OCEANOGRAPHICAL OBSERVATIONS
IN THE PACIFIC OCEAN IN 1960
H.M.A.S. *GASCOYNE*
Cruise G 3/60

OCEANOGRAPHICAL CRUISE REPORT NO. 6

DIVISION OF FISHERIES AND OCEANOGRAPHY
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL
RESEARCH ORGANIZATION, AUSTRALIA 1963

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No. 6

Oceanographical Observations in the Pacific Ocean in 1960

H.M.A.S. GASCOYNE

Cruise G 3/60

November 8 - December 4, 1960

I. INTRODUCTION

Data are recorded in this volume for the third cruise in 1960 of H.M.A.S. Gascoyne, Royal Australian Navy frigate, which carries out oceanographical cruises in the Pacific Ocean.

Objectives

This cruise was planned (1) to study the dynamics of the East Australian Current system, (2) to obtain an estimate of the densities of benthic animals on the continental shelf, (3) to take sediment samples for mineral analysis and for qualitative study of the Foraminifera by the Department of Geology, University of New South Wales, and (4) to collect phytoplankton to 100 m.

Itinerary of Cruise

During this cruise 113 stations were occupied (Fig. 1). The cruise commenced at Sydney on November 8, worked three lines of stations south-east from Sydney, returned to Sydney and on November 19, moved north of Sydney where six lines of stations were worked between Sydney and Brisbane; the ship returned to Sydney on December 4.

Scientific Personnel

B.V. Hamon (Cruise Leader)
R.J. MacIntyre
C. Middleton
K. Richards
D. Vaux

The temperature, salinity, and G.E.K. observations were made aboard by Messrs B.V. Hamon, K. Richards, and D. Vaux. The bottom grab was operated by Dr R.J. MacIntyre, and the samples were weighed and specimens identified by him. Mr A.E. Stark of the Division of Mathematical Statistics, using the benthic biomass, estimated the mean total biomass for 75 and 150 fathom stations and carried out analyses of variance.

II. WORK ACCOMPLISHED

Bathythermograph casts were made at 72 stations. Surface hydrology samples were taken at 44 stations and deep hydrology samples at 58 stations. G.E.K. observations were taken on 38 occasions. The orange peel grab sampled at 20 stations and phytoplankton quantitative samples were taken at 23 stations (Table 1).

TABLE 1

WORK DONE AT EACH STATION

Station Number	BT	Hydrology Surface	Hydrology Deep	Grab	G.E.K.	Phytoplankton
201				+		
202	+	+	+			
203	+	+	+			
204	+	+	+			+
205	+	+	+			
206	+	+	+			
207	+					
208	+	+	+			
209	+	+	+			+
210	+	+				+
211	+	+	+			
212	+	+				
213	+	+	+		+	+
214	+	+				
215	+	+	+			+
216	+	+				
217	+	+	+			
218	+	+				
219	+	+	+			+
220	+	+	+			

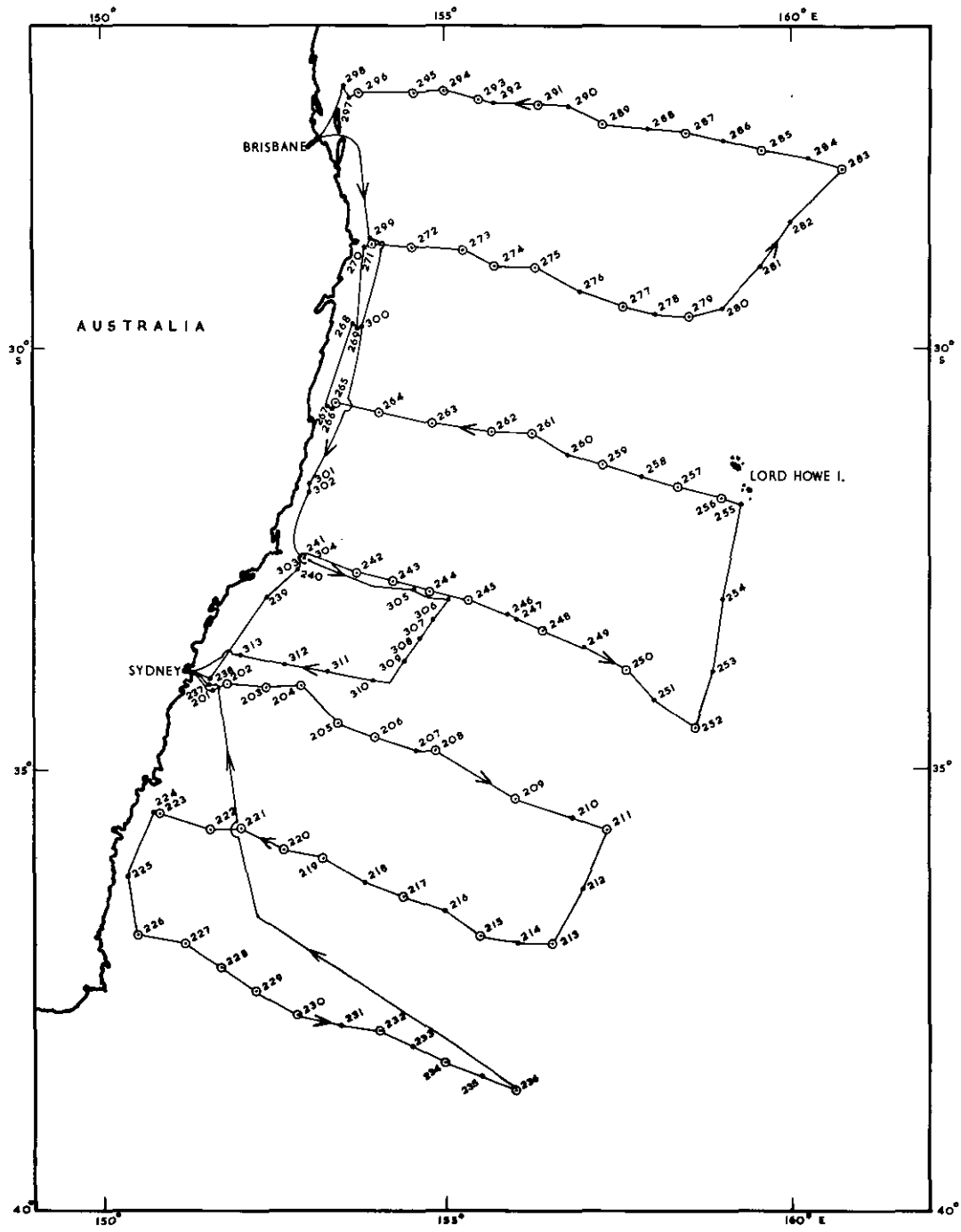

Fig. 1. - Track Chart

Station Number	BT	Surface	Deep	Grab	G.E.K.	Phytoplankton
221	+	+	+			
222		+	+			+
223	+	+	+			
224		+		+		+
225		+		+		
226	+	+	+			
227	+	+	+			+
228	+	+	+			
229	+	+	+			+
230	+	+	+		+	
231	+	+				
232	+	+	+		+	
233	+	+				
234	+	+	+			+
235	+	+				
236	+	+	+		+	+
237		+		+		
238		+		+		
239		+		+		
240		+		+		
241	+	+	+		+	
242	+	+	+		+	+
243		+	+		+	
244		+	+		+	
245	+	+	+		+	
246	+	+				
247		+		+		
248	+	+	+		+	
249	+	+				
250	+	+	+		+	+
251	+	+				
252	+	+	+		+	+
253	+	+				

Station Number	BT	Hydrology Surface	Hydrology Deep	Grab	G.E.K.	Phytoplankton
254	+	+				
255		+		+		
256	+	+	+			+
257	+	+	+			
258	+	+				
259	+	+	+		+	
260	+	+				
261	+	+	+		+	+
262	+	+	+		+	
263	+	+	+		+	+
264	+	+	+		+	
265	+	+	+			
266		+		+		
267		+		+		
268		+		+		
269		+		+		+
270		+		+		
271		+	+		+	
272	+	+	+		+	
273	+	+	+		+	+
274	+	+	+		+	+
275	+	+	+		+	
276	+	+				
277		+	+		+	
278	+	+				
279	+	+	+		+	+
280		+				
281		+			+	
282	+	+				
283		+	+		+	

Station Number	BT	Hydrology Surface	Hydrology Deep	Grab	G.E.K.	Phytoplankton
284	+	+				
285		+	+		+	
286		+				
287	+	+	+		+	+
288	+	+				
289	+	+	+		+	
290		+				
291		+	+			
292	+	+				
293		+	+		+	+
294		+	+		+	
295		+	+		+	+
296		+	+		+	
297		+		+		
298		+		+		
299		+		+		
300		+		+		
301		+		+		
302		+		+	+	
303	+	+	+			
304	+	+				
305	+	+				
306	+	+				
307	+	+				
308	+	+				
309		+				
310		+			+	
311		+			+	
312		+			+	
313		+			+	

III. METHODS OF COLLECTING DATA

1. Physics

The current system was studied by calculating dynamic heights from measured values of salinity and temperature, and the surface currents were measured by towed electrodes (G.E.K.).

Temperature.- Water temperatures were measured by reversing thermometers, supplemented by bathythermograph observations. A direct record of surface temperature was made during part of the cruise by towing a thermistor either in the wake of the ship, or from the chains on the starboard side. The thermistor was connected in a bridge circuit whose output was recorded on a strip-chart recorder. These recorded temperatures did not add significantly to the knowledge of surface temperatures obtained with reversing thermometers and surface sampler, and they are not reported here. When there was no wind or cloud, some interesting observations were made on direct surface heating ("afternoon effect"). This effect showed up as fluctuations of about $\pm$ 0.5°C in the recorded temperature, the amplitude being a maximum in late afternoon. The fluctuations were of very short period when the thermistor was towed in the ship's wake, and of longer period when it was towed alongside. This surface heating effect was observed between station G 3/285/60 and G 3/292/60.

Salinity.- The salinity of all samples was measured on board, using a portable temperature - chlorinity bridge. Additional samples from depths below 500 m were stored and measured ashore on an inductive salinometer. Both sets of values are given in the tables. It was noticed that the value obtained on board was almost always higher than that obtained on a duplicate sample ashore. The average difference was about 0.03‰ in salinity. This bias is too consistent to be explained in terms of the limited reading accuracy of the chlorinity - temperature bridge. Some of the stored samples were too high in salinity, due presumably to badly-fitting stoppers. Except for these, the values obtained ashore are considered more accurate.

G.E.K.- This cruise was the first on which the towed electrode (G.E.K.) method was used on Naval frigates for the measurement of surface currents.

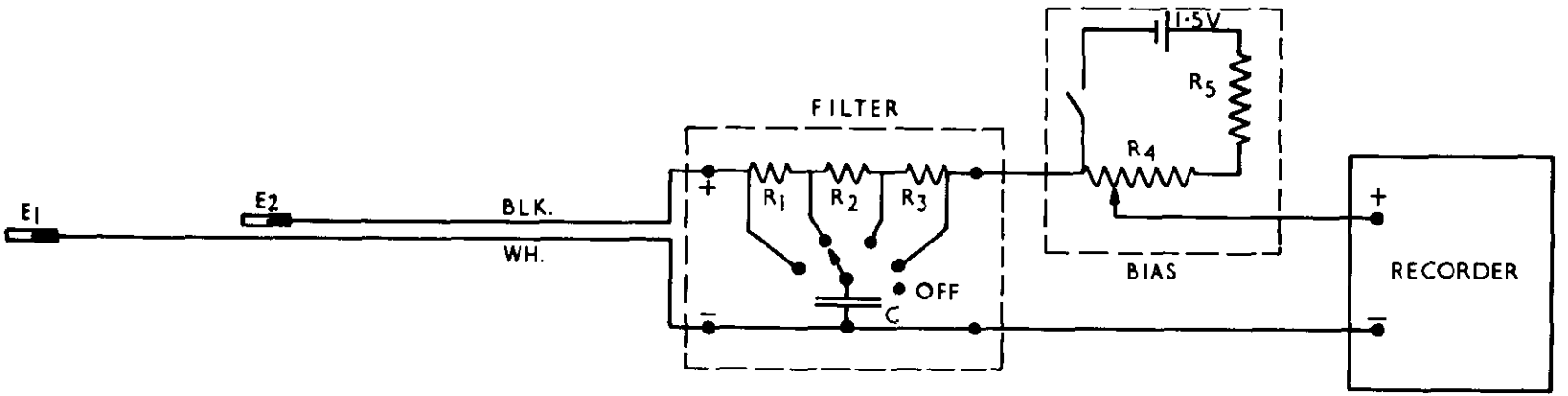

Fig. 2.- Circuit of G.E.K. E_1: far electrode. E_2: near electrode. R_1: 100 ohms. R_2 R_3: 200 ohms. C: 1500 mfd reversible electrolytic capacitor. R_4: 100 ohms. R_5: 5000 ohms. Recorder: Leeds and Northrup type H range 0 - 20 millivolts.

The towed cable consisted of 250 m of neutrally-buoyant cable, with two electrodes (Cambridge Inst. Co., pattern No. 52571) attached 100 m apart. A new and relatively simple method of attaching the electrodes to the cable was used, and proved completely satisfactory.

The drag of the cable in the water was measured at three speeds, with the following results:

Speed (knots)	Drag (lb)
8	44
10	60
12	83

Even at 12 knots, the drag is small compared with the cable's breaking strain (300 lb).

The circuit used is shown in Figure 2. The wave filtering time-constant (15,000 mfd x 540 ohm = 0.8 sec.) is less than frequently used, but was considered adequate in an area where surface currents are large.

The electrodes were streamed continuously, except when bad weather made it too dangerous to pay the cables out over the stern. While being streamed, the system gave a continuous record of the component of current normal to the ship's track. The electrode "zero" was checked about three or four times a day, usually immediately before a hydrology station. These "zero" checks also give the component of current parallel to the ship's track. During a hydrology station, the cable was hauled in and flaked down on the helicopter platform. The two electrodes were placed in a bucket of sea-water. The cable was not hauled in when the ship stopped for a bathythermograph station.

Surface current components were calculated as

$$v = 0.37\ e$$

where e is the recorder deflection from the electrode "zero" position, in millivolts, and v is the velocity in knots. This corresponds to a value of 0.52 gauss for the vertical component of the earth's magnetic field, and a "K Factor" (von Arx, 1950) of unity. No allowance was made for the variation (0.44 to 0.55 gauss) of the vertical component of the earth's magnetic field with latitude.

The electrode "zero" varied during the cruise. The extreme range of variation was about 1.7 mV (equivalent to 0.6 knot). Linear interpolation between successive "zero" determinations was used in calculating the component of current normal to the ship's track. Current components so calculated may be in error by about 0.2 or 0.3 knot, due to the variations in electrode "zero".

Observations were logged from the continuous record each hour, the trace being smoothed by eye to remove residual wave effects and the effects of small changes in course. It was noted that hourly readings were sufficient to extract almost all the information in the record.

Although it was possible to tow the electrodes in bad weather, and the record appeared to be satisfactory, the results under these conditions may be in error due to the direct effect of wind on the cable, which is partly out of water under these conditions. Knauss and Reid (1957) claim that errors of the order of one quarter of a knot, in the down-wind direction, can occur with neutrally buoyant cable in winds of Beaufort force 3-4. Since winds up to force 6, and occasionally up to force 7 or 8, were encountered on this cruise, the error due to windage may be appreciable. The direct wind effect is not known well enough for the observed surface currents to be corrected. Sections of the ship's track where winds of Beaufort force 5 or more were encountered are indicated in Figures 8 and 9, by the letter W.

Dynamic Heights.- A rapid method of calculating approximate dynamic heights from temperature alone was used during this cruise.

If departures from a mean temperature - salinity curve in a given area are neglected, the thermosteric anomalies from which dynamic heights are calculated become functions of temperature only. Approximate dynamic heights, which are sufficiently accurate for guidance during a cruise, can then be calculated within a few minutes after the end of each hydrology station. The method used is as follows.

A mean T-S curve was plotted using data from previous cruises in the same area. Corresponding values of temperature and salinity were read off the curve at intervals of 1°C in temperature, and tabulated. The thermosteric anomalies for each temperature - salinity combination were obtained from

Table VA of U.S. Hydrographic Office Publication No. 614. The anomalies were then plotted against temperature.

In use the protected thermometer readings (uncorrected) at nominal depths of 50, 150, 300, 500, 700, and 900 m were tabulated after each station, and the corresponding thermosteric anomalies were obtained from the graph. Numerical integration of the thermosteric anomalies gives immediately the approximate dynamic height of the surface relative to 1000 decibars, in dynamic centimetres. An example is given in Table 2.

TABLE 2

Calculation of Dynamic Heights

Nominal Depth(m)	Depth Interval(m)	Temp(°C)	Therm. Anom.
50	100	18.9	234
150	100	15.6	173
300	200	12.8	143
500	200	9.4	116
700	200	7.6	102
900	200	5.8	88
		Integral	130500
		Dynamic Height	130 cm

Nominal depths from the meter block were used if the wire angle was less than about 15°; for larger wire angles a rough calculation of actual depths was made, using only the deepest unprotected thermometer on each cast. The required protected thermometer readings were then read from a graph of temperature against depth.

An analysis of the results for 48 stations showed that the mean dynamic height by the above method was about 2 dyn. cm less than the true value. The standard deviation of the difference between the two methods was also about 2 dyn. cm.

2. Benthos

Equipment.- The grab employed for quantitative sampling of benthos was a 2 cubic foot standard Hayward Bucket, or "Orange peel", grab (Fig. 3). It was modified, by the addition of a gravity operated trip mechanism, to operate on a

single wire. Interlocking plates of stainless steel were added to prevent the sediment from washing out through the top of the grab. Flexible steel cable of $1\frac{1}{2}$ in. circumference was passed from a large steam winch through a radial davit on the port quarter of the ship so that the grab was worked over the stern and landed on the port side.

Methods.- Sediment from the grab was discharged into cylindrical steel tubs $22\frac{1}{2}$ in. in diameter and the depth of sediment was measured. Small representative sub-samples of raw sediment were removed for mineral and foram analyses before the sediment was washed through a table of three sorting sieves (12.3, 5.5, 1.5 mm apertures) into a box beneath (Fig. 4). The box retained sand particles but silt and small animals were washed out into a fine (0.7 mm) sieve.

Mineral samples were stored in polythene bags without preservative, but foram samples were preserved in glass jars with 70% ethyl alcohol containing acid fuchsin as a stain.

The collections of benthos were preserved in 10% formalin neutralized with hexamine. Very large specimens, particularly the soft corals from the triangular dredge hauls, were wrapped in cotton gauze and stored in large cans of formalin. Small delicate animals were first separated into plastic tubes which were then added to the plastic bags containing medium sized specimens.

In the laboratory, samples were sorted into groups and, after excess formalin had been removed on filter paper, they were weighed. The results of this are shown in Table 3 (pp. 84-87).

At most stations several grab samples were taken and the resulting catches are expressed as weights per grab. While the orange peel grab is one of the most efficient digging samplers, it seldom delivered its maximum load of sediment due, no doubt, to variations in the nature of the bottom in the area sampled, and the amount of sediment, particularly sand, which washed out of the grab. Ideally this instrument samples a square .25 m^2 in area to a depth of about 15 cm, so that a factor of four could be used to convert the figures shown to express catch per m^2, and in fact diving observations indicated that, in stiff sandy mud, the grab did leave a square hole of these dimensions, but more often the yield was smaller and averaged 1/5th of the total possible volume. Barnard and

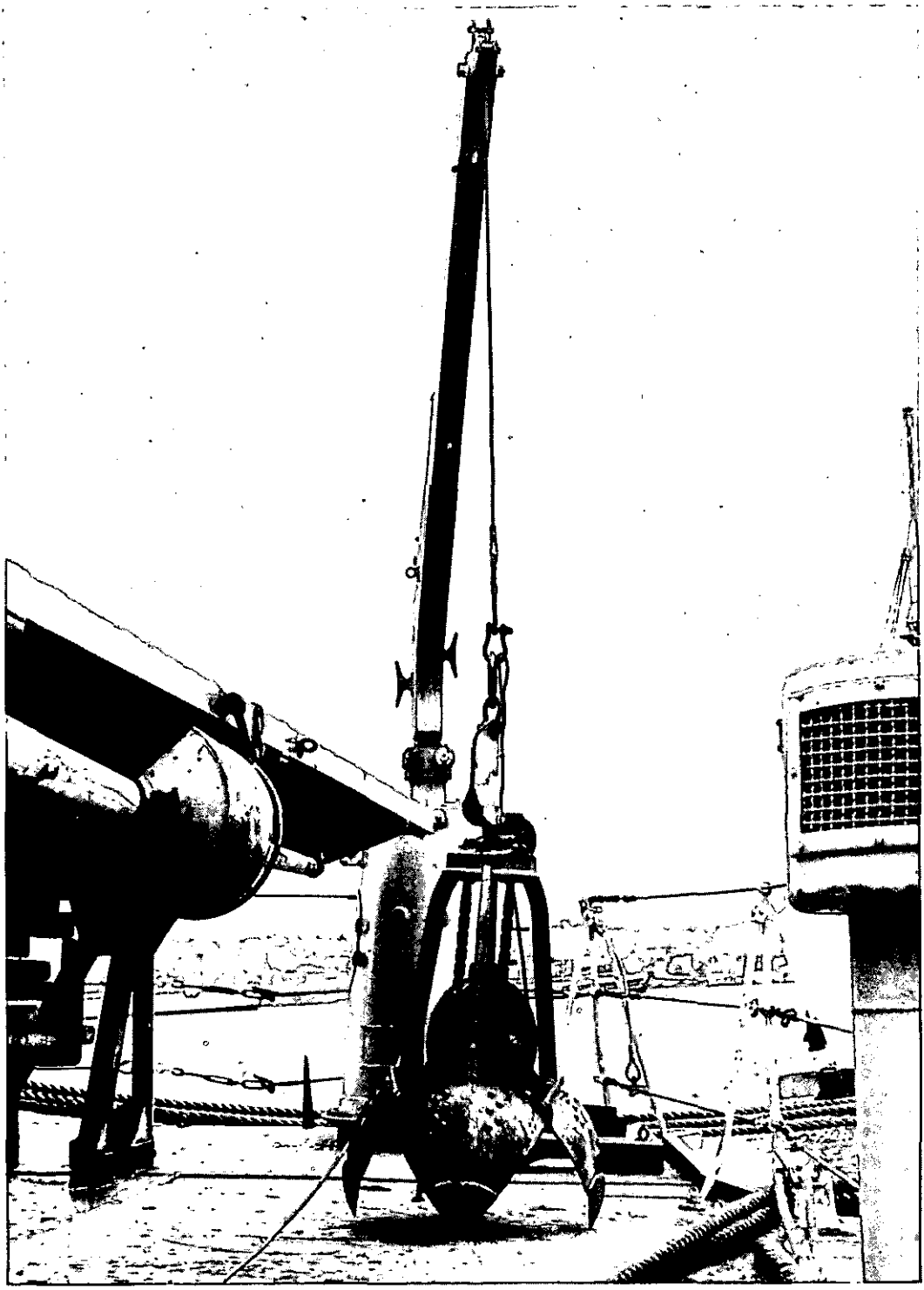

Fig. 3.- Hayward "orange peel" grab

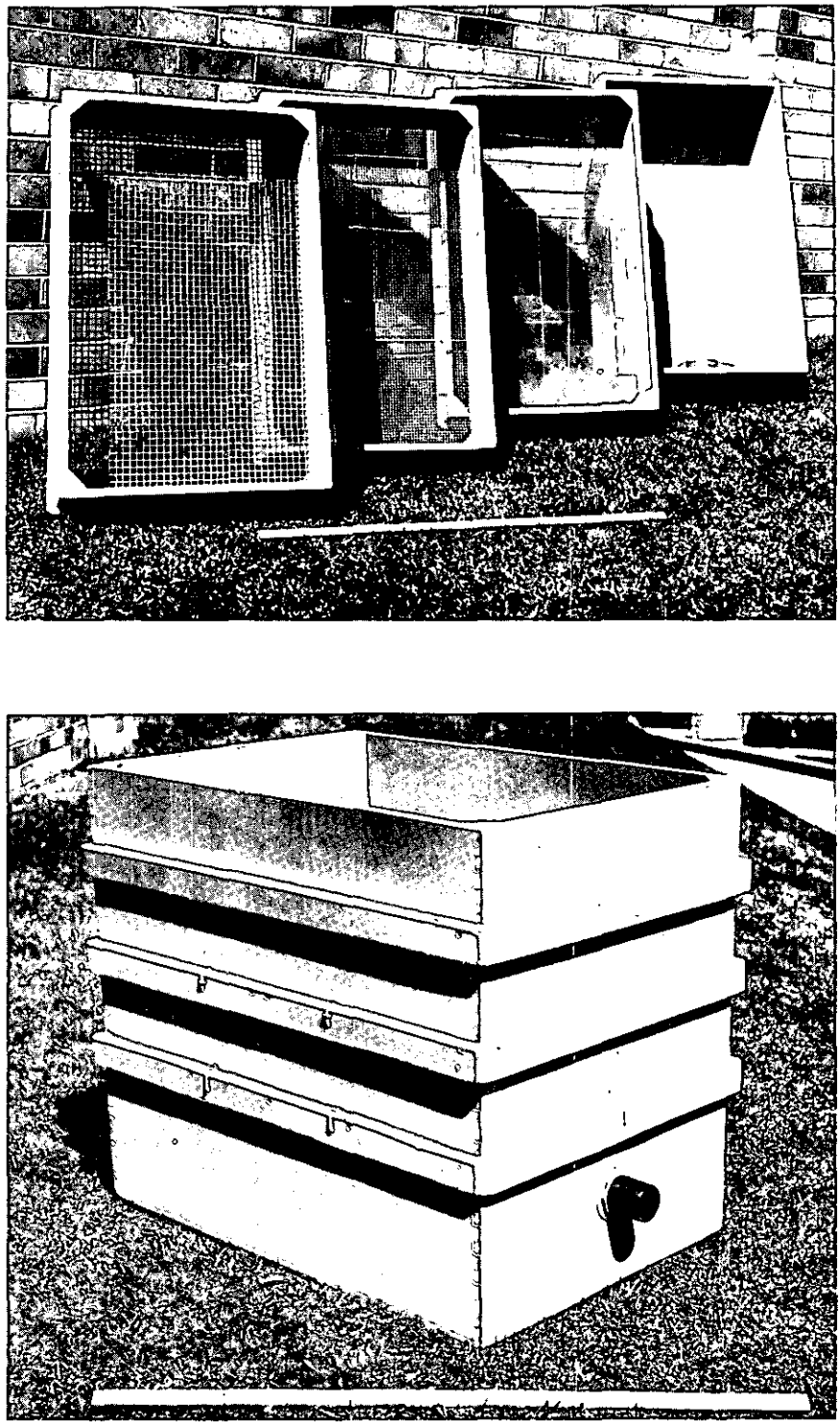

Fig. 4.- Sieves used for sorting benthos.

Jones (1959) note that on hard sands a similar instrument samples only half of the maximum area and yields 1/6th of the total volume so that a factor of 8 is required to express the catches in g/m^2. Until calibration experiments have been carried out, no factor is being related to the volume of sediment taken in order to express g/m^2; the factor required to make the conversion will probably be between 4 and 8.

Using the data presented in Table 3 (pp. 84-87) the mean total biomass (with sponges and corals extended from the measurements) for samples from 75 and 150 fm depths were estimated (Table 4 p. 88). Analyses of variance were carried out using the figures in Table 4. These are shown in Table 5 (p. 89).

On the basis of these results, the general mean for the biomass level of the 20 samples from the 75 fm depth collected at 8 stations may be taken as 3.18 with a standard error of 0.76. However, for the 150 fm depths, owing to the apparent difference between stations, the appropriate estimate of biomass at this depth was the means of the station means, this was 3.29 with a standard error of 1.25.

3. Phytoplankton

Samples were collected in a 5 l plastic sampler (Davis 1957) at 0, 25, 50, 75, 100, and 150 m. The samples were transferred to polythene bottles and centrifuged immediately at 5,000 g in a continuous centrifuge (Davis 1957); each 5 l sample took 15 min. The residue in the cup was carefully washed into a graduated tube and diluted to 10 ml with sea-water.

Quantitative Examination.- All counts were made with a Petroff Hausser bacterial counting chamber. If the count was more than five per field, four fields were counted; if the count was less than five per field, ten fields were counted.

Organisms with chlorophyll were counted by using a Wild BG 12 fluorescence filter, a Wild OG 1 exclusion filter, an immersed condenser, and a high-power incandescent lamp. The chloroplasts appeared bright red in the blue-violet light.

Organisms without chlorophyll were calculated as the difference between total living organisms and organisms with chlorophyll. Total living organisms were counted after adding acridine orange to give a final concentration of 2 parts per million. The living organisms gave a green fluorescence in the

blue-violet light produced by the filter system described above.

Total particles were counted with ordinary illumination.

Qualitative Examination.- Twenty minute tows were made with a modified Hardy indicator. The plankton was washed off the metal grid (120 meshes/in.) with sea-water, and formalin was added to give a final concentration of 2%. Identifications were made at Cronulla.

REFERENCES

C.S.I.R.O. Aust. (1962).- Oceanographical observations in the Indian Ocean in 1960. H.M.A.S. Diamantina Cruise Dm 1/60. C.S.I.R.O. Aust. Oceanogr. Cruise Rep. 2.

Barnard, J.L., and Jones, G.P. (1959).- Techniques in a large scale survey of marine benthic biology. In Pearson, E.A.(ed.) "Waste disposal in the marine environment" Pergamon Press.

Knauss, J.A., and Reid, J.L. (1957).- The effects of cable design on the accuracy of the G.E.K. Trans. Amer. Geophys. Un. 38: 320-5.

La Fond, E.C. (1951).- Processing oceanographic data. U.S. Navy Hydrogr. Off. Publ. No. 614.

United States Navy Hydrographic Office (1955).- Instruction manual for oceanographic observations. Publ. No. 607.

von Arx, W.S. (1950).- An electromagnetic method for measuring the velocities of ocean currents from a ship under way. Papers Phys. Oceanogr. Met. 11 (3).

IV. DATA SHEETS

The data sheets are arranged in four parts. Part 1 contains the hydrology data for deep stations, giving only temperature, salinity and σ_t figures. Part 2 gives temperature and salinity data from surface sampling. Part 3 gives quantitative data for benthos. Part 4 gives quantitative and qualitative data for phytoplankton.

Explanations of the headings used in the data sheets are given on the first page of each part.

Short vertical lines below certain headings indicate the positions of decimal points.

DATA

PART 1

HYDROLOGY

DEEP STATIONS

EXPLANATION OF HEADINGS

Part 1. Hydrology - Deep Stations

SHIP The figures 20 are used to designate Gascoyne.

CRUISE Cruise numbers are allotted each year, beginning with 1 for the first cruise.

STATION Stations are numbered consecutively for each ship for each year.

DATE Is given as year, month, day.

TIME Given in Zone Time and is the time at the beginning of the first cast. The code letter used for the time zone (Table 6) follows the time.

TABLE 6

CODE FOR TIME ZONES

Longitude Exceeding	Up to but not exceeding	Time Zone (hrs)	Code
07°30'E.	22°30'E.	-1	A
22°30'E.	37°30'E.	-2	B
37°30'E.	52°30'E.	-3	C
52°30'E.	67°30'E.	-4	D
67°30'E.	82°30'E.	-5	E
82°30'E.	97°30'E.	-6	F
97°30'E.	112°30'E.	-7	G
112°30'E.	127°30'E.	-8	H
127°30'E.	142°30'E.	-9	I
142°30'E.	157°30'E.	-10	K
157°30'E.	172°30'E.	-11	L
172°30'E.	180°	-12	M
180°	172°30'W.	+12	Y
172°30'W.	157°30'W.	+11	X
157°30'W.	142°30'W.	+10	W
142°30'W.	127°30'W.	+9	V
127°30'W.	112°30'W.	+8	U
112°30'W.	97°30'W.	+7	T

Longitude Exceeding	Up to but not exceeding	Time Zone (hrs)	Code
97°30'W.	82°30'W.	+6	S
82°30'W.	67°30'W.	+5	R
67°30'W.	52°30'W.	+4	Q
52°30'W.	37°30'W.	+3	P
37°30'W.	22°30'W.	+2	O
22°30'W.	07°30'W.	+1	N
07°30'W.	07°30'E.	0	Z

LATITUDE LONGITUDE	The position of each station is given in degrees and minutes.
SONIC DEPTH	Given in m, measured at standard sound velocity of 800 fm (1463 m) per second.
MAX. SAMP. DEPTH	Maximum sampling depth is given to the nearest 100 m and is in 100 m units.
AIR TEMP. WET DRY	Air temperatures are recorded from wet and dry bulb thermometers in degrees Celsius to 1 decimal place.
WIND DIR. SPEED	Using Tables 8 and 9 in U.S. Hydrogr. Office (1955).
ANEM. HEIGHT	The average height of the anemometer above sea level is given in m.
CLOUD TYPE AMOUNT	Cloud type and amount are coded using Tables 2 and 3 in U.S. Hydrogr. Office (1955).
VIS.	Visibility is coded using Table 4 in U.S. Hydrogr. Office (1955).
SEA DIR. AMOUNT	Sea direction and amount are coded using Tables 5 and 8 in U.S. Hydrogr. Office (1955).

SWELL DIR. AMOUNT	Sea swell direction and amount are coded using Tables 6 and 8 in U.S. Hydrogr. Office (1955).
ATMOS. PRESSURE	Atmospheric pressure is coded. The reading in millibars has the figure for 900 or 1000 omitted, so that 999.4 millibars is recorded as 994 and 1013.4 as 134.
WIRE ANGLES CAST 1 CAST 2	Wire angles are measured at the surface and expressed in degrees for each cast. No more than two wire angles are recorded; if there is a third cast, the shallow cast angle is neglected.
CAST	The cast numbers (corresponding to the wire angles) are shown.
DEPTH	Actual sampling depth given in m, a blank indicates 0 m.
TEMP.	Sea temperatures are recorded in degrees Celsius, to 2 decimal places.
S‰	Salinities are recorded in parts per thousand, to 3 decimal places.
σt	Sigma-t recorded to 3 decimal places.
S‰ (2)	Salinity values recorded for duplicate samples from depths below 500 m, were measured on an inductive salinometer at this Laboratory.
DOUBTFUL	A figure in this column indicates that the values for certain properties are doubtful or have been interpolated. The properties are designated by the following numbers:- 1. temperature, 2. Salinity, 3. temperature and salinity.

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	202	60	11	09	105 K	3401 S	15147 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
1024	09	178	200	20	4	16	8	5	8	20	2	3	1	85	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1906	35820	25650		
2	25	1904	35820	25655		
2	50	1904	35820	25655		
2	75	1898	35810	25663		
2	100	1898	35810	25663		
2	150	1788	35660	25824		
1	200	1714	35750	26073		
2	300	1551	35500	26261		
1	400	1244	35120	26615		
1	500	1094	34960	26774		
1	700	783	34700	27084	34.664	
1	900	602	34490	27169	34.483	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	203	60	11	09	450 K	3403 S	15221 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4901	15	128	200	23	1	16	8	0	8	23	2	6	1	97	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)		DOUBTFUL
2		1918	35730	25550			
2	25	1917	35730	25553			
2	50	1900	35700	25574			
2	75	1894	35750	25627			2
2	100	1808	35660	25775			
2	150	1671	35570	26038			
2	300	1396	35370	26499			
2	400	1258	35210	26657			
2	496	1075	34920	26777			
2	695	824	34630	26967	34.616		
2	1093	506	34490	27286	34.470		
1	1292	387	34540	27456	34.521		
1	1491	306	34610	27590	34.583		

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	204	60	11	09	905 K	3402 S	15253 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4755	15	200	217	24	1	16	7	0	8	24	2	5	1	1012	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1876	35730	25658		
2	25	1862	35730	25693		
2	50	1832	35710	25753		
2	75	1746	35640	25912		
2	100	1694	35700	26083		
2	150	1572	35500	26213		
2	200	1460	35410	26393		
2	300	1352	35350	26576		
2	400	1115	34960	26736		
2	498	996	34850	26861		
2	698	760	34610	27047	34.618	
2	897	599	34520	27196	34.520	
1	1094	476	34520	27344	34.482	
1	1296	378	34580	27496	34.572	
1	1495	313	34630	27600	34.587	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	205	60	11	09	1440 K	3428 S	15323 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4846	13	156	184	22	3	16	7	0	7	22	4	2	1	123	35	27

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)		DOUBTFUL
2		1810	35640	25755			1
2	22	1810	35680	25785			
2	44	1761	35640	25875			
2	66	1753	35620	25879			
2	88	1595	35520	26176			
2	132	1524	35440	26275			
2	175	1430	35390	26442			
2	263	1310	35340	26654			
2	351	1117	35070	26818			
1	405	1008	34870	26856			
1	575	790	34600	26995	34.587		
1	756	632	34490	27130	34.519		
1	935	518	34490	27272	34.478		
1	1120	408	34520	27418	34.514		
1	1305	331	34580	27543	34.623		

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	206	60	11	09	1900 K	3455 S	15358 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4846	15	146	177	22	3	16	7	6	8	22	4			153	10	10

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1747	35610	25886		
2	25	1750	35640	25902		
2	50	1742	35620	25906		
2	75	1532	35520	26319		
2	100	1484	35440	26364		
2	150	1364	35280	26497		
2	200	1270	35170	26603		
2	300	1091	34960	26779		
2	400	925	34740	26894		
1	470	850	34650	26943		
1	663	686	34540	27097	34.519	
1	855	541	34490	27244	34.471	
1	1055	443	34490	27357	34.492	
1	1255	360	34560	27499	34.543	
1	1455	300	34600	27588	34.597	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	208	60	11	10	1000 K	3446 S	15451 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
484	14	144	172	20	3	16	7	9	8	20	4	19	3	1811	35	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1768	35610	25835		
2	24	1767	35640	25861		
2	48	1762	35610	25850		
2	72	1595	35520	26176		
2	97	1532	35480	26288		
2	186	1335	35250	26533		
2	296	1095	34920	26741		
2	396	934	34760	26895		
1	420	908	34690	26882		
1	606	746	34560	27028	34.554	
1	794	575	34470	27187	34.477	
1	980	483	34490	27312	34.483	
1	1164	388	34540	27455	34.527	
1	1352	329	34600	27561	34.568	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	209	60	11	10	1730 K	3519 S	156 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4663	15	161	200	17	2	16	7	9	8	18	3	18	3	166	07	15

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1857	35730	25706		
2	25	1844	35700	25716		
2	50	1770	35640	25853		
2	75	1604	35520	26156		
2	100	1563	35480	26219		
2	150	1510	35550	26391		
2	200	1436	35440	26468		
2	300	1194	35050	26658		
2	400	1013	34830	26816		
1	500	900	34720	26919		
1	700	690	34520	27075	34.521	
1	900	522	34470	27251	34.473	
1	1100	432	34510	27384	34.496	
1	1300	346	34560	27512	34.551	
1	1500	285	34610	27609	34.607	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	211	60	11	11	130 K	3541 S	15720 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4663	15	156	189	15	1	16	7	0	7	16	3	18	1	213	05	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1791	35610	25779		
2	25	1789	35610	25784		
2	50	1748	35620	25892		
2	75	1573	35530	26234		
2	100	1512	35440	26302		
2	150	1423	35370	26442		
2	200	1294	35210	26586		
2	300	1110	34940	26729		
2	400	979	34810	26859		
1	500	869	34690	26945		
1	700	700	34540	27077	34.515	
1	900	552	34490	27231	34.475	
1	1100	440	34510	27376	34.511	
1	1300	358	34560	27501	34.536	
1	1500	304	34630	27608	34.581	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	213	60	11	11	1030 K	3704 S	15632 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4572	15	144	189	00		16	8	8	8			16	1	1766	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1847	35680	25693		
2	25	1826	35700	25760		
2	50	1818	35680	25765		
2	75	1566	35480	26212		
2	100	1504	35430	26312		
2	150	1431	35390	26440		
2	200	1319	35210	26535		
2	300	1138	34990	26717		
2	400	990	34810	26840		
1	500	874	34670	26921		
1	700	710	34560	27079	34.523	
1	900	556	34490	27226	34.469	
1	1100	442	34510	27374	34.485	
1	1300	356	34540	27487	34.536	
1	1500	298	34600	27590	34.593	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	215	60	11	11	1630 K	3655 S	15529 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4572	15	156	206	00		16	8	8	1			19	1	144	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1719	35610	25954		
2	25	1680	35610	26047		
2	50	1640	35610	26141		
2	75	1557	35590	26317		
2	100	1459	35440	26418		
2	150	1411	35440	26521		
2	200	1306	35260	26600		
2	300	1080	34970	26807		
2	400	939	34780	26902		
1	500	845	34670	26966		
1	700	690	34580	27123	34.508	
1	900	547	34520	27261	34.466	
1	1100	430	34540	27410	34.480	
1	1300	354	34600	27536	34.535	
1	1500	301	34650	27627	34.601	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	217	60	11	11	2310 K	3628 S	15423 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4709	15	167	200	04	1	16	7	5	1			18	1	1478	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1801	35710	25831		
2	24	1777	35710	25890		
2	47	1765	35680	25896		
2	71	1637	35590	26133		
2	94	1477	35440	26379		
2	140	1343	35320	26571		
2	187	1319	35350	26643		
3	300	1182	35160	26766		
2	382	983	34830	26870		
1	500	865	34690	26951		
1	700	692	34560	27104	34.507	
1	900	537	34510	27265	34.640	
1	1100	422	34520	27403	34.481	
1	1300	335	34580	27539	34.527	
1	1500	291	34630	27620	34.586	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	219	60	11	12	625 K	3606 S	15313 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
5303	15	178	194	02	2	16	7	0	8	2	3	2	1	93	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1890	35820	25691		
2	25	1890	35820	25691		
2	50	1891	35860	25719		
2	75	1887	35820	25698		
2	100	1884	35820	25706		
2	150	1758	35660	25898		
2	200	1696	35710	26086		
2	300	1492	35440	26346		
2	400	1288	35280	26652		
1	499	1075	34960	26808		
1	698	829	34670	26991	34.612	
1	897	651	34540	27144	34.486	
1	1090	511	34520	27304	34.471	
1	1282	420	34510	27397	34.506	
1	1471	346	34600	27544	34.586	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	220	60	11	12	1030 K	3555 S	15238 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4846	15	200	217	02	9	16	5	0	8	2	4	1	3	27	10	20

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)		DOUBTFUL
2		1904	35860	25685			
2	23	1901	35860	25693			
2	44	1902	35860	25691			
2	65	1901	35860	25693			
2	84	1901	35840	25678			
2	126	1901	35840	25678			
2	170	1838	35770	25784			
2	357	1641	35610	26139			
1	466	1492	35500	26392			
1	664	1111	35010	26782	34.951		
1	862	816	34670	27011	34.613		
1	1062	625	34540	27178	34.492		
1	1261	489	34520	27329	34.504		
1	1461	392	34580	27482	34.527		

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	221	60	11	12	1440 K	3540 S	152 8 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4846	15	206	217	01	3	16	6	0	8	1	4		4	963	15	35

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1901	35840	25678		
2	48	1901	35860	25693		
2	71	1901	35860	25693		
2	94	1898	35840	25686		
2	140	1876	35820	25726		
2	184	1756	35700	25933		
2	269	1715	35790	26102		
2	351	1714	35790	26104		
1	493	1712	35770	26093		
1	688	1304	35340	26666	35.275	
1	880	846	34690	26981	34.652	
1	1072	649	34540	27147	34.499	
1	1263	502	34520	27314	34.477	
1	1456	405	34630	27508	34.619	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	222	60	11	13	600 K	3542 S	15135 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4846	15	13'3	18'9	20	3	16	7	0	8	99	4	21	3	3'5	10	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1887	35820	25698		
2	50	1885	35840	25719		
2	74	1888	35820	25696		
2	99	1886	35820	25701		
2	148	1881	35820	25714		
2	198	1745	35930	26136		
2	296	1718	35770	26079		
2	392	1715	35770	26086		
1	494	1533	35480	26286		
1	692	1095	34940	26757	34.949	
1	889	772	34600	27022	34.572	
1	1088	610	34510	27174	34.474	
1	1286	470	34510	27343	34.497	
1	1485	358	34600	27532	34.583	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	223	60	11	13	1105 K	3531 S	15051 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
896	05	156	194	12	1	16	8	8	3	99	2	16	1	79	45	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1901	35810	25655		
2	25	1898	35810	25663		
2	50	1898	35810	25663		
2	75	1887	35810	25691		
1	80	1890	35810	25683		
2	100	1840	35730	25749		
2	150	1649	35590	26105		
1	155	1691	35620	26029		
1	230	1416	35340	26434		
1	280	1214	35080	26643		
1	380	911	34740	26917	34.719	
1	490	761	34600	27038	34.585	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	226	60	11	13	2200 K	3655 S	15030 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
3017	13	156	189	20	8	16	5	0	8	20	5	21	3	133	40	20

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1884	35750	25653		
2	25	1884	35750	25653		
2	50	1844	35660	25690		
2	75	1638	35480	26060		
2	100	1486	35350	26280		
2	150	1293	35190	26560		
2	200	1254	35210	26660		
2	300	1066	34920	26790		
1	390	920	34740	26902		
2	400	931	34780	26915		
1	550	777	34580	26999	34.570	
1	719	674	34540	27113	34.513	
1	880	562	34490	27219	34.470	
1	1061	460	34520	27362	34.487	
1	1253	356	34580	27518	34.541	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	227	60	11	14	715 K	3707 S	15113 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4938	14	128	156	23	3	16	8	9	3	8	6	22	3	165	26	05

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1755	35710	25944		
2	50	1748	35700	25953		
2	74	1695	35640	26035		
2	99	1552	35520	26274		
2	148	1487	35500	26403		
2	198	1342	35320	26573		
2	297	1182	35100	26720		
2	396	980	35300	27239		
1	436	931	34760	26900		
1	628	771	34600	27023	34.570	
1	818	628	34540	27174	34.486	
1	1006	483	34510	27328	34.480	
1	1192	391	34540	27451	34.520	
1	1376	334	34560	27524	34.557	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	228	60	11	14	1115 K	3717 S	15145 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4682	15	133	167	20	3	16	8	0	6	99	4	24	7	1688	05	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1742	35590	25883		
2	50	1728	35590	25917		
2	75	1579	35500	26198		
2	100	1446	35320	26354		
2	150	1258	35140	26603		
2	200	1090	34960	26781		
2	300	945	34780	26892		
2	400	858	34690	26962		
1	498	792	34600	26992		
1	696	632	34520	27153	34.484	
1	894	495	34490	27298	34.459	
1	1093	406	34520	27430	34.508	
1	1293	348	34580	27526	34.548	
1	1493	295	34630	27616	34.592	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	229	60	11	14	1525 K	3734 S	15216 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4755	15	144	183	22	2	16	8	8	6	99	4	21	3	1622	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1785	35710	25870		
2	50	1748	35660	25922		
2	75	1662	35590	26074		
2	100	1549	35530	26289		
2	150	1376	35300	26487		
2	200	1311	35350	26659		
2	300	1086	34960	26788		
2	400	938	34960	27044		
1	500	830	34670	26990		
1	700	668	34540	27121	34.504	
1	900	534	34520	27276	34.473	
1	1098	442	34520	27382	34.496	
1	1297	368	34580	27507	34.543	
1	1497	295	34630	27616	34.601	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	230	60	11	14	1915 K	3705 S	15250 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4572	13	133	172	20	2	16	7	0	7	99	3	19	3	1766	15	20

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1746	35710	25965		
2	50	1742	35710	25975		
2	74	1597	35530	26179		
2	99	1541	35500	26283		
2	148	1389	35440	26568		
2	198	1314	35340	26646		
2	292	1088	34960	26785		
2	379	944	34780	26894		
1	465	852	34670	26956		
1	635	726	34580	27072	34.554	
1	820	611	34520	27181	34.495	
1	1005	496	34520	27321	34.475	
1	1195	393	34560	27465	34.519	
1	1385	310	34580	27563	34.566	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	232	60	11	15	200 K	3806 S	154 6 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4938	15	156	183	20	1	16	7	8	2	20	2	20	1	1811	05	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1535	35570	26351		
2	49	1534	35460	26268		
2	74	1532	35480	26288		
2	98	1429	35460	26498		
2	148	1314	35340	26646		
2	197	1211	35230	26765		
2	293	998	34830	26842		
2	387	847	35030	27245		
1	484	767	34600	27029		
1	678	612	34520	27179	34.482	
1	872	487	34490	27308	34.473	
1	1070	394	34540	27448	34.517	
1	1259	329	34360	27529	34.555	
1	1469	275	34630	27634	34.603	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	234	60	11	15	805 K	3822 S	15459 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4572	15	128	161	19	2	16	8	8	5	19	3	20	3	194	15	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1614	35570	26171		
2	50	1594	35530	26186		
2	75	1502	35550	26409		
2	100	1448	35480	26473		
2	150	1346	35320	26565		
2	200	1306	35320	26646		
2	300	1151	35080	26762		
2	400	992	34850	26868		
1	498	878	34690	26930		
1	691	722	34560	27062	34.540	
1	887	572	34510	27222	34.473	
1	1087	451	34510	27364	34.477	
1	1286	370	34560	27489	34.526	
1	1485	310	34610	27586	34.582	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	236	60	11	15	1445 K	3842 S	156 3 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4755	15	11 1	14 4	19	2	16	8	8	4	19	2	22	3	21 7	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1579	35530	26221		
2	50	1568	35530	26246		
2	75	1560	35530	26264		
2	100	1497	35530	26404		
2	150	1430	35460	26496		
2	200	1404	35480	26557		
2	300	1318	35410	26692		
2	400	1145	35070	26766		
1	500	1020	34880	26843		
1	700	804	34630	26998	34.603	
1	900	638	34520	27145	34.494	
1	1100	500	34510	27308	34.470	
1	1300	393	34540	27449	34.506	
1	1500	324	34600	27565	34.557	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	241	60	11	20	320 K	3229 S	15259 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
969	08	178	217	14	1	16	8	9				17	1	171	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2160	35770	24933		
2	24	2021	35700	25258		
2	48	1884	35590	25531		
2	71	1736	35550	25867		
2	94	1693	35640	26039		
2	142	1556	35460	26219		
2	189	1473	35360	26326		
2	284	1266	35170	26611		
2	378	1058	34920	26808		
1	464	928	34760	26905		
1	650	731	34540	27034	34.533	
1	838	564	34470	27200	34.473	

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SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	242	60	11	20	800 K	3240 S	15342 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4801	14	172	239	10	1	16	8	8	1	10	2	17	1	188	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2239	35750	24696		
2	25	2234	35750	24710		
2	50	2150	35750	24946		
2	75	2056	35840	25271		
2	100	1954	35820	25526		
2	150	1916	35820	25624		
2	200	1878	35810	25714		
2	300	1638	35500	26062		
3	368	1342	35170	26457		
1	461	1204	35080	26662		
1	630	878	34700	26938	34.680	
1	799	697	34540	27081	34.530	
1	980	558	34490	27223	34.471	
1	1163	454	34510	27360	34.491	
1	1350	366	34560	27493	34.544	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	243	60	11	20	1120 K	3246 S	15412 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4755	14	172	211	15	1	16	8	8	1	15	2	16	1	177	27	10

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2206	35820	24842		
2	22	2145	35860	25043		
2	44	2134	35840	25058		
2	66	1974	35900	25534		
2	88	1927	35900	25657		
2	132	1891	35880	25734		
2	176	1880	35880	25762		
2	264	1796	35790	25904		
2	352	1584	35500	26186		
1	440	1439	35390	26423		
1	620	1040	34940	26855	34.879	
1	804	771	34630	27047	34.580	
1	995	588	34540	27226	34.476	
1	1187	457	34540	27381	34.489	
1	1379	366	34580	27509	34.539	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	244	60	11	20	1610 K	3255 S	15446 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4801	14	17 8	21 1	11	1	16	8	8	1	11	2	16	1	16 8	15	05

CAST	DEPTH	TEMP.	S‰	σ_t	S‰ (2)	DOUBTFUL
2		2180	35820	24915		
2	23	2104	35820	25125		
2	46	2078	35820	25196		
2	70	1990	35820	25431		
2	93	1952	35820	25531		
2	139	1880	35770	25678		
2	186	1866	35820	25752		
2	278	1671	35550	26022		
2	371	1479	35410	26352		
1	455	1398	35350	26479		
1	638	962	34780	26864	34.806	
1	817	751	34560	27021	34.562	
1	1010	592	34510	27197	34.482	
1	1200	477	34490	27319	34.487	
1	1391	384	34520	27443	34.522	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	245	60	11	20	2000 K	3302 S	15519 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4901	14	122	206	10	1	16	8	9		10	2	16	1	174	12	07

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2054	35820	25261		
2	24	2024	35820	25341		
2	47	1994	35790	25398		
2	71	1953	35810	25521		
2	94	1902	35840	25675		
2	141	1872	35840	25752		
2	189	1841	35810	25807		
2	283	1688	35610	26028		
2	375	1484	35410	26341		
1	468	1305	35210	26563	34.804	
1	653	964	34780	26861		
1	838	761	34560	27006	34.568	
1	1020	595	34490	27177	34.478	
1	1203	484	34490	27311	34.483	
1	1388	394	34520	27432	34.526	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	248	60	11	21	345 K	3322 S	15623 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4023	14	183	211	05	1	16	8	8	4	5	2	13	1	171	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1959	35840	25528		
2	24	1928	35820	25593		
2	47	1916	35820	25624		
2	70	1889	35810	25686		
2	94	1876	35810	25719		
2	141	1834	35770	25794		
2	188	1800	35750	25864		
2	282	1778	35700	25880		
2	377	1613	35520	26135		
1	470	1503	35440	26322		
1	658	987	34830	26861	34.795	
1	846	785	34610	27010	34.577	
1	1034	593	34540	27219	34.487	
1	1220	487	34540	27347	34.477	
1	1408	389	34600	27501	34.521	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	250	60	11	.21	1040 L	3350 S	15737 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4846	14	200	228	09	1	16	8	8	2	9	2	10	1	1866	05	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)		DOUBTFUL
2		1953	35680	25422			
2	22	1905	35680	25546			
2	44	1650	35480	26018			
2	67	1520	35350	26215			
2	89	1442	35320	26363			
2	133	1350	35250	26502			
2	178	1229	35140	26660			
2	266	1092	34920	26747			
2	355	943	34780	26895			
1	471	868	34650	26915			
1	653	722	34560	27062	34.541		
1	834	591	34520	27206	34.471		
1	1020	489	34520	27329	34.502		
1	1209	398	34560	27460	34.512		
1	1397	320	34630	27593	34.564		

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	252	60	11	21	1720 L	3432 S	15838 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4846	14	183	206	02	2	16	7	8	7	2	3	6	3	1810	02	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		1950	35700	25445		
2	24	1838	35640	25685		
2	47	1792	35620	25784		
2	70	1669	35520	26004		
2	94	1592	35530	26191		
2	140	1479	35440	26375		
2	189	1348	35250	26507		
2	283	1183	35070	26694		
2	378	1039	34850	26786		
1	472	938	34740	26873		
1	660	719	34540	27051	34.528	
1	850	585	34470	27174	34.473	
1	1038	472	34490	27325	34.494	
1	1227	386	34520	27441	34.528	
1	1416	320	34560	27537	34.576	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	256	60	11	22	1215 L	3148 S	159 9 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
192	14	172	206	01	2	16	8	8	8	1	3	3	1	145	00	05

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2038	35790	25281		
2	23	2038	35810	25296		
2	45	2038	35810	25296		
2	68	2000	35810	25397		
2	90	1949	35860	25569		
2	135	1910	35840	25655		
2	180	1898	35820	25670		
2	270	1816	35770	25839		
2	359	1686	35590	26018		
1	474	1399	35300	26439		
1	649	1066	34900	26778	34.900	
1	824	859	34690	26960	34.661	
1	1010	660	34520	27116	34.508	
1	1196	521	34510	27284	34.479	
1	1381	400	34600	27490	34.524	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	257	60	11	22	1710 L	3140 S	15824 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4682	14	183	206	02	2	16	7	0	8	2	4	2	3	120	00	01

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2008	35840	25399		
2	23	2011	35860	25406		
2	46	1969	35880	25532		
2	69	1906	35840	25502		
2	92	1887	35840	25714		
2	139	1866	35880	25798		
2	186	1857	35880	25820		
2	280	1796	35770	25889		
2	379	1641	35550	26093		
1	449	1529	35440	26264		
1	620	1105	34970	26762	34.937	
1	795	831	34670	26988	34.934	
1	984	656	34540	27137	34.897	
1	1176	527	34490	27261	34.475	
1	1369	411	34540	27431	34.516	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	259	60	11	23	2330 K	3124 S	15717 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
3036	14	194	222	34	1	16	4	9	8	2		2	1	1033	15	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2006	35880	25435		
2	22	2008	35910	25452		
2	44	1987	35900	25500		
2	66	1968	35880	25535		
2	87	1935	35880	25621		
2	132	1882	35910	25780		
2	180	1865	35900	25815		
2	273	1843	35840	25825		
2	371	1740	35700	25972		
1	464	1509	35430	26301		
1	643	1097	34960	26769	34.924	
1	819	840	34720	27013	34.633	
1	1010	656	34520	27122	34.498	
1	1202	529	34490	27259	34.471	
1	1391	412	34520	27414	34.600	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	261	60	11	23	645 K	3109 S	15613 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4755	14	161	211	16	1	16	8	8	2			2	1	136	05	10

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2038	35860	25334		
2	23	2038	35910	25372		
2	47	2002	35910	25468		
2	70	1956	35900	25581		
2	93	1896	35820	25675		
2	140	1857	35820	25775		
2	186	1812	35750	25834		
2	280	1708	35610	25980		
2	371	1547	35460	26239		
1	460	1355	35250	26492		
1	642	984	34830	26866	34.787	
1	828	778	34630	27036	34.578	
1	1013	611	34540	27196	34.483	
1	1202	470	34520	27351	34.483	
1	1390	391	34540	27451	34.525	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	262	60	11	23	1030 K	3100 S	15540 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4261	14	189	222	15	2	16	8	8	1	15	2	2	1	1488	13	00

CAST	DEPTH	TEMP.	s‰	σ_t	s‰(2)	DOUBTFUL
2		2048	35840	25292		
2	23	2026	35840	25324		
2	46	1984	35840	25462		
2	69	1905	35830	25660		
2	92	1865	35820	25754		
2	139	1849	35820	25795		
2	186	1818	35820	25872		
2	281	1709	35610	25978		
2	378	1509	35410	26286		
1	469	1322	35210	26529		
1	652	982	34810	26854	34.784	
1	835	740	34560	27037	34.645	
1	1026	583	34510	27208	34.555	
1	1218	456	34510	27358	34.489	
1	1410	374	34540	27469	34.525	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	263	60	11	23	1605 K	3054 S	15448 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4224	14	189	228	14	2	16	9	8	1	14	2	5	1	127	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2185	35860	24932		
2	23	2152	35810	24986		
2	47	2012	35880	25419		
2	71	1954	35860	25556		
2	94	1925	35860	25631		
2	141	1886	35820	25701		
2	188	1826	35790	25829		
2	281	1682	35590	26027		
2	375	1495	35410	26317		
1	470	1296	35190	26566		
1	658	971	34780	26849	34.778	
1	846	740	34580	27052	34.546	
1	1033	583	34510	27208	34.479	
1	1220	462	34510	27352	34.488	
1	1407	381	34540	27462	34.537	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	264	60	11	23	2030 K	3046 S	154 7 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4206	14	178	211	07	1	16	8	0				4	1	148	05	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2276	35750	24591		
2	23	2275	35790	24624		
2	46	2121	35790	25056		
2	72	1996	35840	25431		
2	93	1953	35840	25543		
2	140	1931	35840	25601		
2	187	1906	35810	25642		
2	280	1776	35680	25869		
2	374	1511	35350	26235		
1	471	1325	35160	26484		
1	658	937	34740	26874	34.723	
1	844	700	34520	27062	34.519	
1	1031	543	34490	27242	34.471	
1	1217	433	34520	27391	34.499	
1	1403	353	34560	27505	34.549	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	265	60	11	23	130 K	3040 S	15324 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
1143	08	183	217	03	1	16	8	0		3	0	2	1	134	25	15

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2077	35660	25077		
2	20	2058	35680	25144		
2	40	1991	35660	25307		
2	59	1877	35640	25586		
2	77	1777	35550	25767		
2	114	1559	35370	26143		
2	150	1438	35260	26325		
2	222	1182	34990	26634		
2	305	1024	34810	26782		
1	412	865	34650	26920		
1	590	708	34520	27050	34.519	
1	770	601	34490	27170	34.468	
1	835	559	34490	27222	34.462	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	271	60	11	25	100 K	2843 S	15356 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
1143	09	167	222	18	2	16	8	9	8	9	2	5	1	145	35	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)		DOUBTFUL
2		2388	35840	24332			
2	23	2384	35820	24329			
2	45	2232	35810	24761			
2	66	2137	35840	25050			
2	87	2011	35770	25338			
2	131	1883	35700	25617			
2	176	1812	35620	25734			
2	266	1595	35390	26076			
2	359	1065	34880	26764			
1	431	900	34720	26919			
1	598	771	34600	27023	34.562		
1	765	634	34510	27143	34.475		
1	946	517	34510	27289	34.468		

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	272	60	11	25	515 K	2847 S	15431 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
3823	14	194	222	14	2	16	8	8	3	14	3	16	3	174	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2229	35930	24861		
2	23	2223	35930	24878		
2	45	2155	35900	25046		
2	68	2037	35840	25322		
2	90	1998	35840	25425		
2	133	1936	35900	25633		
2	176	1909	35880	25688		
2	266	1859	35810	25762		
2	360	1660	35530	26033		
1	467	1415	35280	26389		
1	654	954	34780	26877	34.754	
1	840	720	34560	27065	34.535	
1	1026	548	34510	27251	34.473	
1	1213	427	34540	27414	34.507	
1	1400	343	34600	27547	34.553	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	273	60	11	25	940 K	2847 S	15515 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4133	14	178	217	19	2	16	8	8	1	19	2	16	1	176	12	30

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2214	35860	24850		
2	22	2194	35880	24922		
2	44	2063	35880	25282		
2	66	1961	35900	25568		
2	88	1936	35900	25633		
2	130	1899	35840	25683		
2	174	1889	35860	25724		
2	262	1795	35750	25876		
2	356	1614	35550	26156		
1	470	1353	35230	26481		
1	650	977	34810	26862	34.781	
1	832	714	34580	27089	34.533	
1	1015	556	34510	27242	34.476	
1	1196	463	34520	27358	34.495	
1	1371	368	34560	27491	34.542	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	274	60	11	25	1343 K	2859 S	15542 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
3968	13	183	233	20	1	16	8	8	2	13	2	21	1	178	32	25

CAST	DEPTH	TEMP.	$S‰$	σ_t	$S‰_{(2)}$	DOUBTFUL
2		2146	35610	24850		
2	22	2040	35810	25291		
2	44	1977	35810	25458		
2	65	1912	35790	25612		
2	86	1857	35790	25752		
2	128	1799	35730	25850		
2	170	1745	35660	25930		
2	257	1570	35520	26233		
2	348	1370	35300	26500		
1	448	1172	35030	26684		
1	610	879	34690	26929	34.690	
1	766	697	34520	27066	34.534	
1	928	573	34470	27189	34.479	
1	1098	454	34490	27345	34.499	
1	1272	382	34520	27445	34.558	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	275	60	11	25	1745 K	2906 S	15618 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
384	14	200	228	19	1	16	9	8	2	20	3	19	1	1655	10	10

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2118	35750	25034		
2	23	2084	35750	25127		
2	47	1864	35730	25688		
2	71	1797	35710	25840		
2	94	1734	35640	25941		
2	141	1611	35500	26124		
2	189	1479	35350	26305		
2	282	1298	35190	26562		
2	377	1131	35010	26745		
1	463	992	34780	26813		
1	663	749	34540	27008	34.562	
1	848	590	34490	27184	34.473	
1	1019	463	34490	27335	34.493	
1	1219	381	34540	27462	34.538	
1	1390	322	34610	27575	34.568	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	277	60	11	26	30 L	2928 S	15734 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4389	13	183	211	00		16	8	0				19	1	175	30	23

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2076	35770	25163		
2	23	2052	35790	25243		
2	46	2008	35790	25361		
2	68	1882	35730	25642		
2	90	1808	35700	25806		
2	135	1753	35640	25895		
2	182	1632	35520	26091		
2	274	1450	35340	26361		
2	369	1294	35190	26570		
1	423	1189	35030	26652		
1	590	874	34670	26921	34.680	
1	765	707	34510	27044	34.530	
1	923	577	34470	27184	34.476	
1	1093	455	34490	27344	34.491	
1	1274	381	34520	27446	34.533	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	279	60	11	26	615 L	2934 S	15835 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
3383	14	178	217	15	1	16	8	8	2			16	1	1711	.14	05

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2167	35820	24952		
2	24	2147	35820	25007		
2	47	1987	35840	25454		
2	70	1948	35810	25534		
2	93	1921	35810	25604		
2	139	1885	35790	25681		
2	186	1819	35680	25763		
2	277	1599	35410	26093		
2	370	1402	35280	26417		
1	471	1219	35030	26594		
1	650	878	34670	26915	34.663	
1	821	700	34510	27054	34.523	
1	1004	542	34470	27227	34.475	
1	1190	447	34490	27352	34.501	
1	1376	352	34540	27491	34.548	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	283	60	11	26	2330 L	2748 S	16046 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
2195	14	194	228	13	1	16	8	0	4			15	1	163	10	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2221	35790	24777		
2	23	2150	35770	24960		
2	47	2108	35770	25082		
2	70	2001	35790	25385		
2	94	1952	35820	25536		
2	140	1914	35810	25627		
2	188	1903	35810	25655		
2	281	1807	35660	25783		
2	375	1598	35460	26129		
1	464	1375	35260	26464		
1	648	946	34780	26896	34.741	
1	834	691	34520	27080	34.511	
1	1022	548	34470	27225	34.470	
1	1213	439	34510	27382	34.515	
1	1404	361	34540	27480	34.551	

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SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	285	60	11	27	620 L	2733 S	15937 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4975	14	172	217	14	1	16	8	1	4			18	3	157	00	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)		DOUBTFUL
2		2188	35840	24908			
2	24	2139	35820	25029			
2	47	2117	35810	25082			
2	70	2008	35810	25376			
2	93	1959	35840	25528			
2	141	1929	35820	25591			
2	188	1899	35810	25660			
2	281	1832	35710	25753			
2	375	1681	35530	25983			
1	472	1504	35410	26297			
1	661	1051	34870	26781	34.868		
1	838	760	34610	27047	34.566		
1	1006	620	34490	27145	34.461		1
1	1214	451	34510	27364	34.499		
1	1401	364	34560	27495	34.549		

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	287	60	11	27	1245 L	2722 S	15828 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
3944	14	183	222	14	1	16	8	1	7			18	1	1566	05	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2358	35880	24451		
2	23	2259	35880	24738		
2	46	2136	35880	25083		
2	70	2038	35820	25304		
2	94	1975	35820	25470		
2	141	1898	35790	25647		
2	188	1882	35820	25711		
2	281	1783	35710	25880		
2	376	1583	35640	26296		
1	465	1364	35210	26443		
1	660	942	34740	26866	34.717	
1	837	692	34520	27073	34.503	
1	1025	544	34490	27241	34.472	
1	1212	444	34510	27371	34.501	
1	1398	356	34560	27502	34.556	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	289	60	11	27	1930 K	2714 S	15716 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
3671	14	172	239	06	1	16	8	1	8			18	1	155	15	05

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2268	35950	24765		
2	23	2194	35950	24975		
2	47	2105	35900	25183		
2	71	1983	35860	25480		
2	94	1934	35860	25608		
2	141	1879	35790	25696		
2	188	1848	35750	25744		
2	281	1712	35550	25925		
2	375	1528	35370	26213		
1	459	1347	35190	26462		
1	637	958	34790	26878	34.758	
1	819	686	34520	27081	34.501	
1	1001	543	34490	27242	34.460	
1	1187	435	34510	27381	34.500	
1	1373	349	34560	27509	34.556	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	291	60	11	28	100 K	2705 S	15618 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
4663	14	194	233	12	1	16	8	5	1			18	1	158	07	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2291	35880	24646		
2	24	2241	35880	24789		
2	47	2095	35880	25195		
2	71	2042	35880	25339		
2	94	1978	35860	25493		
2	142	1941	35840	25575		
2	189	1868	35810	25739		
2	283	1772	35700	25894		
2	378	1492	35370	26292		
1	464	1245	35070	26575		
1	650	872	34690	26940	34.663	
1	837	643	34510	27131	34.475	
1	1025	516	34510	27290	34.468	
1	1213	419	34540	27422	34.513	
1	1402	350	34600	27540	34.555	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	293	60	11	28	800 K	2655 S	15528 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
5486	14	194	233	09	1	16	8	8	3			18	1	1644	10	00

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2463	35680	23987		
2	24	2439	35680	24059		
2	47	2302	35640	24432		
2	71	2239	35710	24666		
2	94	2153	35770	24952		
2	141	2058	35810	25242		
2	188	1938	35770	25529		
2	281	1808	35710	25813		
2	375	1556	35430	26196		
1	468	1350	35210	26471		
1	654	934	34630	26793	34.734	2
1	839	688	34560	27110	34.506	2
1	1024	532	34490	27255	34.467	
1	1210	428	34520	27397	34.501	
1	1398	354	34580	27520	34.549	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	294	60	11	28	1120 K	2649 S	15459 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
3823	13	211	250	13	1	16	8	9	4	13	2	16	1	1741	05	05

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		25160	35590	23758		
2	24	24740	35570	23871		
2	47	23900	35660	24190		
2	71	23210	35730	24445		
2	95	22540	35730	24638		
2	142	21250	35810	25060		
2	188	20410	35840	25311		
2	281	18940	35770	25642		
2	374	16100	35410	26057		
1	444	13960	35190	26360		
1	632	9570	34790	26880	34.748	
1	819	6780	34520	27092	34.499	
1	1006	5290	34510	27274	34.467	
1	1193	4220	34540	27419	34.508	
1	1280	3500	34580	27524	34.549	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	295	60	11	28	1445 K	2650 S	15433 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
5669	14	206	239	13	1	16	8	8	4	15	2	16	1	153	08	08

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2547	35570	23648		
2	23	2482	35610	23877		
2	46	2429	35640	24059		
2	69	2244	35710	24652		
2	92	2156	35770	24944		
2	138	2034	35750	25261		
2	192	1878	35620	25569		
2	276	1687	35500	25946		
2	368	1426	35260	26351		
1	456	1238	35030	26557		
1	636	842	34630	26940	34.651	
1	818	623	34470	27126	34.483	
1	1008	510	34470	27265	34.473	
1	1199	409	34520	27417	34.514	
1	1390	349	34540	27493	34.555	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	296	60	11	28	1915 K	2650 S	15346 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
1116	09	211	239	13	1	16	9	8	4	14	2	16	1	148	15	20

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
2		2470	35820	24072		
2	22	2384	35820	24329		
2	44	2147	35790	24984		
2	66	1933	35660	25458		
2	88	1867	35640	25612		
2	132	1738	35520	25839		
2	178	1603	35390	26058		
2	265	1377	35190	26400		
1	348	1221	35010	26575		
1	532	941	34720	26852	34.725	
1	708	710	34520	27048	34.521	
1	900	595	34490	27177	34.460	

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	3	303	60	12	02	2300 K	3229 S	15258 E

SONIC DEPTH	MAX. SAMP. DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SPEED	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST 1	WIRE ANGLES CAST 2
567	03	206	228	02	02	16	8	7	8	02	2	02	3	1015	15	

CAST	DEPTH	TEMP.	S‰	σ_t	S‰(2)	DOUBTFUL
1		1988	35630	25292	35.630	
1	23	1987	35638	25301	35.638	
1	45	1965	35623	25347	35.623	
1	67	1672	35469	25958	35.469	
1	93	1561	35378	26145	35.378	
1	126	1450	35329	26352	35.329	
1	165	1411	35315	26425	35.315	
1	245	1387	35219	26401	35.219	
1	330	1175	35048	26692	35.048	

DATA

PART 2

HYDROLOGY

SURFACE SAMPLING

EXPLANATION OF HEADINGS

Part 2 Hydrology - Surface Sampling

STATION	Stations are numbered consecutively for each ship for each year.
DATE	Is shown as year, month, day.
TIME	Given in Zone Time. The code letter used for the time zone (Table 6) follows the time.
LATITUDE LONGITUDE	The position of each station is given in degrees and minutes.
TEMP.	Sea temperatures are recorded in °C to 2 decimal places and are accurate to 1 decimal place.
S‰	Salinities are recorded in parts per thousand, to 2 decimal places.

STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE	TEMP.	S‰
202	60	11	9	100K	3401S	15147E	1906	3582
203	60	11	9	500K	3403S	15221E	1918	3573
204	60	11	9	930K	3402S	15253E	1876	3573
205	60	11	9	1445K	3428S	15323E	1810	3564
206	60	11	9	1934K	3455S	15358E	1747	3561
208	60	11	10	1000K	3446S	15451E	1768	3561
209	60	11	10	1730K	3519S	15600E	1857	3573
210	60	11	10	2245K	3533S	15649E	1740	
211	60	11	11	130K	3541S	15720E	1791	3561
212	60	11	11	630K	3623S	15658E		
213	60	11	11	1030K	3704S	15632E	1847	3568
214	60	11	11	1345K	3704S	15605E	1810	3552
215	60	11	11	1630K	3655S	15529E	1719	3561
216	60	11	11	2030K	3639S	15458E	1730	
217	60	11	11	2310K	3627S	15423E	1801	3571
218	60	11	12	320K	3617S	15349E	1730	
219	60	11	12	625K	3606S	15313E	1890	3582
220	60	11	12	1030K	3555S	15238E	1904	3586
221	60	11	12	1440K	3540S	15208E	1901	3584
222	60	11	13	600K	3542S	15135E	1887	3582
223	60	11	13	1105K	3531S	15051E	1901	3581
224	60	11	13	1230K	3531S	15046E		
225	60	11	13	1730K	3612S	15022E		
226	60	11	13	2200K	3655S	15030E	1884	3575
227	60	11	14	715K	3707S	15113E	1755	3571
228	60	11	14	1115K	3717S	15145E	1742	3559
229	60	11	14	1525K	3734S	15216E	1785	3571
230	60	11	14	1915K	3750S	15250E	1746	3571
231	60	11	14	2315K	3759S	15329E		
232	60	11	15	200K	3806S	15406E	1535	3557
233	60	11	15	530K	3811S	15431E		
234	60	11	15	805K	3822S	15459E	1614	3557
235	60	11	15	1145K	3832S	15531E	1580	
236	60	11	15	1445K	3842S	15603E	1579	3553
237	60	11	17	345K	3403S	15133E		
238	60	11	17	545K	3354S	15132E		
239	60	11	19	2130K	3258S	15224E		
240	60	11	20	125K	3235S	15250E		
241	60	11	20	320K	3229S	15259E	2160	3577
242	60	11	20	800K	3240S	15342E	2239	3575
243	60	11	20	1120K	3246S	15412E	2206	3582
244	60	11	20	1610K	3255S	15446E	2180	3582
245	60	11	20	2000K	3302S	15519E	2054	3582
246	60	11	20	2330K	3311S	15555E	2030	
247	60	11	21	30K	3314S	15606E		

STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE	TEMP.	S‰
248	60	11	21	345K	3322S	15623E	1959	3584
249	60	11	21	755K	3333S	15702E	2140	
250	60	11	22	1045K	3350S	15737E	1953	3568
251	60	11	21	415K	3411S	15807E	1930	
252	60	11	21	1720K	3432S	15838E	1950	3570
253	60	11	21	2240K	3349S	15853E	2040	
254	60	11	22	300K	3305S	15908E	2190	
255	60	11	22	950K	3153S	15917E		
256	60	11	22	1215K	3148S	15909E	2038	3579
257	60	11	22	1710K	3140S	15824E	2008	3584
258	60	11	22	2050K	3132S	15751E	2110	
259	60	11	22	2330K	3124S	15717E	2006	3583
260	60	11	23	335K	3117S	15646E	2010	
261	60	11	23	645K	3109S	15613E	2038	3586
262	60	11	23	1030K	3100S	15540E	2048	3584
263	60	11	23	1605K	3054S	15448E	2185	3586
264	60	11	23	2030K	3046S	15407E	2276	3575
265	60	11	24	130K	3040S	15324E	2077	3566
266	60	11	24	245K	3041S	15321E		
267	60	11	24	340K	3041S	15317E		
268	60	11	24	1045K	2942S	15338E		
269	60	11	24	1145K	2945S	15342E		
270	60	11	24	2030K	2846S	15350E		
271	60	11	25	100K	2843S	15356E	2388	3584
272	60	11	25	515K	2847S	15431E	2229	3593
273	60	11	25	940K	2847S	15515E	2214	3586
274	60	11	25	1343K	2859S	15542E	2146	3561
275	60	11	25	1745K	2906S	15618E	2118	3575
276	60	11	25	2130K	2918S	15658E	2090	
277	60	11	25	30K	2928S	15734E	2076	3577
278	60	11	26	355K	2934S	15809E	2140	
279	60	11	26	615K	2934S	15835E	2167	3582
280	60	11	26	1100K	2930S	15905E		
281	60	11	25	1515K	2902S	15932E	2200	
282	60	11	25	1840K	2828S	16000E	2190	
283	60	11	26	2330K	2748S	16046E	2221	3579
284	60	11	27	300K	2740S	16015E	2210	
285	60	11	27	620K	2733S	15937E	2188	3584
286	60	11	27	945K	2727S	15903E	2250	
287	60	11	27	1245K	2722S	15828E	2358	3588
288	60	11	27	1610K	2717S	15756E	2330	
289	60	11	27	1930K	2714S	15716E	2268	3595
290	60	11	27	2230K	2709S	15647E	2250	
291	60	11	28	100K	2705S	15618E	2291	3588
292	60	11	28	500K	2659S	15541E		
293	60	11	28	800K	2655S	15528E	2463	3568

STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE	TEMP.	S‰
294	60	11	28	1120K	2649S	15459E	2516	3559
295	60	11	28	1445K	2650S	15433E	2547	3557
296	60	11	28	1915K	2650S	15346E	2470	3582
297	60	11	28	2030K	2654S	15337E		
298	60	11	28	2215K	2646S	15334E		
299	60	12	1	2330K	2842S	15354E		
300	60	12	2	640K	2945S	15346E		
301	60	12	2	1705K	3137S	15309E		
302	60	12	2	1815K	3140S	15306E		
303	60	12	2	2300K	3229S	15258E	1988	3563
304	60	12	3	2K	3232S	15302E		
305	60	12	3	800K	3254S	15431E		
306	60	12	3	1033K	3301S	15502E	2140	
307	60	12	3	1340K	3314S	15449E		
308	60	12	3	1445K	3328S	15436E	2090	
309	60	12	3	1635K	3343S	15423E		
310	60	12	3	1930K	3358S	15356E		
311	60	12	3	2230K	3351S	15317E		
312	60	12	4	130K	3345S	15239E		
313	60	12	4	430K	3338S	15200E		

DATA

PART 3

BENTHOS

TABLE 3

BENTHIC BIOMASS *

Station	Sample No.	Depth fm	Sediment Volumes cu. ft	Corals[1]	Sponges	Worms[2]	Molluscs	Crustacea	Ophiuroids	Echinoids
201	1	200	0.35	.22	2.33	1.04		0.02		
	2	200	0.58		0.41	2.71		0.05		
	3	200	0.23		0.11	0.16		0.01		
	4	200			0.40	0.17	0.01	0.02		
	5	200	0.46		0.13	0.03		0.01	0.08	
225	1	80		0.01	0.01	0.01				
237		140		0.01	0.15	1.04	1.38	0.08		
238	1	75	0.23	.23	0.01	1.64	0.01	0.06	0.01	
	2	75	0.23	4.78		0.85	0.09	0.20	0.01	
	3	75	0.23	0.07	3.33	1.07	0.22	0.49	0.13	0.01
239	1	75	0.23	0.16	0.08	0.95	0.05	0.25		0.01
	2	75	0.35	0.21	0.06	1.19	2.85	.39		0.01
	3	75	0.35	0.24	4.54	2.66	0.21	0.57		.01
240	1	145	0.35			0.54	0.26	0.69		
	2	145	0.58	0.02	0.01	0.36	2.91	0.02		
	3	145	0.23			0.68	0.22	0.01	0.23	
247	1	75		7.75	2.20	0.49	0.06	0.16	0.03	
	Δ									
255	Δ									
266	1	140-130	0.46	0.04		0.34	0.08	0.24	0.08	0.01
267	1	75-76	0.58	0.03		0.89	0.98	0.41	0.02	
	2	75-76	0.92	0.02	0.05	1.61	0.01	0.52	0.01	
	3	75-76	1.15	.05	6.95	2.34		2.19	0.30	

Station	Sample No.	Depth fm	Sediment Volumes cu. ft	Corals[1]	Sponges	Worms[2]	Molluscs	Crustacea	Ophiuroids	Echinoids
268	1	74-71	0.23	0.01		0.64	4.33	0.32	0.08	0.01
	2	74-71	0.58	0.22		7.12	4.14	0.57	0.06	
	3	74-71	0.52	0.60	4.20	1.05	0.18	0.21	0.05	
280	Δ									
297	2	145-140	0.11		0.94	0.02	11.90	0.02	0.01	
298	1	73-70	0.29	0.01		1.42	0.01	0.16		
	2	73-70	0.23	.03		.54	10.55	0.26		0.02
	3	73-70	0.29	0.01		0.20	0.01	0.09	1.40	
299	1	140		1.17	88.55	0.11		0.01	0.06	
300	1	128		0.08		0.05		0.01	0.01	
302	1	76		1.50		0.34	0.09	0.02	1.10	
	2	76	0.29	0.04		0.33	1.82	0.08	0.02	0.01
	3	76	0.23	0.20	1.18	0.87		0.07	0.09	
Total			10.28	17.71	115.28	33.46	42.37	8.21	3.78	0.09

1 All coral growth including Actinozoa and Bryozoa, etc.
2 Polychaeta.
Δ Dredge hauls.
* Weights of biomass expressed in g/grab.

TABLE 3 CONTINUED

Station	Sample No.	Holothurians	Ascidians	Forams	Brachiopods	Fish	Others	Total	Totals Less Corals & Sponges
201	1			1.28		0.07		4.96	2.41
	2							3.17	2.76
	3			0.23				0.51	0.40
	4							.24	0.20
	5							.25	0.12
255	1					0.14		0.17	0.16
237								2.66	2.50
238	1							1.96	1.52
	2							5.93	1.15
	3					0.06	Mostly Worms .19	5.57	2.17
239	1							1.50	1.26
	2	0.03						4.74	4.47
	3	0.01			0.01			8.25	3.47
240	1							1.49	1.49
	2							3.32	3.29
	3							1.14	1.14
247	1							10.69	0.74
	Δ								
255	Δ								
266	1							0.79	0.67
267	1							2.33	2.30
	2							2.22	2.15
	3							11.83	4.83

Station	Sample No.	Holothurians	Ascidians	Forams[3]	Brachiopods	Fish	Others	Total	Totals Less Corals & Sponges
297	2	0.18						13.07	12.13
298	1						Algae .01	1.61	1.60
	2				0.01		Algae .74	12.15	12.12
	3				0.01		Algae 0.09	1.81	1.8
299	1	0.02		.09				90.01	2.29
300	1	0.01	2.19					2.35	2.27
302	1							3.05	1.55
	2	0.15						2.45	2.41
	3	0.01						2.42	1.04
Total		0.53	2.19	1.60	0.03	0.27	1.03	226.55	95.30

3 Foraminifera

TABLE 4

BENTHOS BIOMASS - AUSTRALIAN CONTINENTAL SHELF

75 fathoms			150 fathoms		
Station	Single grab (g)	Station subtotal (g)	Station	Single grab (g)	Station subtotal (g)
255	0.16	0.16	201	2.41	
238	1.52			2.76	
	1.15			0.40	
	2.17	4.84		0.20	
239	1.26			0.12	5.89
	4.47				
	3.47	9.20	237	2.50	2.50
247	0.47	0.47			
267	2.30		240	1.49	
	2.15			3.29	
	4.83	9.28		1.14	5.92
268	5.38				
	11.90		266	0.67	0.67
	1.61	18.89			
298	1.60		297	12.13	12.13
	12.12				
	1.80	15.52	299	2.29	2.29
302	1.55				
	2.41		300	2.27	2.27
	1.04	5.00			
Total	63.63			31.67	

TABLE 5

ANALYSES OF VARIANCE CARRIED OUT ON 75 fm AND 150 fm DATA

75 fm

Source	d.f.	S.S.	M.S.	Variance ratio
Between stations	7	70.430	10.061	non-significant
Residual	12	138.030	11.503	
Total	19	208.460		

150 fm

Source	d.f.	S.S.	M.S.	Variance ratio
Between stations	6	105.7004	17.617	11.289 **
Residual	6	9.3633	1.561	
Total	12	115.0637		

** Significant at 1% level

DATA

PART 4

PHYTOPLANKTON

EXPLANATION OF HEADINGS

Part 4 Phytoplankton

SHIP	All cruises aboard Gascoyne are designated by the figures 20.
CRUISE	Cruise numbers are allotted each year, beginning with 1 for the first cruise.
STATION	Stations are numbered consecutively for each ship for each year.
DATE	Given as year, month, day.
TIME	Given in Zone Time. The code letter used for the time zone (Table 6) follows the time.
LATITUDE LONGITUDE	The position of each station is given in degrees and minutes.
DEPTH	Given in m. A blank at the top of this column denotes 0 m.
ORGANISMS WITH CHLOROPHYLL / WITHOUT CHLOROPHYLL	The counts of organisms with and without chlorophyll are expressed as log numbers per litre.
TOTAL PARTICLES	The counts of total particles are expressed as log numbers per litre.

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	204	60	11	09	930 K	3402 S	15253 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
25	5000	4810	6510
50	5000	4810	4930
75	0000	4180	6401
100	0000		6390
			6570

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	208	60	11	01	1000 K	3446 S	15451 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
	4000	5290	6550
25	0000	4000	6760
50	0000	4300	7120
75	0000		6910
100	0000		7000

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	209	60	11	10	1730 K	3519 S	15600 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
		4180	6590
25	0000	5600	6720
50	0000	5300	6670
75	0000		6560
100	0000		6670

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	213	60	11	11	1030 K	3704 S	15632 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6730
25	0000		5430
50	0000	5300	6720
75	0000		6850
100	0000		6640

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	215	60	11	11	1645 K	3655 S	15529 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			7150
25	0000	5000	6920
50	0000	5300	6880
75	0000		6980
100	0000		6800

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	219	60	11	12	630 K	3606 S	15313 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			5080
20	0000	5000	9350
50	0000		6700
75	0000	5000	6780
100	0000		6860

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	222	60	11	13	630 K	3542 S	15135 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6980
25	0000		6450
50	0000		6850
75	0000		6860
100	0000		6850

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	224	60	11	13	1230 K	3531 S	15046 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6570
25	0000		6670
50	0000		6760
75	0000		6770
100	0000		6670

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	227	60	11	14	730 K	3707 S	15113 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6600
25	0000		6800
50	0000		6670
75	0000		6850
100	0000		6870

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	229	60	11	14	1530 K	3734 S	15216 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
		5300	6720
25	0000		6700
50	0000		6600
75	0000		6560
100	5000	4180	6850

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	234	60	11	15	0900 K	3822 S	15459 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			7030
25	0000		6530
50	0000		6430
75	0000		5220
100	0000		5000

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	236	60	11	15	1430 K	3742 S	15603 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6660
25	0000	5300	5200
50	0000		5160
75	0000		6850
100	0000	5180	6960

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	242	60	11	20	800 K	3240 S	15342 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			5750
25	0000		6780
50	0000		5230
75	0000	5000	6660
100	0000		7090

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	244	60	11	20	1600 K	3255 S	15446 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6500
25	0000		7040
50	0000	5000	6570
75	0000		7020
100	0000		7040

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	250	60	11	21	1030 L	3350 S	15250 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6530
25	5180	4180	6870
50	5180	4000	6720
75	0000		6810
100	0000		6960

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	252	60	11	21	1700 L	3422 S	15838 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6660
25	4180	4900	6930
50	0000	5000	6790
75	0000	4540	6620
100	0000	4000	6720

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	257	60	11	22	1700 L	3432 S	15838 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
		4180	6610
25	0000		6420
50	0000		6300
75	0000	4300	6380
100	0000		6730

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	261	60	11	23	700 K	3109 S	15613 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6710
25	0000		5340
50	0000		6420
75	0000		6770
100	0000		5080

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	263	60	11	23	1600 K	3054 S	15448 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6510
25	0000		6730
50	0000		6420
75	0000		6440
100	0000	4000	6770

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	268	60	11	24	1000 K	2942 S	15338 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
		4000	6530
25	0000		7030
50	0000	4540	6440
75	0000	4400	6510
100	0000		6690

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	273	60	11	25	940 K	2847 S	15515 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6830
25	0000	4400	6960
50	0000		6630
75	4400	5300	6940
100	0000		6540

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	274	60	11	25	1343 K	2859 S	15542 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
		4880	6890
25	0000		6430
50	0000		6500
75	4400	4180	5200
100	0000	5300	7010

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	279	60	11	26	615 L	2934 S	15835 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
		4400	6490
25	0000		6380
50	0000	5000	5220
75	0000	5600	5260
100	0000	4700	5270

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	287	60	11	27	1300 L	2722 S	15828 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
25	0000		
50	0000	5000	5000
75	0000	5000	5000
100	0000	4880	4880

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	293	60	11	28	0815 K	2655 S	15528 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6880
25	0000	4400	7130
50	0000	4700	7160
75	0000	5400	7060
100	0000		6790

SHIP	CRUISE	STATION	YEAR	MONTH	DAY	TIME	LATITUDE	LONGITUDE
20	03	295	60	11	28	1500 K	2650 S	15433 E

DEPTH	ORGANISMS		TOTAL PARTICLES
	WITH CHLOROPHYLL	WITHOUT CHLOROPHYLL	
			6970
25	4400	4400	6150
50	0000	4400	6510
75	0000	5180	6310
100	0000		4310

TABLE 6

OCCURRENCE OF DIATOMS

Numbers refer to stations at which organisms were found

Amphiprora striolata 250.

Asteriolampra marylandica 244.

Asterionella japonica 224, 227, 229.

Asteromphalus danicus 268.
A. flabellatus 244.
A. heptactis 213, 215, 242, 244, 256, 263, 274.

Aulicodiscus danicus 268.

Biddulphia aurita 252.

Chaetoceros atlanticum 256.
C. brevis 256, 268.
C. comosum 256.
C. decipiens 250.
C. denticulatum 295.
C. laciniosum 229, 256, 257.
C. mitra 252.
C. pendulum 250, 263.
C. peruvianum 219, 234, 252, 295.
C. simile 252, 256.
C. sociale 252.
C. teres 268.

Climacodium frauenfeldianum 252, 256, 268, 293.

Cochlodinium faurei 257.
C. rosaceum 279.

Corethron criophilum 204, 250, 252, 256.

Coscinodiscus concinnus 256.
C. excentricus 293
C. granii 242, 250, 252, 268.

Stephanopyxis turris 204, 208, 209, 213, 224, 227, 250, 252, 256, 268.

Streptotheca thamesis 204, 227, 252, 256, 268.

Synedra ulna 295.

Terpsinoe musica 242.

Thalassionema nitzschoides 250, 252, 256, 285.

Thalassiothrix frauenfeldii 227, 250, 252, 268.
T. pacifica 268.

Thalassiosira rotula 229.
T. subtilis 256, 268, 295.

Tropidoneis lepidoptera 268.

TABLE 7

OCCURRENCE OF DINOFLAGELLATES

Numbers refer to stations at which organisms were found.

Amphisolenia bidentata 274, 295.
A. globifera 256.
A. palmata 222.

Ceratium belone 268.
C. buceros 208, 209, 213, 229, 234, 244, 252, 256, 293, 295.
C. candelabrum 256, 263, 268, 279, 285, 295.
C. carriense 250, 268.
C. contortum 204, 295.
C. contrarium 213, 224, 293, 295.
C. declinatum 295.
C. deflexum 285.
C. euarcuatum 287.
C. extensum 204, 224, 234, 268, 293, 295.
C. falcatum 295.
C. furca 204, 208, 209, 213, 215, 219, 222, 224, 227, 229, 234, 244, 250, 252, 256, 257, 268, 273, 274, 285, 293.

V. FIGURES

Physics

Fig. 5.- Contours of equal surface temperature and surface salinity.

Fig. 6.- Dynamic topography; 0 m relative to 1300 decibars. The spacing of contours between stations has been adjusted in several places to accord with the G.E.K. results.

Fig. 7.- Dynamic topography; 200 decibar surface relative to 1300 decibars.

Fig. 8.- Dynamic topography; 400 decibar surface relative to 1300 decibars.

Fig. 9.- Dynamic topography; 900 decibar surface relative to 1300 decibars.

Fig. 10.- Current observations by G.E.K. Stations G 3/202/60 to G 3/296/60.

Fig. 11.- Current observations by G.E.K. Stations G 3/304/60 to G 3/313/60.

In Figs 10-11, current components to the right or left of the ship's track are indicated by shading, and current vectors obtained when the ship's course was altered to check electrode "zero" are indicated by thick arrows.

Figs 12-18.- Show the dynamic heights of a number of isobaric surfaces relative to the 1300 decibar surface, in vertical sections at right angles to the coast. At the coastal end of each section, extrapolation by Helland - Hansen's method has been used to permit referring the dynamic heights to the 1300 decibar surface.

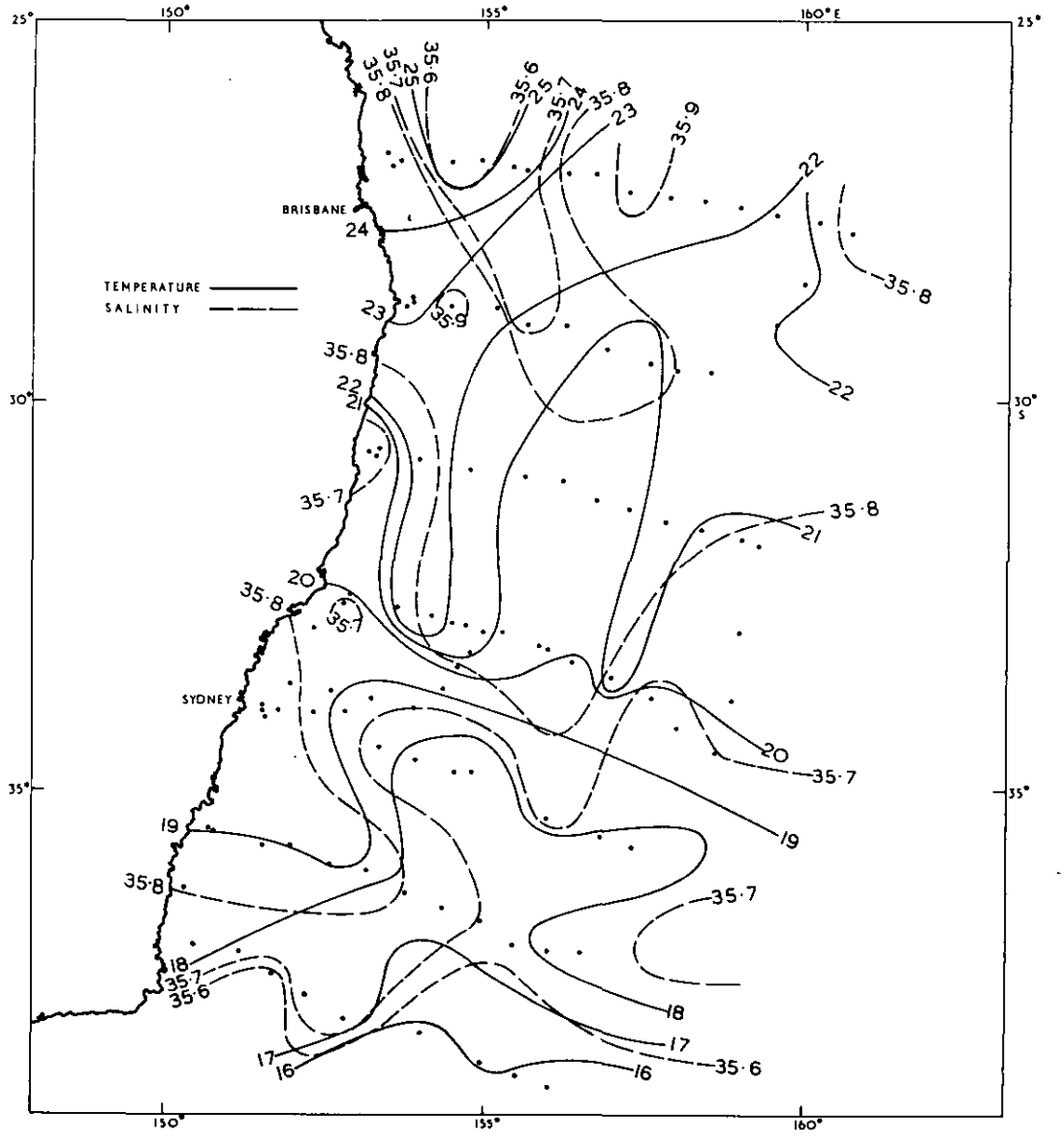
25°
150°
155°
160° E
30° S
35°
BRISBANE
SYDNEY
TEMPERATURE
SALINITY
35·6
35·7
35·8
35·9
24
23
22
21
20
19
18
17
16
25

Fig 5

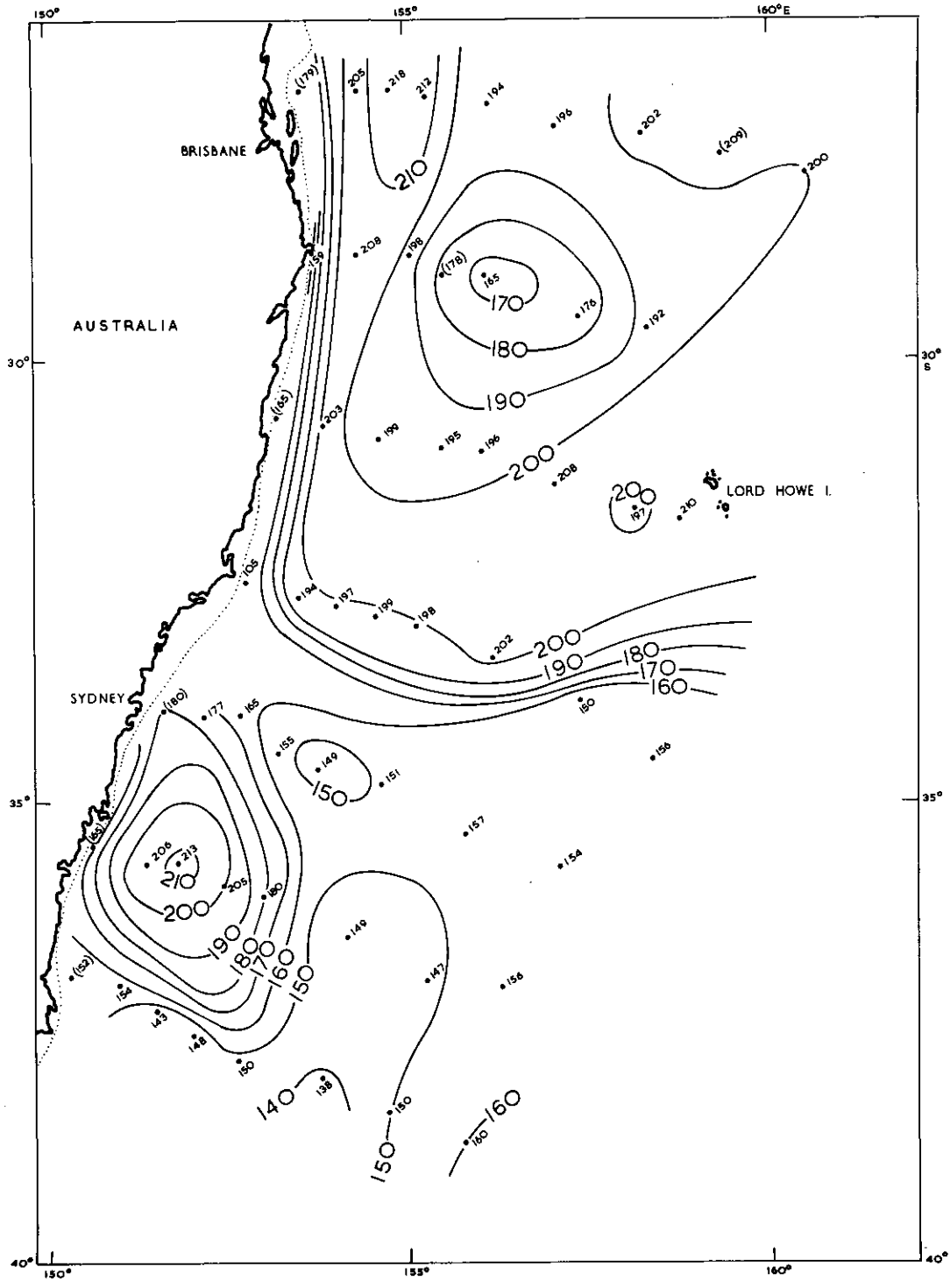
150°
155°
160°E
BRISBANE
AUSTRALIA
SYDNEY
LORD HOWE I.
30°
S
35°
40°
210
200
190
180
170
160
150
140

Fig 6

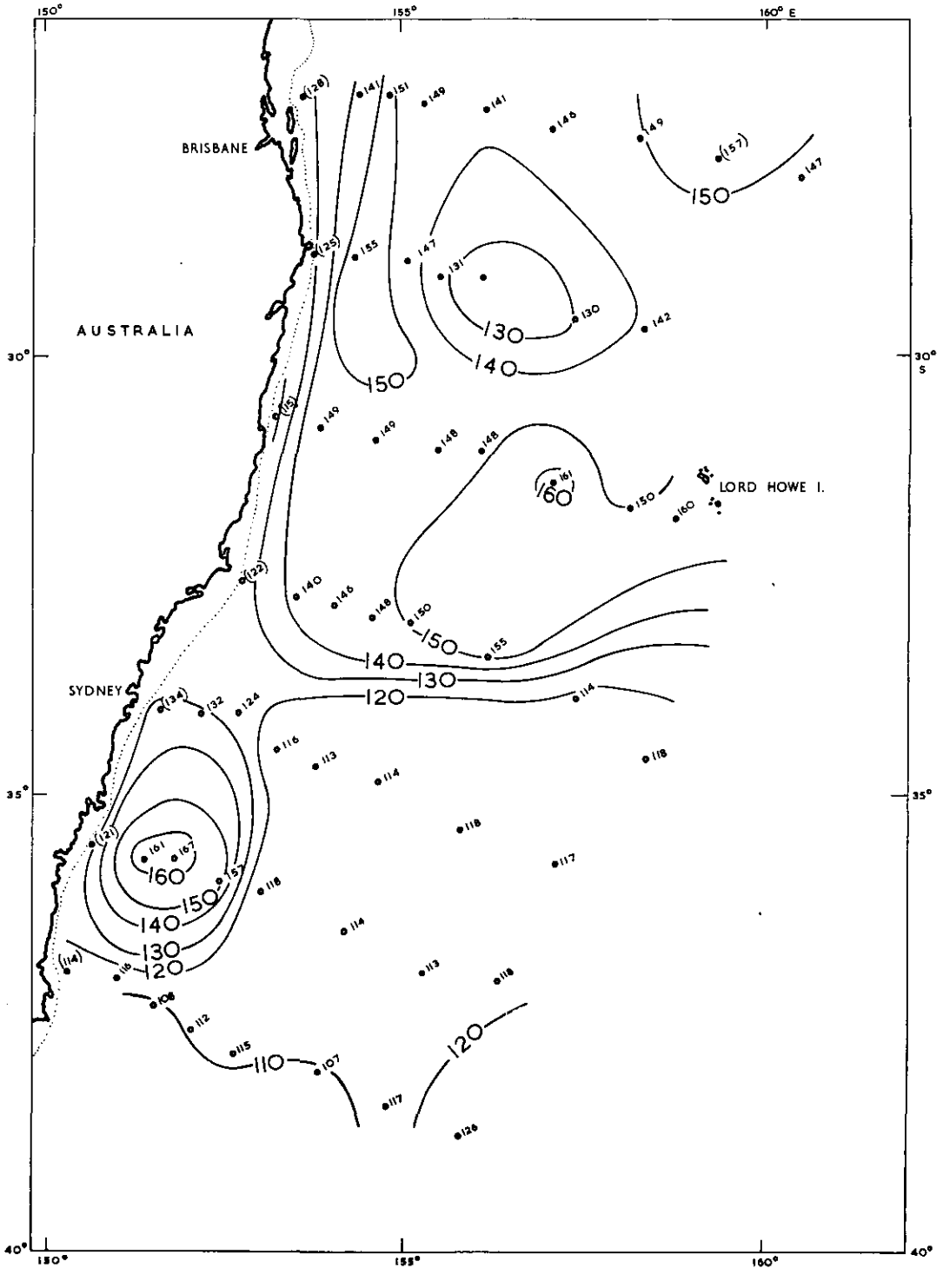
150°
155°
160° E
BRISBANE
AUSTRALIA
LORD HOWE I.
SYDNEY
30°
30° S
35°
40°
150
140
130
120
110
160

Fig 7

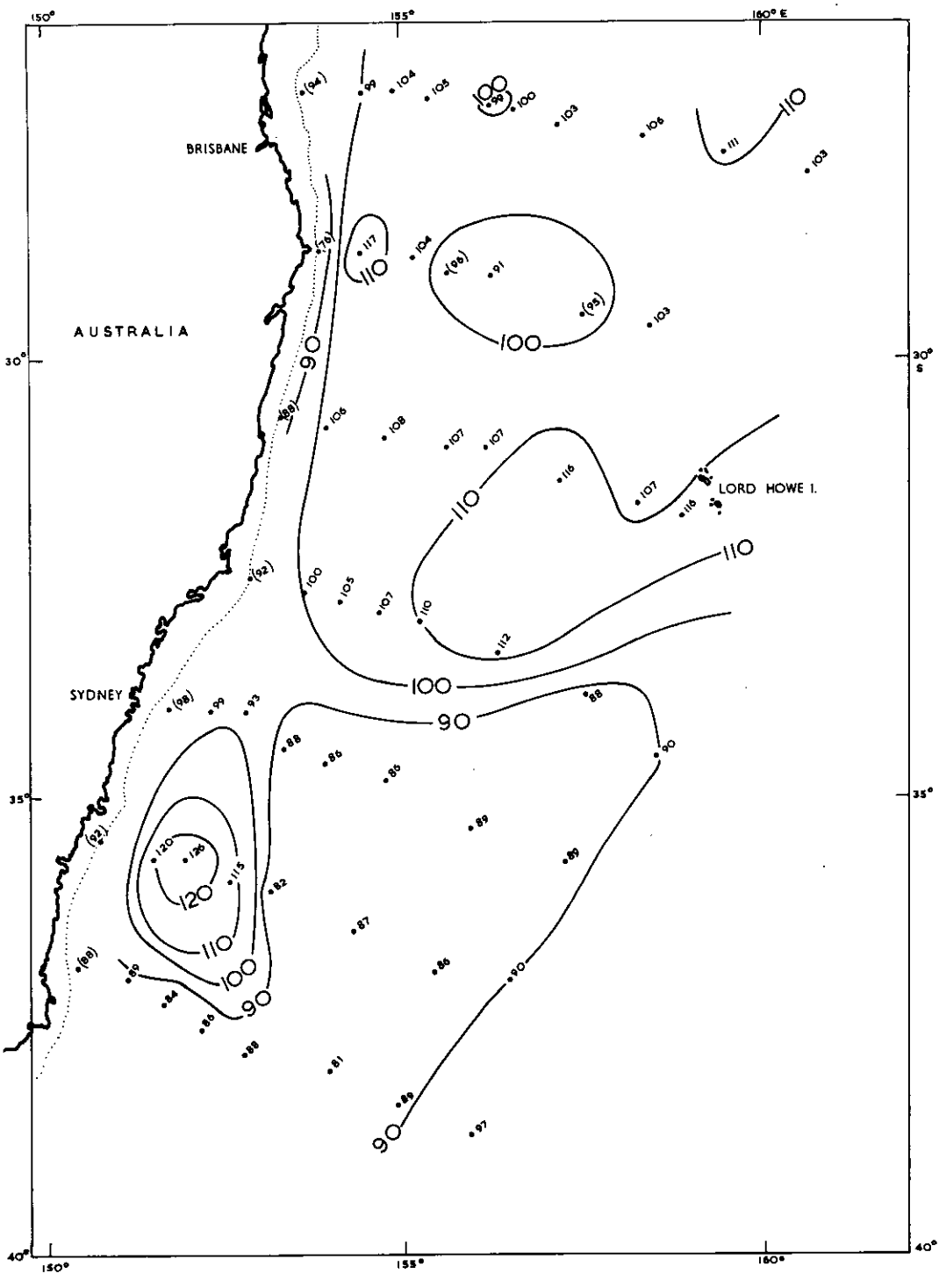
150°
155°
160° E
BRISBANE
AUSTRALIA
LORD HOWE I.
SYDNEY
30°
35°
40°
(94)
99
104
105
100
103
106
111
103
117
104
(96)
91
(95)
103
(79)
(88)
106
108
107
107
116
107
116
110
110
112
100
105
107
(92)
100
90
(98)
99
93
88
86
85
90
89
89
(92)
120
120
115
82
87
86
90
(68)
85
84
85
88
81
89
97
90

Fig 8

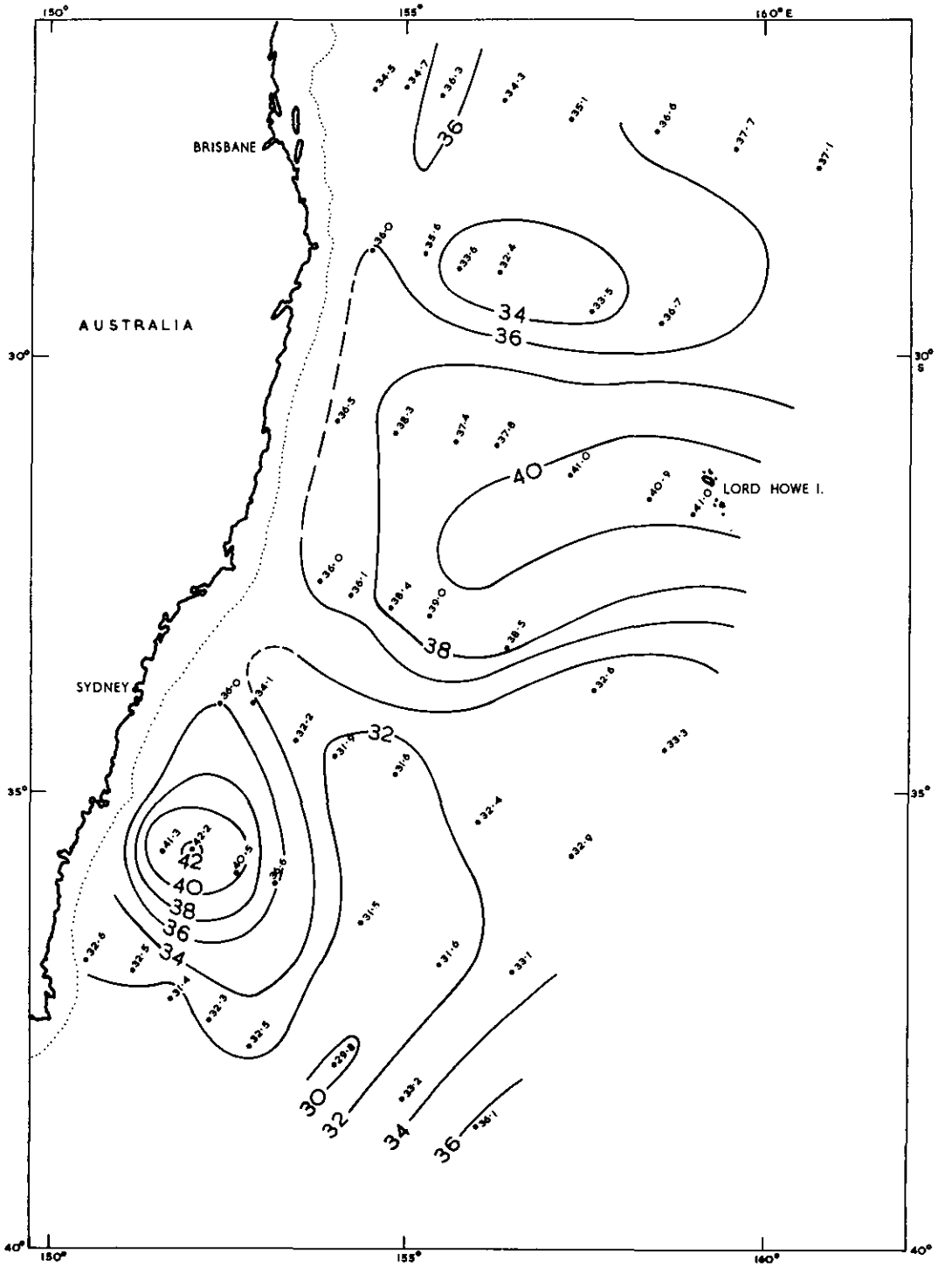
150°
155°
160° E
BRISBANE
AUSTRALIA
30°
30° S
LORD HOWE I.
SYDNEY
35°
35°
40°
150°
155°
160°
40°

Fig 9

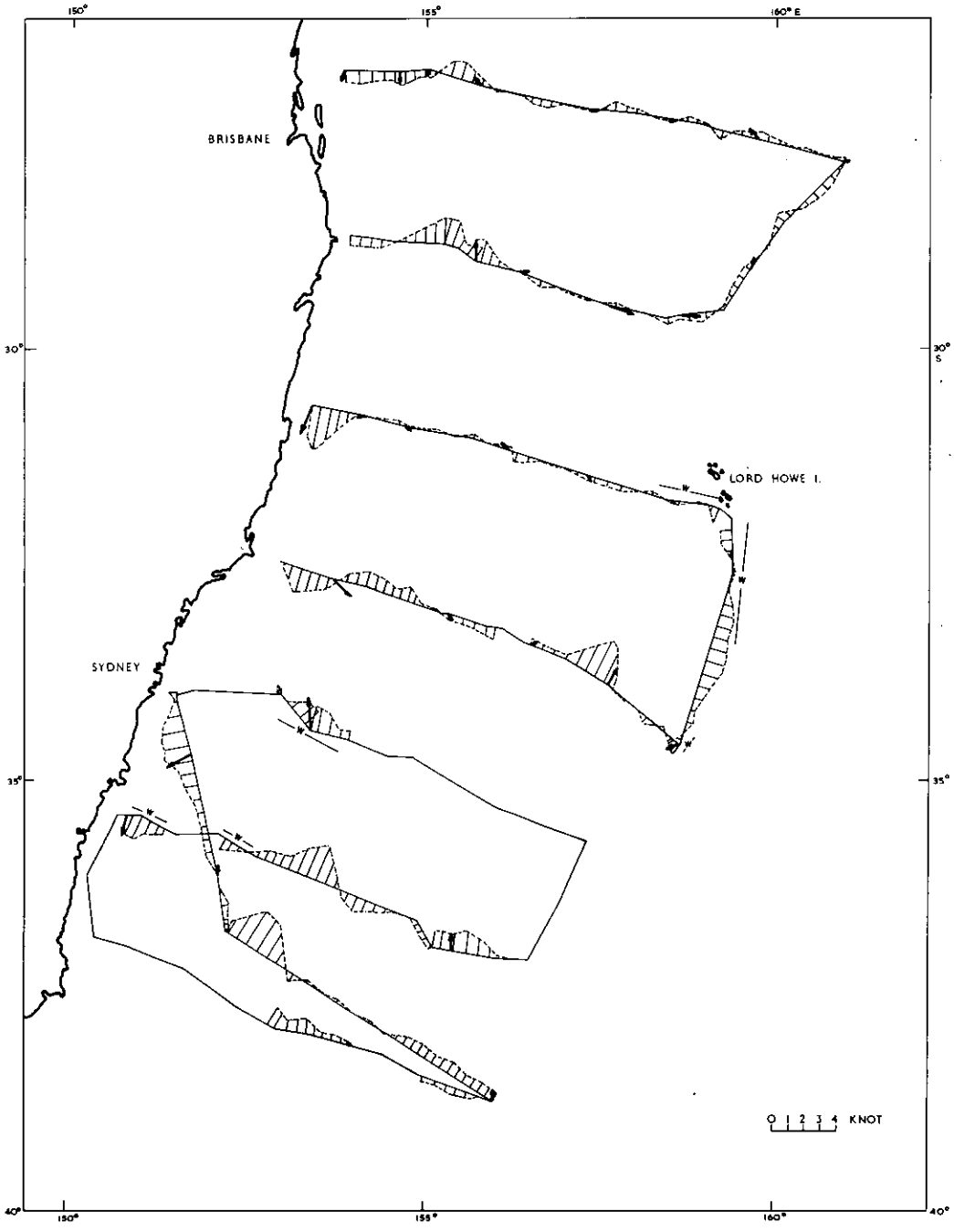
150°
155°
160° E
BRISBANE
30°
30° S
LORD HOWE I.
SYDNEY
35°
35°
40°
150°
155°
160°
40°
0 1 2 3 4 KNOT

Fig 10

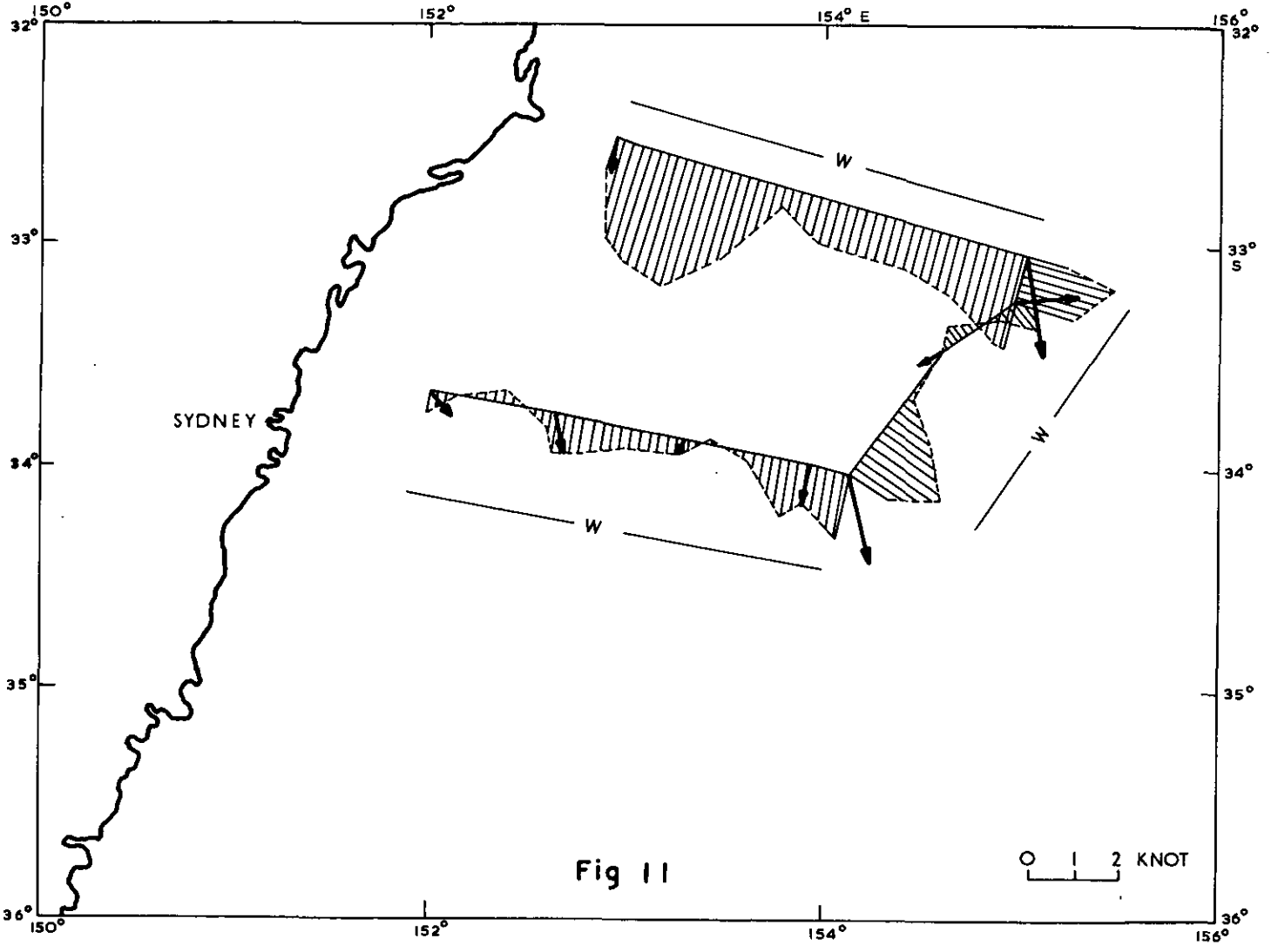

Fig 11

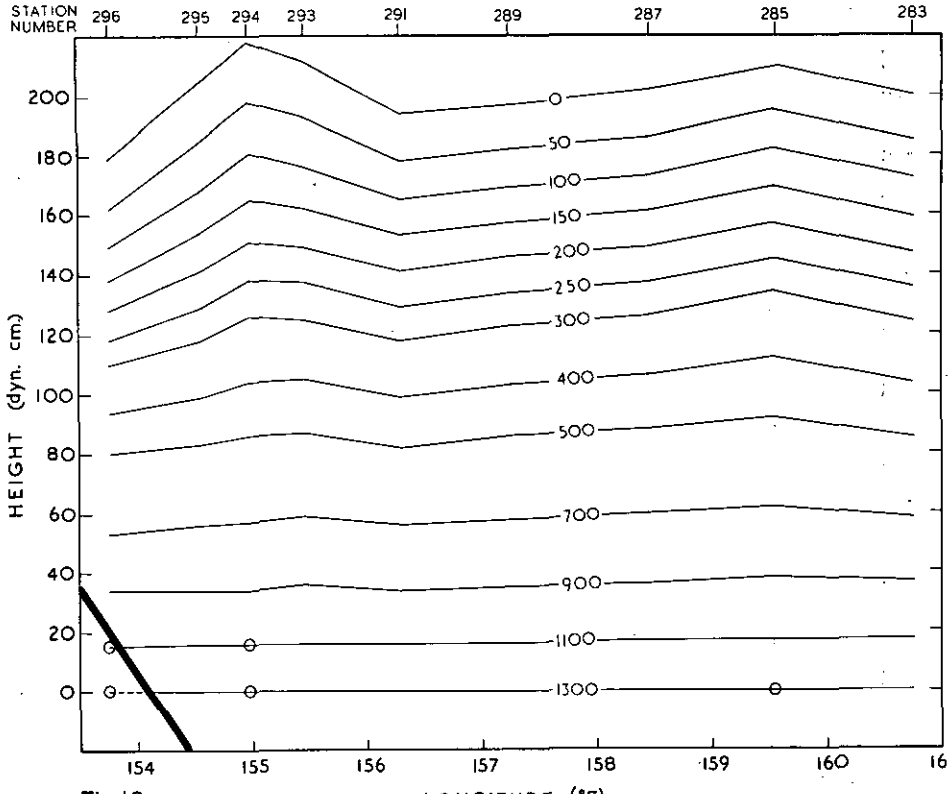
STATION NUMBER
296
295
294
293
291
289
287
285
283
HEIGHT (dyn. cm.)
200
180
160
140
120
100
80
60
40
20
0
0
50
100
150
200
250
300
400
500
700
900
1100
1300
154
155
156
157
158
159
160
161
LONGITUDE (°E)

Fig 12

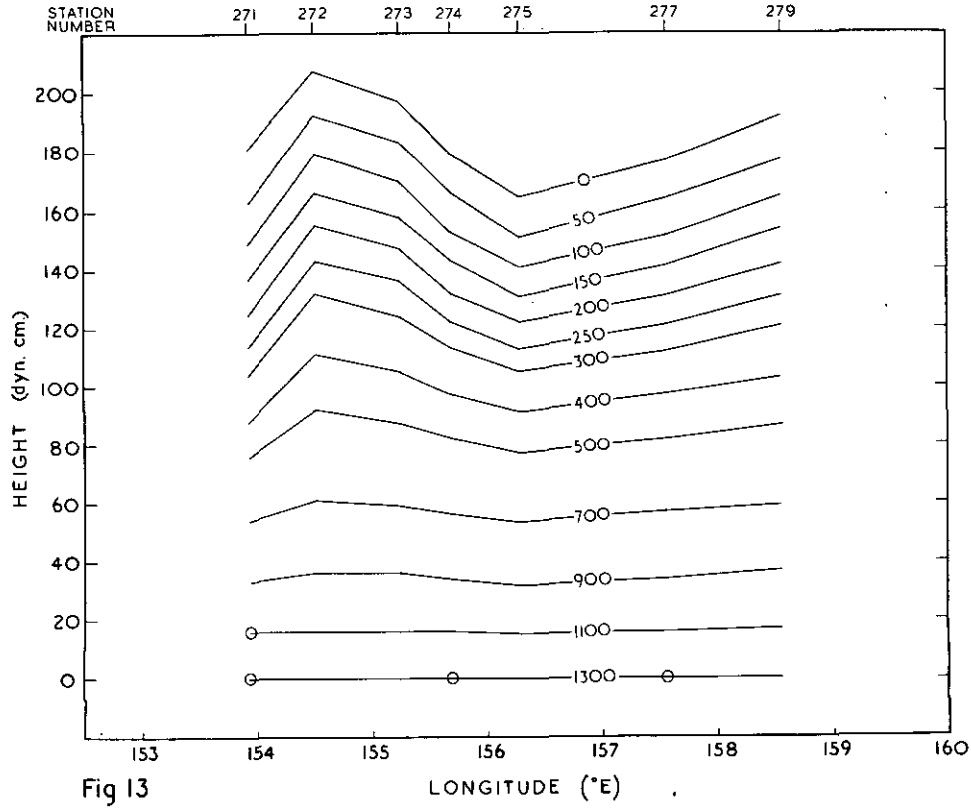
STATION NUMBER
271
272
273
274
275
277
279
HEIGHT (dyn. cm.)
200
180
160
140
120
100
80
60
40
20
0
0
50
100
150
200
250
300
400
500
700
900
1100
1300
153
154
155
156
157
158
159
160
LONGITUDE (°E)

Fig 13

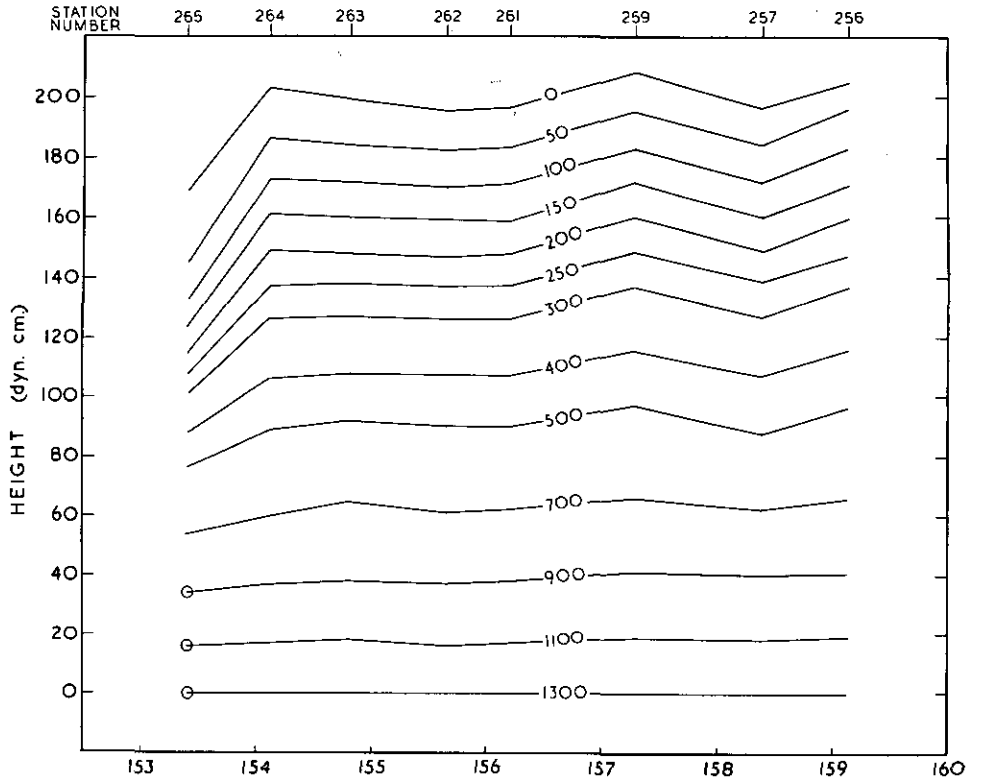
STATION NUMBER
265
264
263
262
261
259
257
256
HEIGHT (dyn. cm)
200
180
160
140
120
100
80
60
40
20
0
0
50
100
150
200
250
300
400
500
700
900
1100
1300
153
154
155
156
157
158
159
160
LONGITUDE (°E)

Fig 14

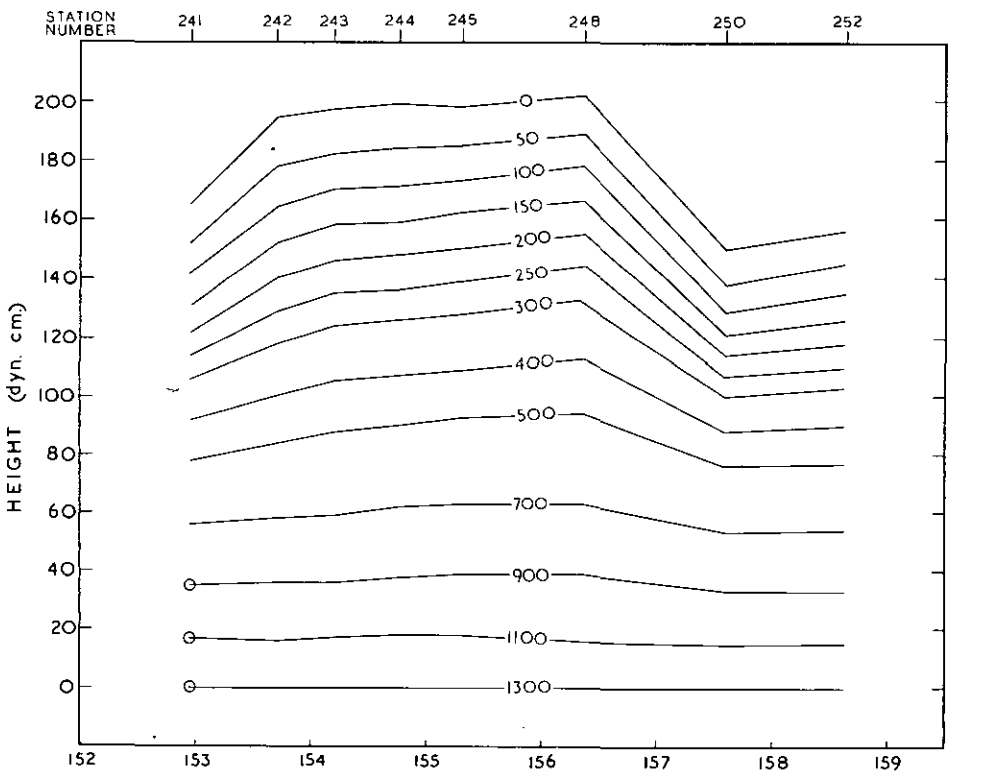
STATION NUMBER
241
242
243
244
245
248
250
252
HEIGHT (dyn. cm)
200
180
160
140
120
100
80
60
40
20
0
0
50
100
150
200
250
300
400
500
700
900
1100
1300
152
153
154
155
156
157
158
159
LONGITUDE (°E)

Fig 15

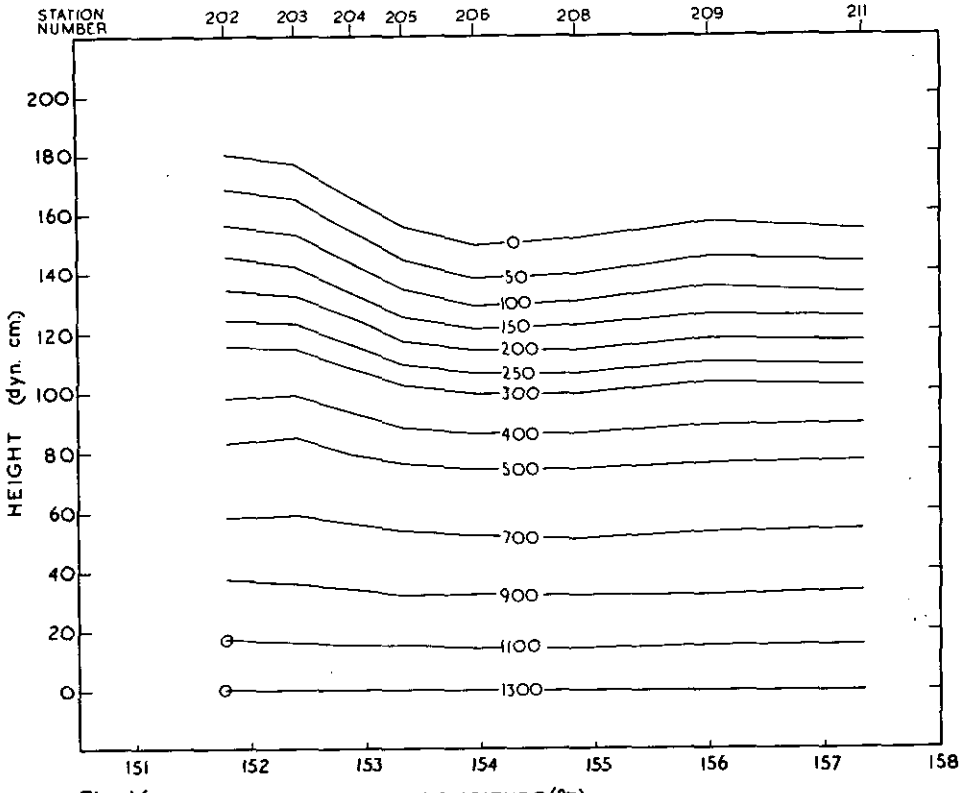
STATION NUMBER
202
203
204
205
206
208
209
211
200
180
160
140
120
100
80
60
40
20
0
HEIGHT (dyn. cm)
0
50
100
150
200
250
300
400
500
700
900
1100
1300
151
152
153
154
155
156
157
158
LONGITUDE (°E)

Fig 16

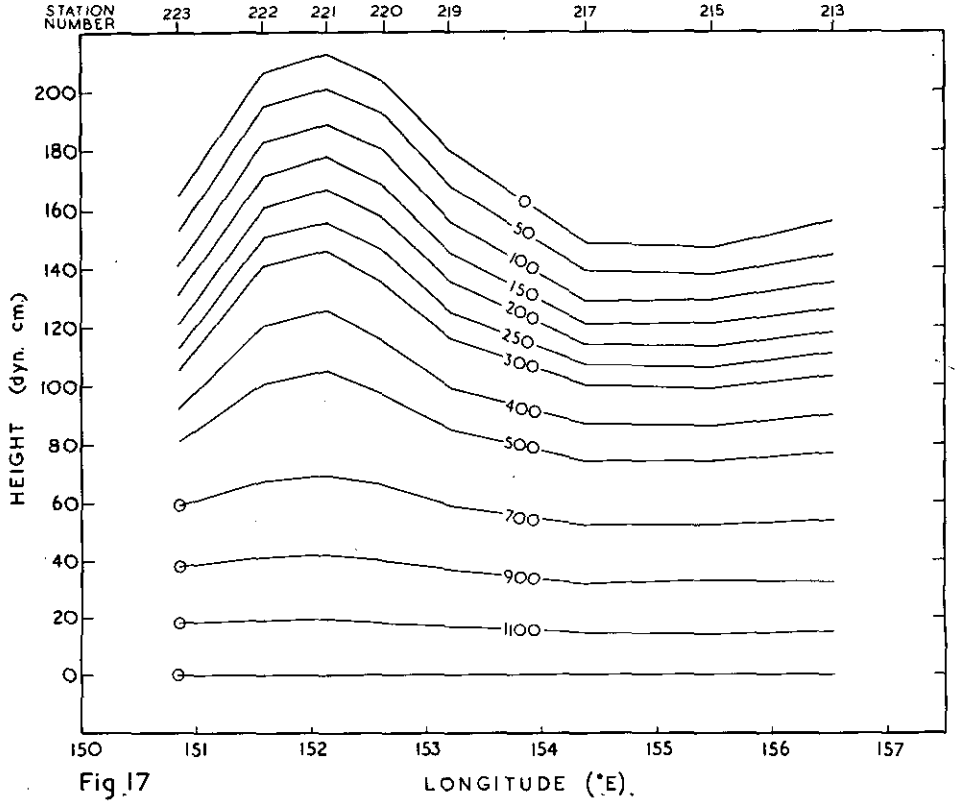
STATION NUMBER
223
222
221
220
219
217
215
213
200
180
160
140
120
100
80
60
40
20
0
HEIGHT (dyn. cm)
0
50
100
150
200
250
300
400
500
700
900
1100
150
151
152
153
154
155
156
157
LONGITUDE (°E)

Fig 17

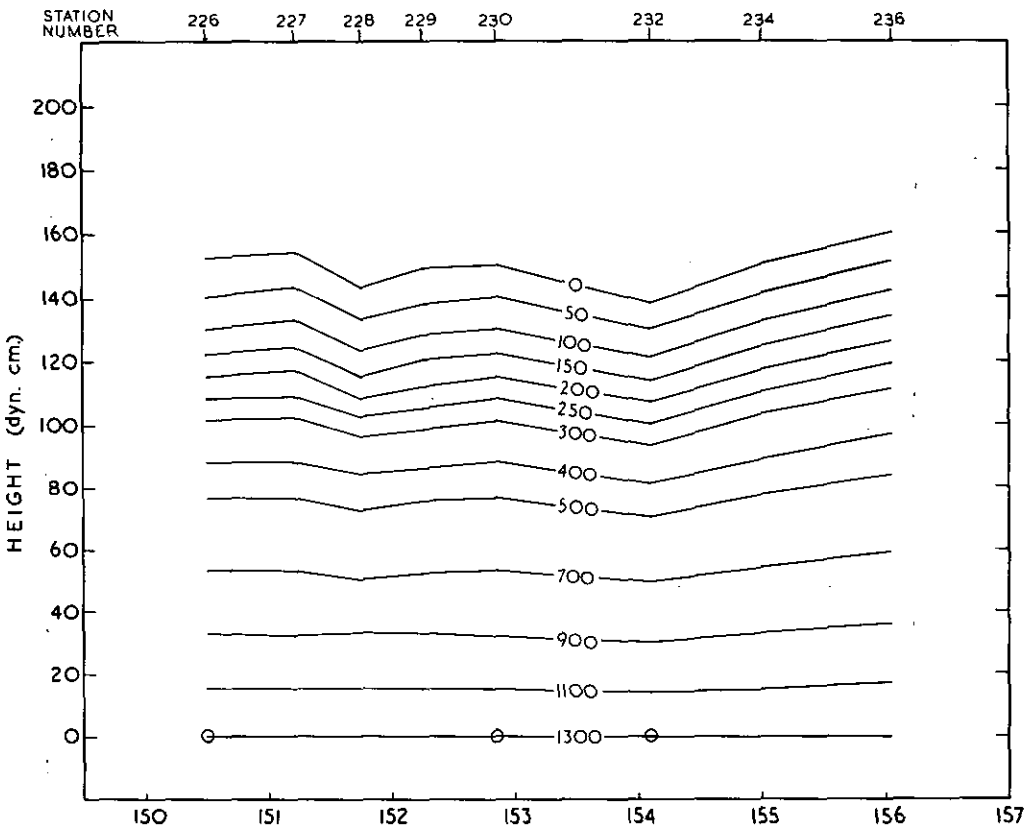
STATION NUMBER
226
227
228
229
230
232
234
236
200
180
160
140
120
100
80
60
40
20
0
HEIGHT (dyn. cm.)
0
50
100
150
200
250
300
400
500
700
900
1100
1300
150
151
152
153
154
155
156
157
LONGITUDE (°E)

Fig 18

OCEANOGRAPHICAL CRUISE REPORTS

1. Oceanographic observations in the Indian Ocean in 1959. H.M.A.S. *Diamantina* Cruises Dm1/59 and Dm2/59.
2. *Oceanographic observations* in the Indian Ocean in 1960. H.M.A.S. *Diamantina* Cruise Dm1/60.
3. Oceanographical observations in the Indian Ocean in 1960. H.M.A.S. *Diamantina* Cruise Dm2/60.
4. Oceanographical observations in the Indian Ocean in 1960. H.M.A.S. *Diamantina* Cruise Dm3/60.
5. Oceanographical observations in the Pacific Ocean in 1960. H.M.A.S. *Gascoyne* Cruises G1/60 and G2/60.
6. Oceanographical observations in the Pacific Ocean in 1960. H.M.A.S. *Gascoyne* Cruise G3/60.