EAST BASS BASIN
part 4 //

067001

FINAL SUBSIDY REPORT

OF

THE OFFSHORE GIPPSLAND BASIN

MARINE SEISMIC SURVEY, EH-68

PREPARED FOR

THE BUREAU OF MINERAL RECOURCES

CANBERRA, A.C.T.

Submitted by
Esso Exploration and Production Australia, Inc.

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W.D. Laporte

December 1968

OR - 041

067002

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ABSTRACT

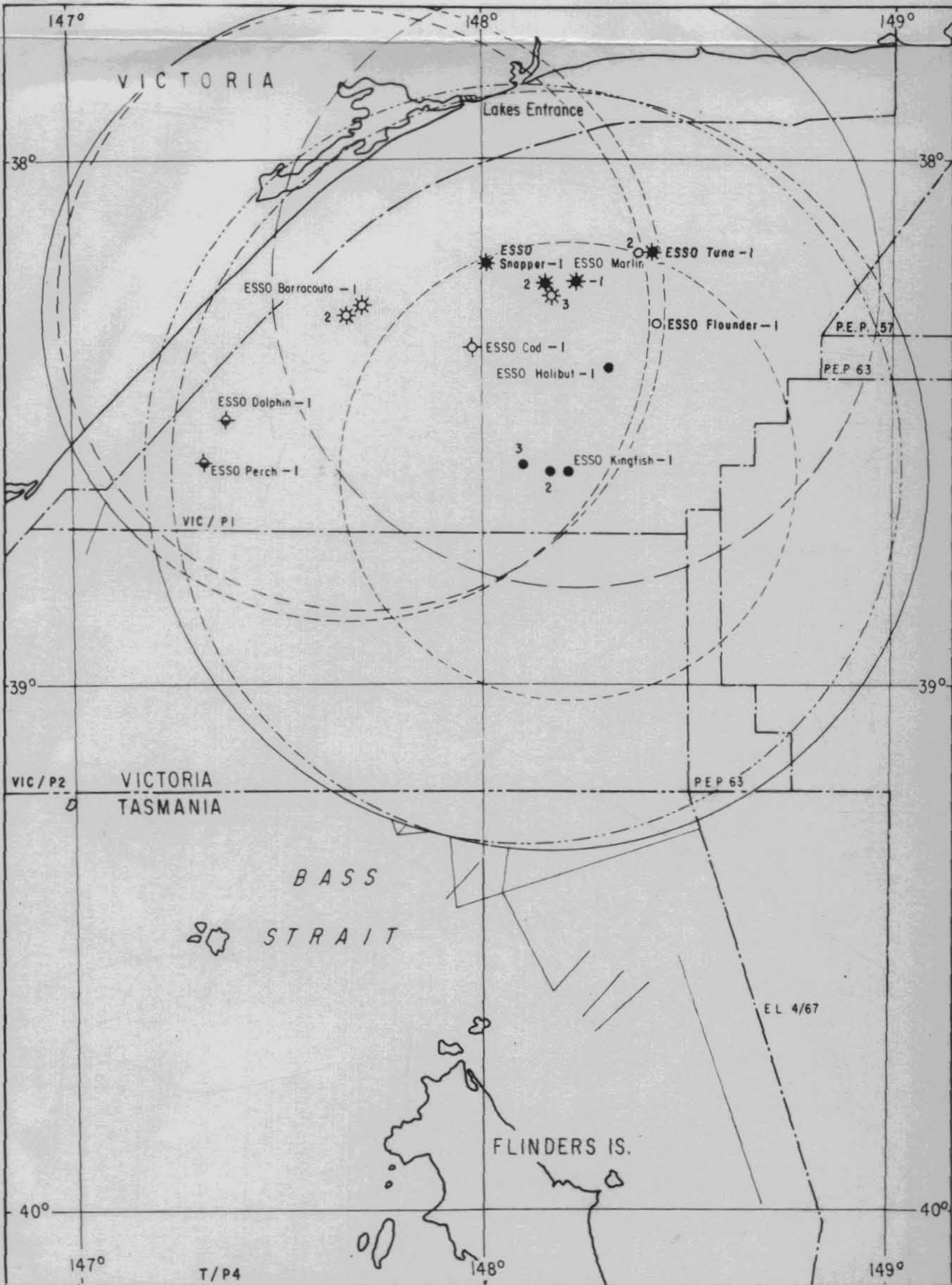
The Gippsland EH-68 Marine Seismic Survey was conducted between May 1, 1968 and August 24, 1968. It was programmed to detail the structural aspects of the large stratigraphic play area in the southwestern part of the Gippsland Basin. Within the subsidized area approximately 141 miles of twelve-fold C.D.P. Aquapulse data was recorded and processed digitally. The new data was integrated with interpretations of previous seismic surveys.

The results of earlier surveys indicated that Latrobe sediments onlapped shallow basement and excellent stratigraphic play possibilities existed. The EH-68 survey substantiated this play and more clearly outlined the zero edge of the Latrobe. The resolution of the shallow data proved that the Aquapulse was a capable tool for defining this sort of play.

Included in the report are structure maps on top of (1) Lakes Entrance Formation, (2) Latrobe Delta Topographic Surface, and (3) Basement. Isopach maps between (1) Lakes Entrance and Latrobe and (2) Latrobe and Basement are also included.

Results of the survey were encouraging and the next exploration stage will be to test the subsurface stratigraphy with the drill.

067C05



Petroleum tenement boundary

EH-68 Seismic Survey

5 cm

Figure 1

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

GIPPSLAND EH68
MARINE SEISMIC SURVEY
VICTORIA - TASMANIA

Scale

20 10 0 20

MILES

DEC. 1968

DWG. 1062/G/1

INTRODUCTION

The offshore Gippsland Marine Seismic Survey EH-68 was conducted in the Bass Strait and Tasman Sea between May 1, 1968 and August 24, 1968. Approximately 703 miles of twelve-fold C.D.P. reflection seismic data was recorded and processed digitally. The remaining area in Gippsland Basin qualifying for subsidy is defined by 40 mile radii drawn from Barracouta A-1 and B-1 gas wells and 50 mile radii from the Kingfish oil wells. Approximately 141 miles of the EH-68 survey falls within the remaining subsidy area. The exploration program covered in the report was carried out by Esso Exploration & Production Australia Inc. in connection with a farm-in agreement with Hematite Petroleum Pty. Ltd. The farm-in agreement covers the following exploration licenses: PEP-38 in Victoria; PEP-39 in Victoria; and EL-1/60 in Tasmania.

Field work was conducted by Western Geophysical Co. and processing was done by Geophysical Services International. Supervision and interpretation was done by Esso. Field operations are covered in a comprehensive report by Western Geophysical Co. that is included in the appendix of this report.

Accompanying the report are subsurface structure maps and isopachous maps interpreted from seismic data obtained from previous surveys and the EH-68 survey.

GIPPSLAND BASIN GENERAL

The Gippsland Basin is in southeastern Victoria, Australia with approximately two-thirds of the basin located offshore in the Tasman Sea. Water depths vary from 0 to greater than 600', however, most of the area falls inside the 300' water depth contour.

In general, the term Gippsland Basin refers to those rocks of Upper Cretaceous and Tertiary age. These sediments are underlain by some 20,000'+ of Lower Cretaceous and several thousand feet of Paleozoic rocks. During the Paleozoic Era the present Gippsland Basin area was part of the broad north-south trending Tasman Geosyncline which extended along the entire east coast of Australia. In Lower Cretaceous time a thick section of sub-greywacke, siltstones and shales was deposited in an east-west trending regional graben or half-graben in contrast to the older depositional trend. The Gippsland Basin began to assume its present configuration at the beginning of Upper Cretaceous time.

The Gippsland Basin is wedge-shaped with the apex to the west and opening to the east. It is bounded on the north by a broad north-south trending mountain system where sedimentary, fine and coarse grained igneous and some metamorphic Paleozoic rocks outcrop. Eastward the basin extends offshore at least as far as the present continental slope and probably beyond. The southern boundary of the Upper Cretaceous-Tertiary basin is marked by the large normal down-to-the-north east-west trending Foster Fault System, giving the basin a half-graben configuration. The Lower Cretaceous, Upper Cretaceous, Paleocene and most of the Eocene sediments are confined to the north down-side of this fault system. In late Eocene the fault system stabilized and sediments began to onlap the low-lying granitic area

067C07

5 cm

DWG. 1062/G/2

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

GIPPSLAND BASIN

VICTORIA – TASMANIA

SCHEMATIC OF CONTOURED HORIZONS

A. FULL LINES REPRESENT CONTOURED HORIZONS AND THE GENERAL BASINWARD EXTENT TO WHICH THEY CAN BE RELIABLY FOLLOWED.

B. DASHED LINES REPRESENT INTERPRETATION OF GENERALIZED REGIONAL TRENDS WHICH ARE NOT CAPABLE OF SPECIFIC SEISMIC MAPPING.

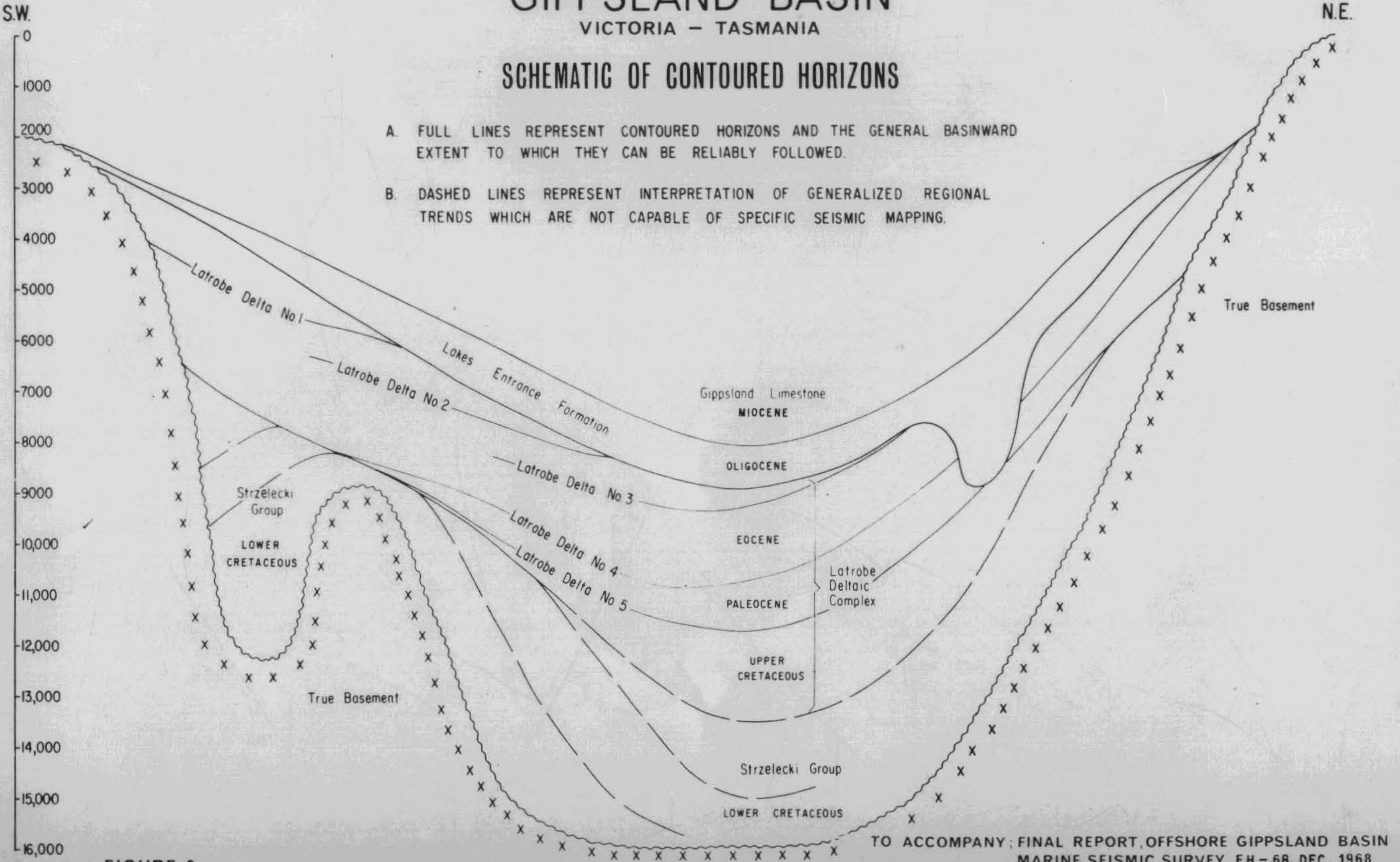


FIGURE 2

TO ACCOMPANY: FINAL REPORT, OFFSHORE GIPPSLAND BASIN MARINE SEISMIC SURVEY EH – 68 DEC. 1968

CR-041

5 cm

067008

AGE	FORMATION	GRAPHIC	FLUIDS	LITHOLOGIC DESCRIPTION	
Quaternary				Sand - Silt and Clay	Non-marine
U.Pliocene	Haunted Hill Gravels		Fresh water	Gravel - Sand and Clay	Non-marine
L.Pliocene	Jemmy Point Fm.		Fresh water (Artesian)	Friable fossiliferous sandstone, sandy marl with bryozoa	Marine
U. Miocene	Tambo River Fm.			.Interbeds marl and limestone, fossiliferous	Marine
Miocene	Gippsland Fm.		Rarely porous Local ss Dev. in EGS I & II - Saltwater	Soft, calcareous marl, and shale - with occ. streaks lt. grey, micritic, foss. ls. SS. White, fine-medium grained, with good porosity and permeability	Marine
Oligocene	Lakes Entrance Fm. Glauconitic member Colquhoun Gravel member		Fresh water	Soft, calcareous shale and marl Glauconitic member-very shaly, very glauconitic sandstone with local pockets of Perm. Colquhoun Gravel-present along northeast rim of basin, conglomerate and sandstone with good porosity & perm. Changes facies to southeast to calcareous marl and shale	Marine
Eocene	Latrobe Valley Fm.		Fresh water 500 ppm to salt water (48,000 ppm)	Interbedded sandstone, coal and shale Sandstone, quartzose, very fine to medium to coarse, poorly sorted to well sorted, sub-rounded to sub-angular, friable, carbonaceous. Coal - brown to black Shale - brown to grey, micaceous and carbonaceous	Non-marine
Paleocene-Upper Cretaceous Undiff.	Unnamed		Salt water 50,000 ppm	Interbedded sandstone, shale, coal and siltstone Sandstones, quartzose, fn. to medium to coarse, sub-rounded to sub-angular, well sorted to poorly sorted, carbonaceous, micaceous, cemented with white clay material Siltstones - are argillaceous, carbonaceous, and micaceous Shale - medium to brown, carbonaceous, micaceous Coal - black with conchoidal to sub-conchoidal fracture	Non-marine
Lower Cret. & Jurassic	Strzelecki Group		Salt water 18,000 ppm	Over 8,400' greywacke, feldspathic sandstone, siltstone, carbonaceous shales, black coal and fossil plants, dips to 30° common	Non-marine
Permian				Sandstone very fine to fine, friable to poorly indurated with white clay cement. Shale - dark brown to medium grey. Basaltic volcanics. - Present in Duck Bay-1 only	Non-marine ?
Lower Carbon. to Upper Dev.	Avon River Group			Redbeds, sandstone, conglomerate, siltstone & shale (present in one well) (S.W. Bairnsdale)	Non-marine
Basement					

TO ACCOMPANY: FINAL REPORT, OFFSHORE GIPPSLAND BASIN
MARINE SEISMIC SURVEY, EC-67 DEC. 1968

FIGURE 3

OR-041

DWG. 1062/G/3

to the south. Older units are progressively overstepped by the younger units. The stable area south of the fault system, the granitic Bassian Rise, extending from Wilsons Promontory to the northeastern corner of Tasmania, separated the Gippsland and Bass Basins. The northern boundary of the basin is a shelfal area with all sediments of the Gippsland Basin thinning by onlap and convergence.

SOURCE & QUALITY OF DATA

The EH-68 marine seismic reflection survey was conducted by Western Geophysical Co. under contract to Esso Exploration & Production Australia Inc. Field operations commenced on May 1, 1968 and were concluded on August 24, 1968. In the area covered by this subsidy report twelve-fold C.D.P. data was recorded digitally. The energy source for the data was the sleeve exploder developed by Esso Production Research Co. of Houston, Texas and licensed to Western Geophysical Co. Western calls the source 'Aquapulse'. Four aquapulse guns are towed at a depth of 30' subsea, two from each side of the recording vessel. A mixture of oxygen and propane is injected into the guns, which are then fired simultaneously.

To obtain optimum shallow data, a 1600 meter streamer (geophone group center to center 69.5 meters) was used. The firing rate was 3 pops per 69.5 meters, or 70 pops per mile. Esso supervisory personnel were on board the recording boat throughout the field operations.

The data was digitally processed at the G.S.I. Digital Processing Center in Sydney, N.S.W., Australia with time varying deconvolution (T.V.D.) applied. Velocity control was derived from delta-T analysis and the final sections were presented by variable density using a 10 to 50 CPS filter range. Esso maintained supervision over all facets of data processing operations. The data quality ranged from good to very good.

OBJECTIVES OF SURVEY

The EH-68 seismic survey was conducted, in the area covered by this report, to delineate the structural features of the large stratigraphic play on the southwestern flank of the Gippsland Basin. Previous surveys conducted for Hematite Exploration Pty. Ltd. and Esso had uncovered the possibility of a stratigraphic play in this area. The EH-68 survey was programmed to define the structural stratigraphic traps for the purpose of locating exploratory wells.

RESULTS OF SURVEY

Three structure maps and two isopachous maps were constructed. The interpretation parameters were the same as those used in the EC-67 seismic subsidy report. Structural horizons mapped were (1) Top of Lakes Entrance Formation (Oligocene); (2) Top of Latrobe Delta Topographic Surface (Eocene-Paleocene-Upper Cretaceous); (3) Top of Basement. Isopachous maps were made between (1) Top of Lakes Entrance and Top of Latrobe Delta Topographic Surface and (2) Top of Latrobe and Basement.

The scale of all maps enclosed is 1:100,000. A composite base covering the subsidized area to the south with an inset covering the area to the north was used to keep the number of plates to a minimum. Structure maps are contoured in depth with datum being sea level and static corrections applied for variations in water depth. The time vs. depth table used for depth conversions on structure maps is a composite of all velocity data available at this time. The following is a discussion of the significant features of each of the mapped horizons:

(1) Lakes Entrance Formation (Oligocene)

The structure at the top of the Lakes Entrance is monoclinal and dips approximately one to two degrees northeast toward the center of the basin. It appears to have been deposited in a transgressive onlap sequence under shallow marine conditions. There is no expression at the top of the Lakes Entrance of underlying basement structural features except in the area covered by the inset map (Plate I). This structural feature is related to a positive basement feature associated with up-to-the-basin faulting.

The total thickness of the Lakes Entrance as shown on the isopach map (Plate IV), exhibits a general thickening into the basin. The thinning in the area of the Miocene channel cut is due to channel erosion.

(2) The structure on top of the Latrobe Delta Topographic Surface is also monoclinal and dips two to three degrees per mile to the northeast. The Latrobe was also deposited in an onlapping sequence filling the depressions of an irregular basement complex with the older sediments truncating against basement highs. Should the Latrobe Delta stratigraphy remain similar to that found deeper in the basin, these infilled depressions will form excellent stratigraphic traps. The EH-68 program detailed one such area, as shown in the northwest portion of Plate II.

The only significant structural anomaly at the top of the Latrobe is the closure at the intersection lines EC-108 and EC-112 (inset map, Plate II). This feature is a result of a series of post-Latrobe up-to-the-basin faults.

(3) The Basement structure picture in this area is of primary importance because the basement anomalies form the traps for Latrobe sediments. The structural features shown on the Basement map (Plate III) are probably topographic remnants left from the erosion of the Bassian Rise ridge. The Bassian Rise was very likely peneplained early in Cretaceous time with most of the sediments being carried into the central part of the basin. Thereafter, very few sediments were deposited until the close of the Eocene when the Latrobe Delta Complex had filled most of the Gippsland Basin and had begun to onlap the Bassian Rise. Succeeding sediments continued to onlap the rise until Middle Miocene time, when deposition was continuous with that in the Bass Basin.

CONCLUSIONS & RECOMMENDATIONS.

Earlier seismic surveys had suggested a possible stratigraphic play along the southwestern edge of the Gippsland Basin. The EH-68 Marine Seismic Survey further substantiated this play and more clearly outlined the actual zero edge of the Latrobe. The resolution of the shallow data proved that the Aquapulse is a tool capable of defining this sort of play.

The next logical step appears to be to test the subsurface stratigraphy with the drill. Once this is done, additional seismic control will probably be required.

JWM:AW

APPENDIX TO FINAL SUBSIDY REPORT, GIPPSLAND BASIN MARINE SEISMIC SURVEY
EH-68

067012

APPENDIX

FINAL OPERATIONS REPORT

AUSTRALIA MARINE SEISMIC SURVEY

GIPPSLAND EH-68

FOR

ESSO STANDARD OIL (AUSTRALIA) LTD.

BY

WESTERN GEOPHYSICAL COMPANY OF AMERICA

PARTY 64

MAY - AUGUST, 1968

WESTERN GEOPHYSICAL

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PLATES

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067014

I. SUMMARY

A continuous reflection seismic survey using the AQUAPULSE system was conducted in the Gippsland EH-68 area, offshore Victoria, and Tasmania, Australia.
Operations commenced on May 1, 1968 and were completed on August 14, 1968.
Refer Plate I for detailed location of survey lines.

II. GENERAL INFORMATION

A. Contractors

The survey was conducted by Western Geophysical Company of America, 933 North La Brea Avenue, Los Angeles, California, and 69 Berry Street, North Sydney, New South Wales, Australia. Positioning control was provided by Offshore Navigation, Incorporated, 5728 Jefferson Highway, New Orleans, Louisiana and 159 Bunnerong Road, Kingsford, New South Wales, Australia.

B. Base of Operations

For the first part of the survey, nearest to the Gippsland coast and carried out using a 7590 foot cable, headquarters were set up at Yarram, Victoria. The boat was docked at Port Welshpool, which was the only port near to the prospect which could accommodate the vessel, but lacked supply and transport facilities and was not as central as Yarram for communications. Headquarters were later moved to Devonport, Tasmania where the cable was changed to 5290 feet for the part of the prospect further out in the Bass Strait. Good harbour facilities, twice weekly ferry services and a daily air service were available making Devonport a good base for operations.

C. Weather

Conditions were extremely bad and out of a total of 61 days spent in the Gippsland EH-68 area, 30 days were lost directly due to rough seas. Further time was lost due to not being able to effect cable repairs in rough seas, also excessive amounts of liquid oxygen were lost due to turbulence, necessitating reliance on bottled oxygen which had to be frequently replenished.

D. Surveying Technique

The SHORAN direct ranging method was employed for positioning control. The equipment included track plotter and digital print out system.

The prospect consisted of small nets scattered over a large area which necessitated the use of eight land based stations. A description of the SHORAN system and fixed base station sites is included in a separate report to be submitted by Offshore Navigation, Incorporated.

E. Chronology

April 28, 1968 :	Commonwealth survey completed. "Western Spruce" formerly "Dantzler Spruce" departed for Gippsland EH-68 area from Sydney.
May 1, 1968 :	First day recording - lines EH-155, 155A.
May 2, 1968 :	Offloaded data at Barracouta Rig. Proceeded to Port Welshpool to have instrument cabinet braced.
May 3, 1968 :	Bracing completed. Departed Port Welshpool. Checked Shoran range. Seas too rough to work. Returned to Port Welshpool

May 7, 1968	:	Departed Port Welshpool. Resumed recording - lines EH-200, 199, 205, 207, 204, 202, 206, 201.
May 9, 1968	:	Proceeded to Port Welshpool. Standing by for instrument spares.
May 13, 1968	:	Departed Port Welshpool. Resumed recording - line EH-198.
May 14, 1968	:	Return to Port Welshpool. Repairing cable.
May 16, 1968	:	Departed Port Welshpool for Devonport to pick up spares and work cable on dock. Detectors reduced from 32 to 20 per group.
May 25, 1968	:	Departed Devonport. Seas rough, anchored at Prime Seal Island.
May 30, 1968	:	Underway to prospect.
May 31, 1968	:	Resumed recording - line EH-202A. Seas rough, underway to Port Welshpool.
June 7, 1968	:	Departed Port Welshpool. Resumed recording - lines EH-201A, 203, 206A, 204A.
June 9, 1968	:	Returned to Port Welshpool. Unloading tapes for test.
June 10, 1968	:	Departed Port Welshpool.
June 12, 1968	:	Resumed recording - lines EH-197, 210A, 201A, 204A, 206A, 227A, 190. EH-210 through 227.
June 18, 1968	:	Inadequate Shoran range. Remaining lines postponed till later date.
August 12, 1968	:	Resumed recording in Gippsland EH-68 area with 5290 foot cable - lines EH-181, 162, 161, 160, 183, 184, 157, 182,

August 13, 1968 :	Underway to Devonport to load oxygen and stores.
August 15, 1968 :	Departed Devonport.
August 16, 1968 :	Resumed recording - lines EH-182, 156, 112. EH-185 through 196.
August 19, 1968 :	Loaded oxygen at Barries Beach.
August 20, 1968 :	Resumed recording - lines EH-65, 63, 101.
August 21, 1968 :	Anchored down weather standby at Green Cape.
August 23, 1968 :	Resumed recording - lines EH-208, 209, 120, 120A, 120B. Gippsland EH-68 area completed.

III. RECORDING OPERATIONS

A. Survey Vessel: M/V "Western Spruce" - 119 foot steel hull twin-screw vessel of American registry, powered by two General Motors V-16 Marine Diesel engines, capable of 11 knots cruising speed, and fitted with two Decca 202 Radar, Raytheon fathometer, and Apelco ship-to-shore radio.

B. Instrumentation

Digital Recorder - SDS 1010, 30-channel, 9-track, IBM compatible, EPRCO preferred, $\frac{1}{2}$ inch gapless tape format, binary gain controlled amplifiers.

On-board Display - Raytheon Precision Depth Recorder, driven by output of trace 22, through a TFA-1 amplifier.

Magnetometer - Varian Proton Marine Magnetometer, Model V-4937.

C. Detector Cable

A neutrally-buoyant oil-filled streamer cable equipped with four depth detectors, three special water break detectors, and 24 seismic detector groups was used. Each seismic detector group was 230 feet in length and initially, consisted of 32 crystal geophones in tapered noise cancelling array. On May 18 the number of geophones per group was reduced to 20 for the remainder of the survey.

The 7590 foot cable consisted of dead sections 100 feet in length separating each "live" group, giving a group centre spacing of 330 feet. Refer to Plate II. While recording with the 7590 foot cable, the buoyancy was adjusted so that it ran at an average depth of 45 feet, and depth was maintained by eight CONDEP pressure cable depth controllers, to plus or minus 7 feet.

On July 9, the cable length was reduced to 5290 feet for the remainder of the survey by removing the 100 foot dead sections. While recording with the 5290 foot cable, the buoyancy was adjusted so that it ran at an average depth of 40 feet.

D. Recording Technique

With the AQUAPULSE system, four "guns" in a rectangular array were trailed at a depth of about 30 feet. The gun pulse monitoring system was used in conjunction with MP-8 Geospace phones and 300 Hz galvos.

Tests were made to ascertain the optimum gas pressure and fill time in order to obtain as near as possible a 3:1 gun pulse ratio of the first positive peak to the second. The pressures decided on were Oxygen 50 lb. sq. in., Propane 22 lb. sq. in. with a fill time of 1.5 seconds. Under continuous-tow operations, the metered oxygen/propane mixture was fired electrically at intervals such that when recording with the 7590 foot cable, four pulses per 328 feet, or approximately 64 pulses per mile were produced. When recording with the 5290 foot cable, 3 pulses per 228 feet, or approximately 70 pulses per mile were produced. These pulse densities allow certain options in so-called vertical summing and horizontal stacking, such as 4-sum 12-stack or 8-sum 6-stack, and 3-sum 12-stack or 6-sum 6-stack. Refer to Plate II and III for a detailed diagram of the streamer cable, AQUAPULSE gun array, and navigation antenna - gun array - cable relationship.

IV. DATA PRESENTATION

A. Field

A variable density section was made by recording the output of group 22 on the Raytheon Precision Depth Recorder. It was found that the vertical to horizontal exaggeration was about 5 to 1 recording single pops. Wiggly trace, read-after-write monitors were produced by a Dri-Write camera every 8 pulses, or 656 feet. This monitor displayed data from the 24 seismic data channels, time break, individual gun pulse signatures, and direct water arrivals to the three water break detectors. A separate Dri-Write camera displayed, in graphic form, cable depth measured by the four depth detectors.

B. Processing

The digital tapes were air-shipped to Geophysical Service International, St. Leonards, for processing.

C. Final Interpretation of the data was performed by Esso, Sydney.

V. KEY FIELD PARTY PERSONNEL

A. Esso Standard Oil (Australia) Ltd.

Name	Position
A. Martens	Client Representative
I. Criss	Client Representative
R. Stone	Client Representative

B. Western Geophysical Company of America

Name	Position
J. Hall	Operations Manager
D. Bailey	Assistant Operations Manager
P. Cooper	Co-ordinator
A. Shirley	Instrument Supervisor
R. Stansbury	Observer-Digital Operator
R. Adams	Gun Captain
V. Smith	Supervisor

C. Offshore Navigation, Incorporated

Name	Position
I. Easterbrook	Party Chief
D. Hackenbruck	Mobile Operator
H. Adams	Mobile Operator

VI. STATISTICAL SUMMARY

A. Subsidised Area

(a) Victoria

Cable length - 5290 feet

Line length measured from first to last Shoran position.

Constants:

1 interval - 0.0863 miles plus 228 feet - 0.0432 miles

Gun array centre to group 24 centre - 655 feet

Pop rate - 3 per 228 feet

Record length - 5 seconds

Line	SP - SP	Profiles	Statute Miles
EH 196	7315 - 7393	79	6.82

(b) Tasmania

Cable length - 5290 feet

Line length measured from first to last Shoran position.

Constants:

1 interval	- 0.0863 miles plus 228 feet - 0.0432 miles
Gun array centre to group 24 centre	- 655 feet
Pop rate	- 3 per 228 feet
Record length	- 5 seconds

Line	SP - SP	Profiles	Statute Miles
EH 181	4052 - 4328	277	23.86
EH 162	4329 - 4455	127	10.92
EH 161	4456 - 4557	102	8.76
EH 160	4558 - 4658	101	8.67
EH 183	4659 - 4822	164	14.11
EH 184	4823 - 4893	71	6.08
EH 157	4925 - 5004	80	6.86
EH 182	5005 - 5392	388	33.44
EH 187	5557 - 5627	71	6.13
EH 156	5628 - 5658	31	2.63
EH 185	5813 - 5929	117	10.10
EH 188	5930 - 5961	32	2.72
		Total Mileage	134.28

B. Non-subsidised Area

(a) Victoria

1. Cable length - 7590 feet

Line length measured from first to last Shoran position.

Constants:

1 interval	- 0.1243 miles plus 328 feet - 0.0621 miles.
Gun array centre to group 24 centre	- 960 feet
Pop rate	- 4 per 328 feet
Record length	- 7 seconds

Line	SP - SP	Profiles	Statute Miles
EH 155	1 - 108	108	13.36
EH 200	109 - 167	59	7.27
EH 199	168 - 228	61	7.52
EH 205	229 - 307	79	9.76
EH 207	308 - 474	167	20.69
EH 198	770 - 828	59	7.27
EH 202A	829 - 891	63	7.77
EH 201A	892 - 957		
	952A- 2385	71	8.76
EH 203	958 - 1021		
	1016A- 2375	69	7.89
EH 206A	1022 - 1109		
	1104A- 2380	93	11.50
EH 204A	1110 - 1168		
	1163A- 2370	64	7.89
	Record length - 6 seconds		
EH 197	1169 - 1222	54	6.65
EH 212	1223 - 1360		
	1357A- 1698	154	19.08

Line	SP - SP	Profiles	Statute Miles
EH 211	1363 - 1510	148	18.33
EH 210	1511 - 1606	96	11.87
EH 210A	1607 - 1645		
	1640A- 1688	82	10.13
EH 213	1699 - 1746		
	1740A- 1754	56	6.90
EH 214	1755 - 1810	56	6.90
EH 215	1811 - 1865	55	6.77
EH 216	1866 - 1921	56	6.90
EH 217	1922 - 1976	55	6.77
EH 218	1977 - 2032	56	6.90
EH 219	2033 - 2087	55	6.77
EH 220	2088 - 2143	56	6.90
EH 221	2144 - 2198	55	6.77
EH 222	2199 - 2254	56	6.90
EH 223	2255 - 2309	55	6.77
EH 224	2310 - 2364	55	6.77
EH 225	2386 - 2517	132	16.35
EH 226	2518 - 2577	60	7.40
EH 227	2578 - 2699	122	15.10
EH 227A	2700 - 2748	49	6.03
		Total Mileage	302.64

2. Cable length - 5290 feet

Line length measured from first to last Shoran position.

Constants:

1 interval	- 0.0863 miles plus 228 feet - 0.0432 miles
Gun array centre to group 24 centre	- 655 feet
Pop rate	- 3 per 228 feet
Record length	- 5 seconds

Line	SP - SP	Profiles	Statute Miles
EH 196	7274 - 7314	41	3.49
EH 185	5705 - 5731	27	2.29
EH 188	6008 - 6028	21	1.81
EH 189	6029 - 6174	146	12.56
EH 190	6175 - 6369	195	16.79
EH 191	6370 - 6585	216	18.60
EH 112	6586 - 6697	112	9.62
EH 193	6698 - 6795	98	8.41
EH 192	6796 - 6965	170	14.63
EH 194	6966 - 7132	167	14.37
EH 195	7133 - 7273	141	12.13
EH 65	7394 - 7493	100	8.59
EH 63	7494 - 7659	166	14.28
EH 101	7660 - 7839	180	15.49
EH 208	7840 - 8011	172	14.80
EH 209	8012 - 8240	229	19.72
EH 120	8241 - 8427	187	16.05
EH 120A	8428 - 8610	183	15.84
EH 120B	8611 - 8727	117	10.05
		Total Mileage	229.52

Victoria Total Mileage 532.16

(b) Tasmania

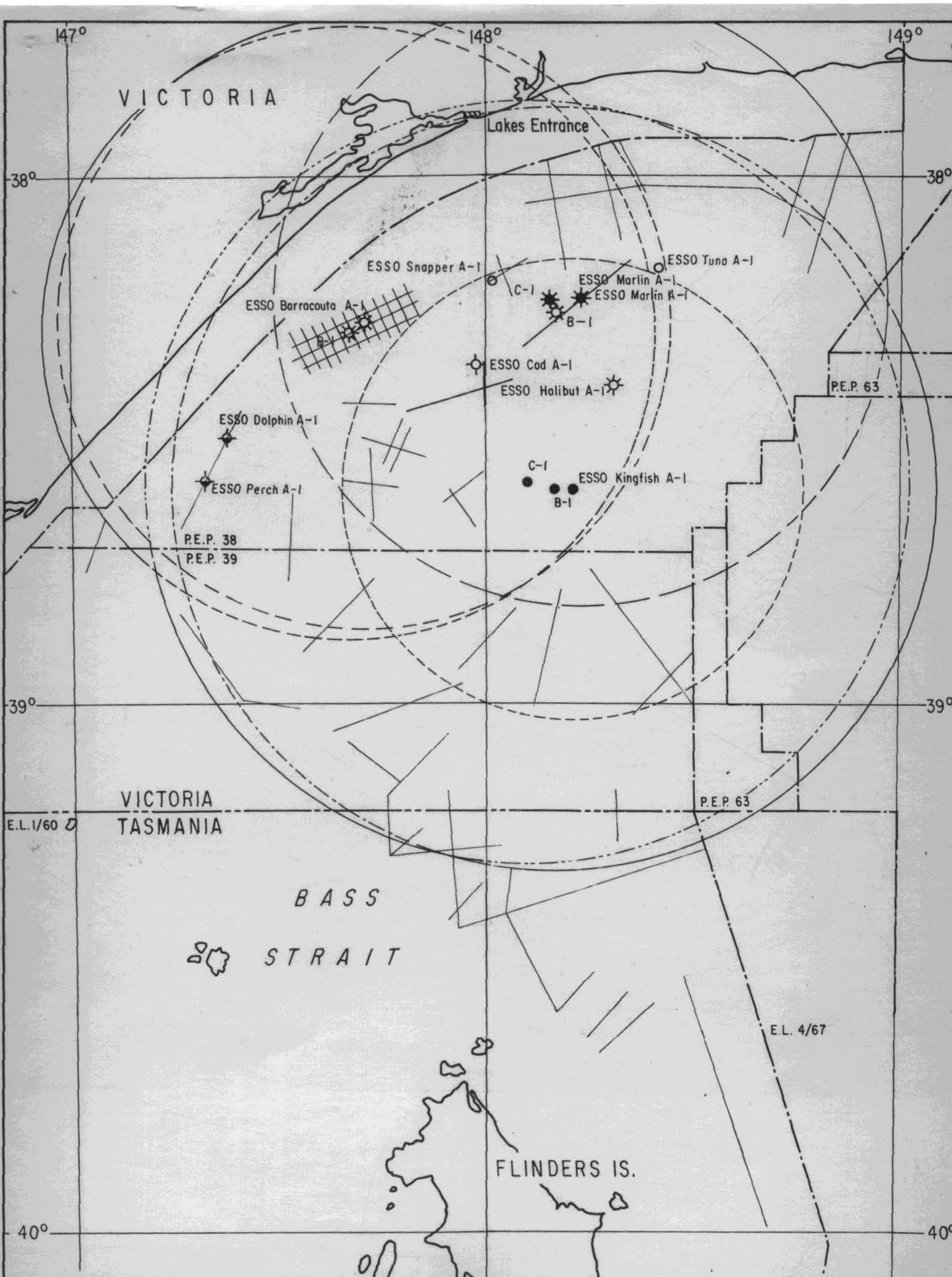
Cable length - 5290 feet

Line length measured from first to last Shoran position.

Constants:

1 interval	- 0.0863 miles plus 228 feet - 0.0432 miles
Gun array centre to group 24 centre	- 655 feet
Pop rate	- 3 per 228 feet
Record length	- 5 seconds

Line	SP - SP	Profiles	Statute Miles
EH 184	4894 - 4924	31	2.68
EH 187	5448 - 5556	109	9.36
EH 156	5659 - 5704	46	3.97
EH 185	5732 - 5812	81	6.99
EH 188	5962 - 6007	46	3.97
		Total Mileage	26.97



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Petroleum tenement boundary

Completed Seismic Survey

5 cm

PLATE 1.

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

GIPPSLAND EH68
MARINE SEISMIC SURVEY
VICTORIA - TASMANIA

Scale

20 10 0 20

MILES

OR-041 Appx

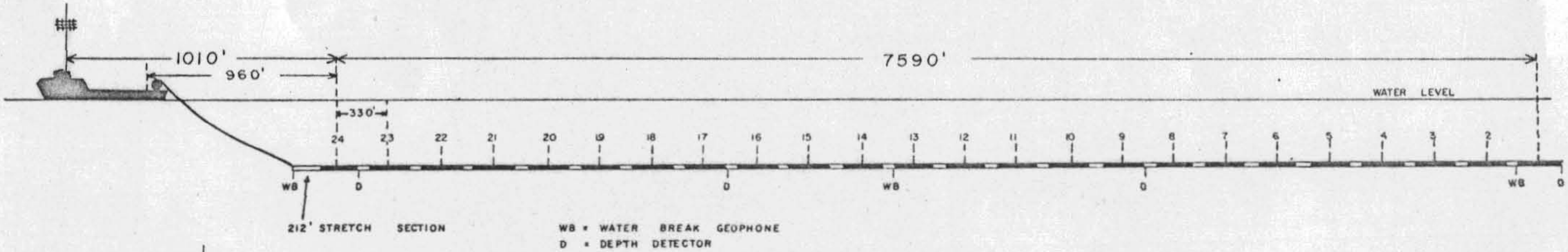
MAY 1968

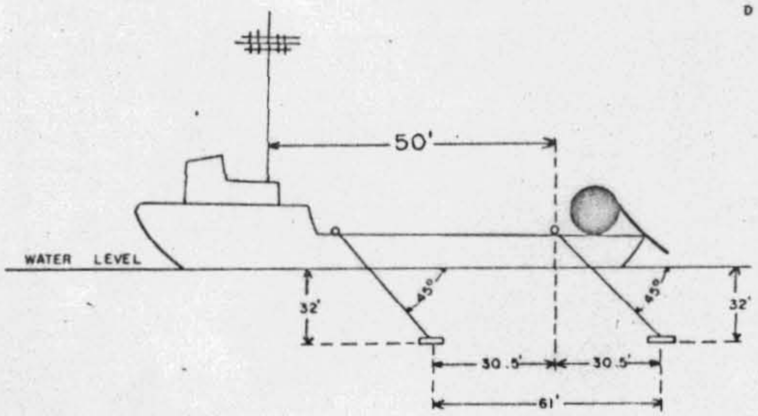
Dwg 851/OP/5

067028

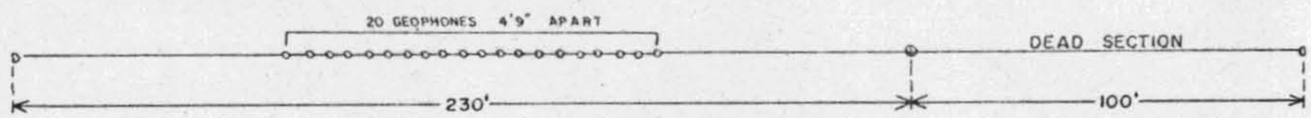
ESSO
SEISMIC SURVEY
1968

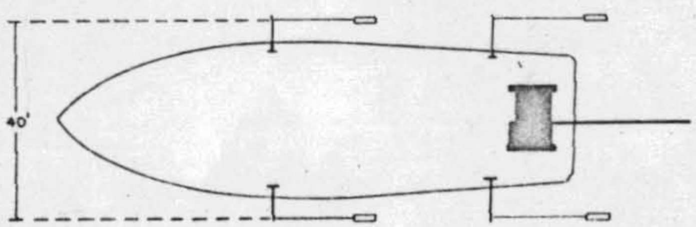
DIAGRAM OF 7590 Ft. STREAMER CABLE





DETAIL OF NOISE CANCELLING ARRAY





WESTERN GEOPHYSICAL
COMPANY
SYDNEY

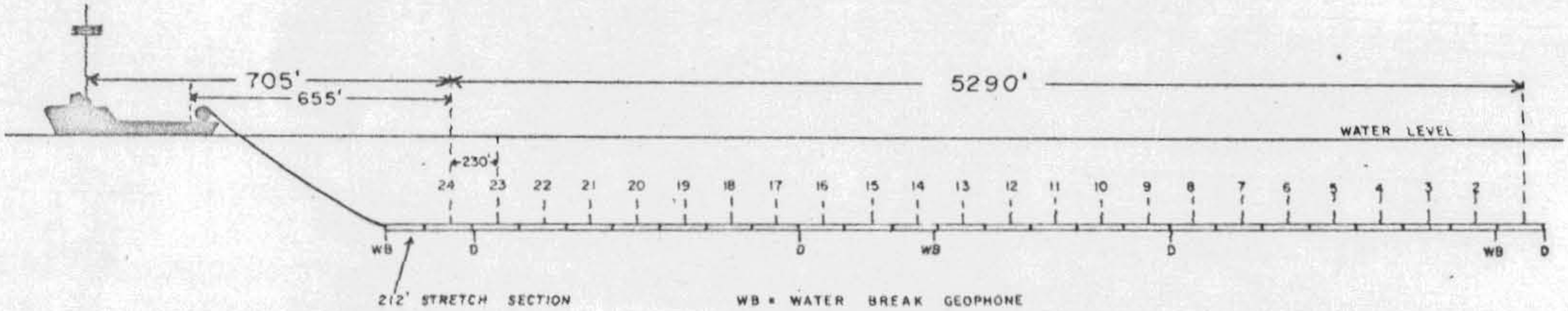
PLATE II

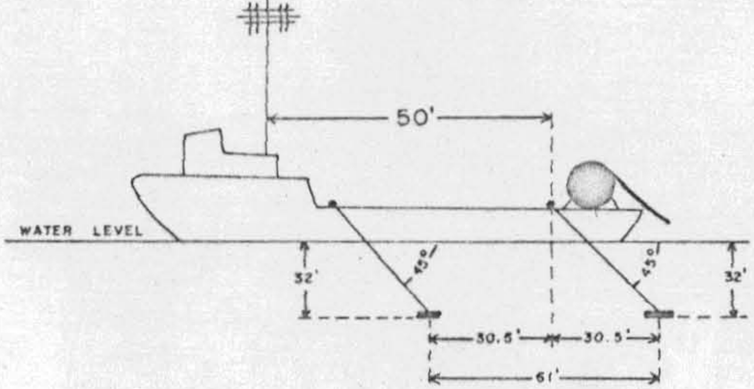
5 cm

067029

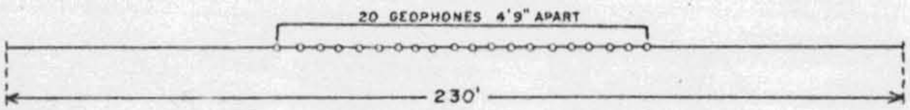
ESSO
SEISMIC SURVEY
1968

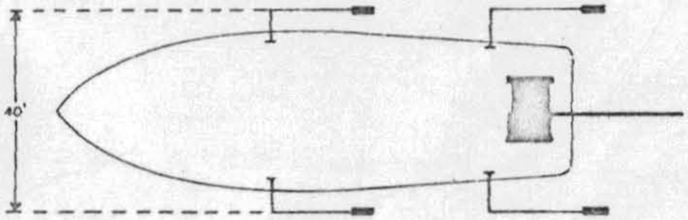
DIAGRAM OF 5290 Ft. STREAMER CABLE





DETAIL OF NOISE CANCELLING ARRAY





WESTERN GEOPHYSICAL COMPANY
SYDNEY

PLATE III

5 cm

GENERAL DESCRIPTION and SPECIFICATIONS

DFR-300 BINARY GAIN SEISMIC SYSTEM (HIGH GAIN)

1. General Information

1.0 Function

1.0.0 The DFR-300 Binary Gain Seismic System accepts data directly from the seismic sensors, conditions the data, and causes the conditioned data to be recorded on digital tape. At the option of the operator, either an analog oscillograph monitor record can be recorded in the read-after-write mode concurrently with the digital recording, output from the amplifiers can be monitored directly, or else selected files can be played back at some later time.

1.0.1 The basic 9-track format is described in Savit, "A proposed standard format for nine-track digital tape", published in Geophysics, v 31, n 4, 1966.

1.1 Physical Description

1.1.1 The recording system consists of seven sections as follows:

1. Input and Test Panel
2. Binary-Gain Input Amplifiers
3. Master Control Panel
4. Magnetic Tape Unit
5. Playback Amplifiers
6. Camera
7. Power Converter

1.2 Input and Test Panel

1.2.1 Included with the input and test panels are bridling switches, cable leakage and continuity tester, precision oscillator and attenuator, group selector switch, and voltage test meter. Test panels include means to terminate the amplifier inputs with a 500 ohm load, a feature used in certain test procedures.

1.3 Binary-Gain Amplifiers

1.3.1 For each amplifier there is provided a hum balance circuit, adjustable high-cut, low-cut, and alias filters, and preamplifier-gain and D.C. offset trim pots.

1.3.2 Amplifier gain is adjusted automatically in 6 db steps; the system always attempts to maintain the signal level between one-fourth and one-half of full scale. To prevent signal clipping and distortion, it is urgent to reduce gain if the signal bursts out above half scale so downward gain-ranging may take place on every alternate scan. At a 1 ms sample rate, the attack rate is 3000 db/sec. On the other hand, in the case of a varying data signal which is crossing zero many times per second, it is apparent that some of the sample values of the signal would fall below the one-quarter scale set-point which triggers the gain increase, yet the signal peaks would be above the trigger level and the existing gain level should be continued. A means is provided to delay the gain increase until all samples fall below the trigger level. This operation is accomplished by examining all samples of a given channel for a time period which is set by a 3-position release-rate switch, having the positions, fast, medium, and slow (30, 40, 60 ms, nominal or 200, 150, 100 db/second). The release rate is an expression of the speed, in decibels per second, at which an amplifier is capable of increasing gain to follow a declining seismic signal. As soon as all samples are below the lower set point for an examination period, the gain is increased by 6 db at the next scan. Thus, with a 30 ms examination period, the gain could be increased 6 db every 30 ms or at a rate of 200 db/sec. Provision of three release rates permits the operator to select the one best suited to the data being received.

1.3.3 Each amplifier unit includes one preamplifier and two paralleled post-amplifiers. The preamplifier has a gain of 40 for systems 105 and all systems with serial number 108 and later. The output of the post-amplifiers is applied to the system multiplexer and also to the analog camera when switched to the noise monitor mode. Of the two post-amplifiers, post-amplifier 1 has selectable gains of 1 and 256; post-amplifier 2 has selectable gains of 16 and 4096. The choice of one of the two gains and one of the two post-amplifiers is a function of the gain-control unit selecting the particular amplifier. In the noise monitor mode, the amplifier gain is forced to ×163,840.

1.4 Logic Control Chassis

1.4.1 The Logic Control chassis contains the master control panel multiplexer, buffer amplifier, gain control unit, A/D and D/A converters, and control logic. Early gain controls for the amplifiers are mounted on the master control panel. The tape drive is included in this chassis unless a 10" tape drive is specified, in which case the tape is mounted in a third rack. An optional dual drive is available for continuous operations.

1.4.2 The analog outputs of the amplifier units are time-multiplexed by the amplifier multiplexer, whence each analog signal is fed to the buffer amplifier. The buffer amplifier serves both as an impedance matcher between the multiplexer and the A/D converter and as an element of the binary gain amplification scheme. Binary signals from the control unit select any one of four buffer-amplifier gains of 1, 2, 4, or 8. The selected buffer-amplifier gain, combined with one of the four gains in the post-amplifiers, result in 15 binary gain steps from 1 to 32,768.

1.4.3 The Gain Control Unit originates a 4-bit gain code to select the gain of one of the two post amplifiers and to control the gain of the buffer amplifier. In general, when the analog value being digitized falls below one-quarter scale, the gain control unit increases the gain code by 1. When the value exceeds one-half scale, the gain control unit decrements the gain code by 1. These values are acquired by decoding the digital outputs of the A/D converter.

1.4.4 The Input Control Unit controls flow of data from the A/D converter, gain control unit, file counter, time counter and other sources to the input bus. This unit sequences and formats the data words into two 8-bit bytes, generates the parity bit, and writes the data on tape via the tape write unit.

1.4.5 The A/D converter is a 14-bit-plus-sign binary converter with complement output for negative numbers. It is controlled by a single start line originating in the input control unit. A trigger pulse on this line for each seismic channel starts the entire conversion sequence. The bit circuits continuously track the analog signal; then, after a particular analog signal has settled, the start signal initiates the sequential clamping of the bit circuits. In this way the precise digital value is achieved very rapidly by successive approximation. The digital output levels are applied to the input bus and are also used to control the gain control units.

1.4.6 The D/A converter accepts the magnitude bits furnished by the A/D converter as well as the 4-bit gain code from the gain control unit. It uses both of these--as mantissa and exponent--in a floating point representation to generate an analog signal with three significant features: (1) The analog output contains the full dynamic range of the system in a form capable of representation on a recording oscillograph. (2) The gain steps that would ordinarily be visible when the system moves from one gain code to another are removed. (3) The average value of the analog signal is normalized by digital and analog AGC, around a manually set playback level, so that rapid changes such as burst-outs are readily visible. The final result is a camera record on which both the average signal value and the reflections are clearly visible for the entire length of the file. On high-gain models, the gain change blips can be displayed at the operator's option.

1.5 Magnetic Tape Unit

1.5.1 The Magnetic Tape Unit is a field tape transport accommodating 9-track tape, ½-inch wide, on 8-½ or 10 inch reels. Direction of tape motion, startup and shutdown are controlled by the system control unit on the basis of the mode selected; tape speed depends upon the sampling rate selected.

1.5.2 A beginning-of-tape sensor determines when first recording may commence, and the end-of-tape sensor warns of the approach of the tape end. If the EOT marker is sensed while a file is being recorded, recording will continue past the EOT mark until the file is completed but no further recording can be done on that reel. It should be noted that this capability is possible because the EOT marker is located 65 feet from the actual end of tape. The tape transport is interlocked with a number of system and transport conditions so that it can operate only when all conditions are ready.

1.5.3 Use of the seismic recording system may involve interlaced recording or playback operations; therefore, a special type of file protection system is provided. This over-write protection uses the electronic detection of data on the tape to inhibit writing. An advance-to-end-of-data control allows the system operator to automatically reposition the tape at the end of the previously recorded data. As a result, it is possible to record a file, replay it or another file, and go ahead with more recording with no chance of inadvertently over-writing data.

1.5.4 In addition to the electronic data-detector-write-inhibitor, conventional write-ring protection is provided. This feature assures the operator that previously recorded data cannot possibly be damaged. If desired, the erase head and electronic file protector can be disabled when recording in the continuous forward mode and, in this case, file protection is available only via the write-ring file protect.

1.5.5 The write logic generates IBM-compatible odd vertical parity which is recorded on tape along with the data. Parity errors are displayed by means of indicator-lights; whenever an excess of parity errors occurs, an audible and visible alarm is activated. The usual EOF characters are generated automatically after the recording has been completed; a manual EOF switch is also available.

1.5.6 A special switch is provided to write a block of all 1's. This block, of indefinite length, is used to check skew.

1.6 Playback Amplifiers

1.6.1 Camera displays can be made in playback mode, either read-after-write during a recording or read only at a later time, or in noise monitor mode.

1.6.2 When the noise-monitor mode is entered, signals are taken from the output of post-amplifier 2 and are fed to the camera. In this mode, the gain is forced to X163,840.

1.6.3 In the direct playback mode only the mantissa is displayed with no reference to the gain code. In this mode the transients due to gain changes are readily visible.

1.6.4 Playback AGC capability is partly analog and partly digital. The digital part removes the transients due to gain changes by bit-shifting and applies gain control to all channels so that the maximum average signal is at a preset level. Differences of amplitude level between channels are then removed by analog AGC applied to individual channels. Burstouts are preserved in their true relationship to the signal envelope level at the point where they occurred. The rate at which the average envelope level is followed in the reconstruction of the signal is adjusted by a three-position AGC rate switch. In addition to the AGC rate, the level at which the average envelope is controlled can also be adjusted. If, for example, the level is reduced, a relatively large burstout capability is provided. To prevent the AGC action from forcing the amplifier to maximum gain when no data signal is present, the AGC preset control is provided to limit the amount of gain control before trip.

1.6.5 Fixed-gain playbacks can be made by locking out the AGC action so that the effective gain is set by the preset switch. It should be noted that if the Preset gain, as set for playback, is greater than the Early gain, as set for record, all signals will be automatically bit-shifted by the amount of the difference, but if the settings are the same, no bit-shifting will occur. For certain test purposes it is desirable to make specified bit-shifts without regard to the early gain setting used at recording time. To accomplish this end, Unit 105, 108 and later models have been equipped with a special function switch providing the option of normal AGC preset, or the capability of shifting the data bits, on playback, by specified fixed amounts regardless of the Early gain setting used during recording.

1.6.6 On playback, the data can be filtered at the option of the operator. Three-position, high- and low-cut filters are provided, with provision to switch the filters out if desired.

1.6.7 Many units have a time accumulator. To monitor its functioning, the least significant bits of the time word are selected and displayed on trace 25 of the camera recording. The signal will appear as a saw-tooth wave with a period of 2048 ms. The time-word display appears on an auxiliary trace.

1.6.8 In addition to the time accumulator display, the time break event is shown as follows. At the beginning of the recording, a DC offset is applied to trace 25. At the moment that the time break is sensed, the offset is removed and the trace returns to normal in the form of a step function. The amplitude of the time-break signal must exceed 1/4 scale for this feature to function.

1.7 Camera

1.7.1 A multi-trace, direct-writing camera is a permanent part of the system. Ordinarily, camera input is fed from the read-after-write heads on the magnetic tape recorder unless the system is in the noise monitor or tape bypass mode. Camera start may be set to coincide with either the recording or playback cycles. For test purposes, the tape can be bypassed so that incoming signals can be played directly into the camera.

1.8 Power Converter Unit

1.8.1 The Power Converter Unit converts 12-volt battery power to thirteen, DC output voltages to operate the units of the 1010 system. Five shielded outputs are used where the maintenance of analog accuracy is critically important. Seven regulated voltages are used principally for digital purposes. An unregulated voltage is used for indicators and relays, and the battery voltage is used directly for motors and heaters.

1.9 Block Diagram

1.9.1 A simplified block diagram is illustrated in Figure 1.

2. Specifications

2.1 System

Number of inputs	24 data channels plus 6 auxiliary channels
Sample rate	1, 2, or 4 ms per scan, switch-selectable
Sample rate accuracy	0.01%
System resolution (A-D)	15 bits including sign
System resolution (D-A)	10 bits including sign manually left shiftable to 84 db
Data code	15 bits in 2 bytes, 1's complement
Redundancy check	Odd vertical parity
Search capability	Forward and reverse for three-digit file identification
Playback AGC control	3 positions: fast, medium, slow
Voltage required	12 v DC

2.2 Amplifier

Maximum input signal	250 mv zero to peak
Input impedance	500 ohms nominal
Minimum gain	32 db
Noise	Less than 0.2 μvp RTI r.m.s.
Cross talk	Greater than 66 db down from full scale
Harmonic distortion	0.1% from 10 Hz to 250 Hz
Automatic gain range, binary gain amplifiers	90 db
Attack rate (@ 1 ms sample rate)	3000 db/sec.
Release rate	200, 150, 100 db/sec. (30, 40, 60 ms delay, nominal)

2.3 Multiplexer, A/D converter

Input	±10 v from seismic amplifier
Number of inputs	30
Noise	±0.6 mv peak referred to ±10 v peak at input to A-D
Coding error	±½ least significant bit
Nagative numbers	1's complement
Linearity	Better than 0.01%
Slope error	Better than 0.01%
Zero error	Better than 0.01%
Conversion time	12 μs

2.4 D/A Converter

Code input	Binary, 1's complement
Number of bits	10 bits, including sign
Accuracy	±0.2%

2.5 Magnetic Tape Unit

Speeds	20, 40, 80 ips
Speed tolerance	±2% long term
Direction	bi-directional
Tape width	½" (0.498 ±0.002)
Recording	IBM compatible
Packing density	800 bpi
Tracks	9
Track spacing	ASI standard
Tape sensing	Photo-reflective IBM compatible both BOT and EOT

Read direction	3 speeds forward, 1 speed reverse
File protection	Electronic and/or write-ring file protection
Erase head	
Reels	8½" or 10" compatible with IBM hubs and snap-off locks

2.6 Filter Amplitude Response Curves

2.6.1 Refer to Figures 2 and 3.

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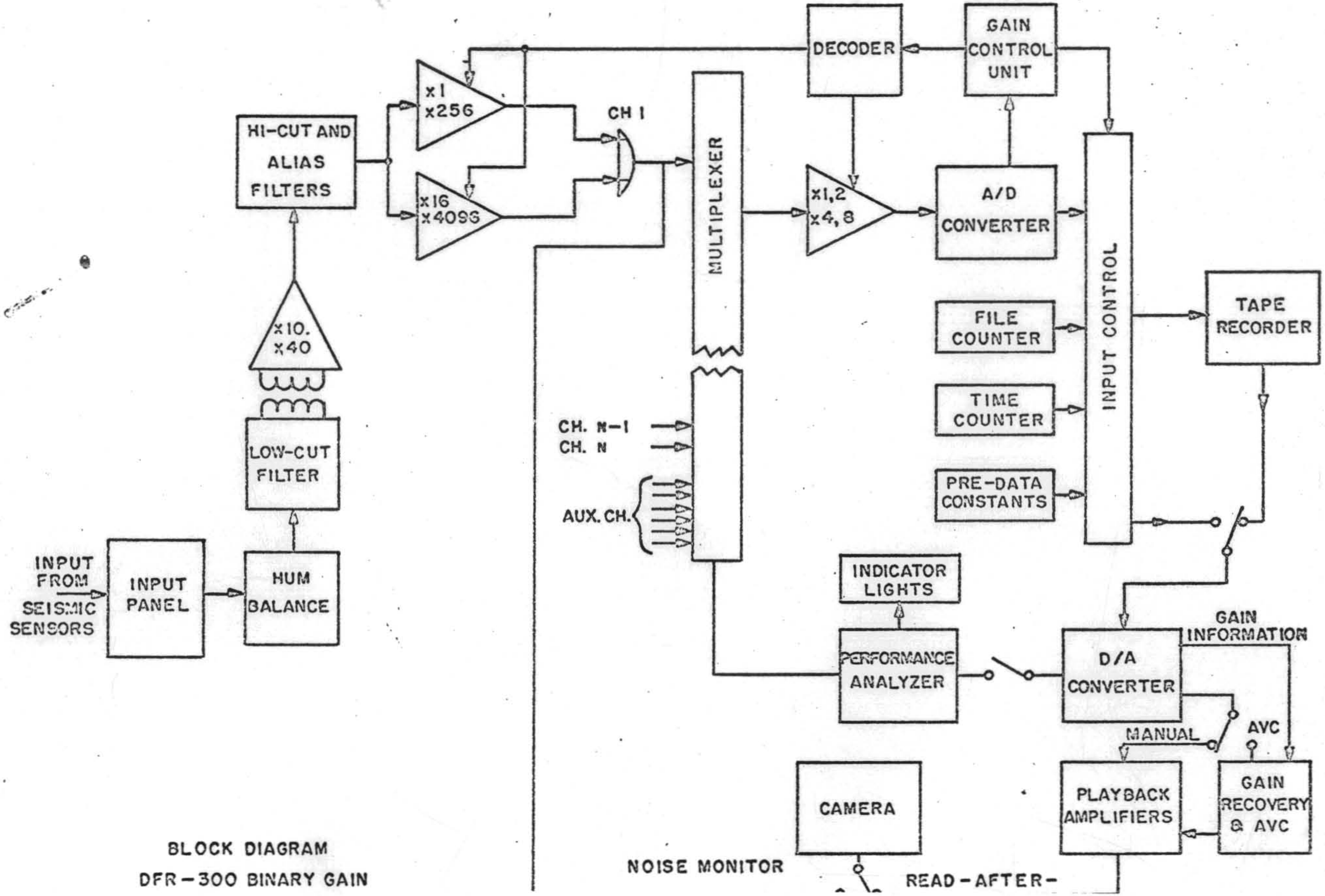


BLOCK DIAGRAM
DFR-300 BINARY GAIN

Figure 1

WESTERN GEOPHYSICAL

5 cm

AMPLITUDE RESPONSE

SDS BINARY GAIN AMPLIFIER

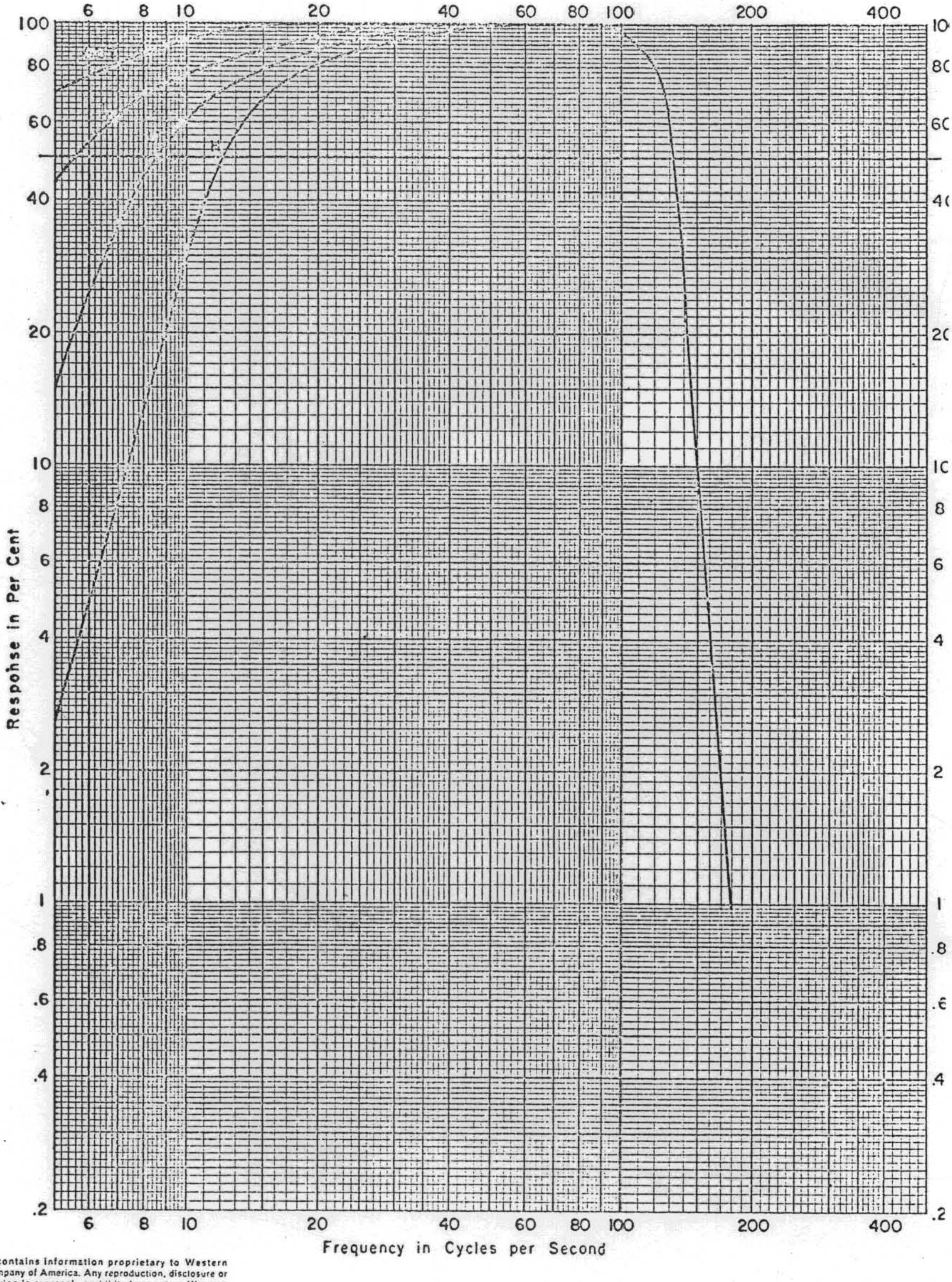
SERIES DFR-300

LOW CUT FILTERS

AMPLIFIER ONLY

HIGH CUT FILTERS-OUT

ALIAS FILTER-2MS



WESTERN GEOPHYSICAL

FIGURE 2.

AMPLITUDE RESPONSE 067041

5 cm

SDS BINARY GAIN AMPLIFIER
SERIES DFR-300
HIGH CUT FILTERS

AMPLIFIER ONLY
LOW CUT FILTER-OUT
ALIAS FILTER-2MS

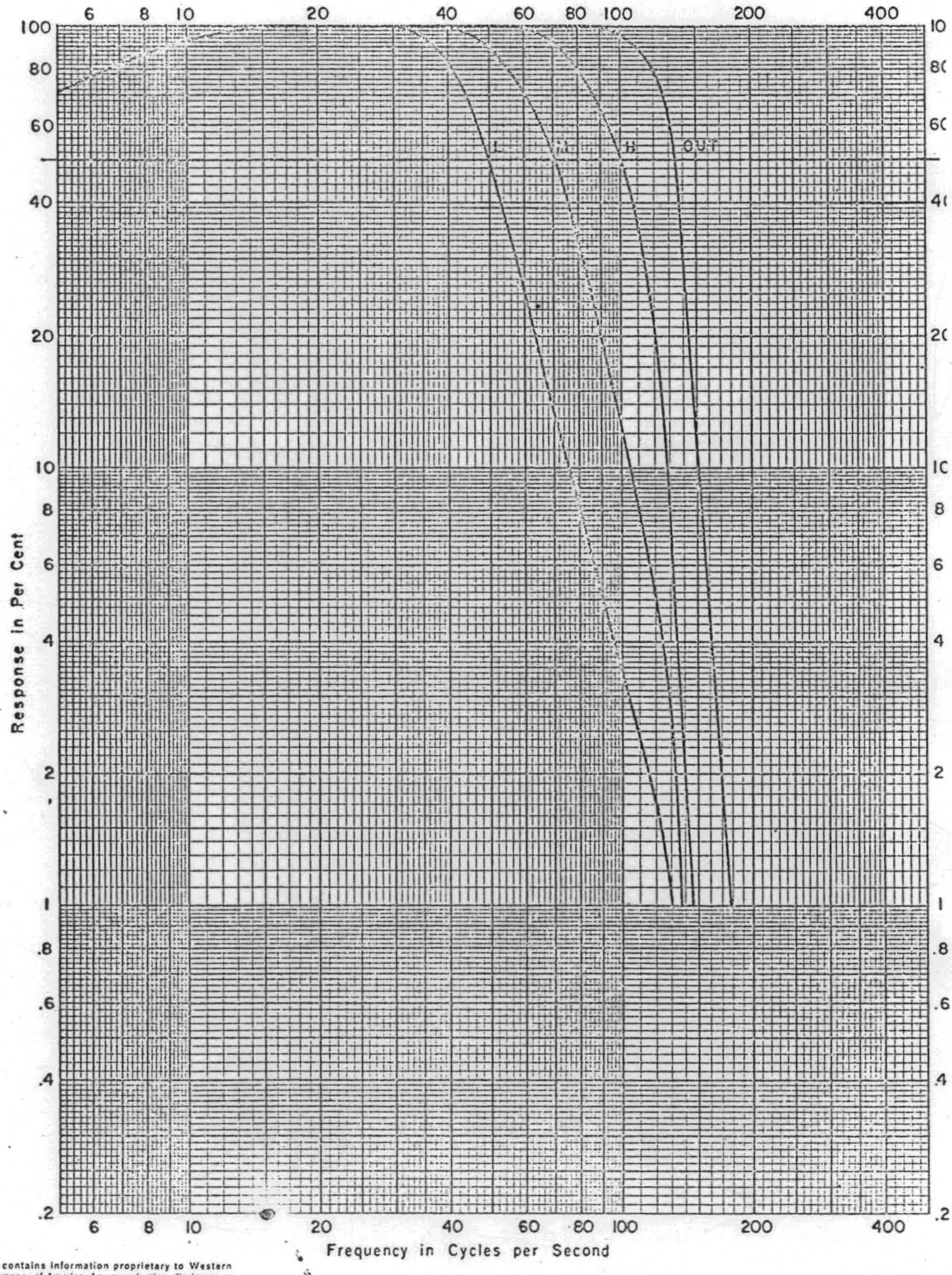


FIGURE 3.

WESTERN GEOPHYSICAL

9-TRACK DIGITAL RECORDING FORMAT

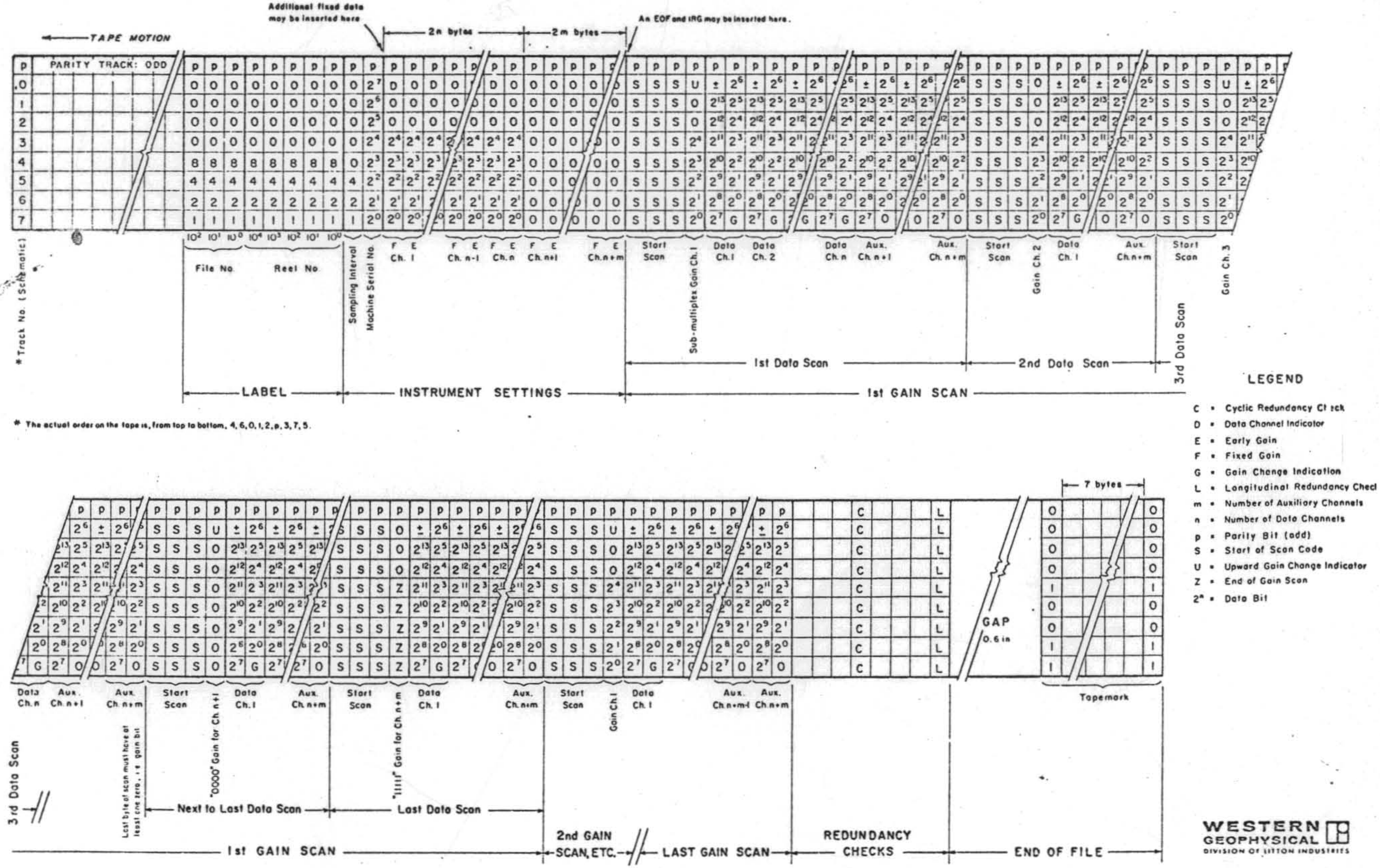


FIGURE 4

067043

TIME-DEPTH TABLE

MARINE SEISMIC SURVEY EH-68

COMPOSITE OF GIPPSLAND WELL SURVEYS

Time	Depth	Time	Depth	Time	Depth
0	0	0.353	1200	0.695	2400
0.015	50	0.368	1250	0.708	2450
0.029	100	0.382	1300	0.722	2500
0.044	150	0.397	1350	0.734	2550
0.059	200	0.412	1400	0.747	2600
0.074	250	0.426	1450	0.759	2650
0.088	300	0.441	1500	0.772	2700
0.103	350	0.456	1550	0.784	2750
0.118	400	0.470	1600	0.796	2800
0.132	450	0.485	1650	0.809	2850
0.147	500	0.500	1700	0.821	2900
0.162	550	0.515	1750	0.834	2950
0.176	600	0.529	1800	0.846	3000
0.191	650	0.544	1850	0.869	3100
0.206	700	0.559	1900	0.892	3200
0.221	750	0.573	1950	0.914	3300
0.235	800	0.588	2000	0.937	3400
0.250	850	0.601	2050	0.960	3500
0.265	900	0.615	2100	0.980	3600
0.280	950	0.628	2150	1.001	3700
0.294	1000	0.642	2200	1.021	3800
0.309	1050	0.655	2250	1.042	3900
0.323	1100	0.668	2300	1.062	4000
0.338	1150	0.682	2350	1.081	4100

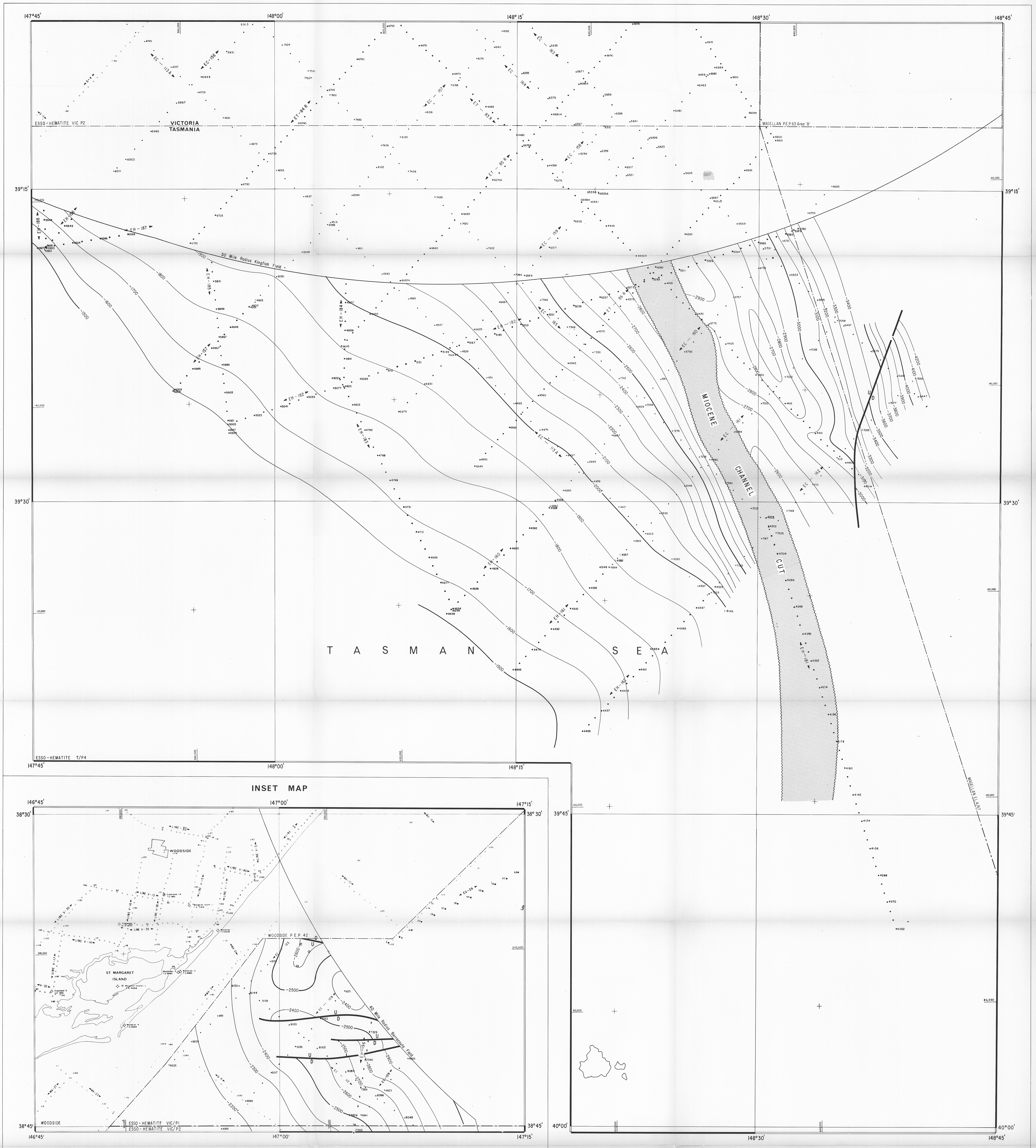
GROPER CURVE

Time	Depth
1.098	4200
1.113	4300
1.130	4400
1.148	4500
1.163	4600
1.180	4700
1.196	4800
1.212	4900
1.230	5000
1.247	5100
1.263	5200
1.281	5300
1.299	5400
1.317	5500
1.335	5600
1.353	5700
1.370	5800
1.385	5900
1.400	6000
1.417	6100
1.434	6200
1.450	6300
1.466	6400
1.482	6500
1.562	7000
1.640	7500

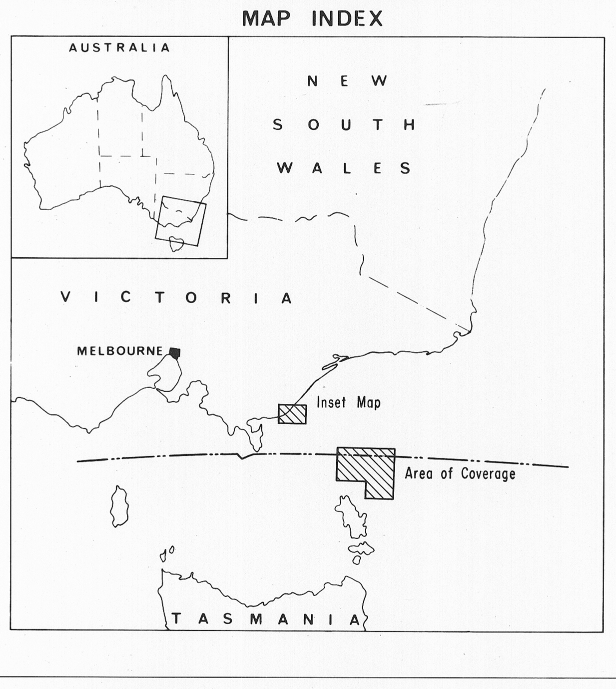
LIST OF SEISMIC SECTIONS

Two copies each of the below listed C.D.P. twelve-fold V.D.F. seismic sections of the EH-68 Survey are submitted with this report.

Line	Miles
EH-156	2.63
EH-157	6.86
EH-160	8.76
EH-162	10.92
EH-181	23.86
EH-182	33.44
EH-183	14.11
EH-184	6.08
EH-185	10.10
EH-187	6.13
EH-188	2.72
EH-196	6.82
	141.10



MAP INDEX



LEGEND

—— 3000 ——	Contour in Feet
○	Analog Seismic Shot Point
○	Digital Seismic Shot Point
⌖	Well, abandoned with Oil Show
⌖	Well, dry and abandoned
U —— D	Fault, 'D' downthrown Side
—— - —— -	Petroleum Tenement Boundary
————	Limit of Subsidy Area, 40 Mile Radius Barracouta Field, 50 Mile Radius, Kingfish Field

EAST BASS BASIN - part 4/12

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

THE GIPPSLAND BASIN

VICTORIA

067046

STRUCTURE CONTOUR MAP ON TOP OF LAKES ENTRANCE FM.

5 cm

CONTOUR INTERVAL : 100 FEET
DATUM : SEA LEVEL

Scale 1 : 100,000

2 1 0 2 4
MILES

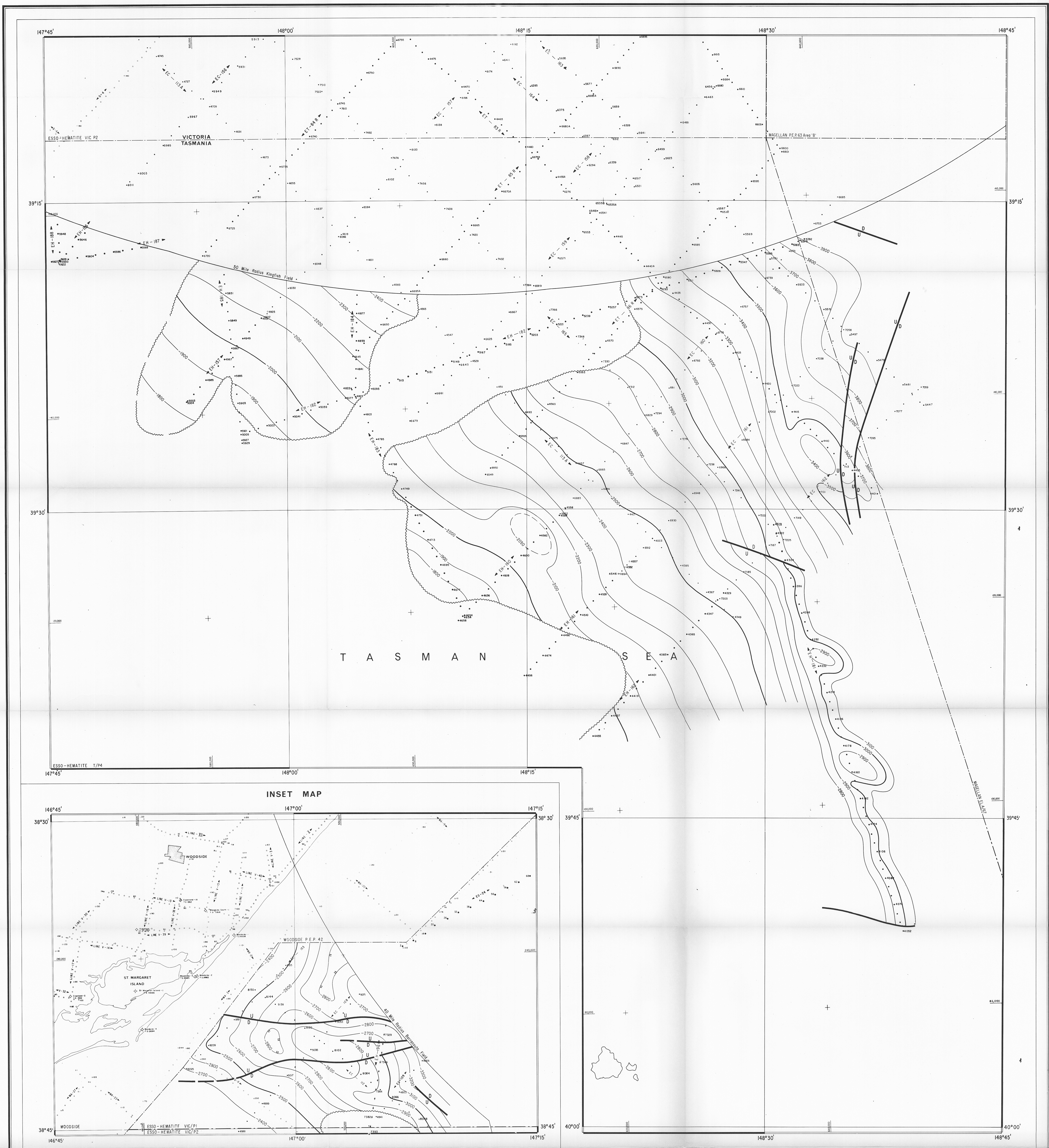
AUTHOR J.W. MILLIKEN, D.B. DEPEW
DRAFTED BY G.C. THOMAS

TO ACCOMPANY FINAL REPORT EH-68 MARINE SEISMIC SURVEY, NOVEMBER 1968

PLATE I

OR-041

DWG-1062/G/4



LEGEND

—— 3000 ——	Contour in Feet
○	Analog Seismic Shot Point
○	Digital Seismic Shot Point
⊕	Well, abandoned with Oil Show
⊕	Well, dry and abandoned
U / D	Fault, 'D' downthrown Side
— · — · —	Petroleum Tenement Boundary
———	Limit of Subsidy Area, 40 Mile Radius Barracouta Field, 50 Mile Radius, Kingfish Field

EAST BASS BASIN - pet 4/3

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

THE GIPPSLAND BASIN

VICTORIA

067047

STRUCTURE CONTOUR MAP ON LATROBE DELTA TOPOGRAPHIC SURFACE

5 cm

CONTOUR INTERVAL : 100 FEET   DATUM : SEA LEVEL

Scale 1 : 100,000

2 1 0 2 4 MILES

AUTHOR : J.W. MILLIKEN, D.B. DEPEW   DRAFTED BY : G.C. THOMAS

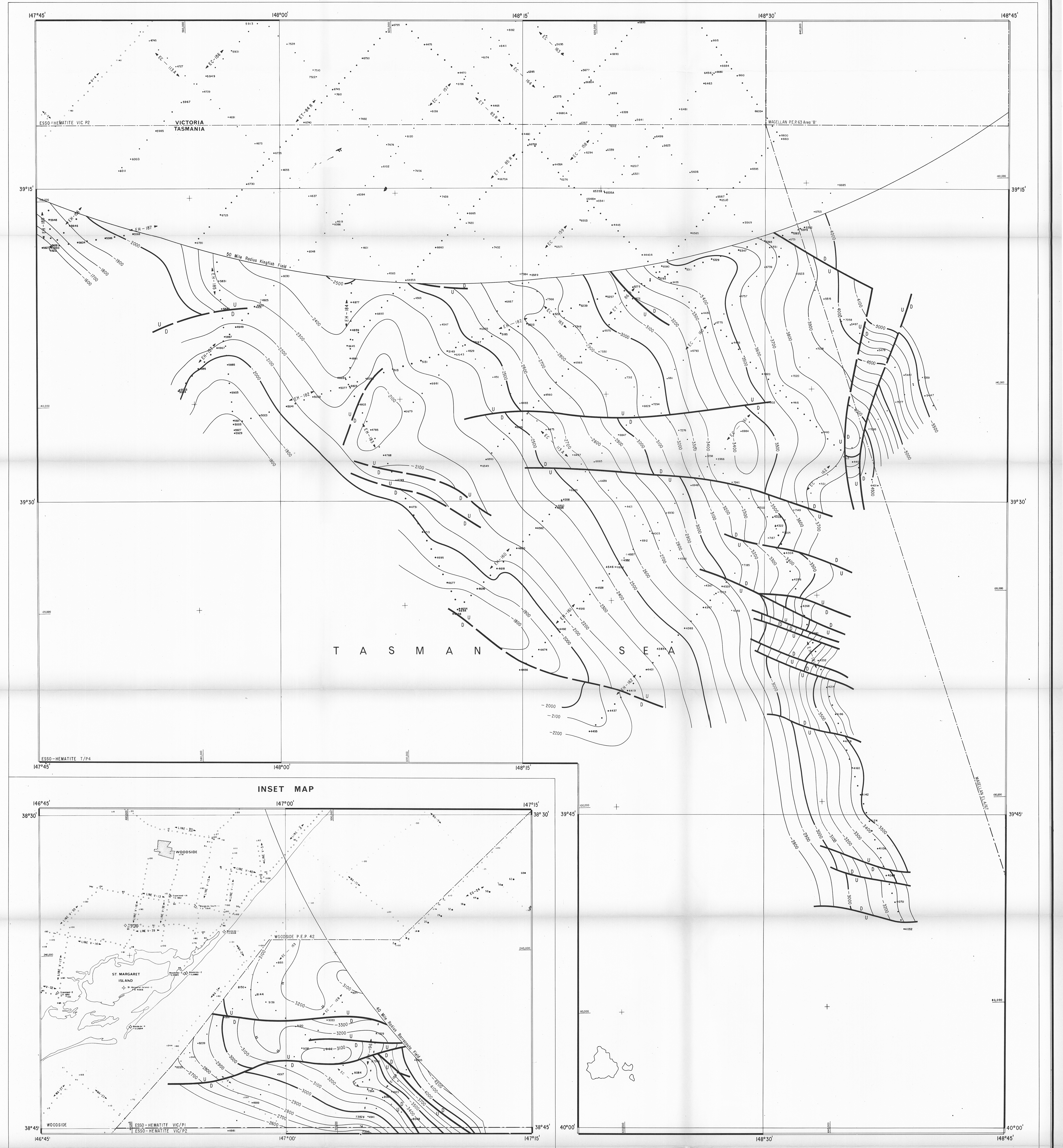
TO ACCOMPANY : FINAL REPORT EH-68 MARINE SEISMIC SURVEY, NOVEMBER 1968

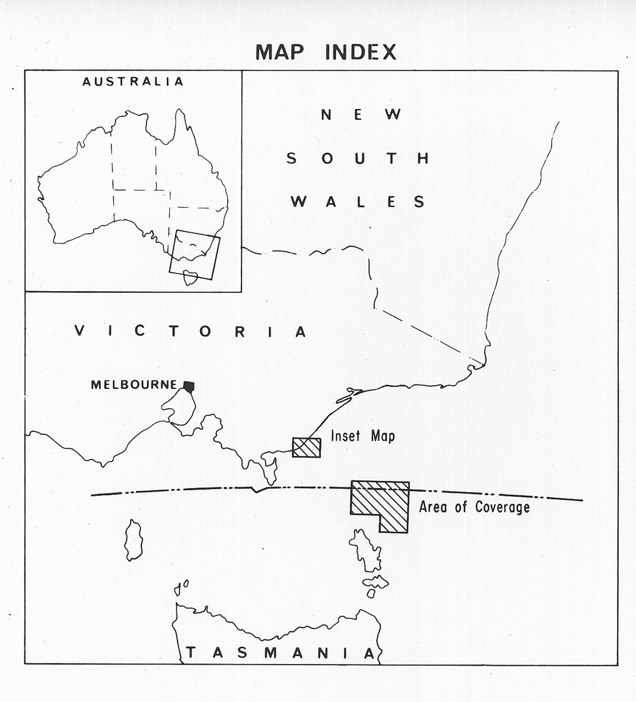
PLATE II

OR-041

DWG-1062/G/5

2





LEGEND

—— 3000 ——	Contour in Feet
∘	Analog Seismic Shot Point
∘	Digital Seismic Shot Point
✦	Well, abandoned with Oil Show
✧	Well, dry and abandoned
U / D	Fault, 'D' downthrown Side
—·—·—	Petroleum Tenement Boundary
———	Limit of Subsidy Area, 40 Mile Radius Barracouta Field, 50 Mile Radius, Kingfish Field

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

THE GIPPSLAND BASIN

VICTORIA

067048

STRUCTURE CONTOUR MAP ON TOP OF BASEMENT

5 cm

CONTOUR INTERVAL : 100 FEET

DATUM : SEA LEVEL

Scale 1 : 100,000

2 1 0 2 4

MILES

AUTHOR : J.W. MILLIKEN, D.B. DEPEW

DRAFTED BY : K.H. REISS

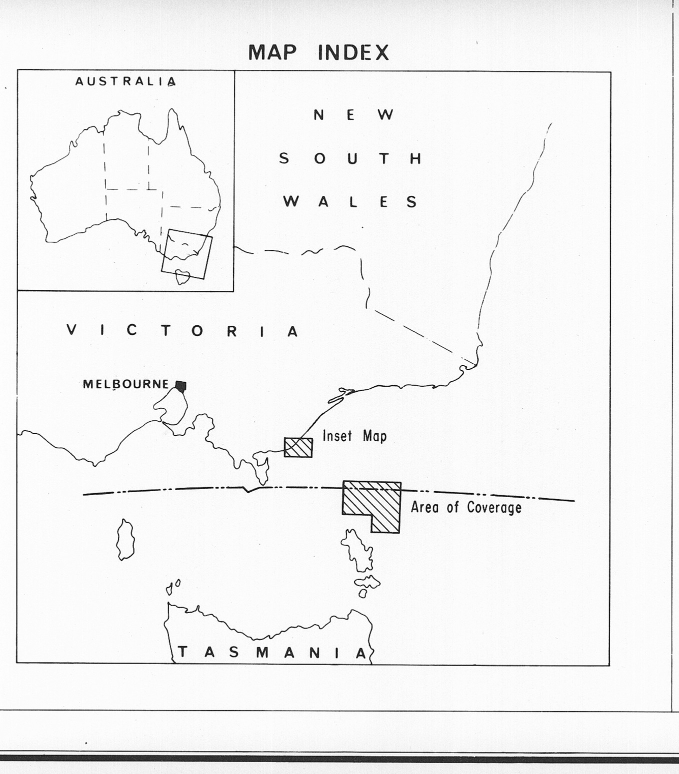
TO ACCOMPANY : FINAL REPORT EH-68 MARINE SEISMIC SURVEY, NOVEMBER 1968

PLATE III

OR-041

DWG. 1062/G/6

3



LEGEND

- 3000 — Contour in Feet
- Analog Seismic Shot Point
- Digital Seismic Shot Point
- Well, abandoned with Oil Show
- Well, dry and abandoned
- U / D — Fault, 'D' downthrown Side
- Petroleum Tenement Boundary
- Limit of Subsidy Area, 40 Mile Radius Barracouta Field, 50 Mile Radius, Kingfish Field

EAST BASS BASIN - part 4/5

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

THE GIPPSLAND BASIN

VICTORIA

067049

ISOPACH MAP OF INTERVAL LAKES ENTRANCE FM. TO LATROBE DELTA TOPOGRAPHIC SURFACE

5 cm

ISOPACH INTERVAL : 100 FEET

Scale 1 : 100,000

2 1 0 2 4 MILES

AUTHOR : J.W. MILLIKEN, D.B. DEPEW DRAFTED BY: M.R. CHÂTENAY

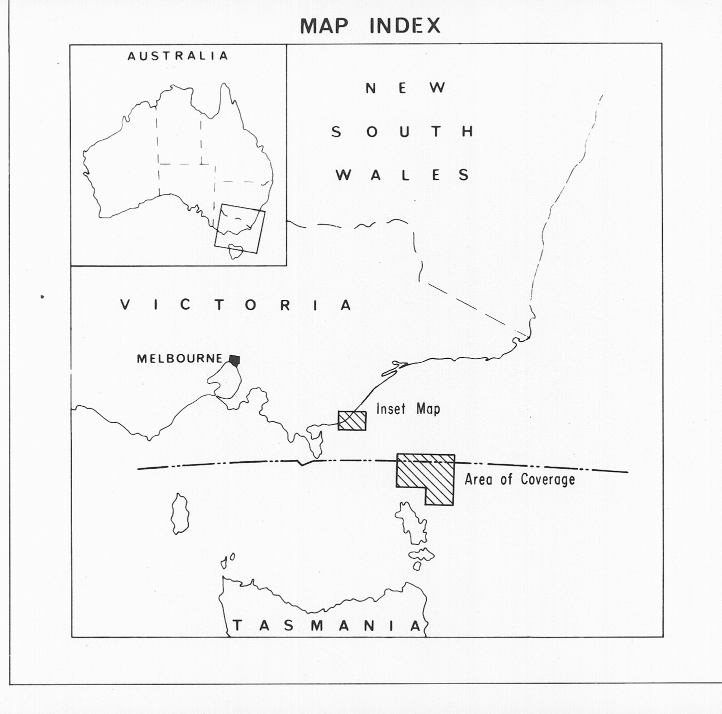
TO ACCOMPANY : FINAL REPORT EH-68 MARINE SEISMIC SURVEY, NOVEMBER 1968

PLATE IV

OR-041

DWG. 1062/G/7

MAP INDEX



LEGEND

3000	Contour in Feet
○	Analog Seismic Shot Point
○	Digital Seismic Shot Point
⌖	Well, abandoned with Oil Show
⌖	Well, dry and abandoned
U / D	Fault, 'D' downthrown Side
— · —	Petroleum Tenement Boundary
——	Limit of Subsidy Area, 40 Mile Radius Barracouta Field, 50 Mile Radius, Kingfish Field

EAST BASS BASIN - part 4/6

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

THE GIPPSLAND BASIN

VICTORIA

067050

ISOPACH MAP OF INTERVAL LATROBE DELTA TOPOGRAPHIC SURFACE TO TOP OF BASEMENT

5 cm

ISOPACH INTERVAL : 100 FEET

Scale 1 : 100,000

2 1 0 2 4

MILES

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PLATE V

OR-041

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