335.27	513,676.18	36.34			FENCE	LETTS BEACH ROAD
1052+3	5,767,056.38	512,532.14	44.74			FENCE	CARRS CREEK ROAD
1250	5,765,113.77	512,226.16	39.65			FENCE	SEASPRAY ROAD

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GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG 85A-4

PARTY 204 SURVEYOR DATE 23-1-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON XXX/LINE	REMARKS
118	5,776,015·10	516,374·85	6·79			FENCE	OPEN PADDOCK
249+5	5,774,719·05	516,185·73	21·00	85A-10	1087	FENCE	LETTS BEACH ROAD
2002	5,757,422·36	513,939·36	31·99			FENCE	

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GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG 85A-5

PARTY 204 SURVEYOR TN/RL DATE JAN. '85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON CR/LINE	REMARKS
100	5 776 176.53	519 413.04	1.68				S.O.L. LETTS BEACH
350	5 774 254.38	519 034.79	17.63	10	1377	✓	NEAR LETTS BEACH RD
1339+4	5 764 527.16	517 486.54	25.77				AT INT. OF CARR CREEK ROAD
2085+3	5 757 187.33	516 342.71	28.38				E.O.L. ON FENCE LINE

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GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-6

PARTY 204 SURVEYOR T.N./R.L. DATE JAN.'85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON CR/LINE	REMARKS
222+4	5,773,855·45	521,457·07	17·04	10	1623+2	✓	
518	5,770,968·57	520,883·92	34·90				
1219+6	5,764,111·02	519,520·57	22·44				ALONGSIDE FENCED ROAD
1971+9	5,756,775·02	518,043·05	26·30				NEAR E.O.L.

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GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG 85A-7

PARTY 204 SURVEYOR DATE 20-1-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON OFF LINE	REMARKS
290	5,772,549·31	524,418·97	14·70	85-10A	518+3		
505	5,770,432·10	524,082·73	19·60	85-11	1782+2		
1511	5,760,548·07	522,387·78	0·99			FENCE	E.O.L.

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GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG 85A-8

PARTY 204 SURVEYOR DATE 18-1-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON XX/LINE	REMARKS
296	5,771,843·63	526,743·08	9·29			FENCE	
1059+7	5,764,352·95	525,513·24	16·40				OPEN PADDOCK

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GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG 85A-9

PARTY 204 SURVEYOR DATE JAN. '85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON XX/LINE	REMARKS
28+6	5,777,169·51	531,715·44	0·58			FENCE	
500	5,772,473·21	531,795·08	5·09				SPERM WHALE HEAD ROAD
564+6	5,771,830·11	531,804·41	8·11			FENCE	LETTS BEACH ROAD
644	5,771,040·19	531,817·04	3·28			FENCE	OPEN PADDOCK

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GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-10

PARTY 204 SURVEYOR T.H. DATE JAN. '85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON CR/LINE	REMARKS
203+7	5,776,063·77	507,514·20	22·99				NEAR S.O.L.
305+2	5 775 941·69	508 519·03	21·17				NEAR ROAD
963+4	5 774 884·00	514 968·27	18·40				
1848+8	5 773 470·74	523 655·30	13·70				NEAR E.O.L.

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PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-10A

PARTY 204 SURVEYOR T.N. DATE JAN. '85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON CR/LINE	REMARKS
200	5,773,821·03	521,522·49	18·50	10	1630	✓	
518+3	5,772,549·31	524,418·97	14·70	7	290	✓	
775+5	5,771,488·84	526,748·21	13·12				ON FENCELINE

GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-10B

PARTY 204 SURVEYOR DATE 9-1-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON EK/LINE	REMARKS
203+8	5,771,280·55	526,817·35	10·50			FENCE	
316+4	5,771,608·66	527,889·93	7·46			FENCE	HIGHWAY
766	5,772,921·72	532,166·10	5·21			FENCE	WHALE HEAD ROAD
825	5,773,091·15	532,729·04	6·64				E.O.L. PIPE LINES

FORM CP 87

GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-11

PARTY 204 SURVEYOR DATE 14-1-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON XR/LINE	REMARKS
159+1	5,772,692.04	508,079.15	84.25			FENCE	SEASPRAY ROAD
707+6	5,771,921.00	513,478.00	74.00				MURTNAUGH ROAD
1110+8	5,771,310.94	517,443.33	51.56			FENCE	JOHNSONS ROAD
1782+2	5,770,432.10	524,082.73	19.48	85A-7	505	FENCE	ROAD
2050	5,770,059.41	526,717.89	13.72				E.O.L.

FORM CP 87

GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-12

PARTY 204 SURVEYOR DATE 16-2-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON CR/LINE	REMARKS
292	5,763,602·58	513,027·64	32·83				SEASPRAY ROAD
1351	5,761,708·17	523,442·12	2·53				E.O.L. TRACK

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GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-13

PARTY 204 SURVEYOR DATE 16-2-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON ~~XR~~/LINE	REMARKS
149+2	5,761,259·26	507,847·24	52·06			FENCE	GIFFARD ROAD
696+1	5 760 390·31	513 247·36	29·60			FENCE	SEA SPRAY ROAD

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PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-14

PARTY 204 SURVEYOR DATE 4-2-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON XX/LINE	REMARKS
100	5 759 509·96	507 366·23	45·87				S.O.L.
319+8	5 759 106·46	509 524·51	39·23			FENCE	GIFFARD ROAD
453+3	5 758 861·61	510 839·13	36·98			FENCE	STRADBROKE ROAD
742+6	5 758 344·87	513 686·04	28·26			FENCE	SEA SPRAY ROAD
1315	5 757 182·38	519 293·74	0·87				E.O.L. (SCRUB)

FORM CP 87

GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-15

PARTY 204 SURVEYOR DATE 8-2-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON ~~XX~~R/LINE	REMARKS
100	5,757,164·96	510,930·33	28·30				S.O.L. PADDOCK
335+2	5,757,639·74	513,236·23	29·23			FENCE	SEA SPRAY STRADBROKE ROAD
410+2	5,757,792·01	513,971·03	28·83	85A-4	1964+7	FENCE	SEA SPRAY STRADBROKE ROAD
1111	5,759,192·40	520,836·06	12·64	85A-13		FENCE	E.O.L.

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GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-16

PARTY 204 SURVEYOR DATE JAN. '85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON XR/LINE	REMARKS
129+7	5,763,994.41	518,023.61	24.32			FENCE	
830+4	5,757,125.20	516,859.42	28.71			FENCE	E.O.L.

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GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85-17

PARTY 204 SURVEYOR DATE 18-2-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON XOR/LINE	REMARKS
100	5,764,020·38	516,013·31	26·67			FENCE	S.O.L.
173+4	5,763,299·48	515,879·53	26·99			FENCE	HAWKINS ROAD
334+7	5,761,714·85	515,591·02	25·64				PRICES ROAD
822+2	5,756,908·00	514,733·70	24·42			FENCE	

GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-18

PARTY 204 SURVEYOR DATE FEB '85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON CR/LINE	REMARKS
700	5,758,392·90	520,399·60	1·29				E.O.L. PADDOCK

GEO SYSTEMS PTY. LTD.

PERMANENT MARKERS

PROSPECT ROSEDALE CLIENT HARTOGEN LINE GHG85A-19

PARTY 204 SURVEYOR DATE 17-2-85 PAGE 1

STATION	NORTHING	EASTING	ELEV.	REFERS TO INT W/LINE	STATION INT	P.M. ON OR/LINE	REMARKS
178+7	5,760,491·94	508,083·11	51·15			FENCE	
707	5,759,590·91	513,290·44	29·30			FENCE	SEASPRAY ROAD
1045+5	5,759,025·80	516,630·13	33·30	85A-5	1897+2	FENCE	

FORM CP 87

APPENDIX "D"

LIST OF DATA TAPES (ROSEDALE)

TAPE N°	FILE N°	VP N°
LINE 85-07		
TEST TAPE HELTEST-01	1 - 14	515
" " HELTEST-02	15 - 24	515
TAPE GHGFA 001 - 009	1 - 139	260 - 692
010 - 019	140 - 298	695 - 1169
020 - 026	299 - 409	1172 - 1511
LINE 85-08		
TAPE GHGFA 027 - 029	1 - 48	162 - 303
030 - 039	49 - 205	303 - 786
040 - 047	206 - 296	789 - 1059
LINE 85-10		
TAPE GHGFA 048 - 049	1 - 32	206 - 293
050 - 059	33 - 178	296 - 749
060 - 069	179 - 335	752 - 1223
070 - 079	336 - 490	1226 - 1688
080 - 083	491 - 543	1691 - 1847
LINE 85-10A		
TAPE GHGFA 084 - 089	1 - 97	100 - 394
090 - 100	98 - 260	397 - 898
LINE 85-10B		
TAPE GHGFA 101 - 109	1 - 143	100 - 538
110 - 116	144 - 236	541 - 823
LINE 85-09		
TAPE GHGFA 117 - 119	1 - 48	27 - 168
120 - 131	49 - 215	171 - 675

LIST OF DATA TAPES (ROSEDALE) (Cont'd)

TAPE Nº	FILE Nº	VP Nº
LINE 85-06		
TAPE GHGFA 132 - 139	2 - 128	106 - 484
140 - 149	129 - 288	487 - 964
150 - 159	289 - 448	967 - 1444
160 - 172	449 - 622	1447 - 1972
LINE 85-16		
TAPE GHGFA 173 - 179	1 - 97	829 - 541
180 - 191	98 - 240	538 - 100
LINE 85-05		
TAPE GHGFA 192 - 199	1 - 116	2083 - 1741
200 - 209	117 - 251	1738 - 1333
210 - 219	252 - 400	1330 - 886
220 - 229	401 - 559	886 - 406
230 - 236	560 - 661	403 - 100
LINE 85-04		
TAPE GHGFA 237 - 239	1 - 48	100 - 244
240 - 249	49 - 208	247 - 727
250 - 259	209 - 368	730 - 1207
260 - 269	369 - 528	1210 - 1687
270 - 278	529 - 658	1690 - 2077
LINE 85-03		
TAPE GHGFA 279 - 289	1 - 168	2065 - 1564
290 - 299	169 - 328	1561 - 1084
300 - 309	329 - 478	1081 - 625
310 - 320	479 - 653	622 - 100

LIST OF DATA TAPES (ROSEDALE) (Cont'd)

TAPE N°	FILE N°	VP N°
LINE 85-11		
TAPE GHGFA 321 - 329	1 - 133	2050 -1648
330 - 339	134 - 288	1645 - 1180
340 - 349	289 - 432	1177 - 745
350 - 359	433 - 592	742 - 262
360 - 363	593 - 646	259 - 94
LINE 85-02		
TAPE GHGFA 364 - 369	1 - 94	10 - 292
370 - 379	95 - 221	295 - 676
380 - 389	222 - 379	679 - 1159
390 - 399	380 - 538	1162 - 1639
400 - 409	539 - 675	1642 - 2053
LINE 85-14		
TAPE GHGFA 410 - 419	1 - 157	103 - 571
420 - 429	158 - 318	574 - 1060
430 - 435	319 - 403	1063 - 1315
LINE 85-15		
TAPE GHGFA 436 - 439	1 - 64	100 - 289
440 - 449	65 - 224	292 - 778
450 - 457	225 - 335	781 - 1111
LINE 85-13		
TAPE GHGFA 458 - 459	1 - 32	1462 - 1372
460 - 469	33 - 179	1369 - 931
470 - 479	180 - 339	928 - 451
480 - 487	340 - 455	448 - 100
LINE 85-19		
TAPE GHGFA 488 - 499	1 - 192	100 - 676
500 - 508	193 - 317	679 - 1051

LIST OF DATA TAPES (ROSEDALE) (Cont'd)

TAPE Nº	FILE Nº	VP Nº
LINE 85-17		
TAPE GHGFA 509 - 519	1 - 157	820 - 355
520 - 525	158 - 242	352 - 100
LINE 85-18		
TAPE GHGFA 526 - 531	1 - 127	700 - 322
LINE 85-12		
TAPE GHGFA 532 - 539	1 - 118	1351 - 994
540 - 549	119 - 263	991 - 559
550 - 559	264 - 416	556 - 100
LINE 85-01		
TAPE GHGFA 560 - 569	1 - 145	1942 - 1504
570 - 579	146 - 299	1501 - 1042
580 - 589	300 - 450	1039 - 583
590 - 600	451 - 614	580 - 85

APPENDIX B

GEOCOR IV

SEISMIC DATA ACQUISITION AND PROCESSING SYSTEM

FIELD TAPE FORMAT

(May 3, 1979)

GEOPHYSICAL SYSTEMS CORPORATION
2085 EAST FOOTHILL BOULEVARD
PASADENA, CALIFORNIA, 91107

GEOCOR IV

FIELD TAPE FORMAT

Field data is recorded on IBM compatible ½ inch, 9 track tape in demultiplexed format at either 800 or 1600 bits-per-inch density. Each tape reel is divided into trace data blocks each containing a trace identification header and data values from one channel (Fig. 1). Each trace data block is separated from the next by a .6 inch interblock gap (IBG). Data values are recorded in two's complement notation with 16 bits per sample standard (recording 1 or 8 bits per sample is available as a non-standard option).

Two trace data block formats are available:

Trace Data Block - 4 word Trace Identification Header (Fig. 2)
Format #1

Trace Data Block - 32 word Trace Identification Header (Fig. 3)
Format #2

Trace Data Block Format #2 contains more header information and is standard.

TRACE HEADER ITEM DEFINITIONS

	Format	Limits
File number is the sequential number assigned to each record (or file) on a magnetic tape. Each line of receivers generates one record at each source point. A record may contain from one to 1024 traces. The file numbering begins at one for the first record on the first tape and continues sequentially through all the tapes for the line.	16 bit two's complement	1 to 32767
Trace Number is the sequential number, beginning at 1, assigned to each trace collected at a source point.	16 bit two's complement	1 to 1024
Source Point Number represents the actual number assigned to each source point by the surveyor.	16 bit two's complement	-32767 to 32767
Port/Channel Code is a code identifying the input port and channel used to collect each trace. The most significant 6 bits represent the port (0-15) and the least significant 10 bits represent the channel (0-1023).	6 bit/10 bit	0-15/0-1023
Source Line Name is the alphabetic or numeric identification of the line of source points.	6 ASCII characters left justified.	
Receiver Line Name is the alphabetic or numeric identification of the line of receivers.	6 ASCII characters left justified.	
Receiver Number represents the actual number assigned to each receiver location by the surveyor.	16 bit two's complement	-32767 to 32767

GEOCOR IV

FIELD TAPE FORMAT

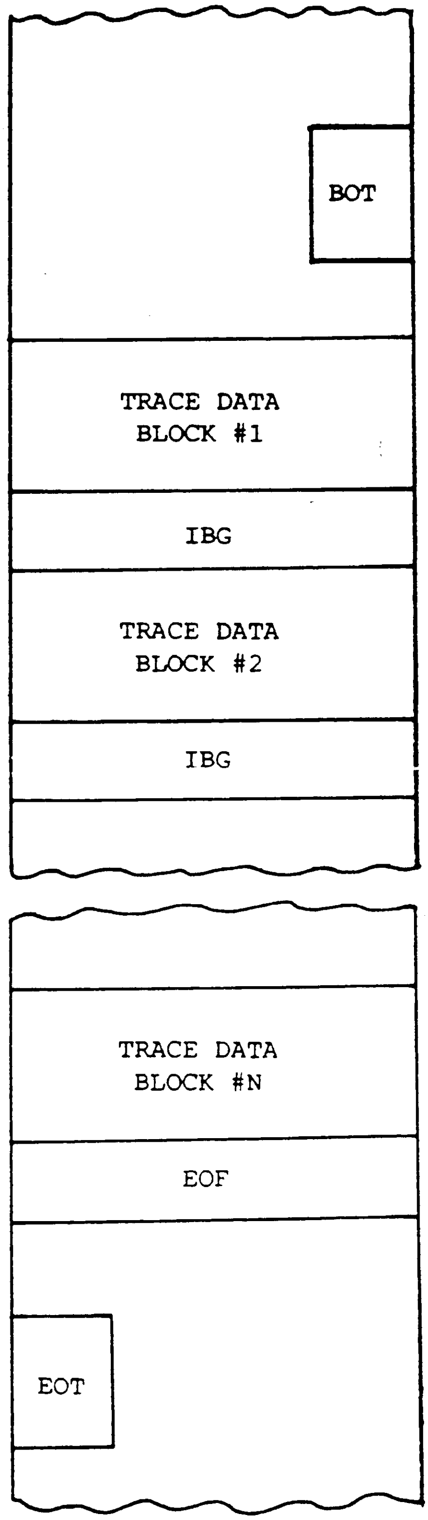


FIG. 1

FORMAT #1

TRACE DATA BLOCK

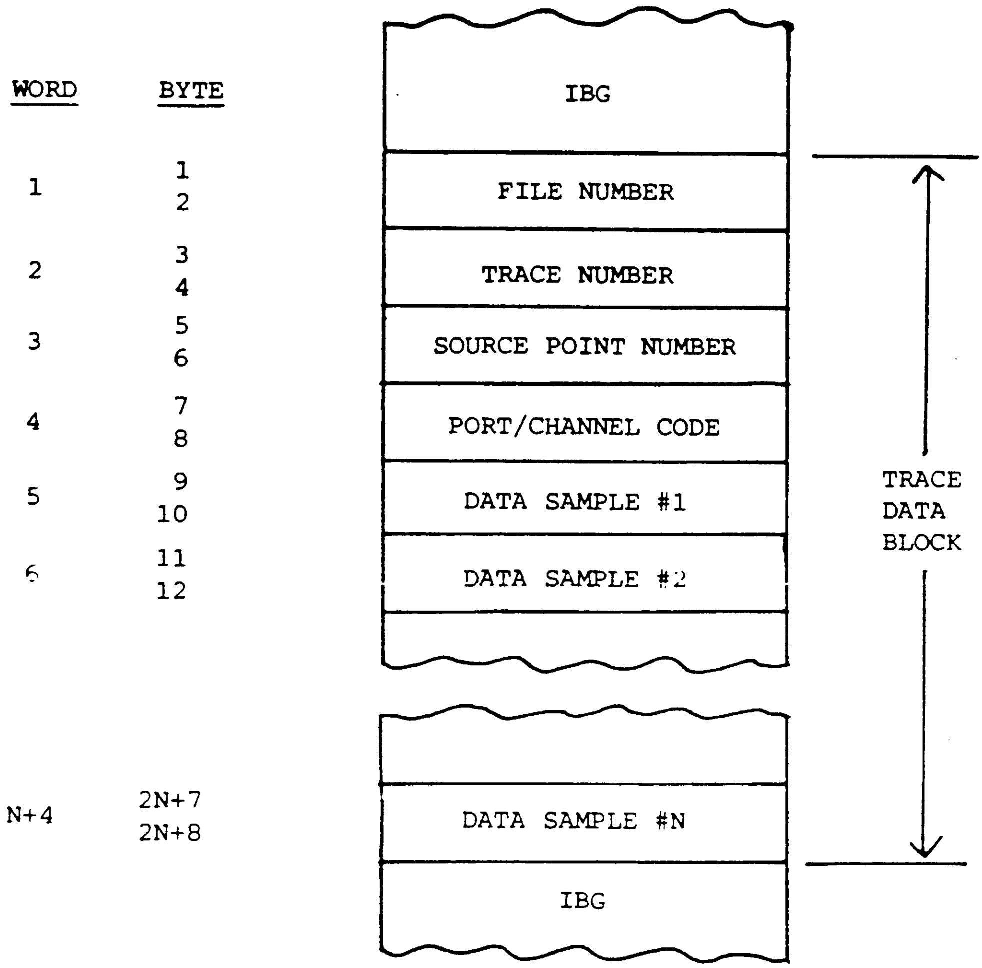


FIG. 2

TRACE DATA BLOCK FORMAT #2

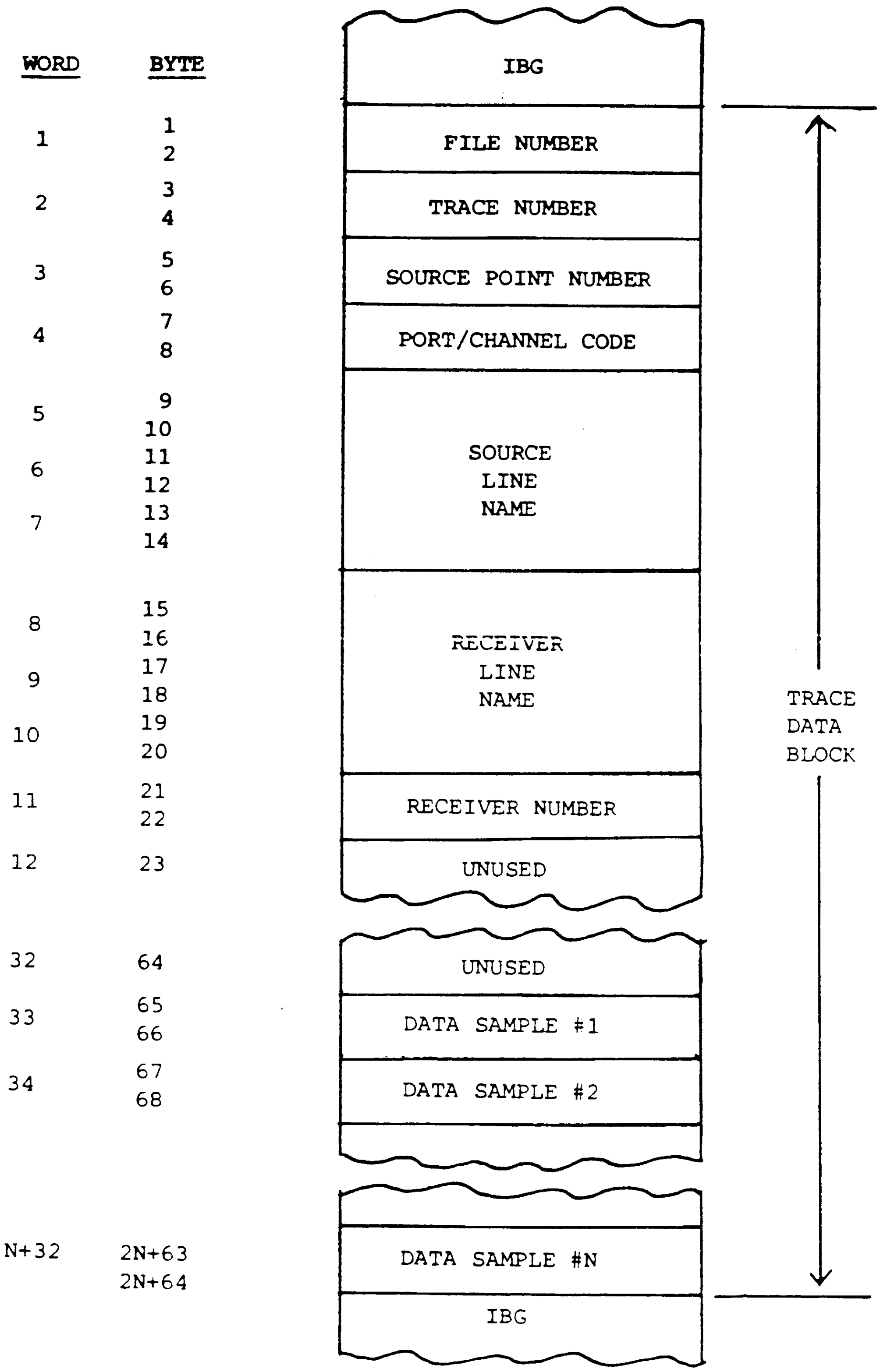


FIG. 3

STACK TAPE FORMAT

WORD	CONTENTS
1	File
2	Trace (=1)
	(Not Used)
23	Avg X
24	Avg X
25	Avg Y
26	Avg Y
27	Avg Static
28	Avg Weight
29	RCP X
30	RCP X
31	RCP Y
32	RCP Y

GATHER TRACE FORMAT

WORD	BYTE	
1	1-2	File Number
2	3-4	Trace Number
3	5-6	Source Point Number
4	7-8	Port/Channel Code
5-7	9-14	Source Line Name
8-10	15-20	Receiver Line Name
11	21-22	Receiver Number
12-13	23-26	Source X
14-15	27-30	Source Y
16	31-32	Source Elevation
17	33-34	Source Residual
18-19	35-38	Receiver X
20-21	39-42	Receiver Y
22	43-44	Receiver Elevation
23	45-46	Receiver Residual
33-n	65-2n	Data Samples

GEOCOR IV

SEISMIC DATA ACQUISITION AND PROCESSING SYSTEM

LOG TAPE FORMAT

(May 15, 1979)

GEOPHYSICAL SYSTEMS CORPORATION
2085 EAST FOOTHILL BOULEVARD
PASADENA, CALIFORNIA, 91107

LOG TAPE FORMAT

All acquisition parameters and log entries recorded in the GEOCOR IV Acquisition Log may also be recorded on magnetic tape for input to subsequent data processing steps. Each line of text written in the log may be recorded as a 65-word block on tape. The format of each text block is described in Figure 2.

Information describing each source point as it is acquired is also recorded in a second format (figures 3, 4, 5). Each source point generates one block of information which contains one section describing the source location and identification and sixteen sections describing the receiver configurations. The source point blocks are 501 words long with the source section occupying words 2-101 and the receiver sections occupying words 102-501. One receiver section is filled in for each independent line of active receivers. An illustration of the total log tape is shown in figure 1.

The information is recorded on IBM compatible, ½ inch, 9-track magnetic tape at either 800 or 1600 bits-per-inch density. Each block of information is separated from the next by a .6 inch inter-block gap (IBG). The source point blocks are written on tape in triplicate to insure that they can be read correctly. Each source point block contains a checksum word to permit detection of incorrect reads.

DEFINITIONS

	Format	Limits
Source Point Number - the number assigned to the actual ground location of each shot or vibrator point.	16 bit two's complement	-32767 to 32767
Source Line Name - the alphabetic or numeric identification of the line of source points.	6 ASCII characters left justified	
Number of Receiver Lines - the number of independent lines of receivers active during data acquisition.	16 bit two's complement	1 to 16
Checksum - the exclusive-or checksum of all the data within the block.	16 bit two's complement	-32768 to 32767
File Number - the number assigned to each group of traces generated by a line of receivers. The file numbers are sequential on tape.	16 bit two's complement	1 to 32767
Receiver Line Name - the alphabetic or numeric identification of the line of receivers.	6 ASCII characters left justified	
Reel Identification - the alphabetic or numeric identification of the magnetic tape reel.	10 ASCII characters left justified	
Number of First Active Trace - the number of the first trace containing seismic data.	16 bit two's complement	1 to 1025
Receiver Number of First Active Trace - the number assigned to the receiver location of the first active tract.	16 bit two's complement	-32767 to 32767
Number of Last Active Trace - the number of the last trace containing seismic data.	16 bit two's complement	1 to 1025
Receiver Number of Last Active Trace - the number assigned to the receiver location of the last active trace.	16 bit two's complement	-32767 to 32767
Number of Traces/File - the number of active and dummy traces within each file on tape. The number of traces/file does not change within a line.	16 bit two's complement	1 to 1025
Block Identification Code - the number which identifies the type of block. 0 = Source Point Block 1 = Text Block	16 bit two's complement	0 to 1

LOG TAPE

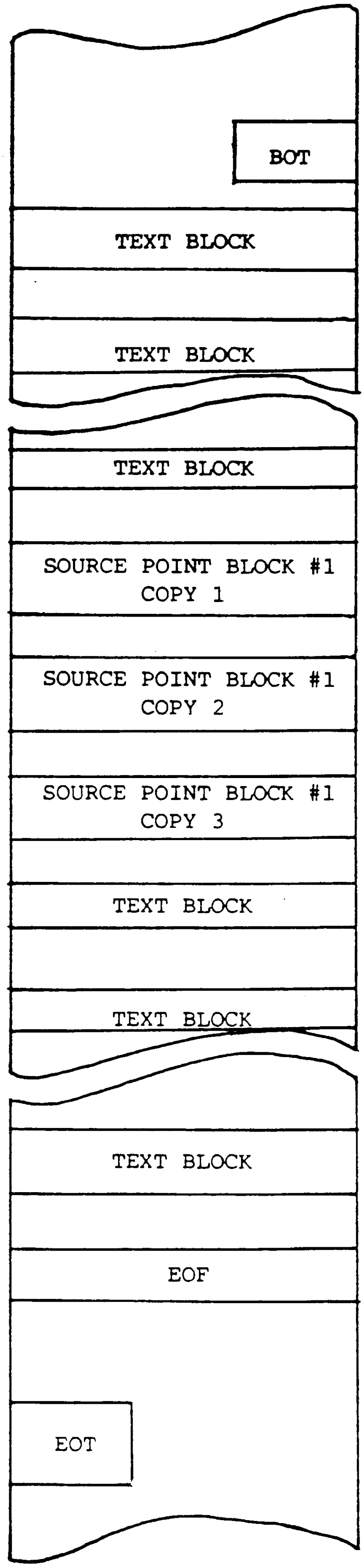


FIG. 1

TEXT BLOCK

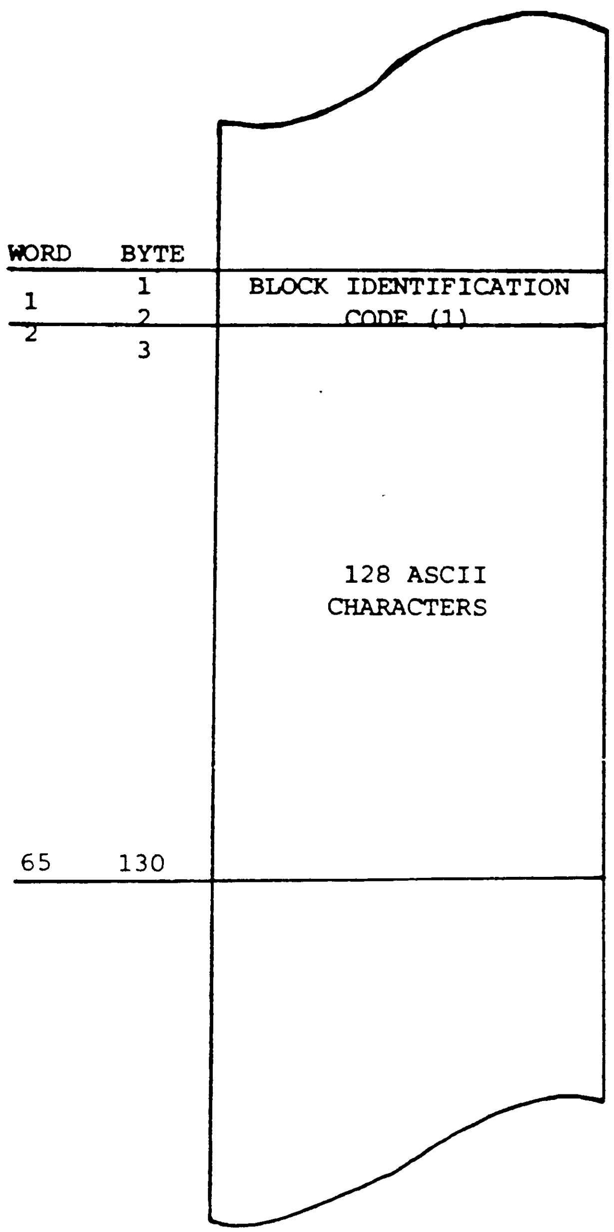


FIG. 2

SOURCE POINT BLOCK

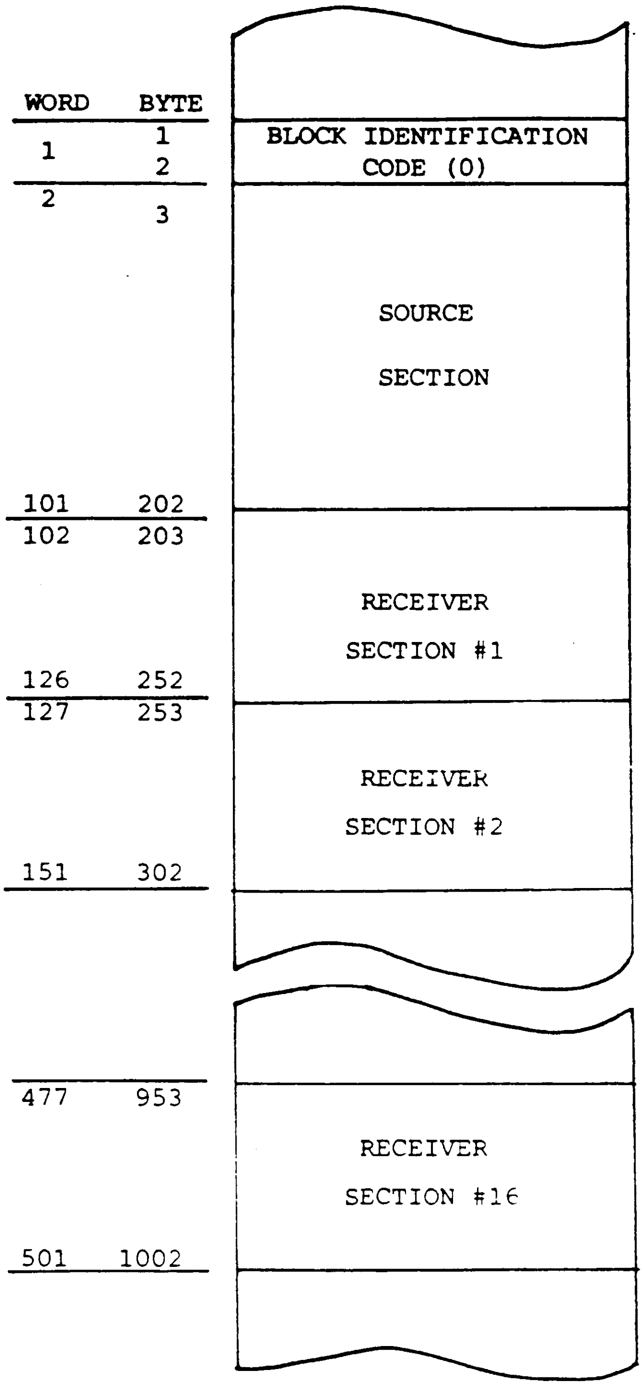


FIG. 3

SOURCE SECTION

OF SOURCE POINT BLOCK

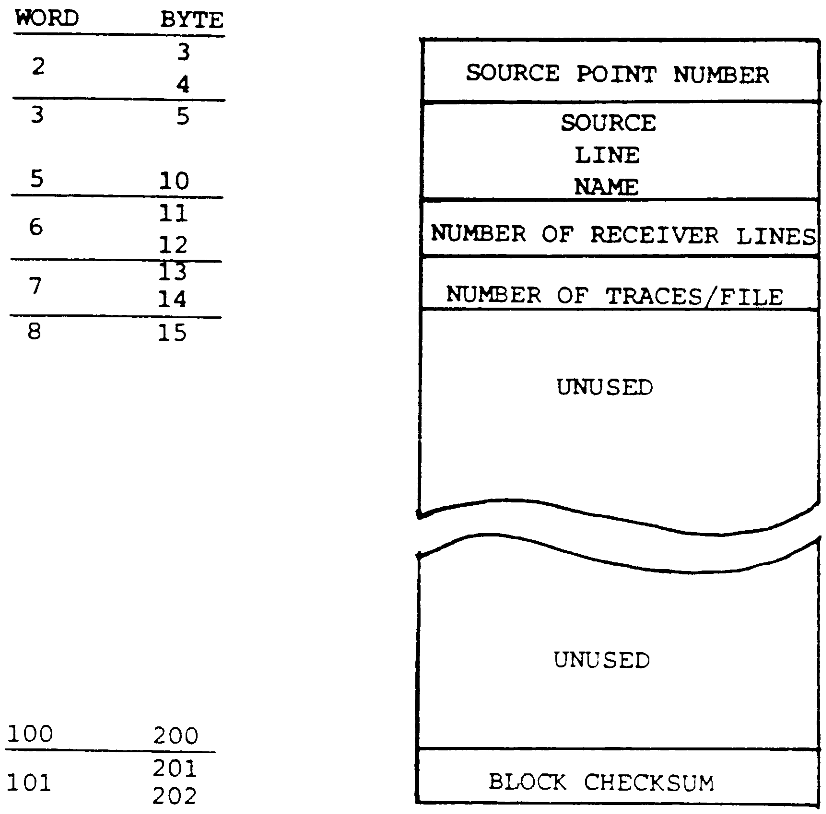


FIG. 4

RECEIVER SECTION #1

OF SOURCE POINT BLOCK

WORD	BYTE	
102	203 204	FILE NUMBER
103 105	205 210	RECEIVER LINE NAME
106 110	211 220	REEL IDENTIFICATION
111	221 222	NUMBER OF FIRST ACTIVE TRACE
112	223 224	RECEIVER NUMBER AT FIRST ACTIVE TRACE
113	225 226	NUMBER OF LAST ACTIVE TRACE
114	227 228	RECEIVER NUMBER AT LAST ACTIVE TRACE
115	229	UNUSED
126	252	UNUSED

FIG. 5

GEOCOR IV

SEISMIC DATA ACQUISITION AND PROCESSING SYSTEM

COORDINATE TAPE FORMAT

(PRELIMINARY WRITEUP)

GEOPHYSICAL SYSTEMS CORPORATION
2085 EAST FOOTHILL BOULEVARD
PASADENA, CALIFORNIA, 91107

GEOCOR IV

Coordinate Tape Format

The GEOCOR IV System records geophysical survey information on magnetic tape in a blocked, gapped format which is fully IBM compatible. For each source point and receiver location associated with the survey, X, Y, and Z coordinate, residual static correction, latitude and longitude information is included. This information is recorded in data blocks which are followed on the coordinate tape by edit blocks which include receiver edit information for each source point.

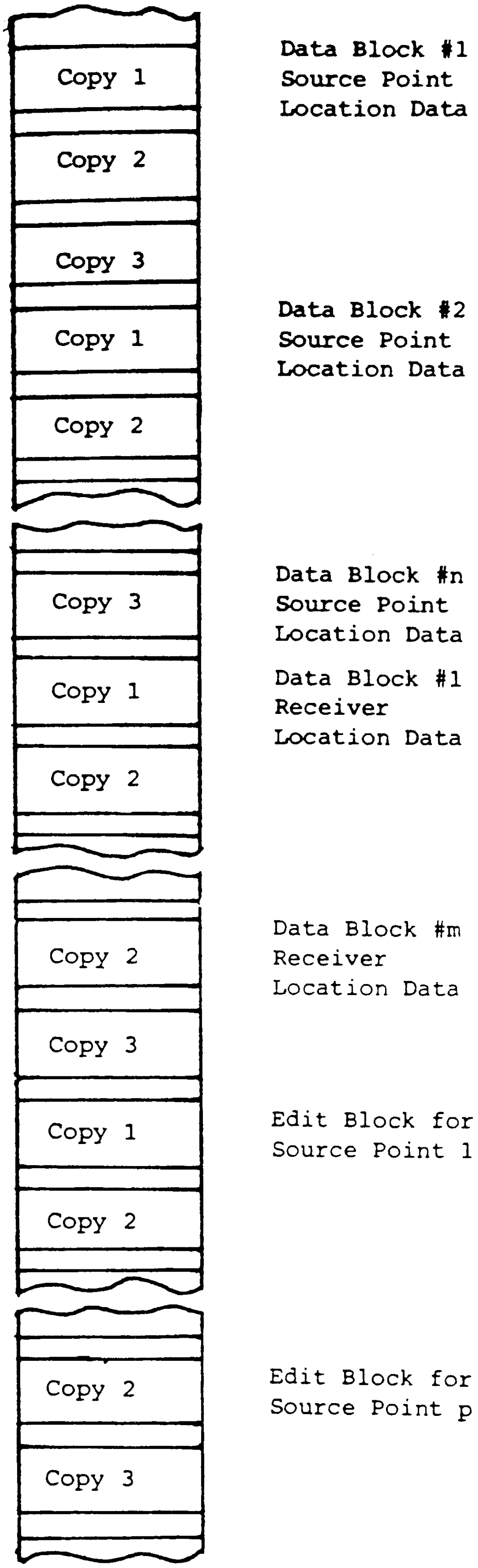
The tape is an IBM-compatible 9-track-magnetic tape that is recorded at either 800 or 1600 bits-per-inch (BPI). Tape codes consist of 16-bit words which include a sign bit and 15 data bits. The data bits are recorded in a straight binary code with a two's complement negative number representation. The sign bit of the least significant word of two word values is always set to zero.

The coordinate tape is written with three identical copies of each block. Each block is separated from the next block by a .6 inch interblock gap (IBG). Data blocks contain 2002 words each and edit blocks contain 1040 words each. (Fig. 1).

Each data block contains a block number (word 1), 100 20-word records (2ords 2-2001) and a checksum (word 2002). (Fig. 2). Each 20-word record is associated with a source point of receiver location. Latitude and longitude are expressed in hundredths of a second as 32-bit integer values. (Fig. 3).

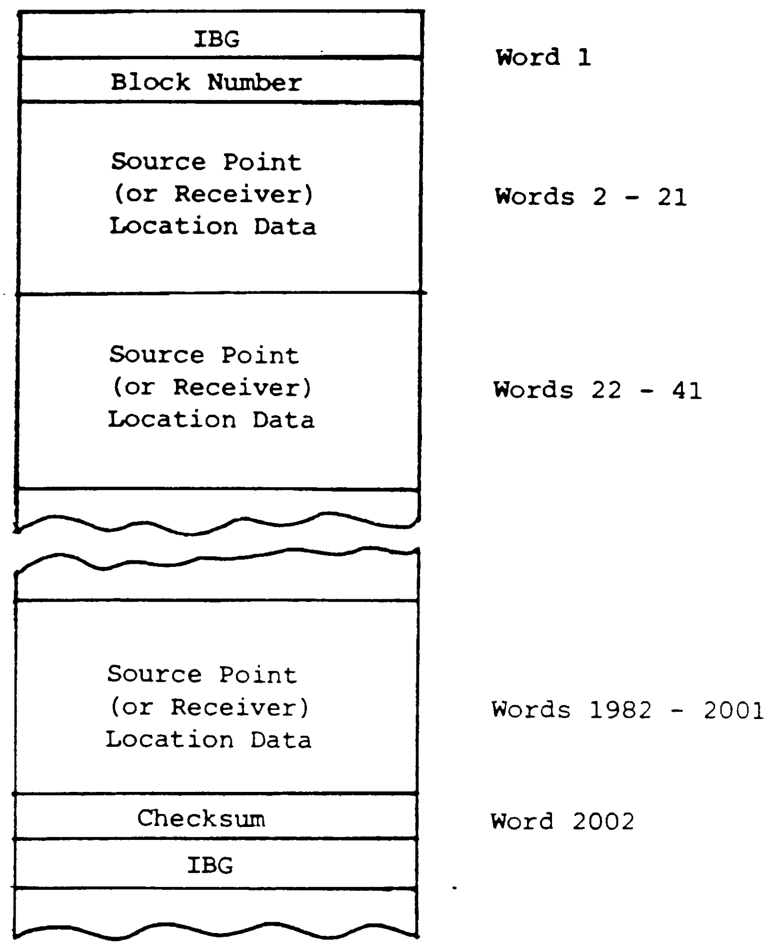
Each edit block contains a block number (word 1), the source point number to which the edits apply (word 2), the number of receiver edits included in the block (word 3), spare words (words 4-15), receiver edits (words 16-1039) and a checksum (word 1040). (Fig. 4).

The first n blocks on the coordinate tape contain source point location data and are numbered consecutively from 1 to n. These are followed by m blocks containing receiver location data numbered from 1 to m. An all-zero record indicates the termination of data within a block, and the remainder of the records in that block will also be all-zero. These data blocks are followed by p edit blocks numbered consecutively from 1 to p. There is one 1040-word edit block for each source point described in the first n data blocks.



COORDINATE TAPE FORMAT

FIG. 1



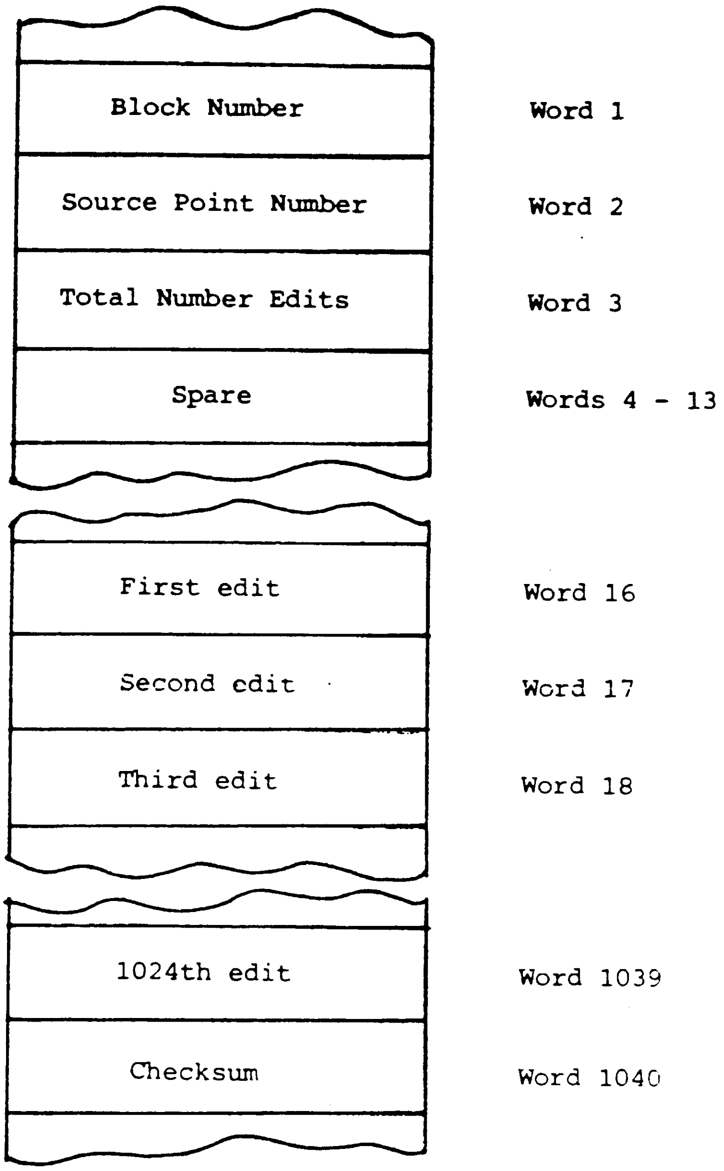
BLOCK FORMAT

FIG. 2

Source or Receiver Line Name (6 Ascii charact- ers left justified)	Words 1 - 3
Source or Receiver #	Word 4
2-word X coordinate	Words 5, 6
2-word Y coordinate	Words 7, 8
1-word Z coordinate	Word 9
2-word packed latitude	Words 10, 11
2-word packed longitude	Words 12, 13
Residual Static	Word 14
Available for additional data	Words 15 - 20

DATA RECORD FORMAT

FIG. 3



EDIT BLOCK FORMAT

FIG. 4

RESIDUAL TAPE FORMAT

The raw residuals output by TDR100 are stored on magnetic tape in variable length records (not longer than 2055 16-bit words). Each source or receiver line is split into segments not exceeding 2048 residual points worth of data. Each record on tape (described below) includes either the raw residuals or correlation counts for one segment and is output in triplicate. The block numbers for residuals are increasing positive integers, while the correlation blocks immediately follow and are numbered with the additive inverse of the corresponding residual block.

All source lines are present on the residual tape before the receiver lines, and the coordinate tape information is used to differentiate the source and receiver records.

For example, a typical 3D prospect might include:

	LINE NAME	POINTS
Source	SRC001	1 - 3500
	SRC002	5001 - 6000
Receiver	REC001	1 - 256
	REC002	1001 - 1256

This would produce a residual output tape as follows:

BLOCK	CONTENT	(Each block in triplicate)	
1	SRC001	1 - 2048	Raw residuals
-1	SRC001	1 - 2048	Correlation count
2	SRC001	2049 - 3500	Raw residuals
-2	SRC001	2049 - 3500	Correlation count
3	SRC002	5001 - 6000	Raw residuals
-3	SRC002	5001 - 6000	Correlation count
4	REC001	1 - 256	Raw residuals
-4	REC001	1 - 256	Correlation count
5	REC002	1001 - 1256	Raw residuals
-5	REC002	1001 - 1256	Correlation count

Each block (either raw residuals or correlation count) is formatted as follows. The checksum is an exclusive - or checksum of all the data (words 1 to n-1) with the block.

<u>WORD</u>

1	......	Block number
2 - 4	......	Source or receiver line name
5	......	First source or receiver point this record
6	......	Last source or receiver point this record
7		
.	......	Raw residuals or correlation count
.	......	for each source or receiver point
n - 1		
n	......	Checksum

APPENDIX "F"

WEEKLY OPERATIONS SUMMARY REPORTS

WEEKLY OPERATIONS SUMMARY

GEO-SYSTEMS PTY. LTD.
173 PLANET STREET, CARLISLE, W.A. 6101

Party No.: 20k
Party Head: H. ATHORN
Address & Phone No.: AMBASSADOR MOTEL SALE 443222
Client: HARTOGEN
Client Rep.: CLAUS KUBALL
Week Ending: 6/1/85
Location: SALE VIC.

DAY/DATE	M 31	T 1	W 2	TH 3	F 4	S 5	S 6	TOTALS WEEK	TOTALS MNTH.
RECORD. HRS.			4.0	9.0	2.0	8.0	7.5	30.5	
TRAVEL HRS.			1.0	1.0	1.0	1.0	1.0	5	
OTHER PD. HRS.			5.0	1.5	0	1.0	0.5	8	
TOTAL PD. HRS.			10.0	11.5	10	10	11.5	53	
PROFILES			—	66	11	174	143	394	
PROD. 1st VIB. No			—	260	518	551	1076		
PROD. ACTUAL				2.55	0.3	5.25	6.35	12.45	
No. A.T.U. OPER.			102	95	96	91	85	—	
No. VIB. OPER.			7	3	4	4	3		
FLD. PROC. HRS.			10	10	3	12	9.5	44.5	
WEATHER			FAIR	WINDY	FINE	WINDY	FINE		

OPERATIONAL PARAMETERS AND EQUIPMENT

AV. ROAD COND. GOOD	GEO. INTERVAL 10	SYSTEM No. 318
AV. FLD. COND. BAD	GEO./GRP. 6	SYSTEM MFG. GSC
AV. REC. QUAL. GOOD	TOTAL GEO. STRINGS 1102	TAPE FORMAT 1600 BPI
VIB. TYPE LES 311	GEO. MFG./TYP. HKL 21A	A.T.U. TYPE GSC No 2
VIB. ELECT. (PELTON)	GEO. FREQ. 10 Hz	NOTCH FILTER OUT
V.P. INTERVAL 30	GEO. INT. RES. 1000 Ω	TRACES/FILE 512
SWPS/V.P. 6	GEO. BASE SPIKE	SWEEP TIME 8 SEC.
SPREAD CONFR. 2560-0-2560	TOTAL CABLES 168	LISTEN TIME 4 SEC.
~~[illegible]~~		SAMPLE RATE 2 MS

COMMENTS, VISITORS, PARAMETERS, PERSONNEL, ETC.

2: Start crew. FU's (PM) - Layout and tool buggies.
3: Test Buggies V Tractors (7 am) - Production buggies - (4.5)
5: Production with Buggies
Visitors — Finian O'Sullivan (Geosystem's)

HOURS		LOST RECORDING TIME ANALYSIS
M		
T		
W	1.0	Vib incorrect program to sweep.
TH	0	
F	7.0	Tractors not working.
S	0	
S	0	

LIST ALL HOURLY PERSONNEL AND HOURS WORKED

TITLE	NAME	M	T	W	TH	F	S	S	Total
VIBE OP'S	B. OARCH	-	-	11½	11½	10½	10	11½	55
	J. FINN	10	8	11½	11½	10½	10	11½	73
	L. DEAN	-	-	11½	11½	10½	10	11½	55
VIBE MECH	B. WILGOSH	10	8	11½	11½	10½	10	11½	73
CHAINIES	B. MURPHY	13	10½	12½	12	10½	11½	12	82
	B. MURPHY (Jnr)	9½	11½	11½	12	10½	10½	12	75.5
	K. NOLAN	-	-	9¼	8¾	8¾	10½	8¼	44.25
CABLE REP.	A. WERTHEIM	-	-	10	11	8	10	10½	49.5
	R. BLACK	-	-	10	11	8	10	10½	49.5
[illegible]	A. [illegible]	-	-	10	10½	10	10	10½	51
[illegible]	M. [illegible]	-	-	10	8	8	10½	10½	47
TRUCK DRV.	A. FERRO	-	-	7¾	8	8	12	8	43.75
	C. WILLIAMS	-	-	12	12	8	10	8	50
	M. TURNBULL	-	-	10	8	8	10	8	44
BOX TRUCK	B. CARTER	-	-	10	9½	8	11¾	12	51.25
	B. ROBSON	-	-	11	9½	11½	11½	12	55.5
UTILITY	K. JENKINS	-	-	10½	8	8	10	10½	46.75
	V. CONLAN	-	-	9	8	8	10	8	43
	M. SMITH	-	-	9	8	11	12½	11½	52
	K. GUNDILL	-	-	9	8	8	10	8	43
	D. BUBB	-	-	8¾	8	8	10	8	42.75
	P. MCINNES	-	-	8¾	9½	8	11	8	45.25
	C. THOMPSON	-	-	9½	8	8	10	8	43.5
	C. OMA	-	-	9	11	8	10	10½	48.5
	T. MCCORKELL	-	-	8¾	8	8	10	8	42.75
	M. JONES	-	-	7¾	8	8	10	8	43.75
	P. ELLIOTT HOLKHAM	-	-	5¼	8	8	10	8	39.25
GEO MAN.	P. MEGGITT	9½	9½	11½	12½	10½	10½	12	76

MONTHLY SALARIED PERSONNEL

TITLE		NAME
P.M.	W	H. ATHORN
"	—	M. [illegible]
"	—	T. WELSH
OBSERVER	W	F. PIRMANN
"	W	H. HUME
JR OBSERVER	—	J. R.
VIBE MECH	W	B. [illegible]
	W	P. [illegible]
CAMP MECH	W	C. [illegible]
SURVEY	W	J. [illegible]
"	W	T. [illegible]
PROCESSOR		C. LUXTON

LIST No. OF ALL EQUIP. ON PARTY

PM	622436		
PERMIT			
SURVEY	6YR172	6YR174	
RECORD.	6LB937	6YR166	
CABLE	6YR165	6KP028	
VIBRATOR	Y793	Y791	Y79[illegible]
	Y787		
VIB. SER.	6LM331	6HA518	
PERSON.	6YR164	6HA5[illegible]	
UTILITY	622435	6722437	[illegible]
IDLE			

EQUIPMENT BREAKDOWNS

TRACTOR VIBRATORS NOT OPERATIONAL AFTER INITIAL TESTING

COMPLETED BY: H ATHORN

FORM CP63

GEO-SYSTEMS PTY. LTD.
173 PLANET STREET, CARLISLE, W.A. 6101

Party No.: 204
Party Head: H ATHORN

WEEKLY OPERATIONS SUMMARY

Address & Phone No.: AMBASSADOR HOTEL, SALE 443222

Client: HARTOGEN Week Ending: 13 / 1 / 85
Client Rep.: CLAUS KUBALL Location: SALE VIC

DAY/DATE	M 7	T 8	W 9	TH 10	F 11	S 12	S 13	TOTALS WEEK	TOTALS MNTH.
RECORD. HRS.	3.5	7.75	7	9	9.25	7.4	8.3	52.2	
TRAVEL HRS.	1.0	1.0	1.0	0.5	1.0	1.0	1.0	6.5	
OTHER PD. HRS.	3.5	–	2.75	–	–	1.1	–	7.35	
TOTAL PD. HRS.	8.5	9.5	11.75	10	10.75	10	9.8	70.3	
PROFILES	53	136	107/47	178	232	84/66	160	1063	
PROD. 1st VIB. No	162	321	741/706	344	893	1595/100	301	4663	
PROD. ACTUAL	1.68	4.2	4.62	5.37	7.02	4.53	4.92	32.34	
No. A.T.U. OPER.	85	90	86	87	85	90	82	102	
No. VIB. OPER.	3	3	3	3	3	3	3		
FLD. PROC. HRS.	9.5	9.5	9.5	10	10.5	9.5	10	68.5	
WEATHER	Cloudy	Fine	Windy	Cloudy	Fine	Fine	Fine		

OPERATIONAL PARAMETERS AND EQUIPMENT

AV. ROAD COND.	GOOD	GEO. INTERVAL	10	SYSTEM No.	318
AV. FLD. COND.	BAD	GEO./GRP.	6	SYSTEM MFG.	GSC
AV. REC. QUAL.	GOOD	TOTAL GEO. STRINGS	1102	TAPE FORMAT	1600 BPI
VIB. TYPE	LES 311	GEO. MFG./TYP.	MKL21A	A.T.U. TYPE	GSC No 2
VIB. ELECT. (PELTON)		GEO. FREQ.	10 HZ.	NOTCH FILTER	OUT
V.P. INTERVAL	30	GEO. INT. RES.	1000Ω	TRACES/FILE	512
SWPS/V.P.	6	GEO. BASE	SPIKE	SWEEP TIME	8 SEC.
SPREAD CONFR.	2560-0-2560	TOTAL CABLES	168	LISTEN TIME	4 SEC.
				SAMPLE RATE	2 MS

COMMENTS, VISITORS, PARAMETERS, PERSONNEL, ETC.

(7) Long line change (8) Slow prod. due detours - fences - swamps. (9) Line change (10) Prod. probs. (11) Good prod day (13) Slow prod due detours

LIST ALL HOURLY PERSONNEL AND HOURS WORKED

TITLE	NAME	M	T	W	TH	F	S	S	Total
VIBE OP'S	B. DARCH	13½	12½	12½	11½	11½	11½	11¾	84.75
	L DEAN	11	11	12½	11½	11½	11½	11¾	80.75
	J FING	11	11	12½	11½	11½	11½	11¾	80.75
	B WILGOSH	11	7½	10.5	W/C	W/C	W/C	W/C	29
	S. WHALLEY	–	11	12½	11½	11½	11½	11¾	69.75
CABLE REP.	A WERTHIEM	10	10	10¼	10	10	10	10¾	71
	K BLACK	10	10	10¼	10	10	10	10	70.25
FIELD CLERK	A SIYMAN	10¼	10	10	10	10	10	10½	70.75
LINE BOSS	M LUCAS	9½	10½	10¾	10	11½	10¼	11¼	73.75
TRUCK DRIV	A FERRELO	11	10	10	11¼	10½	10¾	11¼	74.75
	M TURNBULL	10¾	10¾	10½	–	–	–	–	32
UTILITY	K. JENKINS	9½	10	10	10	11¼	10¼	10	71
	O BUBB	9¾	10	10¼	10	8	S	10½	58.5
	V CONLAN	9½	10	10¼	11½	10	10	10½	71.75
	K GUNDILL	9½	10	10¼	10¼	10¼	10¼	10½	71
	P MCINNES	10½	10	10	10	10½	11½	11¾	74.25
	G THOMPSON	9½	10	10¼	10	10½	10	10	70.25
	C. OMA	9½	10	10	10	10	10¼	10½	70.25
	T McCORKELL	9½	10	10	10	10¼	10	10	69.75
	M JONES	9½	10	10¼	10	S	10	10	59.75
	R LOCKHART	10	10¼	10	10	10	10	10	70.25
	K NOLAN	9½	10½	10¼	10½	11	10½	10½	72.75
BOX TRUCK	B. CARTER	11½	10¾	11½	10½	11¼	11¾	11½	78.5
	D. ROBSON	10¾	11	10¾	11¼	11½	11¾	12¼	79.25
RODMAN	P MUGGITT	11	10½	10½	10½	12½	12	10	77
CHAINIES	M SMITH	11½	12½	10	11	10	10½	10	75.5
	G WILLIAMS	11	10½	10	10	10	10½	10	72
	BRIAN MURPHY	11	10	10	10	10	10½	11	72.5
UTILITY	BRENDON MURPHY	9½	10	10¾	10	10¼	10¼	10¼	71

COMPLETED BY: H ATHORN

MONTHLY SALARIED PERSONNEL

TITLE		NAME
P.M		H ATHORN
OBSERVOR		R. PERMANN
"		H HUME
VIBE TECH		P KILPATRICK
JR OBSERVOR		S. JEYASEELAN
CAMP MECH		G PAULETY
SURVEYOR		I MUGGITT
"		T NEWMAN
PROCESSOR		C [illegible]
SURVEYOR		R [illegible]
A.P.M.		P. JAMIESON
VIB TECH		B. GRIMES

LIST No. OF ALL EQUIP. ON PARTY

PM	622436		
PERMIT			
SURVEY	6YR172	6YR174	
RECORD.	6LB957	6YR166	
CABLE	6YR165	6KP028	
VIBRATOR	Y793	Y791	Y792
	Y787		
VIB. SER.	6LM331	6HA348	
PERSON.	6YR164	[illegible]	
UTILITY	622435	622437	6YX23[illegible]
IDLE			

EQUIPMENT BREAKDOWNS

Repairing tractors.

HOURS		LOST RECORDING TIME ANALYSIS
M	1.5	Vibrator inst. prob.
T	1.5	Vib. and line problems
W	0	
TH	1.0	Vib and line probs.
F	0	
S	0.5	Vib probs.
S	1.45	Inst problems.

FORM CP63

GEOSYSTEMS PTY. LTD.
173 PLANET STREET,
CARLISLE, W.A. 6101

WEEKLY OPERATIONS SUMMARY

Party No.: 204
Party Head: P. JAMIESON
Address & Phone No.: AMBASSADOR HOTEL SALE
Client: HARTOGEN
Client Rep.: CLAUS KUBALL
Location: VICTORIA
Week Ending: 20/1/85

DAY/DATE	M 14	T 15	W 16	TH 17	F 18	S 19	S 20	TOTALS WEEK	TOTALS MNTH.
RECORD. HRS.	7·25	7·5	7·5	7·5	6·25	8	8·75	52·75	
TRAVEL HRS.	1·0	1·0	1·0	1·0	1·0	1·0	1·5	7·5	
OTHER PD. HRS.	1·5	—	0·5	2·0	—	—	—	4·0	
TOTAL PD. HRS.	10·25	9·5	9·5	11	8·25	9·5	10·75	68·75	
PROFILES	32/59	156	164	48/98	159	173	188	1097	
PROD. 1st VIB. No	743/100	349	27	531/106	403	883	1405	—	
PROD. ACTUAL	1·04/3·44	4·79	5·01	1·4/2·94	4·8	5·22	5·7	33·48	
No. A.T.U. OPER.	87	85	85	84	86	86	84	—	
No. VIB. OPER.	3	3	3	3	3	3	3	—	
FLD. PROC. HRS.	10·0	10	9·5	7	10	10	9·5	66	
WEATHER	FINE	HOT	WARM	OVER CAST	OVER CAST	OVER CAST	OVER CAST		

OPERATIONAL PARAMETERS AND EQUIPMENT

AV. ROAD COND.	GOOD	GEO. INTERVAL	10	SYSTEM No.	318
AV. FLD. COND.	ROUGH.	GEO./GRP.	6	SYSTEM MFG.	GSC
AV. REC. QUAL.	GOOD.	TOTAL GEO. STRINGS	1102	TAPE FORMAT	1600 BPI
VIB. TYPE	LRS 311	GEO. MFG./TYP.	MKL21A	A.T.U. TYPE	GSC Nº2
VIB. ELECT. (PELTON)		GEO. FREQ.	10HZ	NOTCH FILTER	OUT
V.P. INTERVAL	30	GEO. INT. RES.	1000Ω	TRACES/FILE	512
SWPS/V.P.	6	GEO. BASE	SPIKE	SWEEP TIME	8 SEC.
SPREAD CONFR.	2560-0-2560	TOTAL CABLES	168	LISTEN TIME	4 SEC.
				SAMPLE RATE	2 MS

COMMENTS, VISITORS, PARAMETERS, PERSONNEL, ETC.

(14) LINE CHANGE & DETOURS (15) LINE-CHANGE (16) RECORDER PROB'S - TAPE DRIVE (17) DAN SCANLIN ARRIVED ON CREW
(18) VIB PROB (19) P. JAMIESON STATUS PARTY-MANAGER.
(20) LONG DETOURS & FENCES

F. O'SULLIVAN ARRIVED 18-1-85 DEPART 20-1-85

LOST RECORDING TIME ANALYSIS

HOURS		
M	·5	BOGGED VIB & BAD TERMINALS.
T	Ø	
W	1·25	COMP & TAPE DRIVE & VIB (MECH)
TH	Ø	
F	2·5	VIB - FLAT TYRE, MECH PROB - LINE PROBLEMS (CABLES).
S	1·5	VIB - LIFT VALVE - BAD CABLES.
S	·5	RADIO & CABLE.

LIST ALL HOURLY PERSONNEL AND HOURS WORKED

TITLE	NAME	M	T	W	TH	F	S	S	Total
VIB OP'S	B. DARCH	11½	12	11½	11½	11½	11¾	12¼	82
	J. FING	11½	12	11½	11½	11½	12	12¼	82·25
	S. WHALEY	14	12	11½	11½	11½	12	12	84·5
	P. MCINNES	11½	12	11½	11½	11½	11¾	12¼	81·75
CHAINIES	M. SMITH	9	10	10½	11	10½	10	10	61
	BRIAN MURPHY	10	10	10½	10½	12	12½	10½	76
	G. WILLIAMS	9	10	10½	11	10½	6	—	57
	P. MEGGITT	10½	11½	12¼	10	10½	14	10	78·75
CABLE REP	A. WERTHIEM	10½	10	10	10	10	10	10	70½
	R. BLACK	10	10	10¾	10	10½	10	11¼	72·5
FIELD CLERK	A. STYMAN	10	10	10	10	10	10	10	70
LINE BOSS	M. LUCAS	10¼	11¾	10¾	11	11¼	11¾	11¾	78·5
TRUCK DRIV	A. FERREO	10¼	8	11	10¼	10½	10¾	11½	72·25
	K. NOLAN	11¼	10¾	11¾	10¾	10¾	12½	12¼	80
BOT TRUCK	D. ROBSON	11½	11¼	11¾	12	12¼	11½	11¾	82
	B. CARTER	11½	12¼	11¾	12	12¼	12½	11¾	82.
UTILITY	K. JENKINS	10¼	10¼	11	10	10¼	11½	11	74·25
	D. BUBB	10	10	10½	10	10½	10	11¾	72·25
	V. CONLAN	10	10¾	10	10½	10½	10½	11	73·25
	K. GUNDILL	10¾	10¾	10¾	10¾	10¾	10½	B	64·25
	C. OMA	8	10¼	10½	10¾	10½	10	11	71
	M. JONES	10	10	10	10	10	10	11¾	71·75
	R. LOCKHART	10	10¼	10¼	10¾	10¼	10	11	72·5
	BRENDON MURPHY	10¼	10¼	10½	10¾	10½	4	11	67·25
	C. HIGGINS	—	—	—	—	10½	10½	11	32
MECH.	P. DELOPULOS	—	—	—	.	.	.	10	41¼

MONTHLY SALARIED PERSONNEL

TITLE		NAME
P.M.		P. JAMIESON
OBSERVOR		R. PERMANN
"		H. HUME
VIB. TECH		P. KILPATRICK
JR OBSERVOR		S. JEYASEELAN
CAMP MECH.		G. RAFFERTY
SURVEYORS		J. MEGGITT
		T. NEWMAIR
PROCESSOR.		C. LUXTON
SURVEYOR		R. LOUSIER
VIBE-TECH	USA	BILLY GRIMES
"	USA	DAN SCANLIN

LIST No. OF ALL EQUIP. ON PARTY

PM	622436 ✓		
PERMIT			
SURVEY	6YR172	6YR174	
RECORD.	6L8937	6YR166 ✓	
CABLE	6YR165	6KP028 ✓	
VIBRATOR	Y793	Y791	Y792
	Y787		
VIB. SER.	6LM331	[illegible] ✓	
PERSON.	6YR164	6HA318	
UTILITY	622435	622437	6YX2[illegible]
IDLE			

EQUIPMENT BREAKDOWNS

MONTHLY SALARY
LALITH JAYAMAHA MILL[illegible]
TRACTOR VIBRATORS NOT OPERATIONAL.

COMPLETED BY: P. JAMIESON

FORM CP63

WEEKLY OPERATIONS SUMMARY

GEO-SYSTEMS PTY. LTD.
173 PLANET STREET,
CARLISLE, W.A. 6101

Party No.: 209
Party Head: P. JAMIESON
Address & Phone No.: AMBASSADOR HOTEL SALE
Client: HARTOGEN
Client Rep.: CLAUS KUBALL
Week Ending: 27/01/'85
Location: VICTORIA

DAY/DATE	M 21	T 22	W 23	TH 24	F 25	S 26	S 27	TOTALS WEEK	TOTALS MNTH.
RECORD. HRS.	10.75	4.5	8.5	8.	6.	7.	8.5	53.25	188.7
TRAVEL HRS.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	7.0	26
OTHER PD. HRS.	.5	1.5	.5	.5	[illegible]	.5	0.5	3.5	48.85
TOTAL PD. HRS.	12.25	6.0	10	[illegible]	[illegible]	[illegible]	10	63.75	243
PROFILES	237	101	204	206	149	183	233	1311	3865
PROD. 1st VIB. No	829	1083	1783	1171	547	100	655	—	—
PROD. ACTUAL	7.30	3.0	6.12	6.24	4.5	5.52	7.02	34.7	117.97
No. A.T.U. OPER.	89	86	86	86	86	85	86	—	—
No. VIB. OPER.	3	3	3	3	3	3	3	—	—
FLD. PROC. HRS.	4.75	1.5	9.5	11	9.5	4.5	9.5	68.25	247.25
WEATHER	FINE	OVERCAST	OVERCAST	OVERCAST	FINE	FINE	FINE		

OPERATIONAL PARAMETERS AND EQUIPMENT

AV. ROAD COND.	GOOD	GEO. INTERVAL	10	SYSTEM No.	318
AV. FLD. COND.	ROUGH	GEO./GRP.	6	SYSTEM MFG.	GSC
AV. REC. QUAL.	GOOD	TOTAL GEO. STRINGS	1102	TAPE FORMAT	1600 BPI
VIB. TYPE	[illegible] 311	GEO. MFG./TYP.	MARK 21 A	A.T.U. TYPE	GSC No 2
VIB. ELECT. (PELTON)		GEO. FREQ.	10 HZ	NOTCH FILTER	OUT
V.P. INTERVAL	50	GEO. INT. RES.	1000 SL	TRACES/FILE	512
SWPS/V.P.	6	GEO. BASE	SPIKE	SWEEP TIME	6 SEC.
SPREAD CONFR.	2500-0-2500	TOTAL CABLES	168	LISTEN TIME	4 SEC.
				SAMPLE RATE	2 MS

COMMENTS, VISITORS, PARAMETERS, PERSONNEL, ETC.

VISITORS: I. FAY ARRIVED ON 25-01-'85.

HOURS		LOST RECORDING TIME ANALYSIS
M	1.0	RECORDER COMP. PROBS. AND VIBE [illegible] PROBS.
T	0.5	BAD CABLES
W	1.0	BAD TERMINAL BOXES
TH	1.0	VIBE PROBS. - RADIO
F	1.75	VIBE PROBS [illegible] - LINE PROBS. - CHANGING INSTRUMENT
S	[illegible]	BAD CABLES AND CHANGING CABLES
S	1.75	BAD CABLES

LIST ALL HOURLY PERSONNEL AND HOURS WORKED

TITLE	NAME	M	T	W	TH	F	S	S	Total
VIBE OP'S	B. DARCH	11¾	12	15½	15½	13¾	11¾	14½	94½
"	J. TING	11¾	12	15½	15½	13¾	11¾	14½	94½
"	S. [illegible]LEY	11¾	12	15½	15½	13¾	11¾	14½	94½
"	P. [illegible]	11¾	12	15½	15½	13¾	11¾	14½	94½
SURVEY	M. [illegible]	12½	11½	12	12½	11	13½	12½	85½
"	[illegible]	11	ON	LEAVE	—	—	—	—	11
"	C. [illegible]	8	10	13½	10	10	11½	12½	72½
"	P. [illegible]	10	12	13½	13½	10	11½	12½	78
[illegible]	A. [illegible]	10	11	10	10	10	10	10	71
"	R. [illegible]	10½	11	11½	10	10	10	10	73
[illegible]	[illegible]	—	—	11	11	10	10		42
[illegible]	[illegible]	11	12½	12	12½	11½	11¾	11	82
[illegible]	A. TERCEO	12¼	12½	11½	11	10	12¼	11¾	79¼
"	[illegible] NOLAN	11	12½	13½	10½	11½	11¼	11½	81½
[illegible]	D. ROBSON	10½	12½	11½	11½	11	11¾	11¾	80¼
"	P. CARTER	10¾	12½	11½	11½	11	12	11½	80¼
UTILITY	[illegible]	10¾	10½	13	10	11½	11	11½	78
"	[illegible]	10¾	10	11	11¾	11½	10½	11	76
"	[illegible]	10½	10	11¼	10	11½	10½	10½	74½
"	M. JONES	10½	10	11¾	11	10	10¾	10½	74
"	R. [illegible]	10½	10½	13½	11½	11	10¾	10½	77¼
"	[illegible] MURPHY	10¾	[illegible]			—	—	—	10¾
"	[illegible] HIGGINS	10¾	10	10	10	8	9½	10½	68½
"	T. McCorkell	10½	10½	10½	10½	11½	11	10½	74¼
"	P. Delopulos	10	11	10	10½	11	10½	10½	73½
"	L. DEAN	10½	10½	13½	10	11½	11	10½	76¾
"	A. DAVIS	10¾	10½	10	10	11½	11	10½	73¾
"	R. STRAW	10½	10	10	10	11½	10½	10½	72½
"	A. TABLEY			10	11½	11½	10½	10	53½

MONTHLY SALARIED PERSONNEL

TITLE		NAME
P.M.		P. JAMIESON
OBSERVER		R. FERNANDO
"		H. HUME
" Extra.		P. CATHERINE
JR. OBSERVER		[illegible]
MECHANIC		L. JAYAMAHA
CAMP TECH		G. RATTELY
SURVEYOR		J. MERRITT
"		T. NEWMAN
"		R. [illegible]
PROCESSOR		[illegible]
[illegible]		Kilpatrick

LIST No. OF ALL EQUIP. ON PARTY

PM	62-150		
PERMIT			
SURVEY	[illegible]	[illegible]	
RECORD.	[illegible]	[illegible]	
CABLE	[illegible]	[illegible]	
VIBRATOR	[illegible]	[illegible]	[illegible]
	[illegible]		
VIB. SER.	[illegible]		
PERSON.	[illegible]	[illegible]	
UTILITY	622-155	[illegible]	[illegible]
IDLE			

EQUIPMENT BREAKDOWNS

~~Monthly Salary~~
VIBE-TECH [illegible]
" D. [illegible]

COMPLETED BY: P. JAMIESON

FORM CP63

[illegible] STEMS PTY. LTD.
173 PLANET STREET,
CARLISLE, W.A. 6101

WEEKLY OPERATIONS SUMMARY

Party No.: 204 Party Head: P. JAMIESON
Address & Phone No.: AMBASSADOR HOTEL SALE
Client: HARTOGEN Client Rep.: C. KUBALL
Week Ending: 03/02/85 Location: SALE, VICT.

DAY/DATE	M 28	T 29	W 30	TH 31	F 01	S 02	S 03	TOTALS WEEK	TOTALS MNTH.
RECORD. HRS.	9.25	7.25	8.5	8.5	7.75	8.5	8.75	58.00	24.50
TRAVEL HRS.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	7.00	3.00
OTHER PD. HRS.	0.75	0.5	0.5	0.5	2.25	0.5	1.25	6.25	8.00
TOTAL PD. HRS.	10.75	8.75	10	10	11	10	10.50	71.00	31.50
PROFILES	241	180	200	208	166	232	201	1478	599
PROD. 1st VIB. No	1357	2065	1525	925	292	1741	1039		
PROD. ACTUAL	7.23	5.37	6.0	6.33	5.01	7.02	6.06	43.02	18.01
No. A.T.U. OPER.	86	85	85	85	85	86	86		
No. VIB. OPER.	3	3	3	3	3	3	3		
FLD. PROC. HRS.	10.0	10.0	10.0	9.25	5.5	10.5	10.00	67.00	27.00
WEATHER	FINE	FINE	WARM	RAINY	FINE	FINE	HOT		

OPERATIONAL PARAMETERS AND EQUIPMENT

AV. ROAD COND.	GOOD	GEO. INTERVAL	10	SYSTEM No.	218
AV. FLD. COND.	ROUGH	GEO./GRP.	6	SYSTEM MFG.	GSC
AV. REC. QUAL.	GOOD	TOTAL GEO. STRINGS	1102	TAPE FORMAT	1600 BPI
VIB. TYPE	LES 311	GEO. MFG./TYP.	MKL2 1A	A.T.U. TYPE	GSC No 2
VIB. ELECT. (PELTON)		GEO. FREQ.	10 HZ	NOTCH FILTER	OUT
V.P. INTERVAL	30	GEO. INT. RES.	1000 SL	TRACES/FILE	512
SWPS/V.P.	6	GEO. BASE	SPIKE	SWEEP TIME	8 SEC.
SPREAD CONFR.	2560-0	TOTAL CABLES	168	LISTEN TIME	4 SEC.
	2560			SAMPLE RATE	2 MS

COMMENTS, VISITORS, PARAMETERS, PERSONNEL, ETC.

31.1.85 Jim Ray · D. Scanlon Leave } Visitors
30.1.85 S. Geches - Hartogen Arrives Sale }

HOURS	LOST RECORDING TIME ANALYSIS
M	[struck out]
T 0.75	0.5 Tuning up radio / 0.25 bad box
W 0.25	0.25 Vibe down.
TH 1.0	0.5 Radio - 0.5 bad cable.
F —	
S 0.75	Simms problem.
S 0.25	[illegible] Box

LIST ALL HOURLY PERSONNEL AND HOURS WORKED

TITLE	NAME	M	T	W	TH	F	S	S	Total
VIBE-OP.	B. DARCH	12	14½	12	11½	ON LEAVE			50.0
"	J. TING	12	14½	12	11½	11½	11¾	11½	84¾
"	S. WHALLEY	12	14½	12	11½	11½	11¾	11½	84¾
"	P. Mc INNES	12	14½	12	11½	11½	11¾	11½	84¾
SURVEY	M. SMITH	12	15	11	12	12	11½	13½	87
"	C. OMA	13	12	-	-	-	-		25
"	P. MEGGITT	13	12	10¼	10½	10¼	10½	10½	77¼
CABLE-REP.	A. WERTHEIM	10	10	10	5	10	10	10	65
"	K. BACK	10	10½	10	10	10½	10	10	71
FIELD-CLERK	E. RATHBONE	10	10	11½	10	10	10	10	71½
TRUCK-DRIV.	A. TERRED	12	12¾	10½	10½	10¾	10¾	10¾	75¾
"	K. NOLAN	12¼	12	11¾	11	10½	11¼	10½	80
BOX TRUCK	D. ROBSON	12¼	11¾	12	12	12	11¾	11¾	83½
"	B. CARTER	14¼	11½	7	11¾	11	11¼	11½	80¼
UTILITY	K. JENKINS	11¼	10¾	9¼	11	10½	10½	10½	73
"	Q. BUBB	10¾	10¾	11	12½	13	12½	11¾	82¼
LINE BOSS	V. CONLAN	11¾	11½	9½	11	10½	11	10¼	76½
UTILITY	M. JONES	10½	10¾	10½	12½	10	12¼	11¾	78¼
"	C. HIGGINS	11½	10¾	9¼	11	8	10½	10½	71½
"	T. Mc CORKELL	11¼	10¾	9¼	10½	10½	10½	10½	72¾
"	P. DELOPULOS	10	10¼	10½	11½	12	12	9½	75¾
"	L. DEAN	11½	10¾	12	11	11½	11¾	11½	80
"	A. DAVIS	10¾	11¾	9¾	11	10¼	10½	10½	74
"	R. STRAW	11½	10¾	9¼	10½	10¼	10½	10½	72¾
"	A. TAPLEY	12	13	11¼	10¾	12	10½	11¾	81¼
"	G. THOMPSON	-	-	9½	7	10	10½	10¼	47¼
"	C. RYAN	-	-	9½	11	10¼	10½	10¼	51¼
"	P. KERMOND	-	-	9¼	10½	10½	10¼	10¼	50½
"	T. CARTER	-	-	-	-	10¼	10½	10¼	31

COMPLETED BY: C. [illegible]

MONTHLY SALARIED PERSONNEL

TITLE		NAME
P.M		P. JAMIESON
OBSERVER		R. PERMAIN
"	L	H. HUME
"	205	P. RATHBONE
JR. OBSERVER		S. JEYASEELN
MECHANIC		L. JAYAMAHA
CAMP MECH.		G. CAFFERTY
SURVEYOR		T. MEGGITT
"		T. NEWMAN
"		K. [illegible]
PROCESSOR		[illegible]ATON/B.H.
APM		S. BARBOUR

LIST No. OF ALL EQUIP. ON PARTY

PM	6--456		-
PERMIT			
SURVEY	6YR112	6YR111	
RECORD.	OLB131	6YR106	
CABLE	6YR165	6KPO28	
VIBRATOR	Y743	Y741	Y74-
	Y137		
VIB. SER.	[illegible]		
PERSON.	6YR164	6MA515	
UTILITY	622455	62245[illegible]	6YR[illegible]
IDLE			

EQUIPMENT BREAKDOWNS

~~MONTHLY [illegible]~~
VIBE TECH B. GRIMES
" D. SCANLON

FORM CP63

GEO-SYSTEMS PTY. LTD.
173 PLANET STREET,
CARLISLE, W.A. 6101

WEEKLY OPERATIONS SUMMARY

Party No.: 204
Party Head: P. JAMIESON
Address & Phone No.: Ambassador Hotel Ade
Client: HARTOGEN
Client Rep.: C. KIMBALL
Week Ending: 10.02.'85
Location: VICTORIA

DAY/DATE	M 04	T 05	W 06	TH 07	F 08	S 09	S 10	TOTALS WEEK	TOTALS MNTH.
RECORD. HRS.	6.5	7.75	8.75	7.25	8.50	7.75	8.75	55.25	79.75
TRAVEL HRS.	1.0	1.00	1.00	1.00	1.00	1.00	1.0	7.0	10
OTHER PD. HRS.	2.5	1.25	1.00	2.50	1.00	2.25	1.5	12.0	20
TOTAL PD. HRS.	10	10	10.75	10.75	10.00	11	11.25	78.75	105.25
PROFILES	112/71	195	236	173/61	232	110/103	232	2575	3124
PROD. 1st VIB. No	433/10	223	817	1531/103	283	949/100	415		
PROD. ACTUAL	5.52	5.94	7.14	7.05	7.05	6.39	27.8	46.11	64.2
No. A.T.U. OPER.	90	92	90	92	94	94	93		
No. VIB. OPER.	3	3	3	3	3	3	3		
FLD. PROC. HRS.	11.25	12.75	11.50	12.00	11.75	11.00	11.10	82.35	107.35
WEATHER	HOT/THUNDER	FINE	FINE	FINE/THUNDER	FINE	FINE	FINE		

OPERATIONAL PARAMETERS AND EQUIPMENT

AV. ROAD COND.	GOOD.	GEO. INTERVAL	10	SYSTEM No.	318
AV. FLD. COND.	ROUGH	GEO./GRP.	6	SYSTEM MFG.	SSC
AV. REC. QUAL.	GOOD.	TOTAL GEO. STRINGS	1102	TAPE FORMAT	1600 BPI
VIB. TYPE	LRS 311	GEO. MFG./TYP.	MK12 1A	A.T.U. TYPE	SSC N°2
VIB. ELECT. (PELTON)		GEO. FREQ.	10Hz	NOTCH FILTER	OUT
V.P. INTERVAL	30	GEO. INT. RES.	1000 SL	TRACES/FILE	512
SWPS/V.P.	6	GEO. BASE	SPIKE	SWEEP TIME	8 SEC.
SPREAD CONFR.		TOTAL CABLES	160	LISTEN TIME	4 SEC.
2560 - 0 - 2560				SAMPLE RATE	2 MS

COMMENTS, VISITORS, PARAMETERS, PERSONNEL, ETC.

All Riding Smoothly. All Coming Along Fine

[signature]

LOST RECORDING TIME ANALYSIS

HOURS		LOST RECORDING TIME ANALYSIS
M	4	D/T 0.50 Hon. Riverside Crew to Vibes (Radio Prob) 0.75 Vibe stuck in low Rng
T	5	0
W	6	0
TH	7	0
F	8	0
S	9	0
S	10	D/T 1.0 BAD CABLE SIM PROBLEMS

LIST ALL HOURLY PERSONNEL AND HOURS WORKED

TITLE	NAME	M	T	W	TH	F	S	S	Total
vibe-op	J. Fry	12	11½	11	11½	11¾	12	13½	83½
"	S. Whalley	12	11½	11	11½	10¾	10¼	10½	77
"	P. M'Innes	12	11½	11	11½	11¾	12	13½	83¼
"	L. Dean	12	11½	11	11½	11¾	12	13½	83¼
SURVEY	M. Smith	13	13	14½	[illegible]	11½	11½	10	85
"	M. Jones	10½	12	10	11½	11½	10½	11½	77¼
"	D. Bubb	12½	12	10	[illegible]	10	10	10	74½
"	A. Tapley	10	10	11	[illegible]	12½	11	11	75¾
	R. Murphy	–	[illegible]	11	[illegible]	12½	11	13½	69½
CABLE-REP	A. Wecinfur	10	10¼	10		10	10	10	70¼
"	K. Lac	10	11	10	[illegible]	10	10	10	71
FIELD MEN	L. LAINE	–	–	10	[illegible]	10	10	10	50
LINE BOSS	L. CONLAN	12	10½	10¾	[illegible]	10½	10½	11½	76
TRUCK DRV	A. FERREO	10	11½	[illegible]	[illegible]	11¼	11¼	11¾	77½
"	K. Nolan	10½	RESIGNED						
BOX TRUCK	D. Robson	11	11¼	12	[illegible]	12	11½	13¼	92¼
"	B. Carter	11	11½	11½	[illegible]	11½	11½	12	80½
Utility	A. Davis	10	10	[illegible]	[illegible]	10¼	10½	10½	69½
"	L. Ryan	10	10	10	[illegible]	10¼	10½	10½	71
"	C. Higgins	10	10½	10½	[illegible]	10¼	10¼	11	72¼
"	T. M'Connell	10	10½	10½	[illegible]	11¾	10½	13½	73¼
"	P. Delopoulos	10½	11½	10	[illegible]	10¾	11	9½	73¼
"	R. Strow	10	10	10	10	10¼	10½	10½	71¼
"	G. Thompson	7¼	10	10½		9½	10¼	10½	70¾
"	P. Redmond	10½	10	10	10	11	10¼	11	72¾
"	J. CARTER	10	10	10	[illegible]	10¼	10¼	10½	71
"	P. MEGGITT	10	Reind						
	G. WILLIAMS	–	–	10	10	11½	11½	10	54½
	P. GUNDILL	–	–	11½	10	10¼	10¾	10¾	53¼
	V. N[illegible]	–	–	10½	10	10½	10½	13½	52½

MONTHLY SALARIED PERSONNEL

TITLE		NAME
PM		P. Jamieson
APM		S. Barbour
OBSERVERS		R. Perman
— " —		H. Hunt
Jr Observer		S. Jayasingh
Mechanic		L. Jayamaha
Vibe Mech	USA	B. Grimes
— " —		S. Rafferty
— " —	L	P. Kilpatrick
Surveyors		T. Meggitt
— " —		T. Newmarr
— " —		R. Coulter

LIST No. OF ALL EQUIP. ON PARTY

PM	622 436		
PERMIT			
SURVEY	6YR172	6YR176	
RECORD.	6C0937	6YR166	
CABLE	6YR161	6KP02E	
VIBRATOR	Y793	Y791	Y792
	Y787		
VIB. SER.	6LM331		
PERSON.	6YR164	6MA132	
UTILITY	622435	622637	6Y22
IDLE			

EQUIPMENT BREAKDOWNS

Monthly Survey:
Processor - A. Hipkiss
Observers - M. Sehinen.

COMPLETED BY: S. BARBOUR.

FORM CP63

WEEKLY OPERATIONS SUMMARY

GEO-SYSTEMS PTY. LTD.
173 PLANET STREET,
CARLISLE, W.A. 6101

Party No.: 204 Party Head: P. JAMIESON
Address & Phone No.: AMBASSADOR HOTEL SALE
Client: HARTOGEN Week Ending: 17/1/2
Client Rep.: C. KUBALL Location: VICTORIA

DAY/DATE	M 11	T 12	W 13	TH 14	F 15	S 16	S 17	TOTALS WEEK	TOTALS MNTH.
RECORD. HRS.	6.75	7.75	7.0	8.5	7.25	7.5	8	52.75	132.5
TRAVEL HRS.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	7.00	17
OTHER PD. HRS.	1.75	1.0	1.75	1.25	2.75	2.0	1.5	12.0	32
TOTAL PD. HRS.	9.5	9.75	9.75	10.75	11.00	10.5	10.5	71.75	177
PROFILES	202	221	32/157	160/75	496/103	92/119	234	1891	5015
PROD: 1st VIB. No	1462	859	196/100	574/820	598/700	595/1351	991		
PROD: ACTUAL	6.03	6.63	5.7	7.02	6.03	6.33	7.02	44.76	108.96
No. A.T.U. OPER.	91	90	92	90	85	97	90		
No. VIB. OPER.	3	3	3	3	3	3	3		
FLD. PROC. HRS.	11.75	11.75	11.25	11.75	11.50	14.75	11.75	81.5	190.85
WEATHER	FINE	FINE	FINE	FINE	FINE	VERY WINDY	FINE	----	

OPERATIONAL PARAMETERS AND EQUIPMENT

AV. ROAD COND. GOOD	GEO. INTERVAL 10	SYSTEM No. 318
AV. FLD. COND. ROUGH	GEO./GRP. 6	SYSTEM MFG. GSC
AV. REC. QUAL. GOOD	TOTAL GEO. STRINGS 1102	TAPE FORMAT 1600 BPI
VIB. TYPE LES 311	GEO. MFG./TYP. MKL 21A	A.T.U. TYPE GSC N°2
VIB. ELECT. (PELTON)	GEO. FREQ. 10 HZ	NOTCH FILTER OUT
V.P. INTERVAL 30	GEO. INT. RES. 1000 SL	TRACES/FILE 512
SWPS/V.P. 6	GEO. BASE SPIKE	SWEEP TIME 8 SEC.
SPREAD CONFR. 2560-0 2560	TOTAL CABLES 168	LISTEN TIME 4 SEC.
		SAMPLE RATE 2 MS

COMMENTS, VISITORS, PARAMETERS, PERSONNEL, ETC.

LOST RECORDING TIME ANALYSIS

HOURS		
M	11	D/T Bad Cable 1.0
T	12	D/T Computer Problem .5 Bad Cable .75
W	13	D/T Line Problem .75 Vibe .5
TH	14	D/T Ø
F	15	D/T Ø
S	16	D/T Bad Terminal .25
S	17	D/T Bad Terminals and cables

LIST ALL HOURLY PERSONNEL AND HOURS WORKED

TITLE	NAME	M	T	W	TH	F	S	S	Total
VIB-OP	J. FING	11 3/4	12	12 1/4	10 1/2	12	11 1/2	11 1/2	91 1/2
"	P. McINNES	11 3/4	12	12 1/4	11 1/2	12	11 1/2	11 1/2	82 1/2
"	L. DEAN	11 3/4	12	12 1/4	11 1/2	8	11 1/2	11 1/2	78 1/2
"	T. McCORNELL	11 3/4	12	12 1/4	15	11 1/2	11 1/2	11 1/2	85 1/2
"	B. DARCH	-	-	-	-	12	11 1/2	11 1/2	35
SURVEY	M. SMITH	11	10	11 1/4	11	11	10	11	75 1/4
"	A. TAPLEY	11	11 1/2	11 1/2	12	10	10	10	76
"	G. WILLIAMS	11	10	11 1/4	11	11	10	10 1/2	74 3/4
"	B. MURPHY	11 1/2	13 1/2	12	12 1/2	12	12	10 1/2	84
"	P. JENSEN	-	-	-	12	10	2		
CAB-KEP	A. WERTHEIM	10 1/2	10	10	10	9 1/2	9 1/2	10	69 1/2
"	K. BLACK	10	10	10	10	10	10	10	70
FIELD-CLERK	L. LAINE	10	10	10	10	10	10	10	70
LINE-BOSS	M. LUCUS	-	11 1/2	10 1/2	10 3/4	10 3/4	10 1/2	10 1/2	64 1/2
TRUCK-LINE	K. GUNDILL	10 3/4	11 1/4	10 1/4	11	10	10 3/4	10 1/2	74 1/2
" "	A. FERREO	10 3/4	11 3/4	10 3/4	11 1/2	10 3/4	10 3/4	12 1/4	78
" "	V. NOCK	11 1/4	11 1/2	10 3/4	10 3/4	10 3/4	10 3/4	11	76 3/4
FOX-TRUCK	D. ROBSON	11 3/4	12	12 1/2	11 1/2	11 1/2	11 1/4	12 1/2	83
"	F. CARTER	11 3/4	11 3/4	11 3/4	11 1/2	11 1/4	10 1/2	11 3/4	80 1/4
UTILITY	A. DAVIS	11	5 1/2	10 1/4	10 1/2	10 1/4	10 1/2	-	58
"	C. RYAN	10 1/2	11	10 1/4	10 1/2	10 1/2	10 1/2	10 1/4	73 1/2
"	P. DELATULOS	10 1/2	11	11 1/2	6	13 1/2	11 1/2	12	76
"	F. STRAW	10	11	10 1/4	10 1/4	10 1/2	10	12 1/4	74 1/4
"	E. THOMPSON	10 1/2	11	10 1/4	10 1/4	10 1/2	10 1/2	10 1/2	73 1/2
"	F. KERMOND	10	11	10 1/4	10 1/2	10	10 3/4	10 1/2	73 1/4
"	J. CARTER	10 1/2	11	10 1/4	10 1/2	10 1/2	10 1/2	10 1/4	73 1/2
"	P. MEGGITT	-	-	BREAK		-	-	-	
"	D. BUBB	10	11 1/4	10 1/4	BREAK		-	-	31 1/2
"	M. JONES	11	11 3/4	11 1/2	10 1/2	10 1/4	10 1/2	10 1/2	76
"	S. WHALLEY	10	11 3/4	BREAK		-	-		21 3/4
"	V. CONLAN	-	-	-	-	-	-	10 1/2	10 1/2

COMPLETED BY:

MONTHLY SALARIED PERSONNEL

TITLE		NAME
P.M		P. JAMIES[illegible]
A.P.M		S. BARBO[illegible]
OBSERVER		R. PERMA[illegible]
JR. OBSERVER		S. JEYAS[illegible]
VIB MECH		P. KILLA[illegible]
" "		B. GRIME[illegible]
SURVEYOR		R. LOSIE[illegible]
"		T. NEUM[illegible]
PROCESSOR		F. HIPN[illegible]
OBSERVER		M. SEME[illegible]
SURVEYOR		H. MATTH[illegible]
VIB TECH		G. JONES

LIST No. OF ALL EQUIP. ON PARTY

PM	622 431		
PERMIT			
SURVEY	6YR 172	6YR 174	
RECORD.	6LB 937	LYR 116	
CABLE	6YR 115	LKP 78	
VIBRATOR	Y 793	Y 791	Y 7[illegible]
	Y 787		
VIB. SER.	[illegible]		
PERSON.	[illegible]	LMA [illegible]	
UTILITY	622 635	[illegible]	[illegible]
IDLE			

EQUIPMENT BREAKDOWNS

FORM CP63

GEO-SYSTEMS PTY. LTD.
173 PLANET STREET,
CARLISLE, W.A. 6101

WEEKLY OPERATIONS SUMMARY

Party No.: 204
Party Head: P JAMIESON
Address & Phone No.: AMBASSADOR HOTEL SALE
Client: HARTOGEN
Client Rep.: C KUBALL
Week Ending: 24/2/85
Location: VICTORIA

DAY/DATE	M 18	T 19	W 20	TH 21	F 22	S 23	S 24	TOTALS WEEK	TOTALS MNTH.
RECORD. HRS.	7.25	9.25	7.00	1.5				25.0	157.5
TRAVEL HRS.	1.0	1.0	.5	.5				3.0	20
OTHER PD. HRS.	2.50	1.50	1.75	4.0				9.75	41.75
TOTAL PD. HRS.	10.75	11.75	9.25	6.0				37.75	214.75
PROFILES	63/139	241	197	37				677	5692
PROD. 1st VIB. No	289/1962	1519	796	196					
PROD. ACTUAL	6.12	7.23	6.0	1.14				20.49	129.45
No. A.T.U. OPER.	90	93	93	94					
No. VIB. OPER.	3	3	3	3					
FLD. PROC. HRS.	10.75	11.5	10.5	12.0				44.75	235.6
WEATHER	FINE	FINE	RAINING FINE	FINE					

OPERATIONAL PARAMETERS AND EQUIPMENT

AV. ROAD COND. GOOD	GEO. INTERVAL 10	SYSTEM No. 318
AV. FLD. COND. ROUGH	GEO./GRP. 6	SYSTEM MFG. GSC
AV. REC. QUAL. GOOD	TOTAL GEO. STRINGS 1102	TAPE FORMAT 1600 BPI
VIB. TYPE LES 311	GEO. MFG./TYP. MKL 21A	A.T.U. TYPE GSC No 2
VIB. ELECT. (PELTON)	GEO. FREQ. 10 HZ	NOTCH FILTER OUT.
V.P. INTERVAL 30	GEO. INT. RES. 1000SL	TRACES/FILE 512
SWPS/V.P. 6	GEO. BASE SPIKE	SWEEP TIME 8 SEC.
SPREAD CONFR. 2560-0-2560	TOTAL CABLES 168	LISTEN TIME 4 SEC.
		SAMPLE RATE 2 MS

COMMENTS, VISITORS, PARAMETERS, PERSONNEL, ETC.

END OF PROSPECT EP 94
TOTAL Km 272.58
TOTAL CHARGABLE HRS 498.5

21-FEB-85

LOST RECORDING TIME ANALYSIS

HOURS		
18M	0	
19T	.25	
20W	7.75	D/T Instrument Problem
21TH	0	
22F		
23S		
24S		

LIST ALL HOURLY PERSONNEL AND HOURS WORKED

TITLE	NAME	M	T	W	TH	F	S	S	Total
VIB-OP	J. FING	12¼	12½	13¼	11¼	9	9½	10½	78¼
" "	P INNES	-	-	-	-	-	-	-	-
" "	L DEAN	12¼	11¾	13¼	11¼	9	9½	7	69
" "	T McCORKELL	13¾	11¼	13¼	11¼	9	9	10½	82
" "	B DARCH	12¼	12½	13¼	11¼	9	9½	10½	78¼
SURVEY	M SMITH	11	10	10	13	11	10	8½	73½
"	A TAPLEY	10	10	10¾	10½	8	10	8	67¼
"	G WILLIAMS	11	10	10	13	11	10	8½	73½
"	F MURPHY	10½	12½	-	10	9	11	9½	62½
CAB-REP	A WERTHEIM	10	10	10½	10	9	9½	3½	62½
" "	R BLACK	10	10	10	9¾	8	9½	3½	60¾
FIELDCLERK	L LAINE	10	10	10	10	10	9½	2	61½
LINE-BOSS	M LUKAS	10½	12	11	9	9	9	3½	64
TRUCK-DRIVER	K GUNDILL	10¾	12¼	10¾	8	8	9½	10½	69¾
" "	A FERREO	11	12¼	11½	9	8	9	3½	64¼
" "	V NOCK	11	12	11	8½	9	9½	10½	71½
UTILITY	J. ANDERSON	-	-	-	-	-	-	9	9
BOX TRUCK	D ROBSON	11	12½	-	-	-	-	-	23½
"	R CARTER	11½	12½	12½	11¼	8	9¾	10½	76
UTILITY	A DAVIS	-	-	9½	8	-	-	-	17½
UTILITY	C RYAN	10½	11¾	12	8	8	9½	3½	62¼
"	P DELAPULOS	12½	12	11	10½	10	9½	11	76½
"	R STRAW	10½	11¾	10¾	9	8	-	-	50
"	G THOMPSON	10¼	11¾	10½	8	8	9½	10½	68½
"	P KERMOND	10½	11¾	10¾	10¾	8	9	3½	64¼
"	J CARTER	10¾	11¾	10¾	8	8	9½	3½	62¼
"	M JONES	10¾	12	12	8	8	9½	10½	70¾
"	V CONLAN	10½	12	13	11¼	8	9¾	10½	75
"	K JENKINS	10¾	11¾	10¾	8	8	9½	10½	69¼
"	F MEGGIT	-	-	10½	8	8	9½	10½	46½
"	C HIGGENS	-	-	-	-	-	9½	10½	20
"	S WHALLEY	-	-	10¾	10¾	8	9½	10	49

MONTHLY SALARIED PERSONNEL

TITLE		NAME
P.M	Field	P JAMIESON
A.P.M	"	S BARBOUR
OBSERVER	F/B	R PERMANN
VIB MECH	F	P KILPATRICK
" "	USA	B GRIMES
SURVEYOR	F/B	R LOSIER
"	Break	T NEUMAIR
PROCESSOR	F	B HIPKISS
OBSERVER	F/B	M SEMEN
SURVEYOR	F	B MATTHAI
VIB TECH	F	G JONES
SURVEYOR	F	J MEGGIT

LIST No. OF ALL EQUIP. ON PARTY

PM	6?? 636		
PERMIT			
SURVEY	6YR 172	6YG 174	
RECORD.	6LB 937	6YR 166	
CABLE	6YR 165	6KP 028	
VIBRATOR	Y 793	Y 791	Y 792
	Y 797		
VIB. SER.	GLM 331		
PERSON.	6YR 166	6MA 312	
UTILITY	622 435	622 437	6YK 2?
IDLE			

EQUIPMENT BREAKDOWNS

COMPLETED BY:

FORM CP63

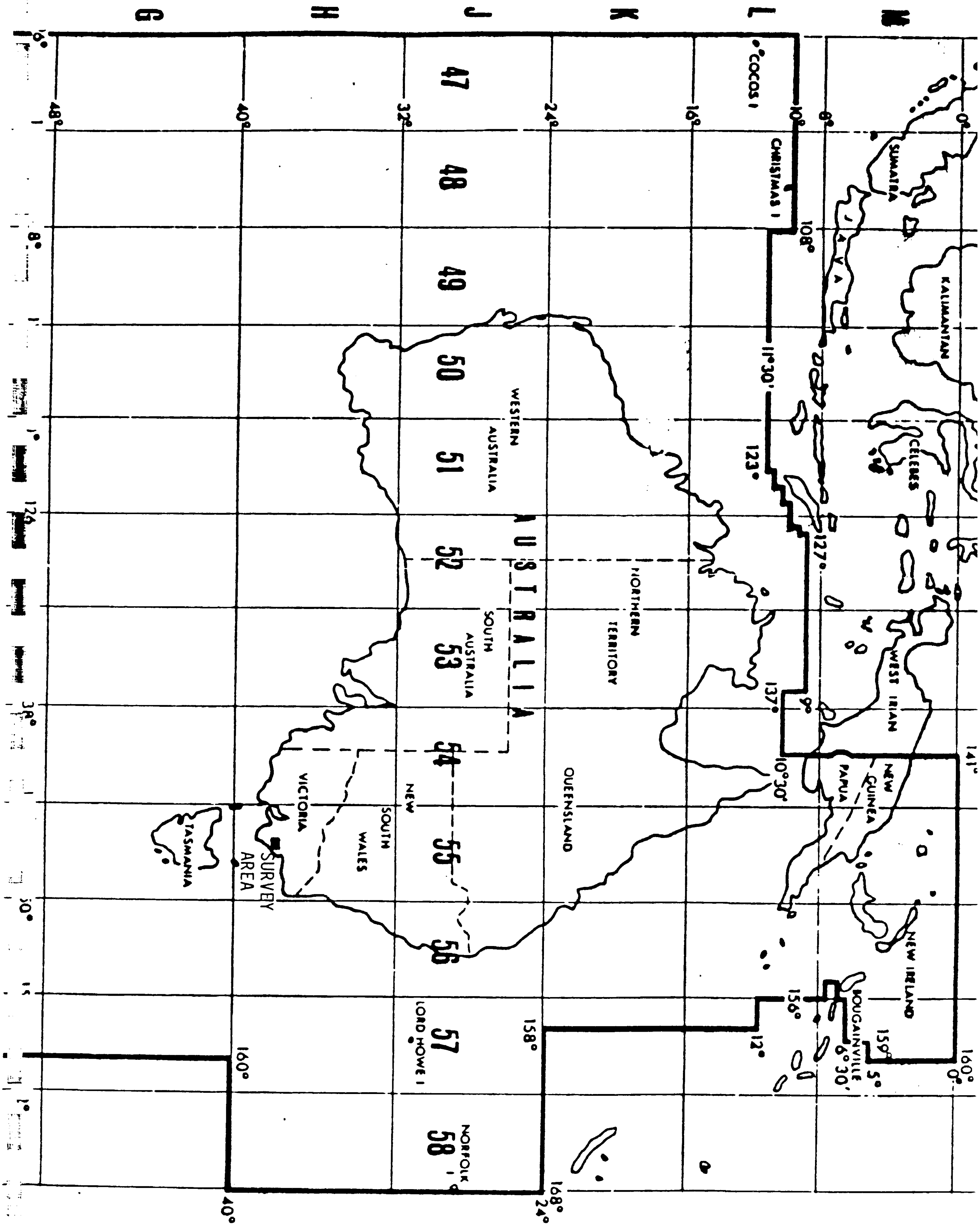
APPENDIX "G"

EQUIPMENT DOWNTIME AND LOST RECORDING TIME ANALYSIS (PRODUCTION PERIOD ONLY)

2	January	:	1.00	hours	vibrator down
4	"	:	7.00		tractors not working
7	"	:	1.50	hours	vibrator problems
8	"	:	1.50	"	line problems
10	"	:	1.00	"	vibe "
12	"	:	0.50	"	" "
13	"	:	1.45	"	instrument problems
14	"	:	0.50	"	bad terminals
16	"	:	1.25	"	tape drive problems
18	"	:	2.50	"	vibe line "
19	"	:	0.50	"	radio-cable "
21	"	:	1.00	"	recorder "
22	"	:	0.50	"	bad cables
23	"	:	1.00	"	bad terminal-boxes
24	"	:	1.00	"	vibe problems
25	"	:	1.75	"	vibe problems, line problems
26	"	:	2.25	"	bad cables
27	"	:	0.75	"	" "
29	"	:	0.75	"	bad boxes
30	"	:	0.25	"	vibe down
31	"	:	1.00	"	radio problem
2	February	:	0.75	"	sims problem
3	"	:	0.25	"	bad box
4	"	:	1.25	"	vibe stuck
10	"	:	1.00	"	sim cable problems
11	"	:	1.00	"	" " "
12	"	:	1.25	"	computer problems
13	"	:	1.25	"	line problems
16	"	:	0.25	"	bad terminals
17	"	:	0.25	"	bad terminals
20	"	:	2.75	"	instrument problems

PLATE "A"

AREA LOCATION


G
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COCOS I
CHRISTMAS I
SUMATRA
JAVA
KALIMANTAN
CELEBES
WEST IRIAN
NEW GUINEA
PAPUA
NEW IRELAND
BOUGAINVILLE
AUSTRALIA
WESTERN AUSTRALIA
NORTHERN TERRITORY
SOUTH AUSTRALIA
QUEENSLAND
NEW SOUTH WALES
VICTORIA
TASMANIA
SURVEY AREA
LORD HOWE I
NORFOLK I
108°
11°30'
123°
127°
137°
10°30'
141°
156°
12°
158°
159°
6°30'
5°
160°
168°
24°
40°
48°
32°
16°
8°
10°

PLATE "B"

SOURCE ARRAY

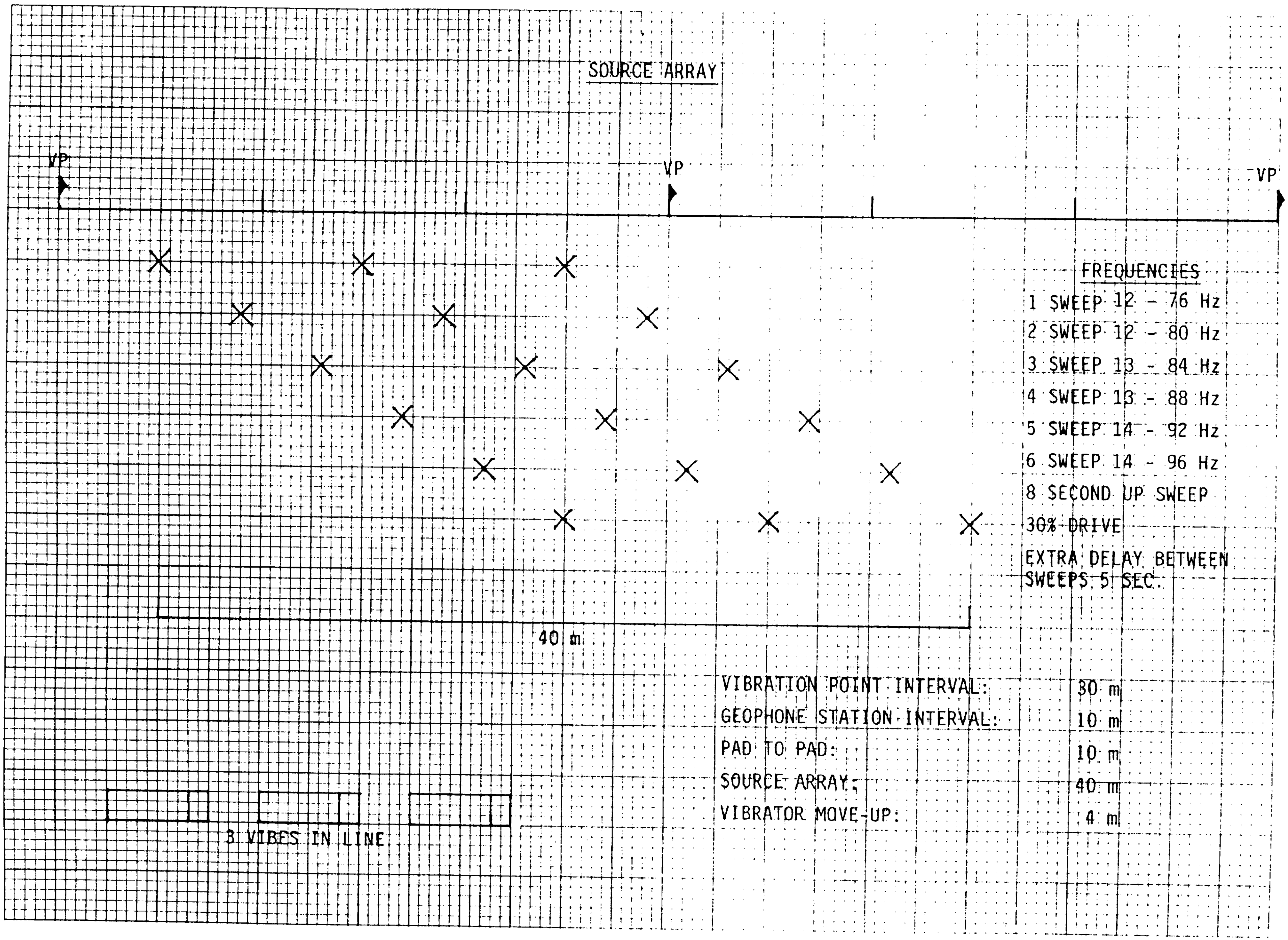
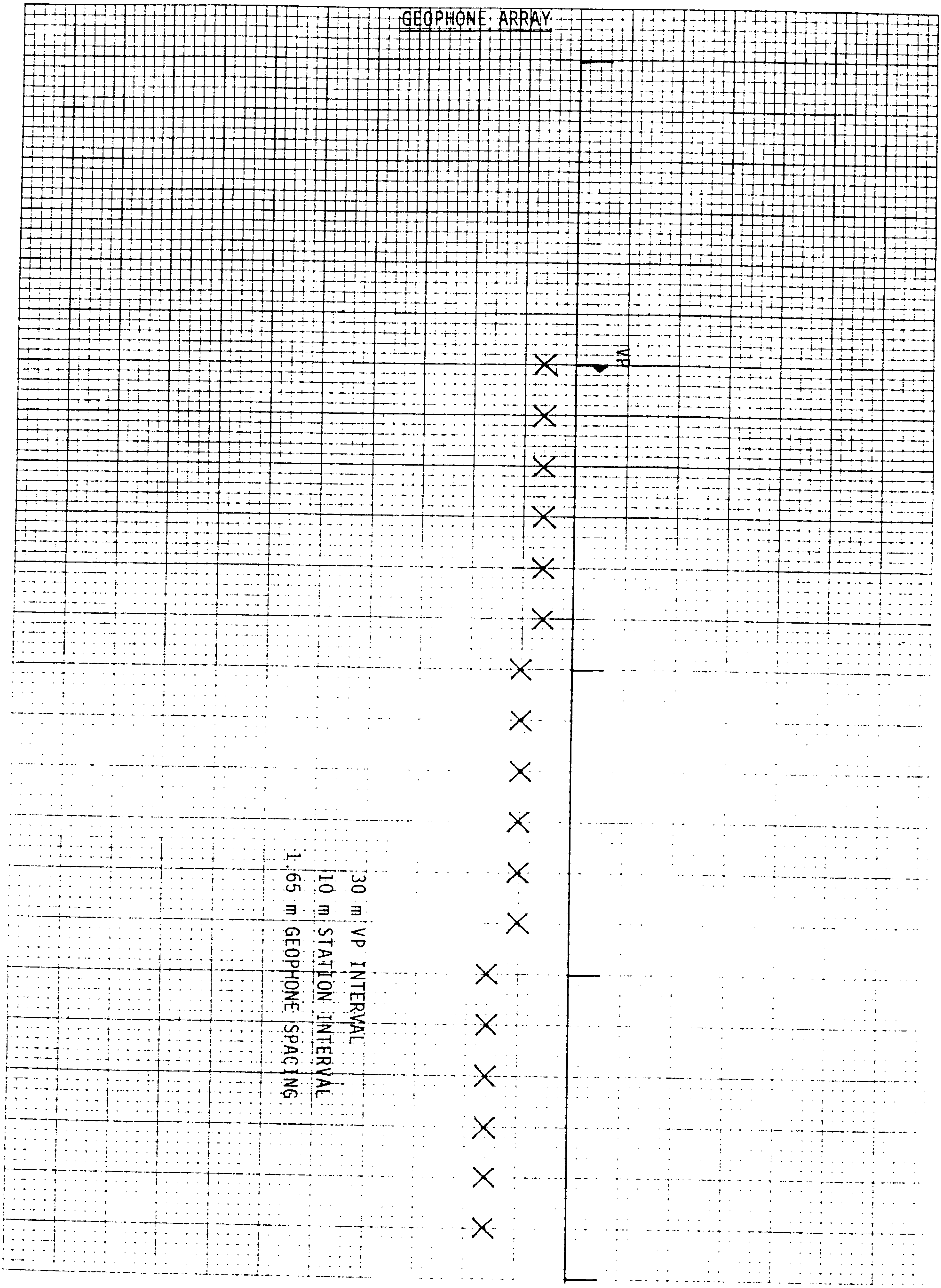

SOURCE ARRAY
VP
VP
VP
FREQUENCIES
1 SWEEP 12 - 76 Hz
2 SWEEP 12 - 80 Hz
3 SWEEP 13 - 84 Hz
4 SWEEP 13 - 88 Hz
5 SWEEP 14 - 92 Hz
6 SWEEP 14 - 96 Hz
8 SECOND UP SWEEP
30% DRIVE
EXTRA DELAY BETWEEN
SWEEPS 5 SEC.
40 m
VIBRATION POINT INTERVAL: 30 m
GEOPHONE STATION INTERVAL: 10 m
PAD TO PAD: 10 m
SOURCE ARRAY: 40 m
VIBRATOR MOVE-UP: 4 m
3 VIBES IN LINE

PLATE "C"

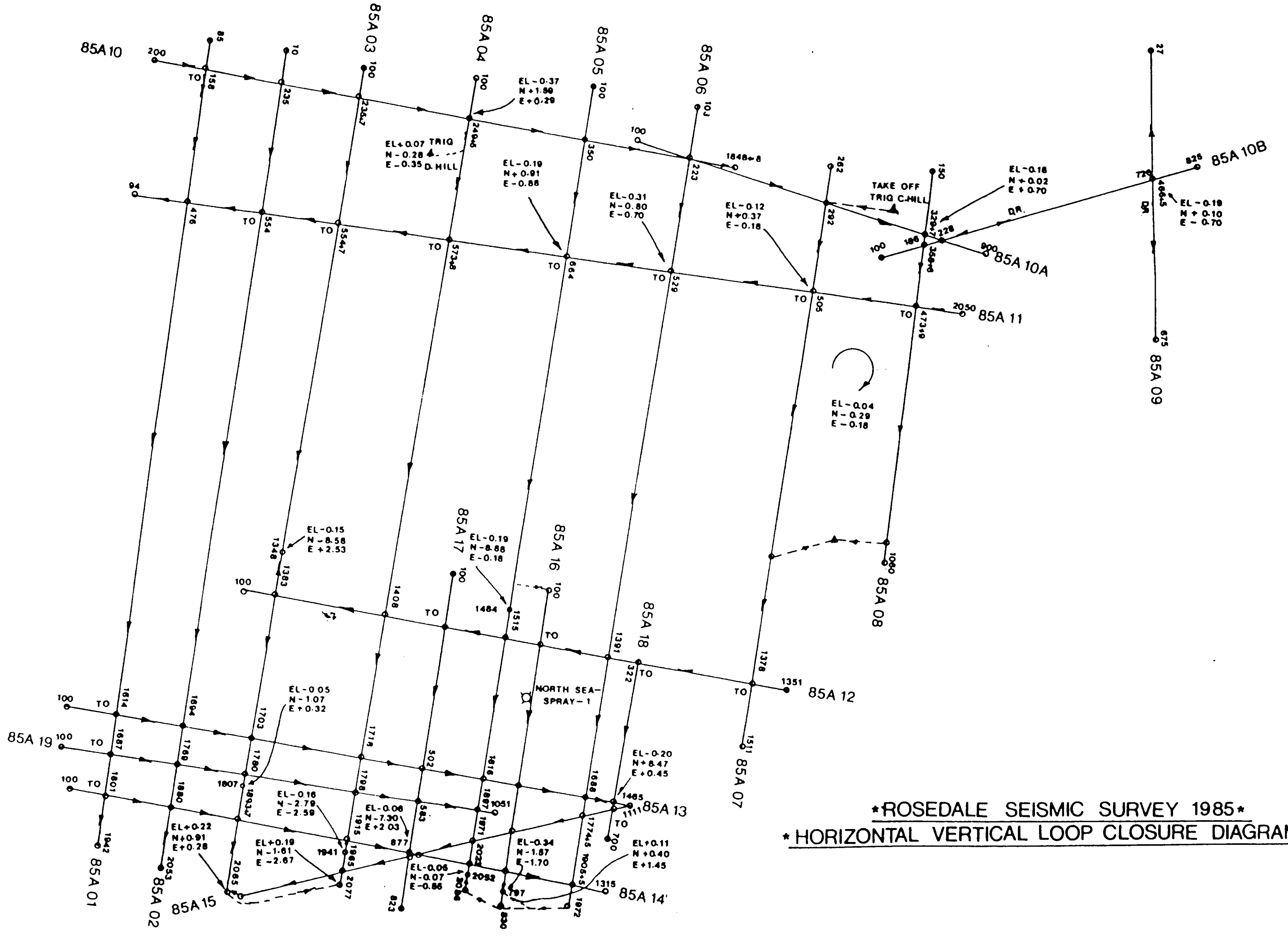
GEOPHONE ARRAY

GEOPHONE ARRAY



ENCLOSURE "A"

HORIZONTAL - VERTICAL LOOP CLOSURE MAP



ROSEDALE SEISMIC SURVEY 1985

HORIZONTAL VERTICAL LOOP CLOSURE DIAGRAM

APPENDIX 2

DATA PROCESSING REPORT

GIPPSLAND BASIN

ROSEDALE SEISMIC SURVEY

PEP 109

FOR

HARTOGEN ENERGY LTD
15 YOUNG STREET
SYDNEY NSW 2000

BY

GEOPHYSICAL SERVICE INC.
6-10 TALAVERA ROAD
NORTH RYDE NSW 2113

SEPTEMBER 1985

TABLE OF CONTENTS

SECTION 1

INTRODUCTION

The Rosedale seismic reflection survey on permit PEP 109 in Victoria was recorded by GEOPHYSICAL SYSTEMS party No. 204. traverse were recorded through january and february, 1985.

Data were recorded split spread using a 512 trace cable, a 10 metre group interval, a near offset of 5 metres, and a far offset of 2565 metres. Vibroseis was used as the seismic source which resulted in a high frequency content. Data were recorded and processed for 86 fold CDP coverage.

Datum statics were computed using the times recorded on an uphole survey and is described in Section 2 of this report. Digital processing was performed by Geophysical Service Inc. in the Sydney Processing Centre using an IBM 3033 computer system. Production processing began in March 1985 and was completed by June, 1985. Details of collection and processing parameters, as well as purchase tapes are listed in the appendices of this report.

SECTION 2

DATUM STATICS

2.1 Collection and Computation Methods

Statics were computed from an uphole survey, using a two layer model with a constant replacement velocity of 1900 m/sec. The weathering layer produced a range of velocities from 500-1100 m/sec., with most lying in the 750-850 range, the sub-weathering produced a range of velocities between 1600-2300 m/sec., the average being approximately 1800 m/sec.

Shot and receiver statics were generally computed using weathering thicknesses and velocities linearly interpolated between upholes. However where discontinuities occurred in the weathering (due to Basalt flows) control uphole information was extrapolated from either direction to points close to the Basalt boundary with interpolation being carried out over the boundary.

This method assumes that all shots were located at the base of, or below, the weathered layer. This assumption was in general correct as evidenced from the implied uphole weathering velocity for most shots. There were however, some instances where the implied uphole velocity indicated that the shots had not penetrated through the weathering layer. At these locations, the field datum static anomalies were considered to be within the range of residual static corrections, and additional static computations were not performed prior to residual statics. This is verified by the actual residual statics, which were within the range of +5 to -5 milliseconds for both shots and receivers. The datum plane used for computations was mean sea level.

SECTION 3

PROCESSING

3.1 Experimental Processing

Experimental processing was performed on line GH85-7 as described below.

A)

1. TAR test: VP 647 and 677
   No tar was used in the processing.

2. Velocity Filter test: VP 647
   Velocity cuts of (6,-3) (8,-4) (10,-5) were tested
   (8,-4) used for processing.

3. Scaling before stack: VP 341-741
   Tested 500 msec. 1000 msec. 500 msec.(DGCS) 1000 msec.(DGCS)
   500 msec. (DGCS) used.

4. Post stack deconvolution: VP 341-741
   tested 16 msec. gap 100 msec. operator
   20 msec. gap 100 msec. operator
   No post stack deconvolution used.

5. Post stack Filter test: VP 341-741

Filter Analyses were performed on raw stack data. The frequencies used were:

0 - 250 Hz	15 - 60 Hz	20 - 70 Hz	25 - 70 Hz
10 - 60 Hz	15 - 70 Hz	20 - 80 Hz	25 - 80 Hz
10 - 70 Hz	15 - 80 Hz	20 - 90 Hz	25 - 90 Hz
10 - 80 Hz	15 - 90 Hz	20 - 100 Hz	25 - 100 Hz

Filter used for processing.
15-80 from 0-700 msec. 15-70 from 900-2500 msec.
linear interpolation of filters between 700 & 900 msec.

6. Post stack Scaling comparison: VP 341-741

Tested 500 msec. 1000msec. 500 msec. (DGCS) 1000 msec. (DGCS)
No post stack scaling used.

B)

Additional tests were run on line GH85-16 over VP 820-460 to confirm spread geometry. This consisted of:

1. Gathering the data into 3 CDP organized data sets, each data set reflecting a different spread configuration.
i.e. shot at 2535 metres from leading receiver group
shot at 2545 metres from leading receiver group
shot a. 2555 metres from leading receiver group
(symetric spread)

2. Using the residual static program HSTATC, an estimate of residual shot and receiver statics were computed for the three data sets and these profiles displayed.

When the spread configuration was symetric the residual shot static at the start of the line was considerably more positive than the respective residual receiver static, as the shot was moved towards the leading group, this gap closed. The configuration was assumed to be correct when this gap minimised. The spread geometry used for the Rosedale survey put the shot location at 2545 metres from the leading group.

3.2 Production Processing Sequence

The following sequence was used to process the data:

* Datum static computation
* Demultiplexing
* Resample and Conversion to minimum phase
* Pre-deconvolution ramp
* Velocity filter
* Designature
* CDP gather and 3:1 CDP decimation
* Time Variant Scaling
* Velpac Velocity Analysis at 3km intervals
* Brute stack
* Residual static computation
* Velpac Velocity Analysis at 1km intervals
* Application of NMO, residual and datum statics
* 86-fold CDP stack
* Filtering
* Scaling
* Film display
* Migration of unfiltered stack
* Filtering
* Scaling
* Film display

In addition to the film displays indicated above, the following sections were displayed on electrostatic paper:

* Brute stack

A flow diagram of the above sequence is shown in Plate 1.

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

4.1 Data Collection.

The quality of data was in general good, with major problem being documentation regards the positioning of the shot with respect to the cable.

Experimentation to confirm location of shot is detailed in section 3.1 B above.

4.2 Datum Statics

In general there was no problems encountered with the datum statics.

4.3 Processing

Data quality was very good for the majority of the prospect. The exception was a small area in the north west of the survey. Incorrect documentation of the spread layout(already referred to above) proved to be a significant delay factor.

Although datum statics were adequate for most of the survey, residual statics resolved some significant static breaks, and should remain as a standard part of the processing sequence.

In poor S/N areas, a cost effective method of an improving S/N in the in the final stack may be achieved by using a decimation rate that is NOT an integer multiple of the shot moveup rate. Using such a rate of decimation allows residual statics to be estimated for every trace collected. All other final parameters can also be determined on the decimated data.

All traces can then be included in the final stack. Post stack migration enhanced the data quality, and should be part of the standard processing sequence for future processing of data from this area.

Respectfully submitted:
GEOPHYSICAL SERVICE INC.

Brian Kilgarriff FOR ED BOYLAN

(Processing Party Chief)

APPENDIX A

LIST OF LINES PROCESSED

LINE	SP RANGE	KMS	RECORDS
GH85-1	1942 - 85	18.60	620
GH85-2	10 - 2050	20.43	682
GH85-3	2065 - 100	19.64	657
GH85-4	100 - 2077	19.77	660
GH85-5	2083 - 100	19.83	663
GH85-6	106 - 1972	18.66	623
GH85-7	260 - 1511	12.51	418
GH85-8	162 - 1059	8.97	300
GH85-9	27 - 675	6.48	217
GH85-10	200 - 1847	16.47	550
GH85-10A	100 - 898	7.98	267
GH85-10B	100 - 823	7.23	242
GH85-11	2054 - 94	19.56	653
GH85-12	100 - 1351	12.51	418
GH85-13	1465 - 100	13.65	456
GH85-14	103 - 1315	12.12	405
GH85-15	100 - 1111	10.11	338
GH85-16	829 - 100	7.29	244
GH85-17	823 - 100	7.23	242
GH85-18	700 - 322	3.78	127
GH85-19	100 - 1051	9.51	318
TOTAL	21 LINES	272.33	9100

APPENDIX B

FIELD PARAMETERS

RECORDED BY	GEOPHYSICAL SYSTEMS
PARTY NUMBER	GSC NO 204
DATE	FEBUARY 1985
INSTRUMENTS	1024 CHANNEL - GEOCOR IV
GEOPHONE TYPE	MARK L21A 10 HZ
SAMPLE RATE	2 MSEC.
SOURCE	
VIBROSEIS	
SWEEPS	6 LINEAR UPSWEEPS
SWEEP LENGTH	8 SECONDS
SWEEP FREQUENCY	12 - 76 HZ
	12 - 80 HZ
	13 - 84 HZ
	13 - 88 HZ
	14 - 92 HZ
	14 - 96 HZ

GEOMETRY

NUMBER OF GROUPS	512
SPLIT SPREAD	2545 - 5 - 15 - 2565 metres
VP INTERVAL	30 metres
GROUP INTERVAL	10 metres
FOLD	86
PROGRESSION	TRACE 1 LEADING

APPENDIX C

PRODUCTION PARAMETERS

Typical processing parameters used are listed below and detailed parameters are appended to each final display section.

All data were processed at a 4msec sample rate and 2.5 seconds record time, but were displayed only to 2 seconds.

Datum was Mean Sea Level.

The surface referenced velocity functions used to stack the data were annotated on the header of each section.

C.1 Field Tape Translation.

All data was translated to an internal GSI format prior to processing.

C.2 RESAMPLE and CONVERSION TO MINIMUM PHASE

Data were resampled from 2 msec. to 4 msec. and converted from zero to minimum phase to comply with deconvolution assumptions.

C.3 PRE-DECONVOLUTION RAMP

	Time msec.	Offset metres	Time msec.	Offset metres	Time msec.	Offset metres	Time msec.	Offset metres
Start times :	0	150	225	300	510	800	1640	2560
End times :	50	150	275	300	560	800	1690	2560

C.4 VELOCITY FILTERING

The velocity filter cuts were +8msec/trace and -4msec/trace which at a 10 metre group interval represents velocities of 2500 metres/sec and 7500 metres/sec respectively. The maximum frequency was 125 Hz. Version 5 velocity filter with normal cosine ramps was used.

C.5 DESIGNATURE

One wavelet was estimated for each record with a maximum frequency of 125 Hz. Version 5 Designature was used.

C.6 SCALING BEFORE STACK

Regular 500 msec. DGCS scaling gates were used for pre stack scaling.
this method uses 250 msec. of data either side of a data point to compute scalers for each sample point on the trace.

C.7 STACK RAMP

The production stack ramp was chosen from the single fold sections produced at the brute stack stage. The ramp is as follows:

Time (sec)	Offset (m)
0.000	150
0.400	600
1.100	1200
1.500	2560

This ramp was applied after relative statics and before mean statics and NMO.

C.8 RESIDUAL STATICS

Several space and time variant gates based on prominent reflectors were picked for each line. Three iterations were made. Gate lengths were varied according to the data on each line. A bandpass filter of 10-50Hz was used. The model smash was 11 depth points for all lines in this prospect.

C.9 VELOCITY ANALYSIS (VELPAC)

Relative statics plus residual statics were applied to the data before velocity analysis.

A 10-65 Hz bandpass filter was applied to the data.

C.10 MIGRATION

Dipcon migration was used for the entire prospect. Maximum allowable dip was 35 degrees, with velocity fields being conditioned from the stacking velocities using the Spacevels software. This conditioning whilst smoothing the stacking velocities maintained 100% of these velocities until 1.0 sec. from this point the values of the stacking velocities were gradually reduced until at 1.4 sec. they reached 90% of the original velocities. From 1.4 sec. to 2.5 sec. reduction to 90% was maintained.

C.11 BAND PASS FILTER

The following band pass bandpass filters were used in production.

Time (seconds)	Frequency (Hz)
0.000	10-85
2.500	10-85

C.12 DISPLAY PARAMETERS

Mode VA/WT

SECTION	TRACES/ INCH	CMS/ SEC	BIAS	MATERIAL
BRUTE STACK	12	7.5	0%	ELECTROSTATIC
RESIDUAL STATICS	12	7.5	0%	ELECTROSTATIC PAPER
VELOCITY ANALYSIS	12	7.5	0%	ELECTROSTATIC PAPER
FINAL STACK	20	15	0%	FILM
MIGRATION	20	15	0%	FILM

All data were plotted normal polarity.

APPENDIX D

DESCRIPTION OF BASIC PROCESSES

D.1 PRE DECONVOLUTION RAMP

PDR is the process whereby first arrival unwanted noise at the front end of seismic records is removed. This is applied prior to deconvolution design.

D.2 VELOCITY FILTERING - VEF

Velocity filtering is a multichannel process that has been combined with designature into one executable load module. Multichannel filtering is a two dimensional frequency wave number operation used to discriminate against specified velocities on pre-stacked data.

Velocity filtering processing requires shot organised data that has a group interval representing adequate spatial sampling. Also, the receiver interval should be less than or equal to the shot interval to avoid aliasing.

The process transforms the data from the space-time domain (X-T) to the frequency-wave number domain (F-K) where the filter is applied. After filter application, the data is transformed back to the X-T domain for the application of further conventional processing.

The apparent horizontal velocity of the noise must be adequately separated from the primary signal for the process to be effective. Examples of noise alignment that can be removed are ground roll and air blast.

These types of noise have a slower apparent velocity than the primary signal or have a dip opposite to the primary. The user supplies a window of primary dip zones to keep; negative dip noise and positive dip noise outside of the keep zones are rejected. These keep and reject zones are usually designed from shot record displays and F-K analyses performed on these records.

Version 5 velocity filtering makes use of "cosine" cut-off ramps, as opposed to the linear ramps of the previous versions. The net effect of the cosine ramps is to reduce the "edge effects" which show as energy alignments parallel to the cut-off dips used in the process. The result is a cleaner record compared to the outputs from previous versions.

D.3 DESIGNATURE

Designature is a prestack deconvolution designed to collapse the effective source wavelet (or "signature") to a short, sharp zero phase wavelet and thus maximise resolution on the seismic traces. The effective source wavelet is the wavelet resulting from the convolution of the actual source wavelet with ghost effects, near surface short period reverberations and the recording instrument response, although on land data, ghost effects are at a minimum. Designature does not take account of additive noise in its design, but assumes that noise is absent or negligible. Therefore it is important to attenuate both coherent and non-coherent additive noise prior to Desig in order to comply as closely as possible with this assumption. This emphasises the importance of the velocity filtering, editing and pre-deconvolution ramp that is done before Desig in the wavelet processing sequence.

One of the fundamental assumptions made in Desig is that the average amplitude spectrum of the record is identical to the average amplitude spectrum of the effective wavelet which is the result of the convolution of several other wavelets or effects.

The phase spectrum of the source wavelet is important since Desig does not measure it, but assumes it to be minimum phase. Most sources have phase spectra approximating minimum phase, excepting Vibroseis* which requires preliminary processing to both collapse the sweep and convert it to a minimum phase characteristic.

D.4 TIME VARIANT SCALING-TVS

Time Variant Scaling produces amplitude equalisation in a time variant manner down the seismic trace as well as from trace to trace. Scalers computed for each gate are applied at the gate centre, with linear interpolation between gate centres. Gate amplitudes are measured for a set of continuous gates on each trace and scalers are computed for each gate to make the average amplitude constant within each gate. This amplitude is 2exp10.

* Trademark of Continental Oil Co.

D.5 PRELIMINARY VELOCITY ANALYSIS - VELPAC

The Velpac velocity module was applied in the spot analysis mode using 11 adjacent depthpoints and 5 sets of moveout corrections. Basic steps of the programme for each analysis include:

- Application of normal moveout (NMO) corrections, corresponding to several different constant velocities or velocity functions, to a set of adjacent depthpoints, followed by CDP stacking.
- A time gated, power based search of the stacked traces to provide picks as functions of time, amplitude, and moveout (which is another expression of velocity).
- Display of selected depthpoint gather traces, stack traces, and power picks.

D.6 PRELIMINARY STACKS

Preliminary stacks with datum statics, single fold sections, and near trace gather sections were produced. Initial velocities were obtained from Velpac velocity analyses performed at 3 km intervals. These sections had several uses:

1. As a quality check on the processing.
2. To give an initial look at the data and identify potential problem areas.
3. To evaluate the velocity functions used.
4. To evaluate the datum statics.
5. To evaluate the prestack mute.
6 To enable selection of design gates for residual static computation.
7. To assist in horizon selection for velocity interpretation.

D.7 AUTOMATIC RESIDUAL STATIC COMPUTATIONS

The method is based upon cross-correlation functions which are used to measure the relative time shifts for each of the traces within a common depth point set. Each of the traces of a CDP set is correlated with a reference trace formed by stacking the other traces within the set.

The location of the peak value of the cross-correlation function gives an estimate of the time shift of the static shifted trace. The time shift measured by the cross-correlation is the sum of several effects, namely:

i. Residual shot static.
ii. Residual receiver static.
iii. Residual normal moveout.
iv. Noise.

The correlation functions are computed over gates which are chosen such that the signal to noise ratio is high and little or no residual moveout is present.

The time shifts obtained from the correlation functions for each trace are then placed in tables of common shot and receiver positions, and a statistical analysis carried out to determine an unique residual source correction for each shot and an unique residual correction for each receiver. This ensures that at all times statics which are applied to data are surface consistent.

Finally, the statics to be applied are synthesised from the estimates of the individual shot and receiver statics by averaging the values along common source and receiver traces.

The process is iterative and several rounds are applied to achieve upgraded estimates of the residual statics to apply - the input to successive iterations being the output from the preceding round. To enable a check of the results, as well as a listing of the computed static, a plot was made of the selected gates with the computed residual statics applied after the final iteration. This plot was also displayed on the final film sections.

D.8 VELOCITY ANALYSIS - VELSCAN

The VELSCAN module used 11 adjacent depth points at each location. The following is a brief description of the process.

VELSCAN generates events as functions of time, amplitude, moveout and dip. The event picking proceeds in the following manner:

- NMO, Static and Residual Static corrections corresponding to a series of velocity functions are applied to a set of depthpoint traces. For each velocity function the NMO corrected traces are stacked. The resulting traces consist of amplitudes as functions of time and moveout.

- Identical operations are applied to adjacent depth points, adding the dimension of space.

- Dip is applied and, for each value of dip, the traces are stacked across depth points. The result is a set of amplitudes as functions of time, moveout and dip.

- An event is located by searching for an amplitude extremum in the time, moveout and dip domains. An extremum may be either a maximum or minimum; i.e. both peaks and troughs are picked. The event attributes of time, amplitude, moveout and dip are assigned to the centre depth point.

- Prior to display, the events are subjected to various sorting and classification algorithms. The powerful picking of VELSCAN yields good results even in relatively poor data areas.

As an aid to interpretation, the VELSCAN module also generates and displays the central CDP without NMO or static corrections and with each of the user supplied reference velocity functions, the stack traces for all depth points used within the scattergram, and the reference velocity functions are plotted on the scattergram.

For this survey the velocity analyses had relative datum statics and residual statics applied prior to NMO corrections.

D.9 APPLICATION OF DATUM STATICS

The application of datum statics was performed in the following manner:-

Prior to application of normal moveout corrections a "mean" datum static was computed for each depth point and a "relative" datum static computed for each trace within that common depth point set. The relative static was simply the difference between the mean datum static and the individual trace datum statics. The relative datum statics thus computed were then applied, together with the residual statics, to the traces prior to the application of normal moveout corrections. A consequence of this method of datum static application is that velocity functions for normal moveout corrections are expressed relative to the surface and not relative to the datum plane.

D.10 NORMAL MOVEOUT CORRECTIONS

Normal moveout corrections are applied to remove increased reflection time on an event caused by spread geometry. The magnitude of the event correction is determined by the following equation:

```
T = (To**2 + X**2)**0.5 - To
              V**2
```

where

T = Normal Moveout.

To = Time of the event at zero offset.

X = Offset of a trace.

V = Root mean square velocity of the event.

D.11 COMMON DEPTH POINT STACK

The traces for each depth point are summed to give one output trace for each depth point. Prior to the mix, first break energy plus the early portion of the traces where NMO corrections have caused severe stretching, resulting in significant frequency changes can be suppressed. The result of this is that the stacking multiplicity varies as a function of record time resulting in improvement of the continuity of shallow events.

D.12 TIME VARIANT FILTERING - TVF

Filtering is applied in a time variant manner to take account of the higher frequency content of the shallow seismic signal and the lower frequency content at depth when rejecting unwanted frequencies or noise. By appropriate filter design, unwanted frequencies are attenuated or removed.

D.13 MIGRATION VELOCITY CONDITIONING - SPACEVELS

SPACEVELS is the velocity modelling process designed for 3D data transformed to a 2D application. The user inputs stacking velocity functions and unmigrated horizon times and coordinates. SPACEVELS then uses an inline inverse ray tracing technique to produce a migration model defined in terms of depths and interval velocities, with the interval velocities referenced to the midpoint of each layer.

The input stacking velocity functions must be spaced frequently enough to adequately define the spatial velocity variations. The horizons selected need to define two essential properties of the model. These are the horizons at which there are major changes in the slope of the stacking velocity versus time functions, and the regional geologic dips present in the survey.

From the depth / interval velocity model, SPACEVELS computes the required velocity function. In this case, the RMS velocity along a zero offset normal incidence raypath for each horizon is computed, this being the input velocity required by the F-K domain migration program.

D.14. DIPCON MIGRATION

Controlled Wavefront Migration (DIPCON) implements the event mapping accuracy of GSI's previous F-K domain migration, with the cosmetic advantages of finite difference migration. This feature has been accomplished by simulating the dispersive character of the finite difference operators in F-K migration.

The normal F-K technique, being a wide angle algorithm, has a tendancy to produce wavefront artifacts reaching into the shallow parts of the section when migrating data with noise bursts. The DIPCON technique will suppress the spurious wavefronts by attenuating them with a dip dependent energy dispersion algorithm. (The dip limit can be specified by the user). However the shape of the diffraction curve is not dip dependent as in finite difference migration, which uses a dip dependent approximation to diffraction mapping, and is therefore less accurate for migrating steeper dips.

DIPCON migration also reduces the mixed appearance sometimes apparent on the deeper data after normal F-K migration, preserving a character closer to that of the input stacked section.

A further consideration is mapping accuracy in the presence of lateral velocity variation. Most finite difference programs in use today are implemented as time migration; that is ray bending caused by the lateral velocity gradient is not taken into account. Under these circumstances events will overmigrate to the position given by the image ray. On the other hand, GSI's F-K domain migration (both normal and DIPCON) implemented with psuedo depth conversion will remove velocity induced dips before migration, and position events more accurately.

APPENDIX E

ROSEDALE HOLD TAPE (UNFILTERED DATA) LISTING

TAPE	CONTENTS
600652	CONSOLIDATED STACK DATA
600653	CONSOLIDATED MIGRATION DATA

PLATE 1

TIPEX PROCESSING FLOW CHART

```
+------------+  +------------------+      +------------------+
:  LATTGEN   :  :       SPPK       :<-----:   FIELD TAPES    :
+-----+------+  +---------+--------+      +------------------+
      :                   :
      :         +---------+--------+
      :         : PREPROCESSING    :
      +-------->: TAR, PDR, VEF,DSG:------------+
      :         : TVS    (DECTRA)  :            :
      :         +---------+--------+    +-------+------+
      :                   :             : BRUTE STACK  :
      :         +------------------+    : WITH STATICS :
      +-------->:  VELPAC VELANAL  :--->:              :
      :         +------------------+    +--------------:
      :                   :
      :         +---------+--------+         +------------+
      :         :    HSTATC        :-------->: VELOCITY   :
      +-------->:   (RSTATSPT)     :         : ANALYSIS   :
      :         :(RESIDUAL STATICS):         :  (VELPAC)  :
      :         +---------+--------+         +------------+
      :                   :                        :
      :                   :                        :
      :         +---------+--------+               :
      +-------->:                  :<--------------+
                :   FINAL STACK    :
      +<--------:                  :---------->+
      :         +---------+--------+           :
+-----+-----+                                  :
: VELOCITY  :                                  :
: CONDITIONING                                 :
+-----+-----+                                  :
      :                                        :
+-----+-----+                                  :
: MIGRATION :                                  :
+-----+-----+                                  :
      :                                        :
+-----------+                            +-----+------+
:    TVF    :                            :    TVF     :
+-----+-----+                            +-----+------+
      :                                        :
+-----+-----+                            +-----+------+
:  DISPLAY  :                            :  DISPLAY   :
+-----------+                            +------------+
```

GSI

ROSEDALE