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A compilation of hydrographic data from the Canary Basin, October to November 1983

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by

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Contents page

List of Tables

Summary of figure captures

Abstract

As part of the Warmwassersphäre project (SFB 133) the research vessel "Poseidon" carried out its 104th cruise in October/ November 1983. Legs 3 and 4 covered to the northern Canary Basin where extensive hydrographic measurements and geochemical tracer observations were made. All but the current meter data have been compiled in this report. Included are CTD (Multisonde), XBT (Expendable Bathythermograph) and DPS (current profiler) observations. The profiler records the vertical distributions of temperature, electrical conductivity and horizontal current components. The continuous surface thermosalinograph records of the cruise, GEK track lines (geomagnetic electrokinetograph) and δ^3He data are presented in preliminary form.

Zusammenfassung

Im Rahmen des Sonderforschungsbereichs 133, "Warmwassersphäre des Atlantiks", fand im Oktober/November 1983 die 104. Reise des Forschungsschiffes "Poseidon" statt. Der 3. und 4. Fahrtabschnitt führte in das nördliche Kanarenbecken, wo umfangreiche hydrographische Messungen und spurenstoffchemische Beobachtungen durchgeführt wurden. Der vorliegende Bericht faßt das gesamte Datenmaterial mit Ausnahme der Strommesserdaten zusammen. Er enthält Multisonden (CTD)-Beobachtungen, Bathythermographen (XBT)-Daten sowie den Datensatz der drahtgeführten Profilsonde (DPS). Die DPS dient der Registrierung der Vertikalverteilungen von Temperatur, elektrischer Leitfähigkeit und horizontalen Strömungskomponenten. Die dargestellten Meßergebnisse umfassen ferner die Thermosalinographenbeobachtungen der Reise, die Aufzeichnungen des geomagnetischen Elektrokinetographen (GEK) sowie die vorläufigen δ^3He-Daten.

Introduction

Between 17 October and 14 November 1983 FS "Poseidon" operated in the North East Atlantic as part of the Warmwassersphäre project of Institut für Meereskunde, Kiel University. This cruise no 104 was divided into two legs: The first (104/3) started in Ponta Delgada in the Azores and was devoted to hydrographic and mooring work in the northern Canary Basin. After a port call in Funchal/Madeira (1 - 4 November) the second leg (104/4) followed with additional investigations south of Madeira and selected stations on course to the home port Kiel.

A variety of instruments was used during "Poseidon" cruise no. 104: CTD casts, in many cases down to the bottom (> 5300 m), with rosette samplers were made to obtain the density stratification and selected geochemical tracer distributions. A separate profiling CTD and current meter instrument, called DPS (Drahtgeführte Profilsonde), operated for over 50 stations down to 800 m. Additional information on the thermal structure of the Warmwassersphäre was obtained by expendable bathythermographs (XBTs). Continuous surface observations of temperature and salinity were collected and validated with salinometer values of surface samples. Most of leg 3 was used for the replenish-ment of mooring 276 and the deployment of 5 moorings, named R, O, P, E, X, in the Canary Basin. On leg 4 the group from the Institut für Angewandte Physik, Kiel University, joined the cruise and collected data with a newly developed geomagnetic electrokinetograph (GEK) south of Maderia and on course to the English Channel.

In this report we present the complete data set of "Poseidon" 104/3,4. Only the mooring data are shown separately by Müller (1984) as part of long term current meter observations started in 1977 as part of the North East Atlantic Dynamic Studies (NEADS). Analysis of the tracer data from this cruise is under progress at Heidelberg University. Preliminary results from the return leg 4 up to the Bay of Biscay are included here as well. A graphic summary on all station work onboard "Poseidon" is presented in Figure 1.1.

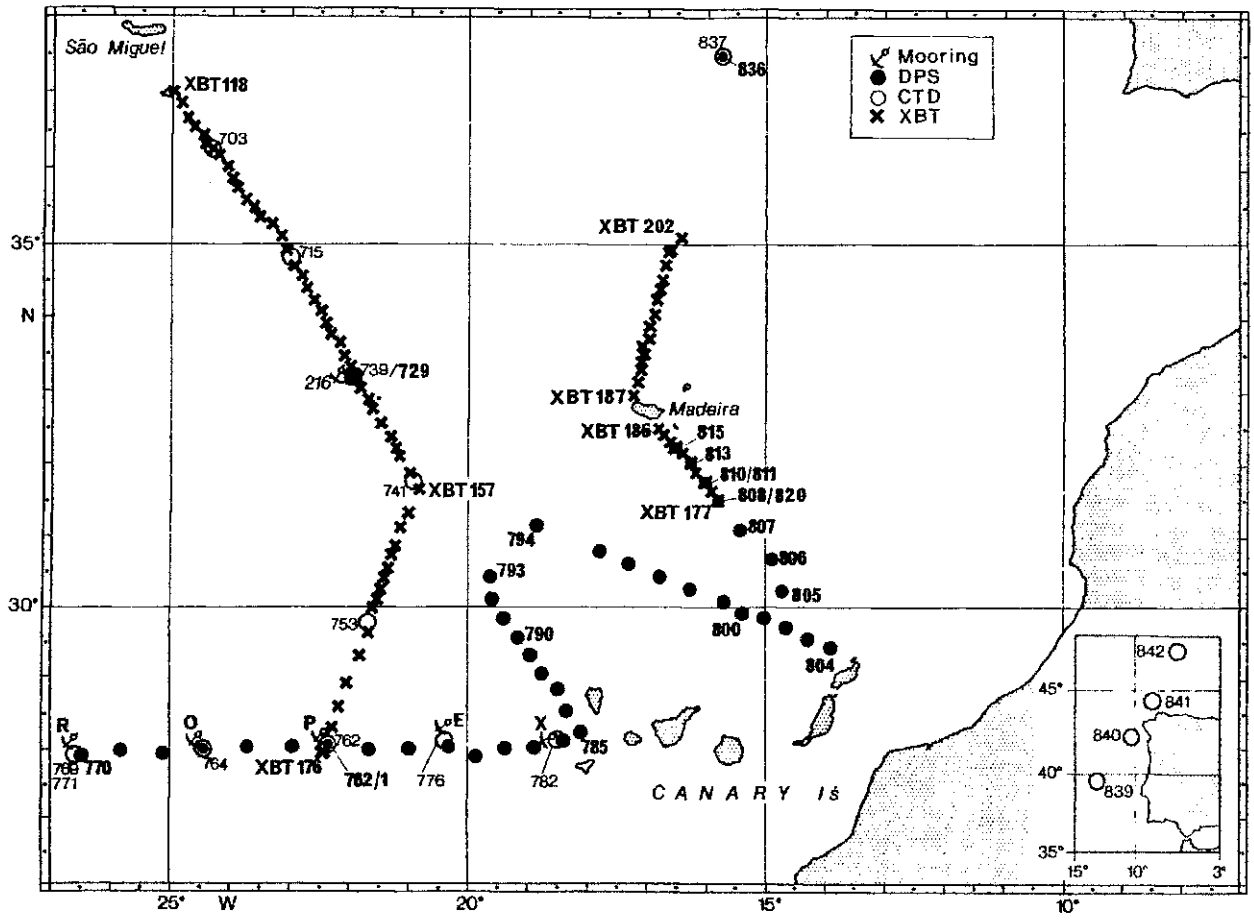


Fig. 1.1 Station chart, location of XBT drops and mooring positions of "Poseidon" cruise 104, legs 3 and 4 from October/November 1983: Station work included regular CTD casts with rosette sampling and vertical current profiling (DPS). In addition to CTD and DPS profiles this report presents hydrographic sections, obtained from XBT probes, the CTD information of DPS stations and tracer data. The GEK track lines, south of Madeira and on the northbound course to the Bay of Biscay, are shown separately in Figures 6.1.and 6.2. Only mooring data have been presented elsewhere (Müller, 1984). Otherwise the complete data set, including surface data, has been compiled in this report.

Whereever possible units and dimensions in this report have been chosen in accordance with the SI unit system (Siedler, 1982). However, some computer generated diagrams may deviate slightly from this rule. For convenience the denominator "practical salinity unit" (PSU) has been chosen for the dimensionless quantity "salinity". Formulas by Fofonoff and Millard (1984) were used for its calculation.

Chapter 2 contains the CTD data in tabular and graphic form. Rosette check values are included in the figures. In chapter 3 we present graphs from the DPS profiler. Temperature and salinity information of the DPS data set further is presented as hydrographic sections. XBT sections are compiled in chapter 4, followed by the continuous surface data in chapter 5. These data are depicted as time series and as objectively mapped charts of the working area in the northern Canary Basin. Chapters 6 and 7 contain the GEK and the δ^3He data of "Poseidon" cruise 104.

2. CTD measurements (W. Zenk)

2.1 Description, data processing, register

Two groups of CTD data were collected. The first group consisted of 10 full depth stations which were mainly situated at mooring locations. They serve as check stations and provide coincident temperature/salinity relationship for the later calculation of inferred densities from the thermistor chain and XBT data. The second CTD data set was primarily for the collection of helium/tritium samples. These data will be processed in more detail by the Heidelberg University group in context with the ocean wide distribution of transient tracers (Sarmiento et al., 1982).

A total of 17 CTD stations was occupied. Station data are listed in Table 2.1. Their positions are given in Figure 1.1. The CTD systems consisted of "Multisonde" instruments, manufactured by Meerestechnik-Elektronik (ME), Trappenkamp, Germany, and a suitable NOVA computer system. The "Multisonde" system itself (Kroebel, 1976), as well as post-cruise data processing have recently been described by Sy (1983) and Peters et al. (1984).

Basicly two different "Multisonde" systems (MS) were used. MS35 was installed when the marine physics branch of the Institut für Meereskunde took over "Poseidon" in Ponta Delgada. During the preceding cruise leg this instrument had been used down to approximately 3000 m depth with reasonable success. Problems with MS35 occurred when it was lowered to the full ocean depth in the central Canary Basin. After two stations (No. 703, 715) it was replaced by MS 45. With one exception this system was used at all following stations without any major difficulties. Apparently a pre-cruise maintenance order to remove some artificial oscillating effects at great depth had been successfully performed by the manufacturer. A repeated dip at station No. 838 served as an instrumental test of Multisonde MS01. Calibration checks were made at numerous depth levels by a rosette sampler system. Test values are included in the vertical profiles of temperature and salinity. Altogether 126 temperature readings and 45 salinity determinations were obtained. Data reduction of the rosette reference values was performed as described by Peters et al. (1984).

Stat. No.	Date 1983	CUT	Position φ	Position λ	Uncorr. Depth (m)	Instr. No.	Remarks
703	17 Oct	20.00	36°17'N	24°22'W	2990	35	Teststation
715	18 Oct	16.00	34°49'N	23°03'W	5109	35	
731	20 Oct	12.45	33°09'N	21°55'W	5237	45	
741	21 Oct	01.46	31°46'N	20°54'W	4839	45	
753	21 Oct	15.55	30°00'N	21°40'W	4890	45	
761	22 Oct	12.25	28°00'N	22°22'W	4851	45	
764	23 Oct	14.20	27°59'N	24°26'W	5158	45	
769	24 Oct	12.06	27°57'N	26°31'W	5128	45	
771	24 Oct	18.20	27°58'N	26°30'W	5203	45	HE/TR-Sample
776	26 Oct	11.15	28°03'N	20°22'W	4560	45	
782	27 Oct	11.00	28°03'N	18°23'W	3758	45	
837	07 Nov	08.13	37°21'N	15°54'W	5016	45	HE/TR-Sample
838	07 Nov	13.14	37°21'N	15°53'W	5012	01	Teststation
839	08 Nov	10.30	39°45'N	13°20'W	5296	45	HE/TR-Sample
840	09 Nov	08.00	42°30'N	10°20'W	2836	45	HE/TR-Sample
841	09 Nov	23.00	44°35'N	08°52'W	4872	45	HE/TR-Sample
842	10 Nov	17.10	47°12'N	06°56'W	3833	45	HE/TR-Sample

Table 2.1: Register of Multisonde (CTD) stations

Taking all available evidences together, is it felt that the MS45 data have the following accuracies in pressure (Δp), temperature (Δt), and salinity (ΔS): $\Delta p = \pm 18$ dbar $\Delta t = \pm 0.01$ K $\Delta S = \pm 0.02$ practical salinity units.

Inaccuracies of MS35 seem to lie above these values by at least a factor of 2. Barely no check values were available (Sy, person. communication).

We present our CTD data in two different ways. The left side of the following double pages show profiles of in-situ temperature, salinity and the potential density parameter σ_θ. Below the profiles diagramms of potential temperature/salinity with selected depth indicators are depicted. The right side of the double page presents a table with measured and derived quantities.

An absolute conductivity value of $C_{15,35} = 42.902$ mS cm^{-1} was used for the calculation of the observed conductivity of LR. The interested reader may recalculate the conductivity ratio R by using $R = LR/C_{15,35}$.

2.2 CTD tables and graphics

Figure 2.1 Sequence of CTD profiles compiled with increasing station numbers (cf. Fig. 1.1 and Table 2.1). On the left side are shown pressure [dbar] profiles of temperature [°C], salinity [practical salinity units] and σ_θ [kg m^{-3}] and potential temperature/salinity diagram with selected depth [m] designators. On the opposing right side a table of measured and inferred parameters at standard pressure levels is presented. For symbols see text.

The following symbols were used:

PR = pressure [dbar] or [10^4 Pa]

TE = in-situ temperature [°C]

LR = electrical conductivity [mS cm^{-1}]

SA = salinity in practical salinity units

ST = potential density $\sigma_\theta = (\frac{\rho(S,\theta,0)}{\text{kg m}^{-3}} - 1000)$ [kg m^{-3}]

with density ρ [kg m^{-3}],

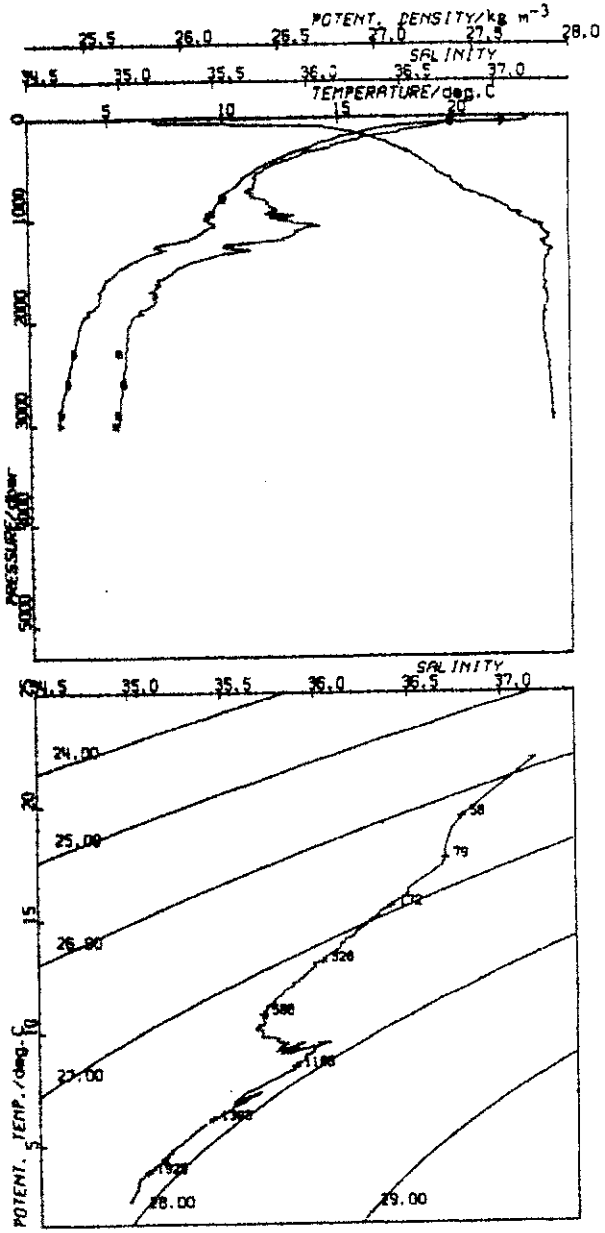
salinity S in practical salinity units

potential temperature θ [°C]

TP = potential temprature [°C]

DE = depth [m]

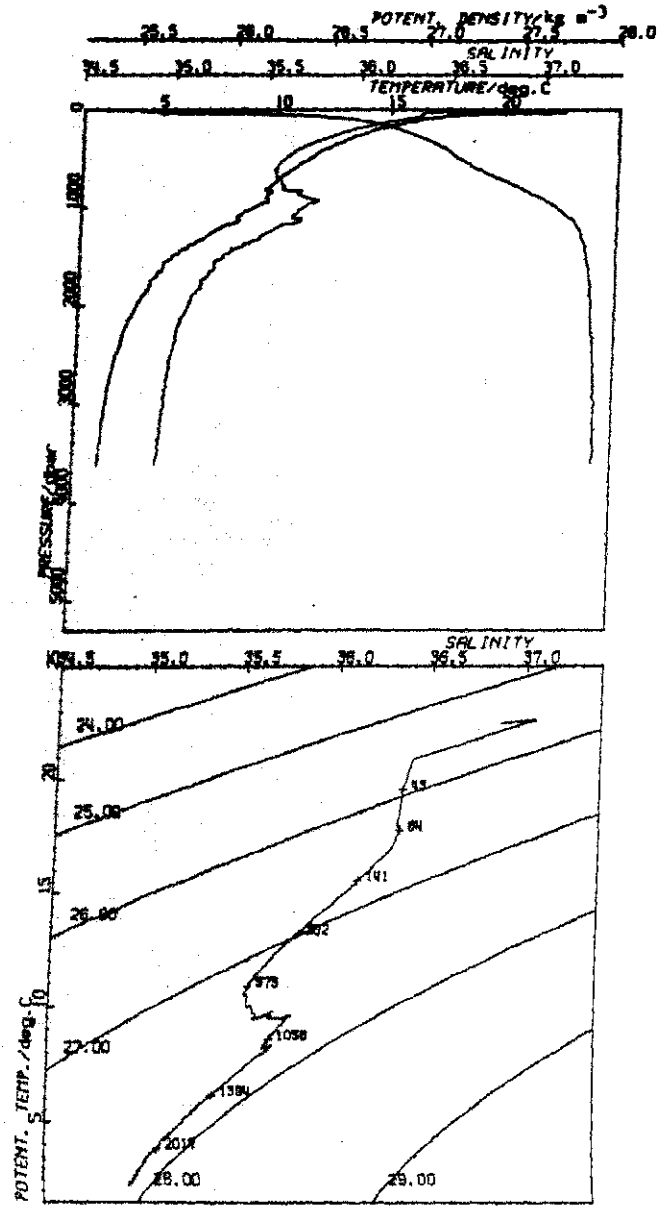
POSEIDON 104
STATION 703/1



POSEIDON 104
DATUM : 17.10.83 STATION : 703 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	22.030	52.723	37.177	25.867	22.026	19.9
40.0	22.024	52.718	37.171	25.865	22.016	39.7
60.0	19.271	49.289	36.765	26.305	19.260	59.6
80.0	17.667	47.535	36.697	26.660	17.653	79.4
100.0	16.999	46.787	36.624	26.767	16.982	99.2
120.0	16.551	46.224	36.545	26.813	16.532	119.1
140.0	16.066	45.681	36.498	26.891	16.044	138.9
160.0	15.815	45.359	36.431	26.898	15.790	158.8
180.0	15.299	44.738	36.338	26.944	15.271	178.6
200.0	14.970	44.361	36.289	26.981	14.940	198.4
250.0	14.224	43.522	36.189	27.067	14.187	248.0
300.0	13.691	42.919	36.105	27.116	13.647	297.6
350.0	12.841	41.958	35.974	27.190	12.793	347.1
400.0	12.376	41.452	35.907	27.232	12.322	396.7
450.0	11.926	40.965	35.841	27.269	11.866	446.3
500.0	11.471	40.475	35.775	27.304	11.407	495.7
550.0	11.202	40.197	35.737	27.326	11.132	545.2
600.0	10.854	39.870	35.725	27.381	10.779	594.7
650.0	10.884	39.890	35.689	27.384	10.603	644.2
700.0	10.400	39.438	35.689	27.435	10.314	693.7
750.0	10.098	39.194	35.715	27.509	10.007	743.2
800.0	9.878	39.037	35.747	27.574	9.782	792.6
850.0	9.757	38.988	35.794	27.692	9.656	842.0
900.0	9.672	38.971	35.838	27.681	9.565	891.5
950.0	9.618	38.002	35.900	27.739	9.506	940.9
1000.0	9.168	38.536	35.843	27.770	9.052	990.3
1100.0	9.272	38.797	35.966	27.852	8.143	1089.1
1200.0	8.525	38.037	35.874	27.901	8.390	1187.8
1300.0	7.404	36.843	35.687	27.922	7.268	1286.5
1400.0	6.246	35.575	35.432	27.880	6.111	1385.1
1500.0	5.345	34.650	35.277	27.870	5.209	1483.7
1600.0	4.877	34.204	35.206	27.870	4.736	1582.2
1700.0	4.511	33.866	35.150	27.866	4.366	1680.7
1800.0	4.534	33.950	35.176	27.886	4.378	1779.1
1900.0	4.051	33.486	35.095	27.873	3.892	1877.5
2000.0	3.779	33.247	35.053	27.868	3.614	1975.9
2200.0	3.543	33.095	35.028	27.873	3.363	2172.5
2400.0	3.310	33.015	35.084	27.941	3.114	2368.9
2600.0	3.103	32.847	35.011	27.904	2.890	2565.1
2800.0	2.911	32.737	34.992	27.907	2.683	2761.1

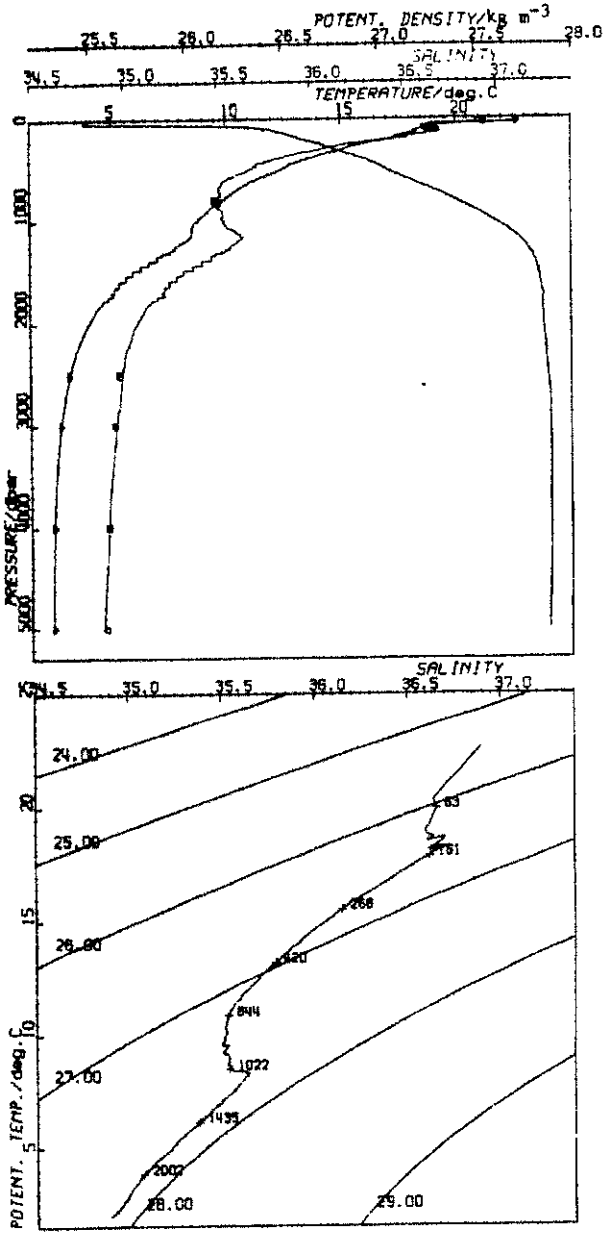
POSEIDON 104
STATION 715/1



POSEIDON 104
DATUM : 18.10.83 STATION : 715 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	22.648	53.228	37.047	26.582	22.642	19.9
40.0	19.903	49.455	36.358	25.827	19.696	39.7
60.0	17.832	47.271	36.328	26.335	17.822	59.6
80.0	17.200	46.612	36.314	26.479	17.187	79.4
100.0	16.448	45.786	36.241	26.603	16.432	99.3
120.0	16.018	45.272	36.186	26.662	15.996	119.1
140.0	15.583	44.771	36.122	26.713	15.561	138.9
160.0	15.185	44.330	36.079	26.769	15.161	158.8
180.0	14.845	43.945	36.032	26.809	14.818	178.6
200.0	14.426	43.482	35.987	26.851	14.396	198.5
250.0	13.845	42.825	35.893	26.919	13.809	248.0
300.0	13.278	42.203	35.817	26.979	13.234	297.6
350.0	12.713	41.592	35.743	27.038	12.665	347.2
400.0	12.220	41.070	35.686	27.090	12.166	396.7
450.0	11.829	40.659	35.635	27.127	11.770	446.3
500.0	11.529	40.360	35.606	27.162	11.464	495.8
550.0	11.139	39.966	35.568	27.206	11.069	545.3
600.0	10.848	39.694	35.556	27.250	10.772	594.8
650.0	10.549	39.424	35.551	27.301	10.469	644.3
700.0	10.198	39.106	35.551	27.364	10.111	693.8
750.0	9.979	38.951	35.583	27.427	9.889	743.3
800.0	9.735	38.758	35.602	27.484	9.640	792.7
850.0	9.831	38.955	35.687	27.536	9.729	842.2
900.0	9.580	38.744	35.695	27.585	9.474	891.6
950.0	9.689	38.957	35.784	27.638	9.575	941.0
1000.0	9.134	38.379	35.714	27.675	9.018	990.4
1100.0	8.379	37.637	35.644	27.740	8.258	1089.2
1200.0	7.698	36.974	35.576	27.791	7.570	1187.9
1300.0	7.021	36.302	35.487	27.819	6.889	1286.6
1400.0	6.246	35.528	35.381	27.840	6.110	1385.3
1500.0	5.549	34.833	35.272	27.842	5.411	1483.9
1600.0	5.175	34.495	35.229	27.854	5.031	1582.4
1700.0	4.904	34.268	35.203	27.865	4.753	1680.9
1800.0	4.526	33.920	35.150	27.866	4.370	1779.4
1900.0	4.276	33.707	35.117	27.887	4.113	1877.8
2000.0	4.039	33.514	35.093	27.873	3.871	1976.1
2200.0	3.631	33.189	35.048	27.879	3.449	2172.7
2400.0	3.356	33.008	35.028	27.892	3.180	2369.2
2600.0	3.108	32.841	34.999	27.894	2.896	2565.4
2800.0	2.983	32.788	34.995	27.905	2.733	2761.4
3000.0	2.843	32.749	34.987	27.911	2.595	2957.3
3200.0	2.745	32.721	34.988	27.906	2.479	3153.0
3400.0	2.670	32.721	34.980	27.908	2.384	3348.6
3600.0	2.595	32.715	34.947	27.905	2.289	3543.9

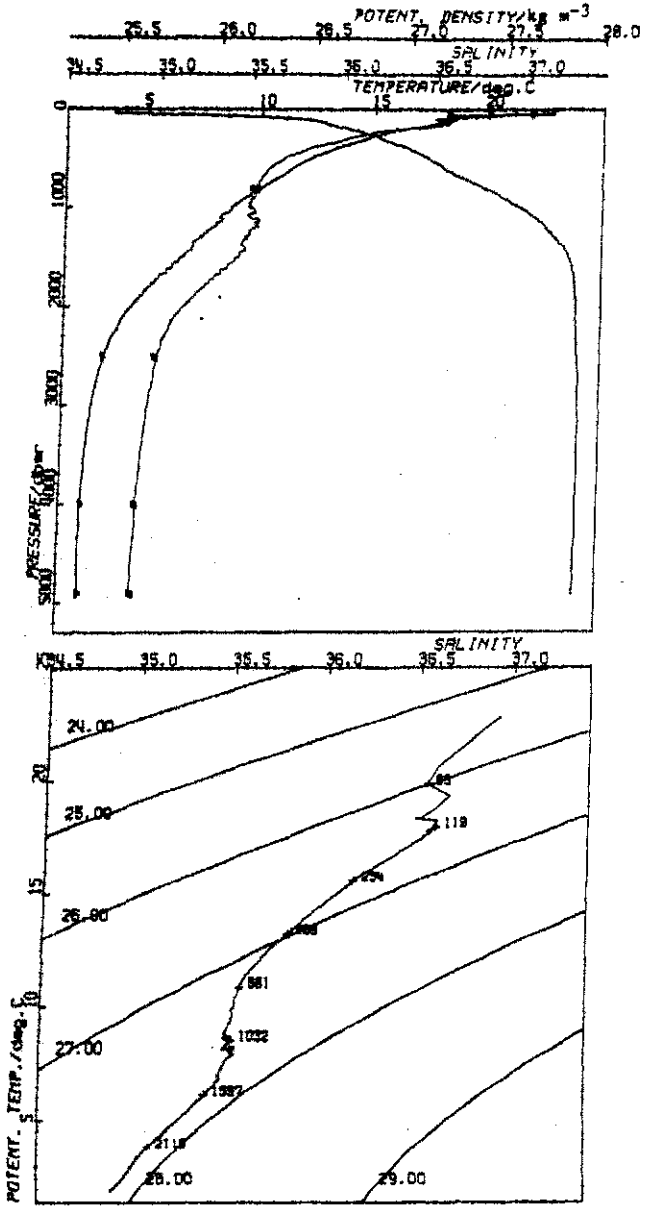
POSEIDON 104
STATION 731/1



POSEIDON 104
DATUM : 20.10.83 STATION : 731 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	22.640	53.035	36.892	25.476	22.636	19.9
40.0	22.646	53.053	36.895	25.478	22.636	39.7
60.0	20.114	50.040	36.640	25.987	20.103	59.6
80.0	18.935	48.789	36.624	26.285	18.921	79.4
100.0	18.539	48.392	36.632	26.393	18.522	99.3
120.0	18.408	48.305	36.667	26.454	18.387	119.1
140.0	18.314	48.257	36.703	26.505	18.289	139.0
160.0	17.897	47.733	36.619	26.546	17.869	158.8
180.0	17.526	47.257	36.533	26.573	17.495	178.7
200.0	17.217	46.888	36.482	26.609	17.184	198.5
250.0	15.846	45.176	36.192	26.710	15.806	248.1
300.0	15.083	44.279	36.059	26.782	15.036	297.7
350.0	14.215	43.279	35.920	26.864	14.164	347.2
400.0	13.538	42.519	35.818	26.930	13.481	396.9
450.0	12.832	41.739	35.719	26.997	12.770	446.3
500.0	12.391	41.280	35.673	27.050	12.323	495.9
550.0	11.812	40.662	35.601	27.106	11.739	545.4
600.0	11.324	40.162	35.553	27.162	11.247	594.9
650.0	10.854	39.698	35.522	27.224	10.772	644.4
700.0	10.507	39.379	35.515	27.281	10.420	693.9
750.0	10.186	39.088	35.521	27.343	10.095	743.4
800.0	9.844	38.782	35.510	27.393	9.749	792.8
850.0	9.525	38.511	35.522	27.458	9.425	842.3
900.0	9.240	38.270	35.531	27.512	9.136	891.7
950.0	9.012	38.079	35.535	27.553	8.904	941.1
1000.0	8.827	37.931	35.541	27.588	8.714	990.6
1100.0	8.546	37.764	35.600	27.680	8.423	1089.3
1200.0	8.199	37.489	35.611	27.744	8.067	1188.1
1300.0	7.597	36.905	35.548	27.785	7.459	1286.8
1400.0	6.639	35.936	35.419	27.818	6.500	1385.5
1500.0	5.959	35.263	35.322	27.831	5.816	1484.1
1600.0	5.347	34.674	35.243	27.844	5.201	1582.6
1700.0	5.043	34.405	35.205	27.851	4.891	1681.1
1800.0	4.841	34.034	35.150	27.853	4.484	1779.6
1900.0	4.310	33.736	35.105	27.855	4.147	1878.0
2000.0	4.018	33.484	35.071	27.858	3.848	1976.4
2200.0	3.604	33.159	35.029	27.868	3.422	2173.0
2400.0	3.308	32.951	35.001	27.875	3.112	2369.5
2600.0	3.101	32.834	34.987	27.888	2.889	2565.8
2800.0	2.934	32.753	34.976	27.893	2.706	2761.8
3000.0	2.799	32.695	34.959	27.893	2.552	2957.8
3200.0	2.708	32.680	34.949	27.894	2.442	3153.5
3400.0	2.629	32.675	34.937	27.893	2.344	3349.0
3600.0	2.569	32.685	34.926	27.891	2.264	3544.4
3800.0	2.523	32.712	34.922	27.893	2.197	3738.6
4000.0	2.488	32.745	34.915	27.892	2.140	3934.7
4200.0	2.460	32.784	34.909	27.892	2.089	4129.5
4400.0	2.442	32.832	34.904	27.891	2.048	4324.2
4600.0	2.437	32.888	34.897	27.888	2.020	4518.7
4800.0	2.441	32.950	34.889	27.883	1.998	4713.1
5000.0	2.451	33.025	34.881	27.886	1.984	4907.3

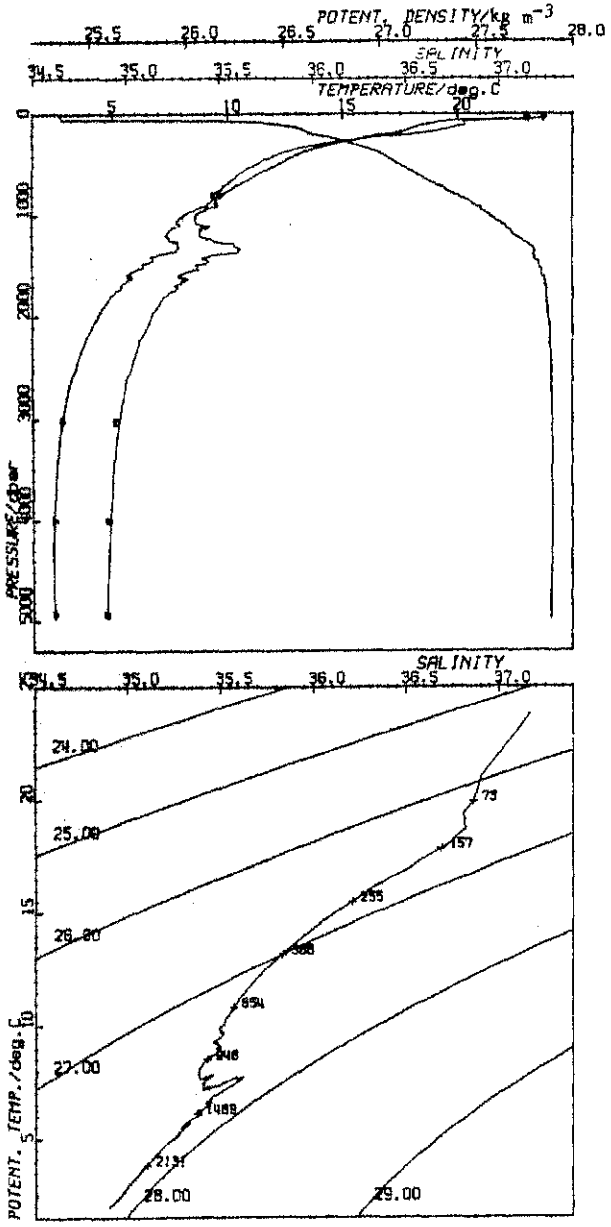
POSEIDON 104
STATION 741/1



POSEIDON 104
DATUM : 21.10.83 STATION : 741 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	22.834	53.279	36.020	25.442	22.830	19.9
40.0	22.826	53.278	36.019	25.444	22.818	39.7
60.0	20.110	49.925	36.548	25.918	20.099	59.6
80.0	19.147	49.029	36.640	26.242	19.132	79.4
100.0	18.221	47.981	36.565	26.422	18.203	99.3
120.0	17.941	47.717	36.581	26.504	17.921	119.1
140.0	17.708	47.457	36.559	26.546	17.684	139.0
160.0	17.323	46.982	36.485	26.584	17.296	158.8
180.0	16.934	46.519	36.418	26.627	16.904	178.7
200.0	16.257	45.666	36.275	26.677	16.225	198.5
250.0	15.427	44.688	36.135	26.761	15.388	248.1
300.0	14.576	43.695	35.991	26.840	14.531	297.7
350.0	13.863	42.889	35.884	26.911	13.812	347.3
400.0	13.162	42.112	35.786	26.981	13.106	396.8
450.0	12.657	41.576	35.728	27.039	12.595	446.4
500.0	12.118	40.987	35.660	27.093	12.049	495.9
550.0	11.734	40.605	35.619	27.135	11.662	545.5
600.0	11.378	40.242	35.583	27.175	11.298	595.0
650.0	11.036	39.911	35.558	27.220	10.954	644.5
700.0	10.685	39.583	35.547	27.275	10.598	694.0
750.0	10.309	39.226	35.531	27.330	10.217	743.4
800.0	9.973	38.914	35.518	27.378	9.877	792.9
850.0	9.626	38.603	35.517	27.437	9.526	842.4
900.0	9.332	38.332	35.504	27.476	9.227	891.8
950.0	8.989	37.985	35.480	27.517	8.861	941.2
1000.0	8.768	37.832	35.496	27.562	8.655	990.7
1100.0	8.252	37.387	35.496	27.644	8.132	1089.5
1200.0	7.922	37.137	35.514	27.709	7.793	1188.2
1300.0	7.388	36.638	35.468	27.752	7.252	1286.9
1400.0	7.087	36.374	35.464	27.795	6.923	1385.6
1500.0	6.622	35.970	35.428	27.829	6.472	1484.2
1600.0	6.184	35.556	35.372	27.843	6.028	1582.8
1700.0	5.812	35.006	35.299	27.858	5.652	1681.3
1800.0	5.241	34.864	35.249	27.864	5.075	1779.8
1900.0	4.773	34.223	35.183	27.866	4.604	1878.3
2000.0	4.427	33.908	35.135	27.886	4.253	1976.7
2200.0	3.829	33.388	35.082	27.872	3.644	2173.3
2400.0	3.435	33.079	35.018	27.877	3.237	2369.8
2600.0	3.149	32.879	34.991	27.884	2.936	2566.1
2800.0	2.967	32.784	34.979	27.892	2.737	2762.2
3000.0	2.799	32.694	34.958	27.892	2.552	2958.1
3200.0	2.675	32.646	34.942	27.892	2.410	3153.8
3400.0	2.591	32.635	34.930	27.891	2.307	3349.4
3600.0	2.527	32.643	34.922	27.891	2.222	3544.5
3800.0	2.475	32.664	34.915	27.892	2.150	3740.1
4000.0	2.437	32.692	34.905	27.889	2.091	3935.1
4200.0	2.418	32.743	34.904	27.891	2.049	4130.0
4400.0	2.408	32.795	34.898	27.889	2.014	4324.7
4600.0	2.416	32.864	34.890	27.884	1.999	4519.3
4800.0	2.431	32.941	34.888	27.883	1.989	4713.6

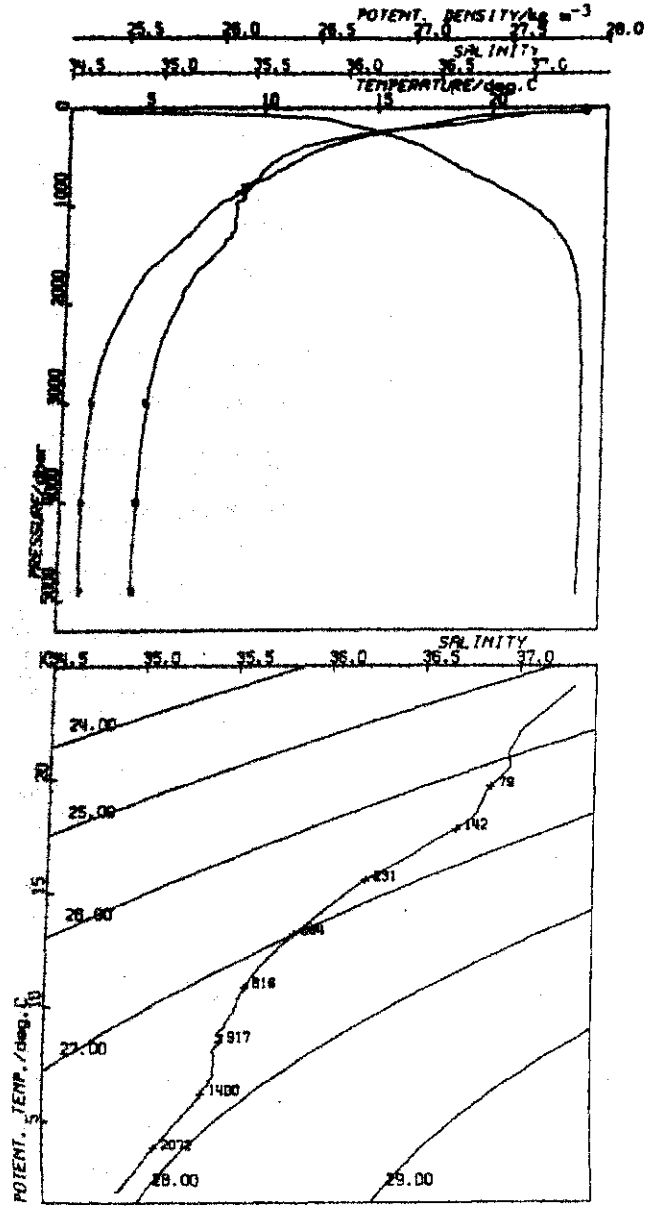
POSEIDON 104
STATION 753/1



POSEIDON 104
DATUM : 21.10.83 STATION : 753 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	23.785	54.627	37.163	25.347	23.781	19.9
40.0	23.778	54.635	37.170	25.357	23.788	39.7
60.0	21.525	51.906	36.936	25.827	21.513	59.6
80.0	19.387	49.458	36.805	26.311	19.352	79.4
100.0	18.914	48.999	36.813	26.435	18.896	99.3
120.0	18.506	48.550	36.788	26.522	18.485	119.1
140.0	18.138	48.116	36.740	26.578	18.114	139.0
160.0	17.859	47.786	36.681	26.603	17.832	158.8
180.0	17.561	47.393	36.619	26.630	17.531	178.7
200.0	17.032	46.731	36.512	26.677	16.999	198.5
250.0	15.862	45.030	36.228	26.780	15.823	248.1
300.0	14.823	43.791	36.037	26.866	14.577	297.7
350.0	13.769	42.817	35.904	26.946	13.718	347.3
400.0	13.139	42.120	35.815	27.008	13.083	396.9
450.0	12.571	41.499	35.736	27.062	12.509	446.5
500.0	12.127	41.033	35.684	27.109	12.060	496.0
550.0	11.708	40.588	35.638	27.155	11.636	545.5
600.0	11.329	40.214	35.600	27.197	11.252	595.1
650.0	10.973	39.860	35.569	27.238	10.891	644.6
700.0	10.513	39.401	35.532	27.293	10.426	694.1
750.0	10.101	38.999	35.503	27.344	10.010	743.6
800.0	9.809	38.747	35.509	27.399	9.714	793.0
850.0	9.383	38.318	35.483	27.453	9.284	842.5
900.0	9.160	38.156	35.491	27.494	9.057	891.9
950.0	8.602	37.583	35.422	27.529	8.496	941.4
1000.0	8.102	37.089	35.374	27.569	7.994	990.8
1100.0	7.860	37.071	35.452	27.653	7.842	1089.6
1200.0	7.288	36.432	35.397	27.709	7.162	1188.4
1300.0	7.834	37.167	35.590	27.783	7.694	1287.1
1400.0	6.917	36.218	35.446	27.802	6.774	1385.8
1500.0	6.375	35.705	35.389	27.831	6.227	1484.4
1600.0	5.824	34.959	35.280	27.841	5.475	1583.0
1700.0	5.437	34.825	35.275	27.860	5.280	1681.6
1800.0	4.933	34.343	35.202	27.862	4.772	1780.1
1900.0	4.605	34.055	35.186	27.871	4.438	1878.5
2000.0	4.357	33.844	35.133	27.873	4.183	1976.9
2200.0	3.880	33.446	35.076	27.878	3.694	2173.6
2400.0	3.531	33.185	35.043	27.888	3.331	2370.1
2600.0	3.216	32.950	35.004	27.888	3.002	2566.4
2800.0	2.984	32.803	34.983	27.894	2.754	2762.6
3000.0	2.828	32.724	34.965	27.886	2.579	2958.5
3200.0	2.683	32.660	34.950	27.897	2.418	3154.3
3400.0	2.590	32.639	34.935	27.895	2.306	3349.9
3600.0	2.520	32.641	34.925	27.894	2.216	3545.3
3800.0	2.470	32.663	34.918	27.895	2.146	3740.6
4000.0	2.434	32.697	34.914	27.896	2.088	3935.7
4200.0	2.411	32.739	34.907	27.894	2.042	4130.6
4400.0	2.405	32.798	34.902	27.892	2.013	4325.3
4600.0	2.414	32.867	34.898	27.889	1.997	4519.9
4800.0	2.429	32.943	34.893	27.888	1.987	4714.3

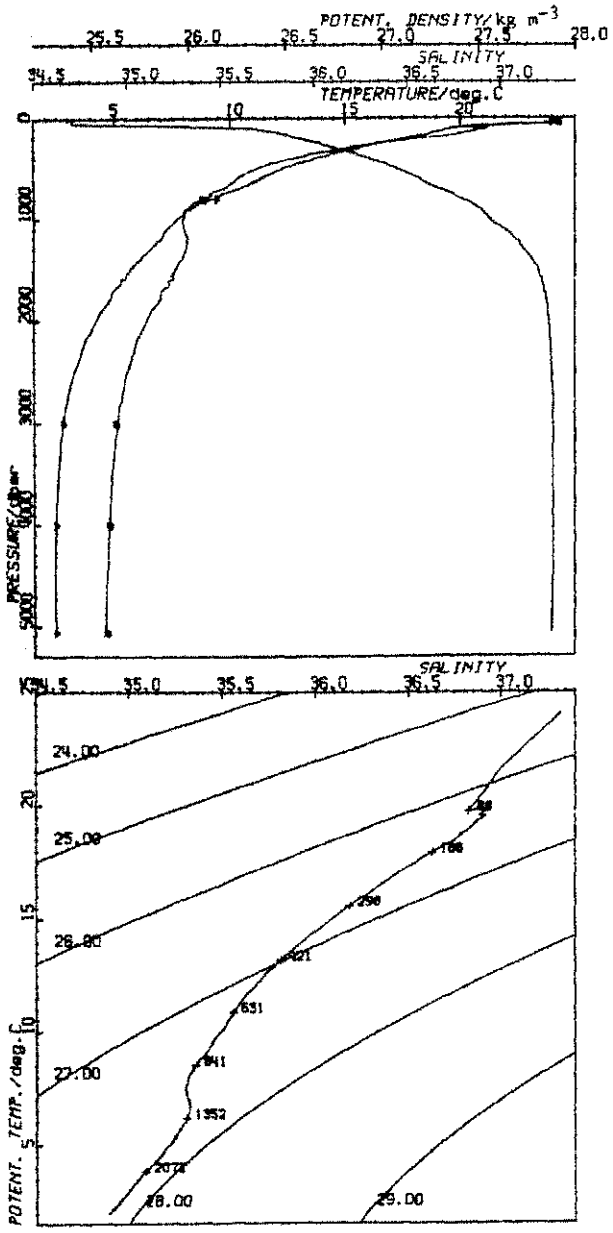
POSEIDON 104
STATION 761/1



POSEIDON 104
DATUM : 22.10.83 STATION : 761 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	24.133	55.165	37.283	25.334	24.128	19.9
40.0	24.129	55.170	37.283	25.337	24.121	39.7
60.0	21.650	52.081	36.958	25.817	21.638	59.6
80.0	19.573	49.838	36.852	26.287	19.558	79.5
100.0	18.744	48.791	36.788	26.460	18.726	99.3
120.0	18.232	48.215	36.748	26.560	18.211	119.2
140.0	17.868	47.794	36.687	26.600	17.864	139.0
160.0	17.493	47.367	36.597	26.629	17.488	158.8
180.0	17.070	46.759	36.511	26.666	17.040	178.7
200.0	16.550	46.119	36.411	26.714	16.517	198.6
250.0	15.258	44.520	36.139	26.802	15.219	248.2
300.0	14.310	43.421	35.985	26.893	14.265	297.8
350.0	13.412	42.405	35.850	26.978	13.362	347.4
400.0	12.699	41.611	35.744	27.041	12.644	397.0
450.0	12.227	41.113	35.688	27.092	12.167	446.5
500.0	11.759	40.625	35.636	27.143	11.694	496.1
550.0	11.389	40.250	35.599	27.184	11.318	545.6
600.0	11.036	39.903	35.572	27.229	10.960	595.1
650.0	10.582	39.434	35.540	27.290	10.481	644.7
700.0	10.278	39.170	35.525	27.329	10.193	694.2
750.0	9.739	38.639	35.489	27.394	9.650	743.7
800.0	9.393	38.307	35.463	27.432	9.301	793.1
850.0	8.978	37.903	35.430	27.474	8.882	842.6
900.0	8.735	37.709	35.446	27.526	8.634	892.1
950.0	8.332	37.321	35.415	27.565	8.228	941.5
1000.0	8.060	37.079	35.407	27.601	7.952	991.0
1100.0	7.601	36.692	35.405	27.669	7.486	1089.8
1200.0	7.192	36.349	35.402	27.726	7.088	1188.6
1300.0	6.845	36.055	35.387	27.764	6.715	1287.3
1400.0	6.335	35.583	35.340	27.796	6.199	1386.0
1500.0	5.842	35.125	35.288	27.819	5.701	1484.7
1600.0	5.373	34.692	35.238	27.837	5.226	1583.3
1700.0	4.914	34.271	35.186	27.850	4.763	1681.8
1800.0	4.678	34.076	35.161	27.858	4.520	1780.4
1900.0	4.371	33.809	35.125	27.864	4.208	1878.8
2000.0	4.145	33.629	35.105	27.872	3.975	1977.2
2200.0	3.730	33.294	35.054	27.875	3.547	2174.0
2400.0	3.379	33.025	35.014	27.879	3.181	2370.5
2600.0	3.079	32.812	34.985	27.885	2.868	2566.8
2800.0	2.898	32.711	34.964	27.887	2.670	2763.0
3000.0	2.751	32.643	34.948	27.888	2.505	2959.0
3400.0	2.565	32.607	34.924	27.888	2.281	3350.4
3600.0	2.495	32.611	34.918	27.888	2.191	3545.8
3800.0	2.449	32.636	34.909	27.889	2.124	3741.2
4000.0	2.418	32.673	34.903	27.888	2.072	3936.3
4200.0	2.401	32.722	34.897	27.887	2.032	4131.2
4400.0	2.397	32.781	34.891	27.884	2.005	4326.0
4600.0	2.410	32.856	34.887	27.882	1.994	4520.6
4800.0	2.428	32.935	34.884	27.880	1.986	4715.1

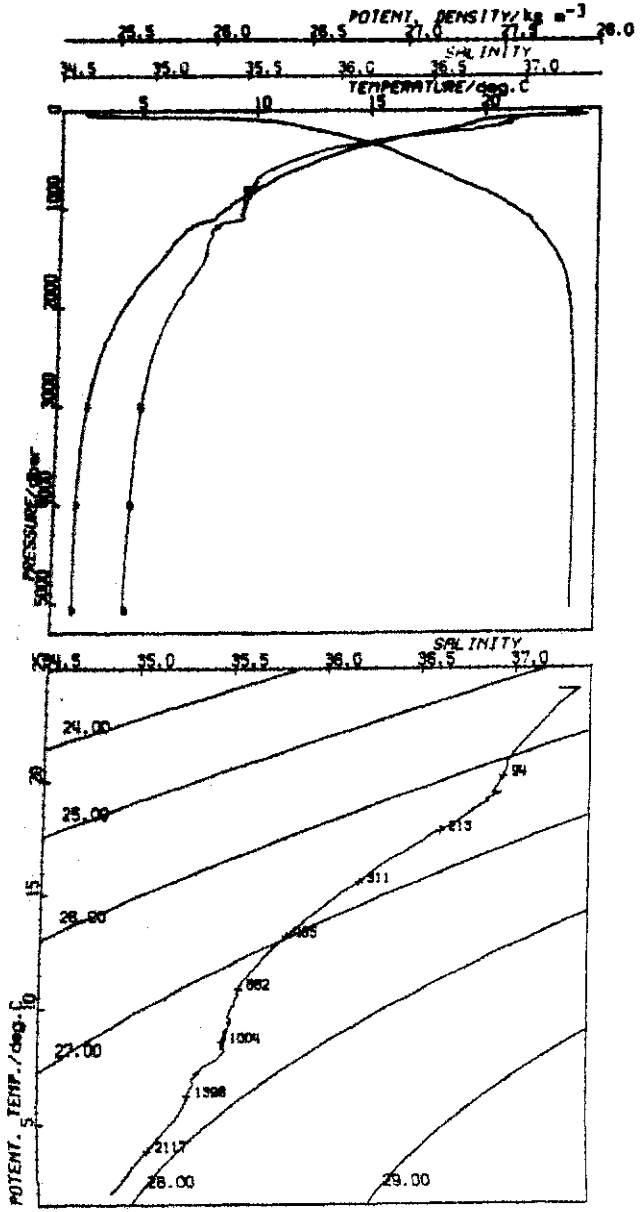
POSEIDON 104
STATION 764/1



POSEIDON 104
DATUM : 23.10.83 STATION : 764 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	24.017	55.087	37.321	25.398	24.012	19.9
40.0	24.015	55.093	37.321	25.399	24.007	39.7
60.0	22.985	53.773	37.163	25.585	22.973	59.6
80.0	20.560	50.842	36.902	26.066	20.545	79.5
100.0	19.634	49.857	36.894	26.310	19.616	99.3
120.0	19.267	49.444	36.867	26.386	19.245	119.2
140.0	18.866	48.971	36.818	26.452	18.841	139.0
160.0	18.503	48.517	36.747	26.493	18.475	158.9
180.0	18.117	48.032	36.671	26.533	18.085	178.7
200.0	17.661	47.443	36.565	26.565	17.627	198.6
250.0	16.404	45.895	36.325	26.684	16.363	248.2
300.0	15.618	44.956	36.182	26.757	15.570	297.8
350.0	14.347	43.467	35.972	26.876	14.295	347.4
400.0	13.634	42.667	35.868	26.948	13.576	397.0
450.0	12.833	41.779	35.758	27.026	12.771	446.5
500.0	12.301	41.207	35.689	27.080	12.233	496.1
550.0	11.780	40.661	35.630	27.135	11.707	545.6
600.0	11.253	40.123	35.582	27.197	11.176	595.1
650.0	10.818	39.686	35.544	27.248	10.737	644.7
700.0	10.188	39.052	35.493	27.320	10.103	694.2
750.0	9.632	38.488	35.438	27.372	9.544	743.7
800.0	8.217	38.089	35.410	27.420	9.126	793.2
850.0	8.574	37.439	35.343	27.470	8.481	842.6
900.0	8.171	37.056	35.316	27.512	8.074	892.1
950.0	7.944	36.860	35.311	27.542	7.843	941.5
1000.0	7.692	36.635	35.299	27.571	7.587	991.0
1100.0	7.270	36.293	35.308	27.639	7.158	1089.8
1200.0	6.922	36.020	35.316	27.696	6.802	1188.6
1300.0	6.550	35.716	35.315	27.746	6.422	1287.3
1400.0	6.115	35.333	35.288	27.783	5.981	1386.0
1500.0	5.667	34.935	35.255	27.814	5.527	1484.7
1600.0	5.341	34.653	35.226	27.831	5.195	1583.3
1700.0	5.016	34.366	35.189	27.841	4.864	1681.8
1800.0	4.766	34.163	35.170	27.855	4.607	1780.4
1900.0	4.450	33.884	35.130	27.859	4.285	1878.8
2000.0	4.191	33.668	35.103	27.886	4.020	1977.2
2200.0	3.738	33.301	35.055	27.875	3.554	2174.0
2400.0	3.416	33.061	35.017	27.878	3.218	2370.5
2600.0	3.120	32.850	34.986	27.883	2.908	2566.8
2800.0	2.917	32.731	34.968	27.888	2.688	2763.0
3000.0	2.758	32.650	34.948	27.888	2.512	2959.0
3200.0	2.661	32.628	34.936	27.888	2.396	3154.8
3400.0	2.580	32.620	34.924	27.887	2.296	3350.4
3600.0	2.522	32.634	34.916	27.886	2.218	3545.9
3800.0	2.474	32.658	34.910	27.888	2.149	3741.2
4000.0	2.448	32.699	34.903	27.886	2.101	3936.3
4200.0	2.427	32.747	34.899	27.886	2.058	4131.2
4400.0	2.412	32.798	34.895	27.888	2.020	4326.0
4600.0	2.409	32.855	34.888	27.882	1.992	4520.6
4800.0	2.416	32.924	34.884	27.881	1.975	4715.1
5000.0	2.435	33.004	34.883	27.881	1.968	4909.3

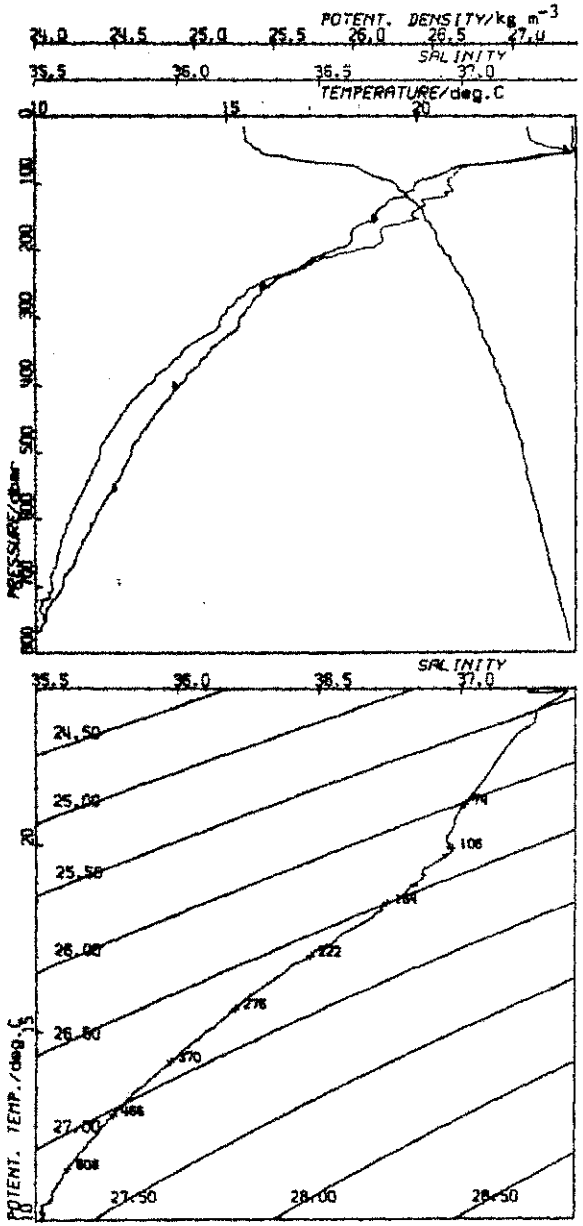
POSEIDON 104
STATION 769/1



POSEIDON 104
DATUM : 24.10.83 STATION : 769 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	24.044	58.001	37.232	25.322	24.040	19.9
40.0	24.049	55.021	37.236	25.325	24.041	39.7
80.0	20.835	51.212	36.984	26.041	20.820	79.5
100.0	20.042	50.336	36.932	26.231	20.023	99.3
120.0	19.548	49.769	36.889	26.330	19.526	119.2
140.0	19.325	49.570	36.813	26.408	19.300	139.0
160.0	19.012	49.184	36.843	26.438	18.983	158.9
180.0	18.529	48.570	36.762	26.499	18.497	178.7
200.0	18.294	48.272	36.710	26.519	18.259	198.6
250.0	16.835	46.423	36.401	26.640	16.794	248.2
300.0	15.810	45.183	36.211	26.735	15.762	297.6
350.0	14.932	44.157	36.067	26.823	14.878	347.4
400.0	14.054	43.148	35.927	26.905	13.995	397.0
450.0	13.414	42.426	35.826	26.962	13.350	446.5
500.0	12.815	41.779	35.752	27.027	12.746	496.1
550.0	12.320	41.250	35.690	27.078	12.245	545.6
600.0	11.762	40.653	35.627	27.139	11.673	595.1
650.0	11.219	40.105	35.575	27.199	11.136	644.7
700.0	10.809	39.699	35.544	27.250	10.721	694.2
750.0	10.424	39.342	35.536	27.313	10.331	743.7
800.0	9.968	38.892	35.501	27.368	9.872	793.2
850.0	9.639	38.609	35.510	27.429	9.539	842.6
900.0	9.311	38.311	35.503	27.479	9.207	892.1
950.0	8.949	37.970	35.484	27.523	8.841	941.5
1000.0	8.642	37.690	35.472	27.563	8.531	991.0
1100.0	8.203	37.328	35.482	27.640	8.083	1089.8
1200.0	7.190	36.293	35.343	27.680	7.067	1188.6
1300.0	6.687	35.839	35.311	27.725	6.558	1287.3
1400.0	6.310	35.516	35.291	27.760	6.174	1386.0
1500.0	6.030	35.295	35.285	27.793	5.887	1484.7
1600.0	5.611	34.928	35.256	27.823	5.461	1583.3
1700.0	5.230	34.585	35.217	27.839	5.075	1681.9
1800.0	4.889	34.284	35.179	27.849	4.729	1780.4
1900.0	4.612	34.050	35.152	27.859	4.445	1878.8
2000.0	4.319	33.795	35.116	27.863	4.146	1977.3
2200.0	3.892	33.449	35.067	27.870	3.706	2174.0
2400.0	3.480	33.121	35.021	27.875	3.281	2370.5
2600.0	3.199	32.922	34.989	27.878	2.985	2566.8
2800.0	3.000	32.810	34.974	27.886	2.769	2763.0
3000.0	2.825	32.711	34.951	27.884	2.578	2959.0
3200.0	2.706	32.672	34.940	27.887	2.441	3154.8
3400.0	2.614	32.654	34.928	27.887	2.330	3350.4
3600.0	2.560	32.671	34.920	27.887	2.255	3545.9
3800.0	2.511	32.691	34.910	27.885	2.185	3741.2
4000.0	2.472	32.722	34.904	27.885	2.125	3936.3
4200.0	2.444	32.763	34.901	27.887	2.074	4131.3
4400.0	2.430	32.812	34.893	27.883	2.037	4326.0
4600.0	2.421	32.864	34.885	27.879	2.004	4520.6
4800.0	2.423	32.929	34.883	27.879	1.981	4715.1
5000.0	2.440	33.008	34.883	27.880	1.972	4909.3

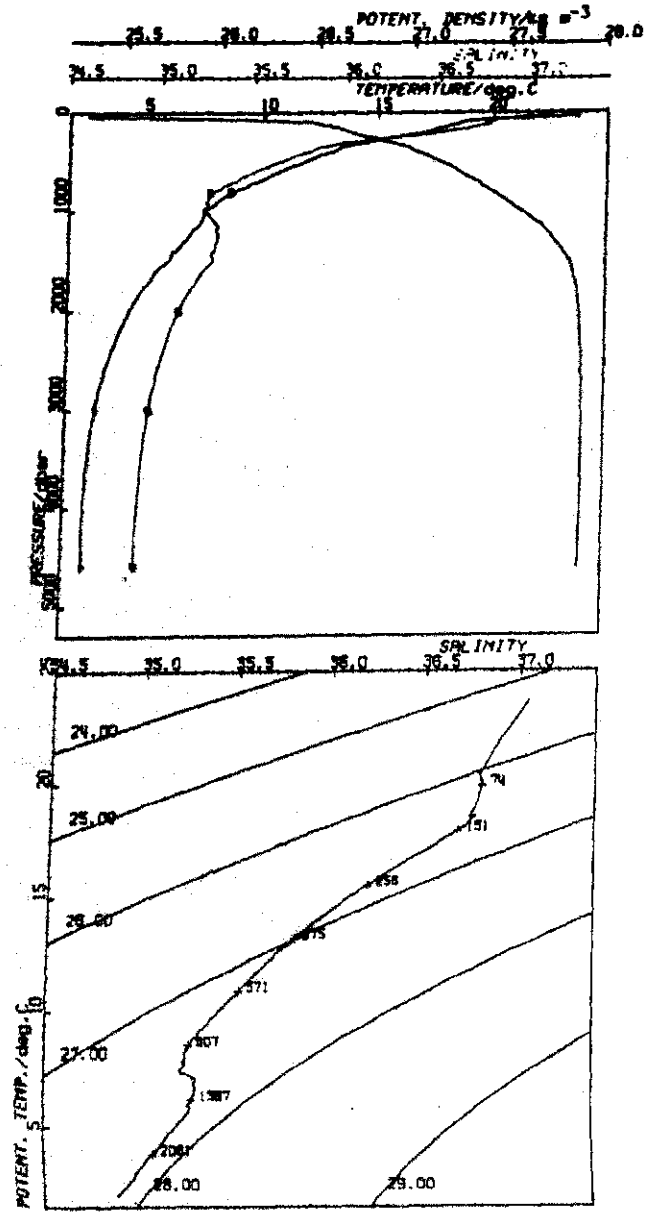
POSEIDON 104
STATION 771/1



POSEIDON 104
DATUM : 24.10.83 STATION : 771 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	24.058	55.013	37.230	25.316	24.054	18.9
40.0	24.054	55.058	37.260	25.342	24.046	39.7
60.0	23.275	54.211	37.259	25.579	23.262	59.6
80.0	20.858	51.266	36.988	26.053	20.843	79.5
100.0	19.958	50.267	36.948	26.266	19.941	99.3
120.0	19.682	49.975	36.942	26.336	19.660	119.2
140.0	18.988	49.129	36.841	26.440	18.963	139.0
160.0	18.615	48.671	36.779	26.489	18.586	158.9
180.0	18.304	48.286	36.721	26.524	18.273	178.7
200.0	17.835	47.698	36.628	26.570	17.801	198.6
250.0	16.186	45.629	36.287	26.705	16.146	248.2
300.0	15.378	44.682	36.155	26.780	15.331	297.8
350.0	14.588	43.781	36.020	26.861	14.536	347.4
400.0	13.777	42.835	35.892	26.937	13.719	397.0
450.0	13.052	42.035	35.795	27.012	12.989	446.5
500.0	12.514	41.458	35.729	27.069	12.445	496.1
550.0	12.059	40.981	35.677	27.118	11.986	545.8
600.0	11.556	40.459	35.624	27.174	11.478	595.1
650.0	11.120	40.019	35.585	27.225	11.038	644.7
700.0	10.710	39.620	35.560	27.280	10.623	694.2
750.0	10.266	39.182	35.528	27.335	10.174	743.7

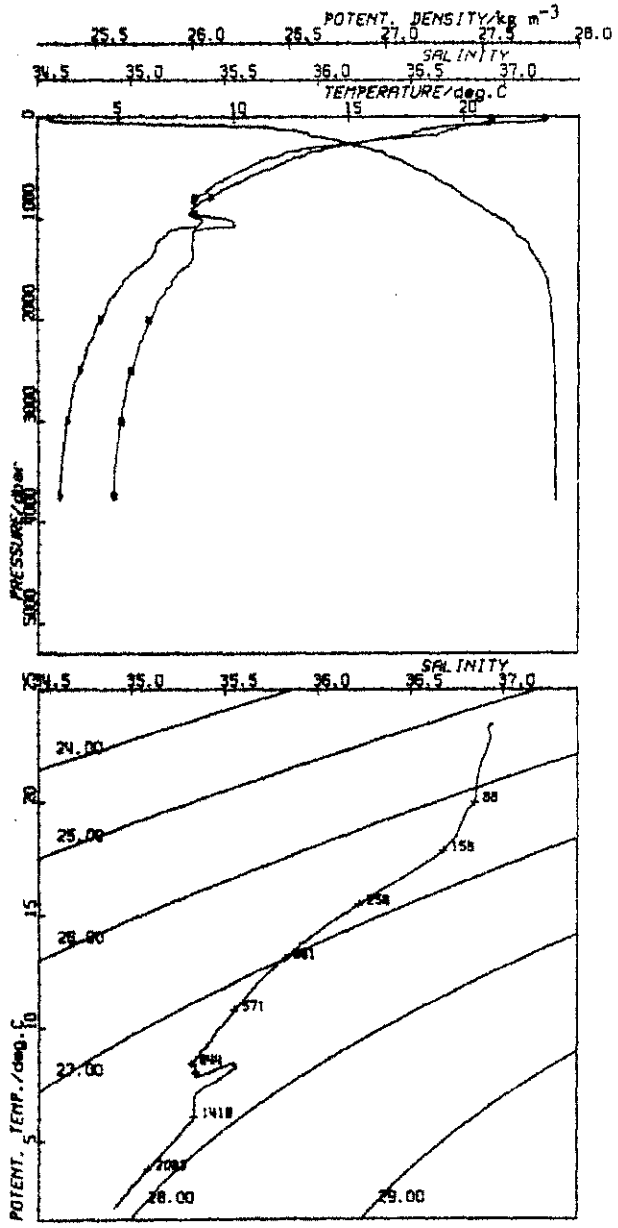
POSEIDON 104
STATION 776/1



POSEIDON 104
DATUM : 28.10.83 STATION : 776 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	23.857	54.331	37.043	25.294	23.853	19.9
40.0	23.854	54.336	37.043	25.296	23.845	39.7
60.0	21.512	51.803	36.884	25.777	21.500	59.8
80.0	19.527	49.614	36.784	26.262	19.512	79.5
100.0	18.606	48.583	36.735	26.455	18.588	99.3
120.0	18.457	48.453	36.749	26.504	18.438	119.2
140.0	18.112	48.056	36.712	26.563	18.088	139.0
160.0	17.798	47.665	36.649	26.594	17.770	158.9
180.0	17.419	47.195	36.576	26.631	17.388	178.7
200.0	17.077	46.768	36.505	26.660	17.043	198.6
250.0	15.709	45.085	36.235	26.775	15.669	248.2
300.0	14.578	43.742	36.033	26.872	14.533	297.8
350.0	13.481	42.475	35.852	26.966	13.431	347.4
400.0	12.983	41.930	35.781	27.014	12.927	397.0
450.0	12.320	41.213	35.697	27.080	12.259	446.5
500.0	11.778	40.634	35.627	27.132	11.712	496.1
550.0	11.159	39.978	35.550	27.188	11.089	545.6
600.0	10.688	39.488	35.493	27.230	10.614	595.1
650.0	10.179	38.961	35.431	27.272	10.101	644.7
700.0	9.719	38.493	35.380	27.311	9.637	694.2
750.0	9.222	37.993	35.329	27.354	9.136	743.7
800.0	8.683	37.459	35.279	27.402	8.595	793.1
850.0	8.302	37.096	35.252	27.440	8.210	842.6
900.0	8.010	36.841	35.248	27.482	7.914	892.1
950.0	7.793	36.682	35.250	27.516	7.694	941.5
1000.0	7.462	36.364	35.238	27.556	7.359	991.0
1100.0	7.258	36.259	35.283	27.622	7.146	1089.8
1200.0	6.929	36.012	35.300	27.682	6.809	1188.6
1300.0	6.597	35.749	35.303	27.730	6.469	1287.3
1400.0	6.164	35.373	35.283	27.772	6.029	1386.0
1500.0	5.903	35.171	35.278	27.803	5.761	1484.7
1600.0	5.385	34.670	35.221	27.825	5.219	1583.3
1700.0	5.054	34.400	35.189	27.836	4.902	1681.8
1800.0	4.730	34.121	35.158	27.850	4.572	1780.4
1900.0	4.442	33.874	35.126	27.857	4.278	1878.8
2000.0	4.184	33.680	35.100	27.865	4.013	1977.2
2200.0	3.816	33.371	35.055	27.868	3.631	2173.9
2400.0	3.477	33.117	35.019	27.874	3.278	2370.5
2600.0	3.205	32.930	34.992	27.879	2.991	2566.8
2800.0	2.989	32.781	34.972	27.887	2.740	2763.0
3000.0	2.818	32.706	34.952	27.885	2.571	2959.0
3200.0	2.667	32.633	34.935	27.887	2.403	3154.8
3400.0	2.576	32.615	34.922	27.885	2.292	3350.4
3600.0	2.500	32.612	34.912	27.885	2.198	3545.9
3800.0	2.450	32.634	34.906	27.886	2.126	3741.2
4000.0	2.409	32.662	34.899	27.886	2.063	3936.3
4200.0	2.394	32.716	34.897	27.888	2.025	4131.2
4400.0	2.401	32.765	34.891	27.884	2.009	4326.0
4600.0	2.424	32.869	34.887	27.881	2.007	4520.6

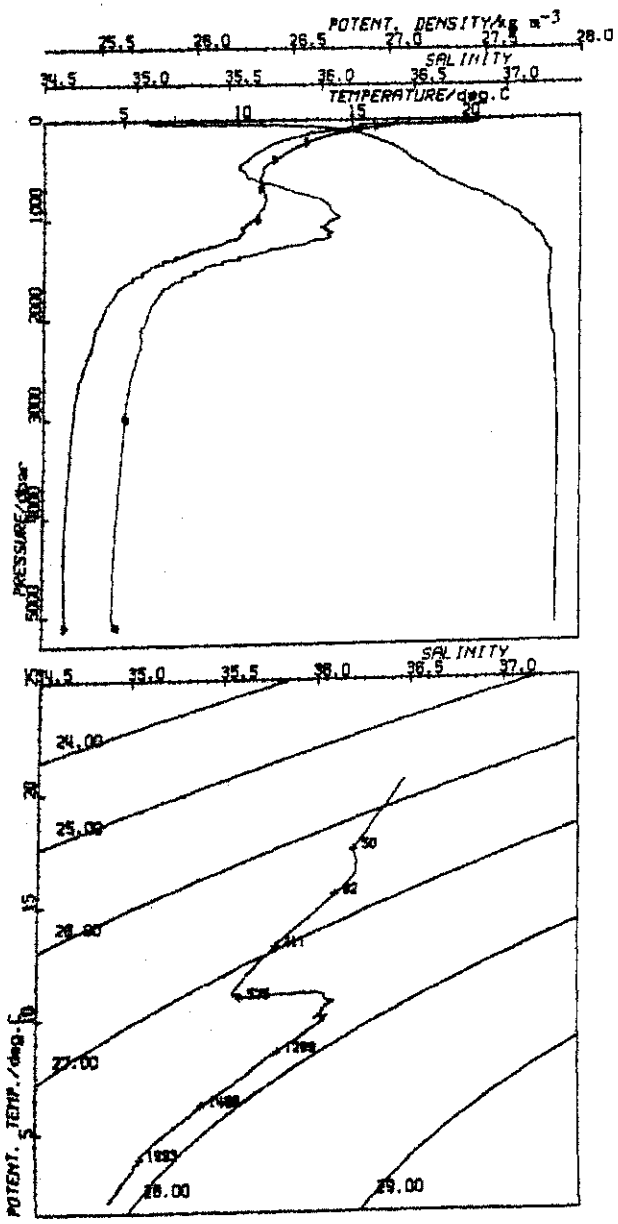
POSEIDON 104
STATION 782/1



POSEIDON 104
DATUM : 27.10.83 STATION : 782 PROFIL : 1

PR	TE	LA	SA	ST	TP	DE
20.0	23.527	54.059	36.942	25.256	23.523	19.9
40.0	23.469	53.987	36.928	25.263	23.461	39.7
60.0	22.969	53.459	36.933	25.415	22.956	59.6
80.0	21.122	51.391	36.860	25.883	21.106	79.5
100.0	18.389	48.467	36.788	26.292	18.370	99.3
120.0	18.781	48.776	36.753	26.430	18.739	119.2
140.0	18.121	48.040	36.690	26.544	18.096	139.0
160.0	17.895	47.781	36.662	26.579	17.868	158.9
180.0	17.743	47.610	36.644	26.605	17.712	178.7
200.0	17.055	46.751	36.509	26.669	17.022	198.6
250.0	15.685	45.062	36.237	26.781	15.645	248.2
300.0	14.514	43.661	36.017	26.874	14.469	297.8
350.0	13.456	42.453	35.854	26.972	13.406	347.4
400.0	12.951	41.895	35.778	27.018	12.895	397.0
450.0	12.205	41.084	35.682	27.091	12.144	446.5
500.0	11.716	40.574	35.627	27.144	11.651	496.1
550.0	11.105	39.940	35.565	27.210	11.035	545.6
600.0	10.673	39.503	35.522	27.255	10.599	595.1
650.0	10.288	39.124	35.482	27.291	10.219	644.7
700.0	9.716	38.532	35.423	27.345	9.634	694.2
750.0	9.425	38.263	35.409	27.383	9.338	743.7
800.0	8.937	37.767	35.352	27.419	8.847	793.1
850.0	8.547	37.389	35.318	27.454	8.454	842.6
900.0	8.320	37.211	35.333	27.502	8.222	892.1
950.0	8.118	37.048	35.338	27.537	8.016	941.5
1000.0	8.420	37.468	35.459	27.588	8.310	991.0
1100.0	8.045	37.168	35.470	27.655	7.928	1089.8
1200.0	6.961	36.065	35.327	27.699	6.840	1188.6
1300.0	6.600	35.771	35.324	27.747	6.472	1287.3
1400.0	6.398	35.632	35.332	27.781	6.259	1386.0
1500.0	5.876	35.151	35.283	27.810	5.734	1484.7
1600.0	5.302	34.618	35.228	27.836	5.157	1583.3
1700.0	4.989	34.345	35.192	27.847	4.837	1681.8
1800.0	4.825	34.020	35.151	27.856	4.467	1780.4
1900.0	4.450	33.883	35.129	27.859	4.285	1878.8
2000.0	4.252	33.728	35.107	27.863	4.080	1977.2
2200.0	3.807	33.361	35.052	27.866	3.623	2173.9
2400.0	3.497	33.138	35.022	27.875	3.298	2370.5
2600.0	3.136	32.861	34.983	27.878	2.923	2566.8
2800.0	2.922	32.727	34.958	27.880	2.693	2763.0
3000.0	2.771	32.658	34.942	27.882	2.525	2959.0
3200.0	2.644	32.605	34.926	27.881	2.380	3154.8
3400.0	2.538	32.575	34.913	27.881	2.255	3350.4
3600.0	2.479	32.590	34.907	27.883	2.177	3545.9

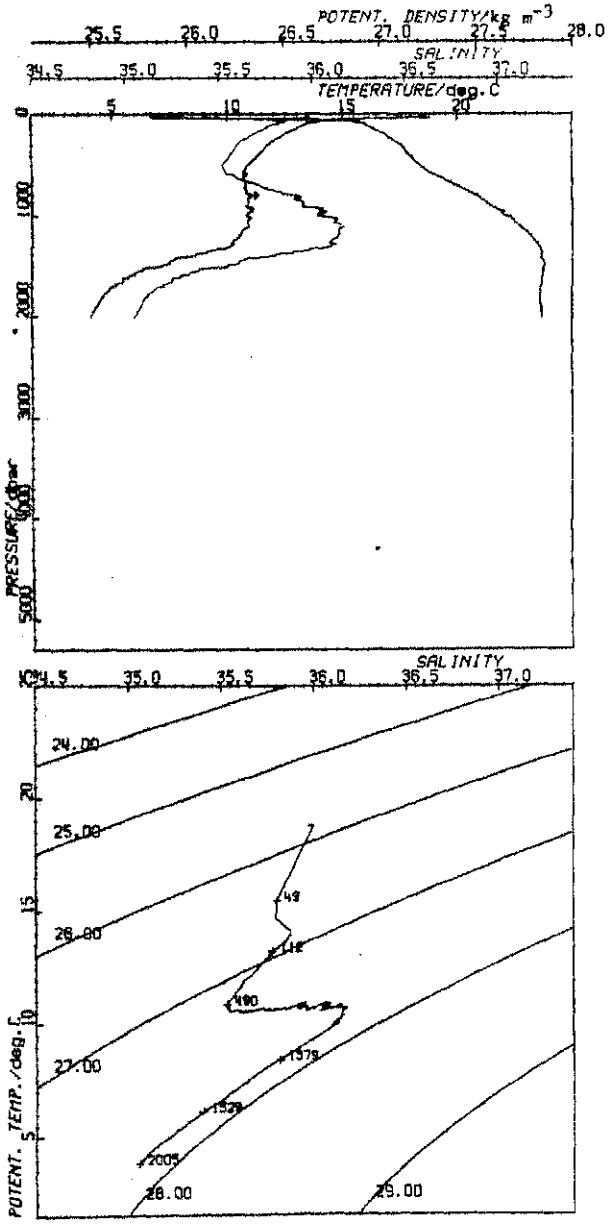
POSEIDON 104
STATION 837/1



POSEIDON 104
DATUM : 7.11.83 STATION : 837 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	20.517	50.244	36.473	25.750	20.513	19.9
40.0	20.413	50.125	36.458	25.767	20.405	39.7
60.0	16.868	46.154	36.210	26.478	16.858	59.5
80.0	16.020	45.260	36.177	26.653	16.007	79.4
100.0	15.292	44.414	36.072	26.738	15.277	99.2
120.0	14.775	43.831	36.008	26.803	14.757	119.1
140.0	14.287	43.264	35.927	26.847	14.267	138.9
160.0	13.992	42.931	35.883	26.877	13.968	158.8
180.0	13.658	42.568	35.846	26.919	13.632	178.6
200.0	13.365	42.237	35.799	26.944	13.336	198.4
250.0	12.783	41.607	35.725	27.006	12.748	248.0
300.0	12.370	41.178	35.678	27.052	12.330	297.6
350.0	11.982	40.772	35.633	27.094	11.935	347.1
400.0	11.721	40.513	35.606	27.124	11.868	396.6
450.0	11.310	40.095	35.565	27.170	11.253	446.2
500.0	11.086	39.891	35.557	27.206	11.022	495.7
550.0	11.038	39.805	35.595	27.245	10.968	545.2
600.0	10.975	39.902	35.631	27.288	10.890	594.7
650.0	11.081	40.106	35.729	27.348	10.978	644.2
700.0	11.089	40.224	35.797	27.397	11.000	693.6
750.0	11.158	40.405	35.889	27.457	11.081	743.1
800.0	11.240	40.606	35.987	27.520	11.136	792.5
850.0	11.148	40.580	36.029	27.571	11.038	842.0
900.0	10.957	40.420	36.034	27.611	10.841	891.4
950.0	10.847	40.366	36.066	27.656	10.725	940.8
1000.0	10.780	40.341	36.085	27.685	10.652	990.2
1100.0	10.198	39.755	36.021	27.739	10.062	1088.9
1200.0	9.939	39.558	36.031	27.794	9.792	1187.7
1300.0	8.329	37.772	35.736	27.824	8.184	1286.3
1400.0	7.235	36.617	35.557	27.848	7.089	1384.9
1500.0	6.116	35.444	35.363	27.844	5.972	1483.5
1600.0	5.389	34.713	35.244	27.840	5.243	1582.1
1700.0	4.740	34.077	35.145	27.837	4.591	1680.5
1800.0	4.448	33.815	35.101	27.835	4.291	1779.0
1900.0	4.215	33.626	35.076	27.841	4.053	1877.4
2000.0	4.001	33.456	35.054	27.847	3.833	1975.7
2200.0	3.675	33.222	35.028	27.860	3.493	2172.3
2400.0	3.391	33.023	34.999	27.866	3.193	2368.6
2600.0	3.093	32.812	34.970	27.872	2.881	2564.8
2800.0	2.911	32.713	34.953	27.876	2.682	2760.8
3000.0	2.803	32.681	34.938	27.876	2.558	2956.7
3200.0	2.713	32.672	34.933	27.881	2.447	3152.3
3400.0	2.642	32.674	34.923	27.881	2.357	3347.8
3600.0	2.594	32.698	34.916	27.881	2.288	3543.1
3800.0	2.542	32.716	34.908	27.881	2.215	3738.3
4000.0	2.497	32.740	34.900	27.879	2.149	3933.2
4200.0	2.453	32.765	34.894	27.880	2.083	4128.0
4400.0	2.437	32.814	34.886	27.879	2.044	4322.6
4600.0	2.448	32.885	34.882	27.875	2.030	4517.1
4800.0	2.468	32.967	34.880	27.874	2.025	4711.4
5000.0	2.493	33.051	34.878	27.872	2.024	4905.5

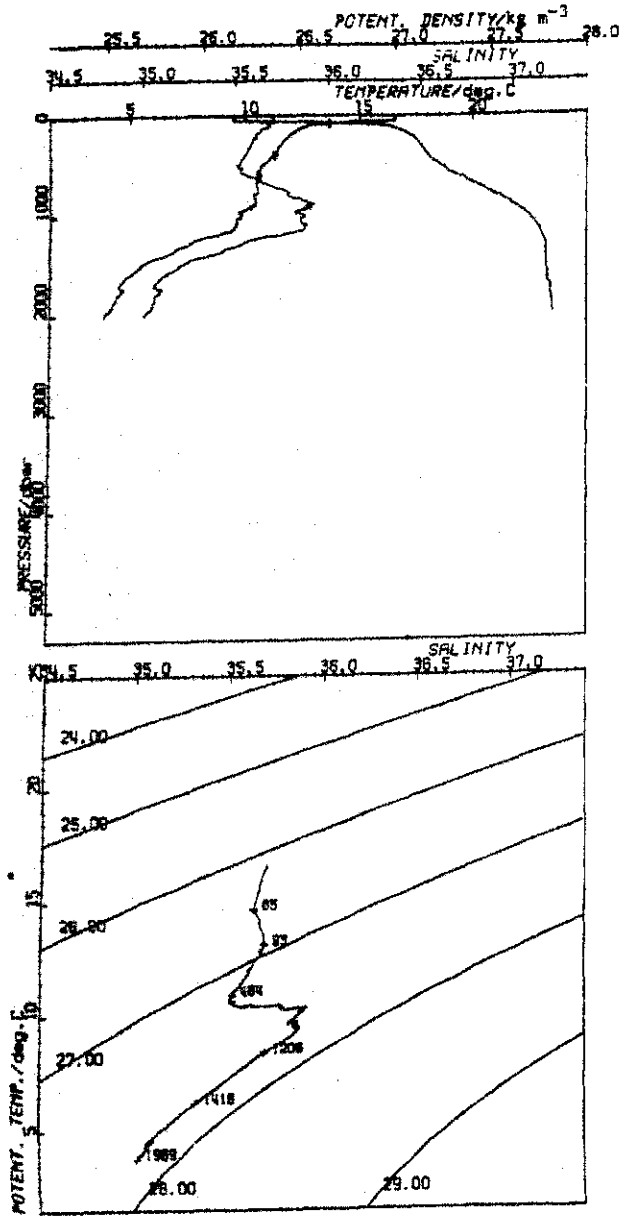
POSEIDON 104
STATION 839/1



POSEIDON 104
DATUM : 8.11.83 STATION : 839 PROFIL : 1

PR	TE	LA	SA	ST	TP	DE
20.0	18.796	47.841	35.969	25.817	18.792	19.8
60.0	14.280	43.083	35.799	26.748	14.271	59.5
80.0	13.887	42.761	35.855	26.876	13.875	79.4
100.0	13.368	42.180	35.785	26.930	13.354	99.2
120.0	13.178	41.978	35.765	26.954	13.159	119.0
140.0	13.022	41.817	35.748	26.973	13.003	138.9
160.0	12.813	41.593	35.722	26.995	12.791	158.7
180.0	12.608	41.382	35.704	27.023	12.584	178.5
200.0	12.462	41.230	35.687	27.039	12.435	198.4
250.0	12.097	40.841	35.634	27.070	12.064	247.9
300.0	11.794	40.540	35.607	27.108	11.755	297.5
350.0	11.579	40.331	35.585	27.133	11.534	347.0
400.0	11.356	40.114	35.563	27.158	11.305	396.6
450.0	11.130	39.888	35.543	27.186	11.073	446.1
500.0	10.889	39.656	35.521	27.214	10.827	495.6
550.0	10.775	39.590	35.534	27.245	10.707	545.1
600.0	10.738	39.627	35.585	27.292	10.663	594.6
650.0	10.681	39.639	35.630	27.339	10.600	644.0
700.0	10.788	39.865	35.730	27.399	10.700	693.5
750.0	10.788	39.955	35.799	27.454	10.694	742.9
800.0	11.075	40.382	35.934	27.509	10.972	792.4
850.0	10.823	40.144	35.911	27.538	10.715	841.8
900.0	10.845	40.230	35.953	27.568	10.730	891.2
950.0	11.078	40.597	36.073	27.620	10.952	940.5
1000.0	10.848	40.384	36.062	27.655	10.719	990.0
1100.0	10.900	40.583	36.166	27.729	10.758	1088.7
1200.0	10.496	40.207	36.142	27.784	10.349	1187.4
1300.0	10.067	39.806	36.095	27.821	9.925	1286.1
1400.0	8.582	38.099	35.803	27.843	8.402	1384.7
1500.0	7.138	36.564	35.553	27.857	6.982	1483.2
1600.0	5.684	35.026	35.293	27.843	5.534	1581.7
1700.0	5.096	34.444	35.196	27.837	4.943	1680.2
1800.0	4.539	33.911	35.115	27.836	4.383	1778.6
1900.0	4.256	33.667	35.081	27.841	4.095	1877.0
2000.0	4.020	33.469	35.049	27.841	3.852	1975.3

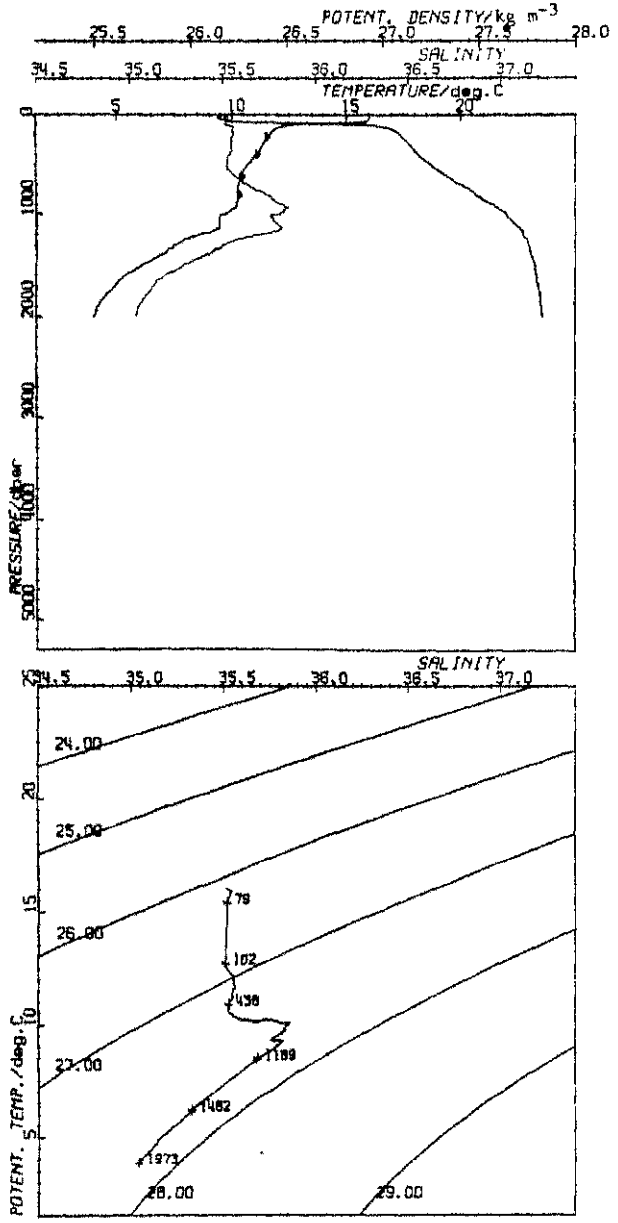
POSEIDON 104
STATION 840/1



POSEIDON 104
DATUM : 9.11.83 STATION : 840 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	16.595	45.282	35.701	26.150	16.592	19.3
40.0	16.594	45.291	35.703	26.153	16.587	39.7
80.0	13.904	42.575	35.665	26.725	13.892	79.4
100.0	12.772	41.465	35.664	26.957	12.758	99.2
120.0	12.613	41.328	35.673	26.996	12.597	119.0
140.0	12.340	41.024	35.630	27.016	12.321	138.8
160.0	12.195	40.894	35.632	27.047	12.174	158.7
180.0	12.045	40.735	35.612	27.061	12.021	178.5
200.0	11.974	40.677	35.613	27.076	11.948	198.3
250.0	11.737	40.449	35.594	27.108	11.705	247.9
300.0	11.571	40.300	35.584	27.133	11.532	297.4
350.0	11.411	40.148	35.566	27.149	11.366	346.9
400.0	11.249	40.000	35.553	27.170	11.198	396.5
450.0	11.007	39.759	35.523	27.193	10.950	446.0
500.0	10.747	39.514	35.506	27.227	10.685	495.5
550.0	10.620	39.434	35.527	27.287	10.552	544.9
600.0	10.494	39.356	35.548	27.307	10.421	594.4
650.0	10.504	39.462	35.624	27.366	10.424	643.9
700.0	10.494	39.524	35.673	27.407	10.408	693.3
750.0	10.566	39.696	35.755	27.459	10.473	742.7
800.0	10.398	39.574	35.775	27.506	10.297	792.2
850.0	10.445	39.722	35.856	27.561	10.339	841.6
900.0	10.462	39.822	35.917	27.608	10.349	891.0
950.0	10.108	39.460	35.875	27.637	9.992	940.4
1000.0	9.845	39.217	35.864	27.675	9.724	989.7
1100.0	9.634	39.075	35.884	27.728	9.502	1088.4
1200.0	8.720	38.100	35.735	27.761	8.583	1187.1
1300.0	7.424	36.712	35.514	27.783	7.288	1285.7
1400.0	6.473	35.723	35.354	27.789	6.335	1384.3
1500.0	5.471	34.702	35.194	27.790	5.334	1482.8
1600.0	4.882	34.137	35.114	27.796	4.741	1581.3
1700.0	4.501	33.787	35.058	27.795	4.356	1679.7
1800.0	4.479	33.821	35.074	27.811	4.324	1778.1
1900.0	4.249	33.637	35.052	27.819	4.088	1876.5
2000.0	3.895	33.323	35.010	27.822	3.729	1974.8

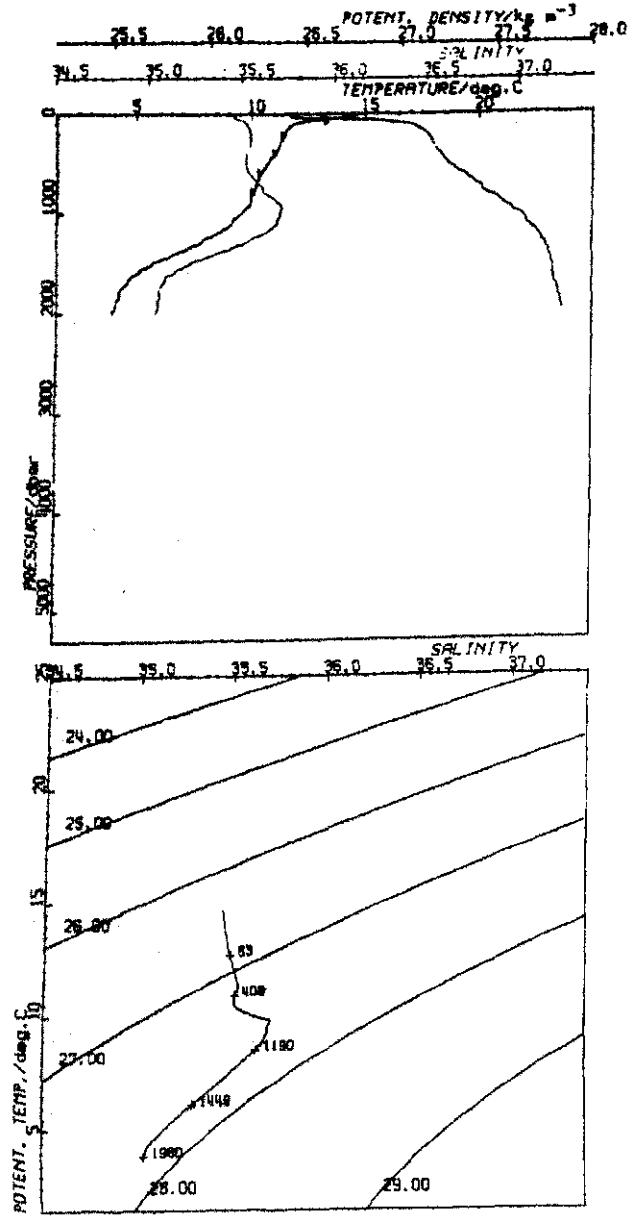
POSEIDON 104
STATION 841/1



POSEIDON 104
DATUM : 9.11.83 STATION : 841 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	16.022	44.495	35.514	26.140	16.019	19.8
40.0	16.023	44.506	35.518	26.142	16.016	39.7
60.0	15.949	44.464	35.536	26.175	15.940	59.5
80.0	15.314	43.810	35.511	26.300	15.301	79.3
100.0	13.075	41.600	35.508	26.775	13.061	99.2
120.0	12.158	40.761	35.556	26.894	12.142	119.0
140.0	11.852	40.562	35.549	27.028	11.933	138.8
160.0	11.830	40.456	35.551	27.054	11.809	158.6
180.0	11.745	40.388	35.557	27.076	11.721	178.5
200.0	11.680	40.333	35.557	27.088	11.654	198.3
250.0	11.482	40.153	35.547	27.119	11.450	247.8
300.0	11.346	40.040	35.543	27.142	11.308	297.4
350.0	11.269	39.995	35.550	27.163	11.224	346.9
400.0	11.088	39.826	35.534	27.185	11.038	396.4
450.0	10.903	39.661	35.526	27.213	10.846	445.9
500.0	10.687	39.471	35.521	27.250	10.625	495.4
550.0	10.541	39.369	35.538	27.289	10.474	544.8
600.0	10.398	39.278	35.562	27.335	10.325	594.3
650.0	10.329	39.259	35.589	27.369	10.249	643.7
700.0	10.279	39.283	35.639	27.418	10.193	693.2
750.0	10.239	39.303	35.677	27.455	10.148	742.6
800.0	10.318	39.455	35.734	27.488	10.217	792.0
850.0	10.265	39.470	35.776	27.530	10.161	841.4
900.0	10.205	39.489	35.832	27.586	10.094	890.8
950.0	9.965	39.272	35.825	27.622	9.850	940.2
1000.0	9.592	38.886	35.775	27.647	9.473	989.5
1100.0	9.437	38.807	35.802	27.696	9.307	1088.2
1200.0	8.520	37.845	35.667	27.739	8.385	1186.9
1300.0	7.514	36.788	35.505	27.763	7.377	1285.5
1400.0	6.798	36.061	35.395	27.778	6.656	1384.0
1500.0	6.030	35.293	35.283	27.792	5.887	1482.5
1600.0	5.334	34.610	35.185	27.799	5.189	1581.0
1700.0	4.853	34.162	35.126	27.809	4.703	1679.4
1800.0	4.462	33.814	35.084	27.821	4.307	1777.8
1900.0	4.163	33.557	35.050	27.826	4.003	1876.1
2000.0	3.941	33.381	35.029	27.833	3.774	1974.4

POSEIDON 104
STATION 842/1



POSEIDON 104
DATUM : 10.11.83 STATION : 842 PROFIL : 1

PR	TE	LR	SA	ST	TP	DE
20.0	14.588	43.004	35.458	26.417	14.585	19.8
40.0	14.585	42.988	35.456	26.421	14.580	39.7
60.0	12.885	41.375	35.488	26.796	12.877	59.5
80.0	12.337	40.867	35.508	26.920	12.326	79.3
100.0	12.020	40.581	35.519	26.992	12.007	99.1
120.0	11.758	40.345	35.529	27.050	11.743	119.0
140.0	11.659	40.259	35.531	27.070	11.641	138.8
160.0	11.532	40.154	35.540	27.102	11.511	158.6
180.0	11.465	40.100	35.542	27.117	11.442	178.4
200.0	11.432	40.079	35.543	27.124	11.406	198.2
250.0	11.303	39.980	35.547	27.152	11.272	247.8
300.0	11.239	39.934	35.541	27.160	11.201	297.3
350.0	11.150	39.865	35.536	27.174	11.108	346.8
400.0	10.962	39.696	35.525	27.201	10.912	396.3
450.0	10.846	39.601	35.520	27.219	10.791	445.8
500.0	10.739	39.522	35.523	27.242	10.677	495.2
550.0	10.603	39.415	35.524	27.268	10.535	544.7
600.0	10.449	39.300	35.535	27.305	10.376	594.1
650.0	10.326	39.226	35.558	27.345	10.247	643.6
700.0	10.239	39.189	35.583	27.381	10.154	693.0
750.0	10.161	39.164	35.611	27.417	10.070	742.4
800.0	10.109	39.146	35.622	27.437	10.012	791.8
850.0	10.014	39.124	35.670	27.491	9.912	841.2
900.0	9.970	39.131	35.699	27.522	9.861	890.6
950.0	9.841	39.043	35.713	27.556	9.727	939.9
1000.0	9.605	38.828	35.703	27.589	9.486	989.3
1100.0	9.168	38.440	35.689	27.652	9.039	1088.0
1200.0	8.559	37.849	35.631	27.705	8.424	1186.6
1300.0	7.775	37.047	35.521	27.738	7.635	1285.2
1400.0	6.730	35.981	35.376	27.772	6.589	1383.7
1500.0	5.681	34.918	35.220	27.785	5.541	1482.2
1600.0	5.042	34.298	35.132	27.792	4.900	1580.6
1700.0	4.594	33.889	35.080	27.802	4.447	1679.0
1800.0	4.229	33.578	35.053	27.821	4.077	1777.4
1900.0	4.073	33.472	35.045	27.831	3.914	1875.7
2000.0	3.928	33.374	35.035	27.839	3.762	1973.9

3. DPS-measurements (J. Breitenbach)

3.1 Description, data processing, register

(52 and 2) DPS stations were taken on legs 3 and 4 of the "Poseidon" cruise 104. The measurements are divided into two groups. The first group consists of a time series obtained near mooring 276 (station 729, cast 1-7). The second, much larger group originates from different positions according to Figure 1.1. Few stations were repeated due to unexpected strong currents.

The "wire guided" current profiler DPS (Drahtgeführte Profilsonde) (Breitenbach, 1984) was primarily developed at the Institut für Meereskunde in Kiel for measurements of current shear and for the determination of Richardson numbers (Fig. 3.1). The profiler is constrained to move along a nearly vertical taut wire. In this application 850 m insulated wire is lowered from a drifting ship with a dead weight at the end. The instrument measures pressure, temperature, electrical conductivity, current speed and direction, and two inclinations as it slides down the wire.

Velocities relative to DPS are measured by a two axis acoustic travel time current meter (cf. Kuhn et al., 1980) and a fluxgate compass. Additional DPS sensors include a 2-axis inclinometer for instrument and wire inclination and a CTD system of the "Kiel Multisonde" design (Kroebel, 1976). The DPS sensors have the following accuracies in pressure (Δp), temperature (Δt), salinity (ΔS) and current components (Δu, Δv): $\Delta p = \pm 3.5$ dbar, $\Delta t = \pm 0.01$ K, $\Delta S = 0.02$ practical salinity units, $\Delta u = \pm 0.01$ ms^{-1}, $\Delta v = \pm 0.01$ ms^{-1}. All sensors are sampled at 10 Hz with a resolution of 16 bit for CTD and 12 bit for the other sensors. At the standard sinking speed of 0.5 ms^{-1} these sample rates correspond to a vertical resolution of 0.05 m.

The DPS transmits, inductively coupled, frequency shift keyed (FSK) signals to the insulated wire. This signal is reconstructed in the deck unit, on-line displayed, and stored on magnetictape. A detailed description of the whole DPS system and its data reduction scheme is given by Breitenbach (1984).

In a first step we removed spikes and gaps from the data. Then we converted raw data with the calibration coefficients to physical units. Current components were estimated from current and compass raw data under special consideration of the interferences from ship's pitch and roll.

The DPS-data are presented on the next pages. First we show (Fig. 3.2) a summary of the time series near mooring 276. Single drops were 3 hours apart. After this sequence follow drops from various positions (Fig. 3.3). The left side of the double pages shows the CTD-profiles and the diagram of temperature and salinity. The right side presents the east (u) and south (v) current- omponents. A comprehensive Table 3.1 contains detailed information on times and locations.

Stat.No.	Date 1983	Position φ	Position λ	CUT	Uncorr. Depth (m)	Ref.No.
729	19 Oct	33°10,9'N	21°55,63'W	13.05 14.07	5231	DPS/1
729	"	33°11,3'N	21°54,4'W	16.00 16.58	5232	DPS/2
729	"	33°10,7'N	21°54,9'W	19.00 19.55	5225	DPS/3
729	"	33°11,0'N	21°55,0'W	22.00 23.00	5232	DPS/4
729	20 Oct	33°10,9'N	21°55,5'W	01.08 02.06	5233	DPS/5
729	"	33°10,9'N	21°54,7'W	04.00 04.52	5234	DPS/6
729	"	33°10,9'N	21°55,1'W	06.50 07.55	5232	DPS/7
762/1	22 Oct	27°59,8'N	22°20,5'W	15.22 16.26	4850	DPS/8
762/2	"	28°00,1'N	23°05,0'W	20.50 21.40	4958	DPS/9
762/3	23 Oct	28°09,0'N	23°42,7'W	00.42 01.44	5052	DPS10
765	"	27°58,5'N	24°24,4'W	14.20 15.26	5153	DPS11
766	"	28°00,0'N	25°05,0'W	19.25 20.23	5228	DPS12
767	24 Oct	28°00,1'N	25°49,7'W	00.11 no result	5240	DPS13
770	"	27°56,6'N	26°30,0'W	15.15 16.17	4771	DPS14
772	"	28°00,0'N	25°49,9'W	22.45 23.40	5240	DPS15
773	25 Oct	28°00,0'N	21°42,1'W	22.15 23.15	4786	DPS16
774	26 Oct	28°00,0'N	21°00,0'W	02.44 03.58	4670	DPS17
777	"	28°03,2'N	20°20,8'W	14.45 15.44	4560	DPS18
778	"	27°59,9'N	19°56,2'W	19.10 20.05	4438	DPS19
779	"	28°00,0'N	19°23,3'W	22.35 23.35	4268	DPS20
780	27 Oct	28°00,7'N	18°52,9'W	02.04 03.10	4087	DPS21
783	"	28°02,5'N	18°24,0'W	13.42 13.40	3340	DPS22
784	"	28°03,7'N	18°21,8'W	15.57 17.03	3798	DPS23
785	"	28°10,0'N	18°05,0'W	18.55 20.00	3485	DPS24
786	"	28°26,5'N	18°18,0'W	22.20 23.20	3362	DPS25
787	28 Oct	28°45,0'N	18°29,7'W	01.31 02.30	4027	DPS26
788	"	29°01,9'N	18°45,0'W	04.51 06.05	4313	DPS27
789	"	29°18,0'N	18°58,5'W	08.21 09.20	4455	DPS28
790	"	29°34,5'N	19°11,0'W	11.45 12.40	4517	DPS29
791	"	29°51,0'N	19°24,0'W	15.12 16.18	4635	DPS30
792	"	30°07,8'N	19°37,0'W	18.55 19.55	4705	DPS31
793	"	30°27,0'N	19°37,0'W	22.20 23.15	4735	DPS32
794	29 Oct	31°05,0'N	18°52,0'W	04.36 05.40	4667	DPS33
795	"	30°44,0'N	17°46,5'W	11.15 12.14	4632	DPS34
796	"	30°35,0'N	17°14,4'W	15.04 16.05	4387	DPS35
797	"	30°23,2'N	16°41,0'W	19.10 20.05	4182	DPS36
798	"	30°13,0'N	16°09,0'W	23.00 24.00	3295	DPS37
799	30 Oct	30°02,0'N	15°36,4'W	04.30 05.31	3327	DPS38
800	"	29°54,5'N	15°15,0'W	07.30 08.25	3415	DPS39
801	"	29°48,0'N	14°53,0'W	10.25 11.30	3465	DPS40
802	"	29°41,1'N	14°33,9'W	13.08 14.07	3443	DPS41
803	"	39°34,1'N	14°09,3'W	16.23 17.18	3362	DPS42
804	"	29°27,0'N	13°49,5'W	19.00 19.55	2698	DPS43
805	31 Oct	30°19,0'N	14°40,0'W	02.38 03.40	2960	DPS44
806	"	30°42,0'N	14°50,3'W	06.35 07.35	3609	DPS45
807	"	31°06,0'N	15°23,5'W	10.25 11.15	4194	DPS46
808	"	31°29,0'N	15°47,0'W	14.08 15.06	4384	DPS47
810	"	31°44,4'N	16°02,0'W	17.05 18.00	4391	DPS48
811	"	31°46,8'N	16°04,2'W	18.00 18.55	4391	DPS49
813	"	32°00,0'N	16°16,5'W	20.50 21.45	4390	DPS50
815	"	32°15,0'N	16°32,0'W	23.30 00.32	3830	DPS51
820	05 Nov	31°27,9'N	15°45,8'W	07.05 08.04	4382	DPS52
836	07 Nov	37°21,0'N	15°53,0'W	07.05 08.10	5019	DPS53

Table 3.1: DPS Register

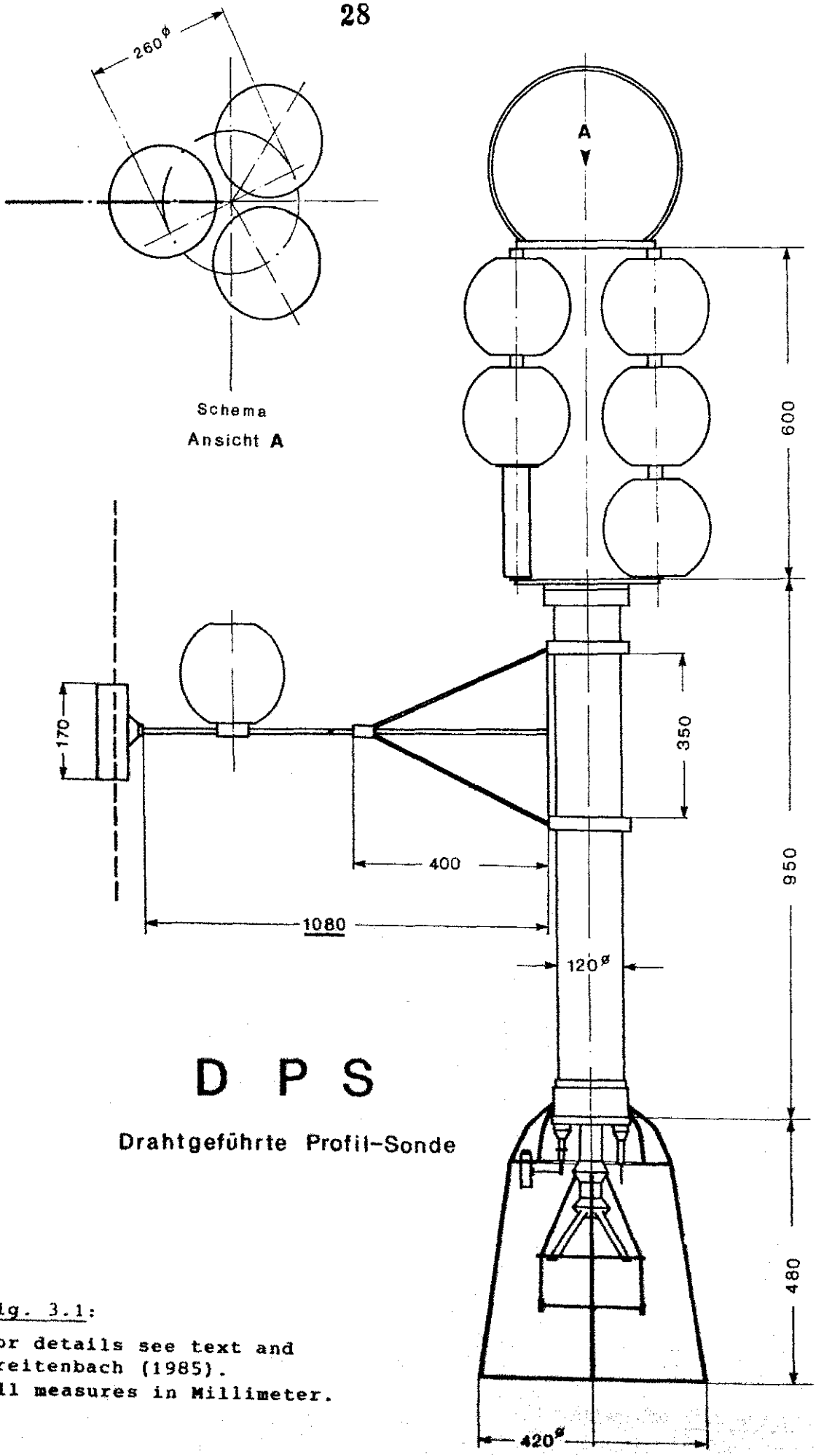


Fig. 3.1:
For details see text and Breitenbach (1985).
All measures in Millimeter.

3.2 Vertical profils

Figure 3.2: Time series of vertical profiles of temperature (a), salinity (b), east component U (c) and north component V (d) of DPS time series no. 729. Profiles were collected at 3 hours intervals near mooring position 276/4 (cf. Fig. 1.1). For dimensions see text of Figure 3.3.

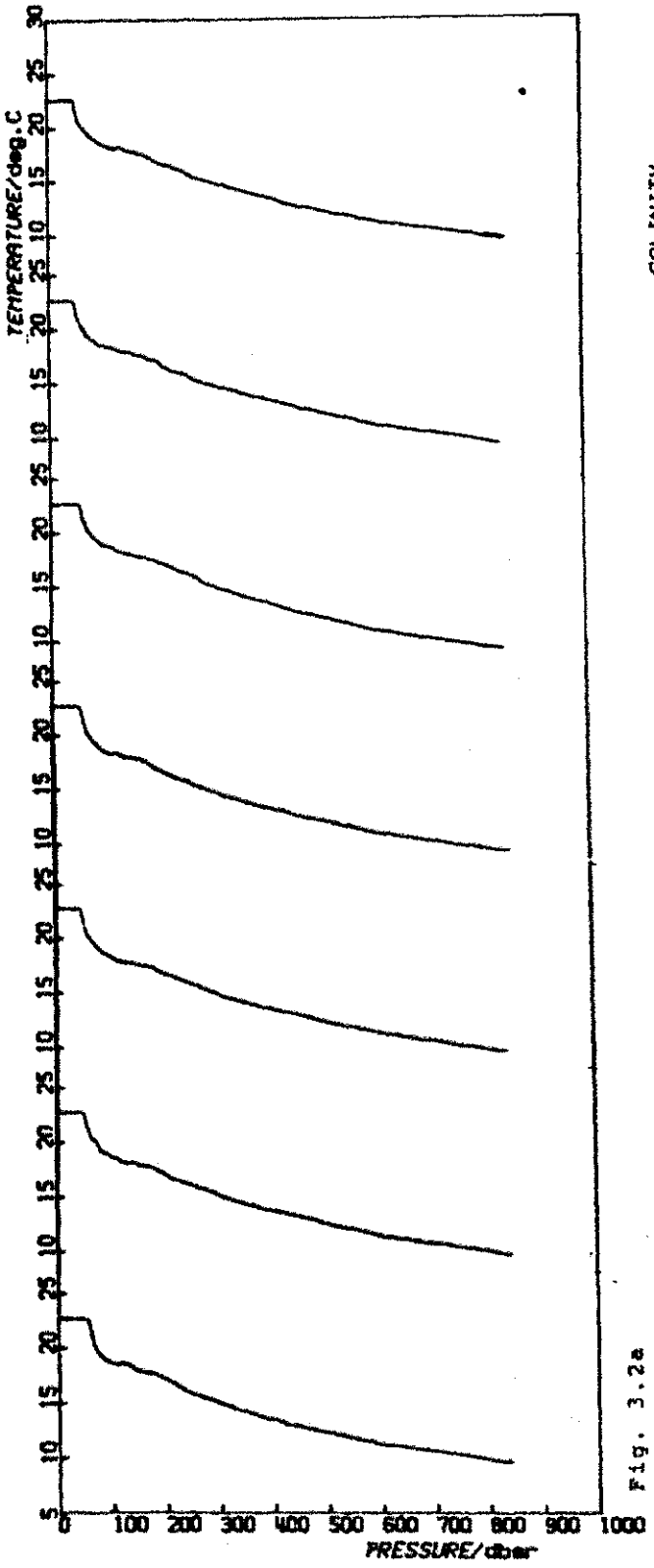


Fig. 3.2a

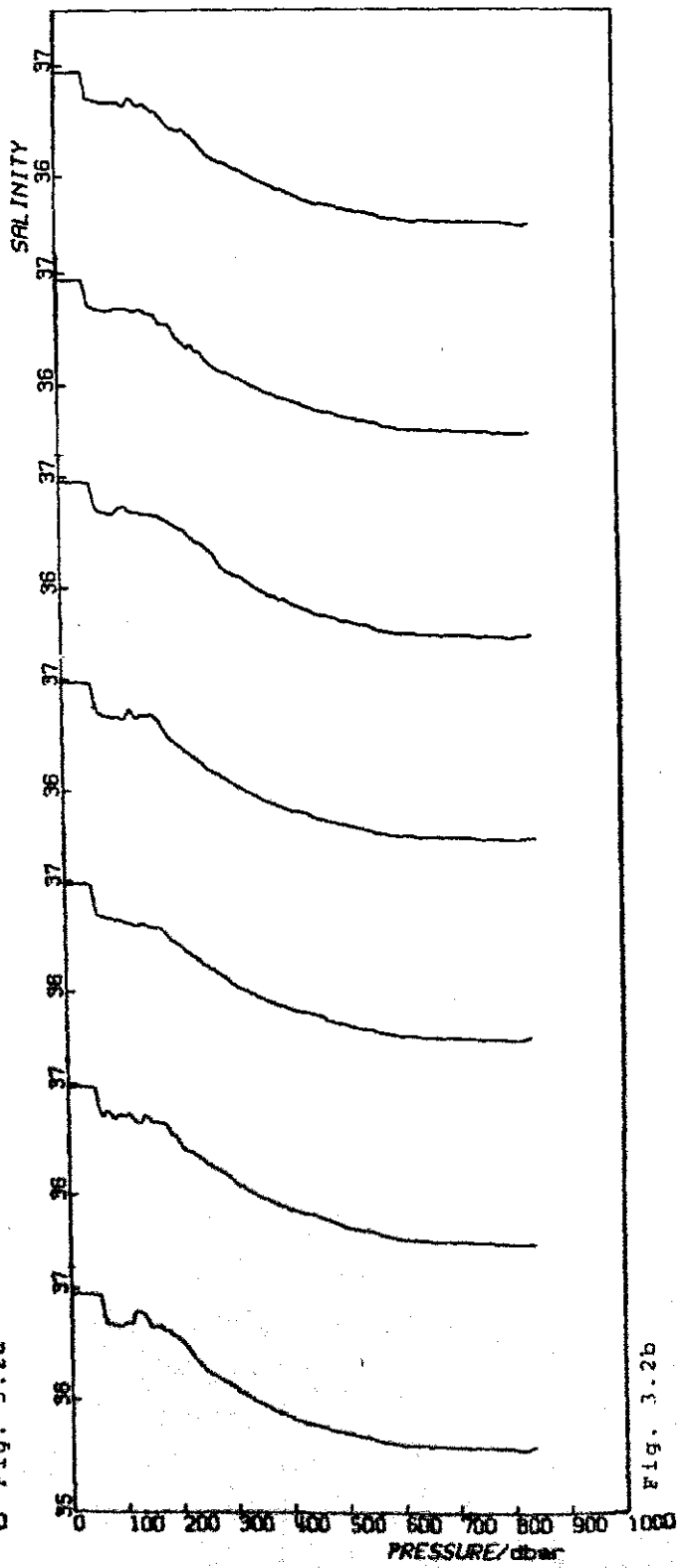


Fig. 3.2b

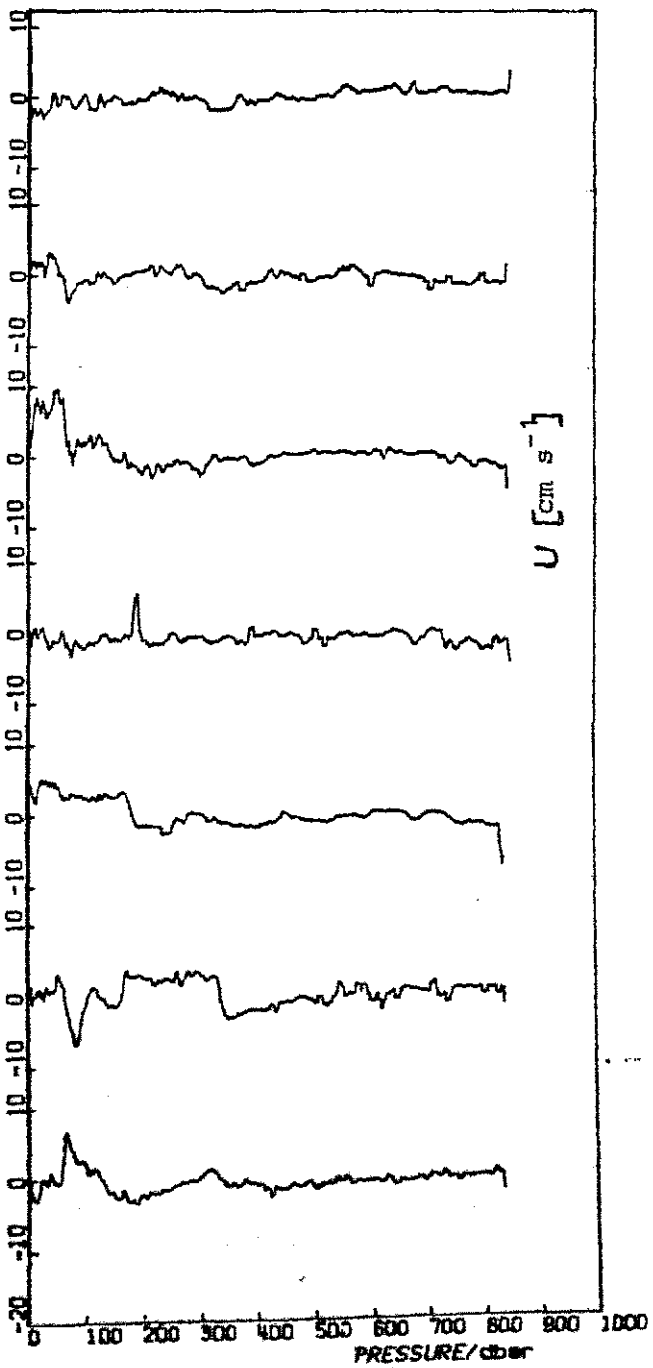


Fig. 3.2c

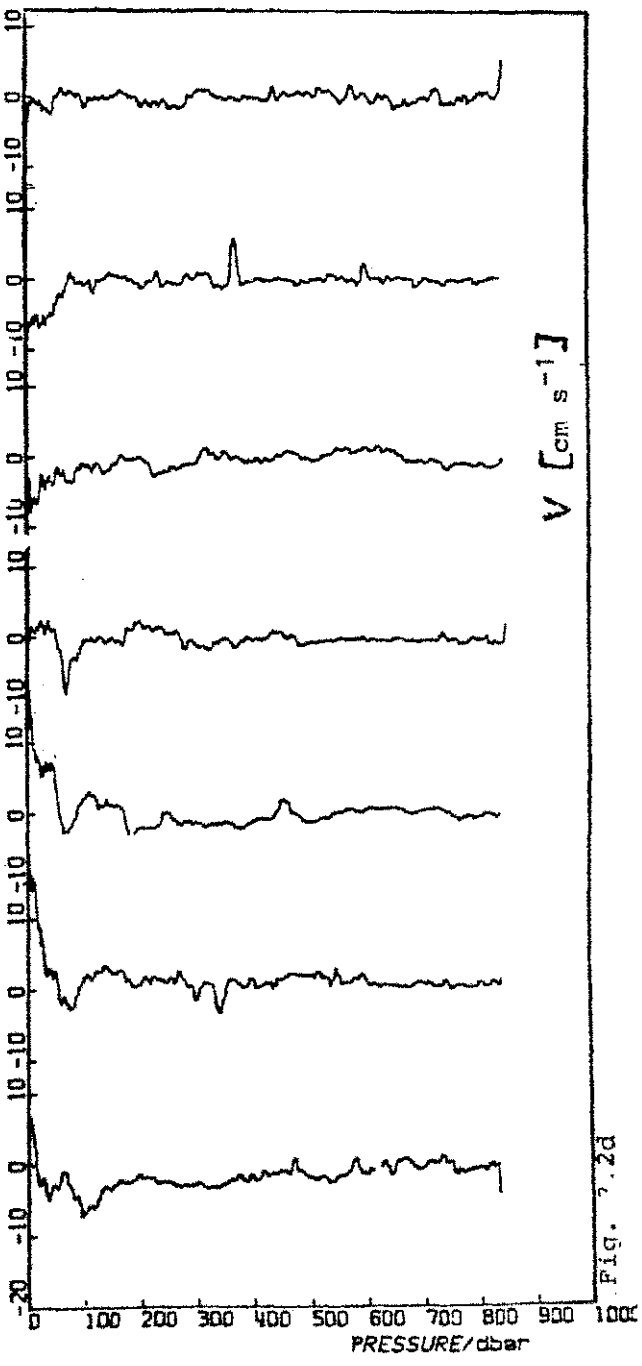
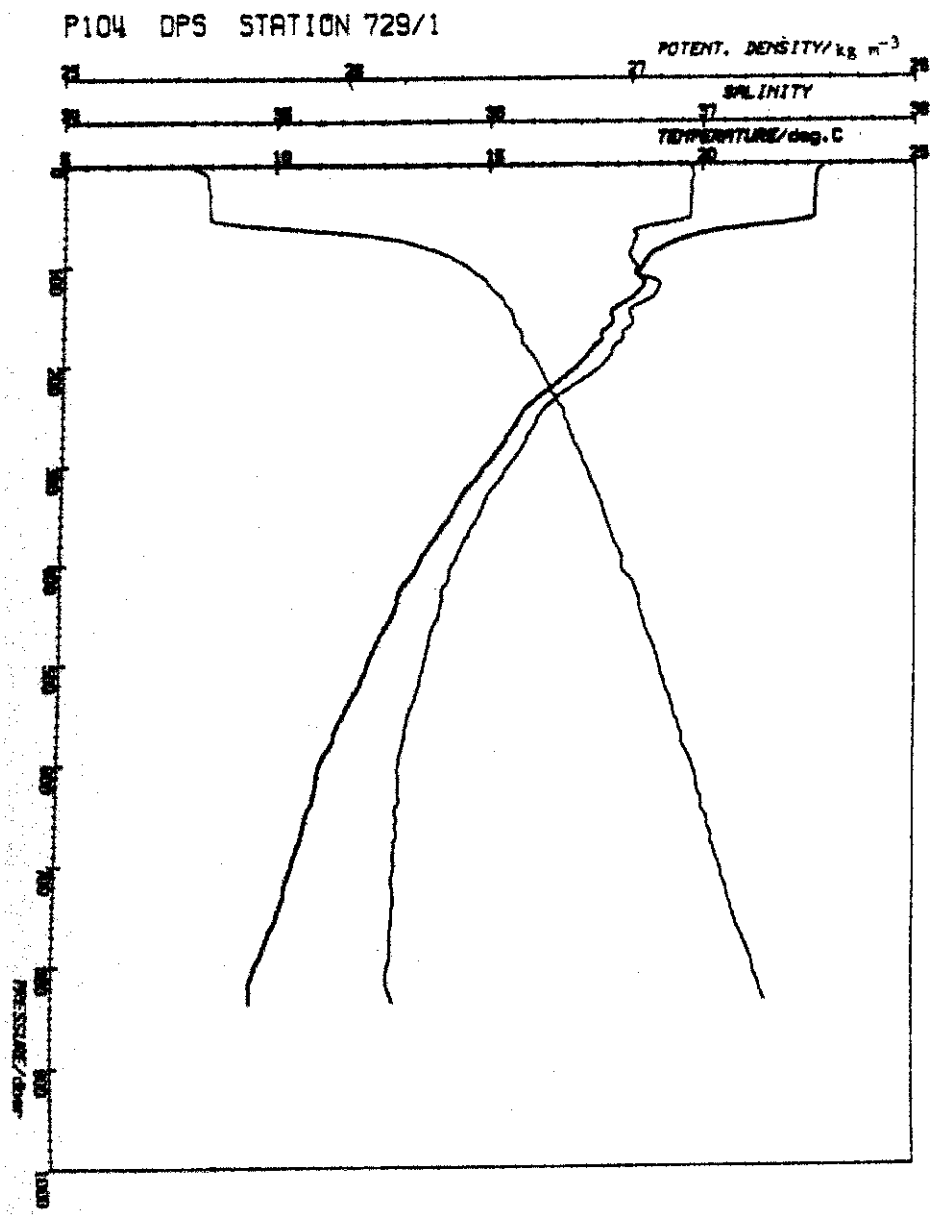
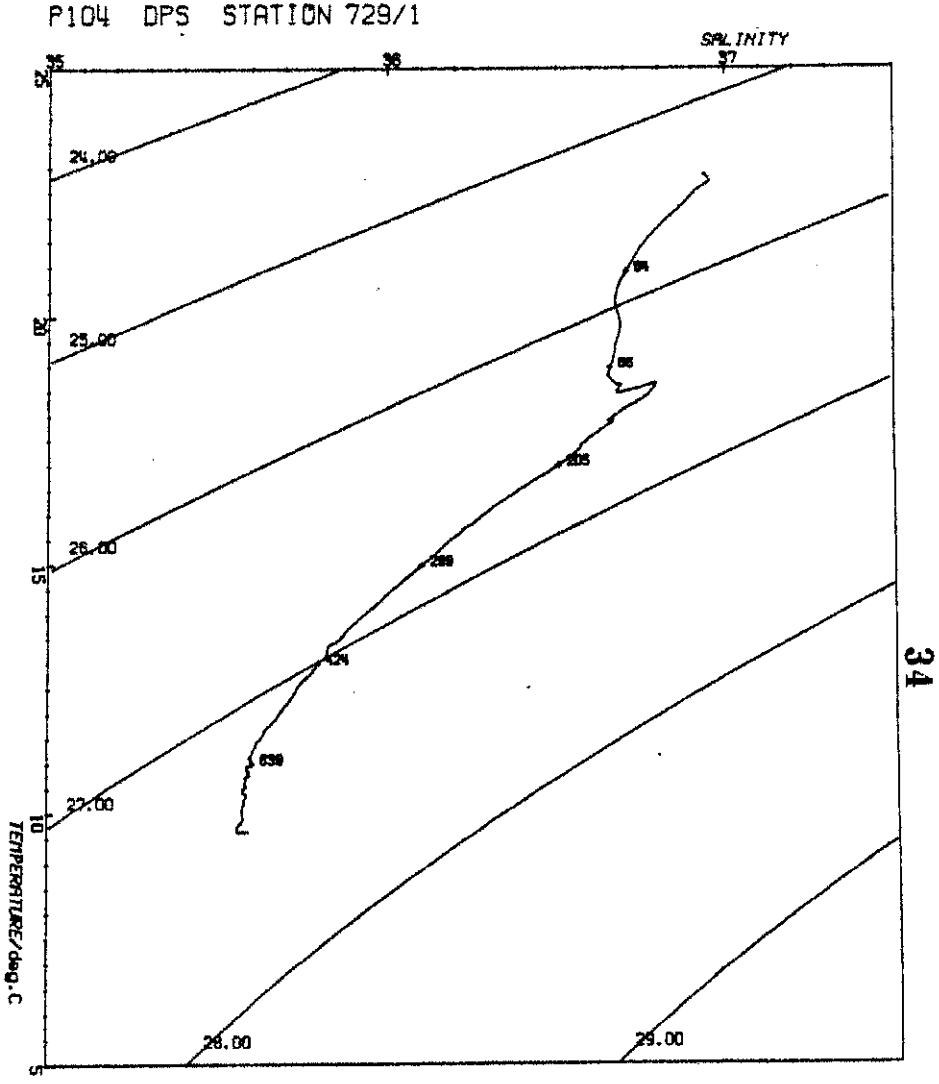


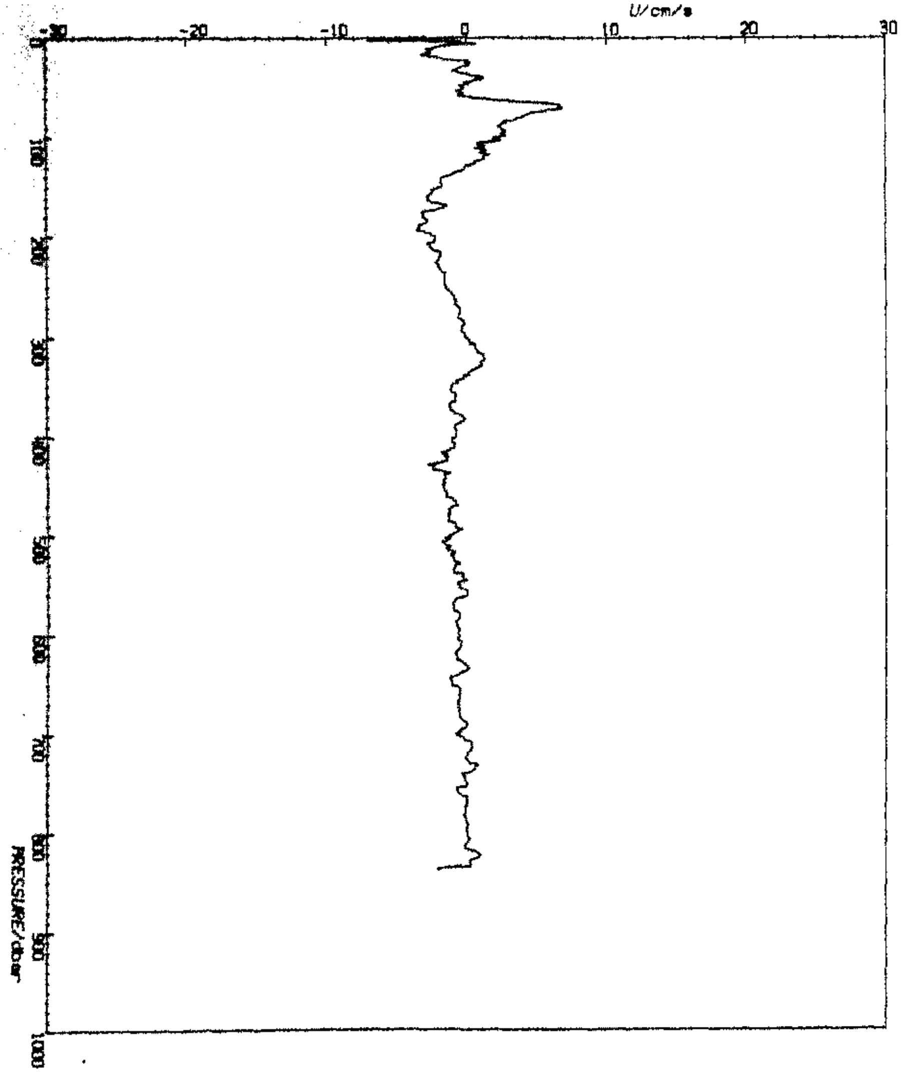
Fig. 3.2d

Fig. 3.3: Sequence of DPS profiles compiled with increasing station numbers (cf Fig. 1.1 and Table 3.1). On the left sides are shown pressure [dbar], profiles of temperature [°C], salinity [practical salinity units] and σ_θ [kg m^{-3}] and temperature/salinity diagrams with selected depth [m] designators. On the opposing right sides profiles of the east (U) and the north (V) components [cm s^{-1}] of the observed currents are given.

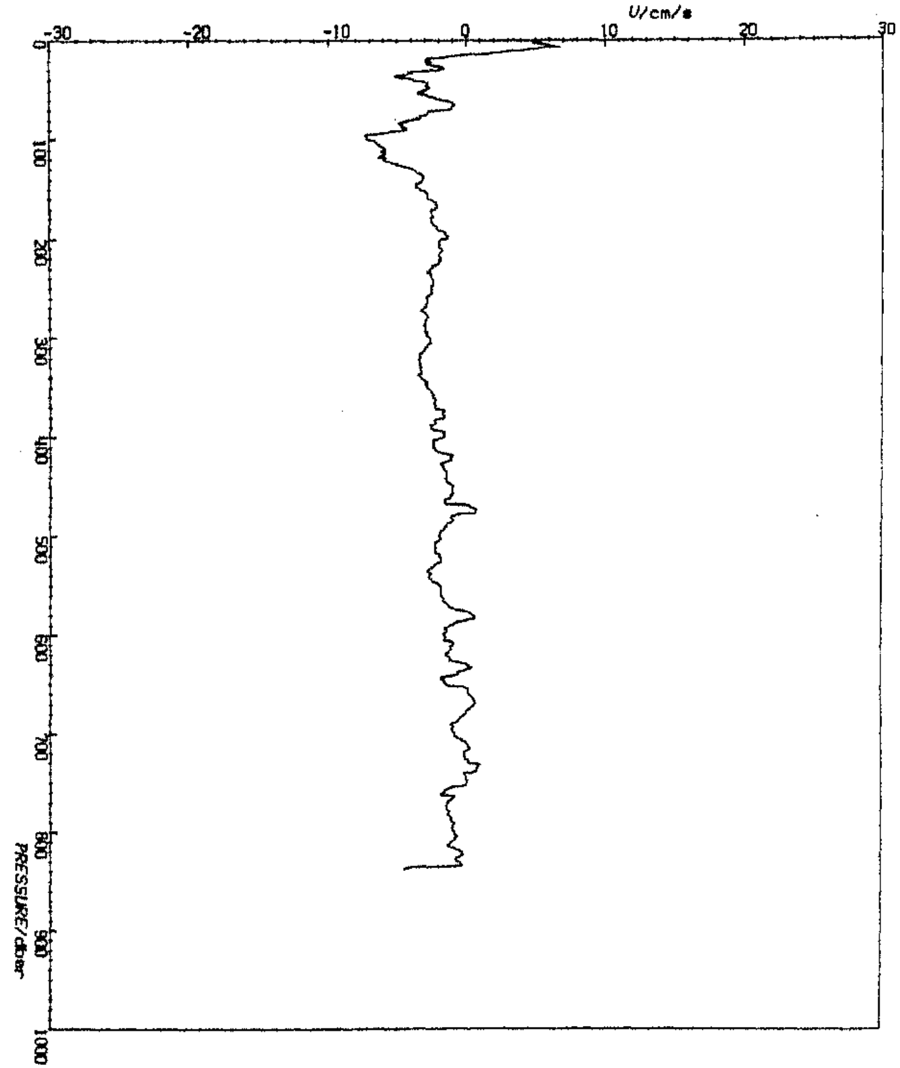

P104 DPS STATION 729/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C
PRESSURE/dbar


P104 DPS STATION 729/1
SALINITY
TEMPERATURE/deg.C
24.00
25.00
26.00
27.00
28.00
29.00

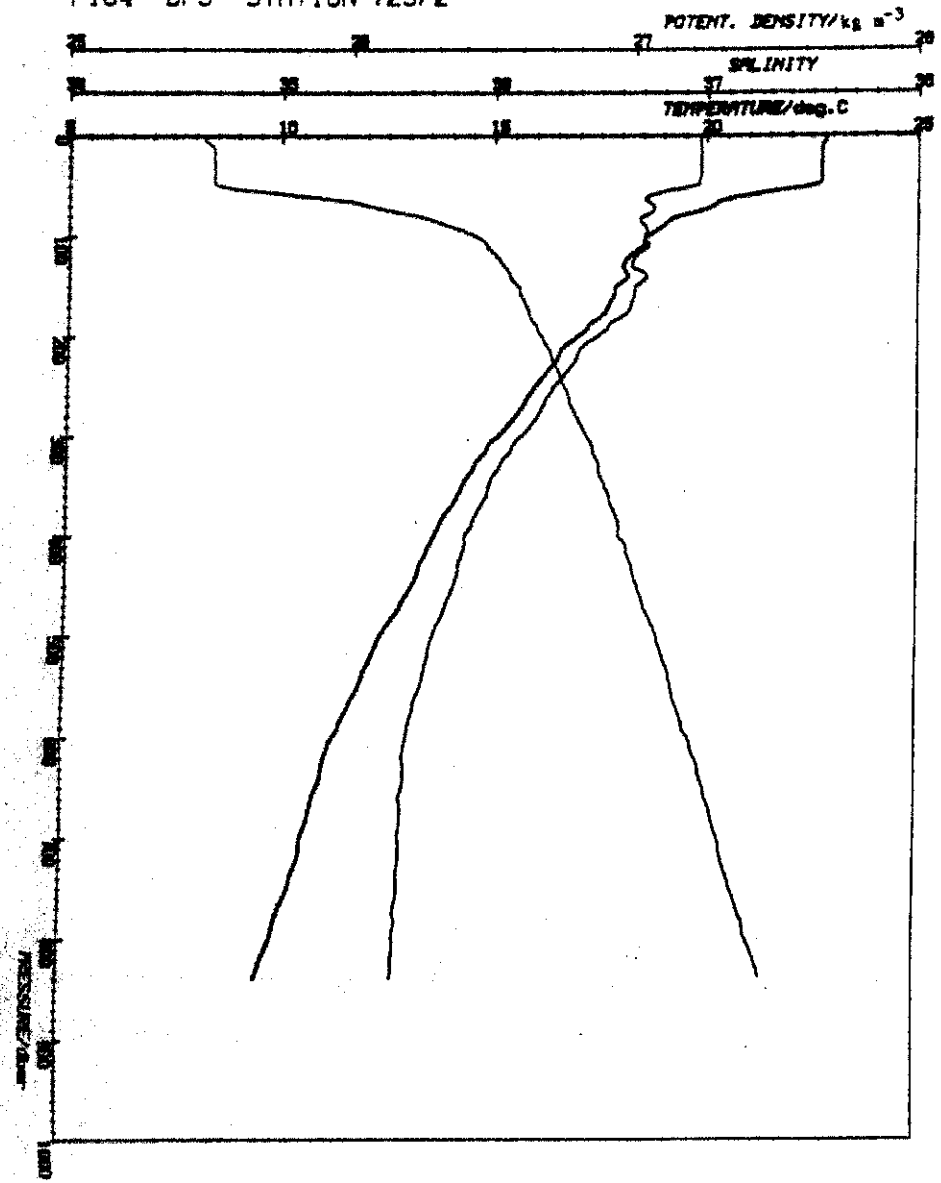
P104 DPS STATION 729/1



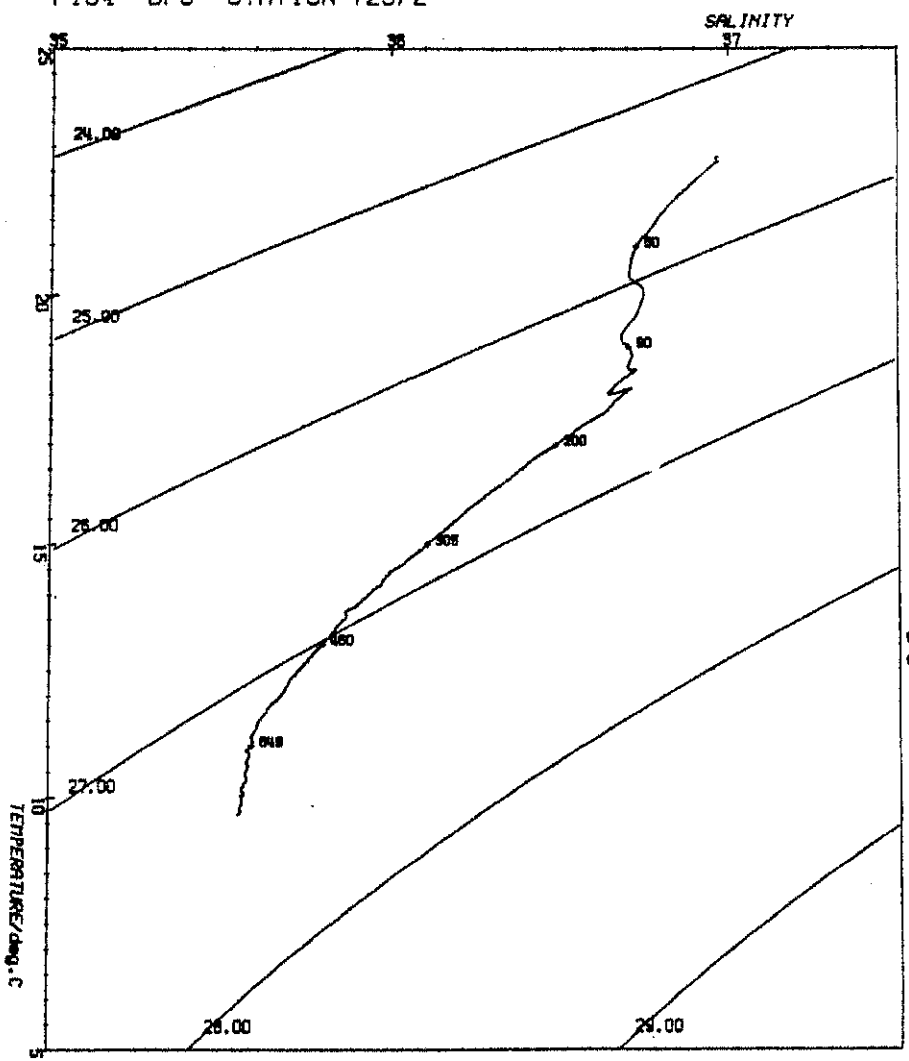
P104 DPS STATION 729/1

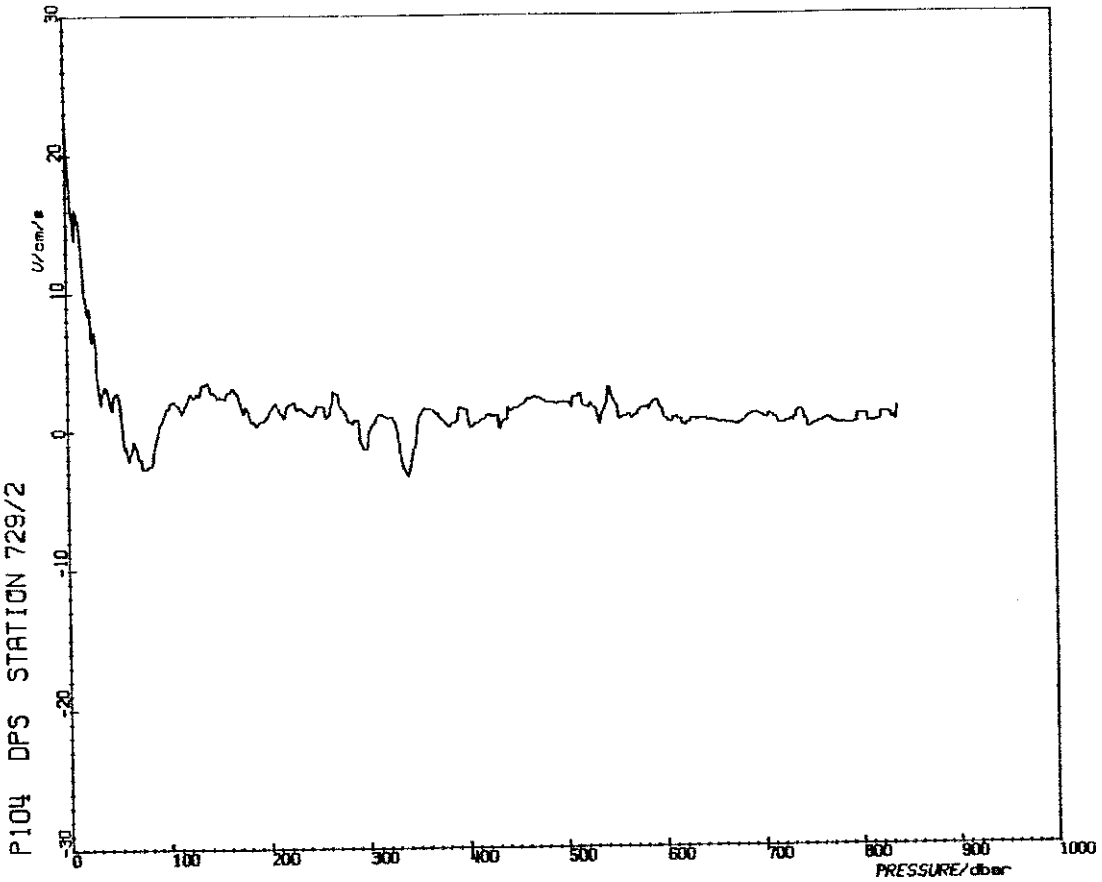


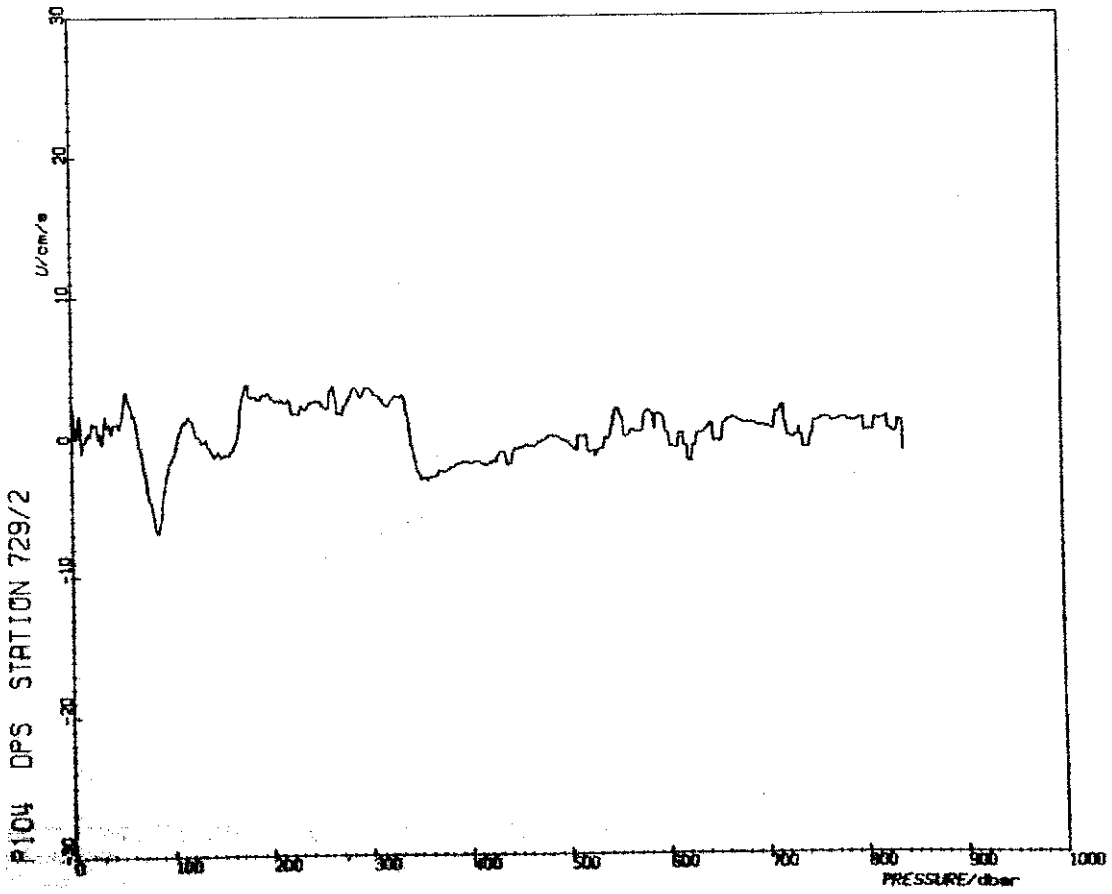
P104 DPS STATION 729/2

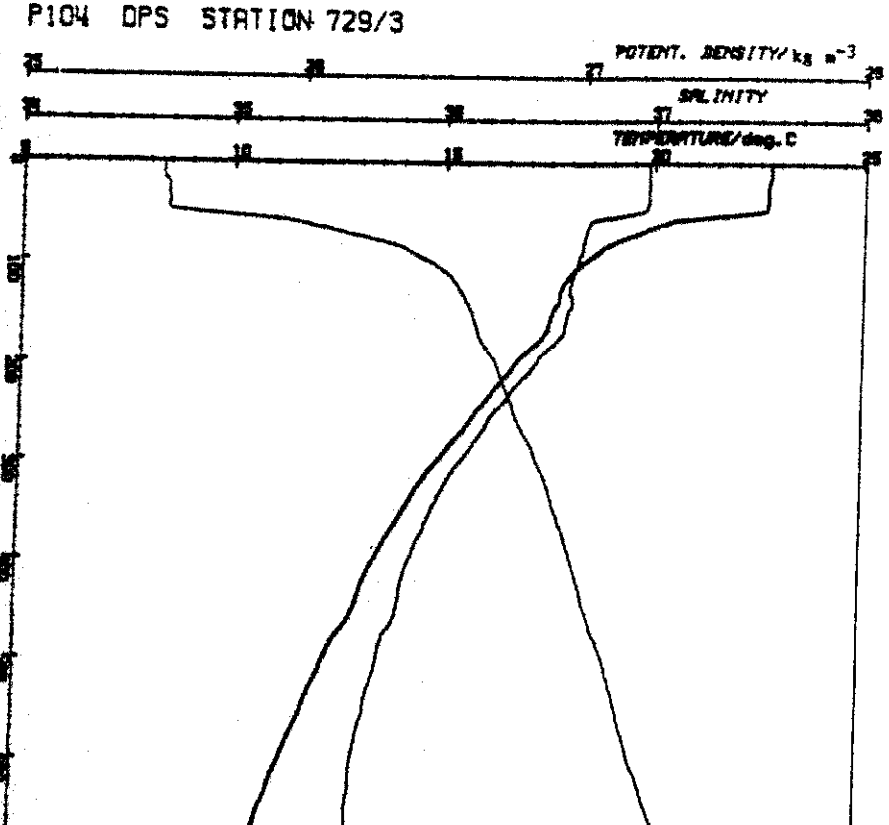


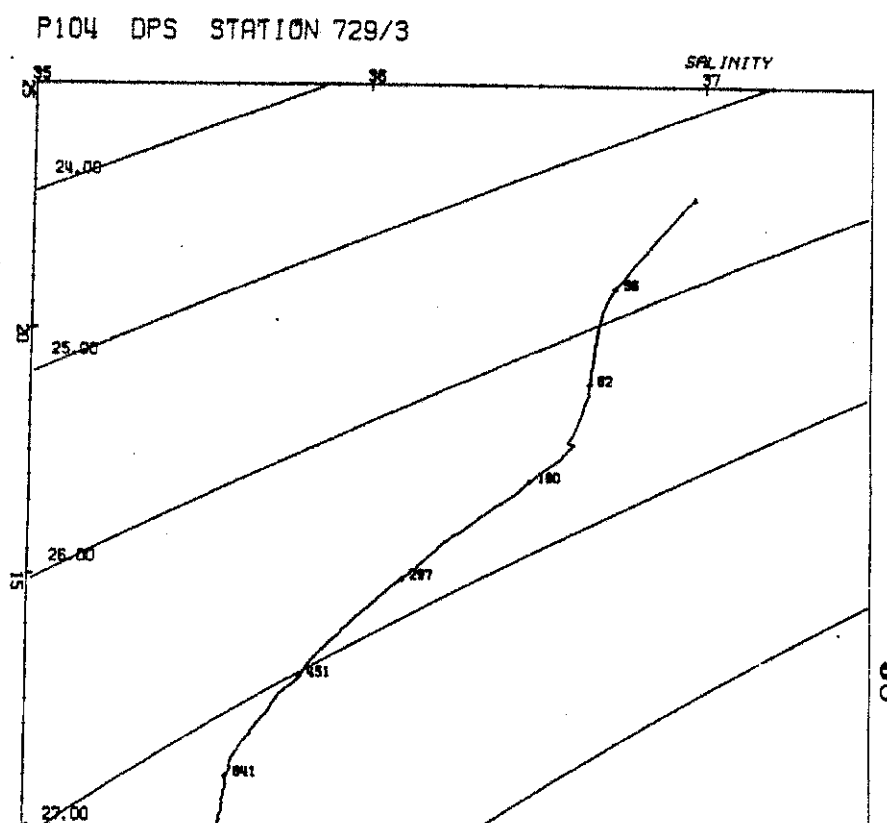
P104 DPS STATION 729/2

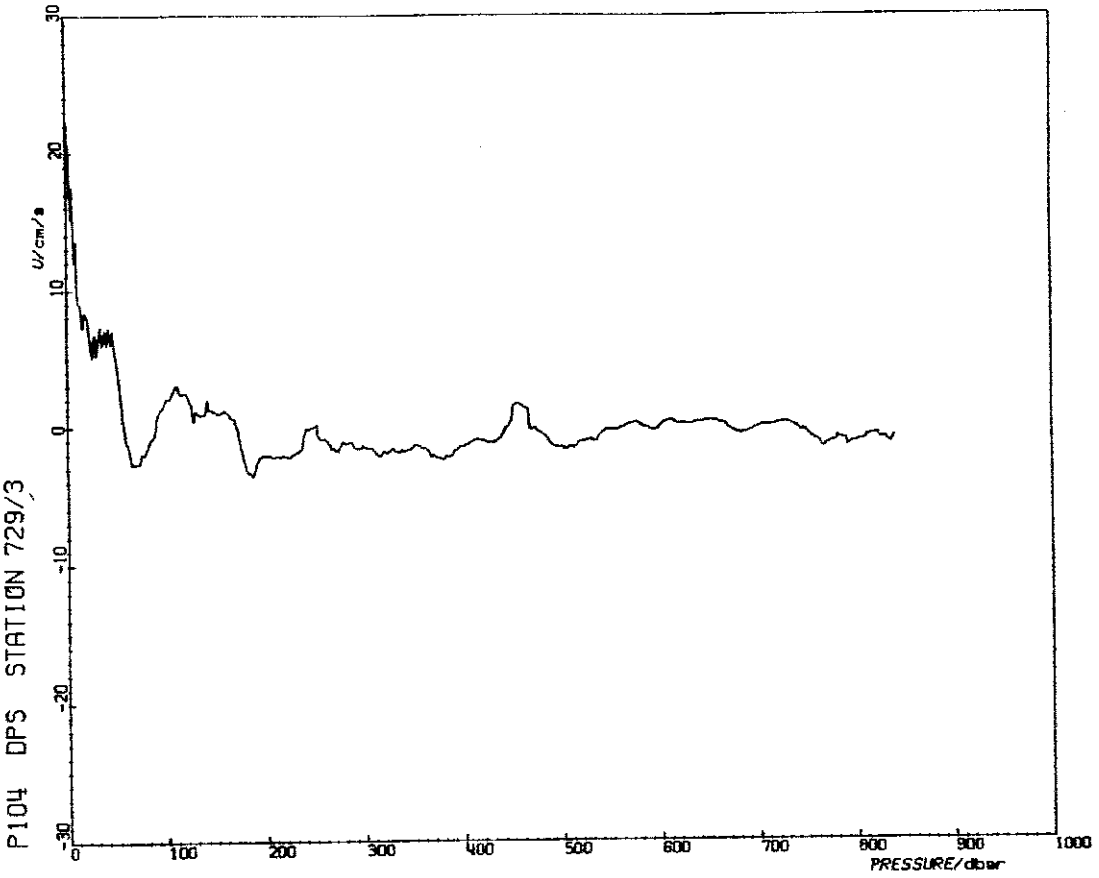


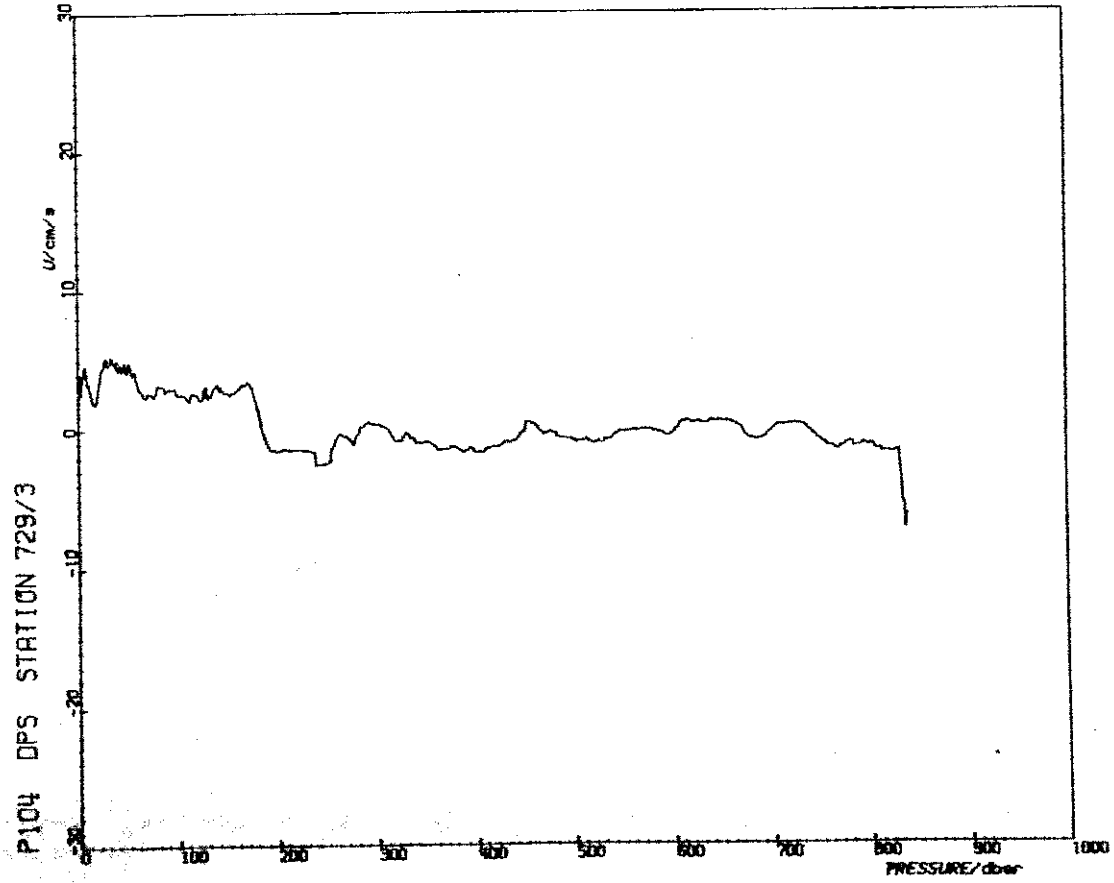

P104 DPS STATION 729/2
U/cm/s
PRESSURE/dbar

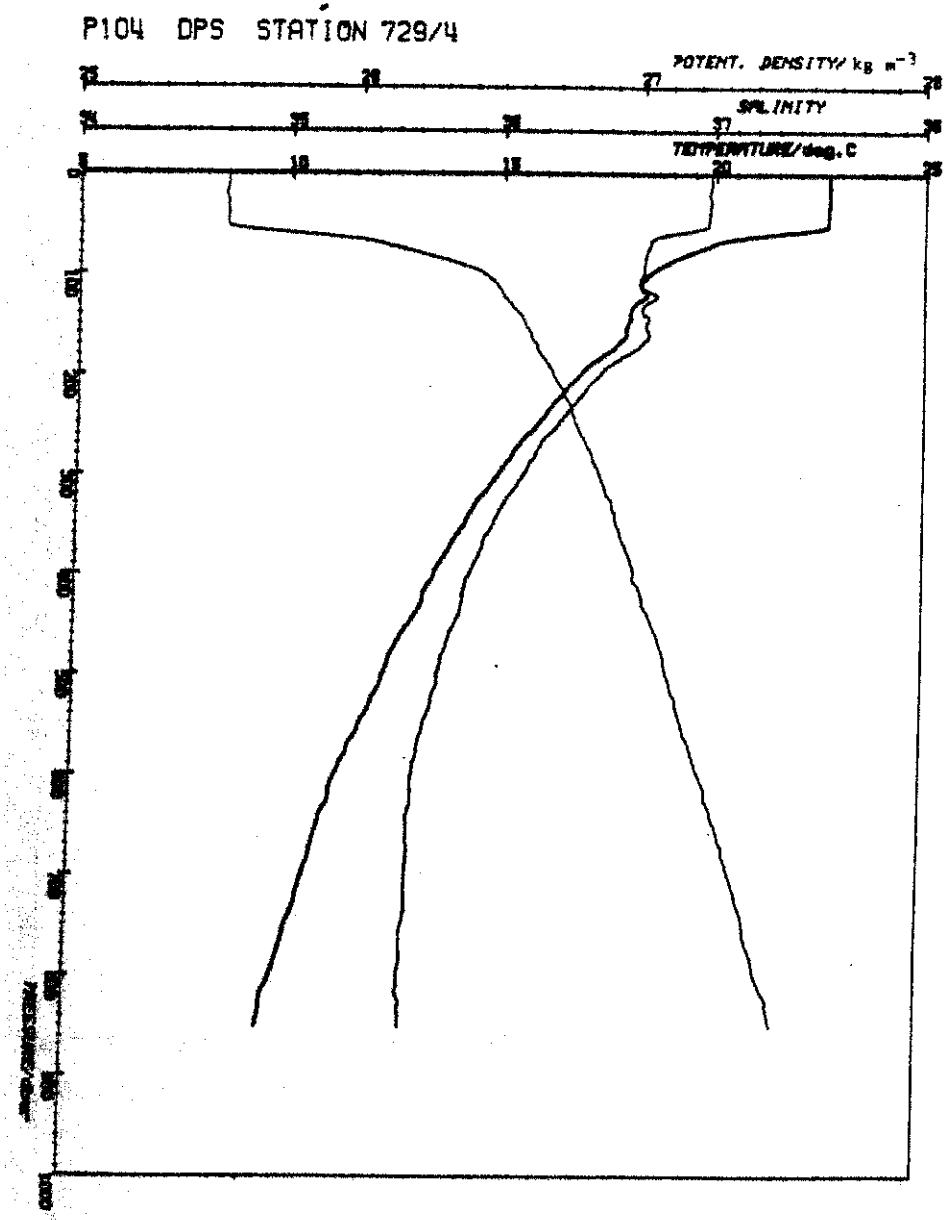

P104 DPS STATION 729/2
U/cm/s
PRESSURE/dbar

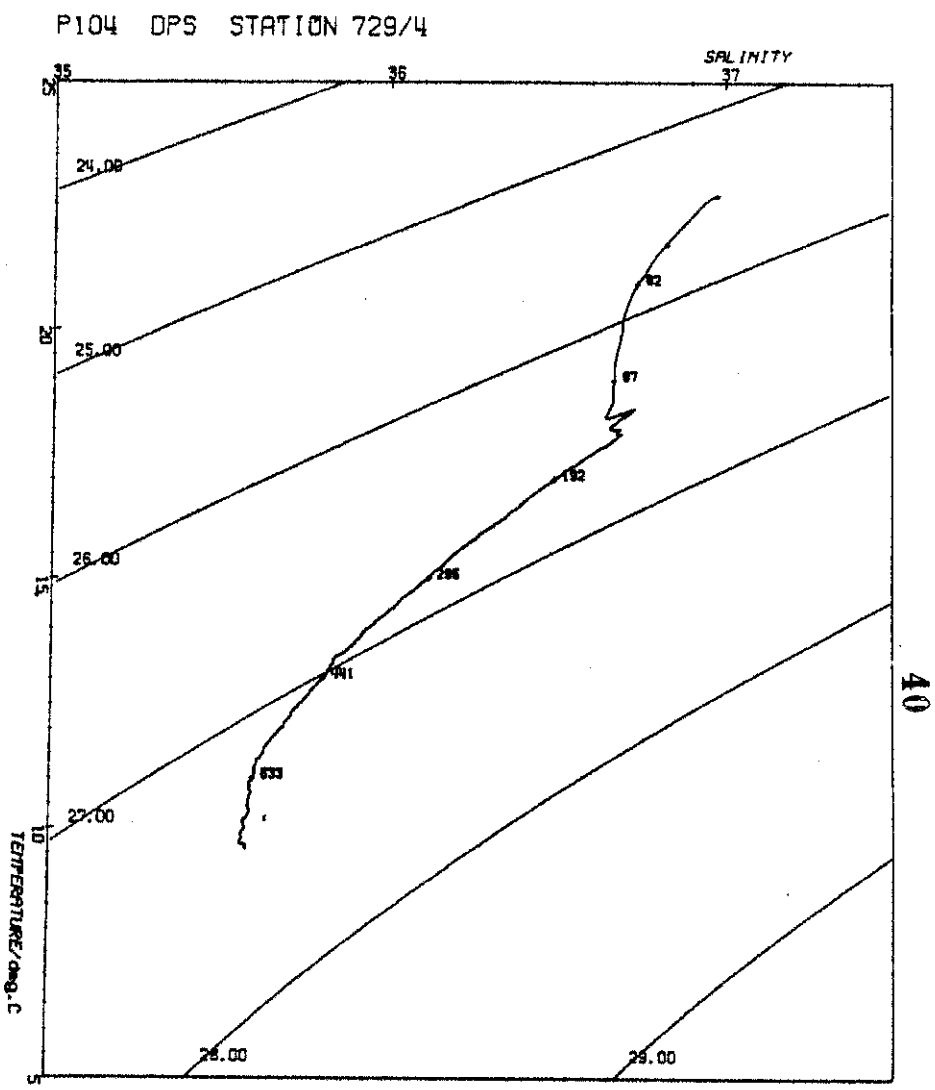

P104 DPS STATION 729/3
POTENT. DENSITY/kg m⁻³
SALINITY
TEMPERATURE/deg. C

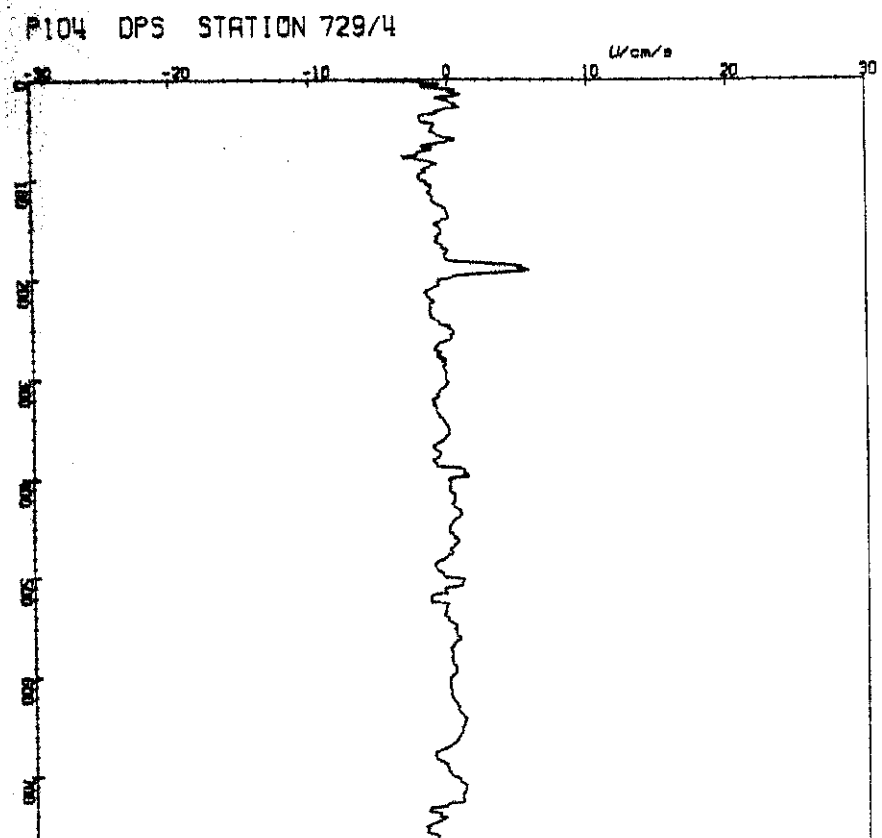

P104 DPS STATION 729/3
SALINITY
24.00
25.00
26.00
27.00

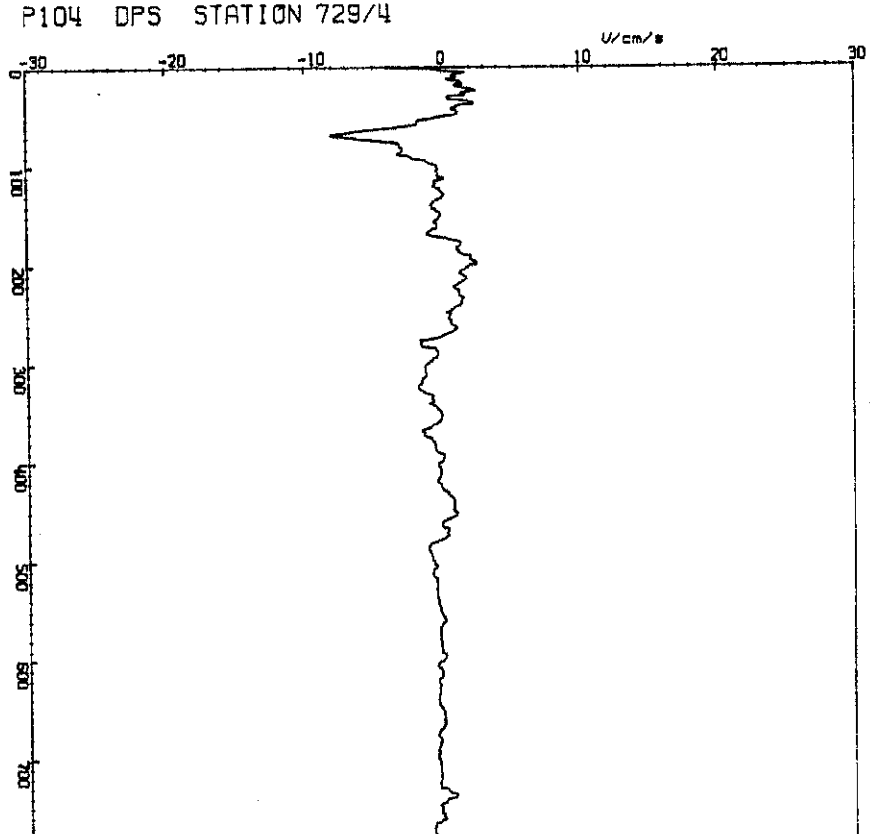

P104 DPS STATION 729/3
u/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar


P104 DPS STATION 729/3
u/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

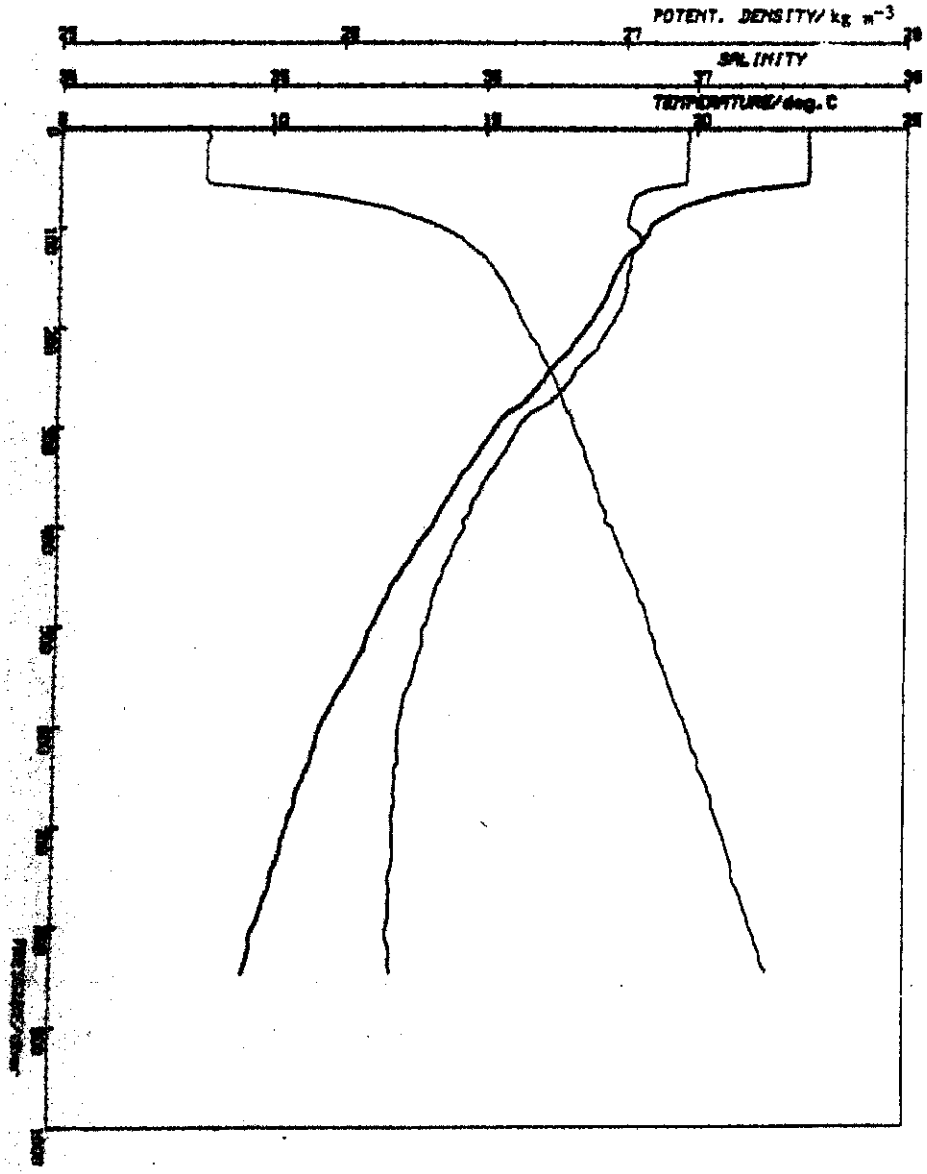

P104 DPS STATION 729/4
POTENT. DENSITY/ kg m-3
SALINITY
TEMPERATURE/deg.C


P104 DPS STATION 729/4
SALINITY
24.00
25.00
26.00
27.00
28.00
29.00
TEMPERATURE/deg.C

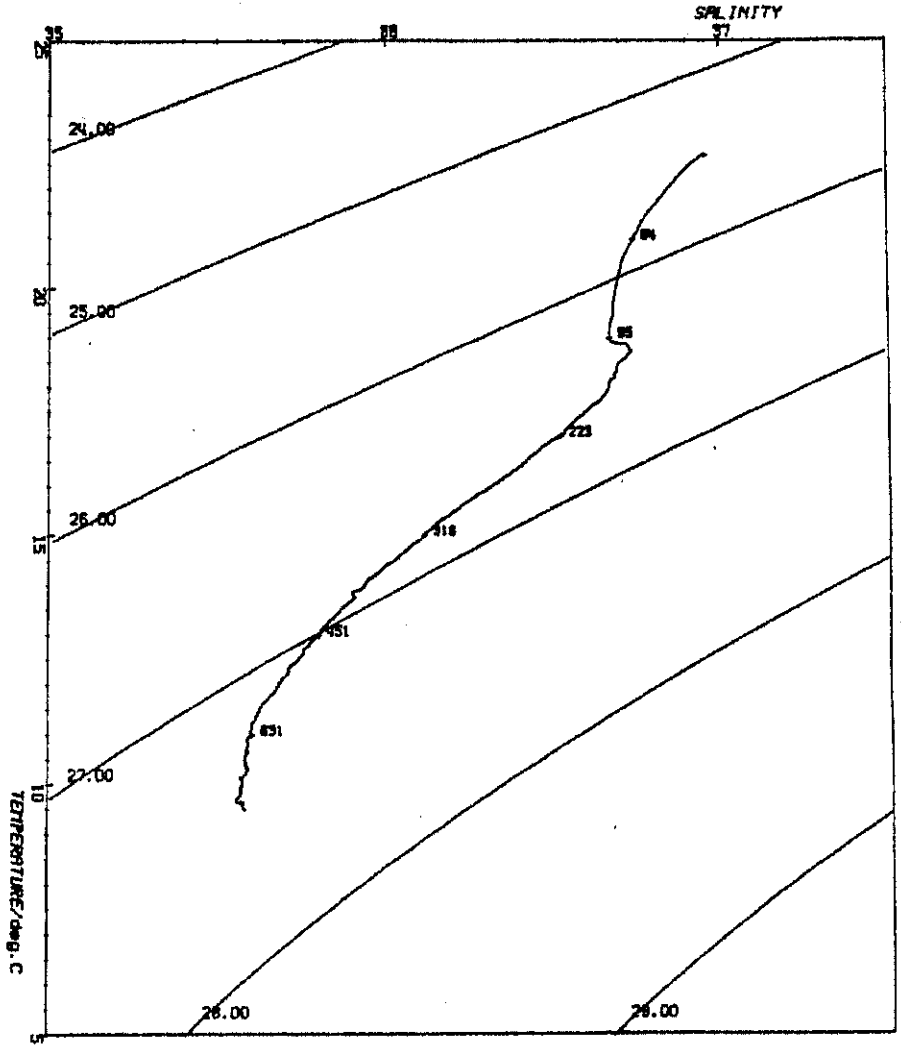

P104 DPS STATION 729/4
U/cm/s
-30
-20
-10
0
10
20
30
100
200
300
400
500
600
700

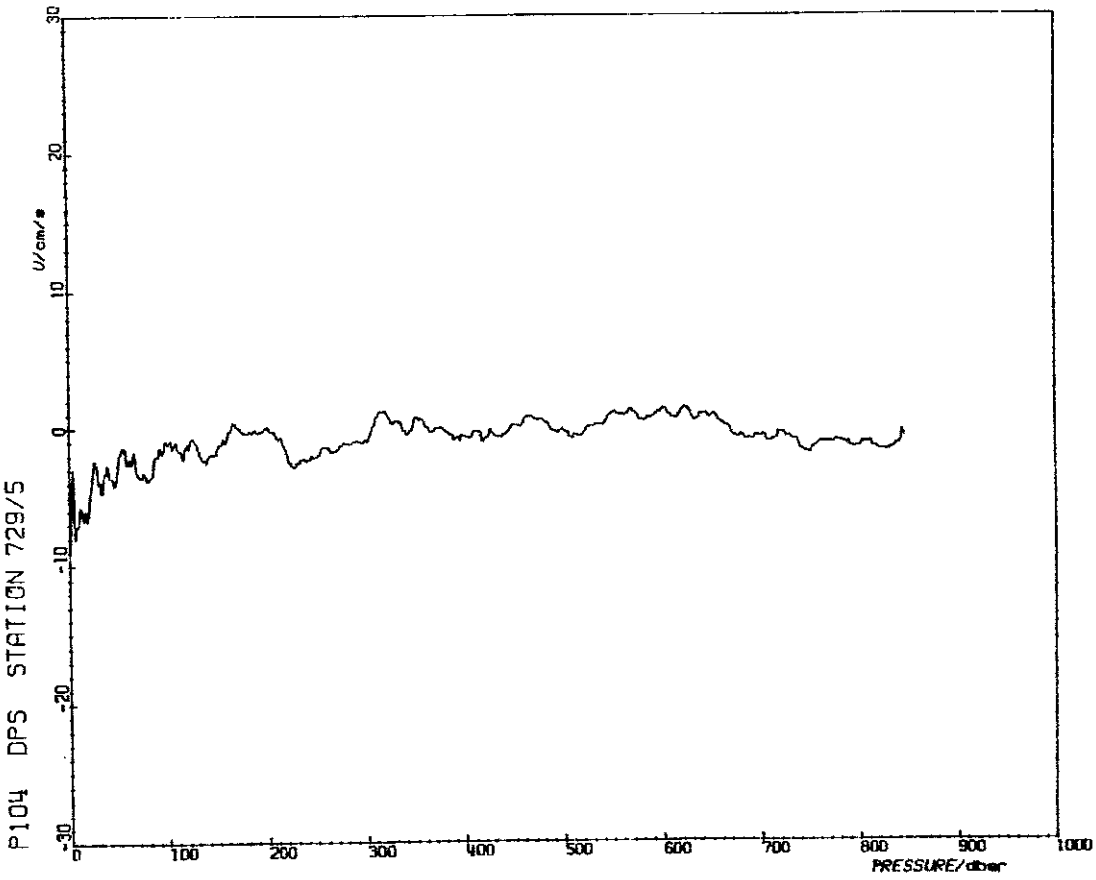

P104 DPS STATION 729/4
U/cm/s
-30
-20
-10
0
10
20
30
100
200
300
400
500
600
700

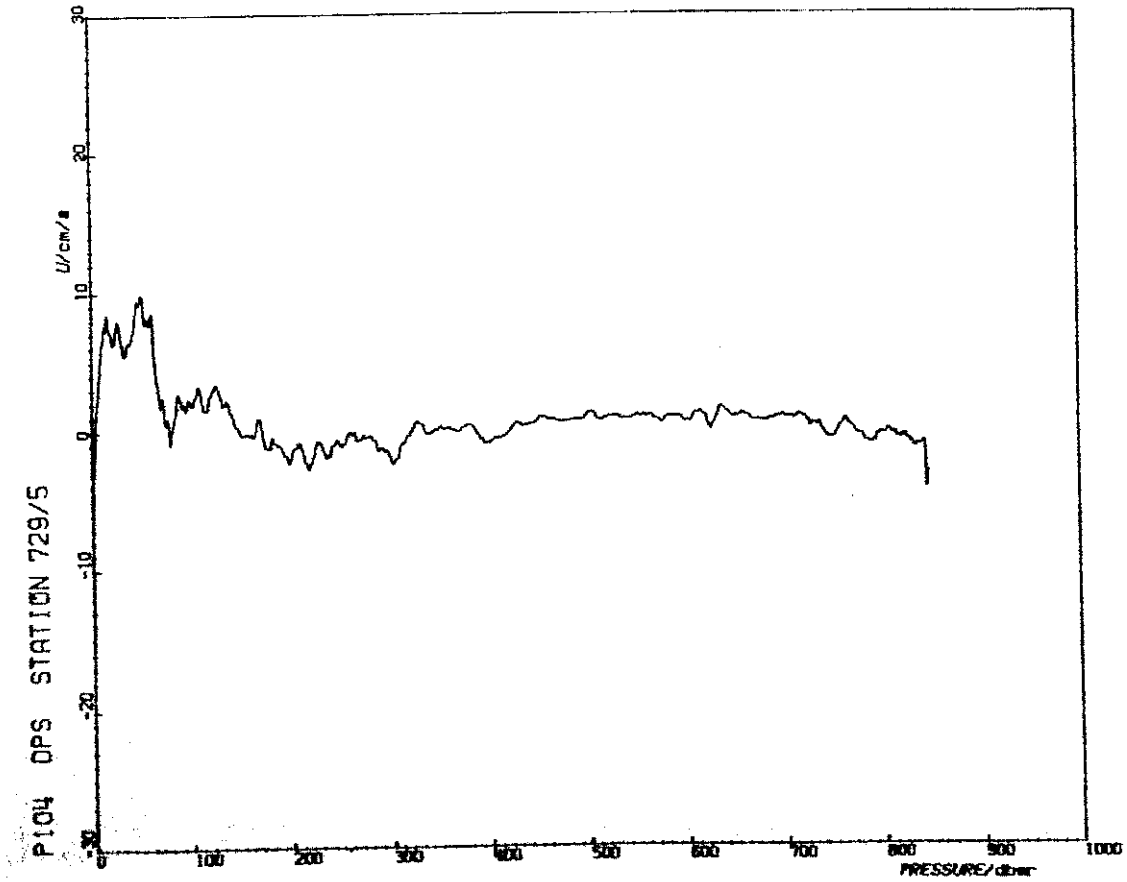
P104 DPS STATION 729/5



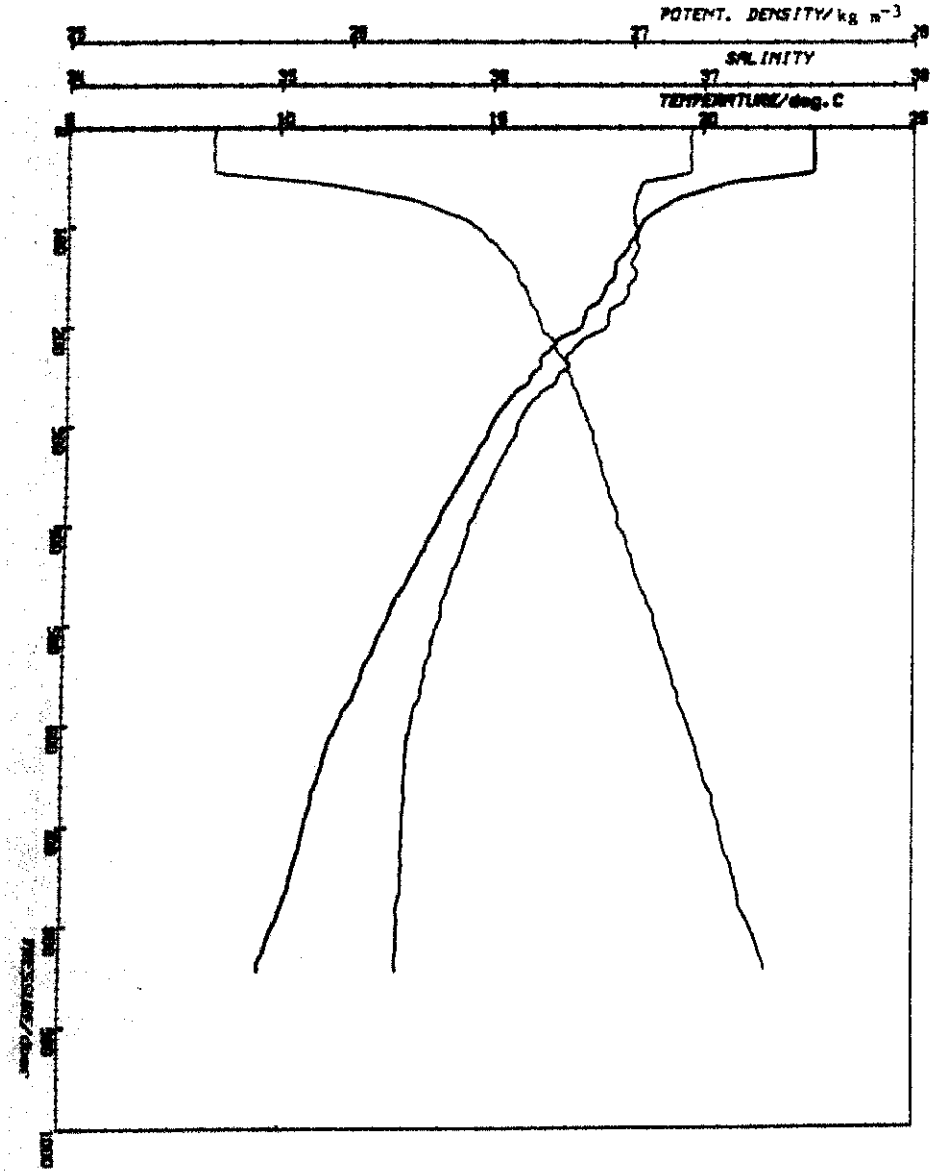
P104 DPS STATION 729/5



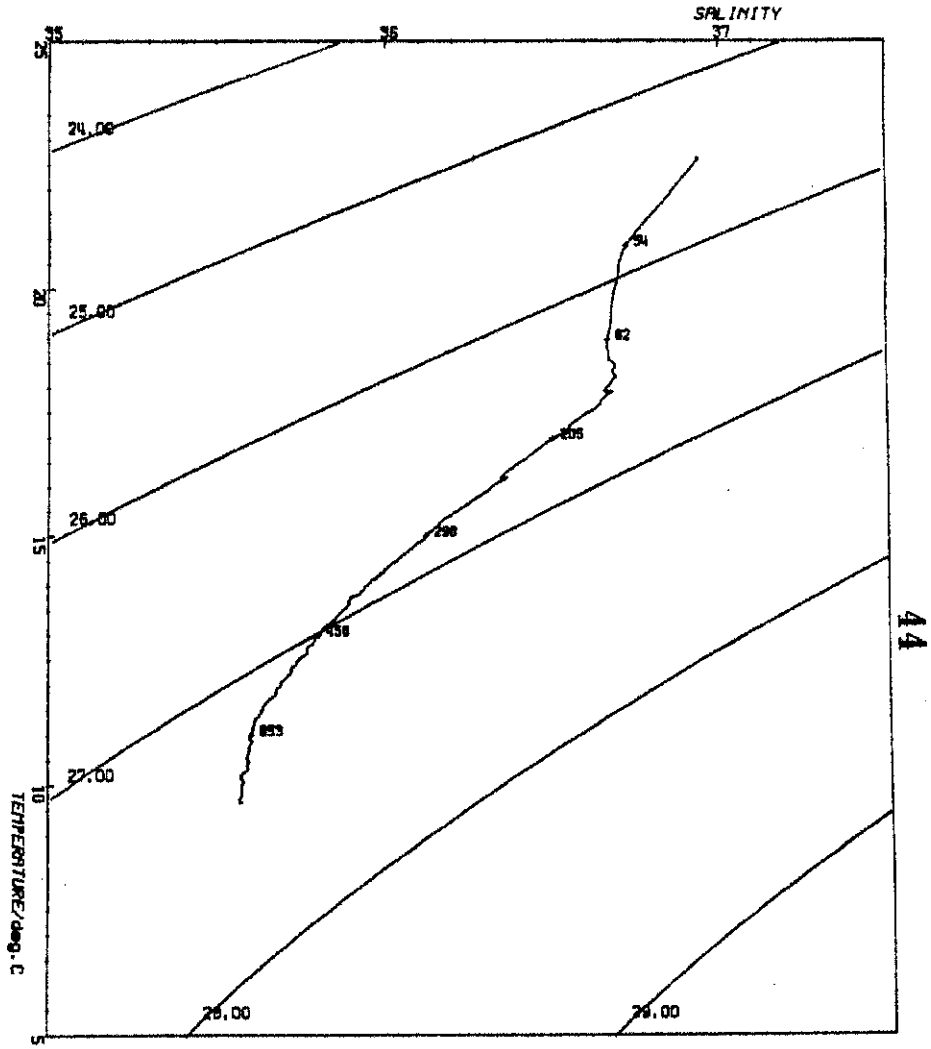

P104 DPS STATION 729/5
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

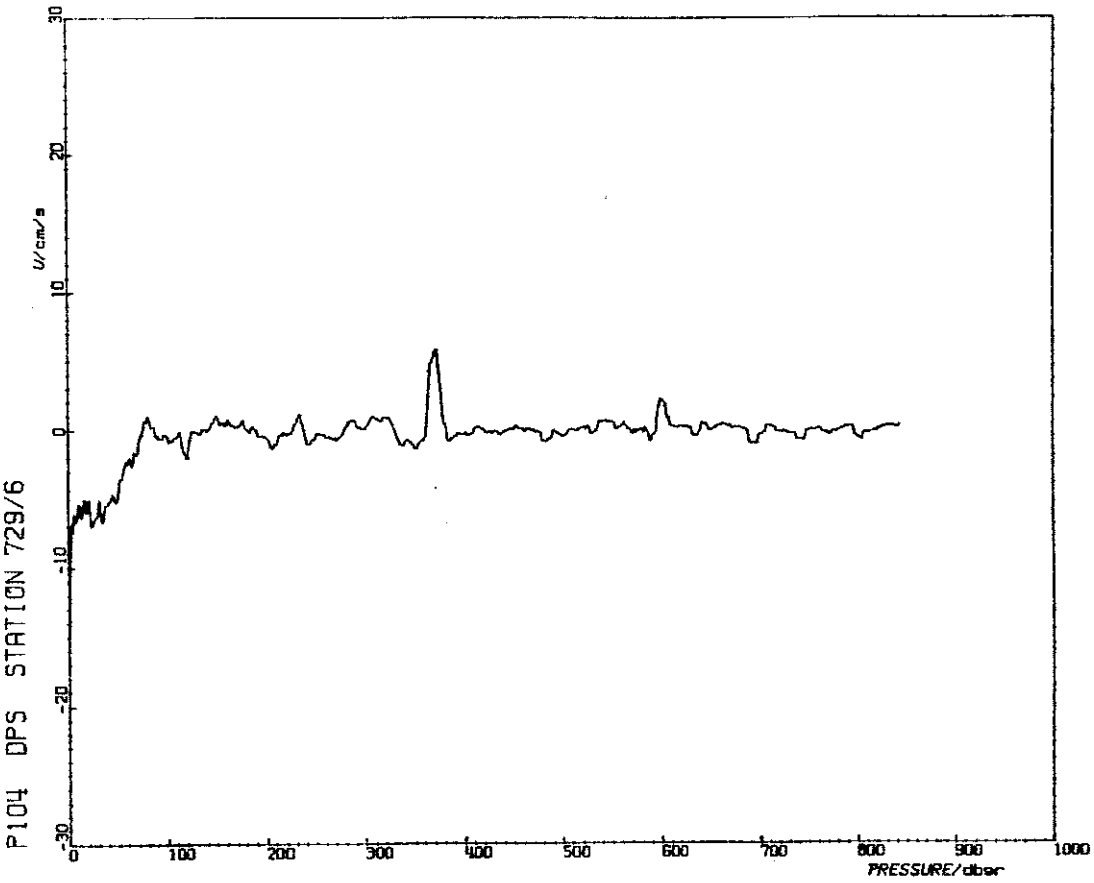

P104 DPS STATION 729/5
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

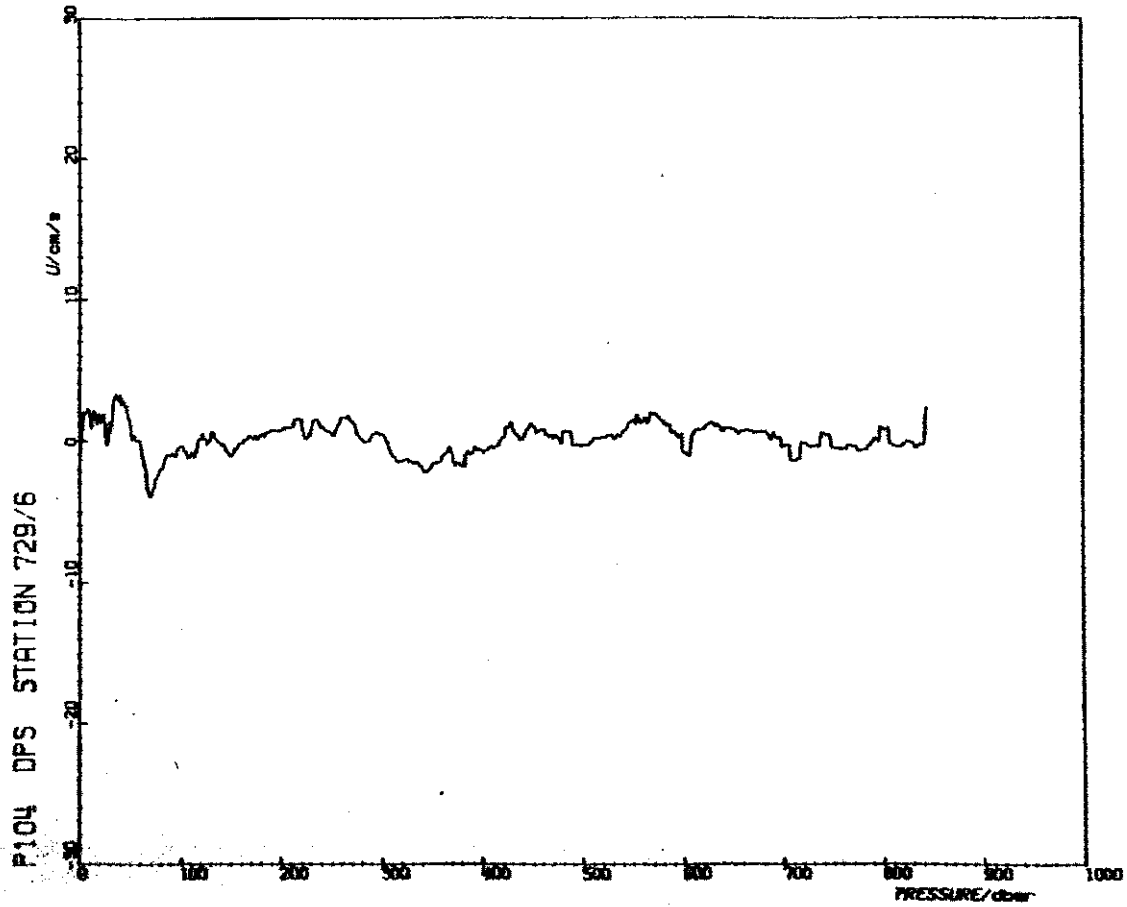
P104 DPS STATION 729/6

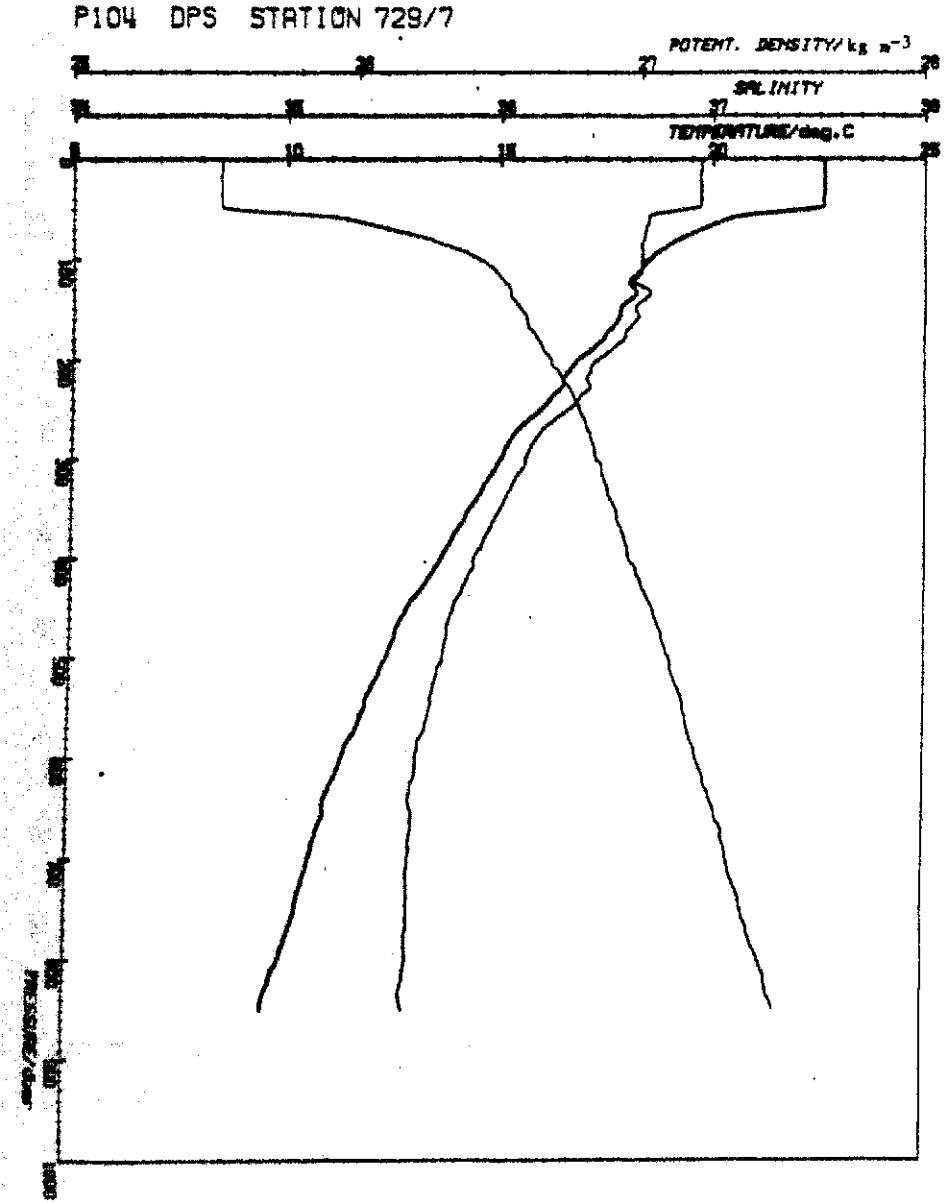


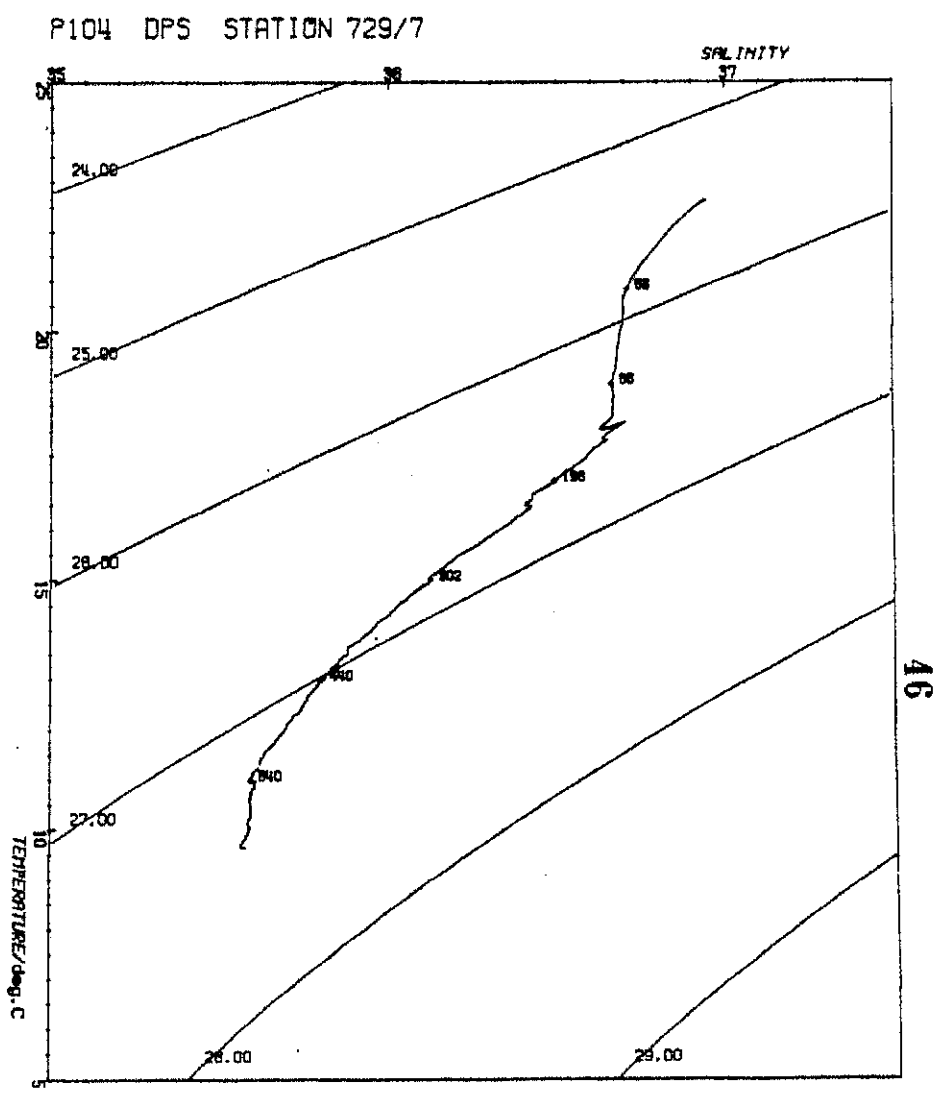
P104 DPS STATION 729/6

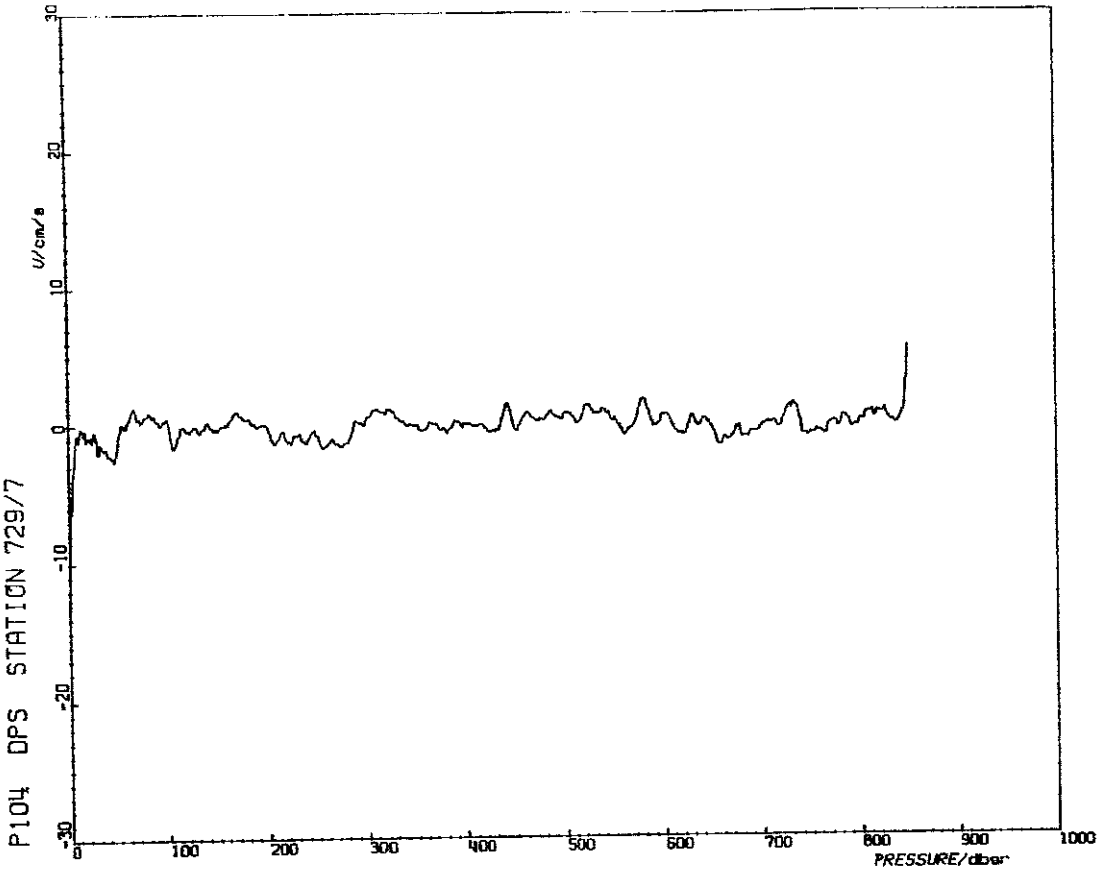


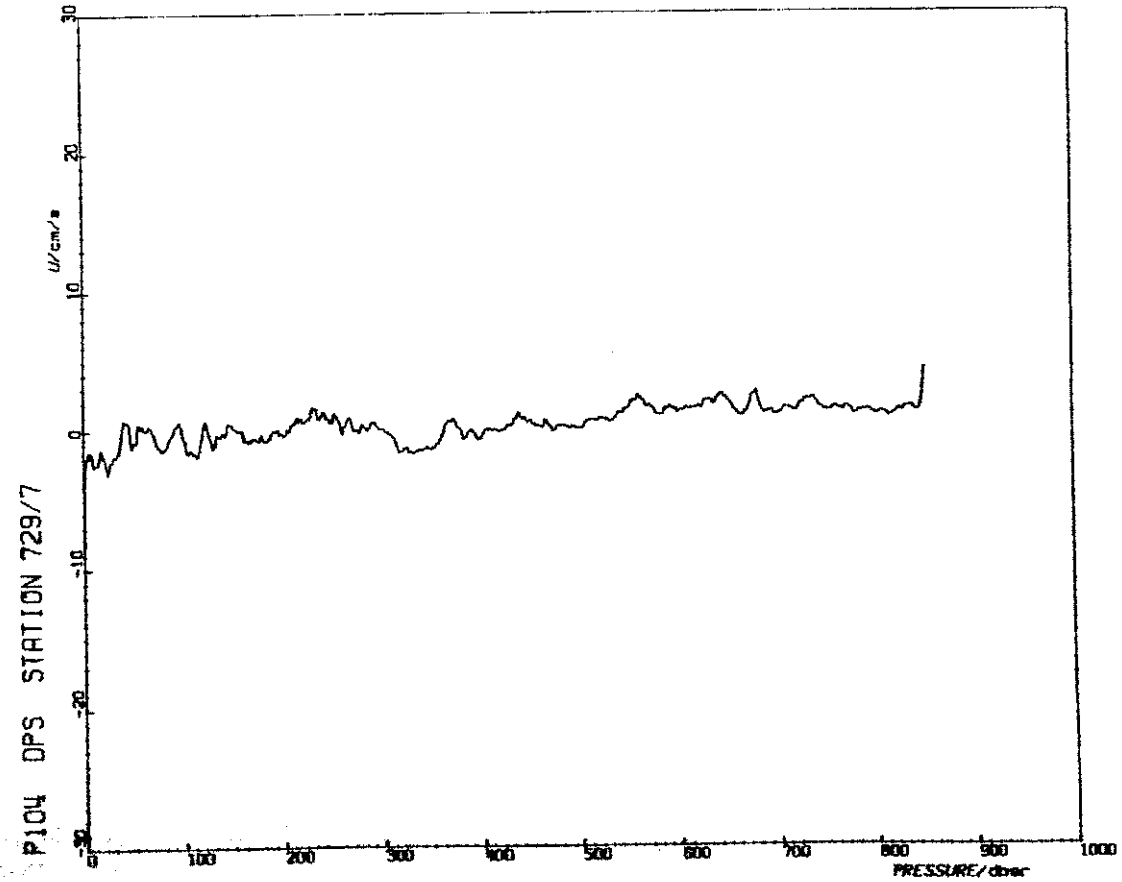

P104 DPS STATION 729/6
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar


P104 DPS STATION 729/6
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

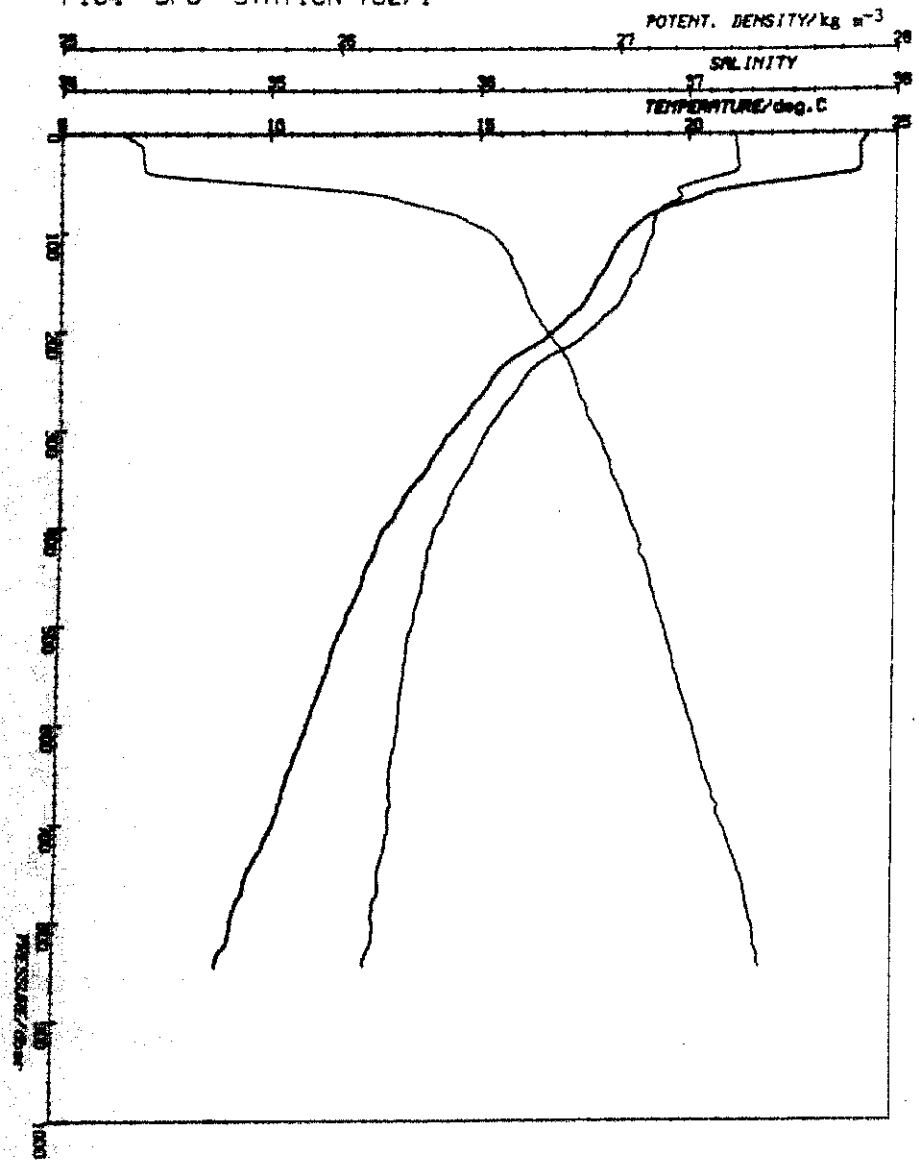

P104 DPS STATION 729/7
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C
PRESSURE/db


P104 DPS STATION 729/7
SALINITY
24.00
25.00
26.00
27.00
28.00
29.00
TEMPERATURE/deg.C

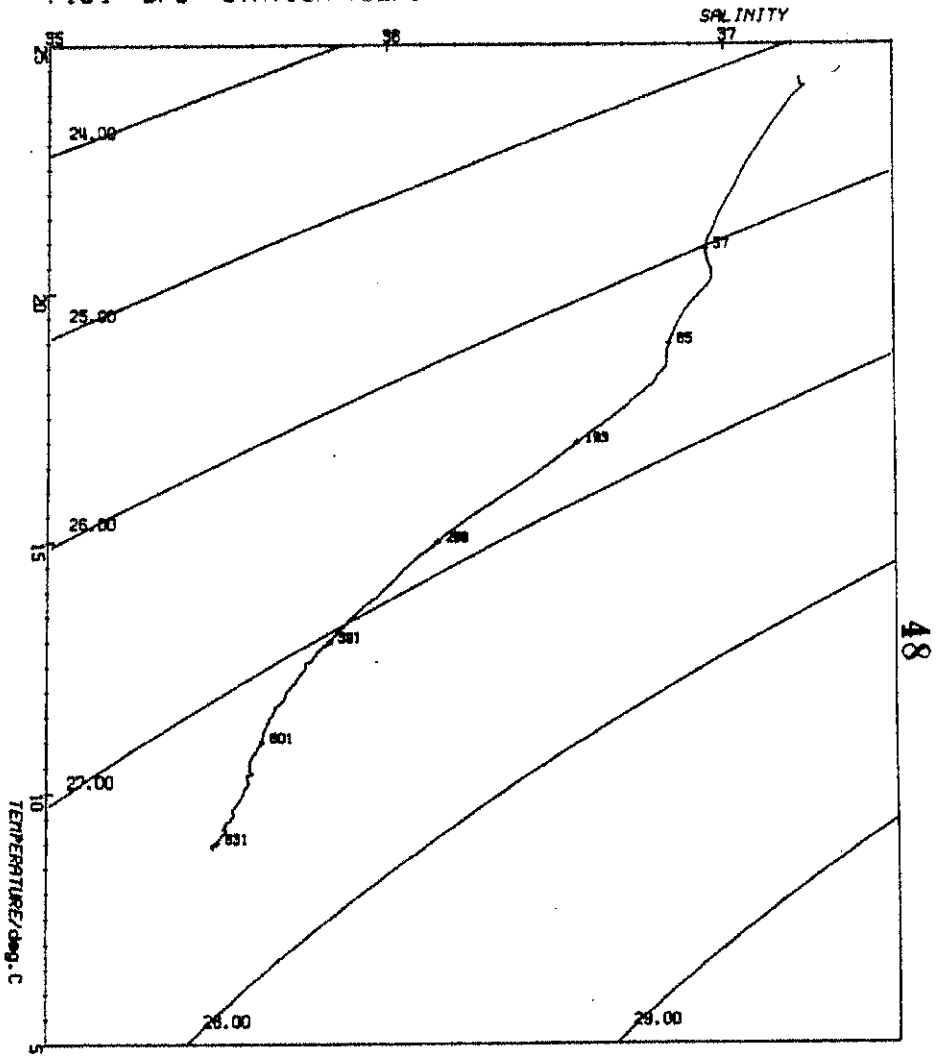

P104 DPS STATION 729/7
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

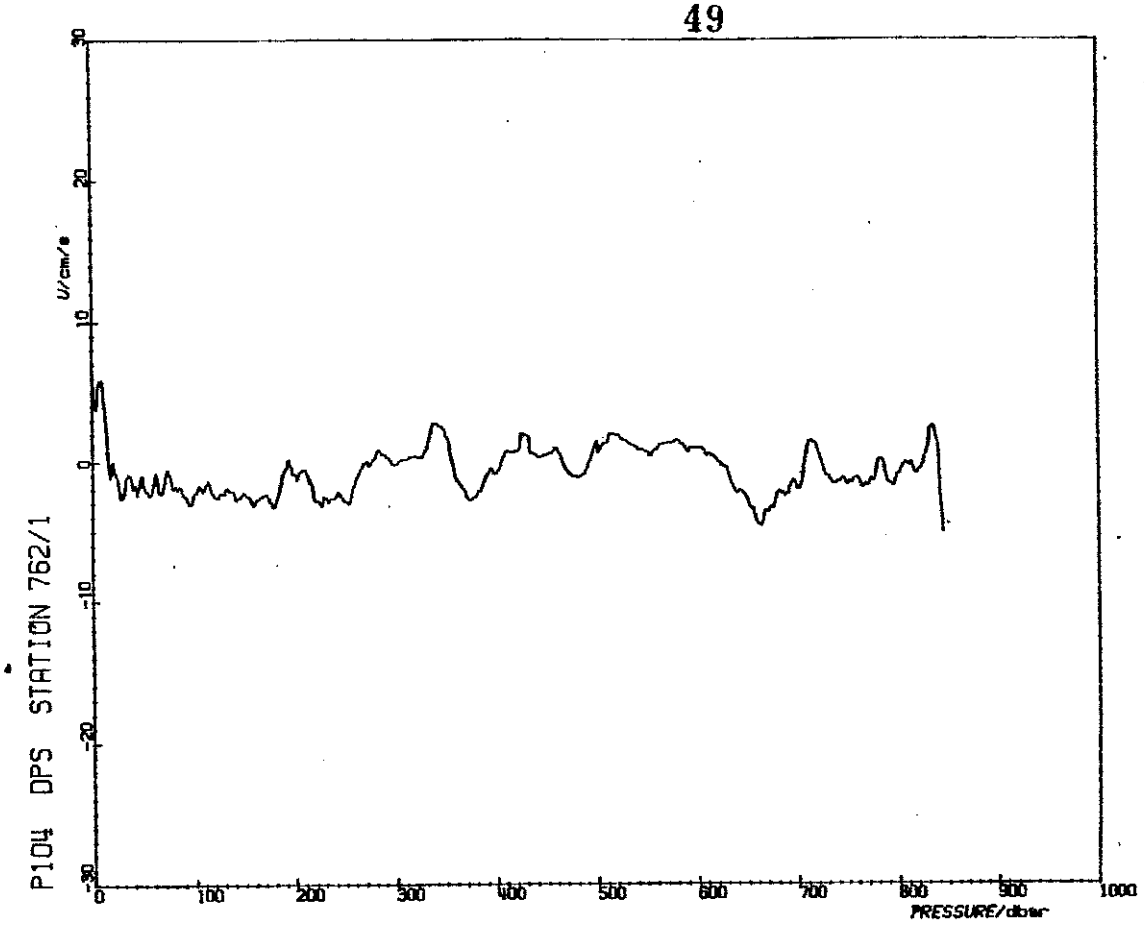

P104 DPS STATION 729/7
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

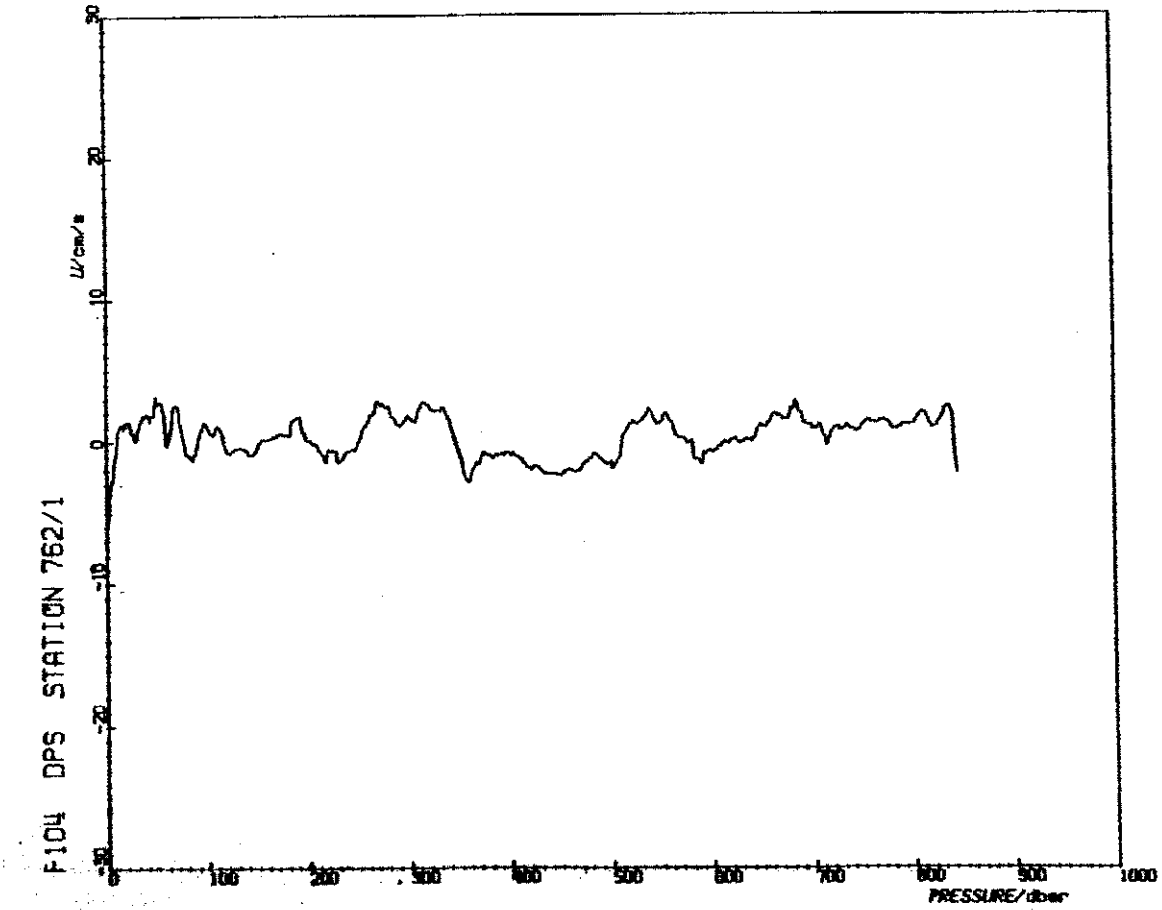
P104 DPS STATION 762/1



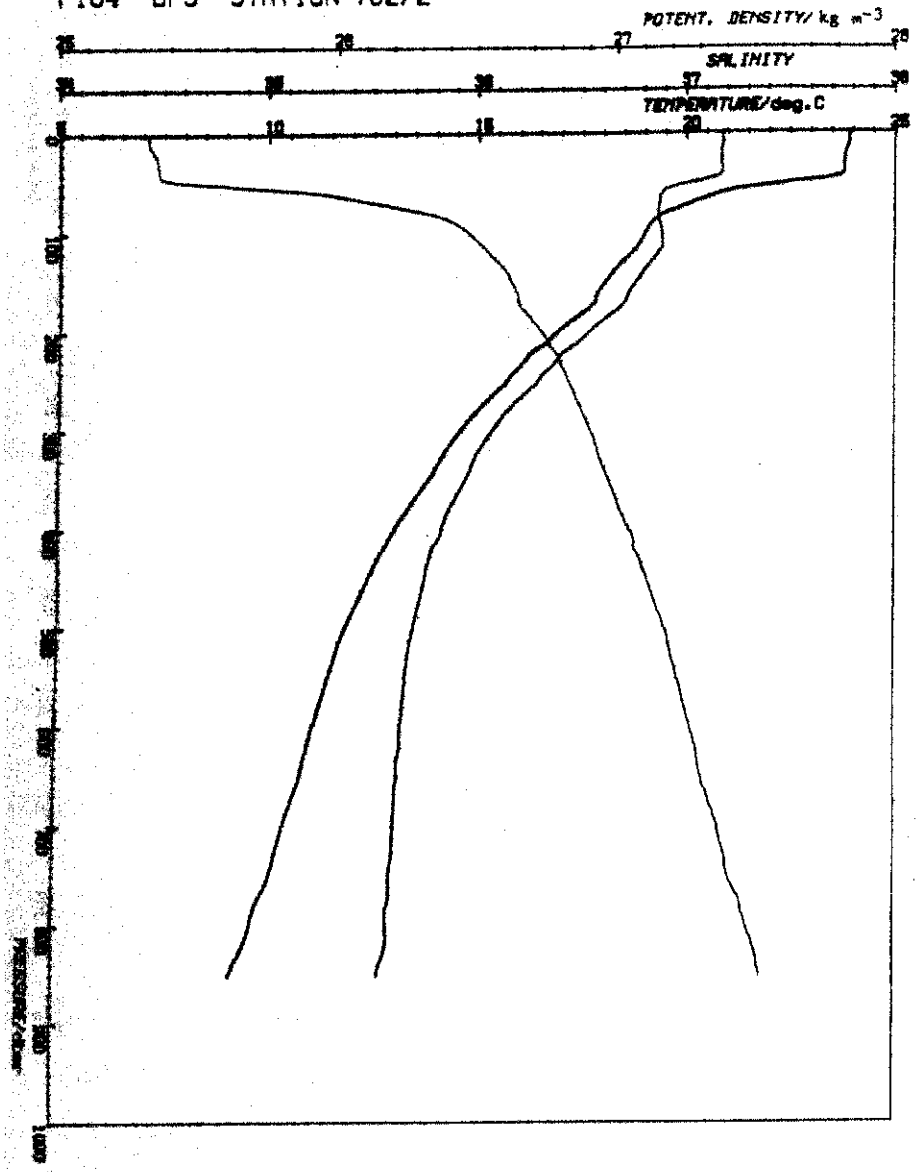
P104 DPS STATION 762/1



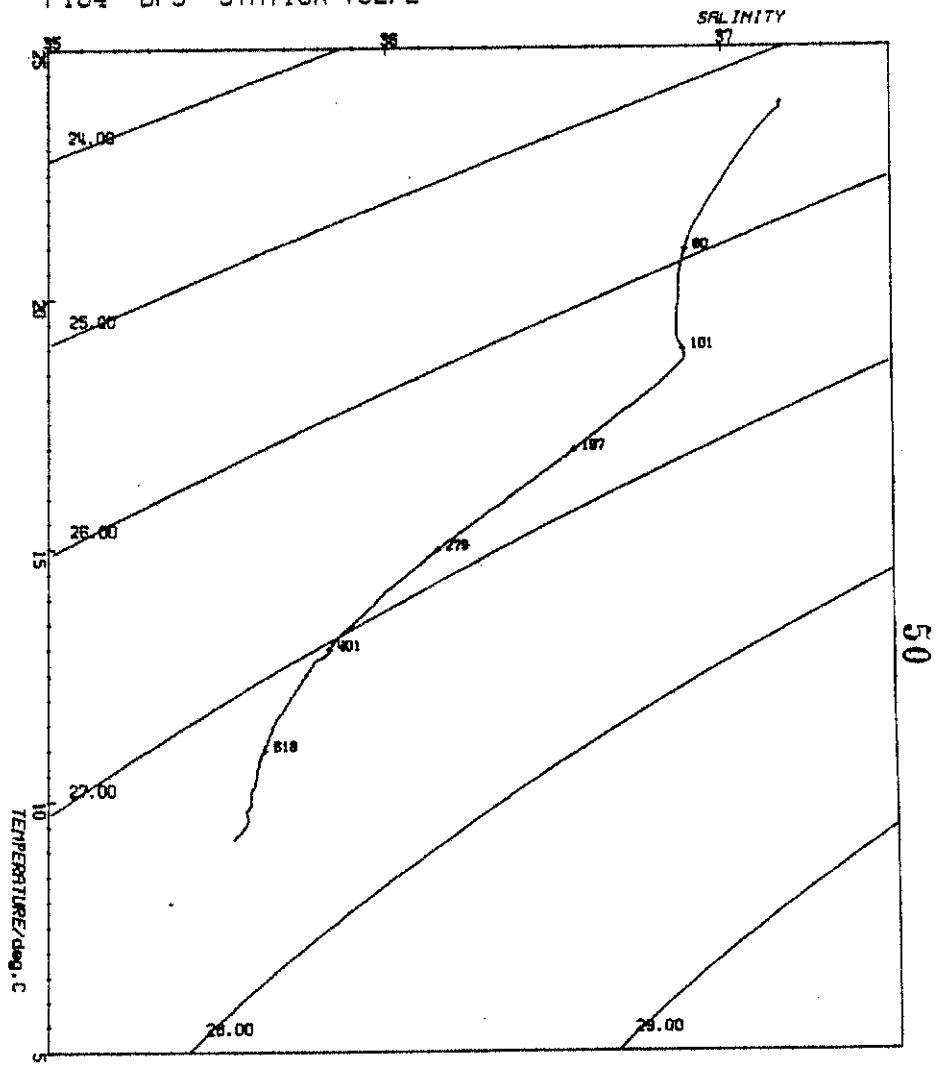

P104 DPS STATION 762/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar


P104 DPS STATION 762/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

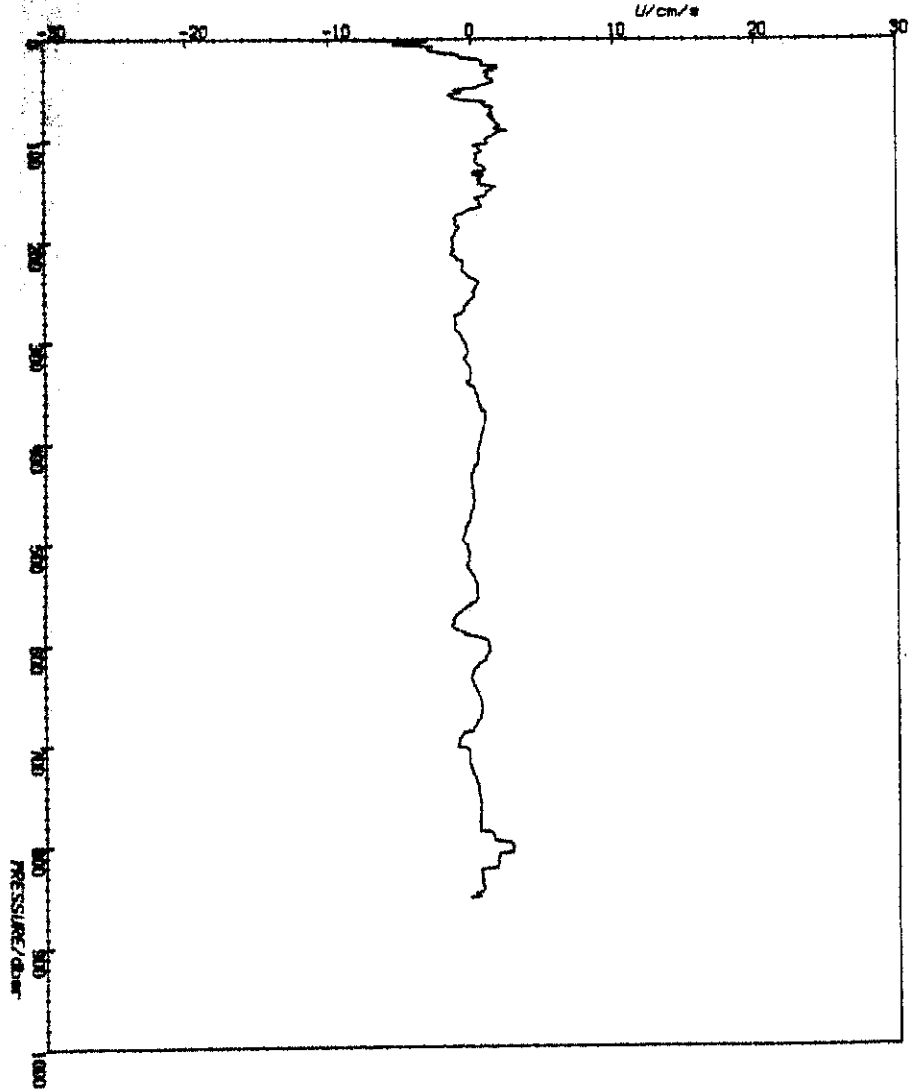
P104 DPS STATION 762/2



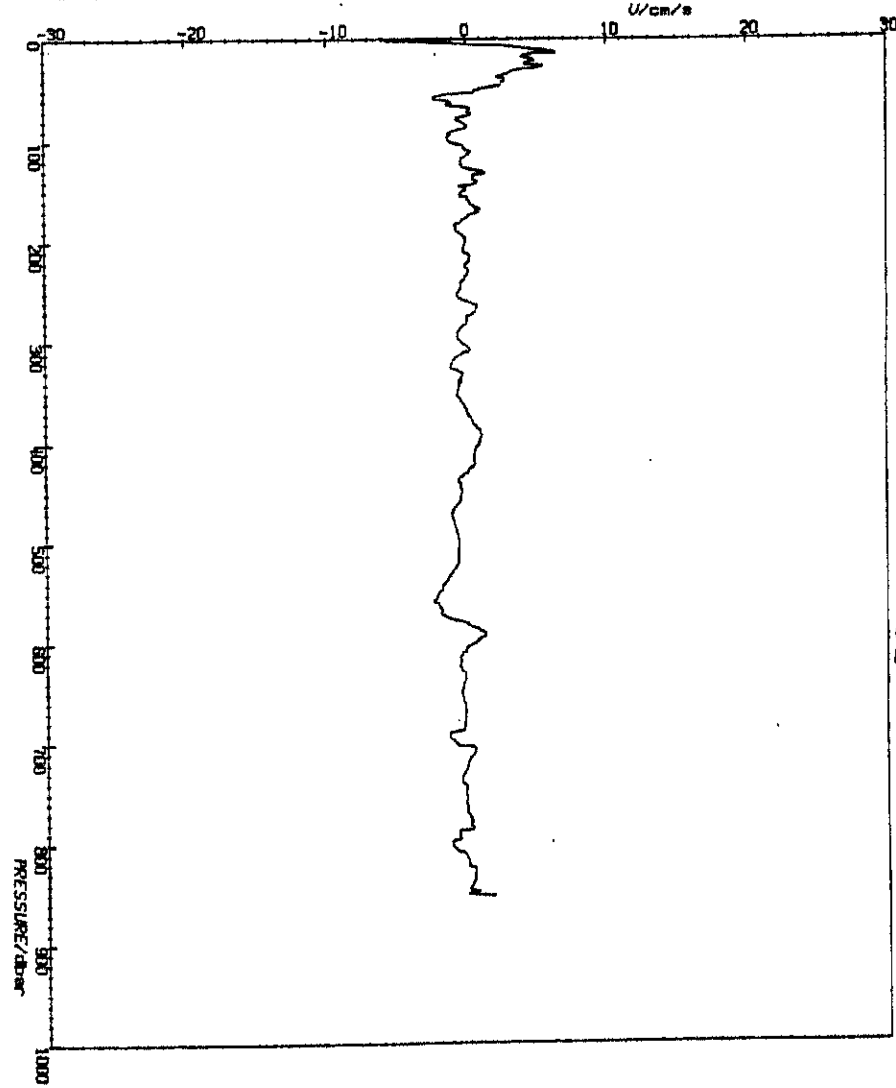
P104 DPS STATION 762/2



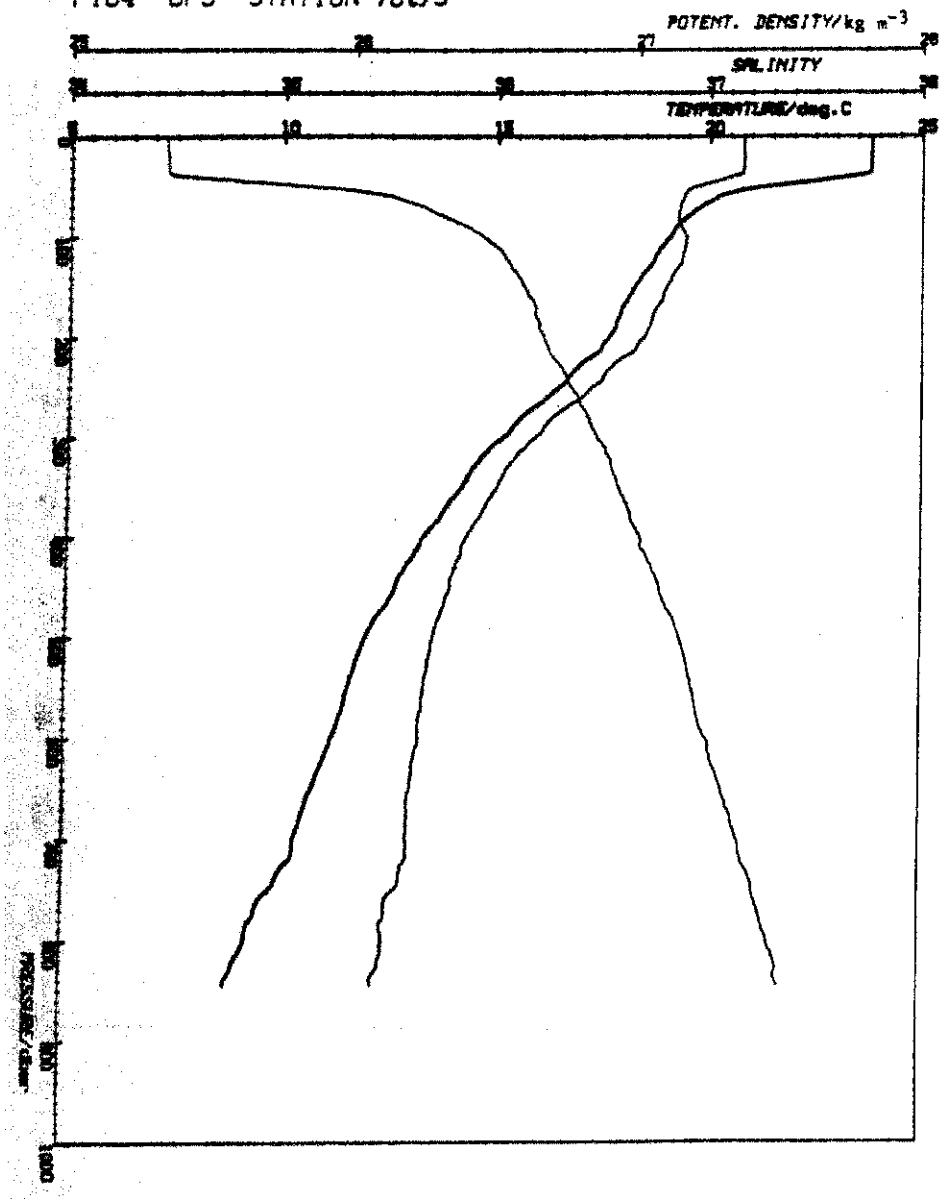
P104 DPS STATION 762/2



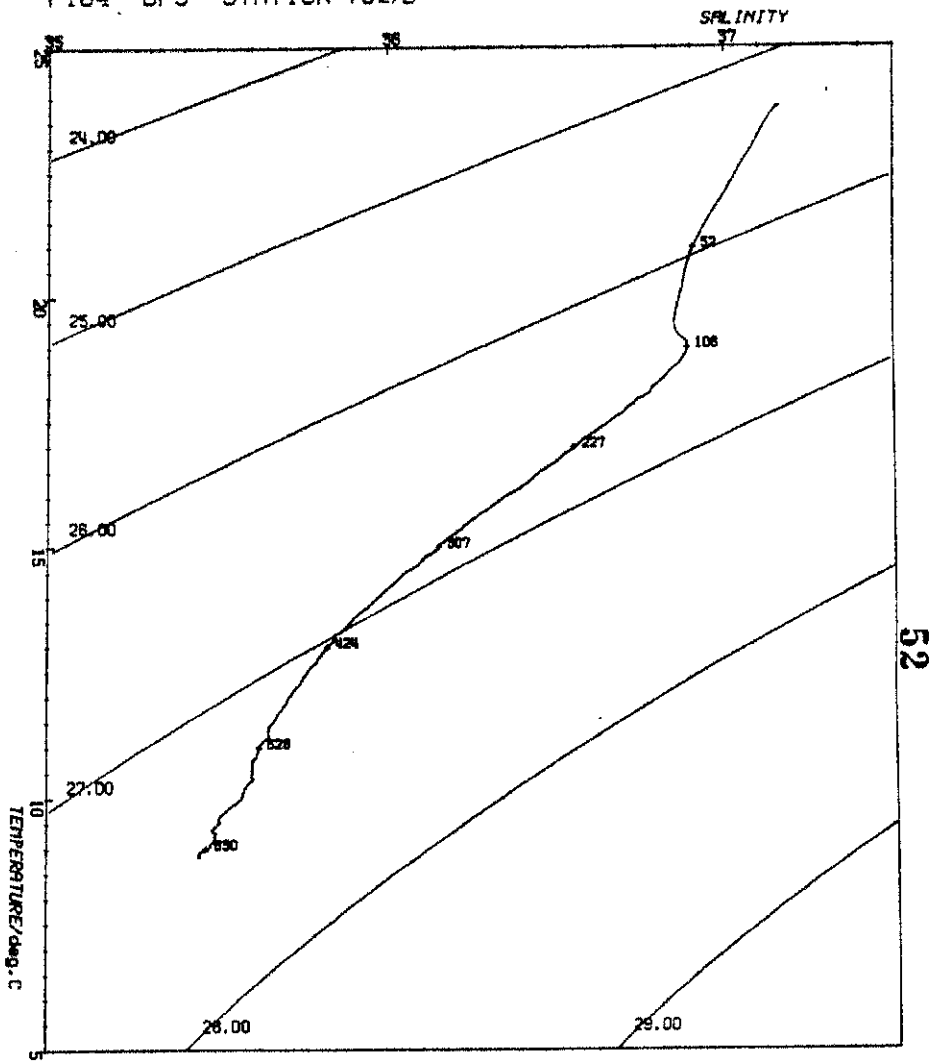
P104 DPS STATION 762/2



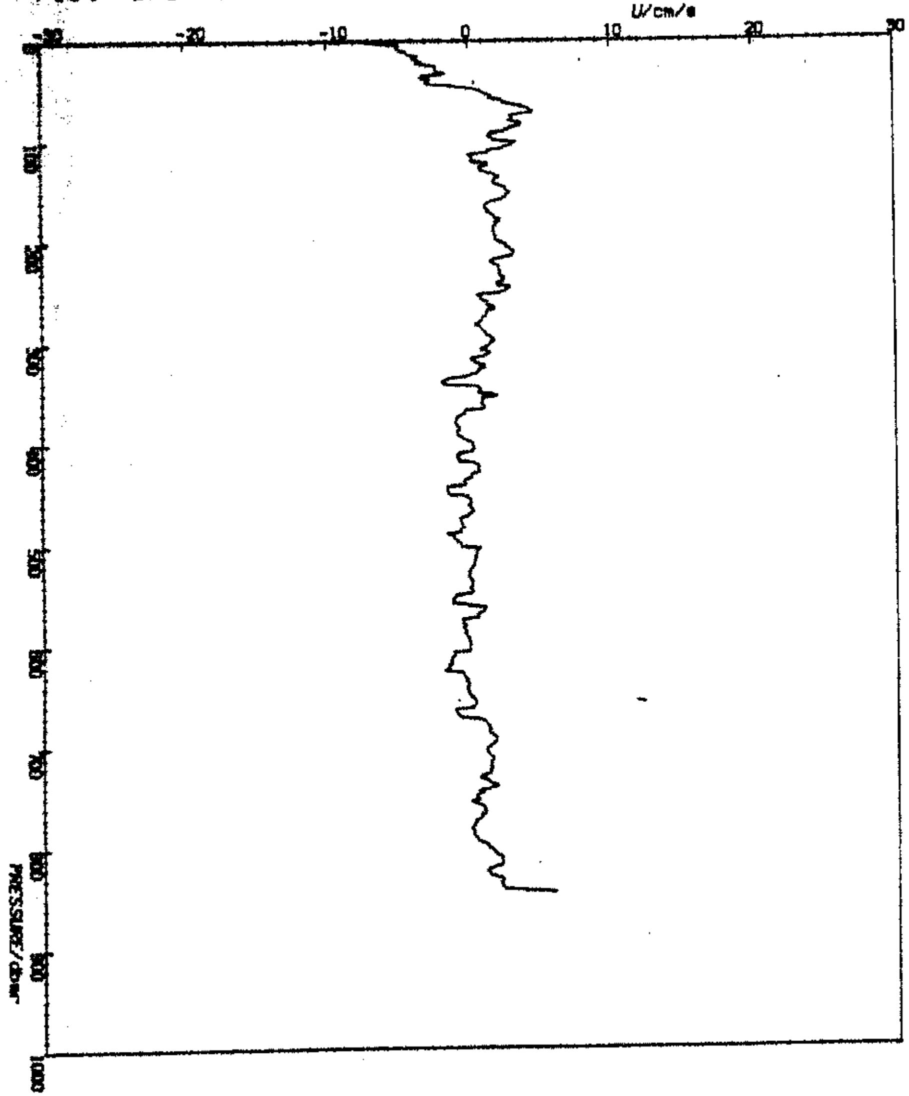
P104 DPS STATION 762/3



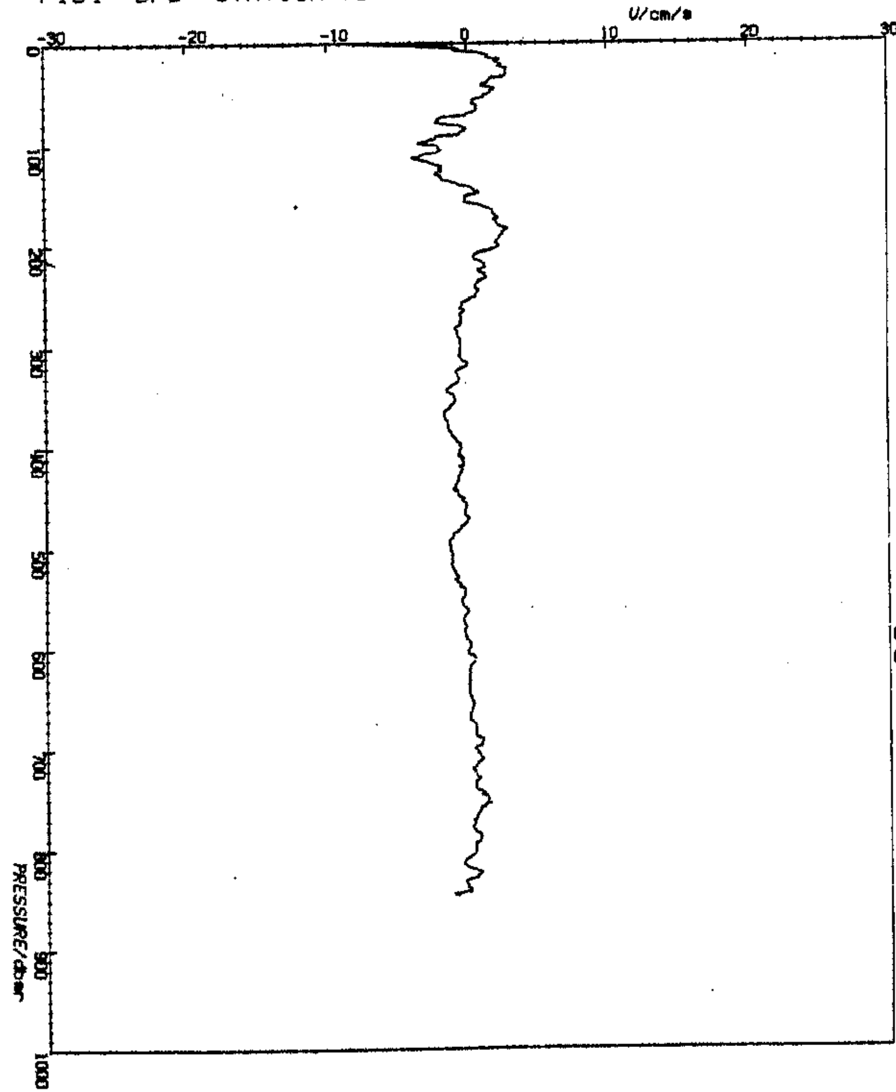
P104 DPS STATION 762/3



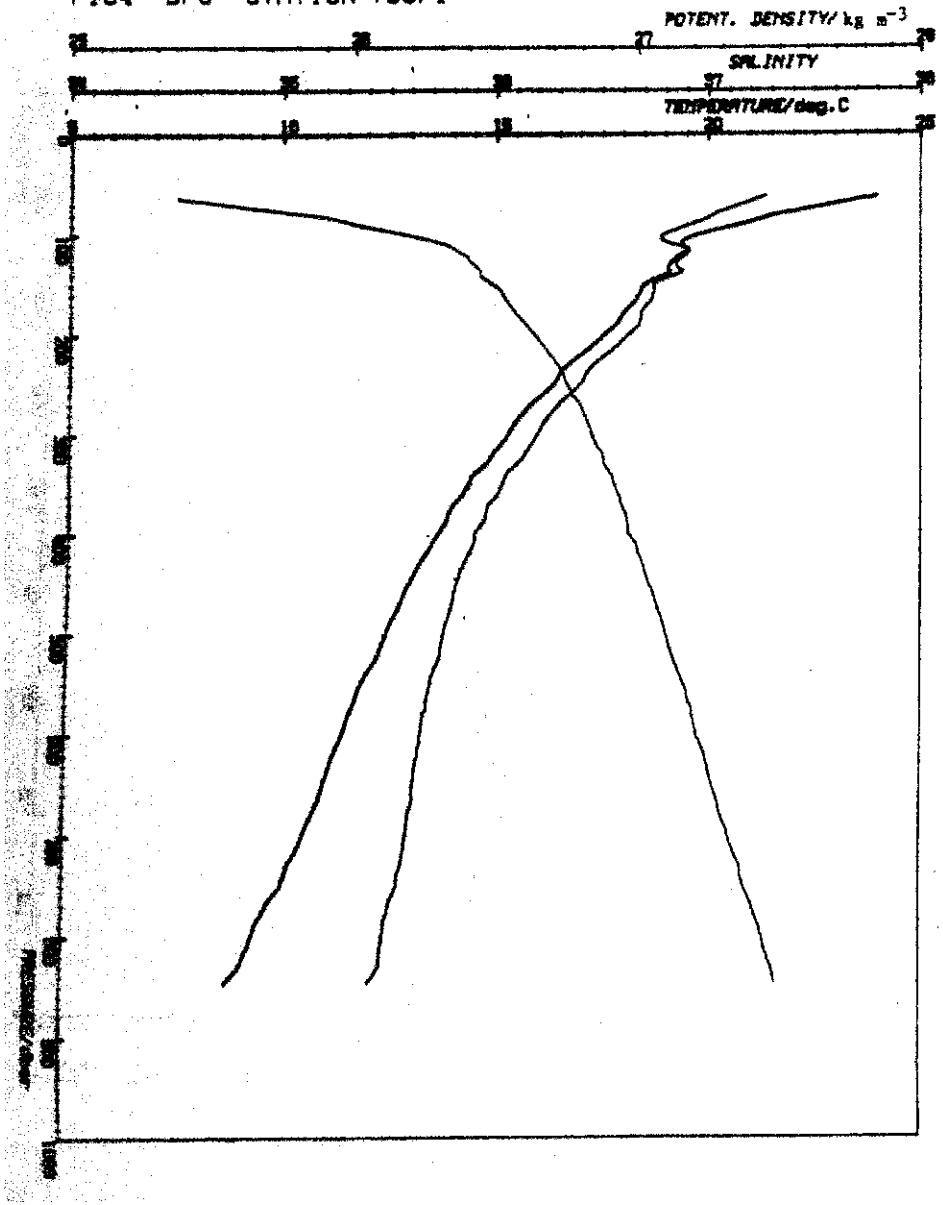
P104 DPS STATION 762/3



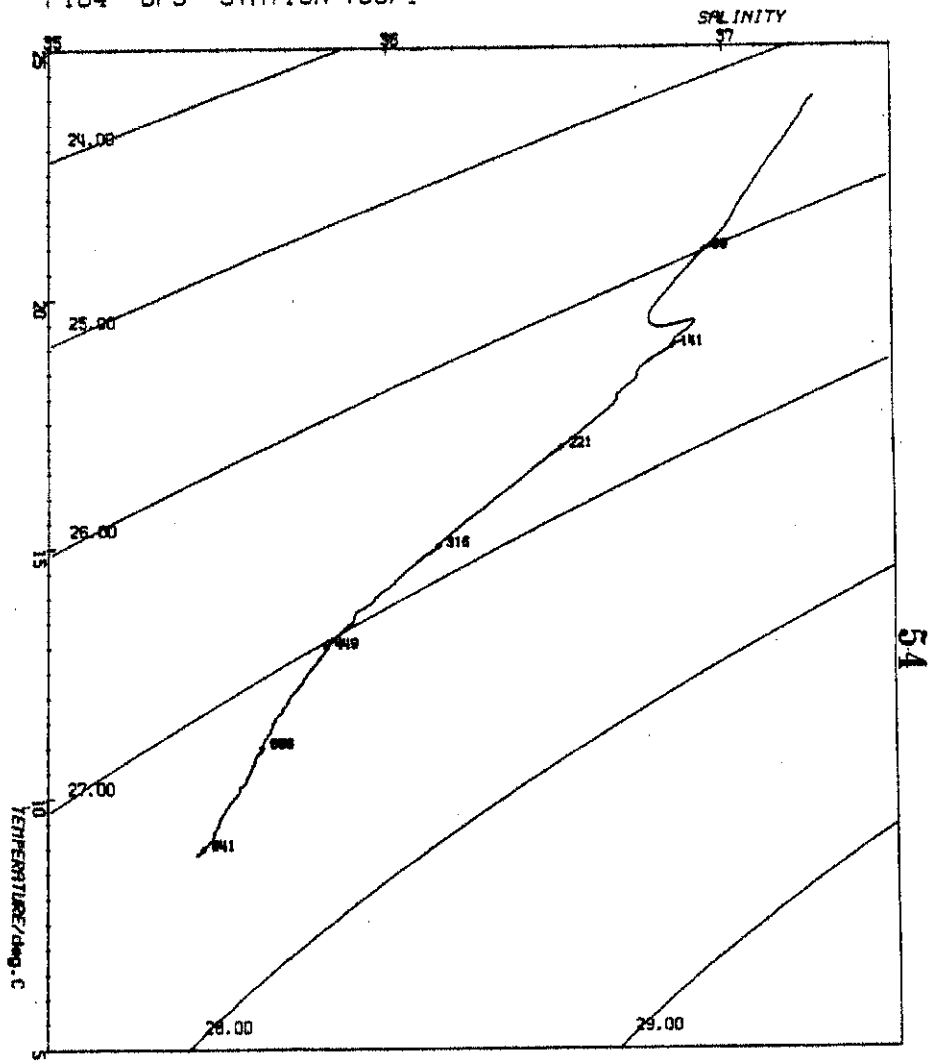
P104 DPS STATION 762/3



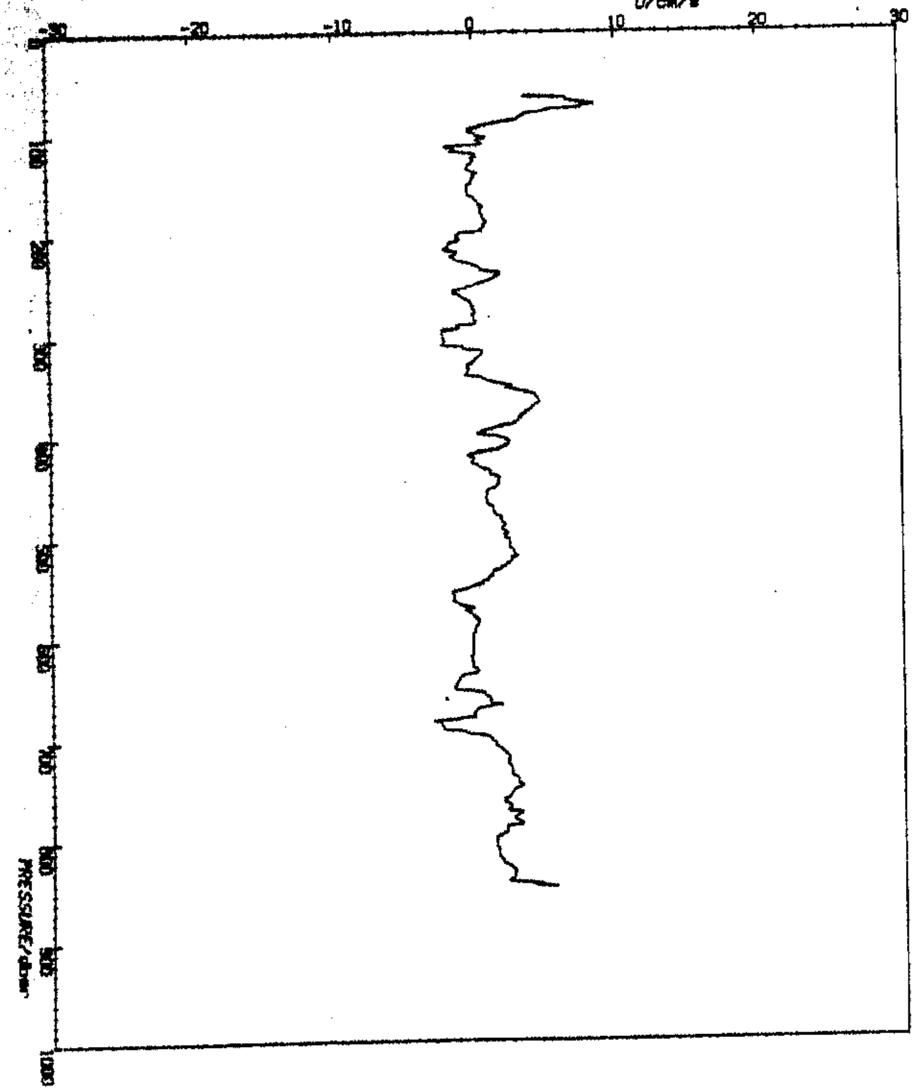
P104 DPS STATION 765/1



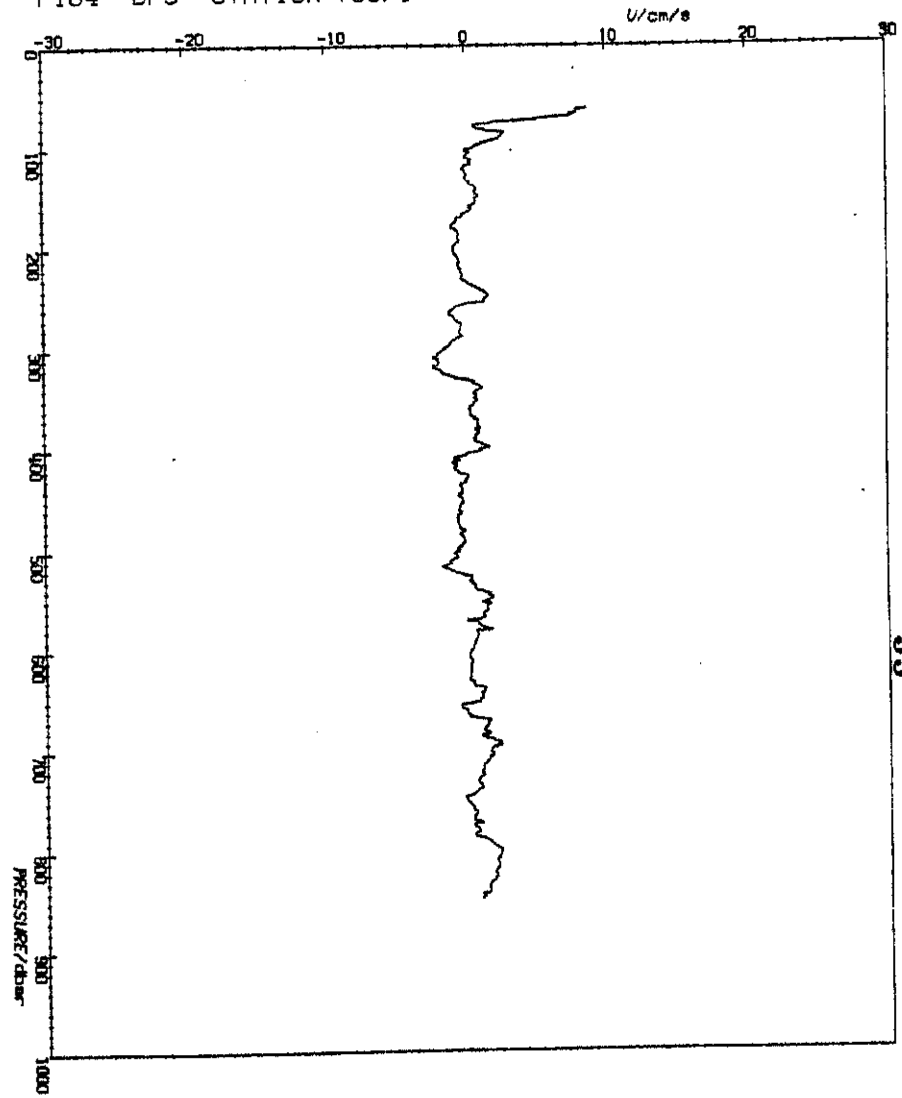
P104 DPS STATION 765/1



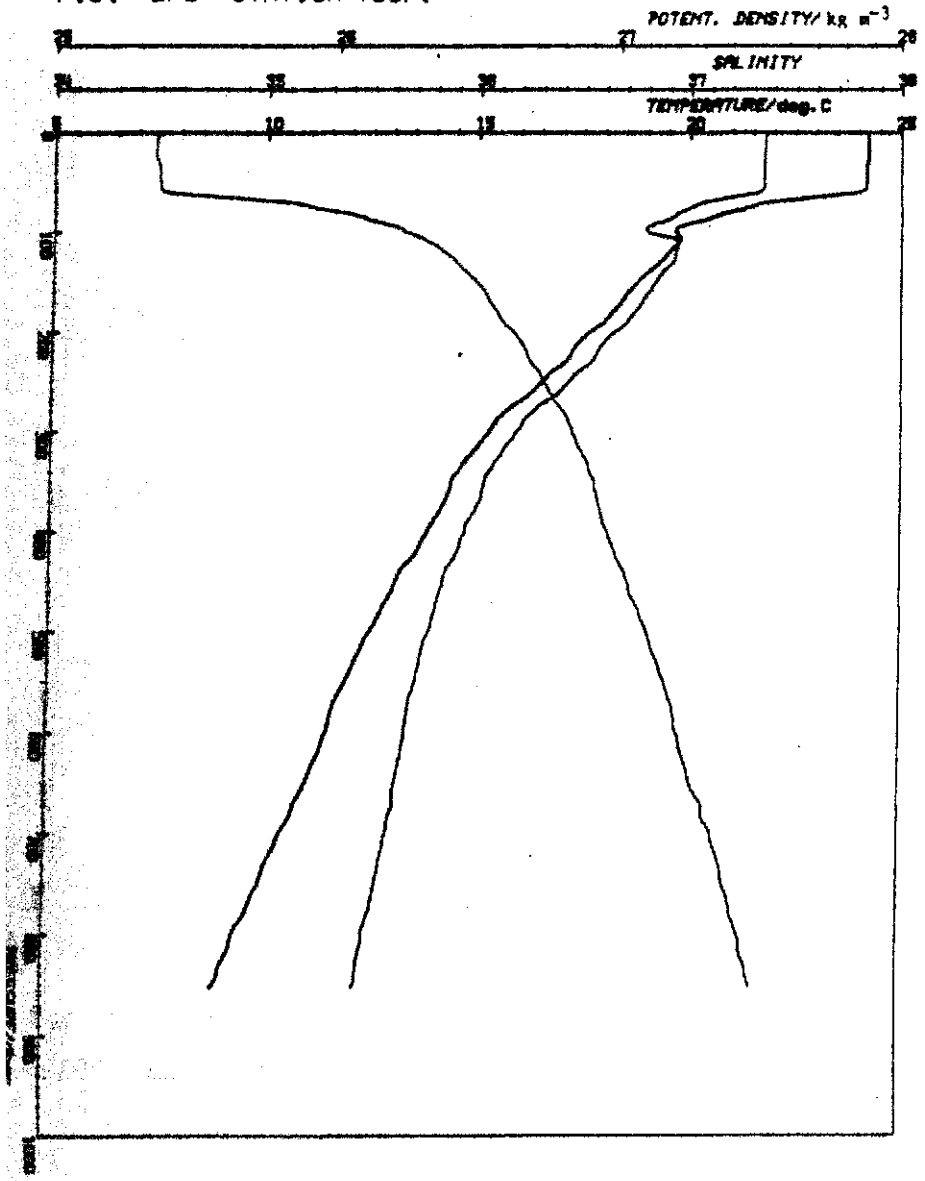
P104 DPS STATION 765/1



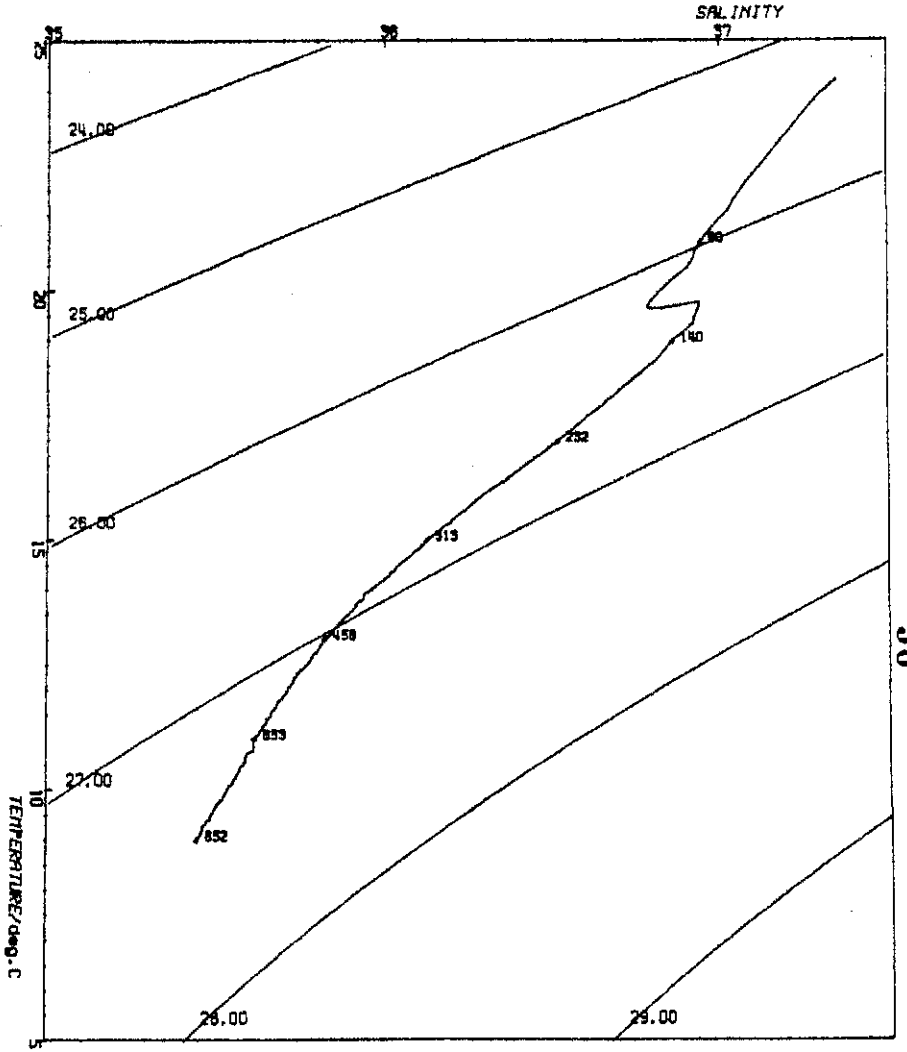
P104 DPS STATION 765/1



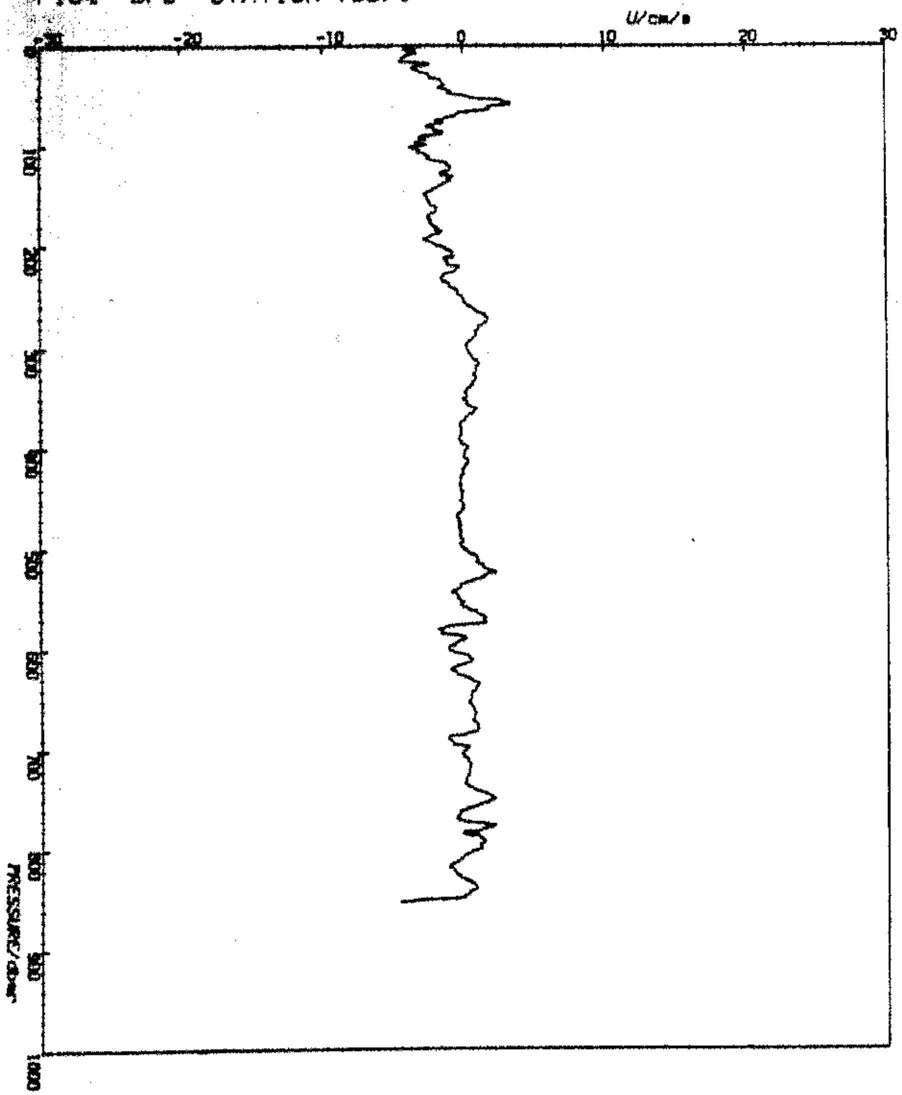
P104 DPS STATION 766/1



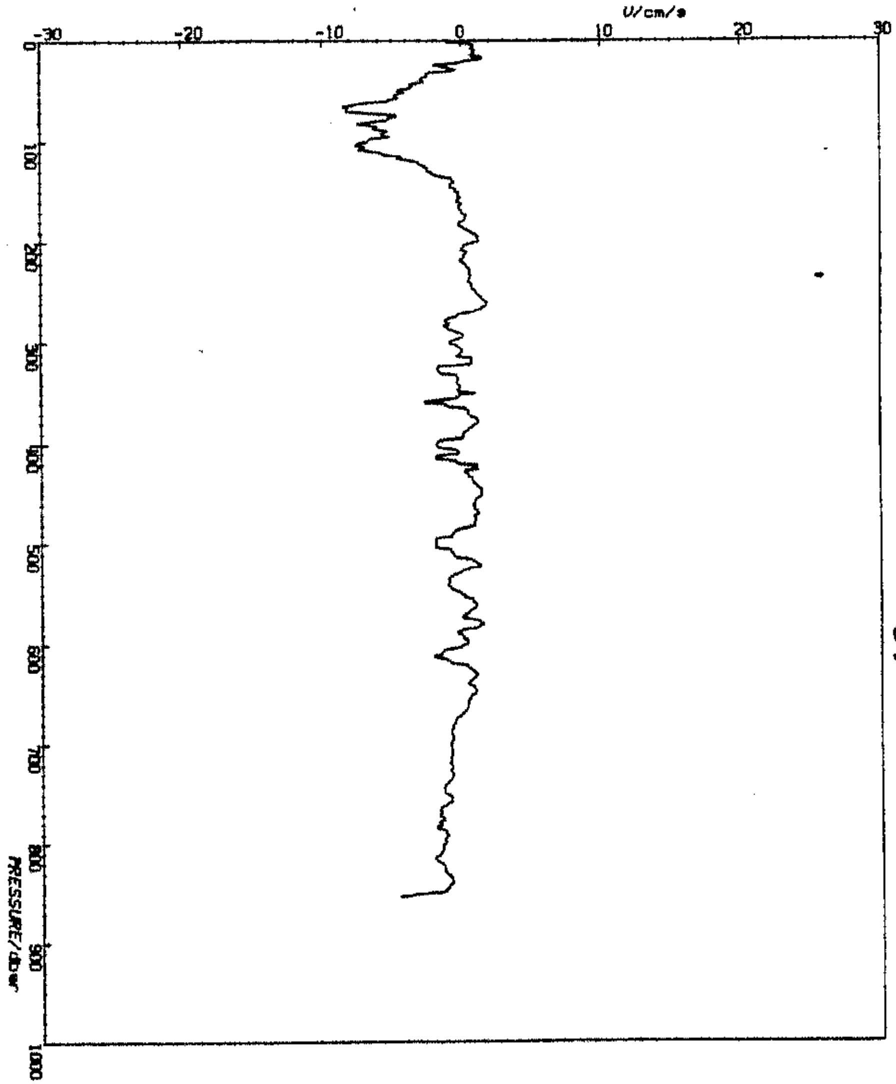
P104 DPS STATION 766/1



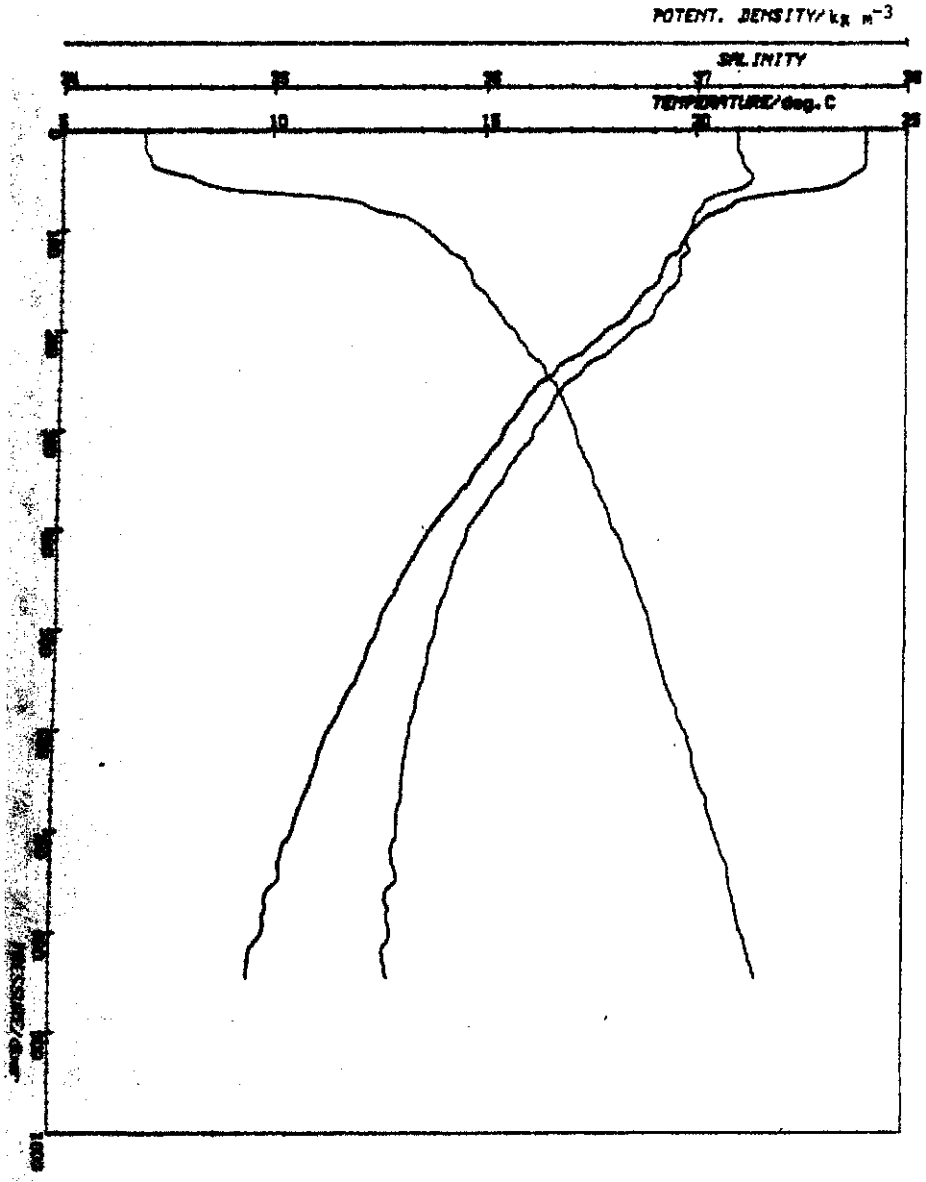
P104 DPS STATION 766/1



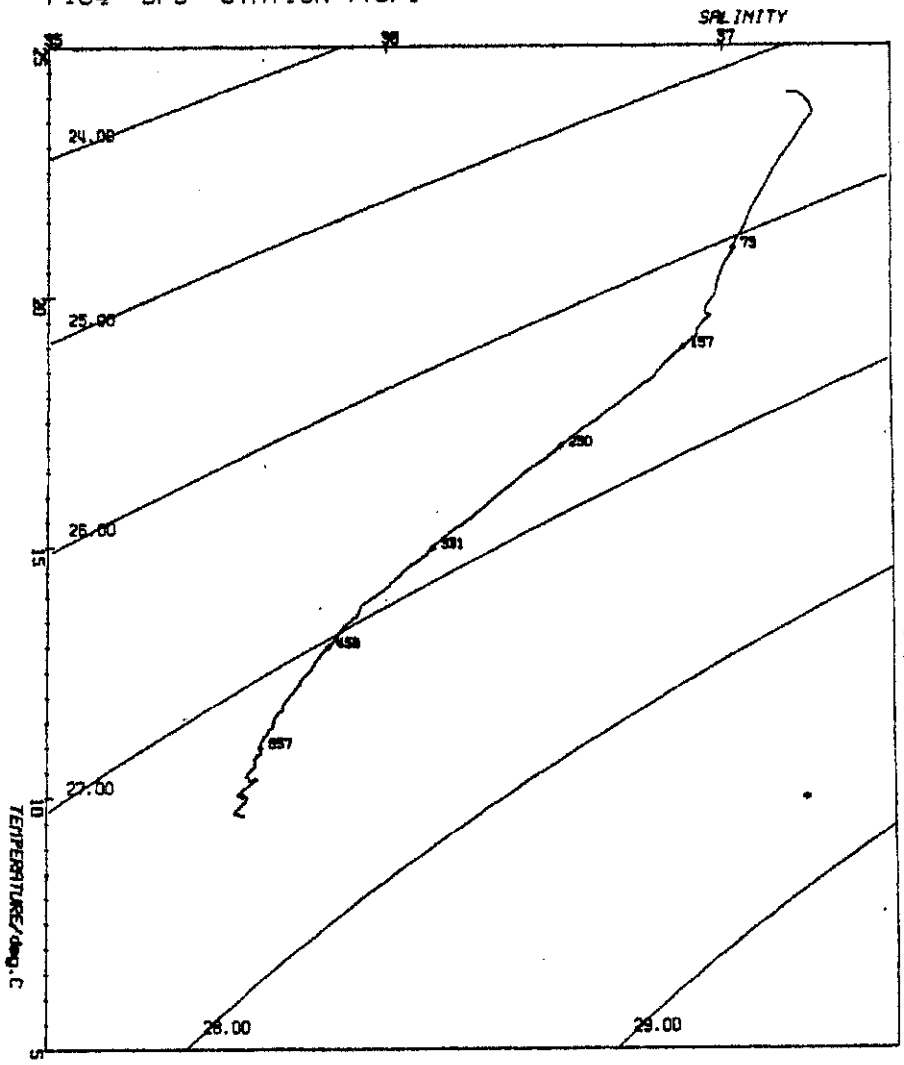
P104 DPS STATION 766/1



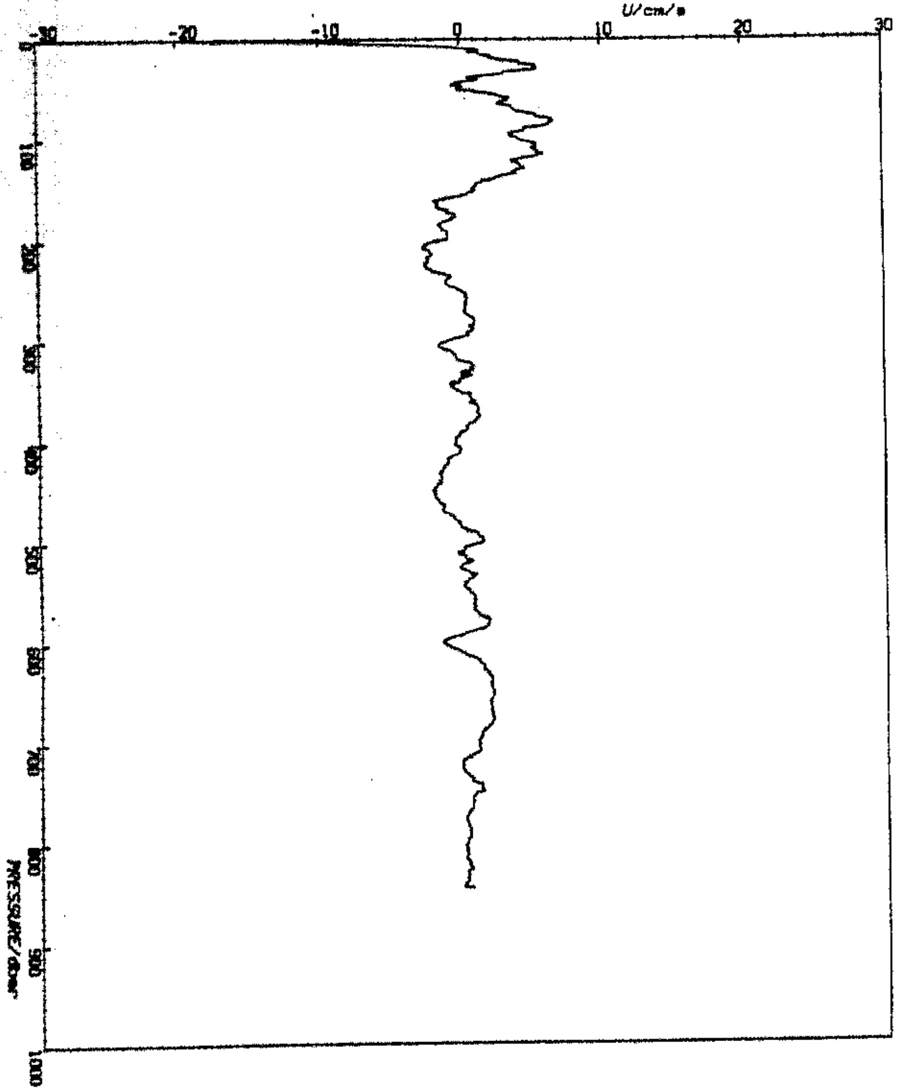
P104 DPS STATION 770/1.



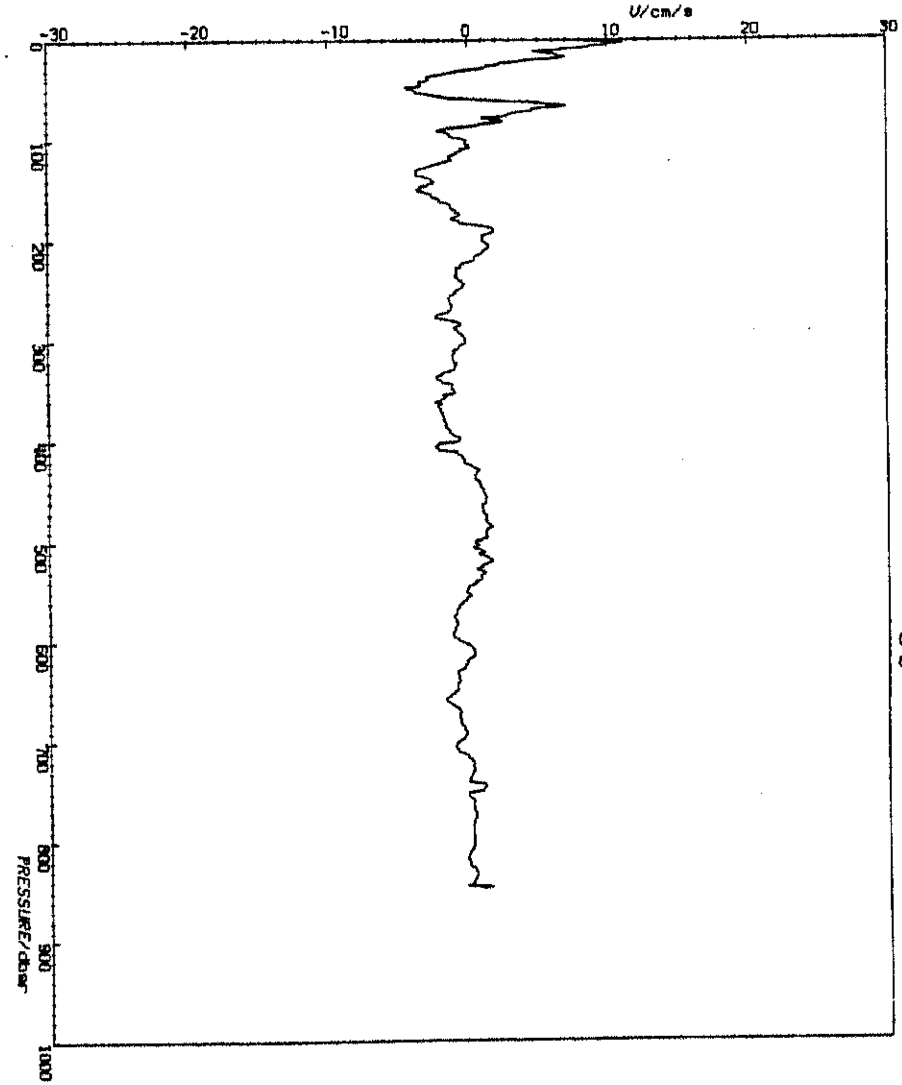
P104 DPS STATION 770/1



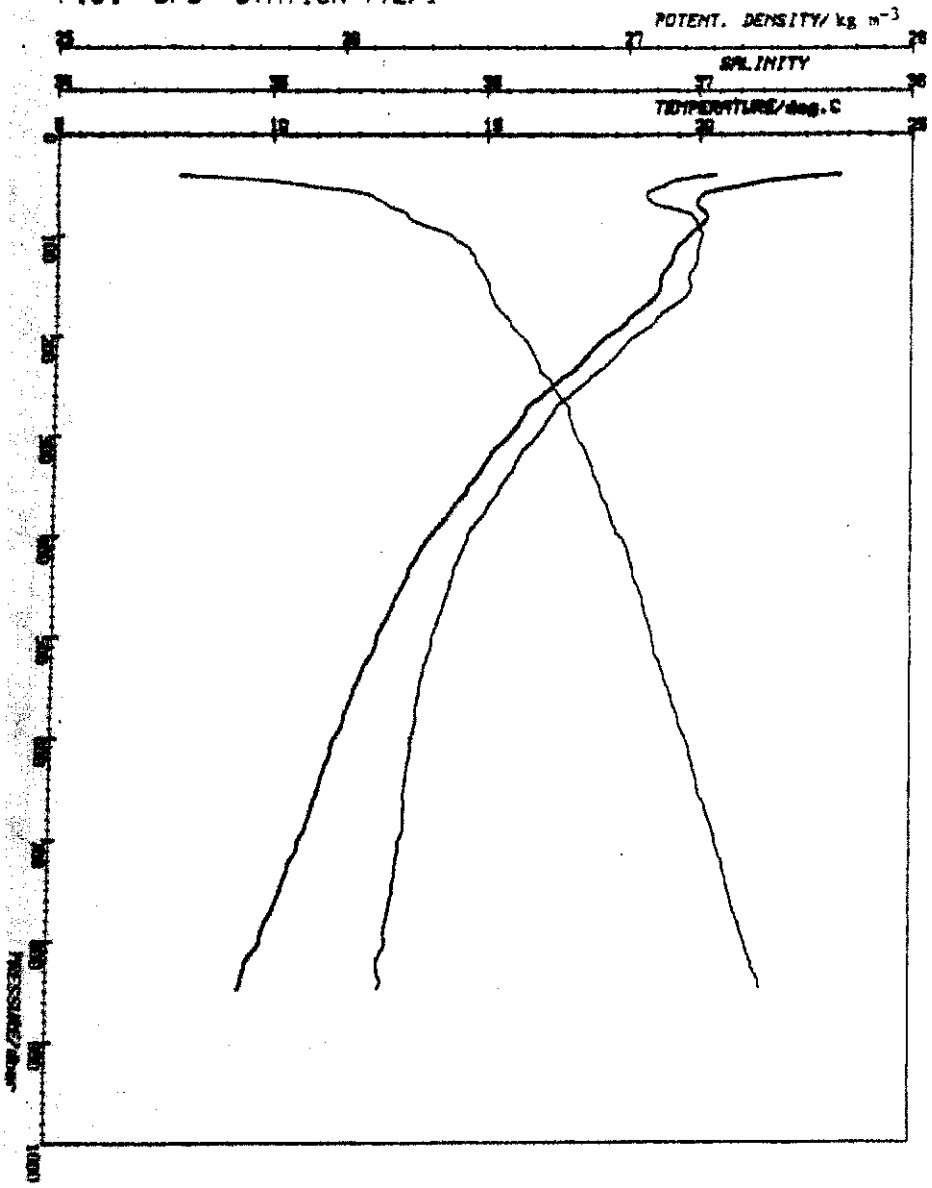
P104 DPS STATION 770/1



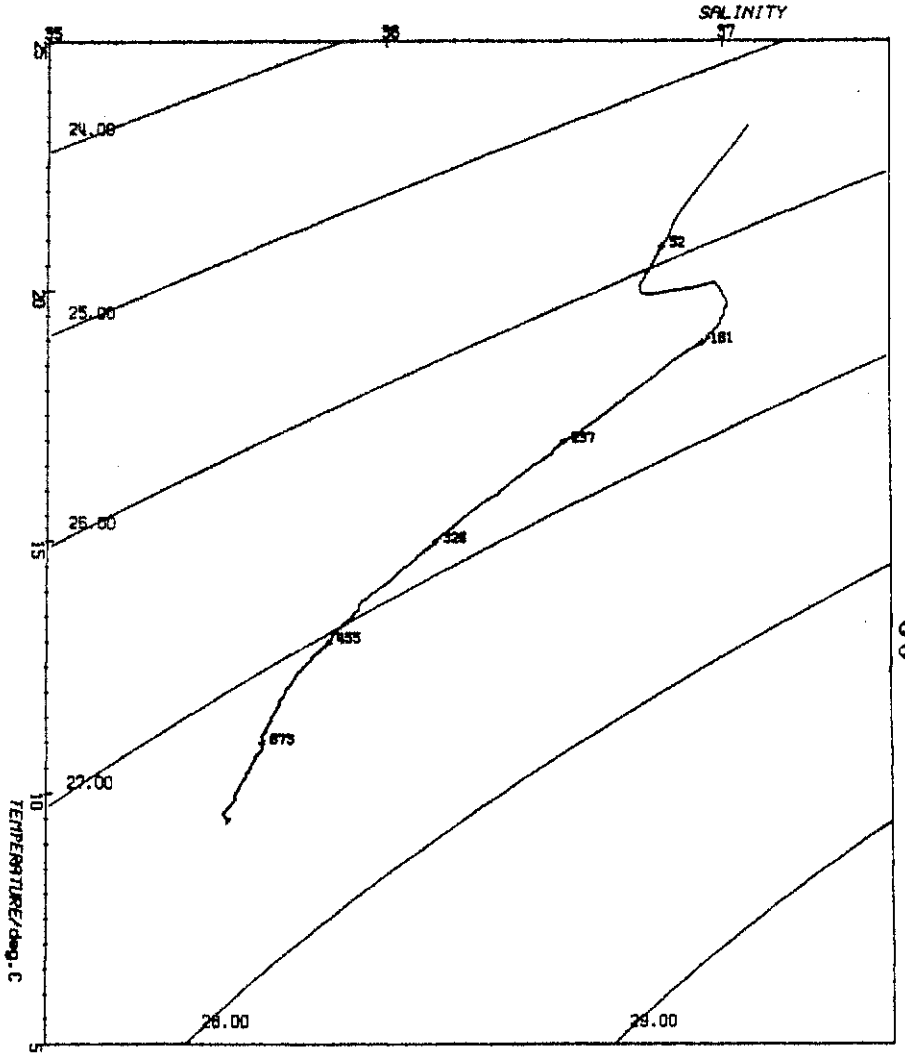
P104 DPS STATION 770/1

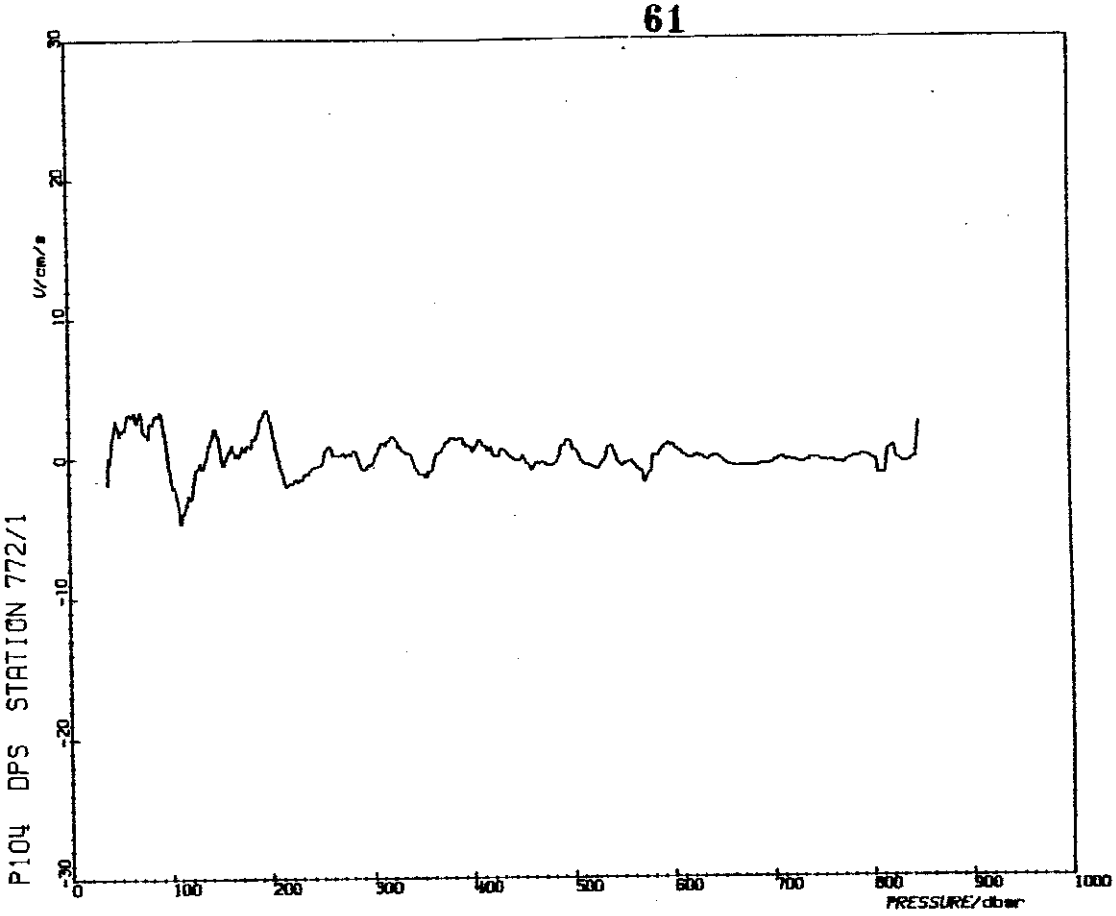


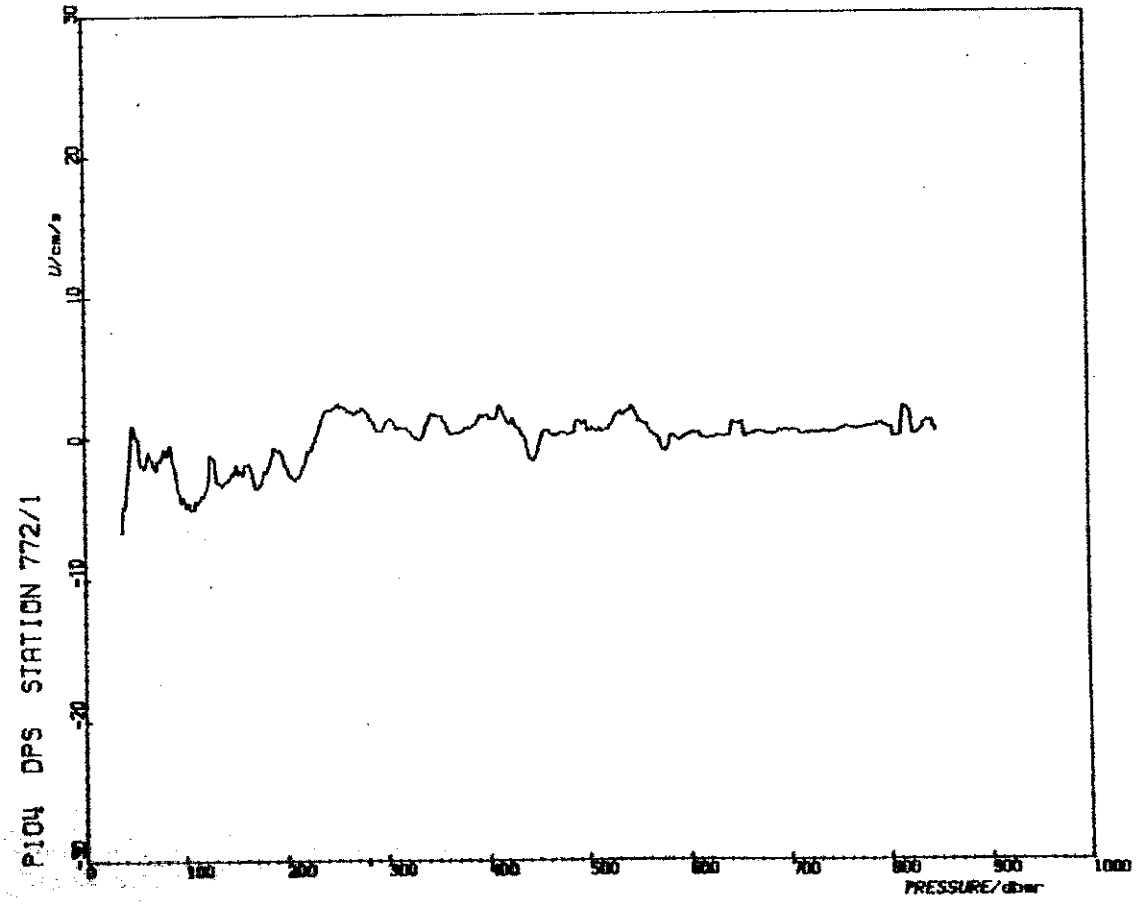
P104 DPS STATION 772/1

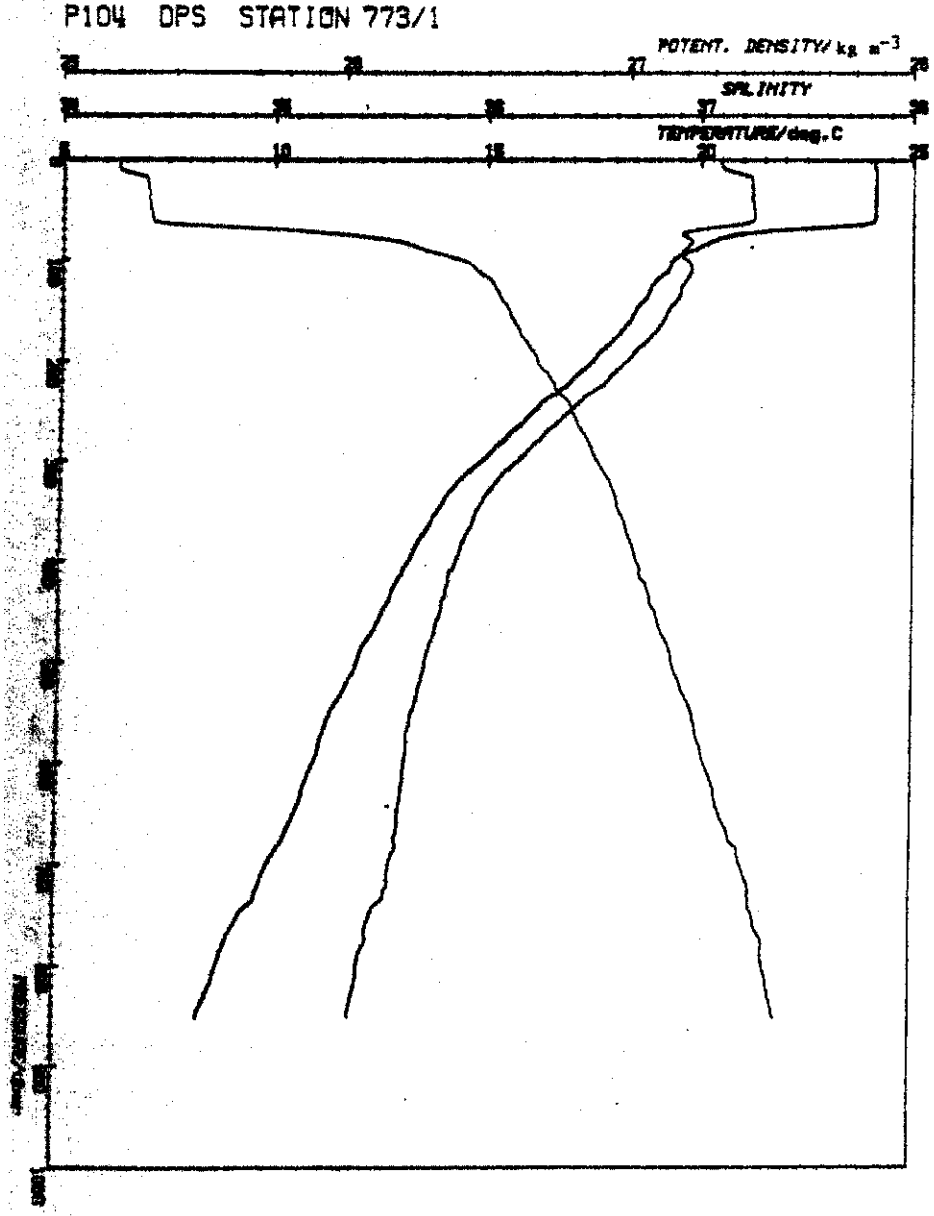


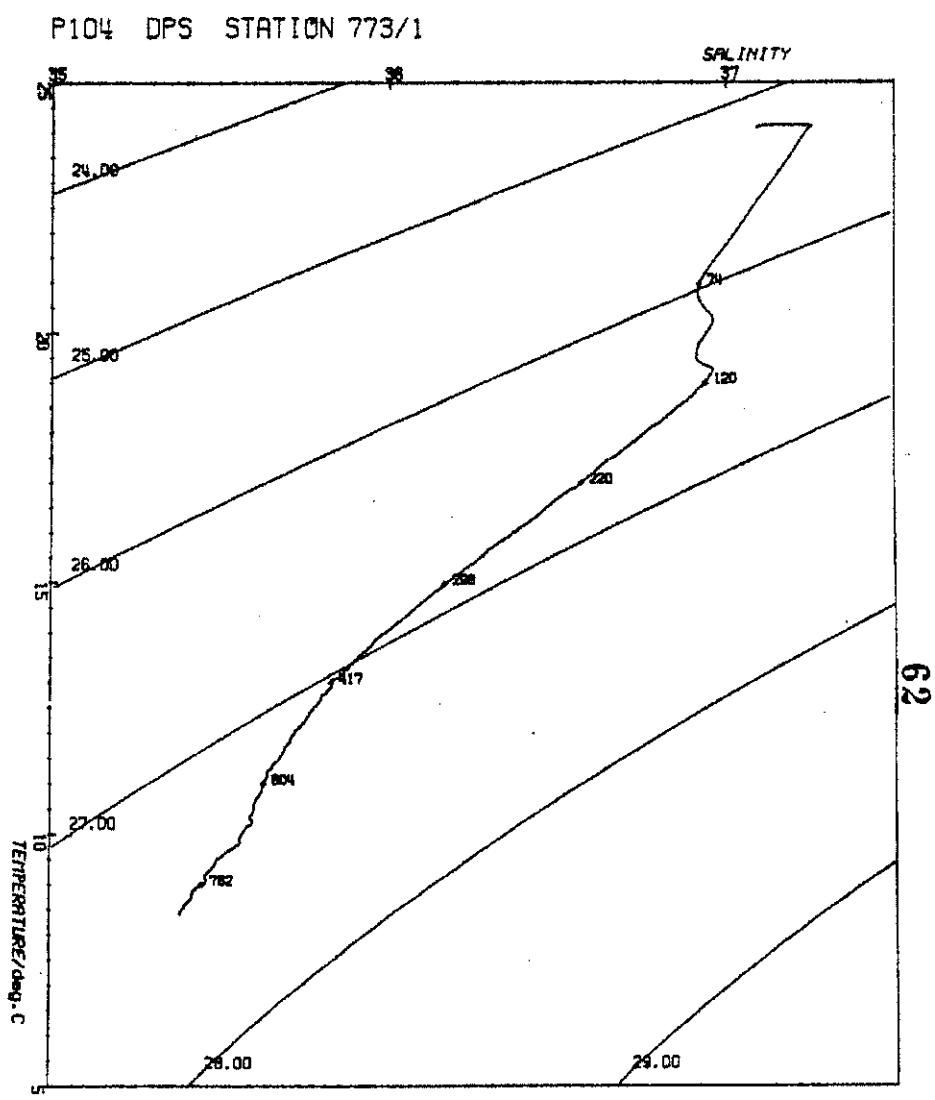
P104 DPS STATION 772/1



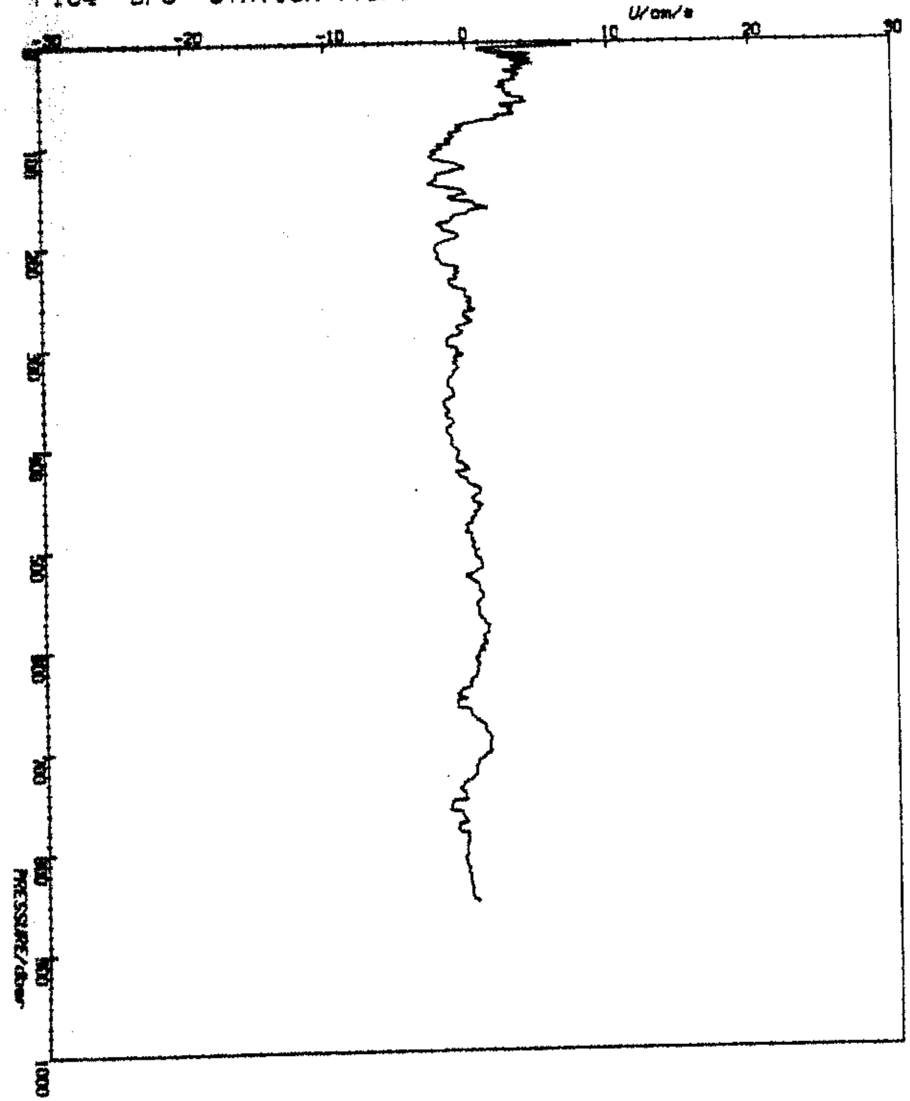

P104 DPS STATION 772/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar


P104 DPS STATION 772/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

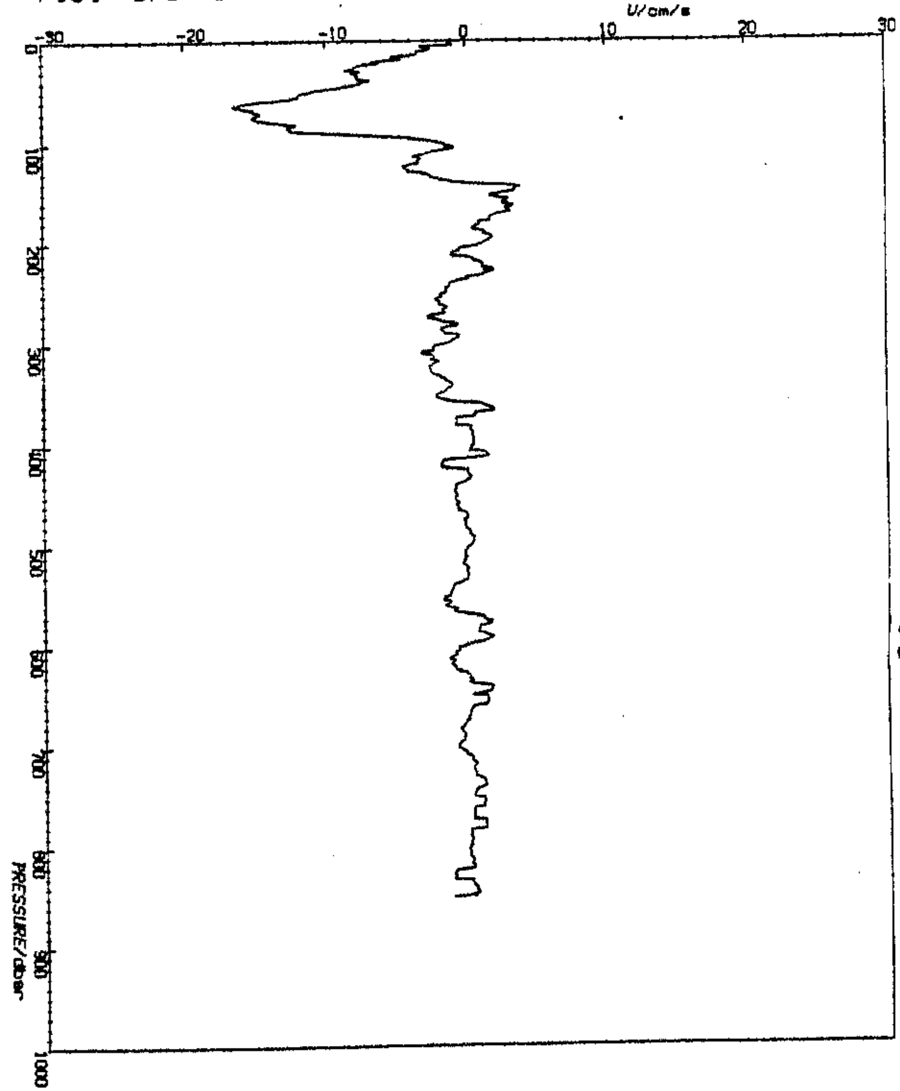

P104 DPS STATION 773/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C


P104 DPS STATION 773/1
SALINITY
24.00
25.00
26.00
27.00
TEMPERATURE/deg.C
29.00

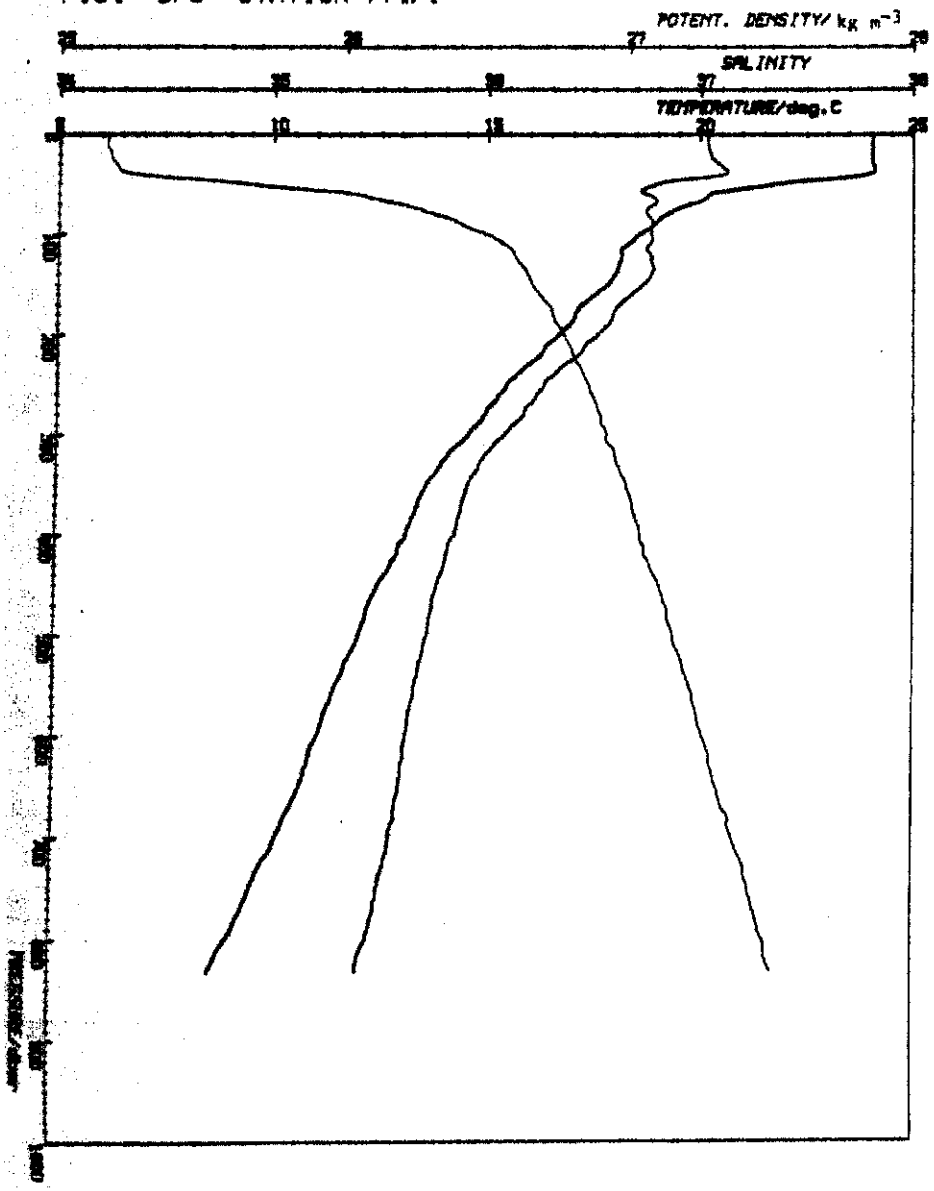
P104 DPS STATION 773/1



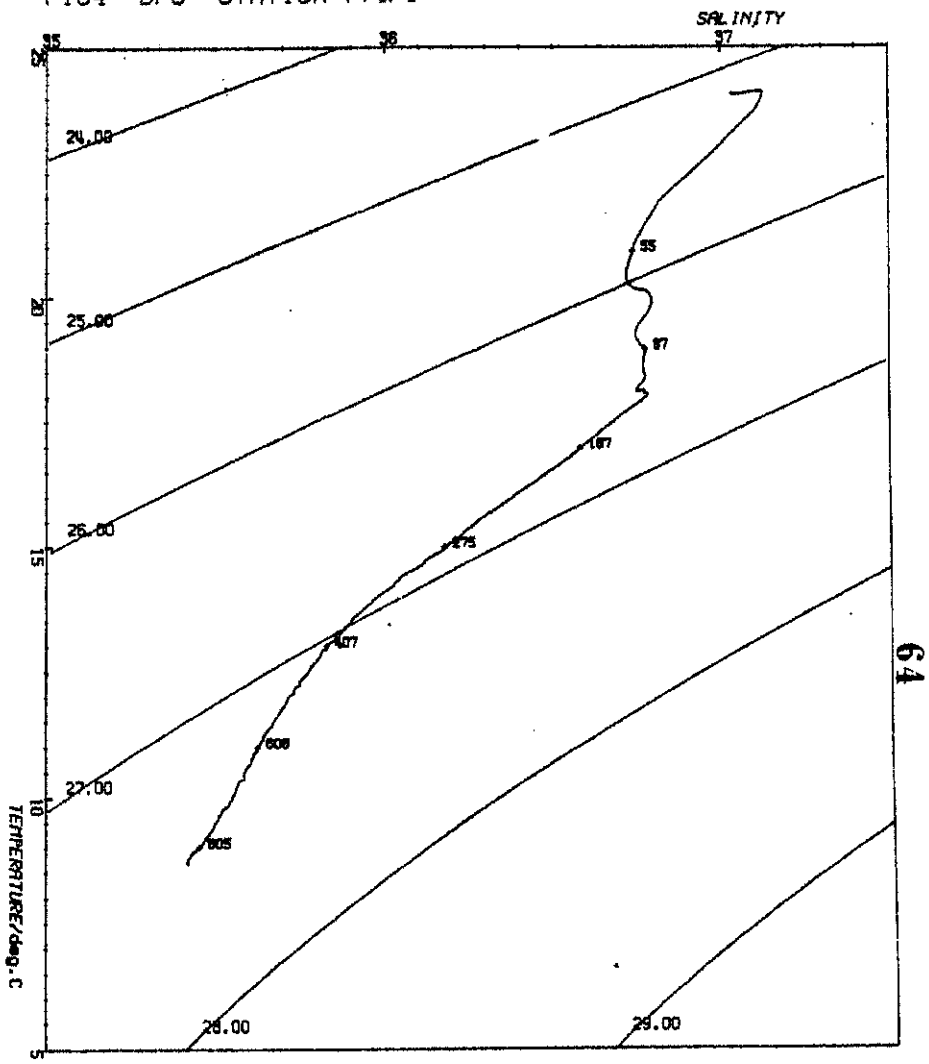
P104 DPS STATION 773/1



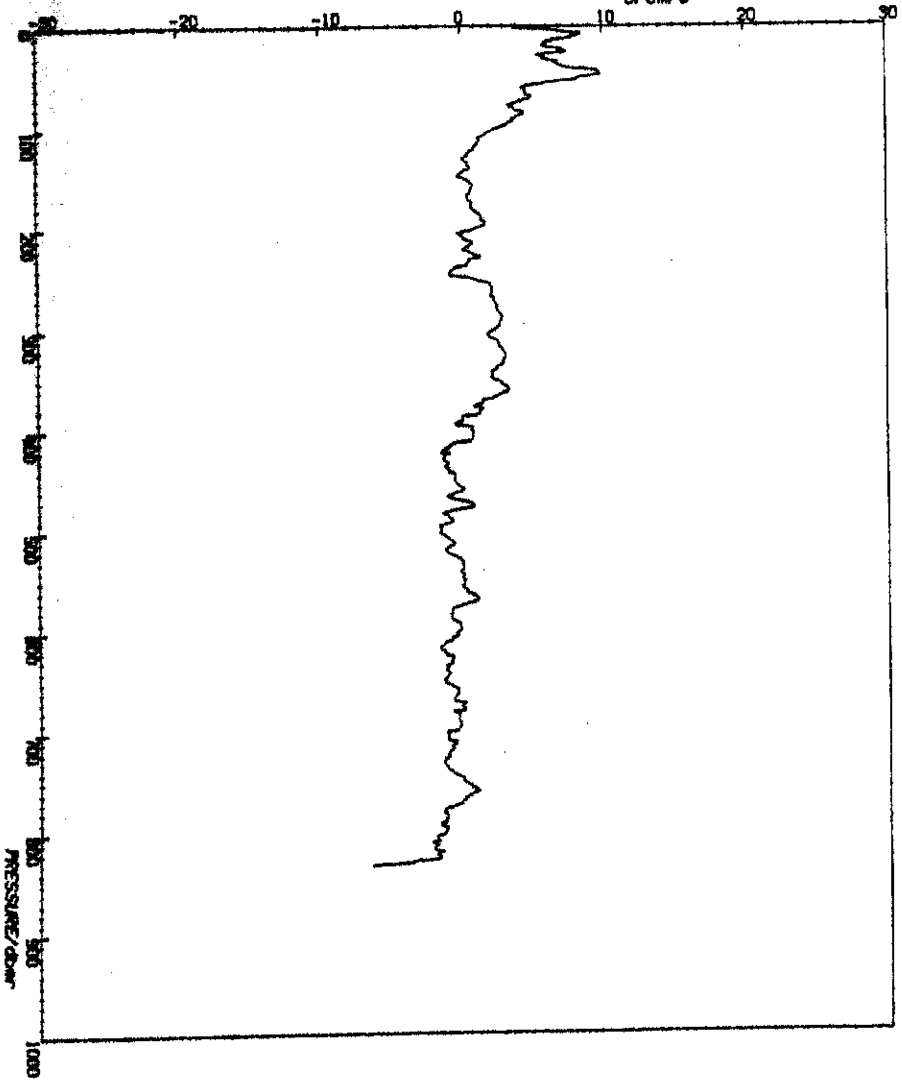
P104 DPS STATION 774/1



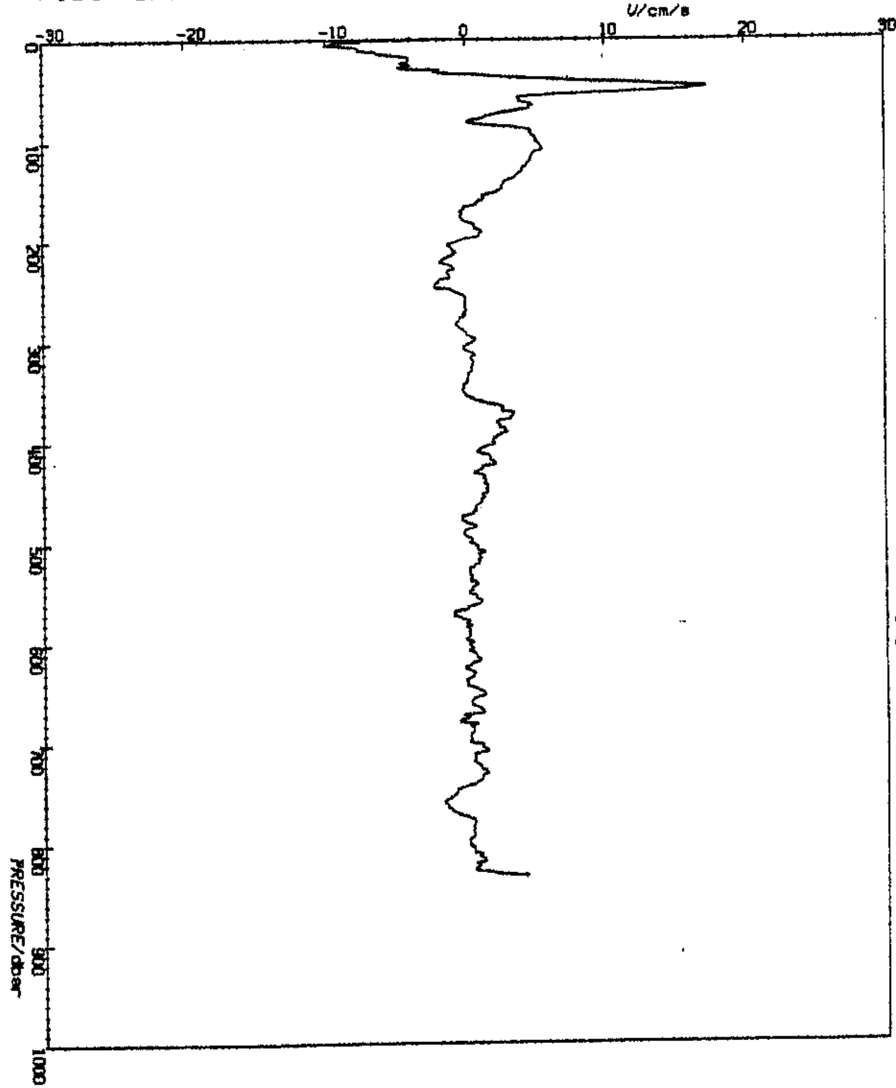
P104 DPS STATION 774/1



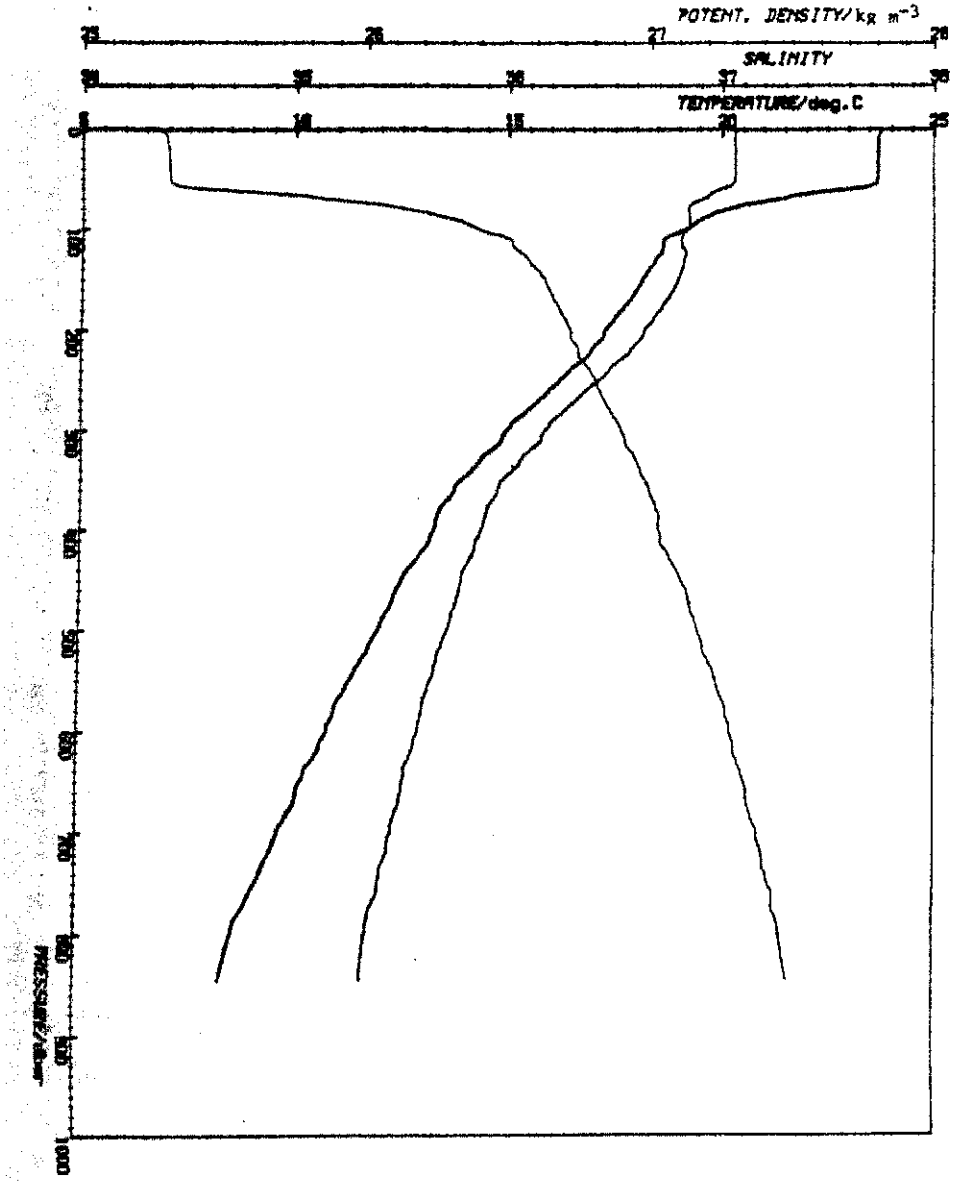
P104 DPS STATION 774/1



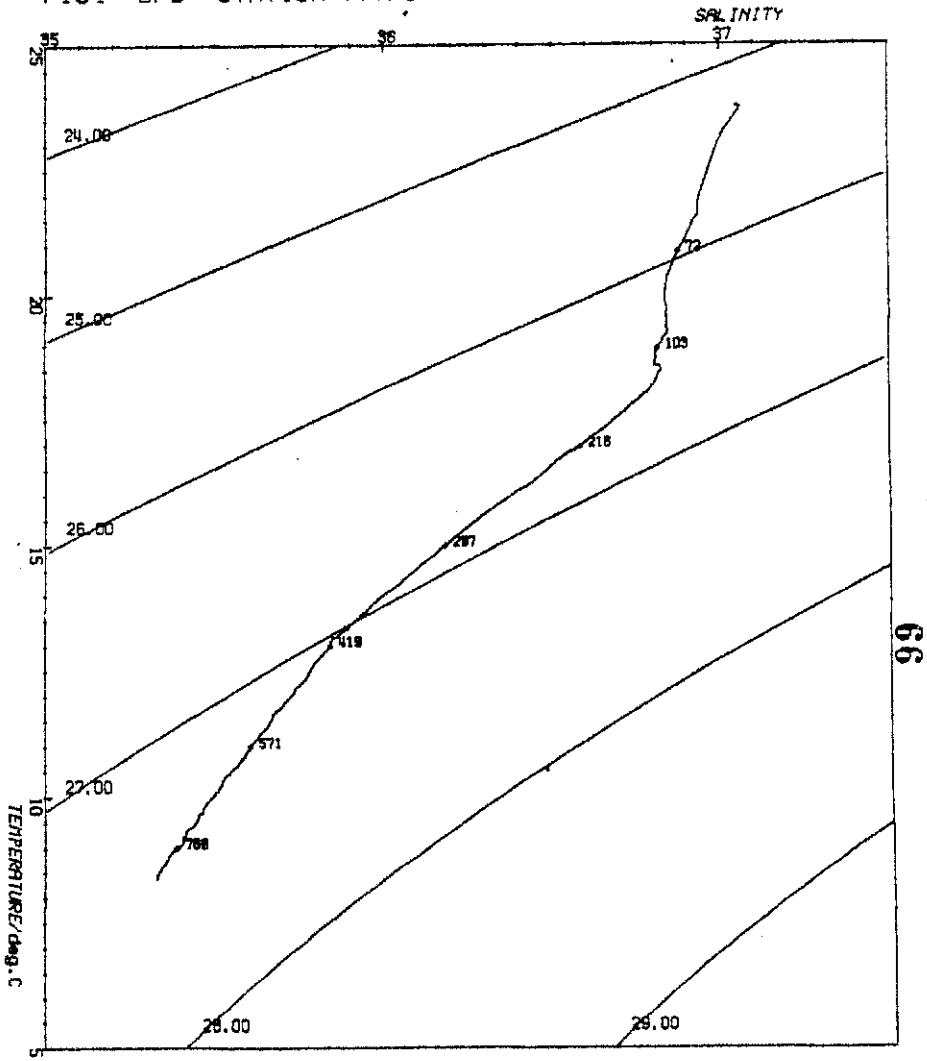
P104 DPS STATION 774/1

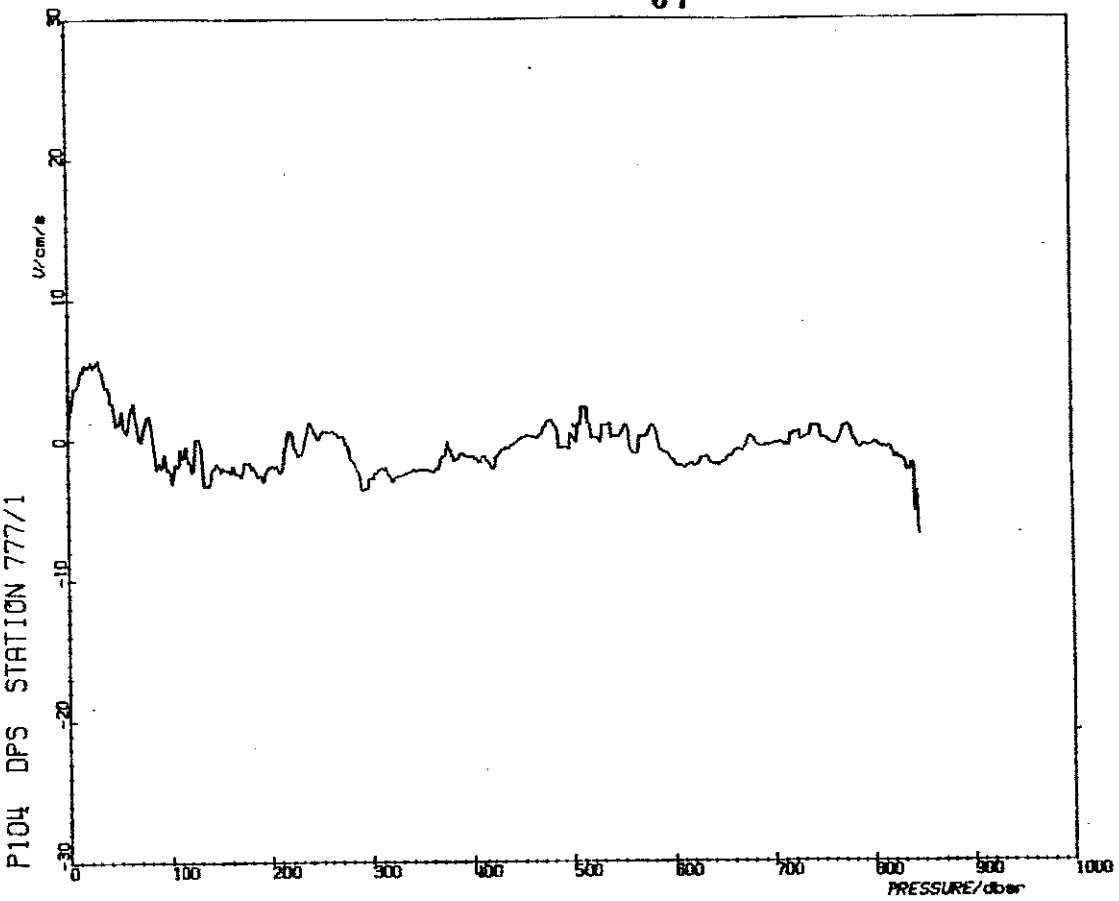


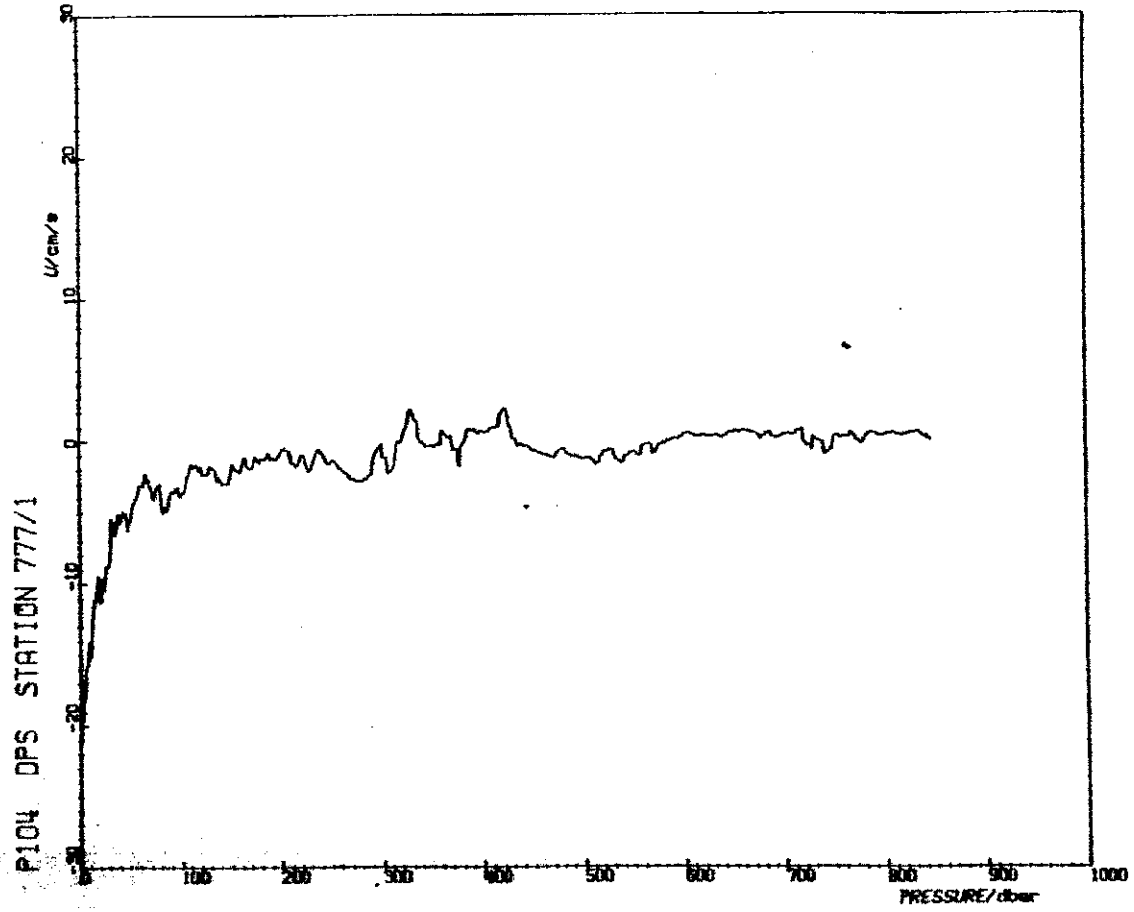
P104 DPS STATION 777/1



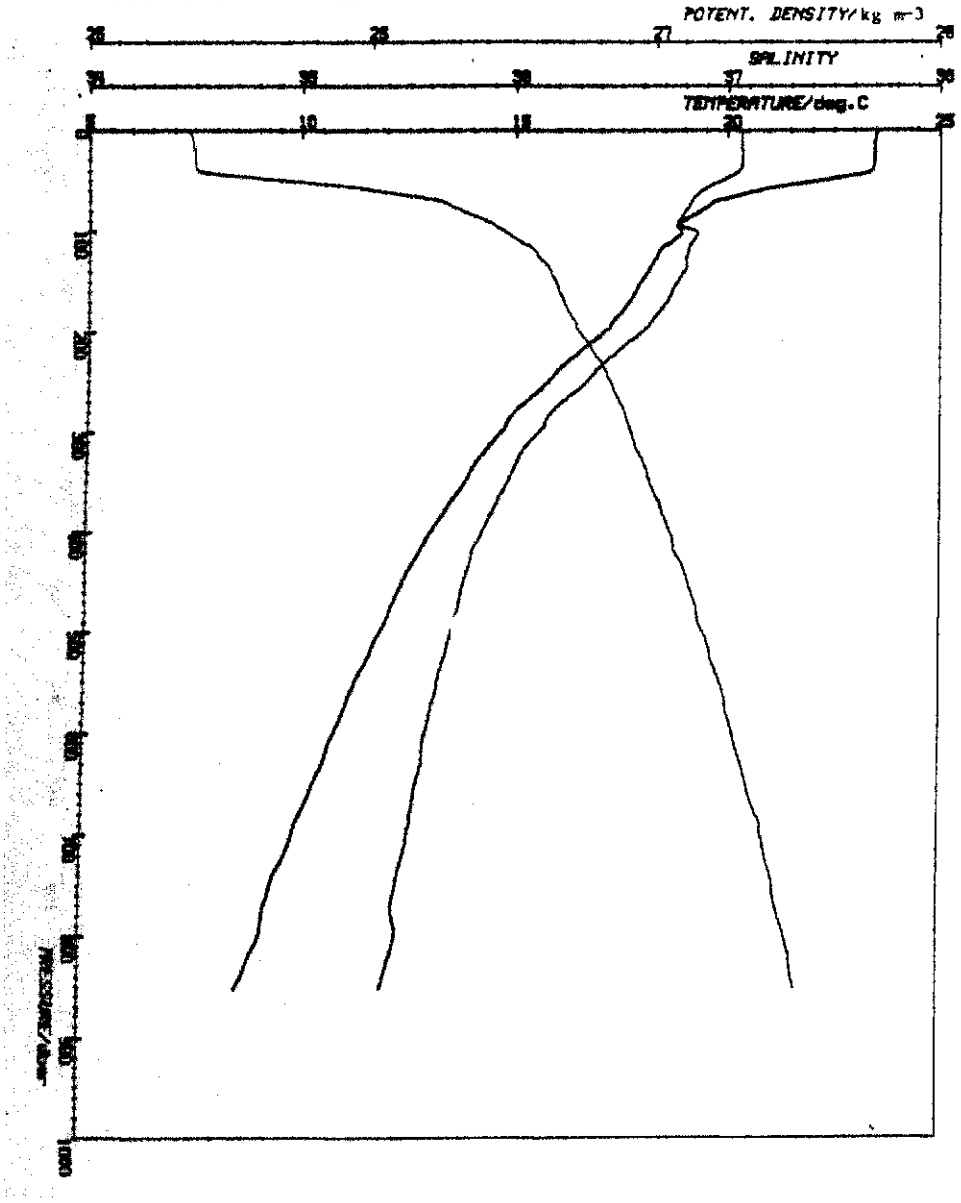
P104 DPS STATION 777/1



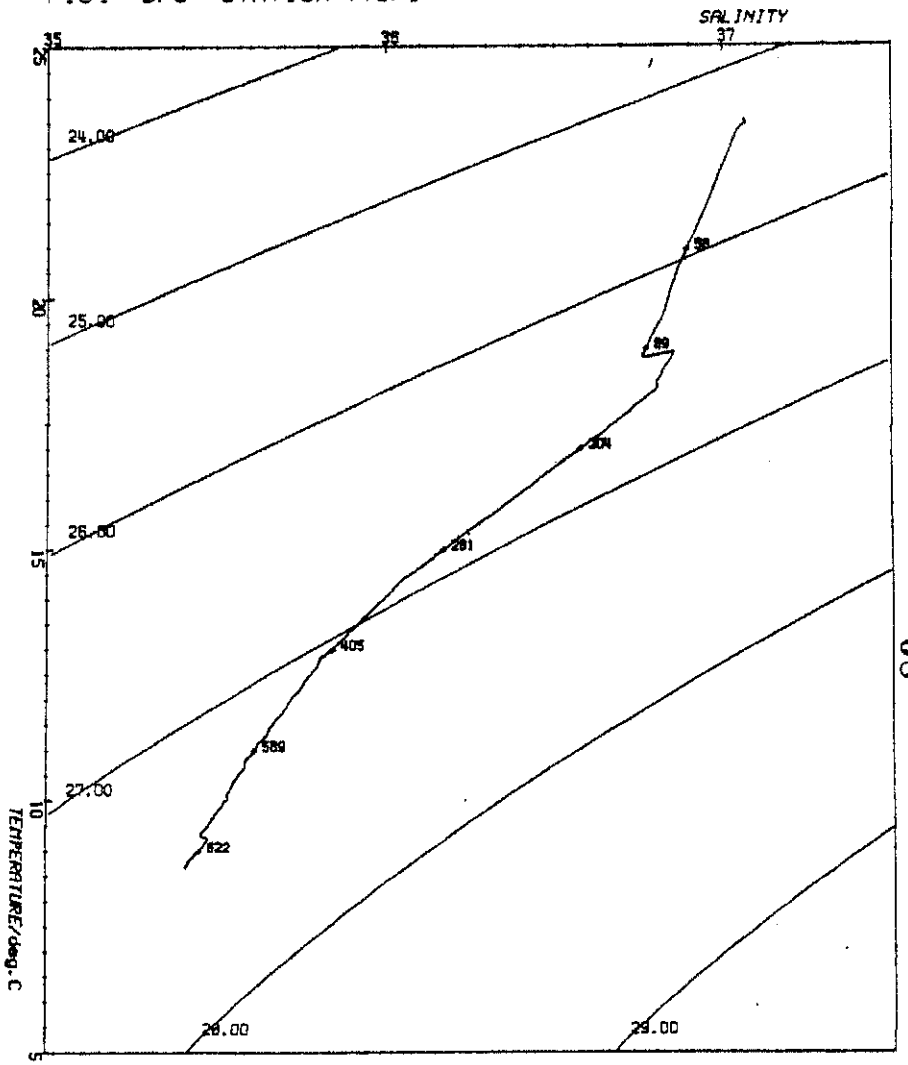

P104 DPS STATION 777/1
U/cm/s
PRESSURE/dbar

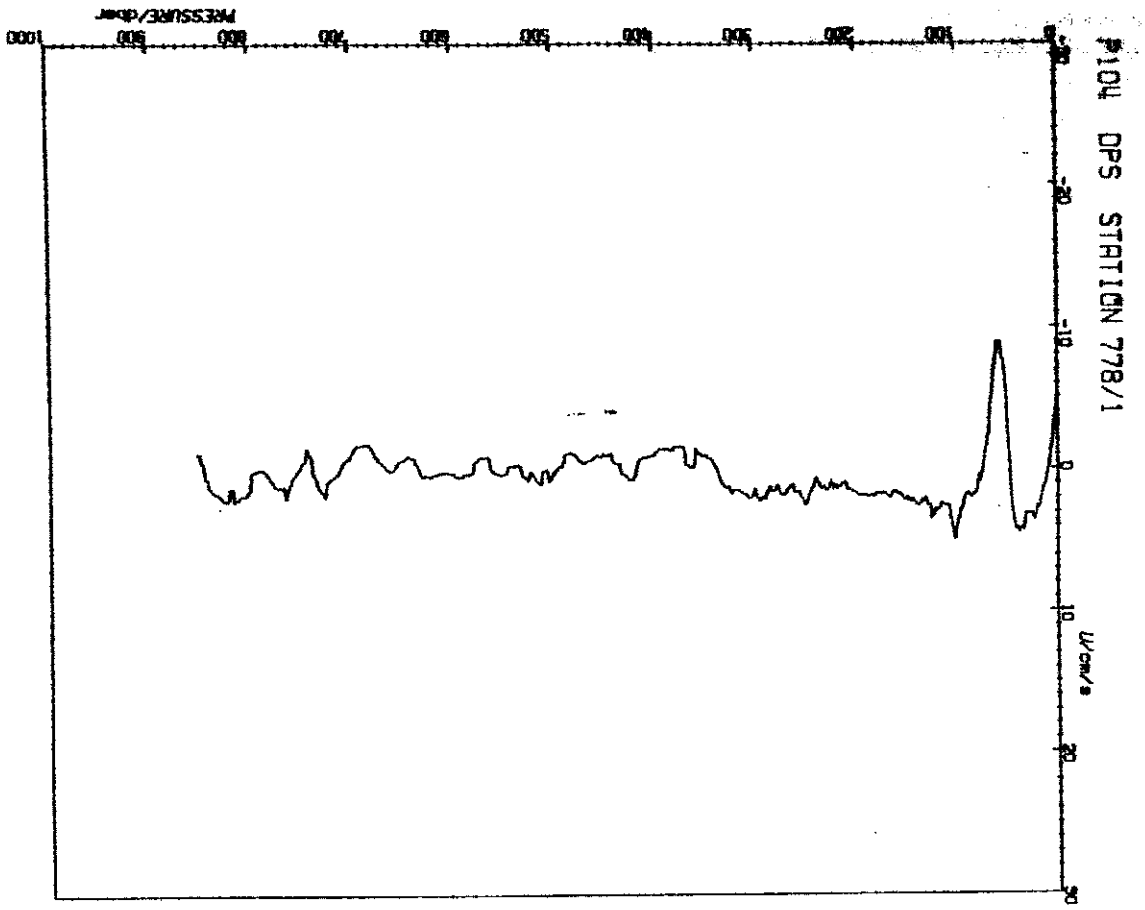

P104 DPS STATION 777/1
U/cm/s
PRESSURE/dbar

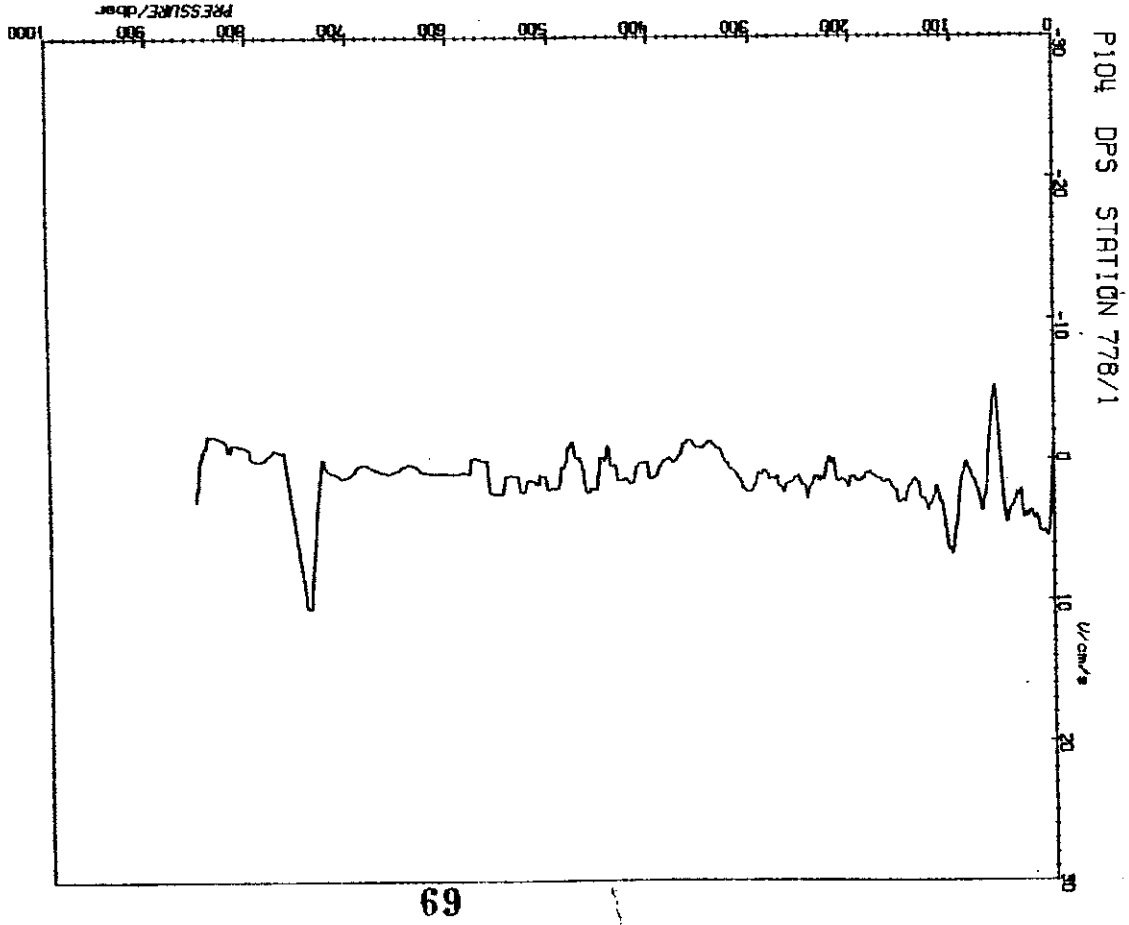
P104 DPS STATION 778/1



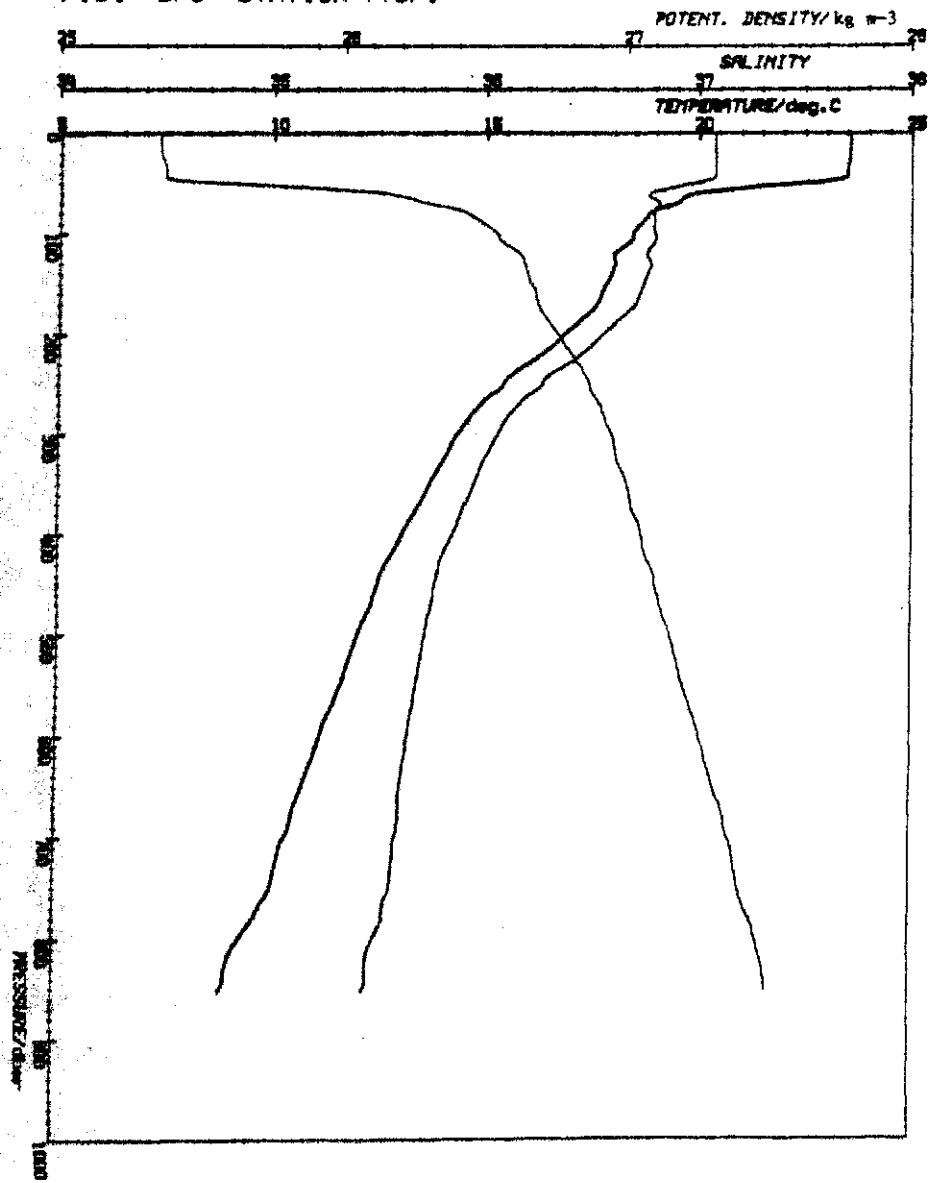
P104 DPS STATION 778/1



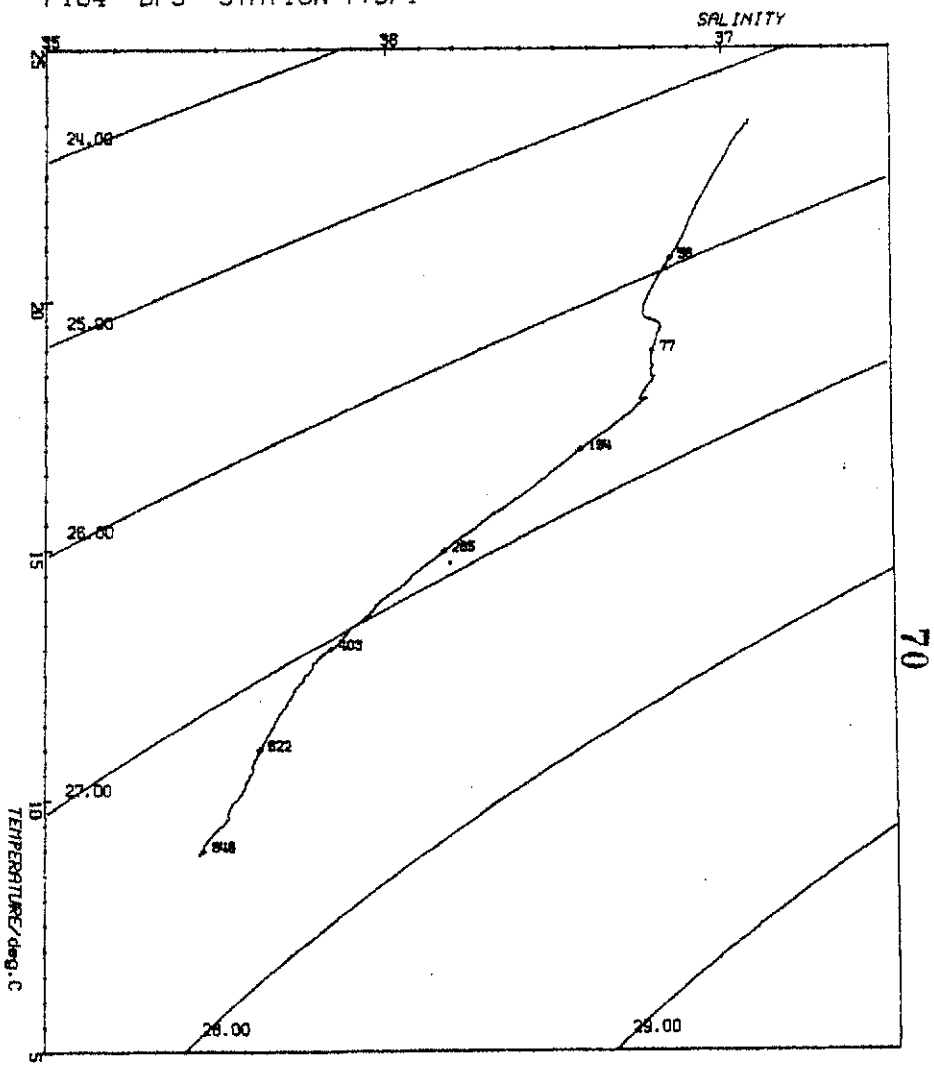

P104 DPS STATION 778/1
PRESSURE/dbar
1000
900
800
700
600
500
400
300
200
100
0
-30
-20
-10
0
10
20
30
u/cm/s


P104 DPS STATION 778/1
PRESSURE/dbar
1000
900
800
700
600
500
400
300
200
100
0
-30
-20
-10
0
10
20
30
u/cm/s

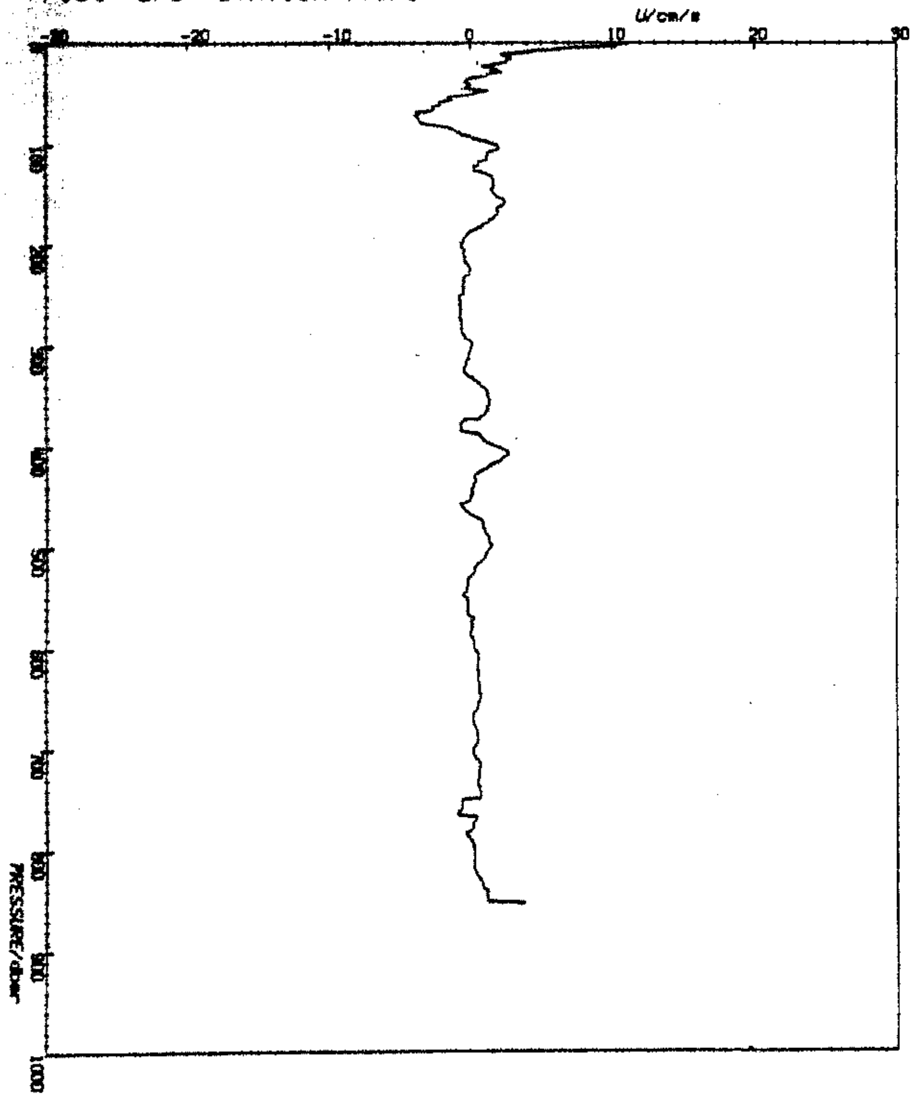
P104 DPS STATION 779/1



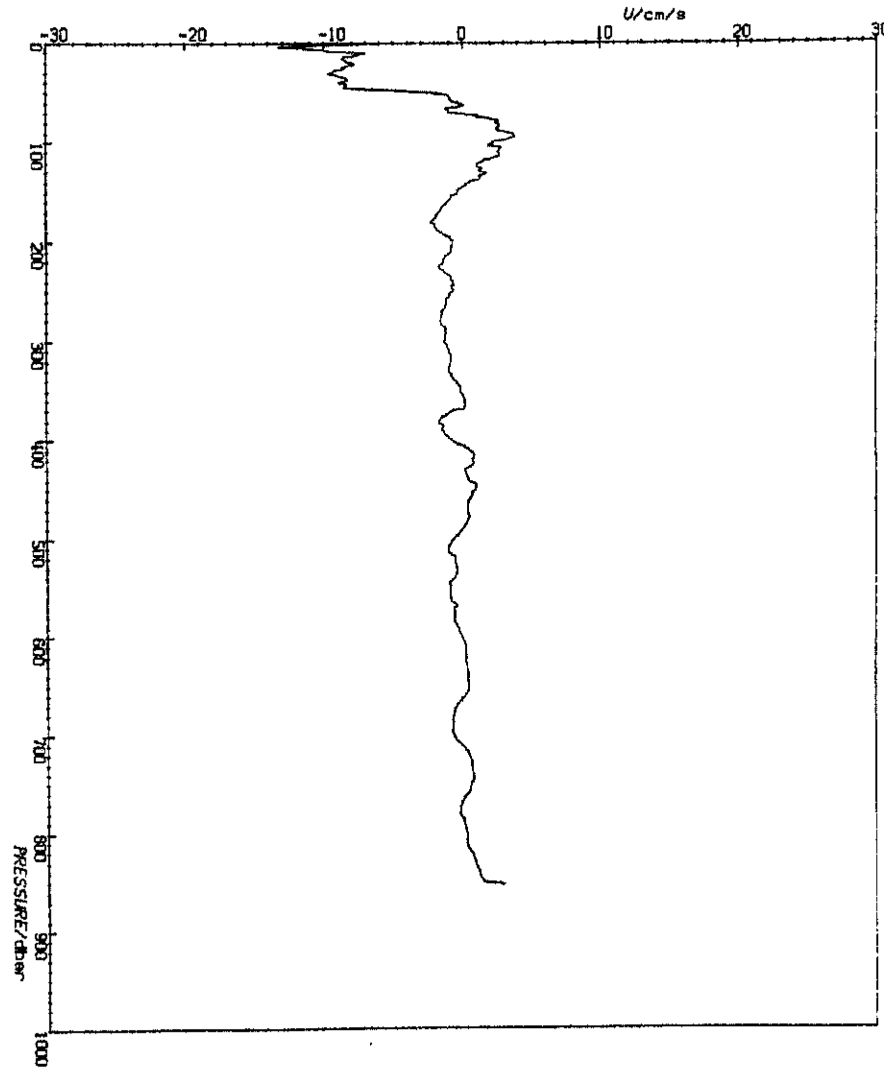
P104 DPS STATION 779/1



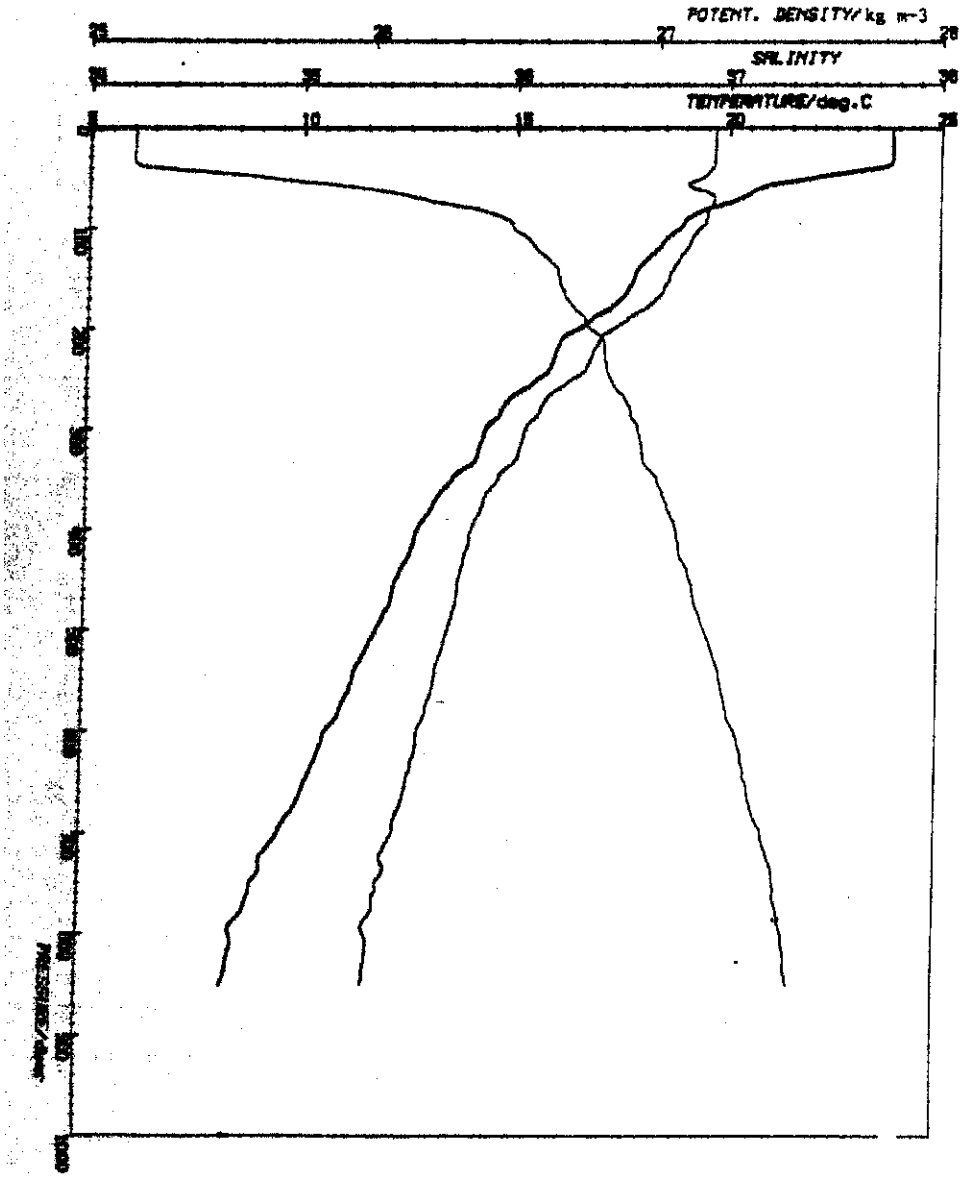
P104 DPS STATION 779/1



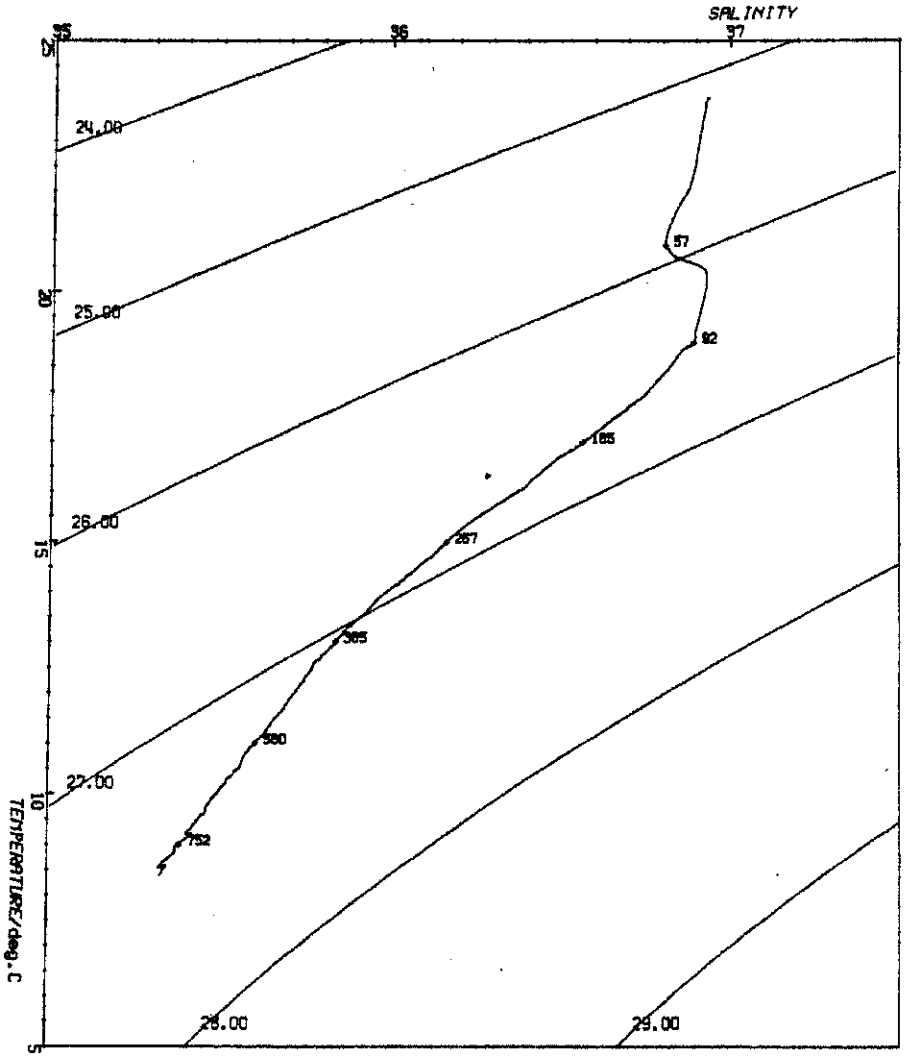
P104 DPS STATION 779/1

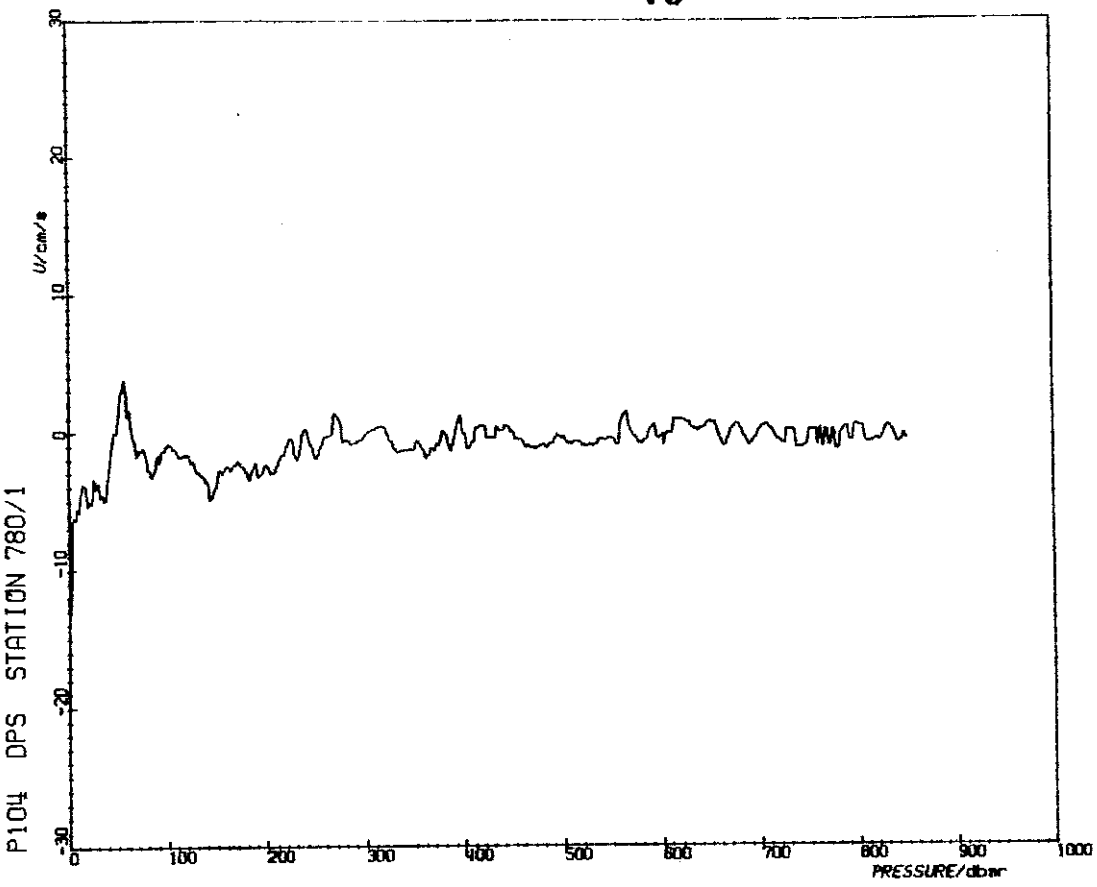


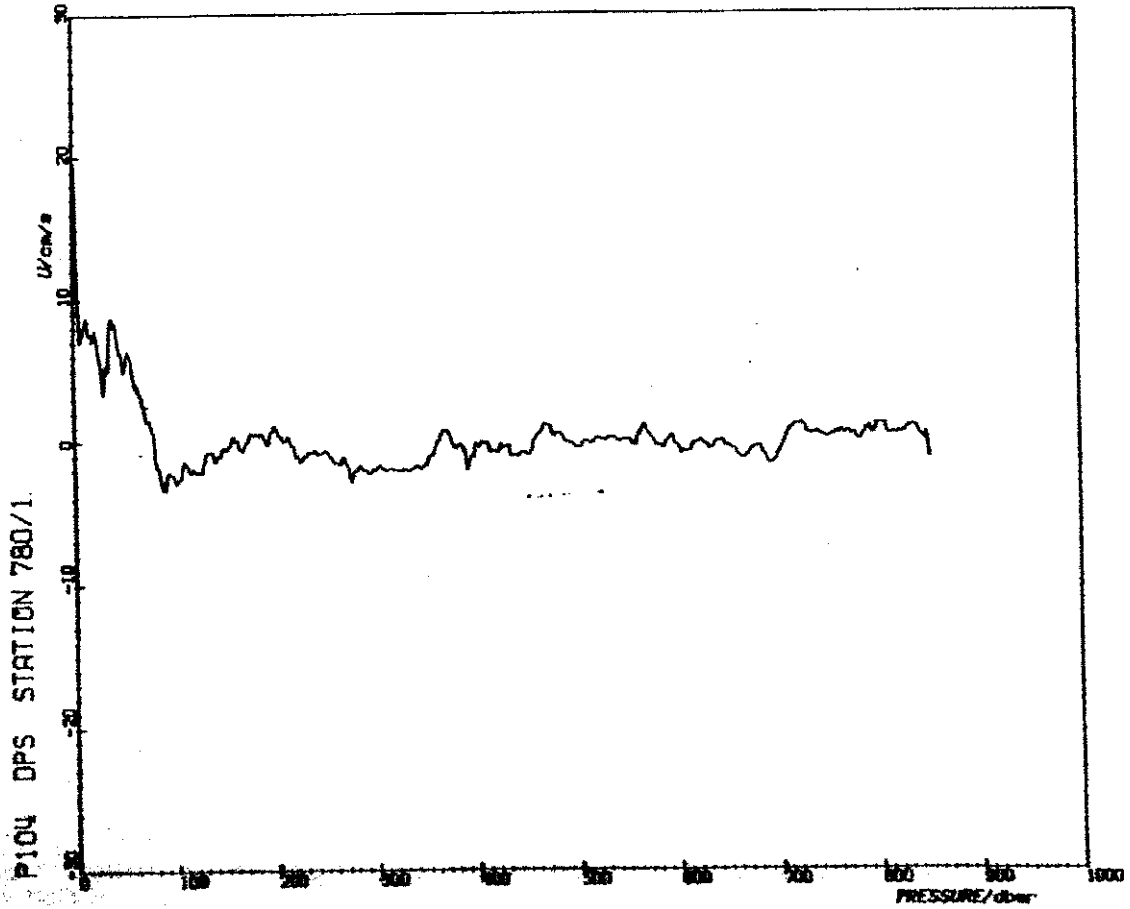
P104 DPS STATION 780/1



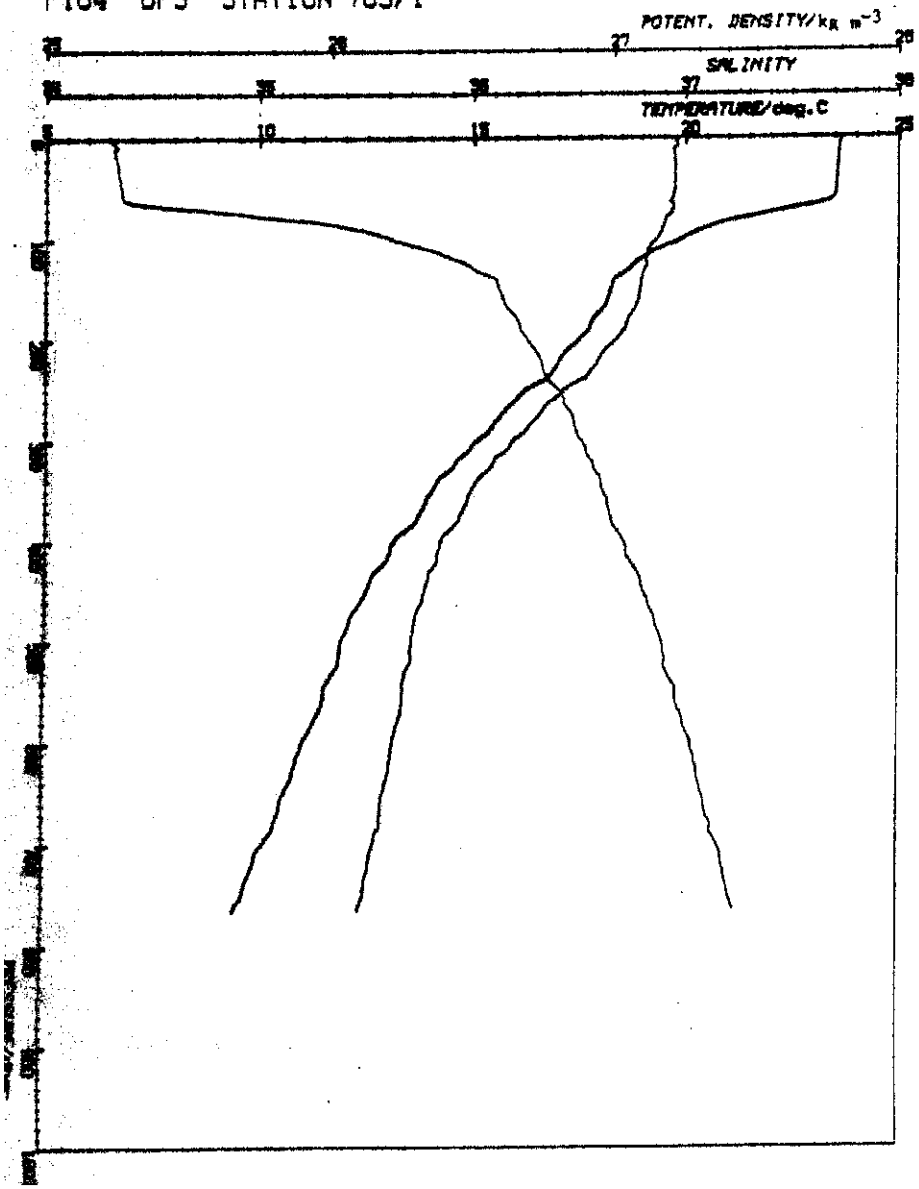
P104 DPS STATION 780/1



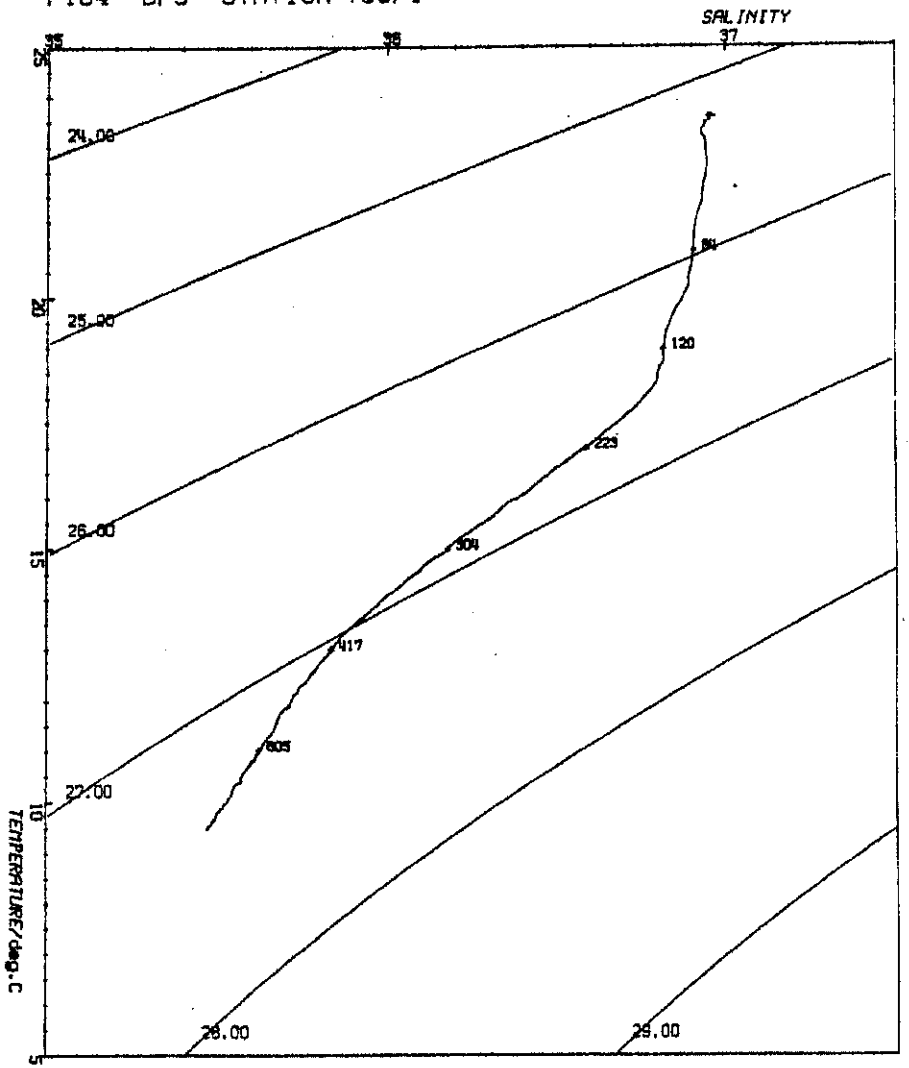

P104 DPS STATION 780/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

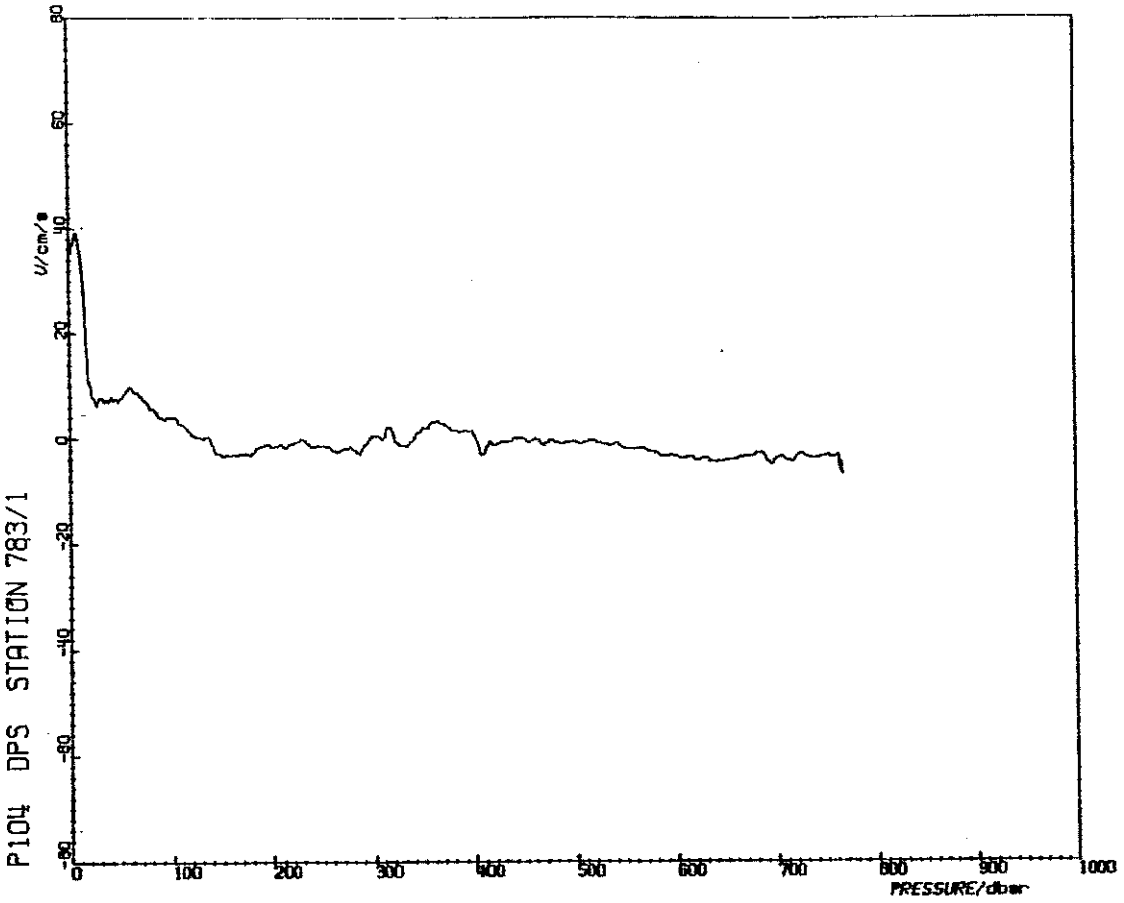

P104 DPS STATION 780/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

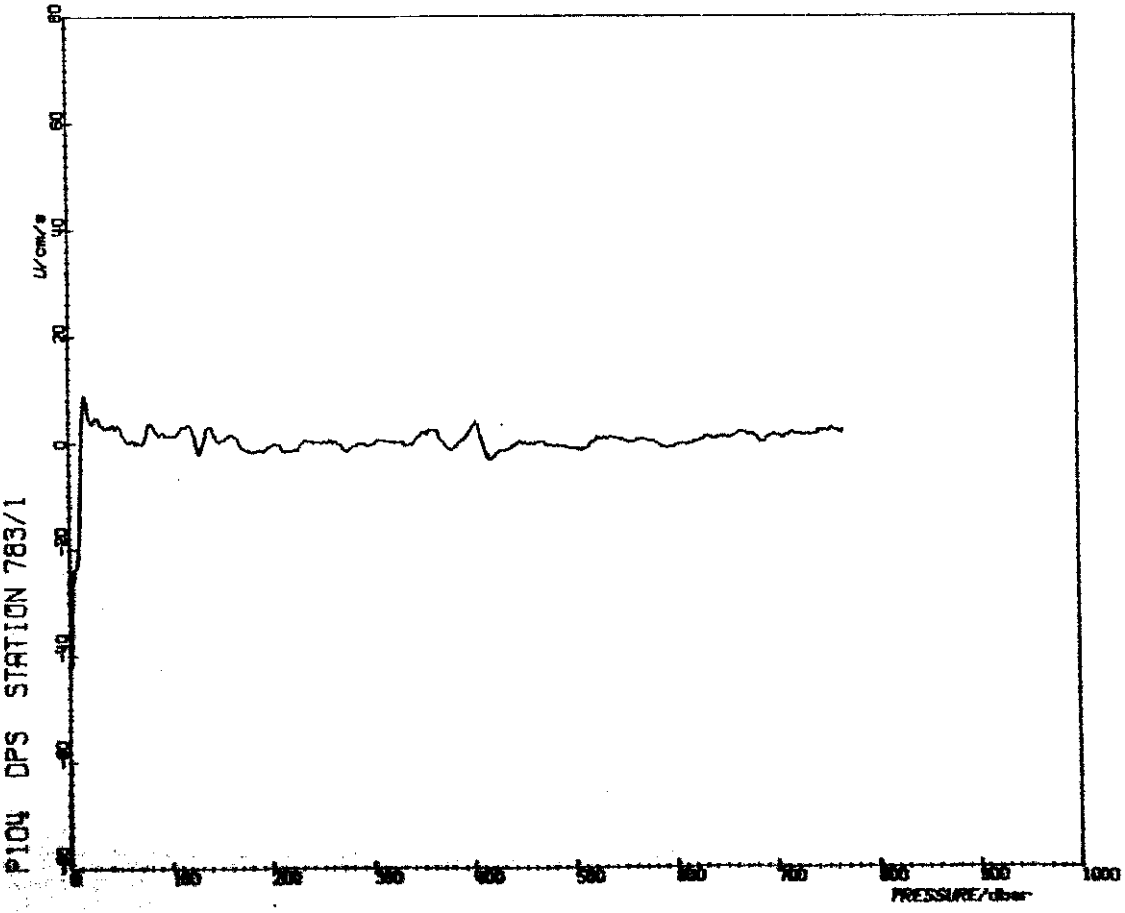
P104 DPS STATION 783/1



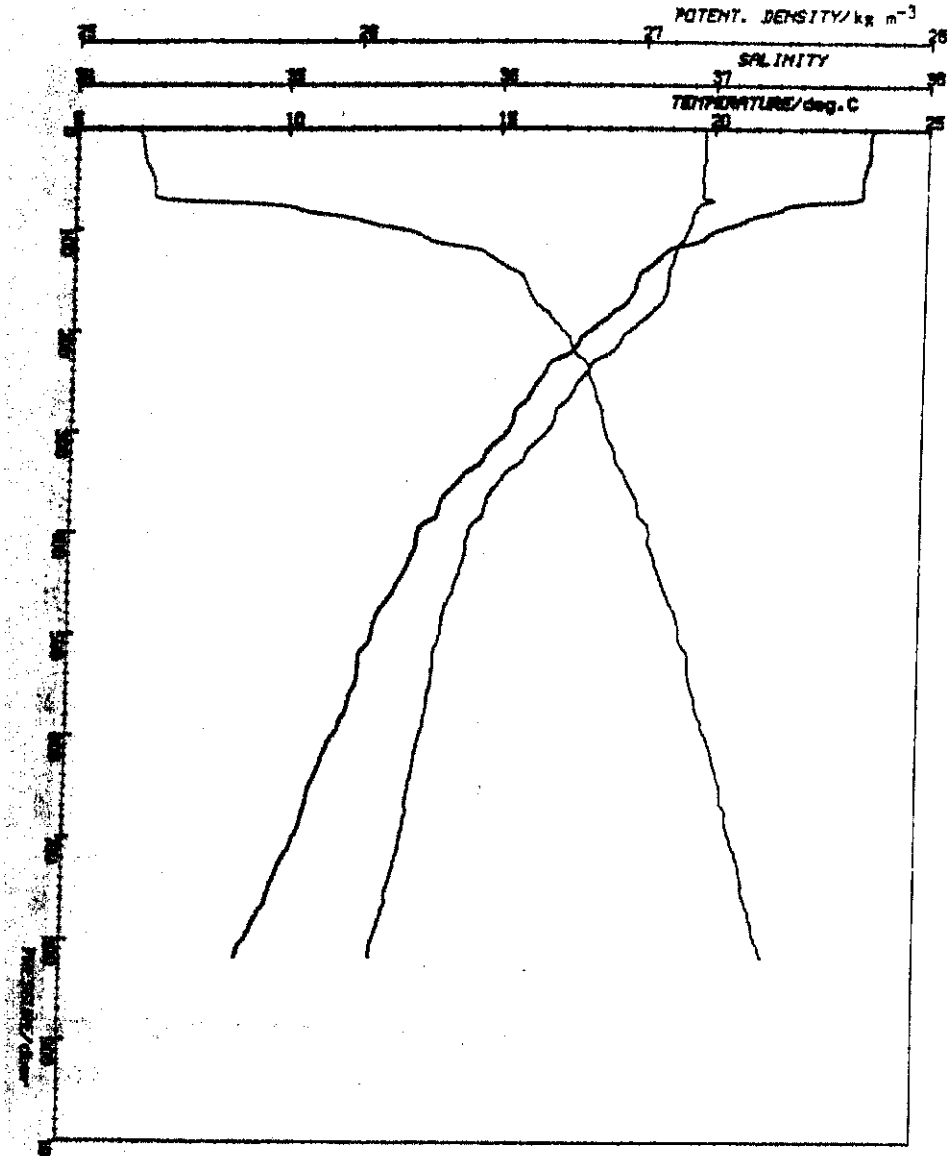
P104 DPS STATION 783/1



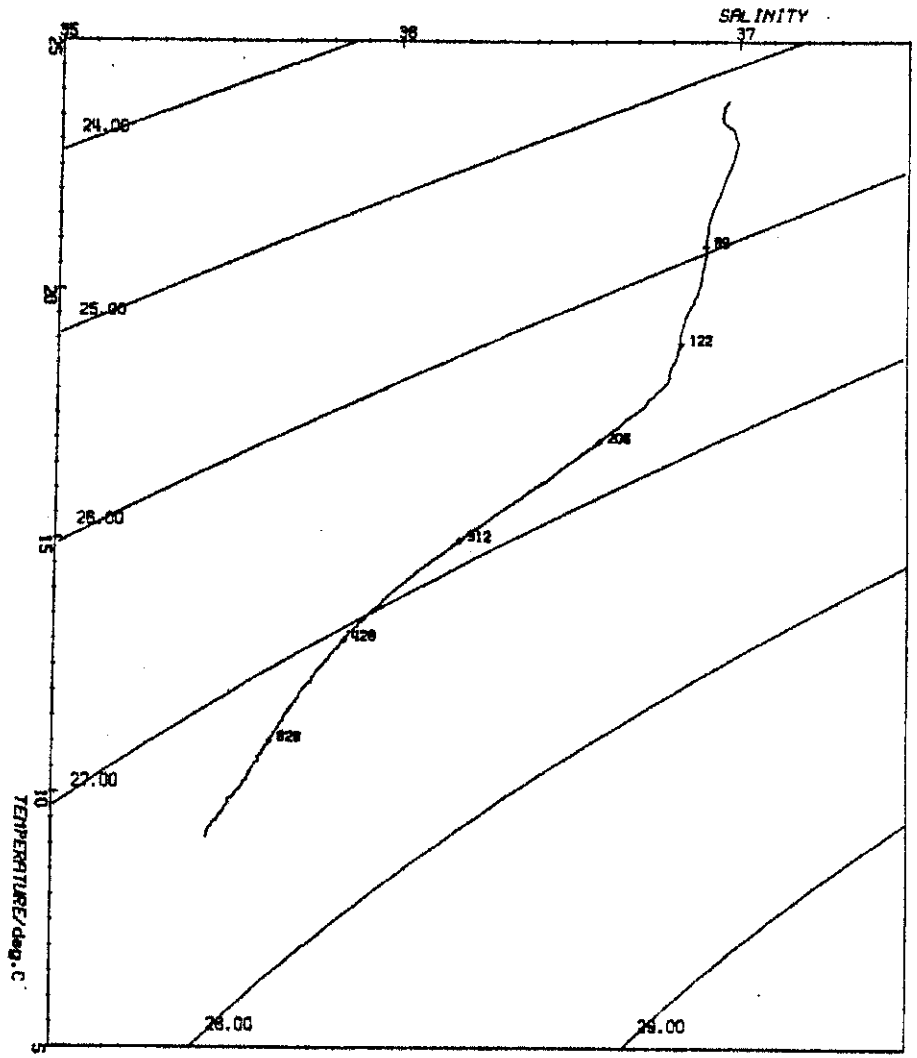

P104 DPS STATION 783/1
u/cm/s
PRESSURE/dbar

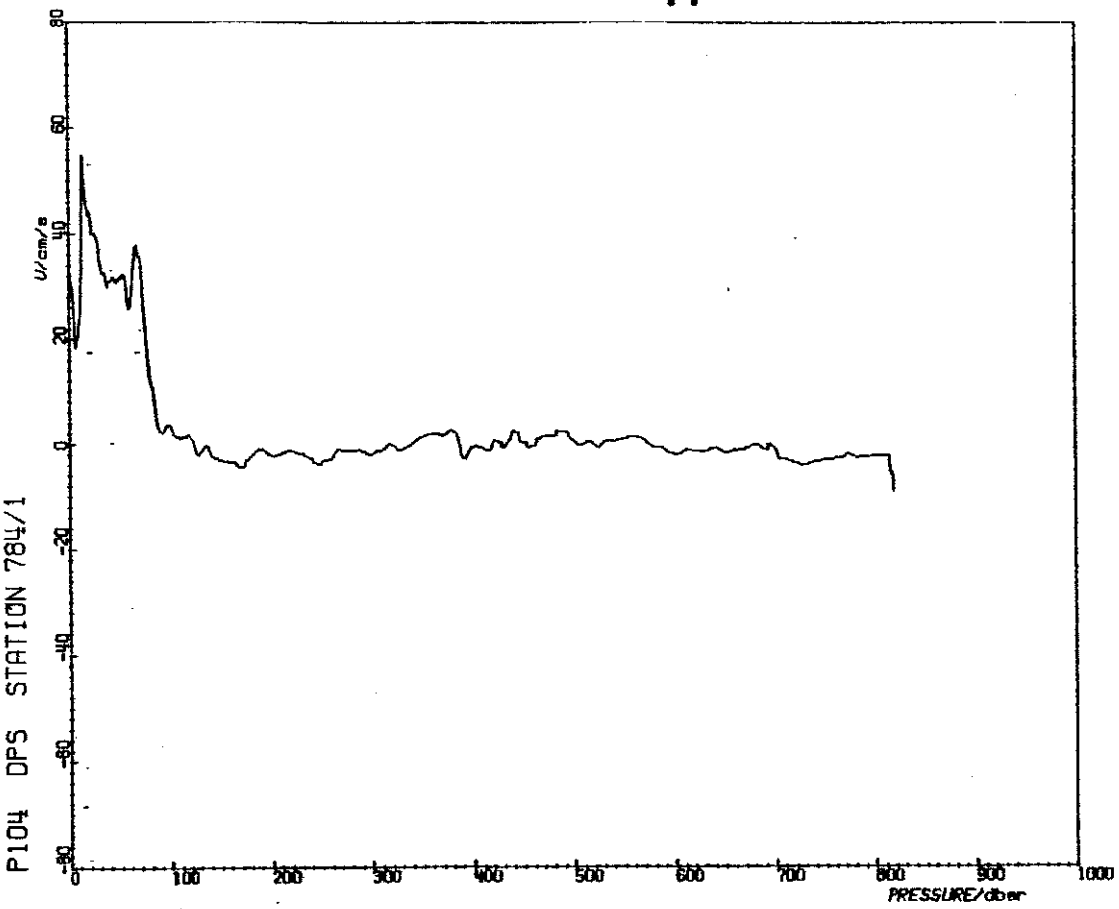

P104 DPS STATION 783/1
u/cm/s
PRESSURE/dbar

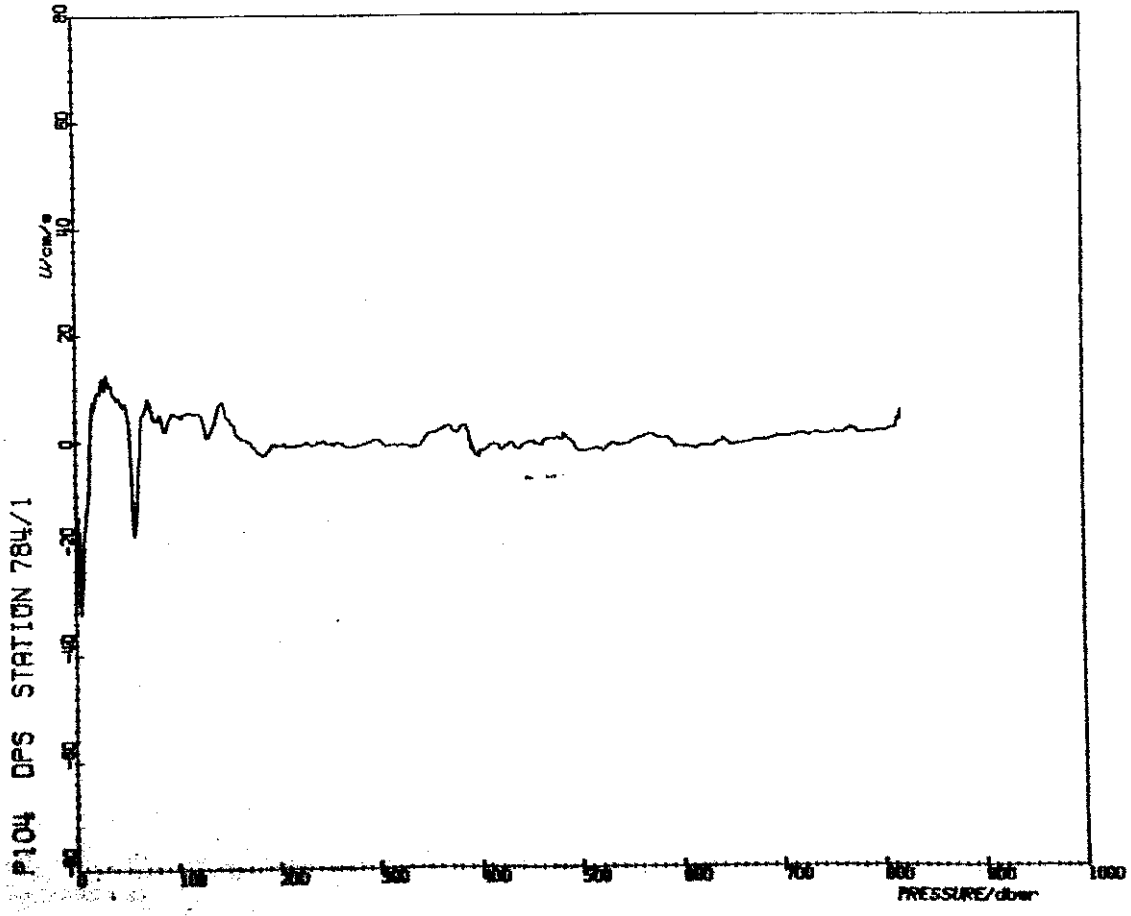
P104 DPS STATION 784/1

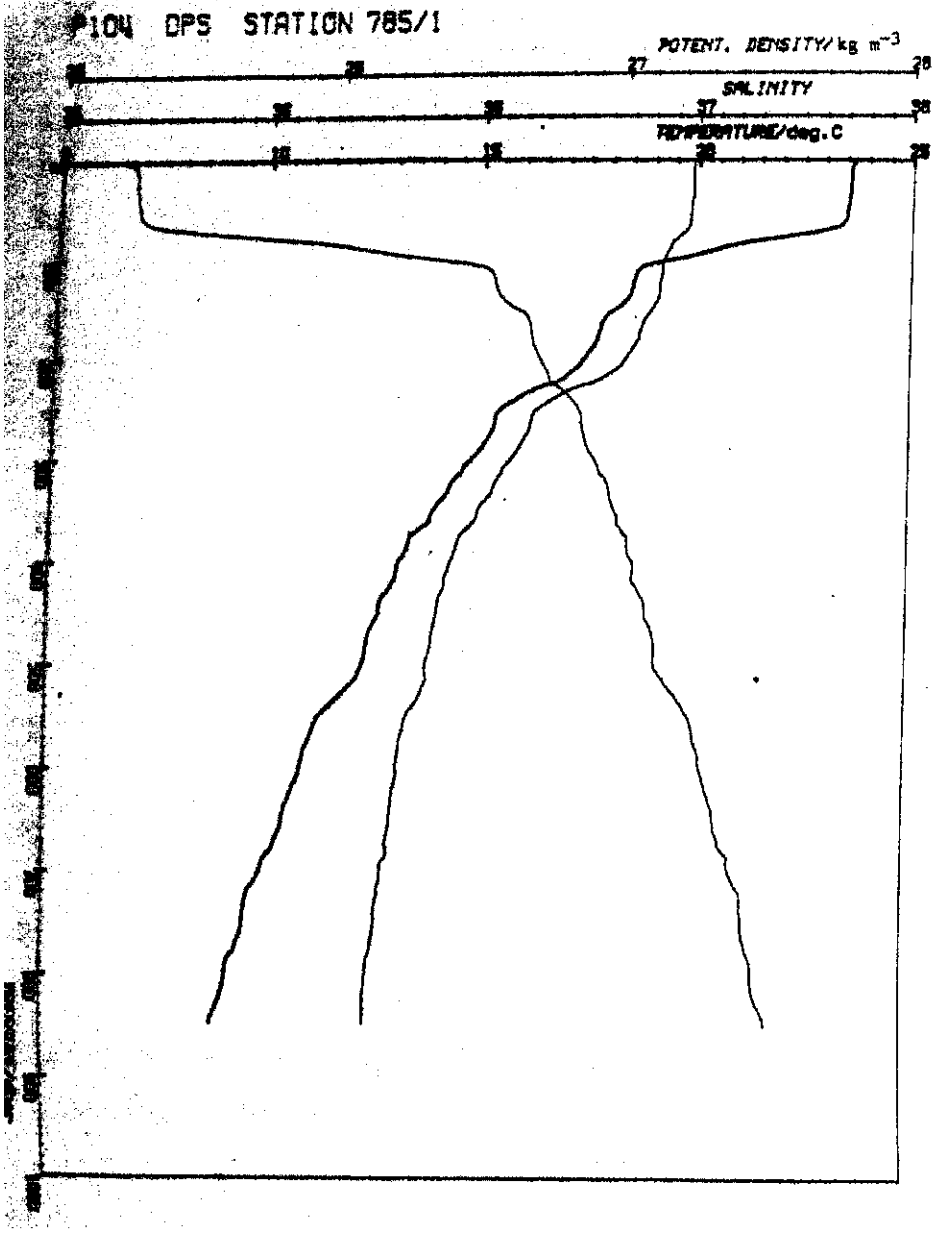


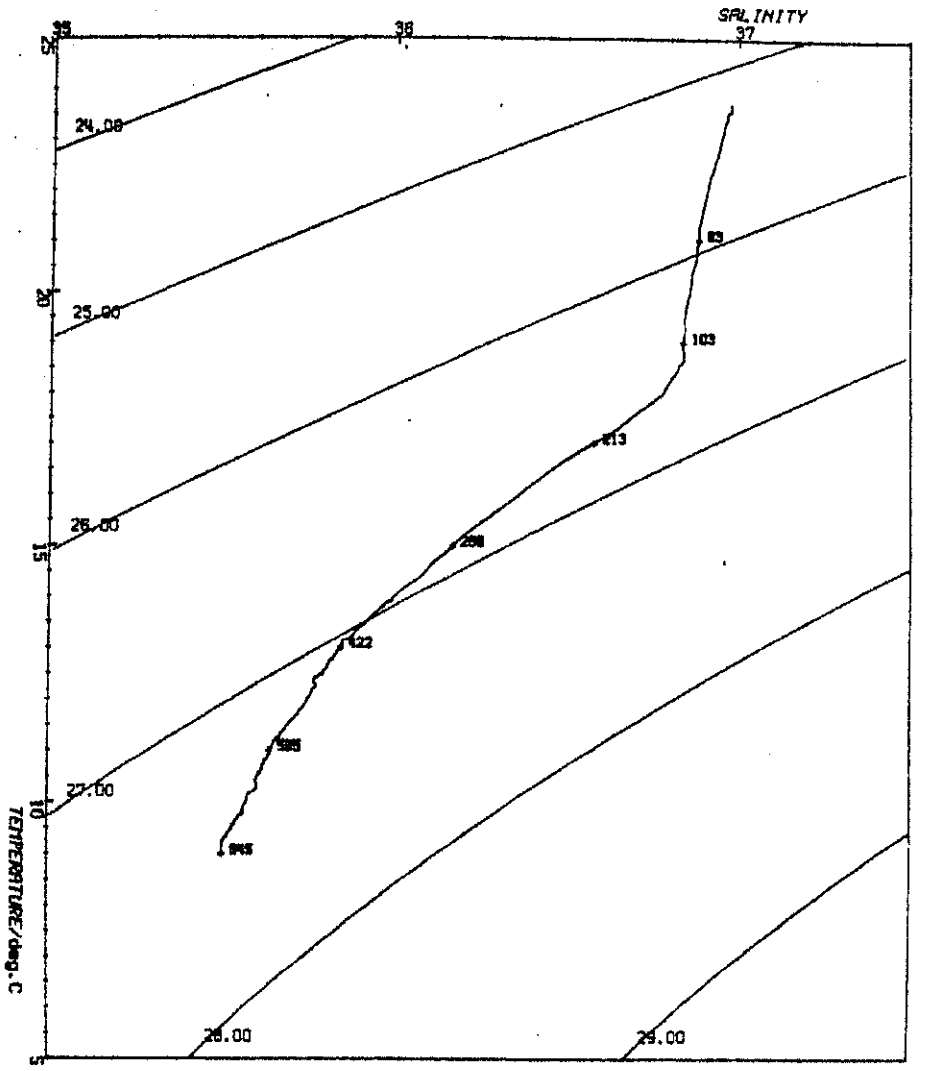
P104 DPS STATION 784/1



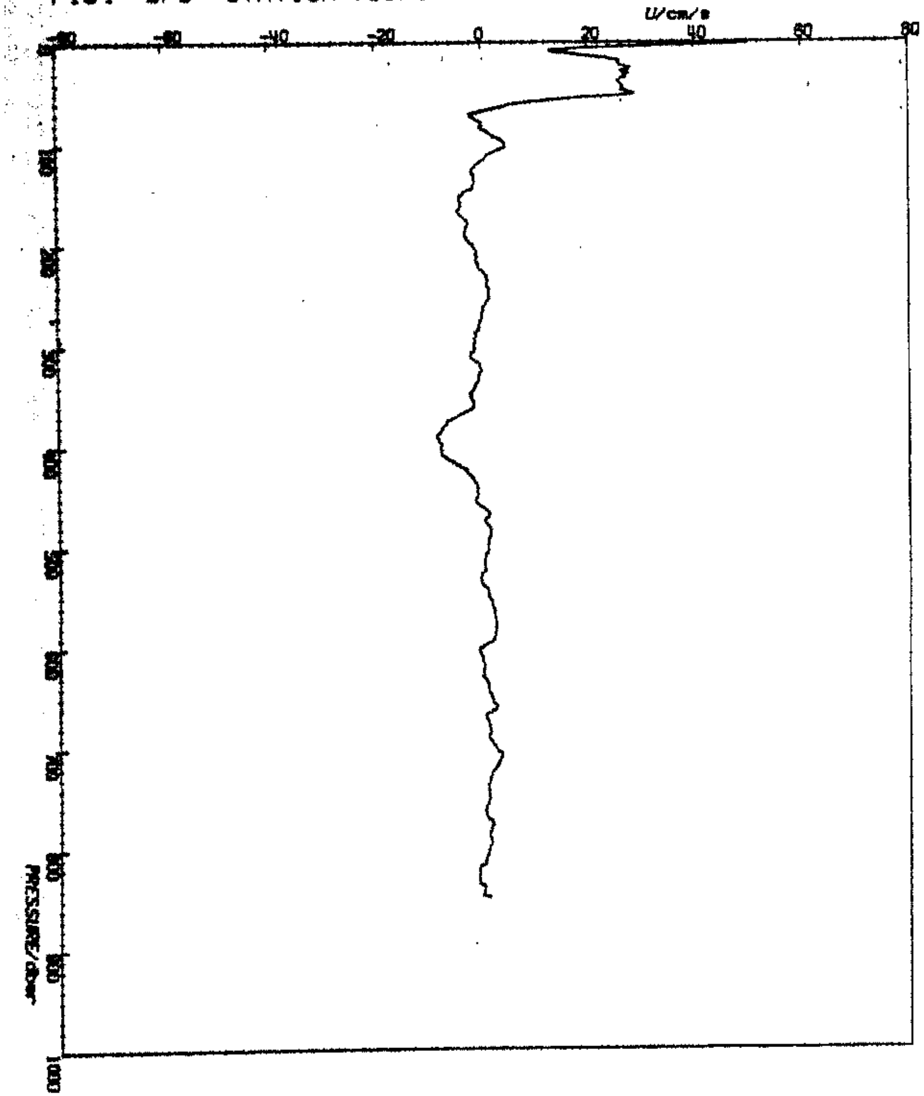

P104 DPS STATION 784/1
U/cm/s
80
60
40
20
0
-20
-40
-60
-80
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar


P104 DPS STATION 784/1
U/cm/s
80
60
40
20
0
-20
-40
-60
-80
PRESSURE/dbar

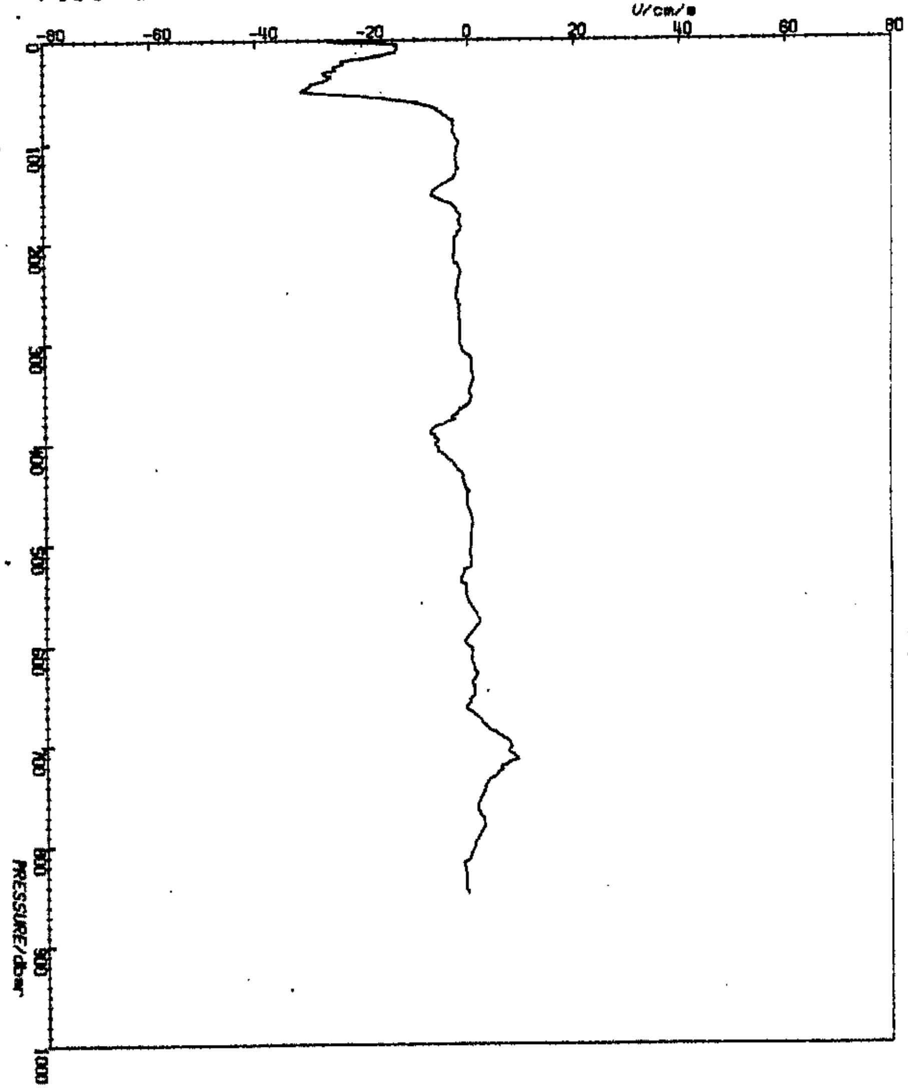

P104 OPS STATION 785/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C


P104 OPS STATION 785/1
SALINITY
24.00
25.00
26.00
27.00
TEMPERATURE/deg.C
28.00
29.00

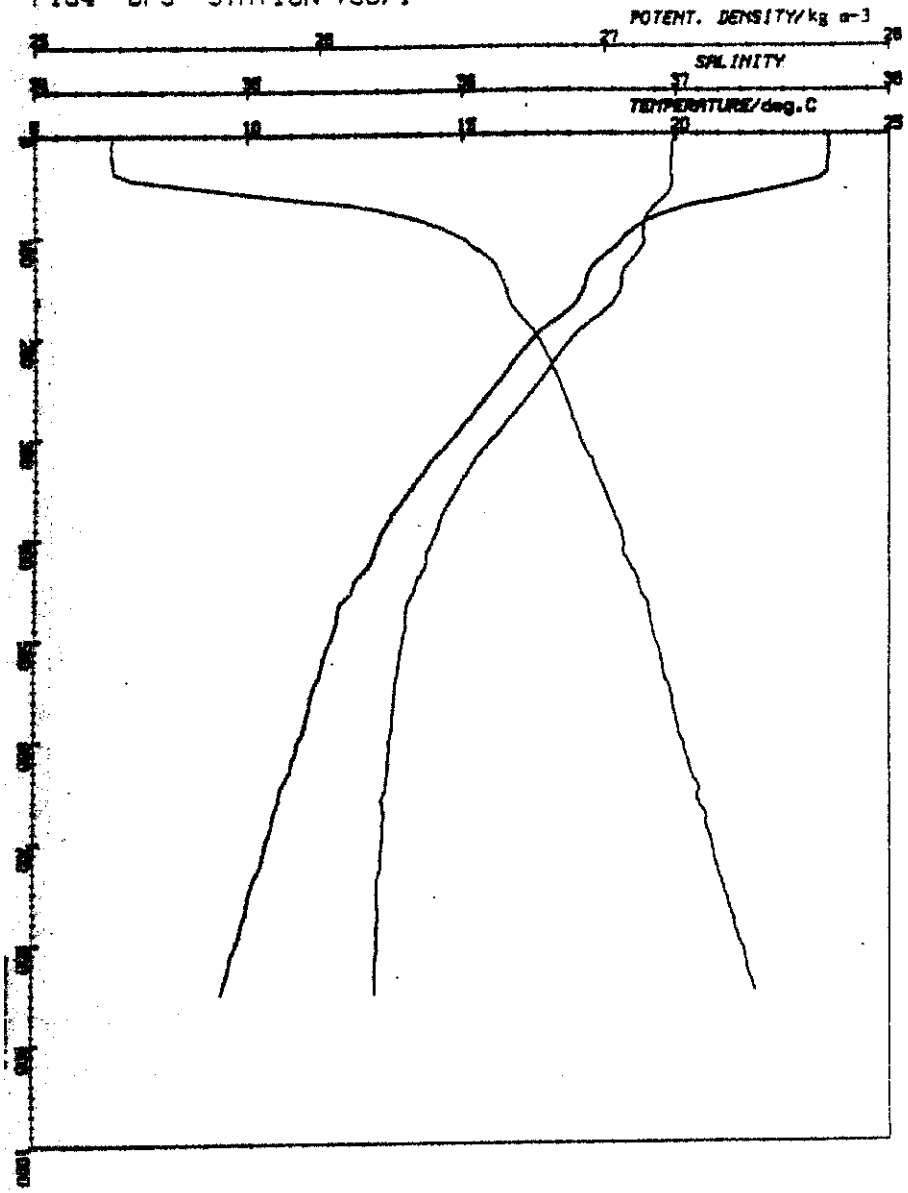
P104 DPS STATION 785/1



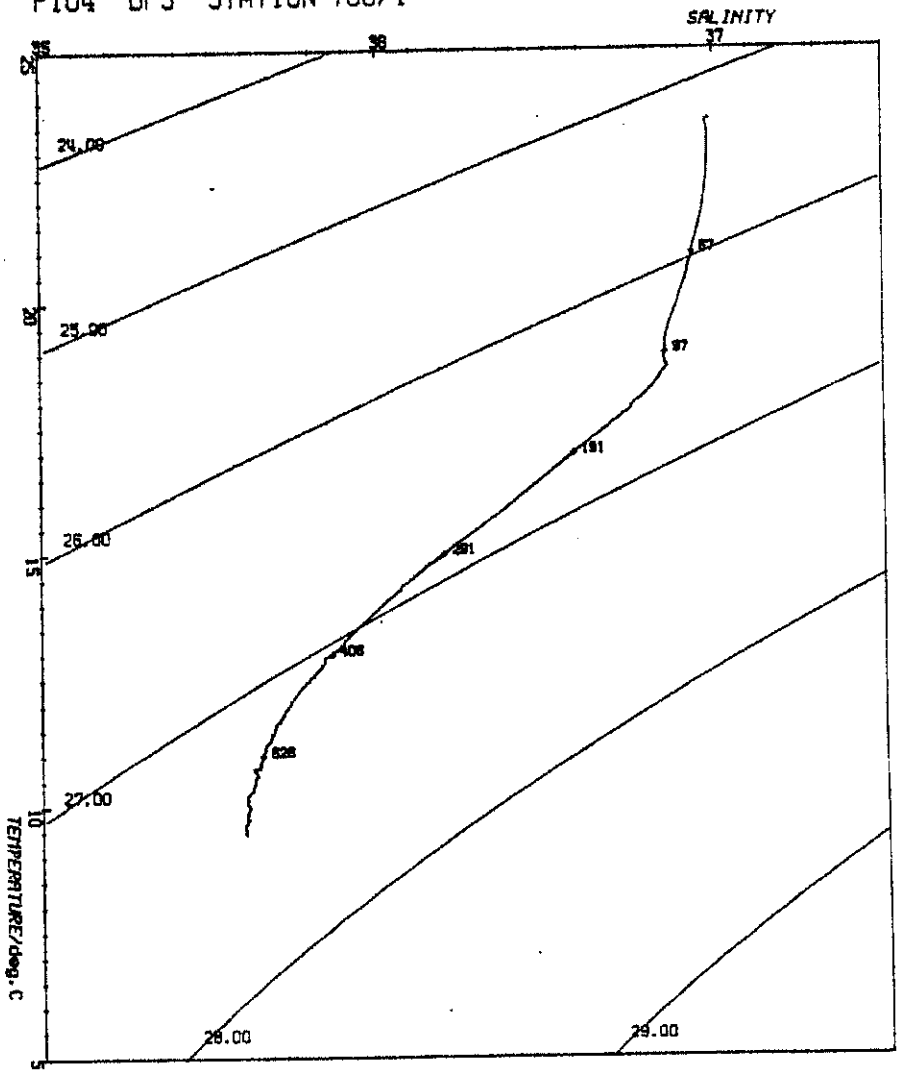
P104 DPS STATION 785/1



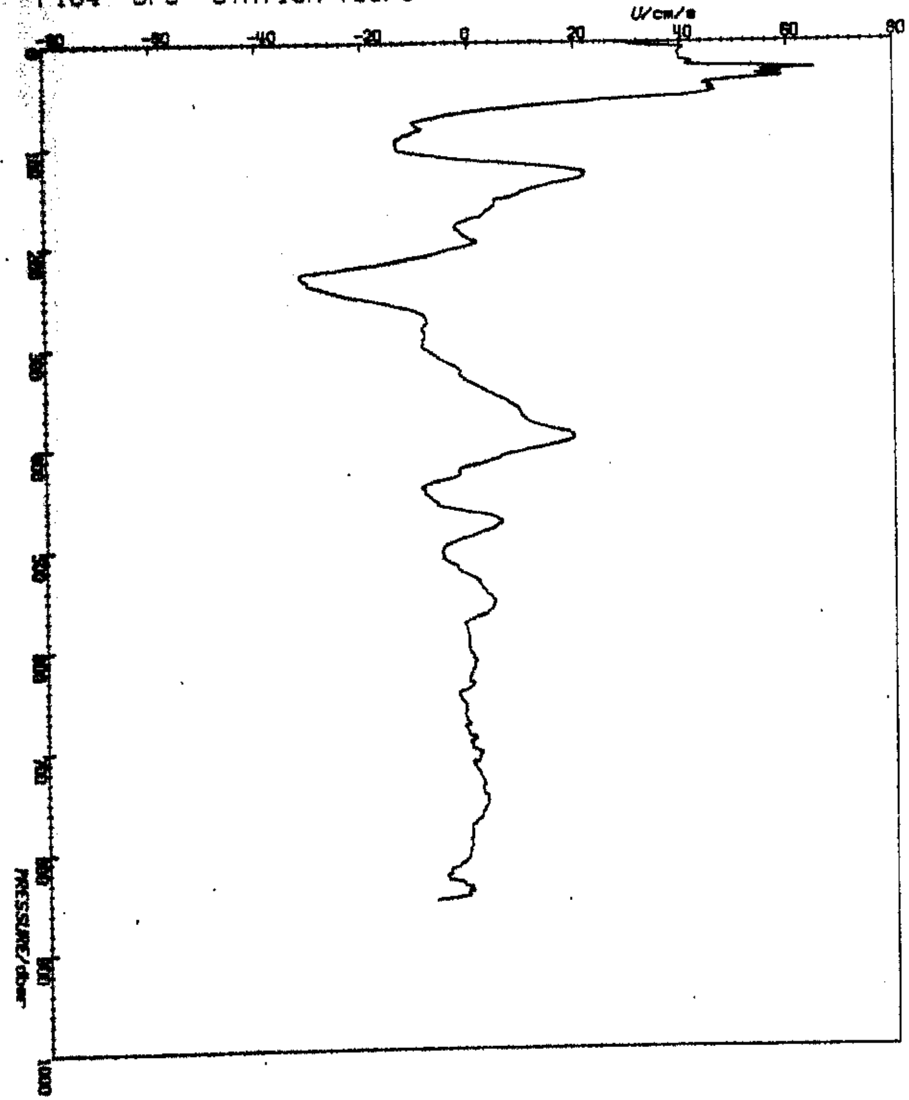
P104 DPS STATION 786/1



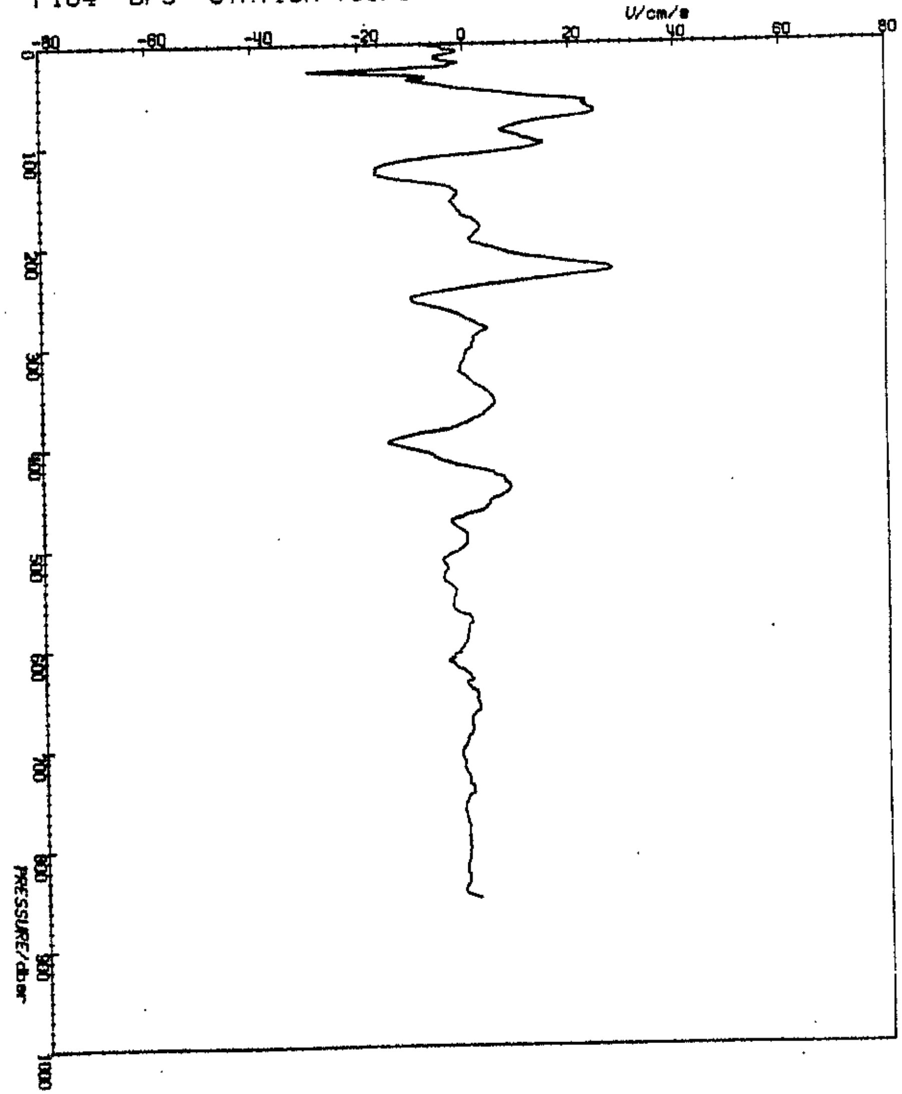
P104 DPS STATION 786/1



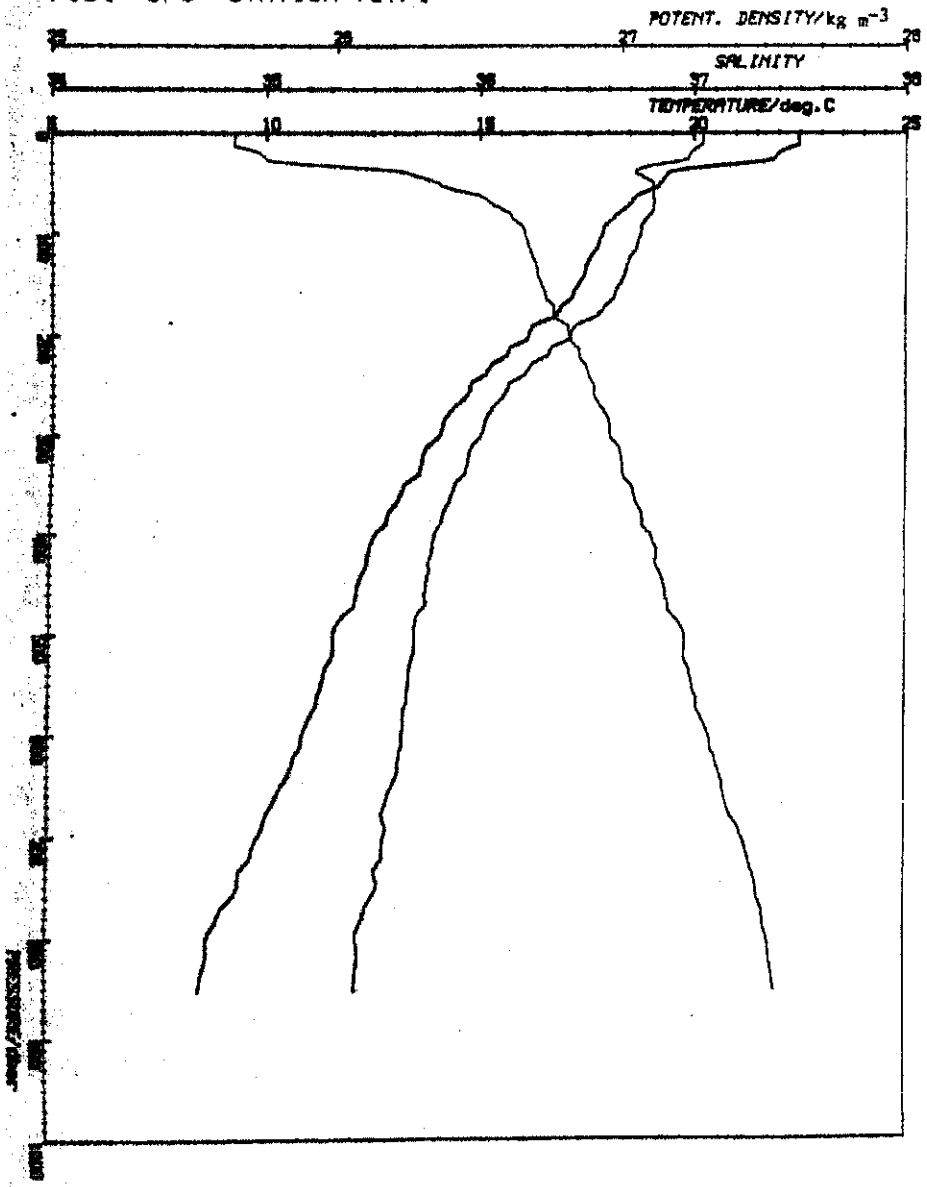
P104 DPS STATION 786/1



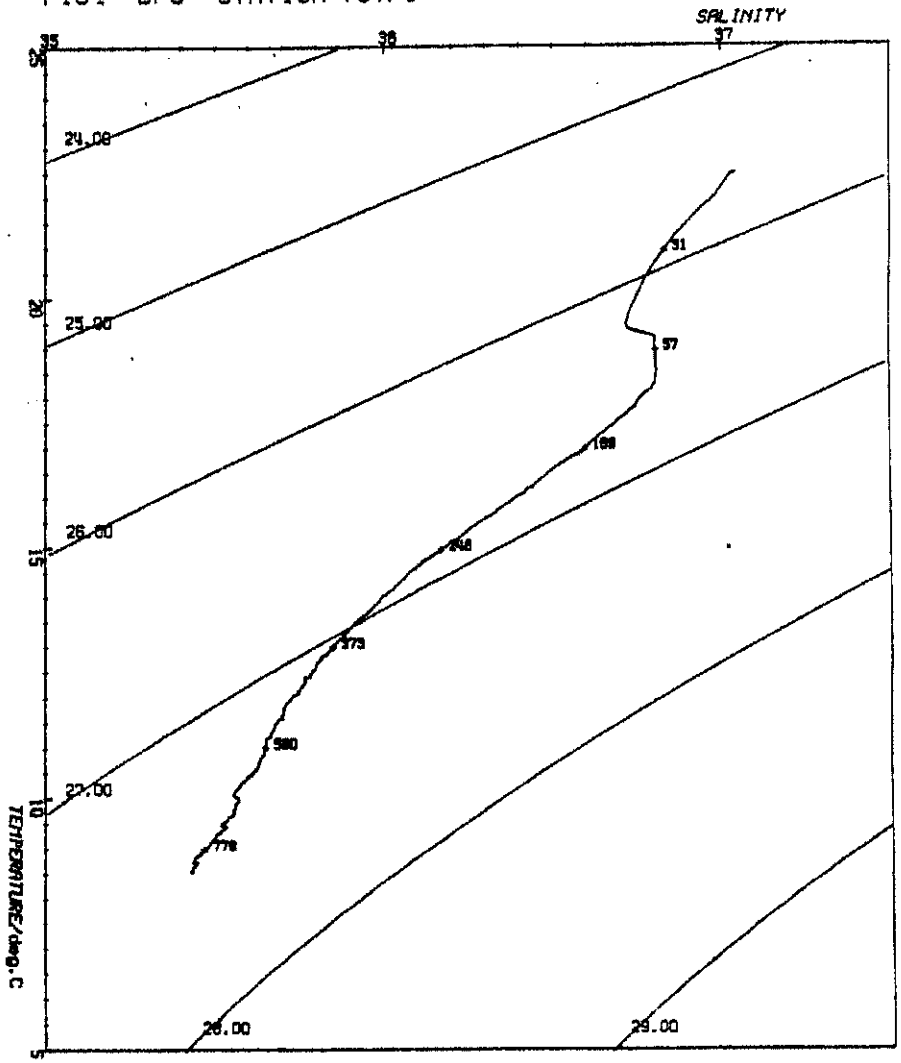
P104 DPS STATION 786/1

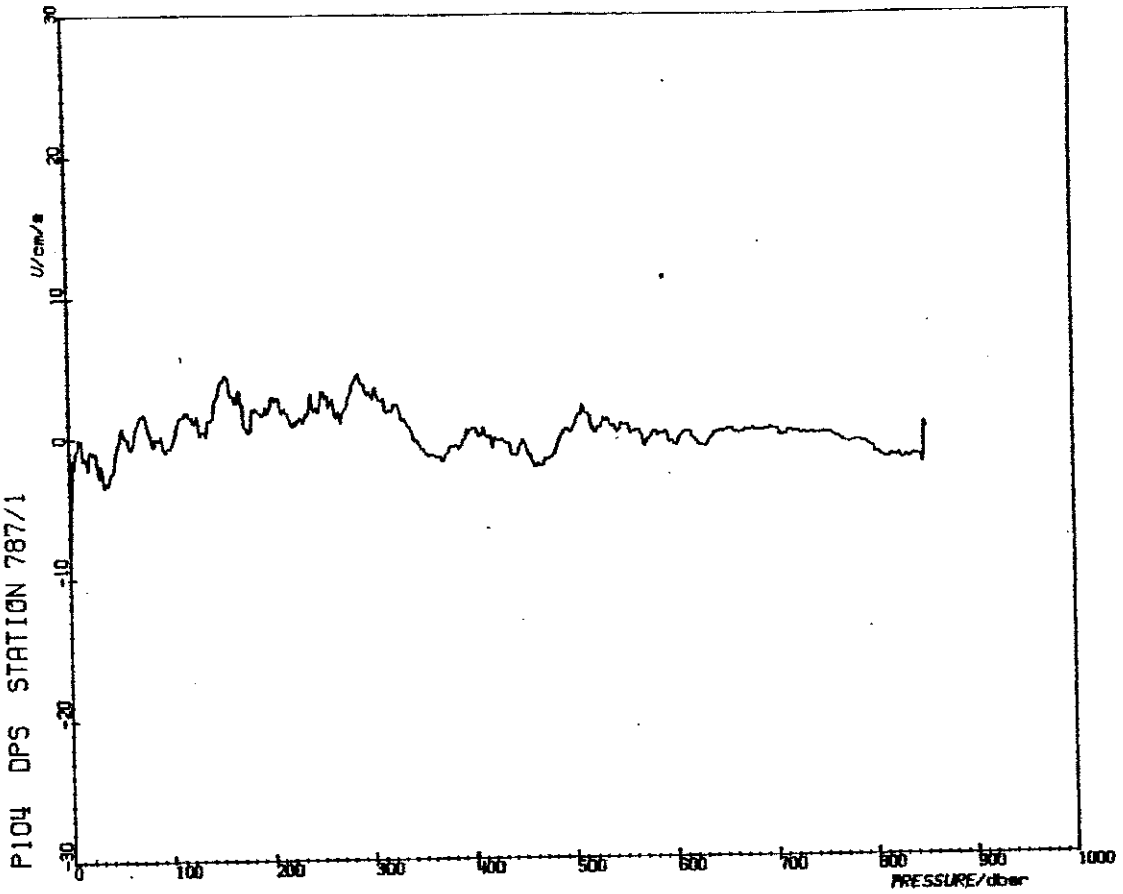


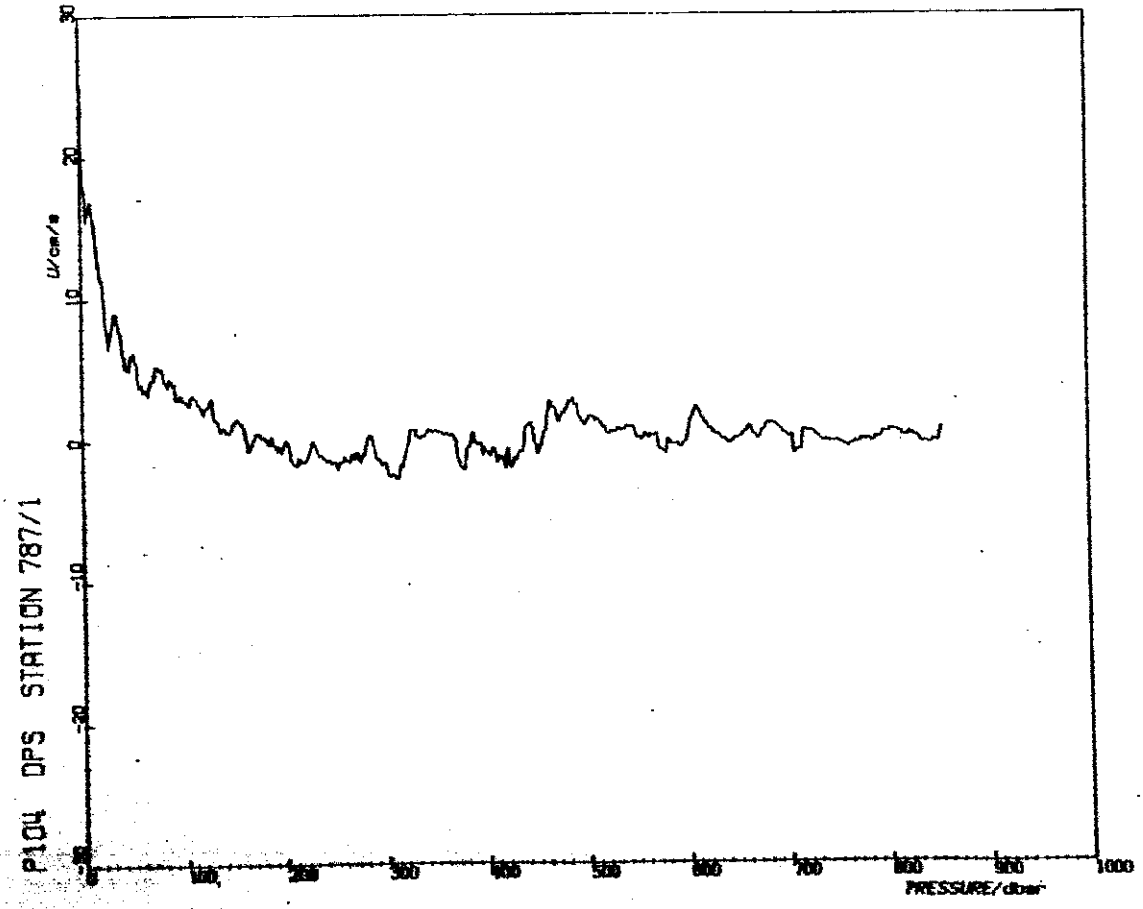
P104 DPS STATION 787/1



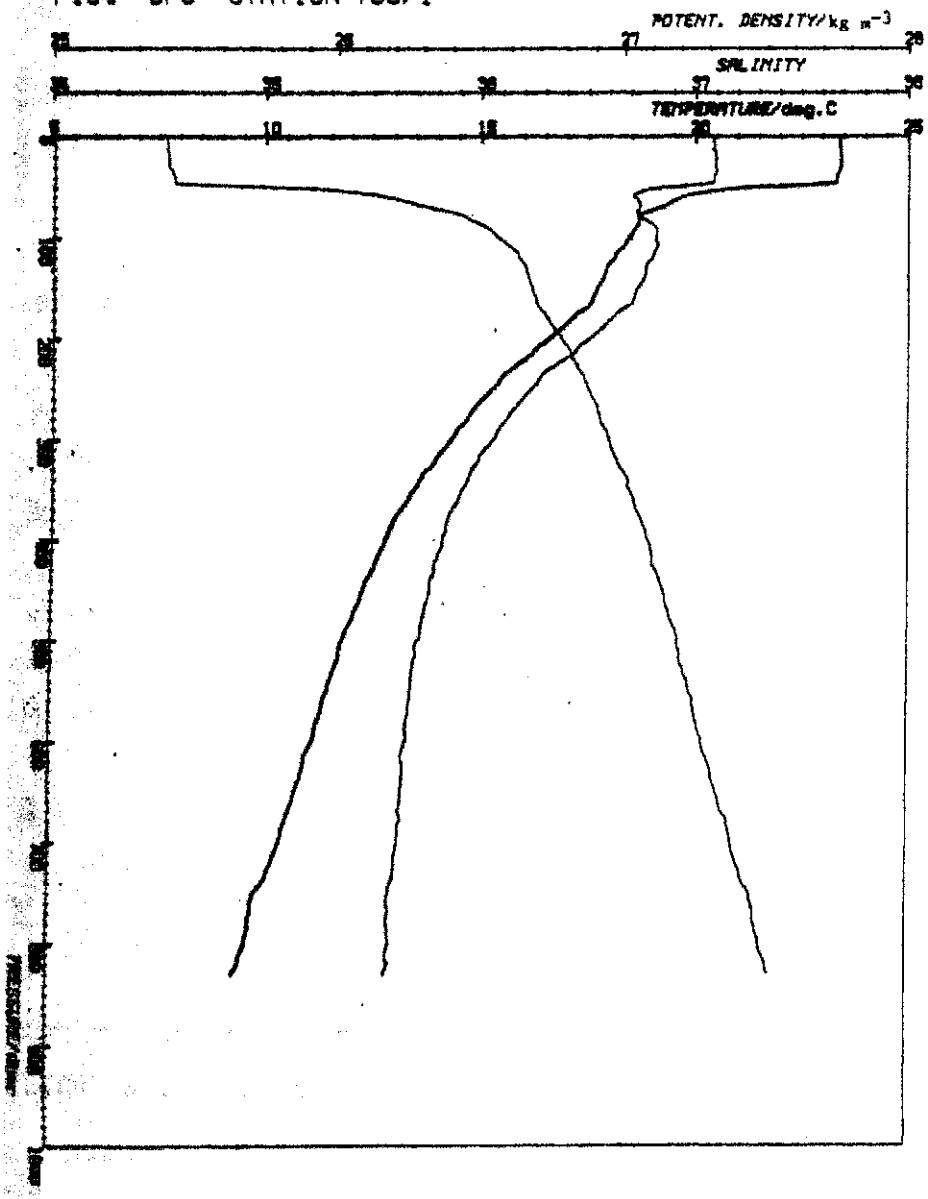
P104 DPS STATION 787/1



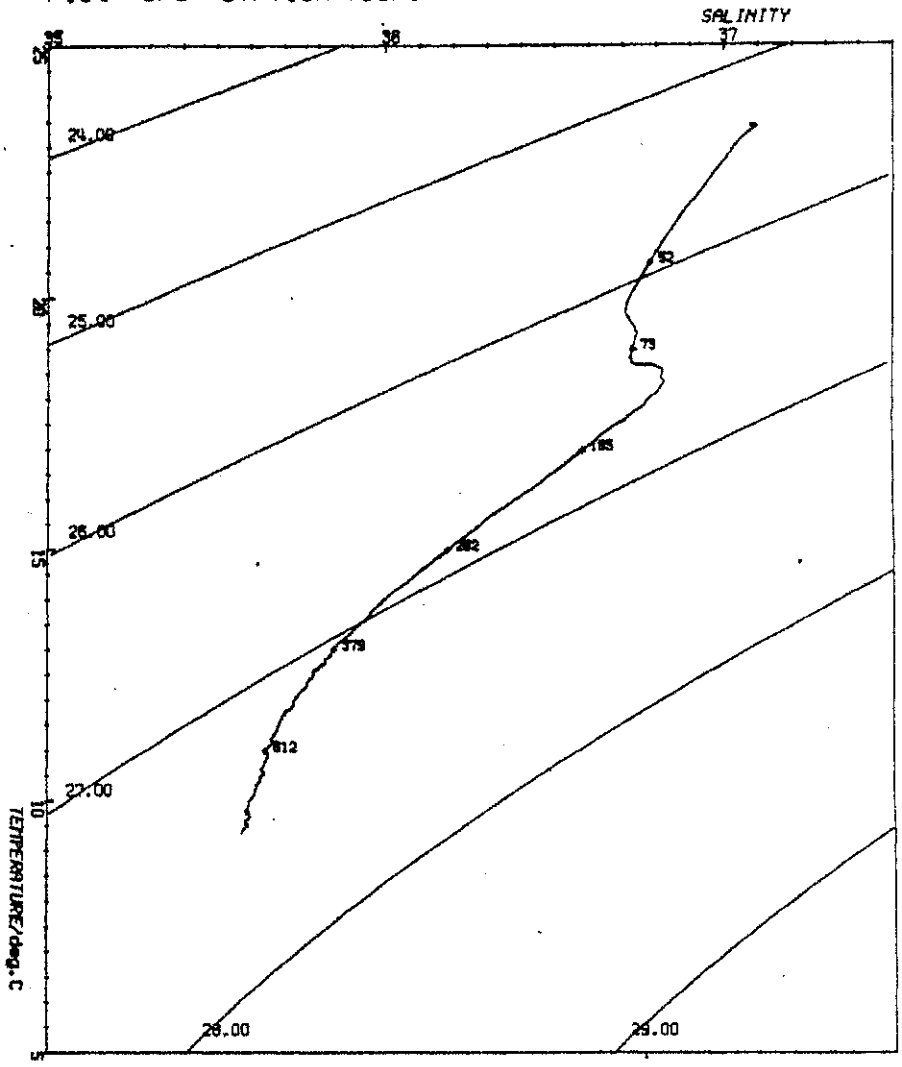

P104 DPS STATION 787/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar


P104 DPS STATION 787/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

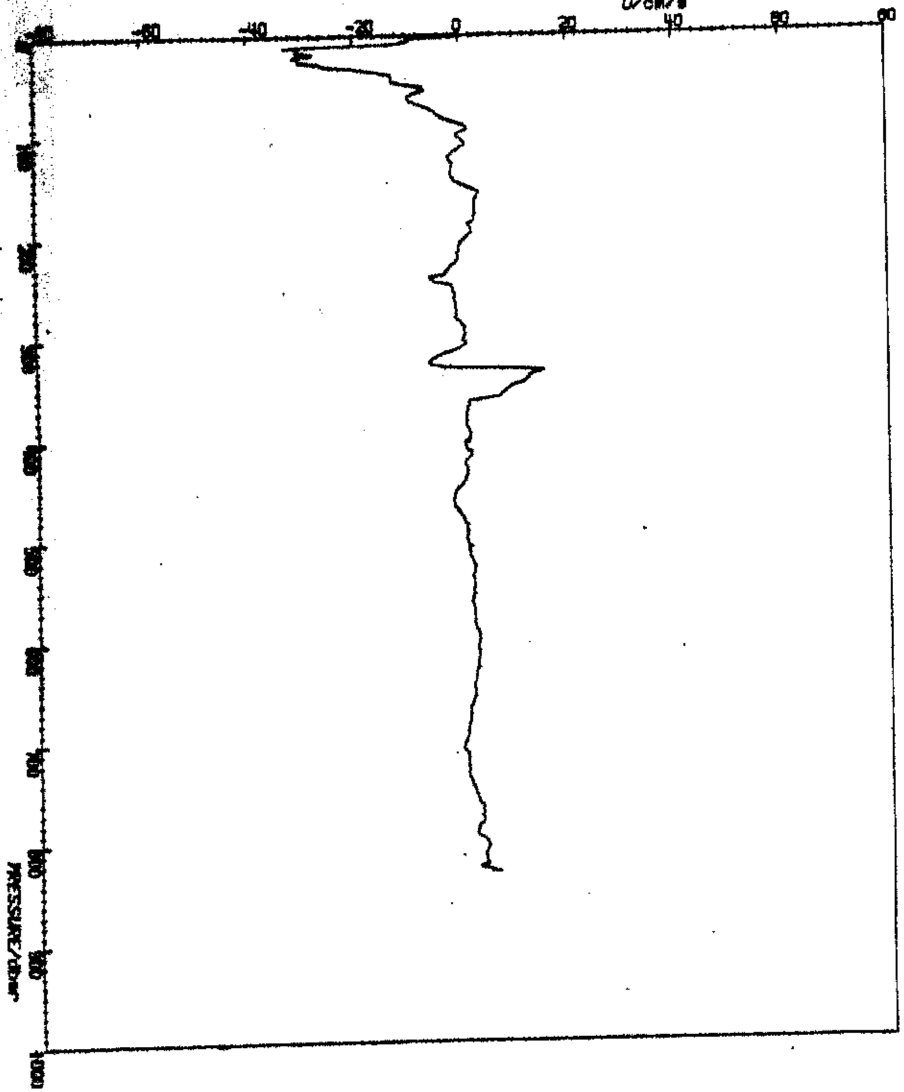
P104 OPS STATION 788/1



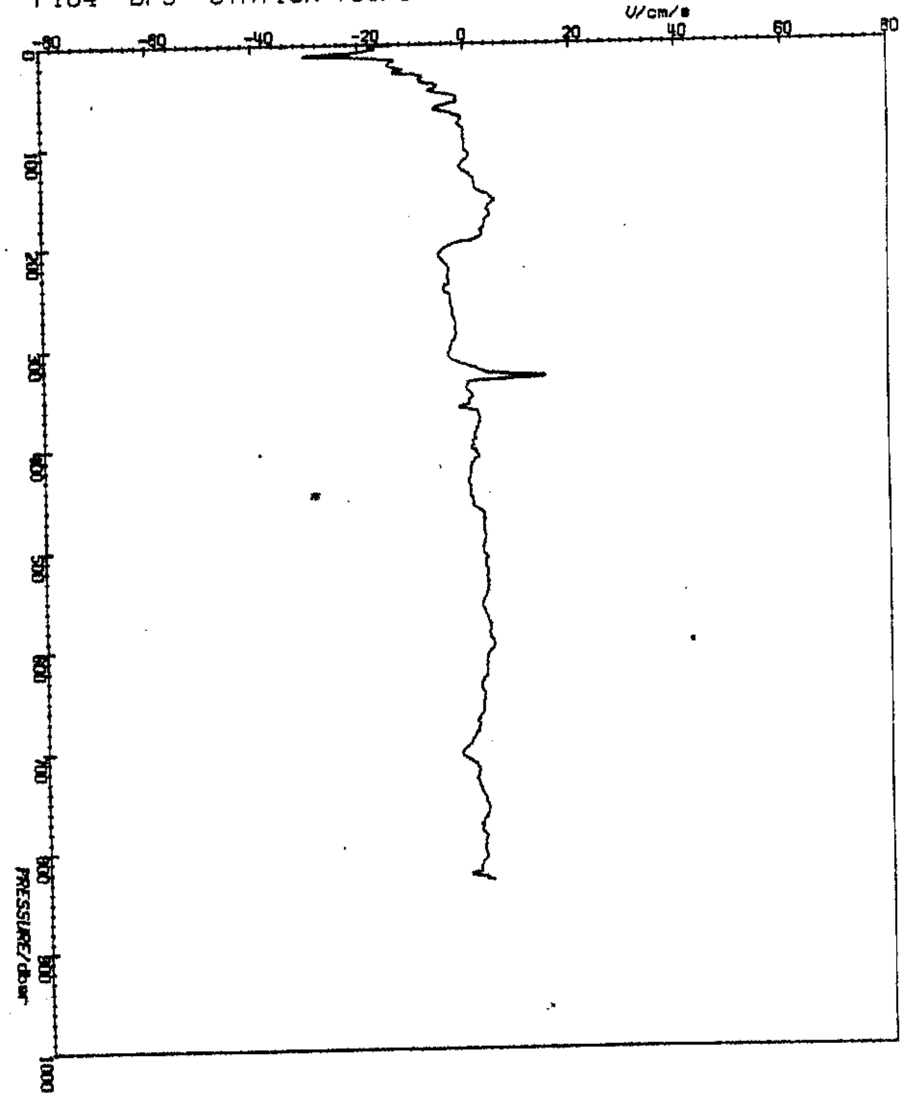
P104 OPS STATION 788/1

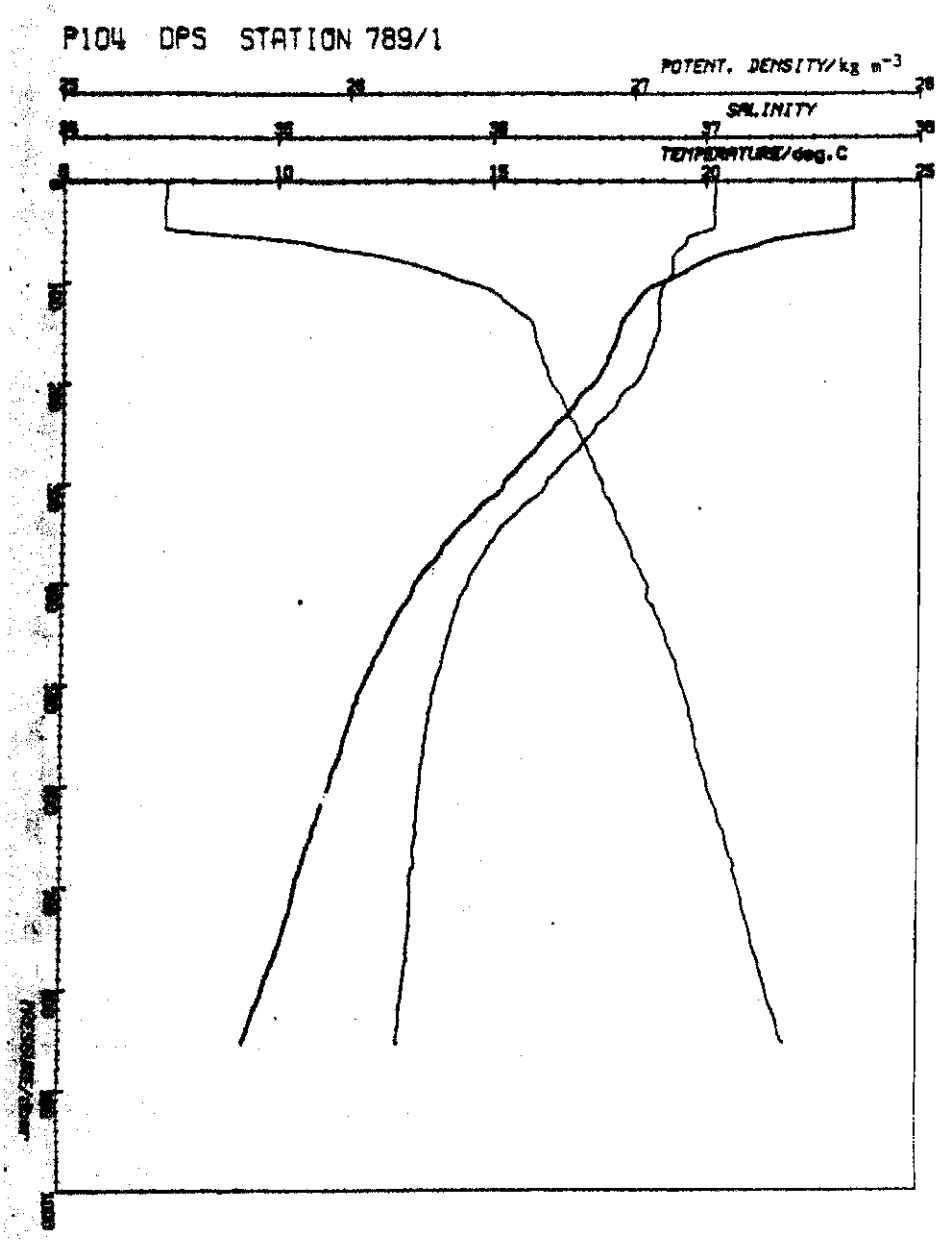


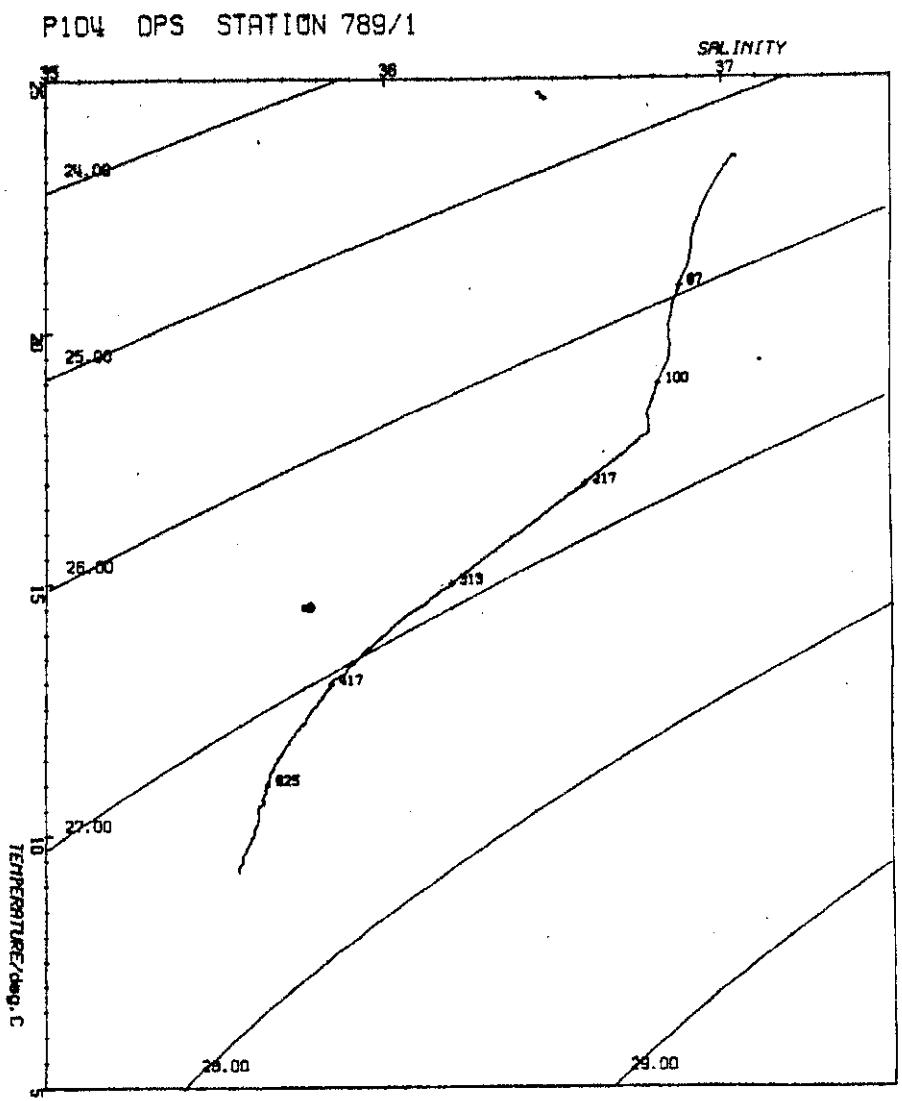
P104 DPS STATION 788/1

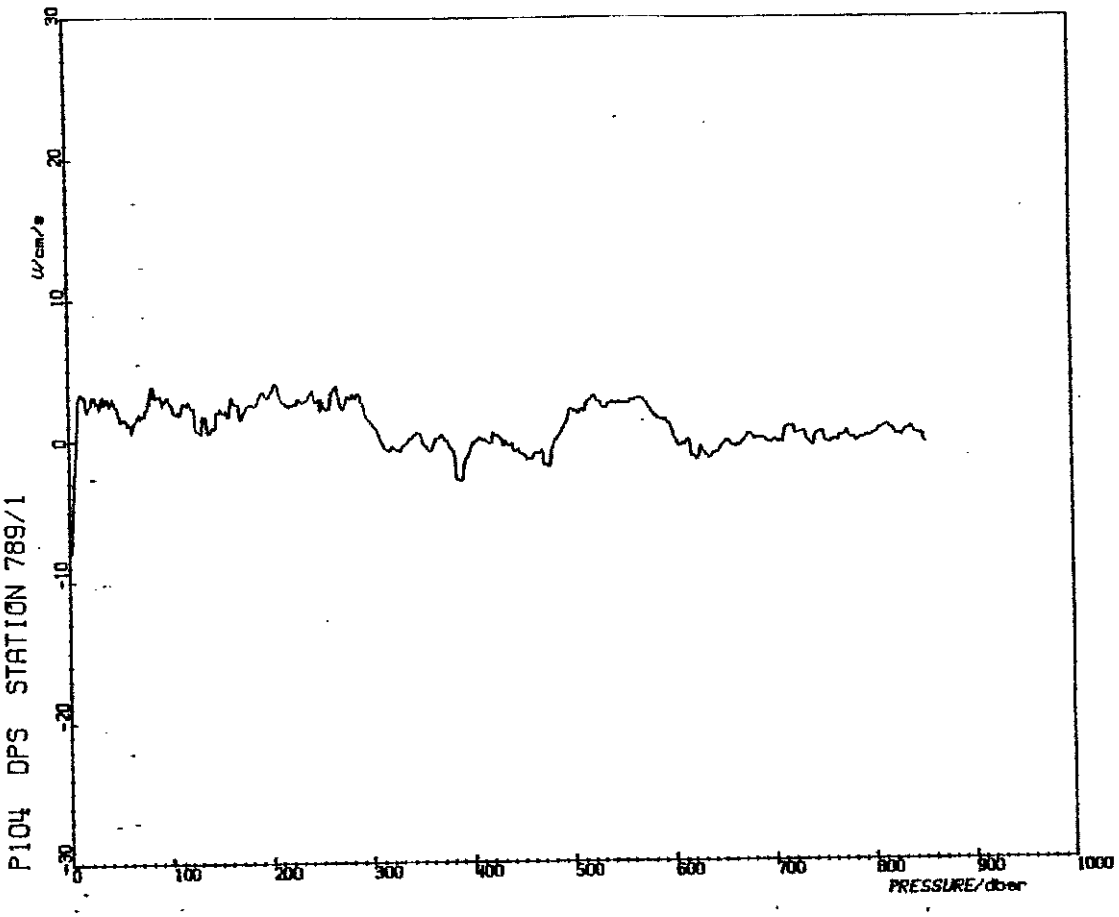


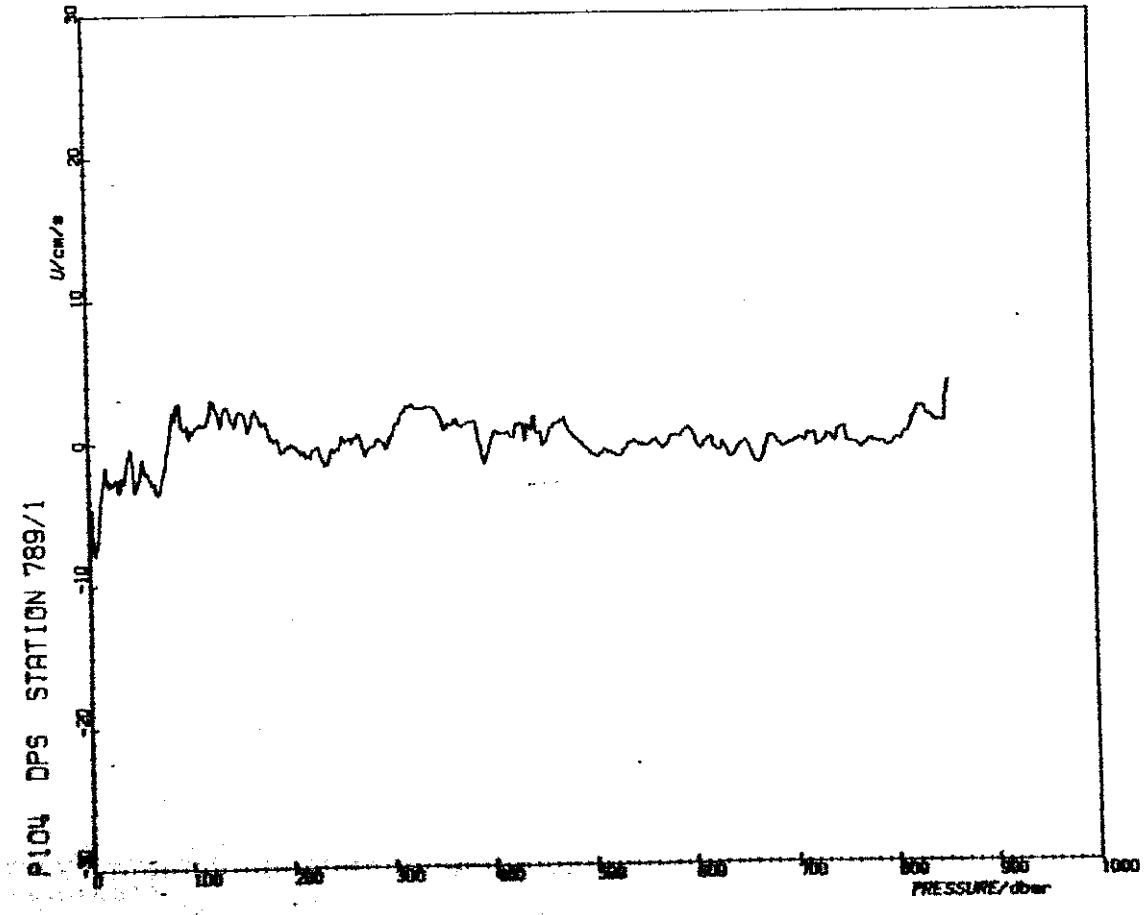
P104 DPS STATION 788/1



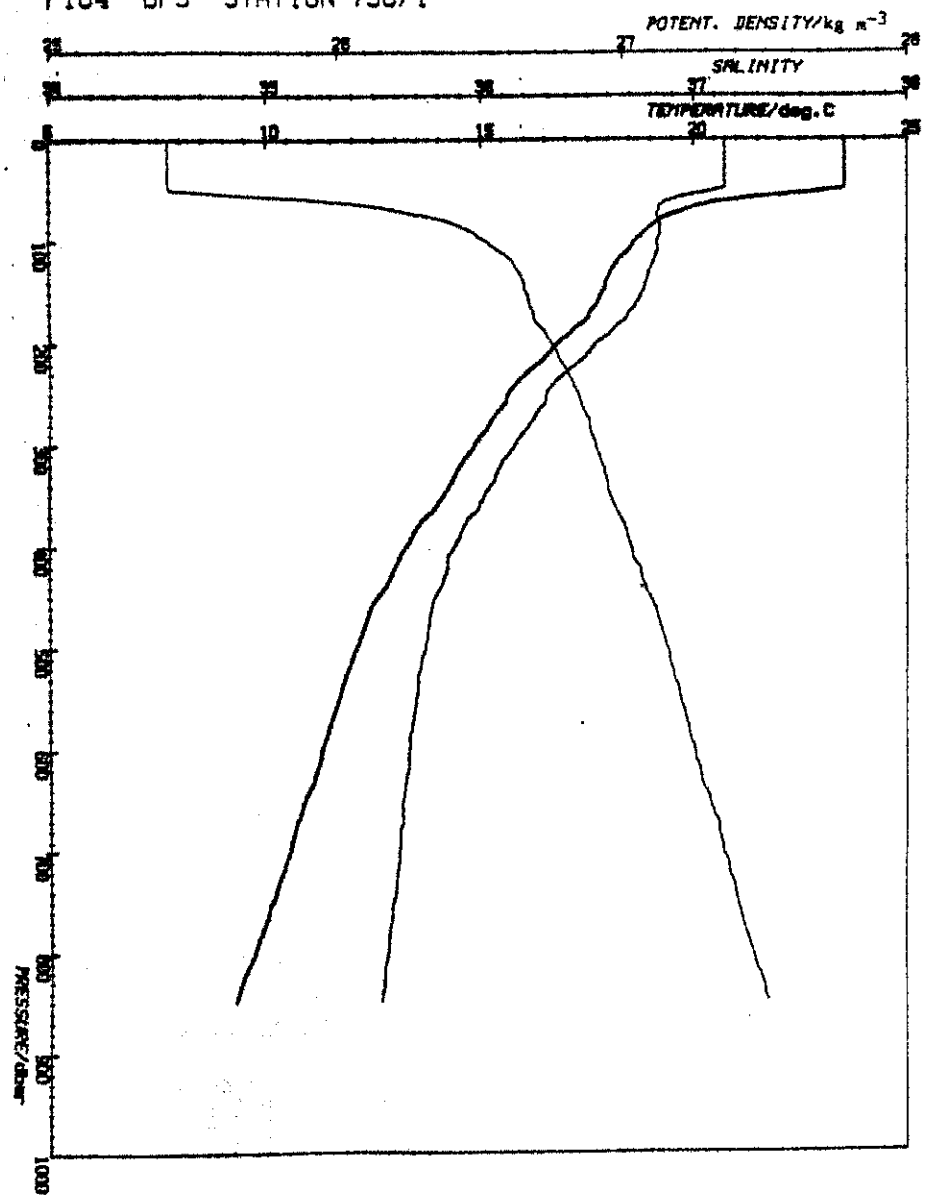

P104 DPS STATION 789/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C


P104 DPS STATION 789/1
SALINITY
24.00
25.00
26.00
27.00
28.00
29.00
97
100
117
119
117
125
TEMPERATURE/deg.C

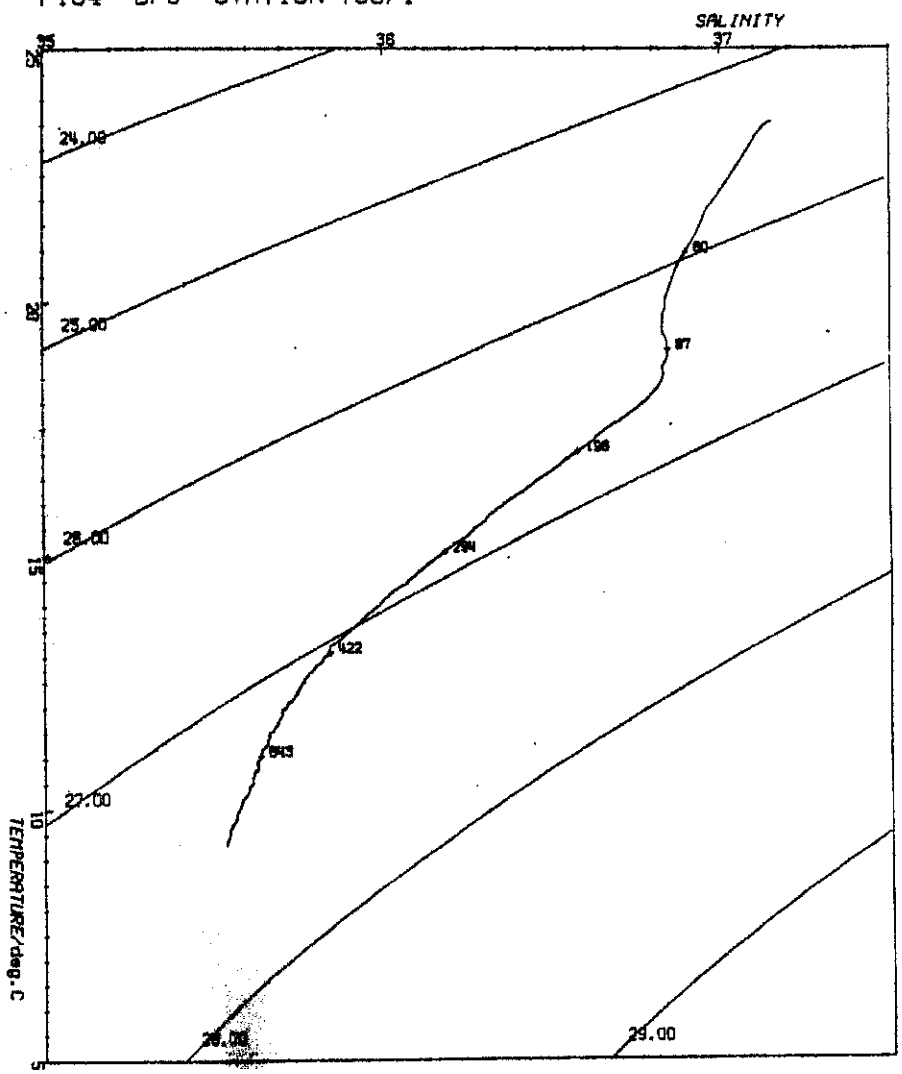

P104 DPS STATION 789/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

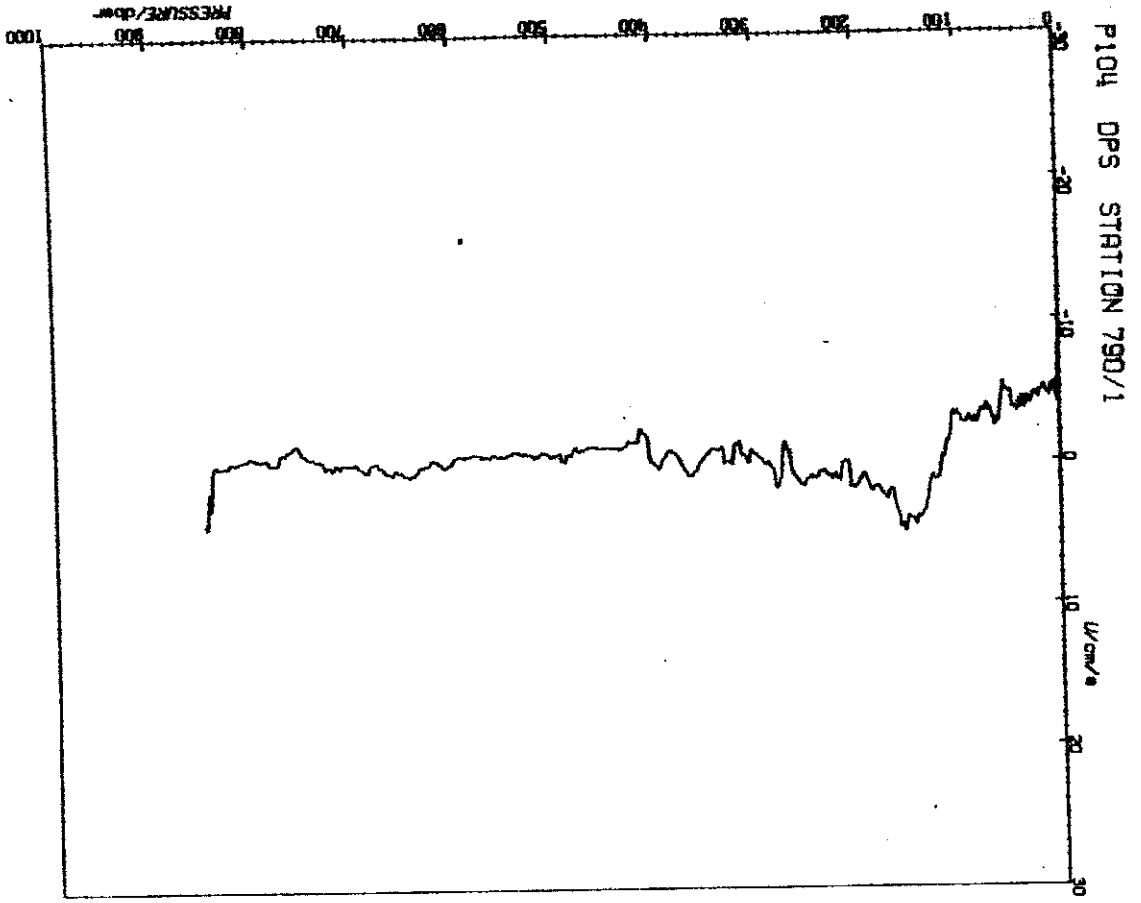

P104 DPS STATION 789/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

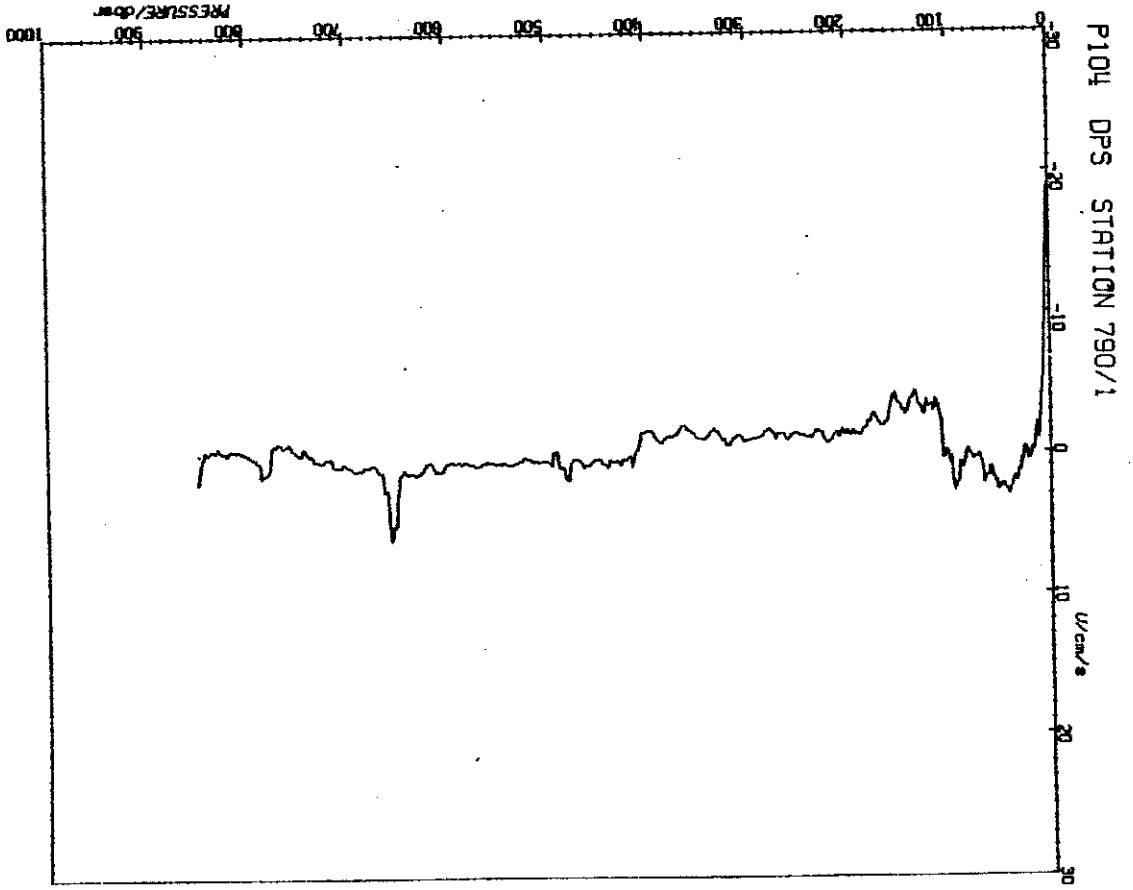
P104 DPS STATION 790/1



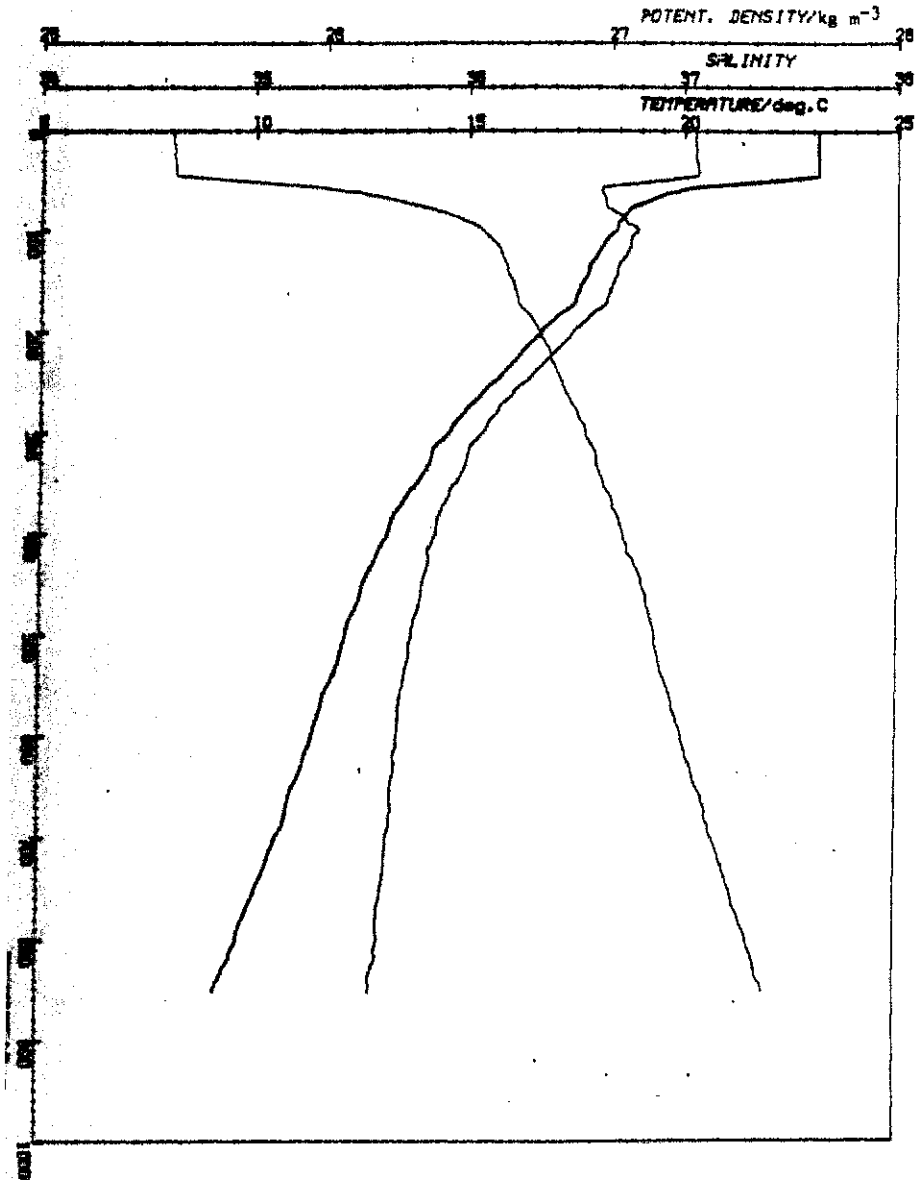
P104 DPS STATION 790/1



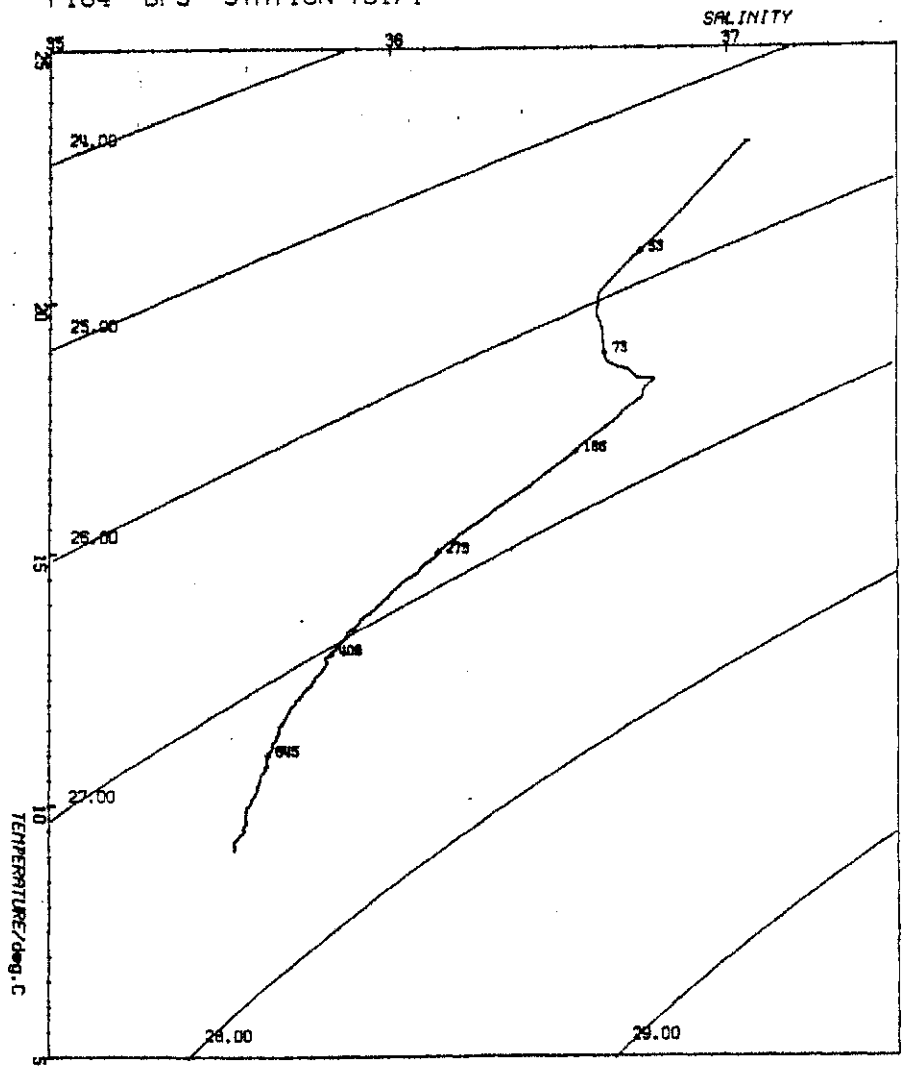

P104 OPS STATION 790/1
PRESSURE/dbar
u/cm/s

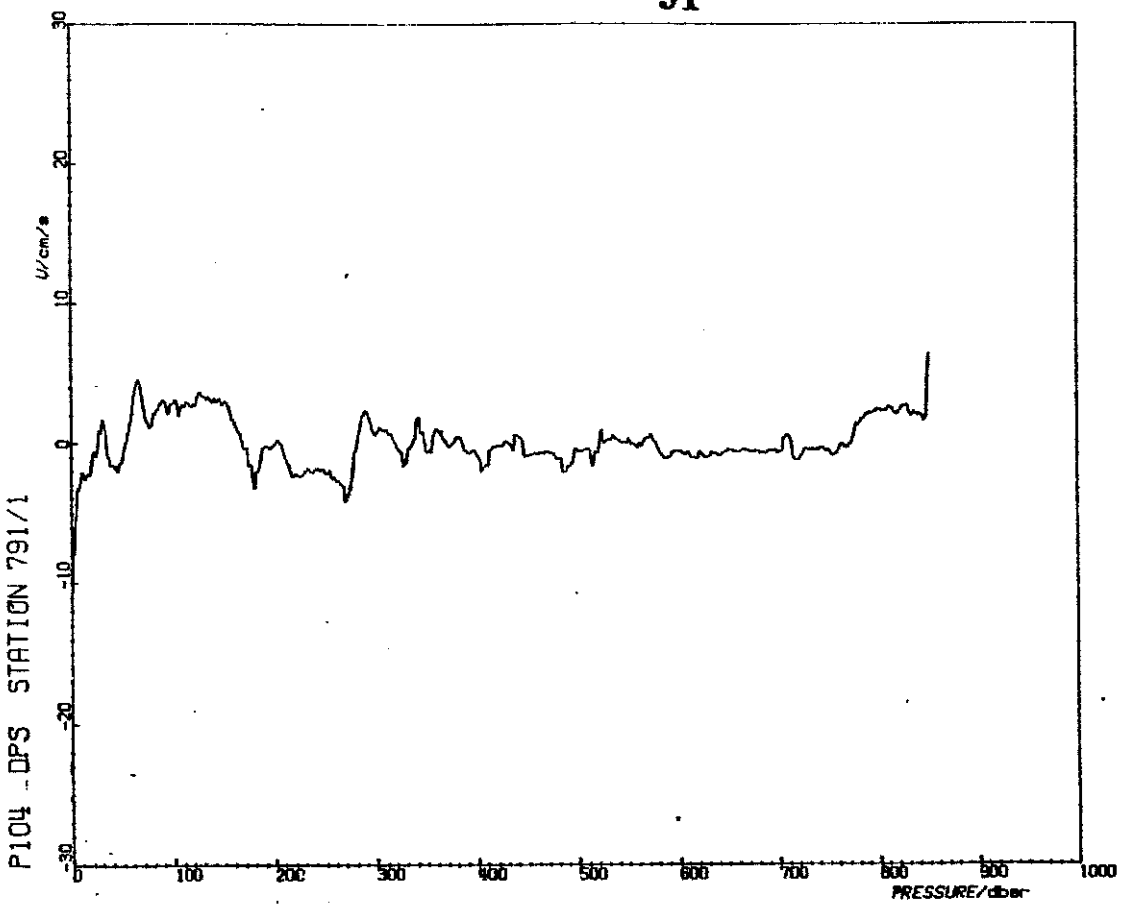

P104 OPS STATION 790/1
PRESSURE/dbar
u/cm/s

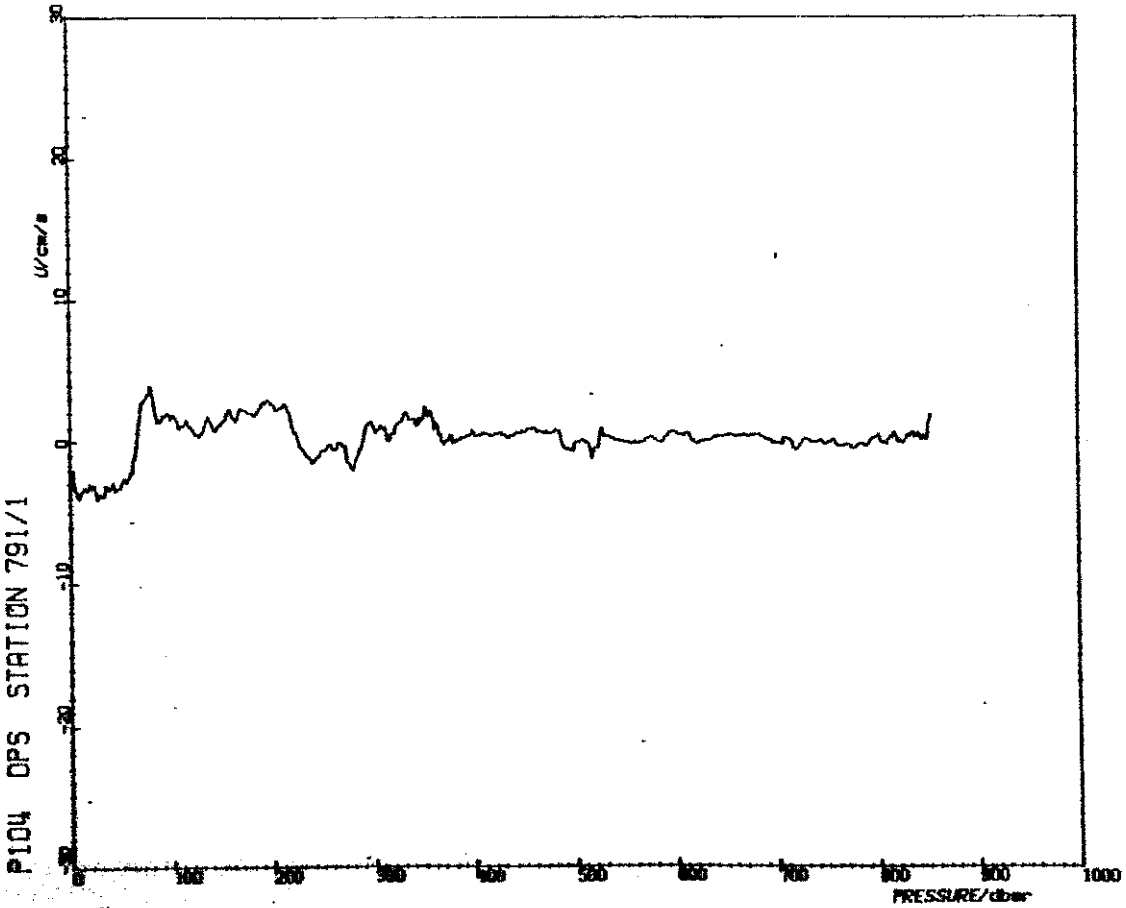
P104 OPS STATION 791/1



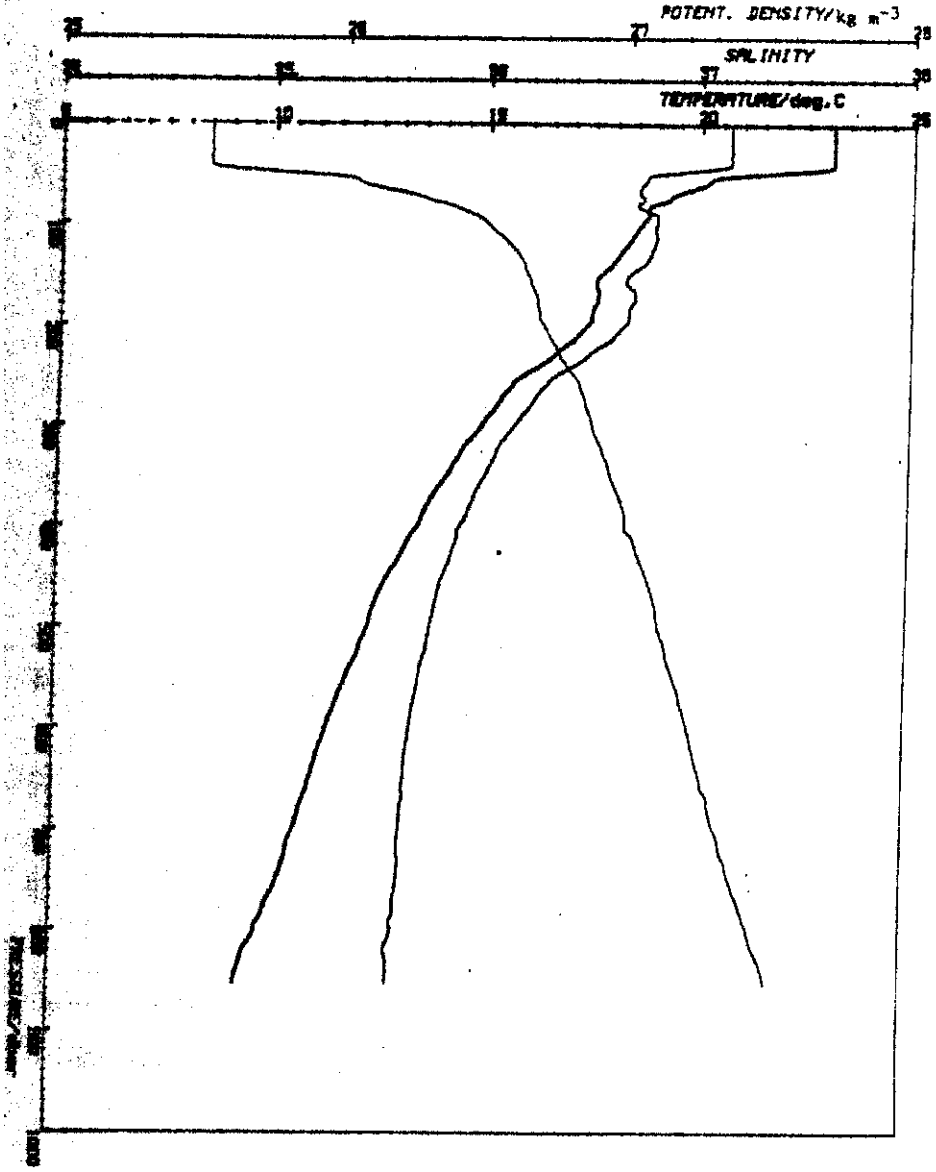
P104 OPS STATION 791/1



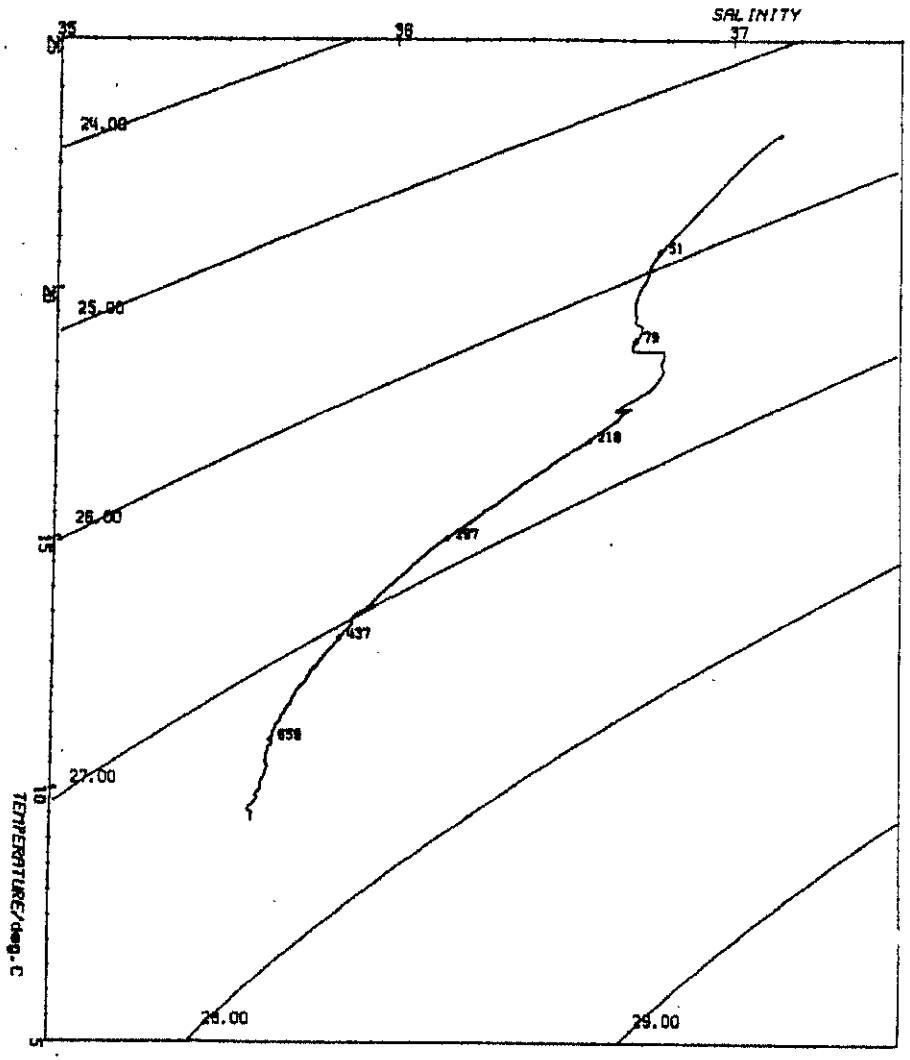

P104 DPS STATION 791/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar


P104 DPS STATION 791/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

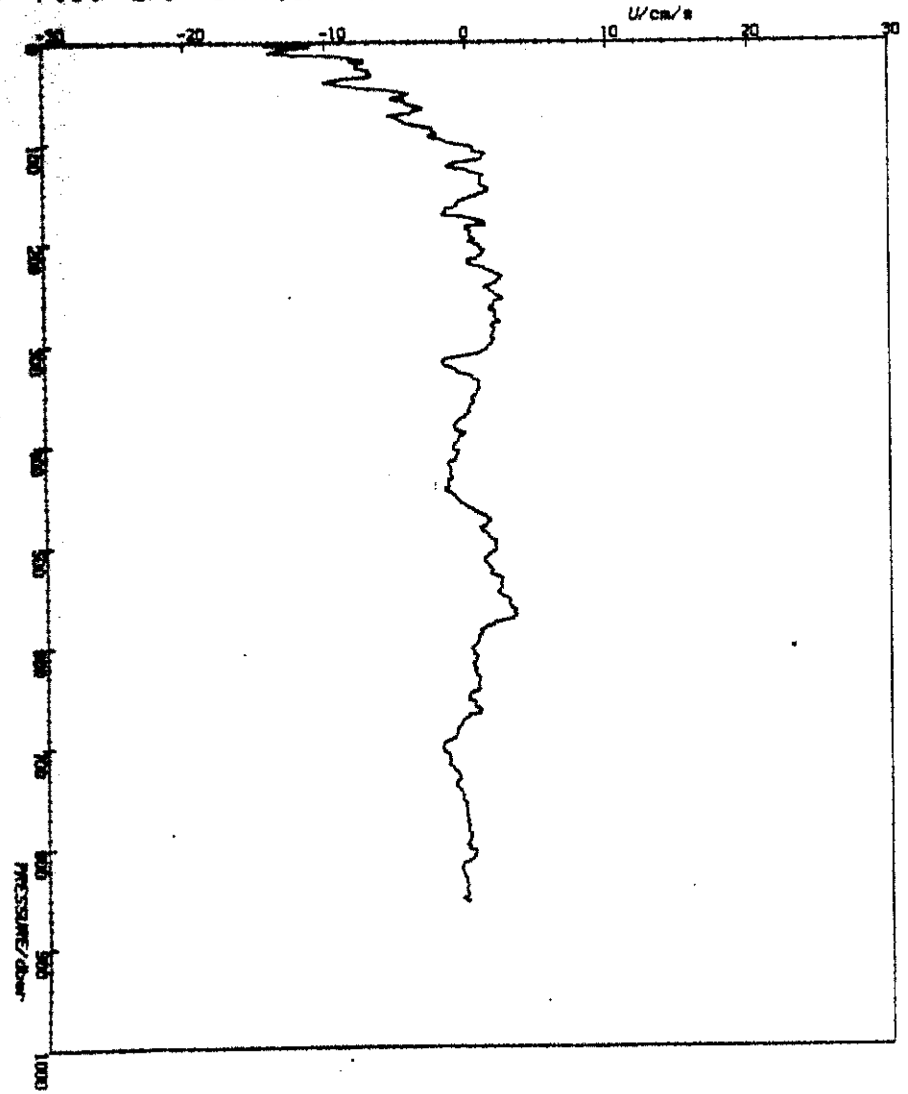
P104 DPS STATION 792/1



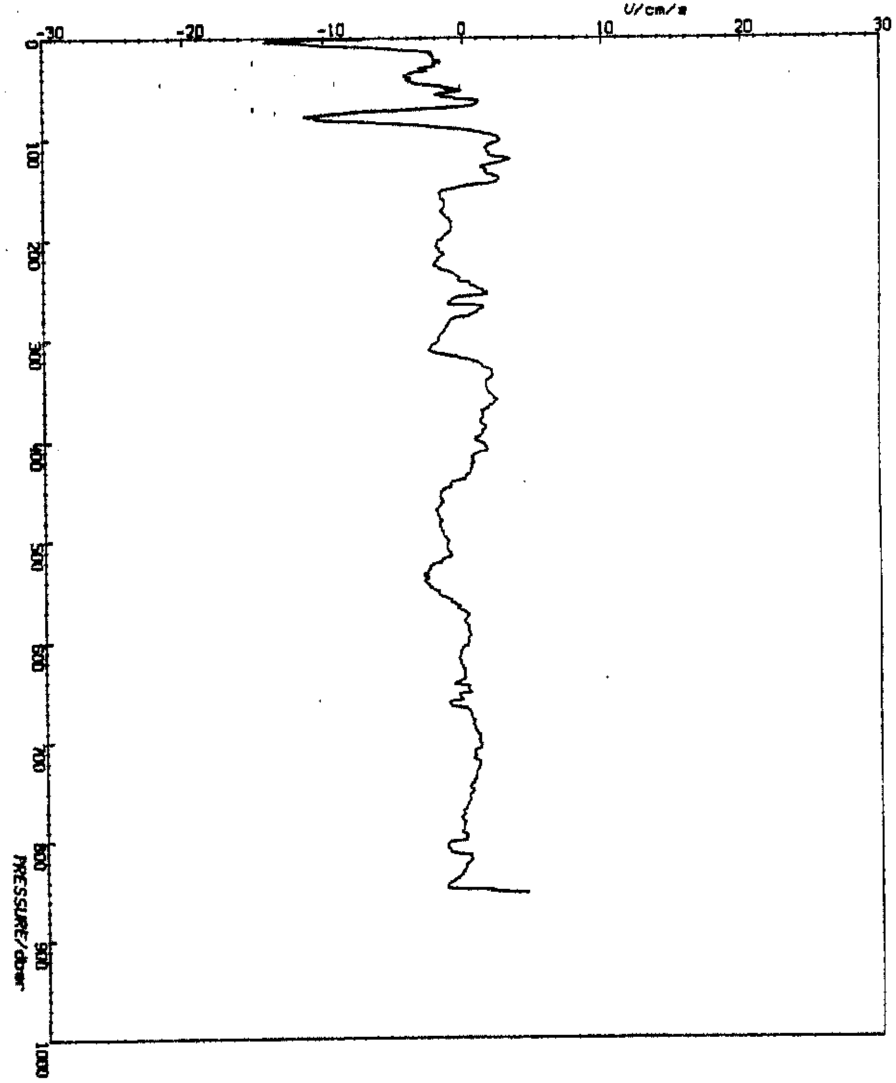
P104 DPS STATION 792/1

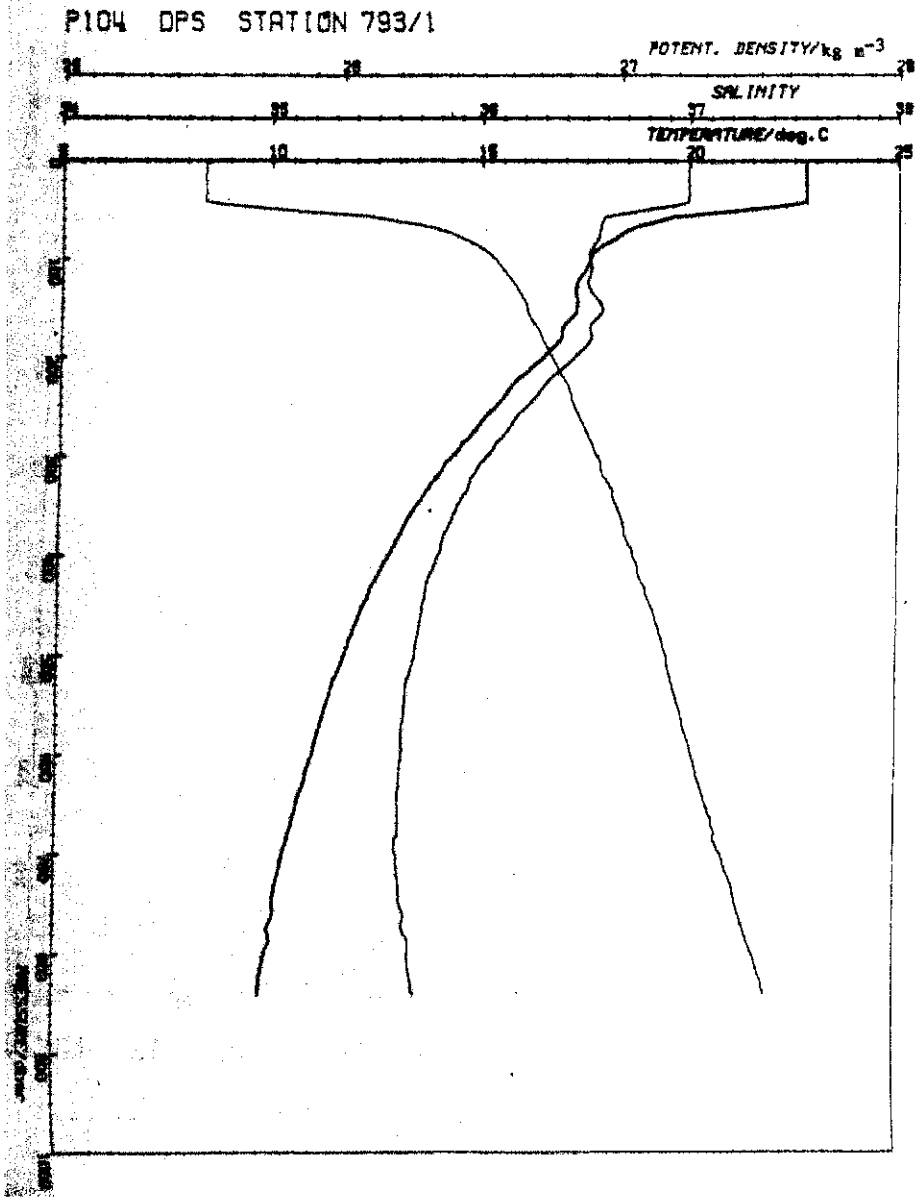


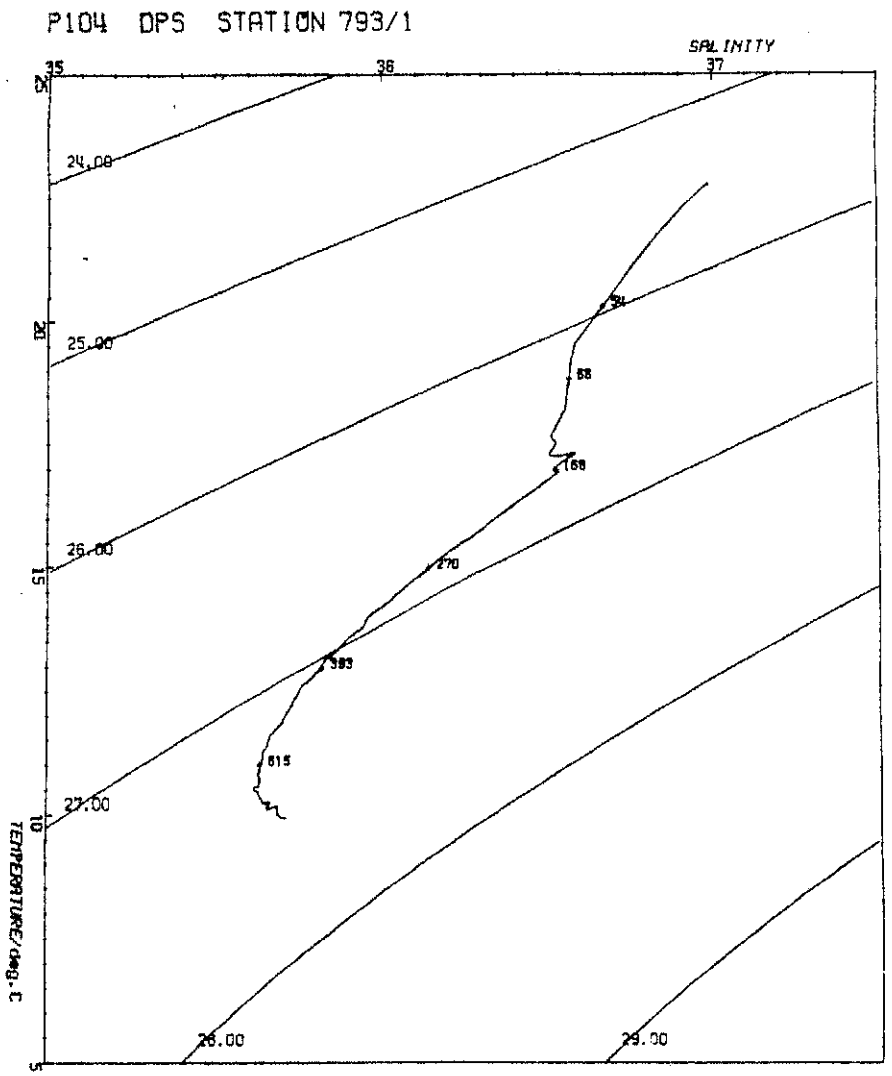
P104 DPS STATION 792/1



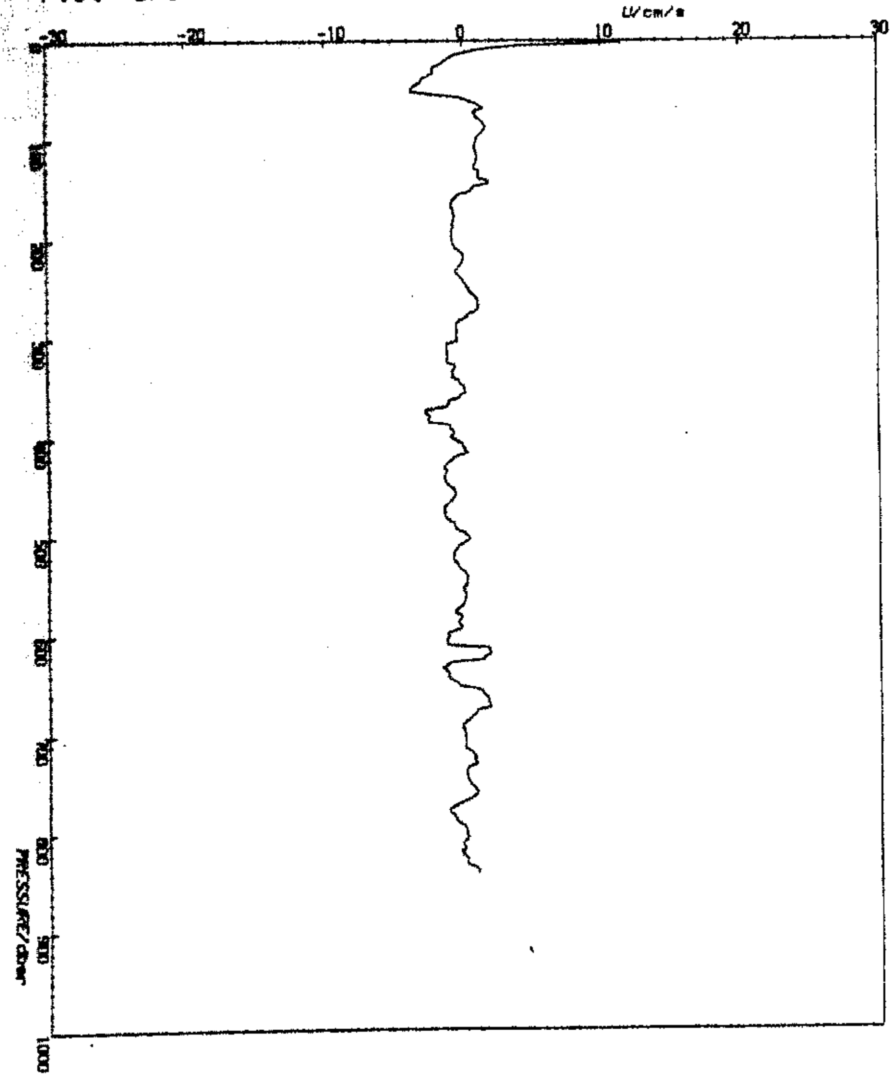
P104 DPS STATION 792/1



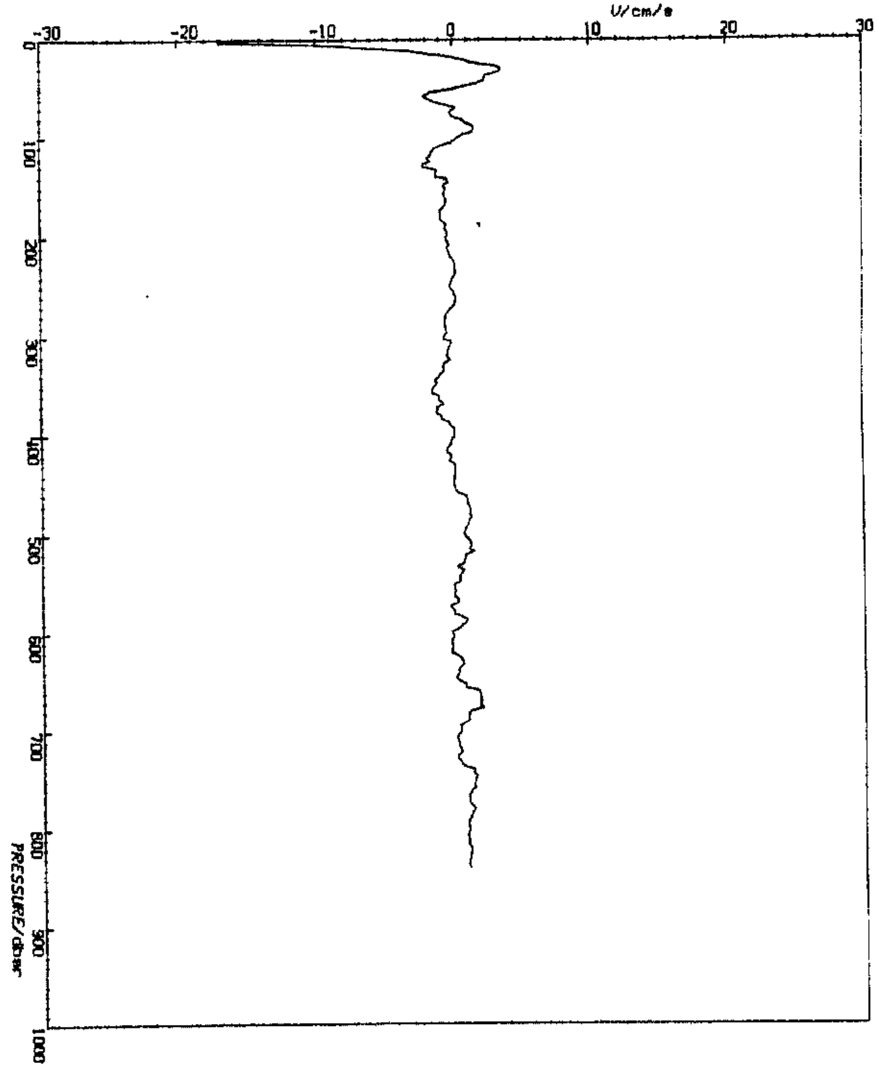

P104 DPS STATION 793/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C


P104 DPS STATION 793/1
SALINITY
TEMPERATURE/deg.C
24.00
25.00
26.00
27.00
26.00
29.00

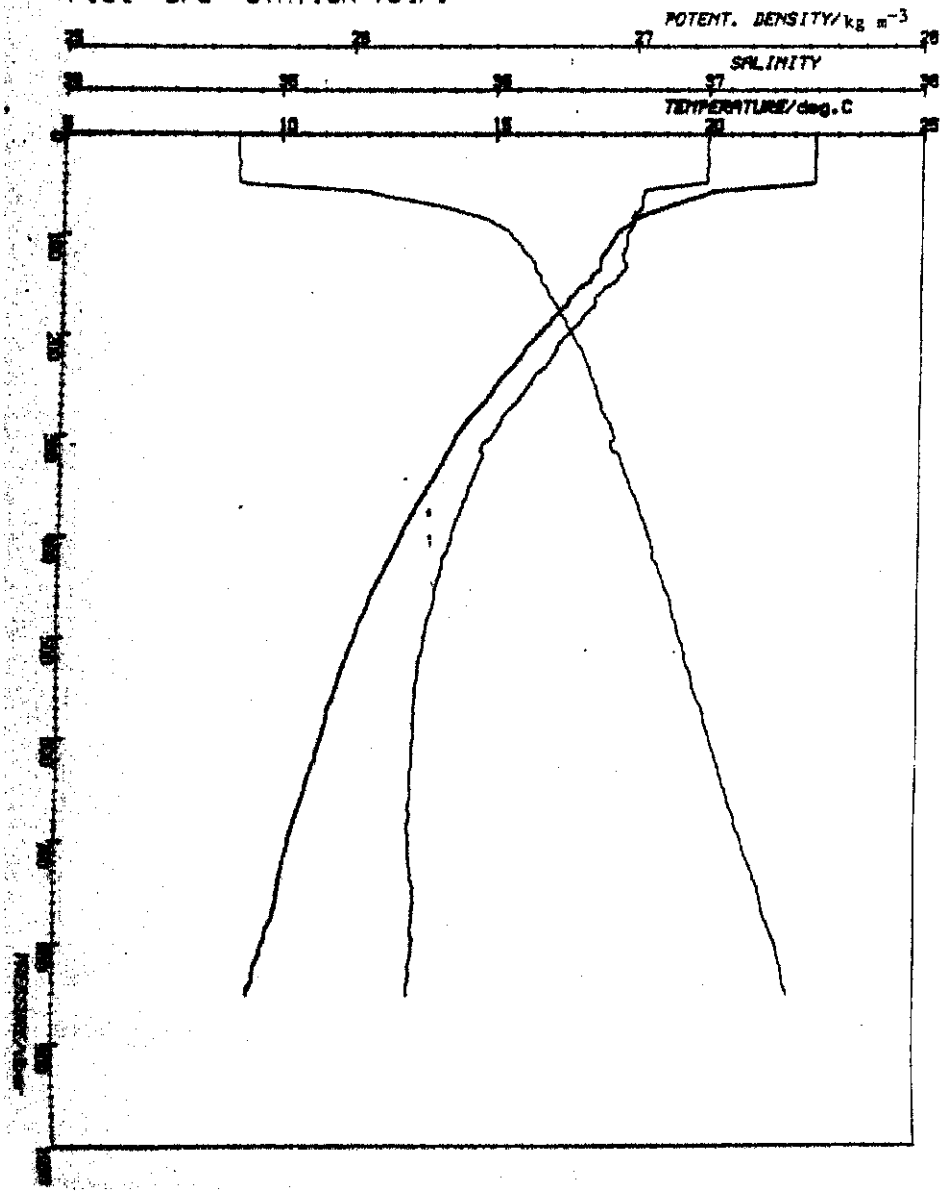
P104 DPS STATION 793/1



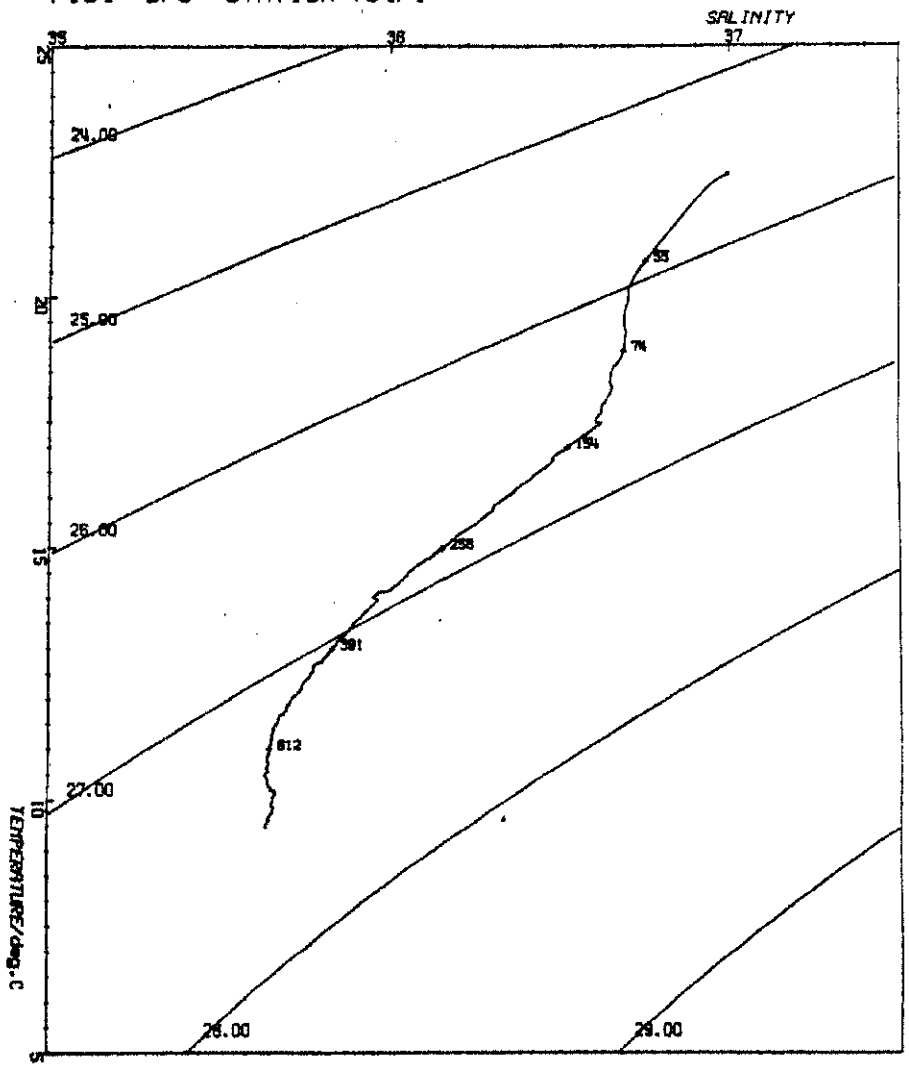
P104 DPS STATION 793/1



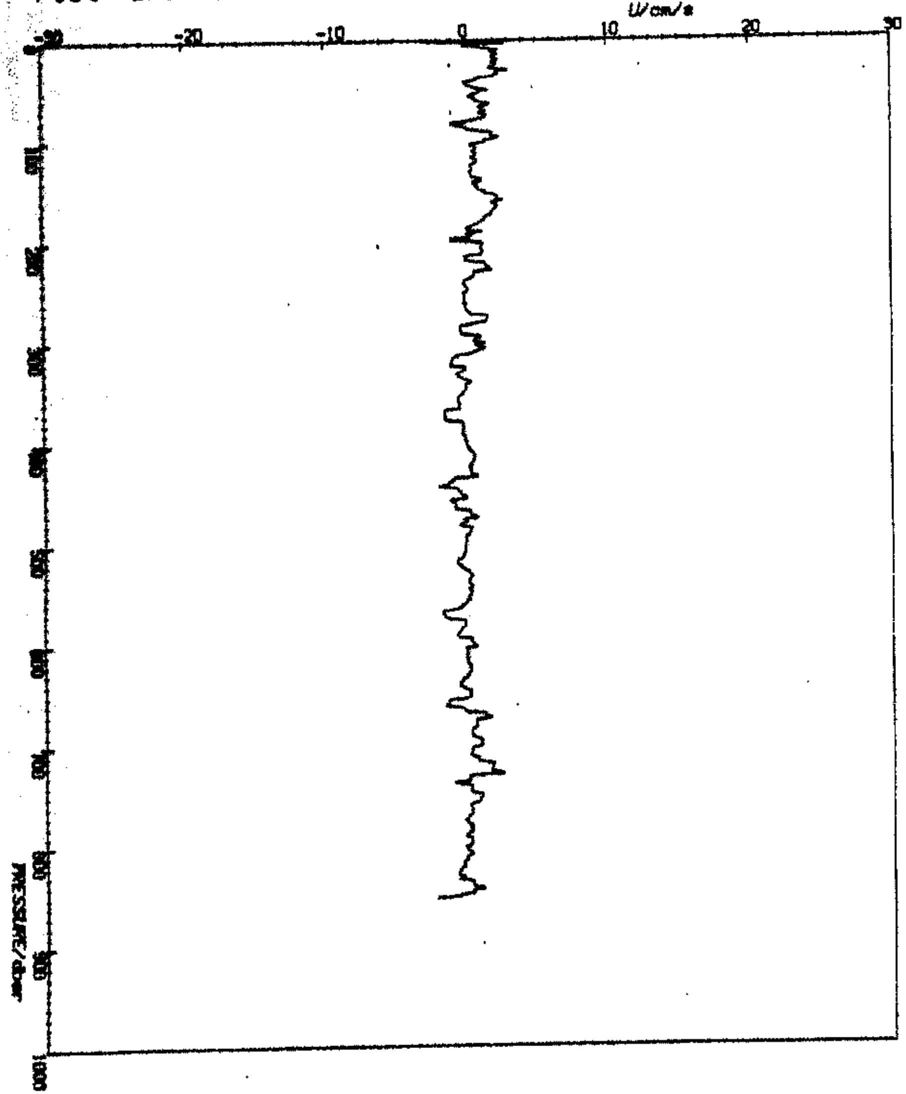
P104 DPS STATION 794/1



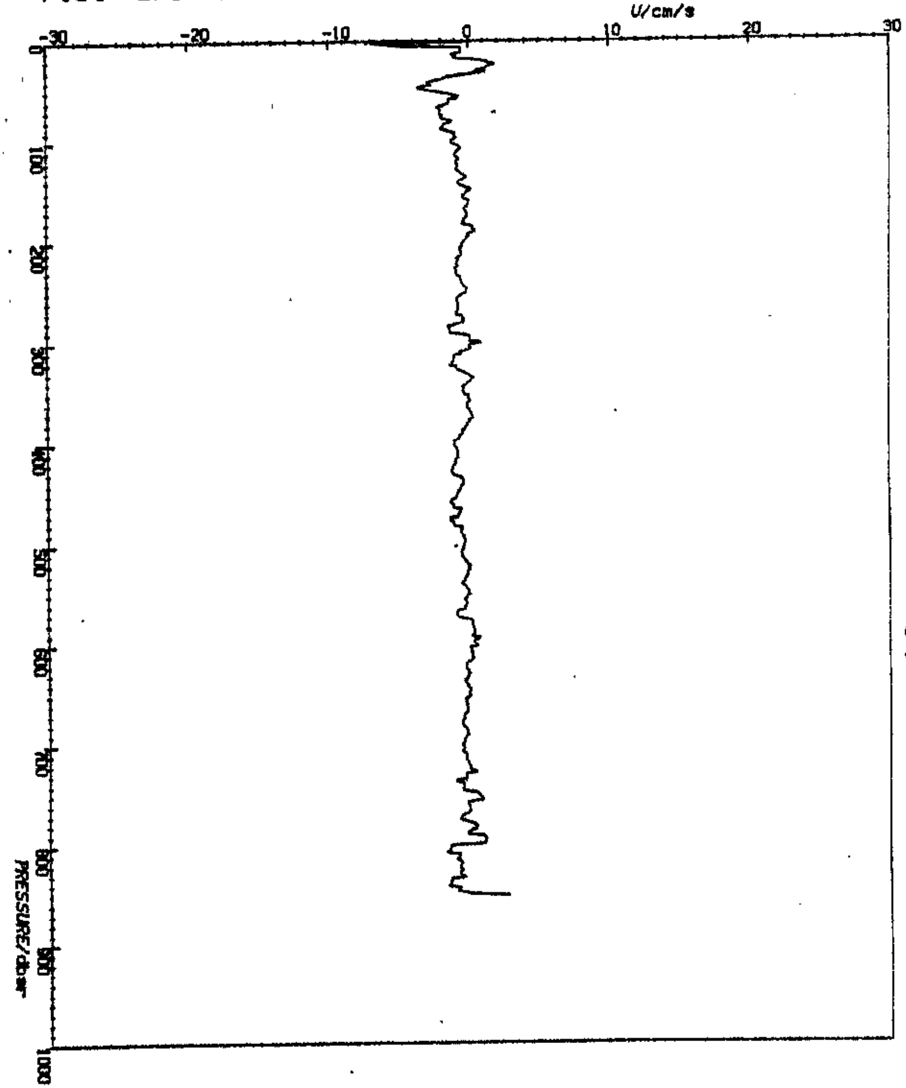
P104 DPS STATION 794/1



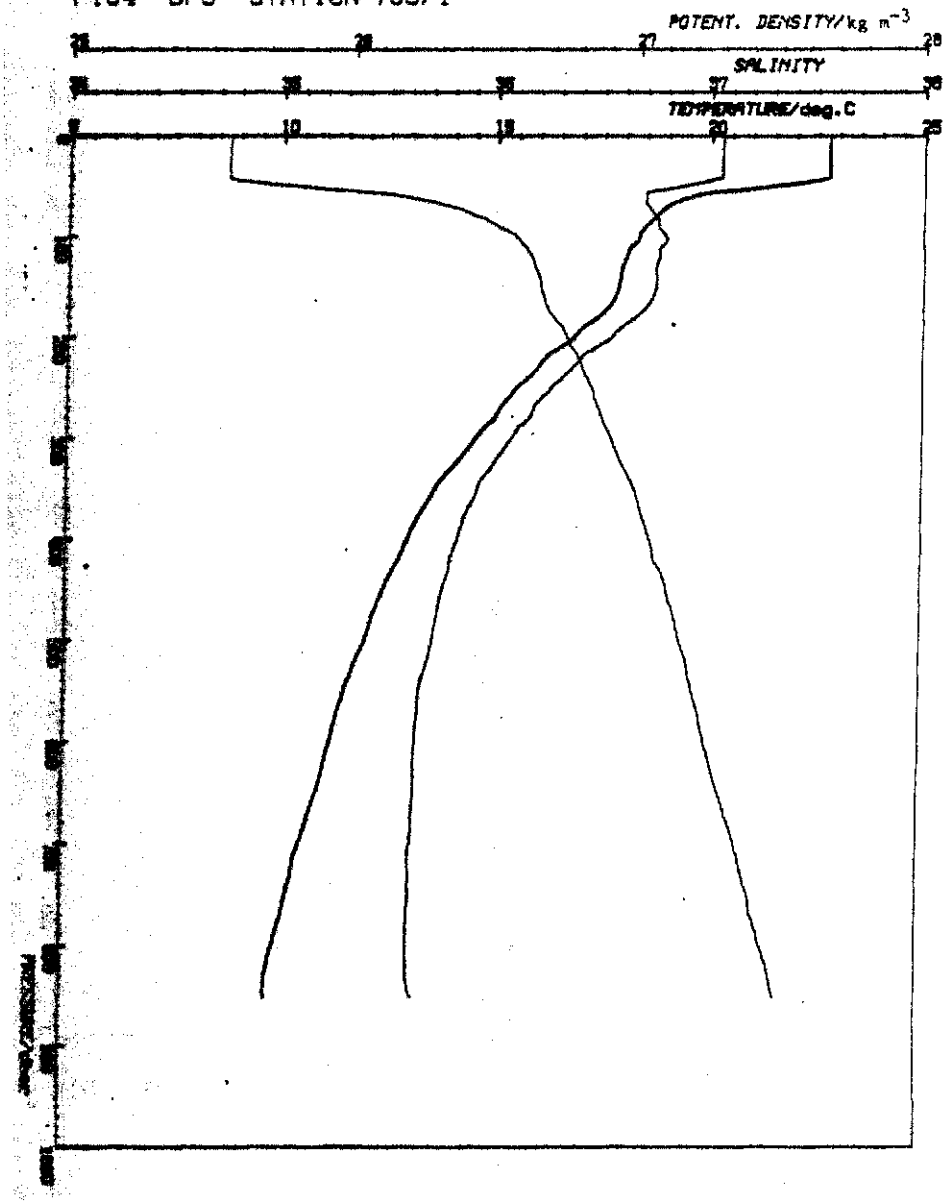
P104 DPS STATION 794/1



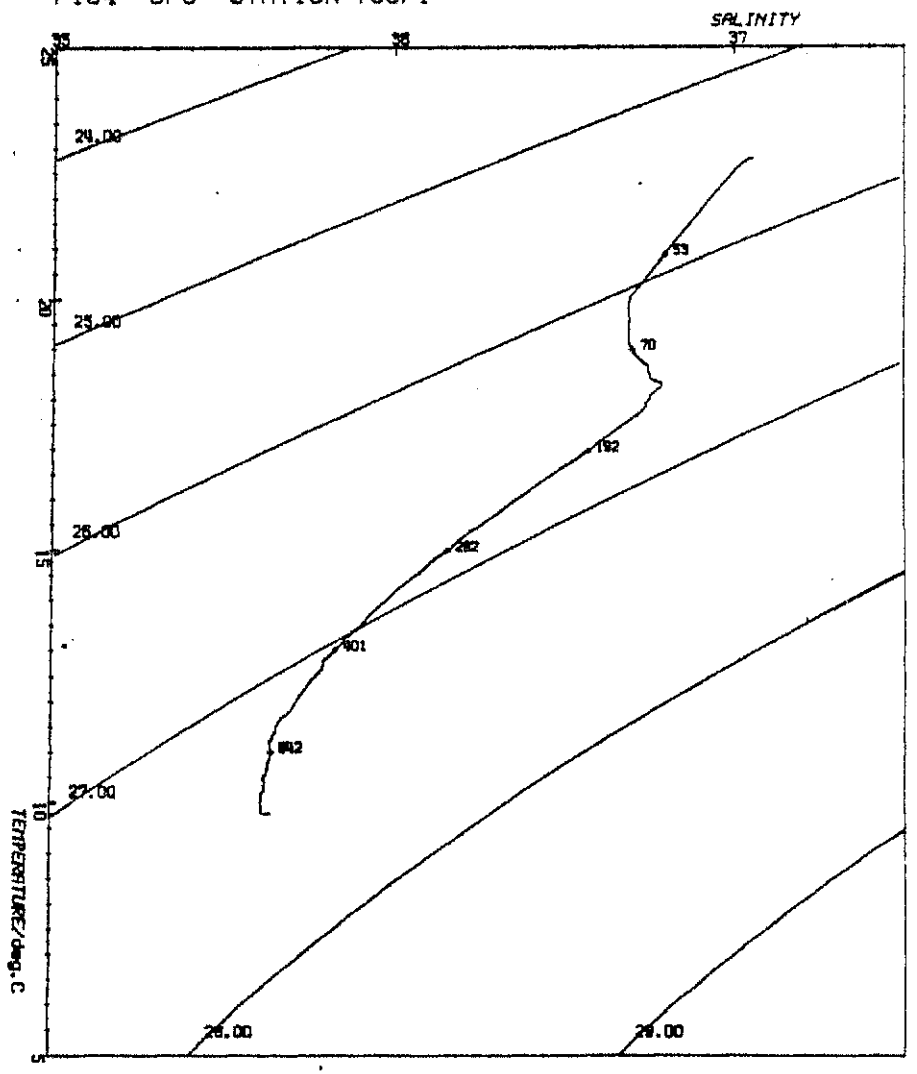
P104 DPS STATION 794/1

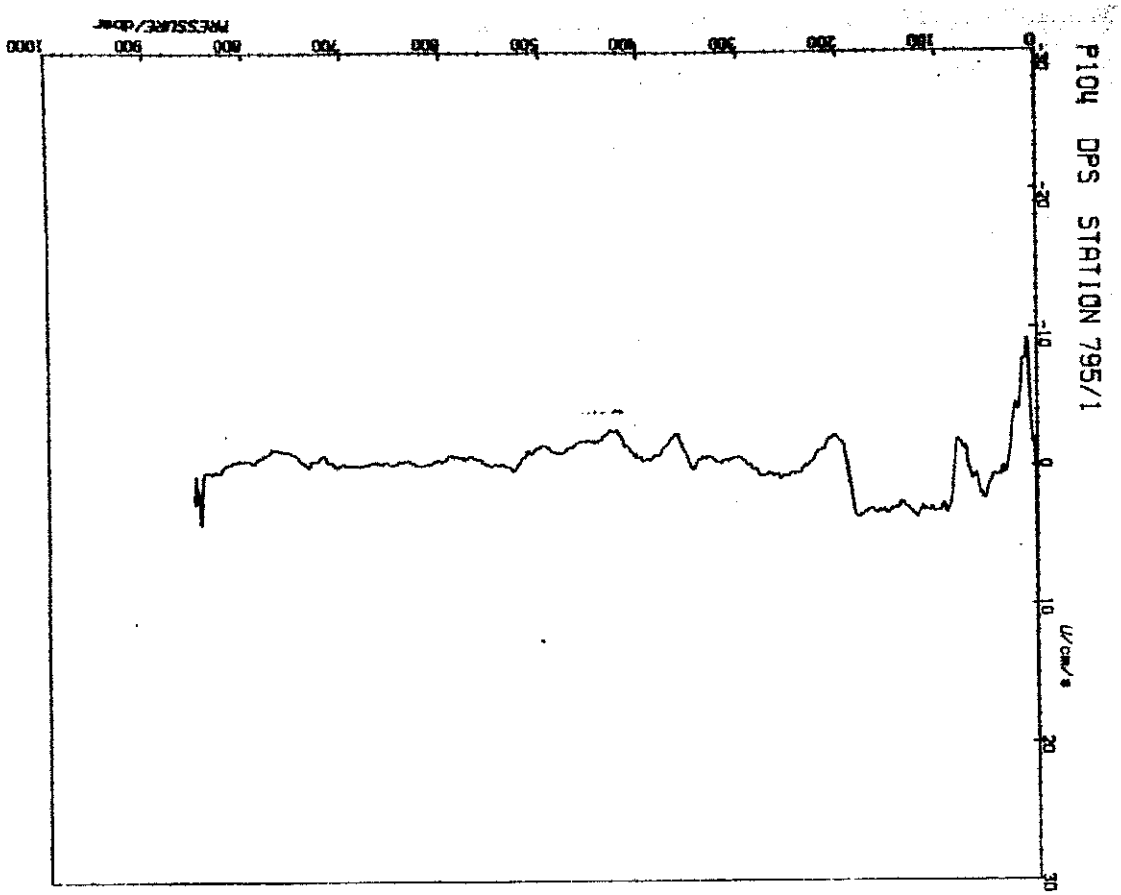


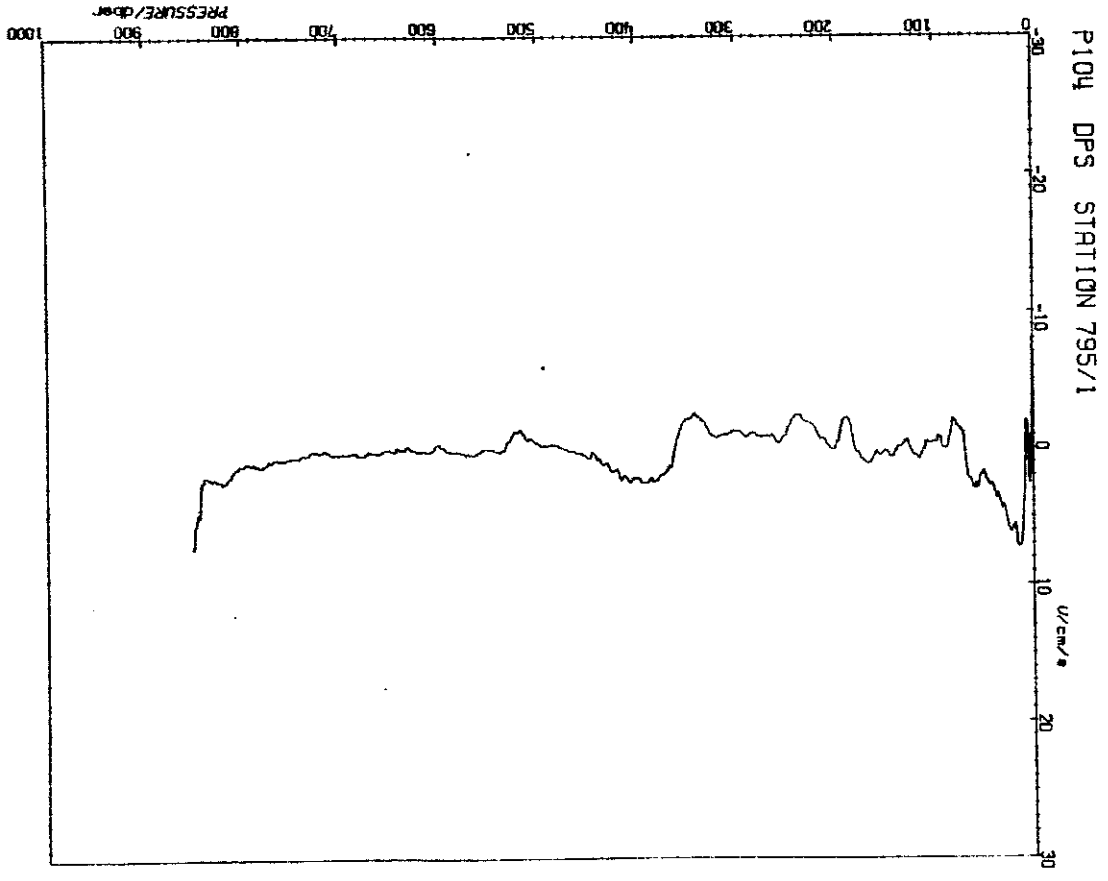
P104 DPS STATION 795/1



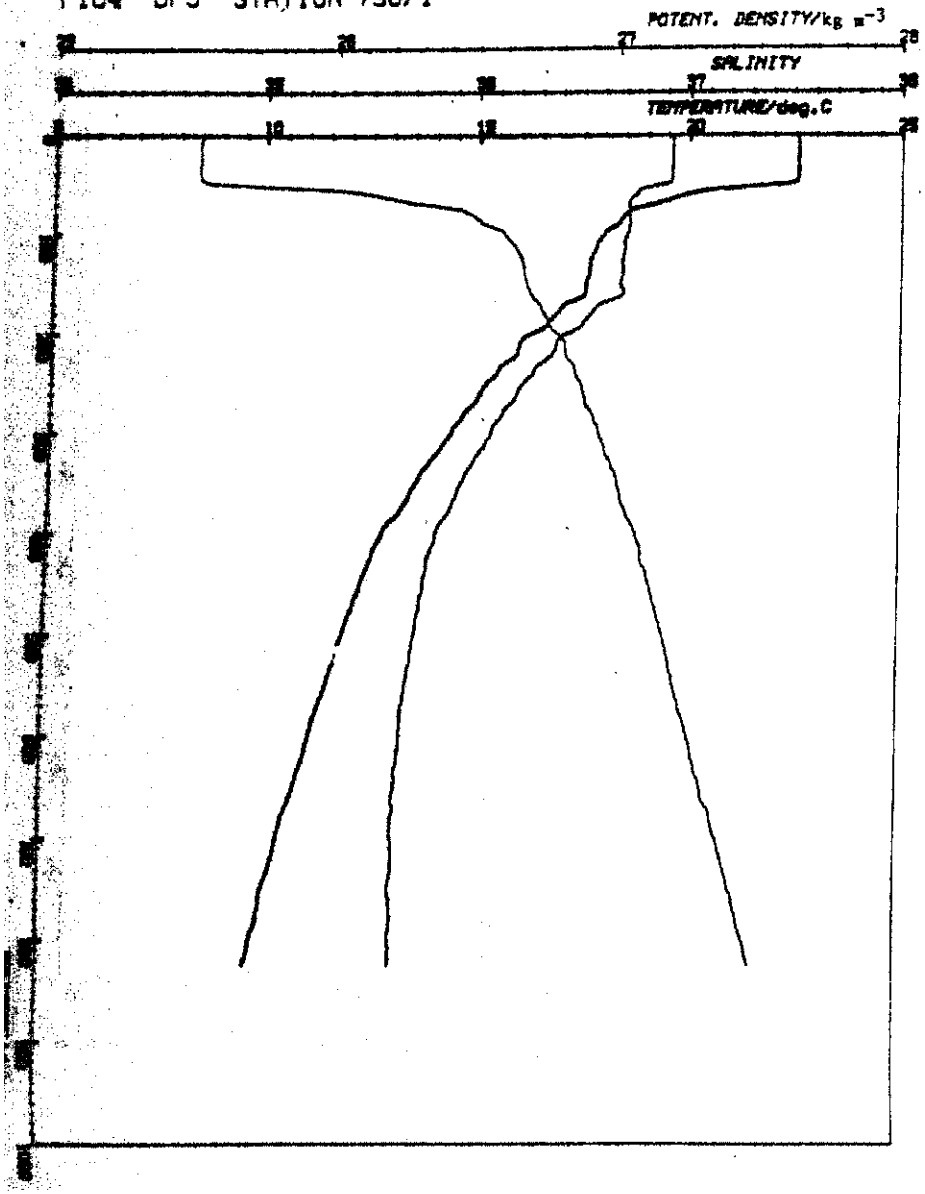
P104 DPS STATION 795/1



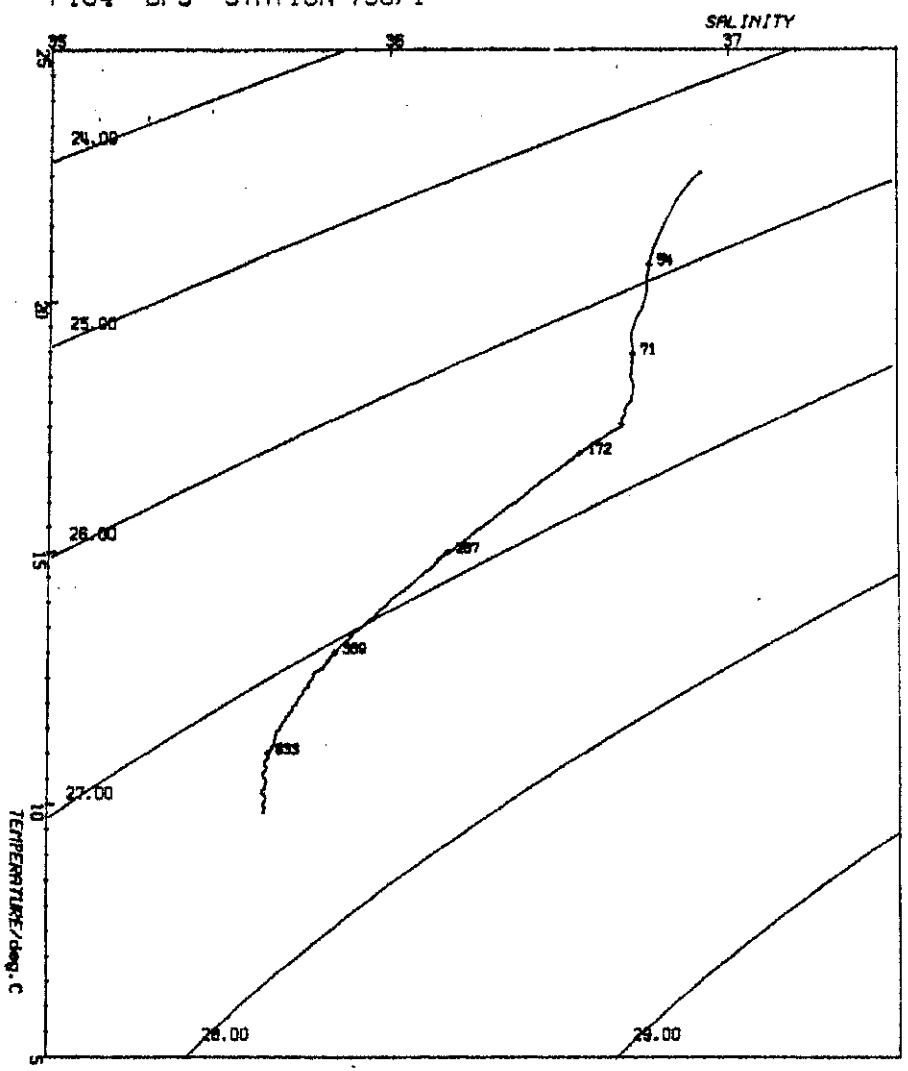

P104 DPS STATION 795/1
PRESSURE/decar
u/cm/s

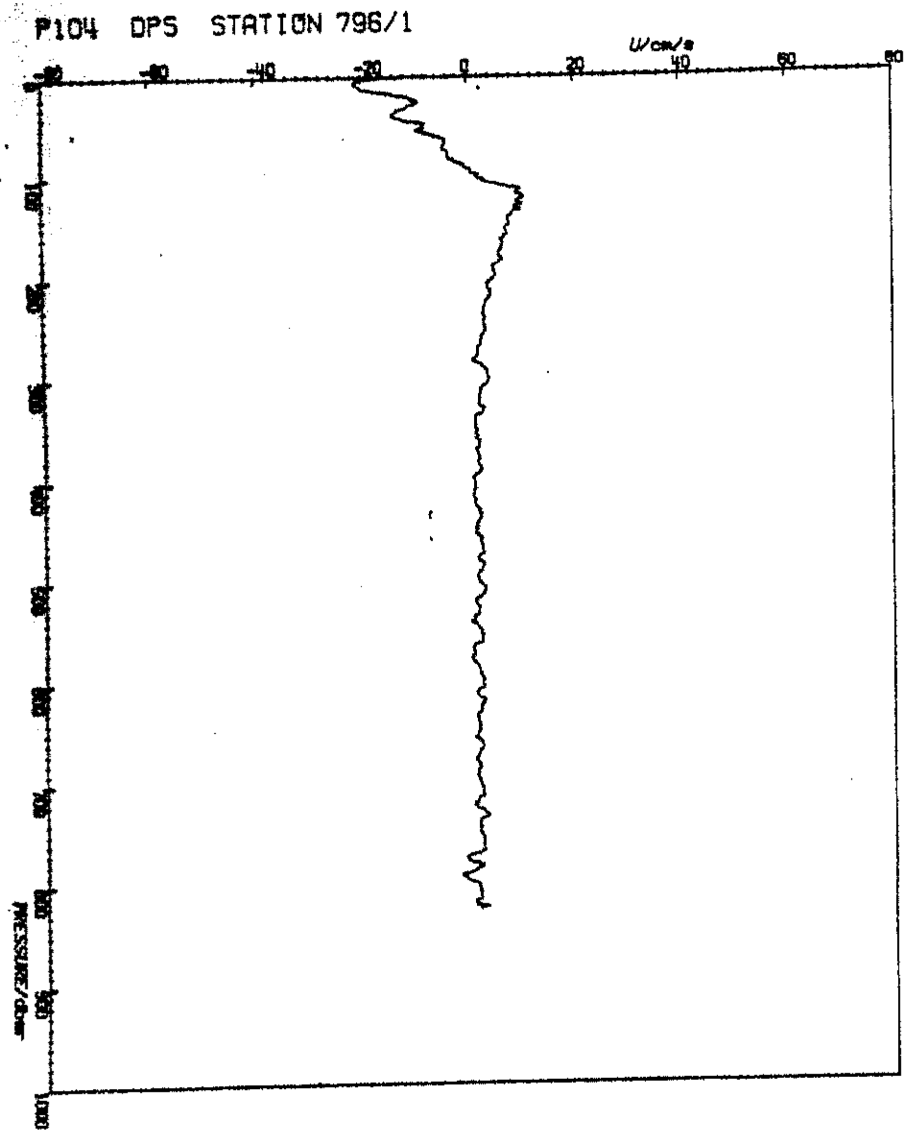

P104 DPS STATION 795/1
PRESSURE/decar
u/cm/s

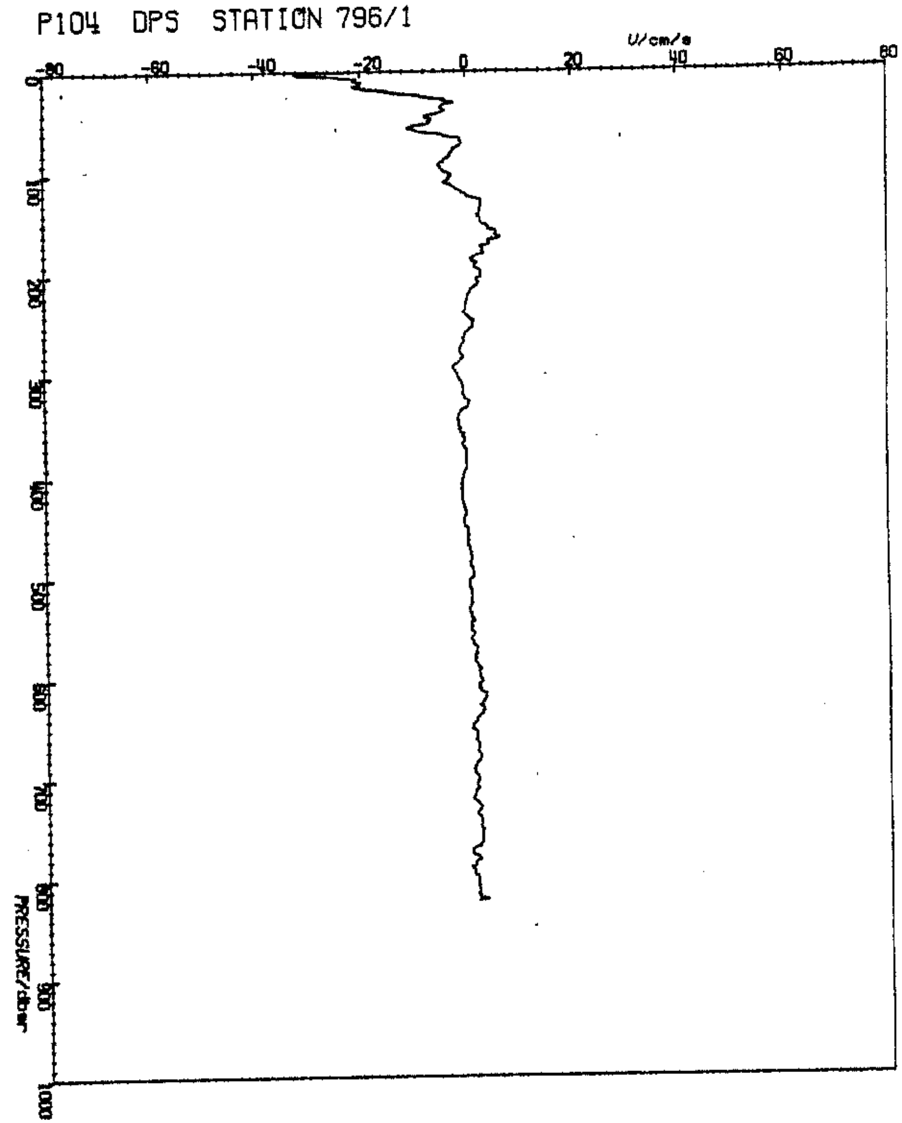
P104 DPS STATION 796/1



P104 DPS STATION 796/1




P104 DPS STATION 796/1
U/cm/s
-80
-60
-40
-20
0
20
40
60
80
PRESSURE/dbar
100
200
300
400
500
600
700
800
900
1000


P104 DPS STATION 796/1
U/cm/s
-80
-60
-40
-20
0
20
40
60
80
PRESSURE/dbar
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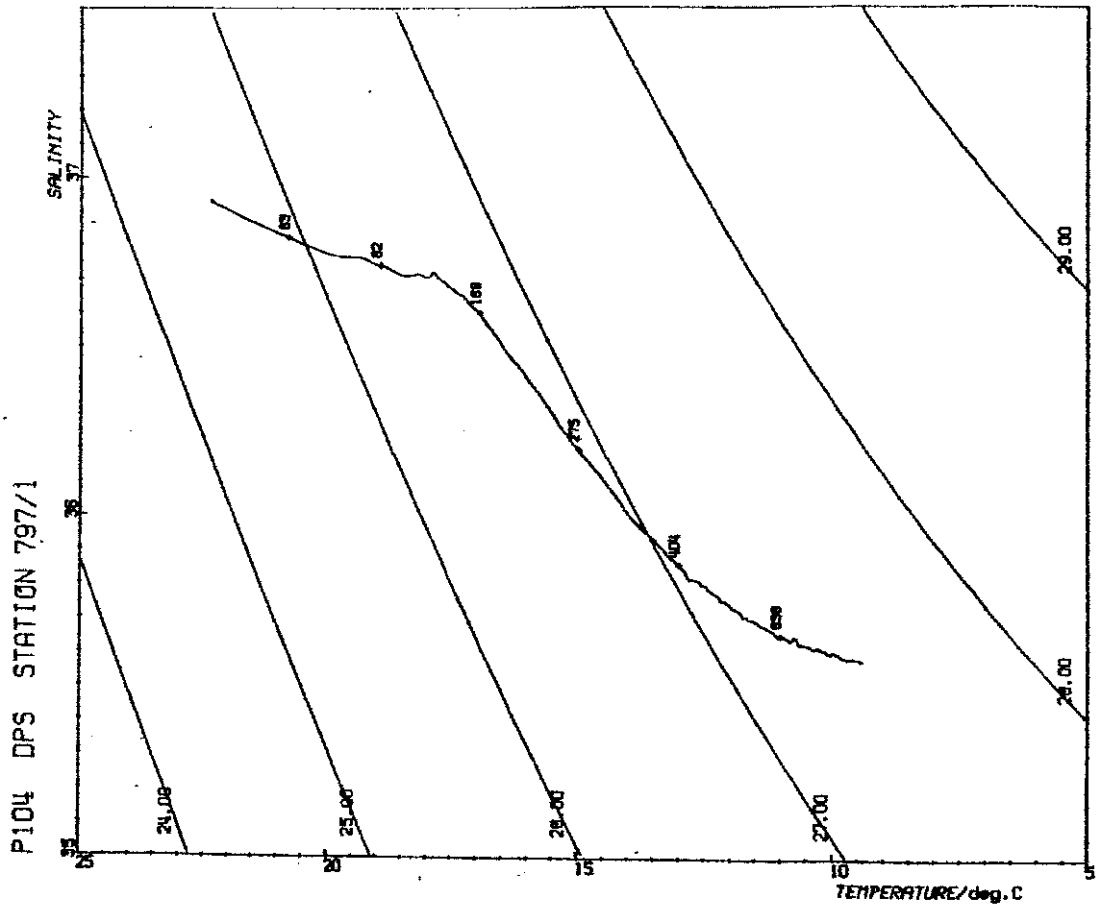
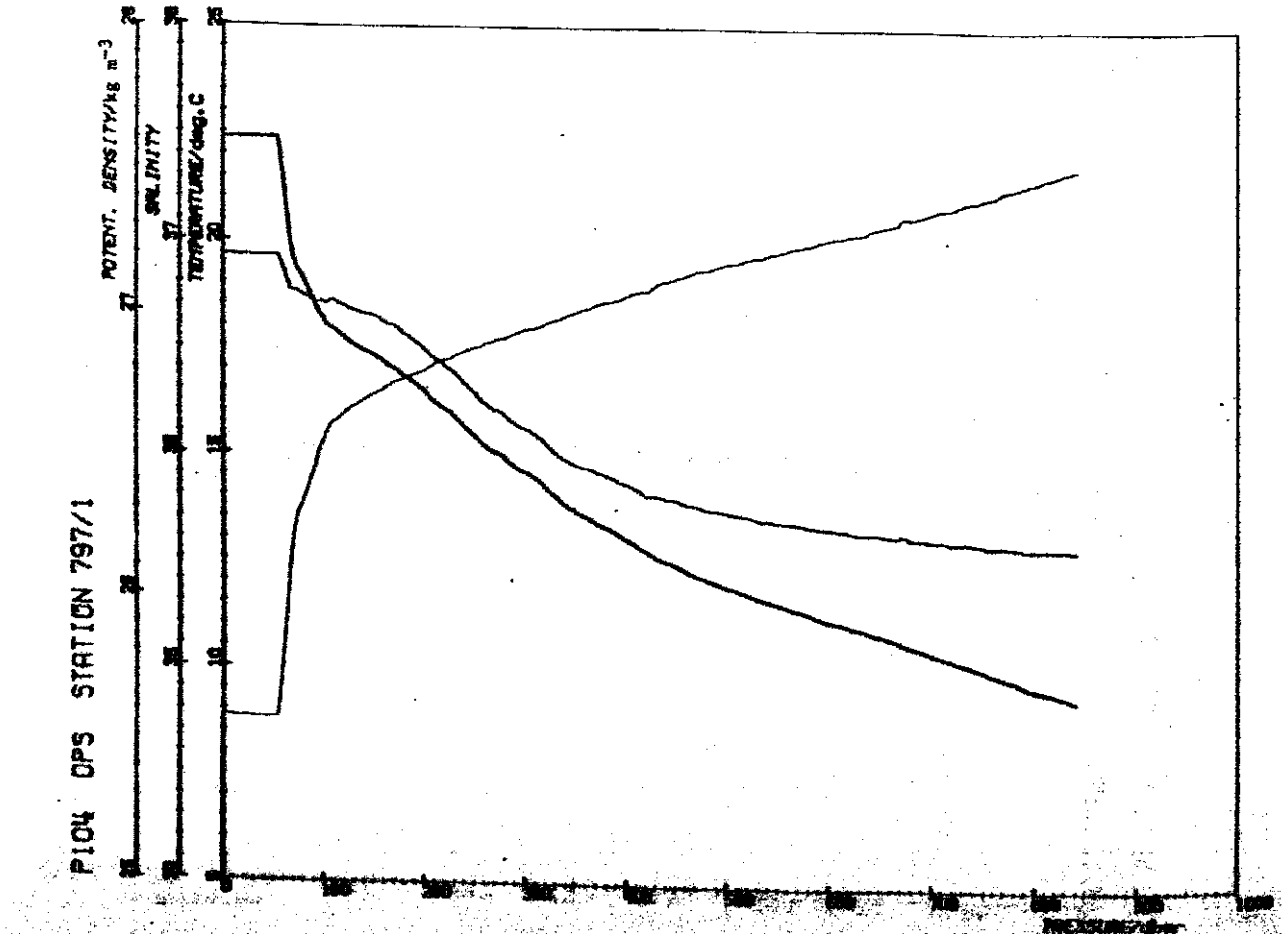
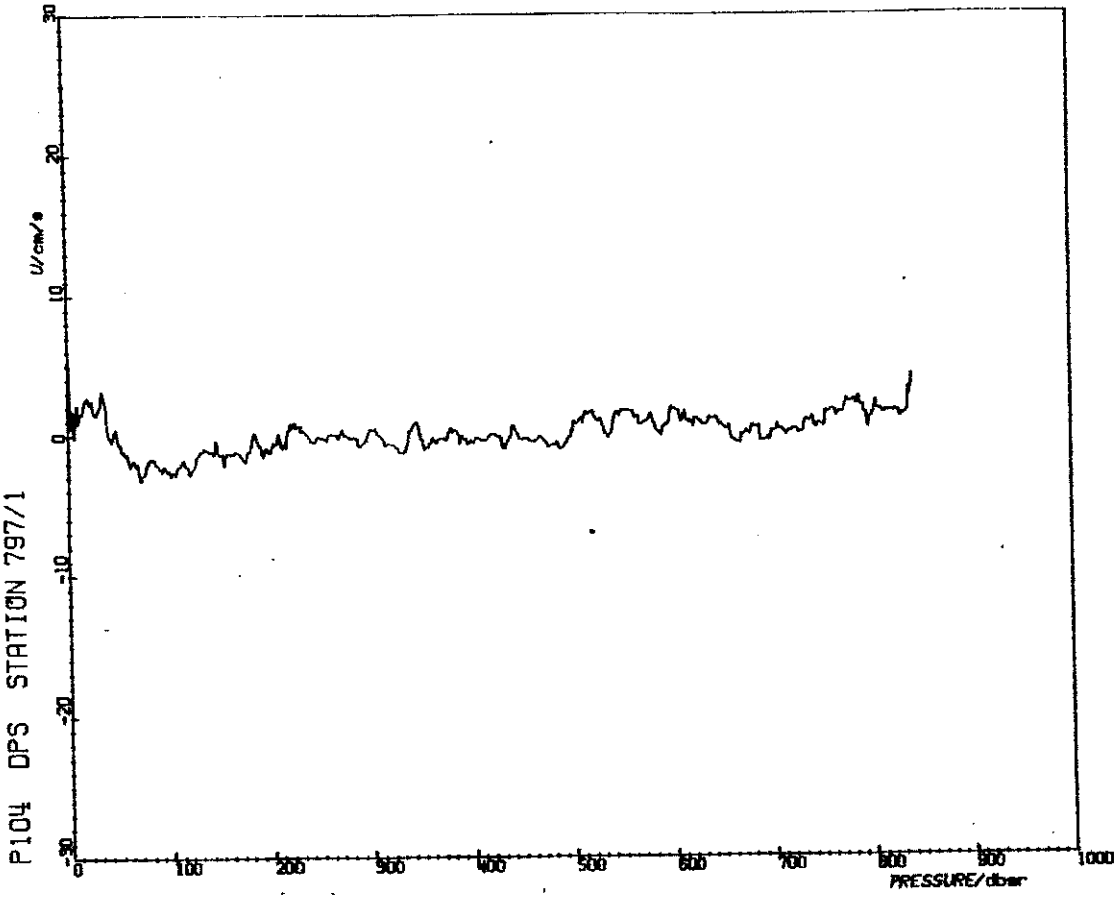
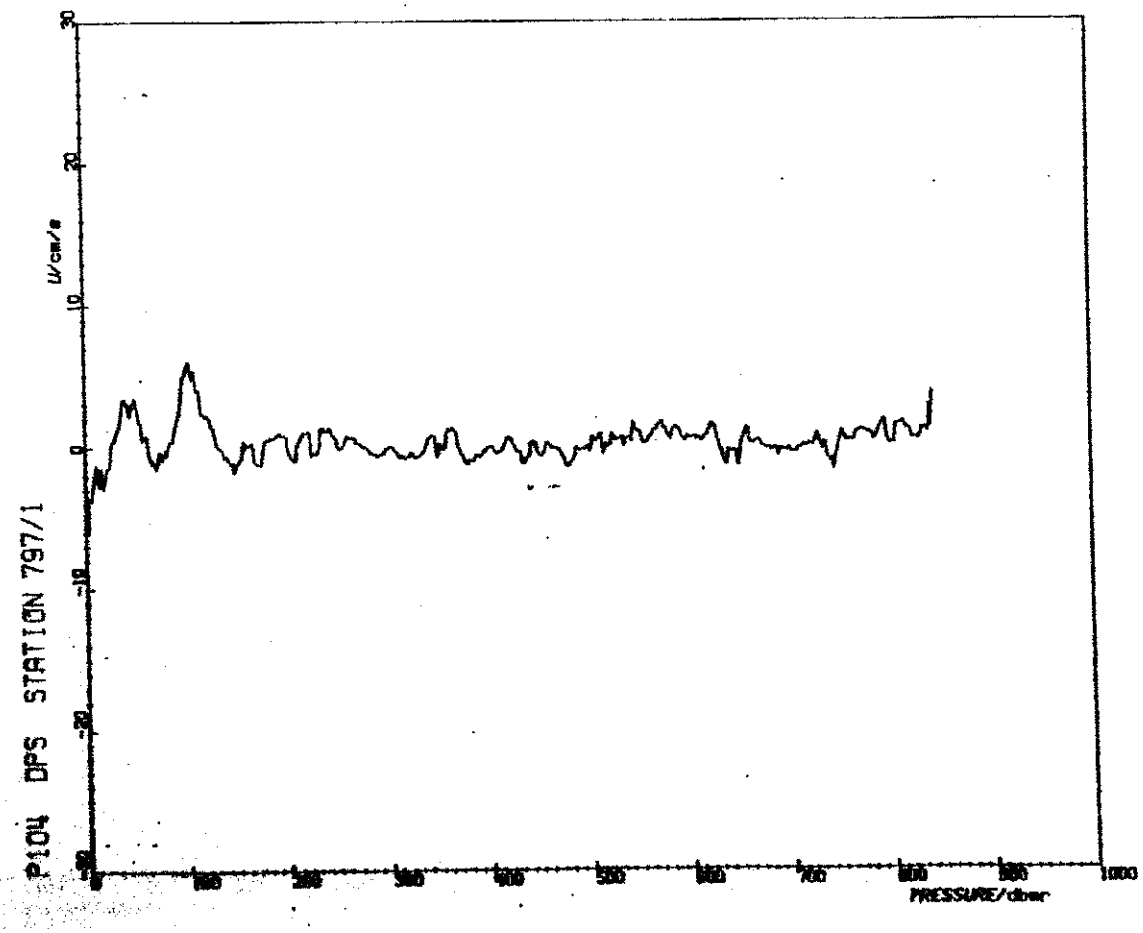
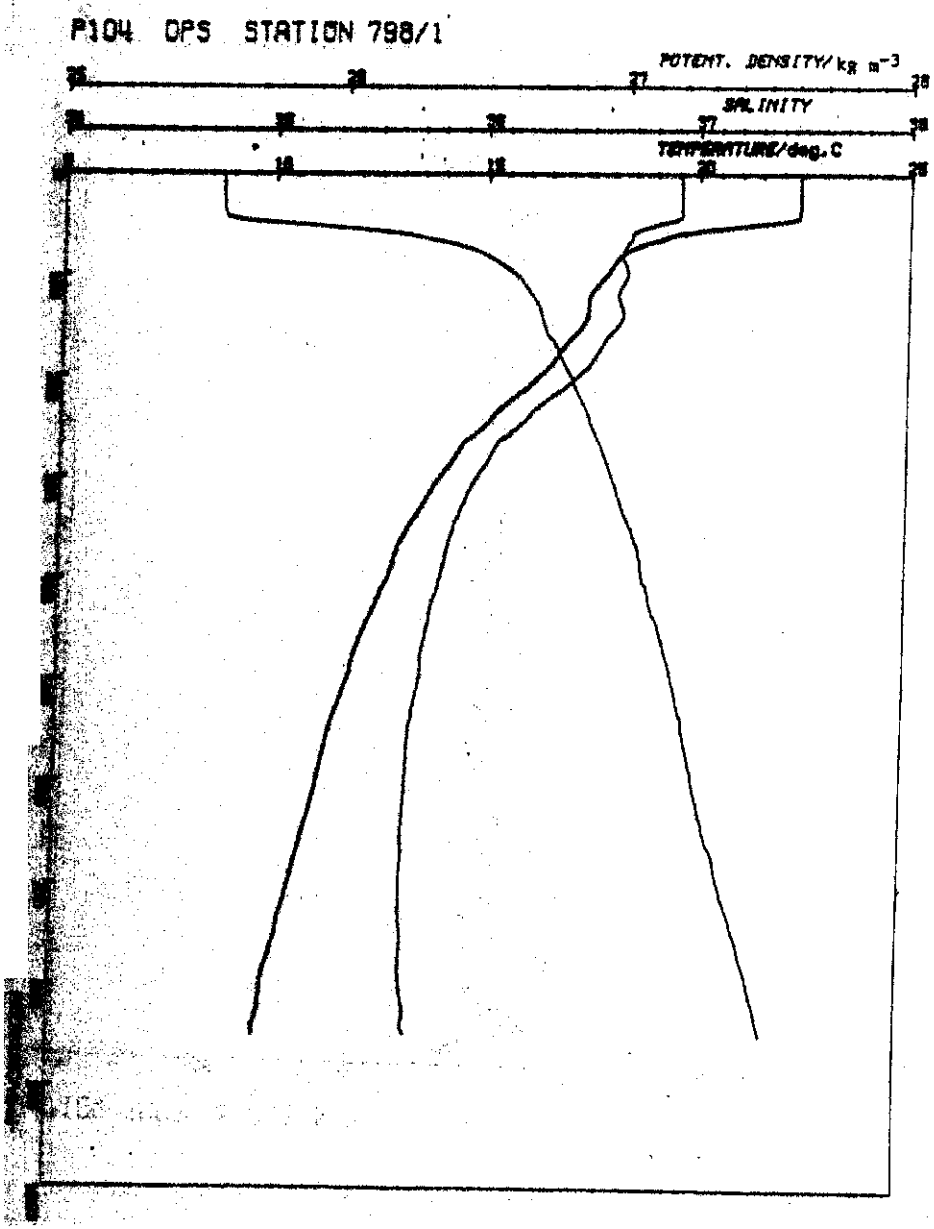
100
200
300
400
500
600
700
800
900
1000

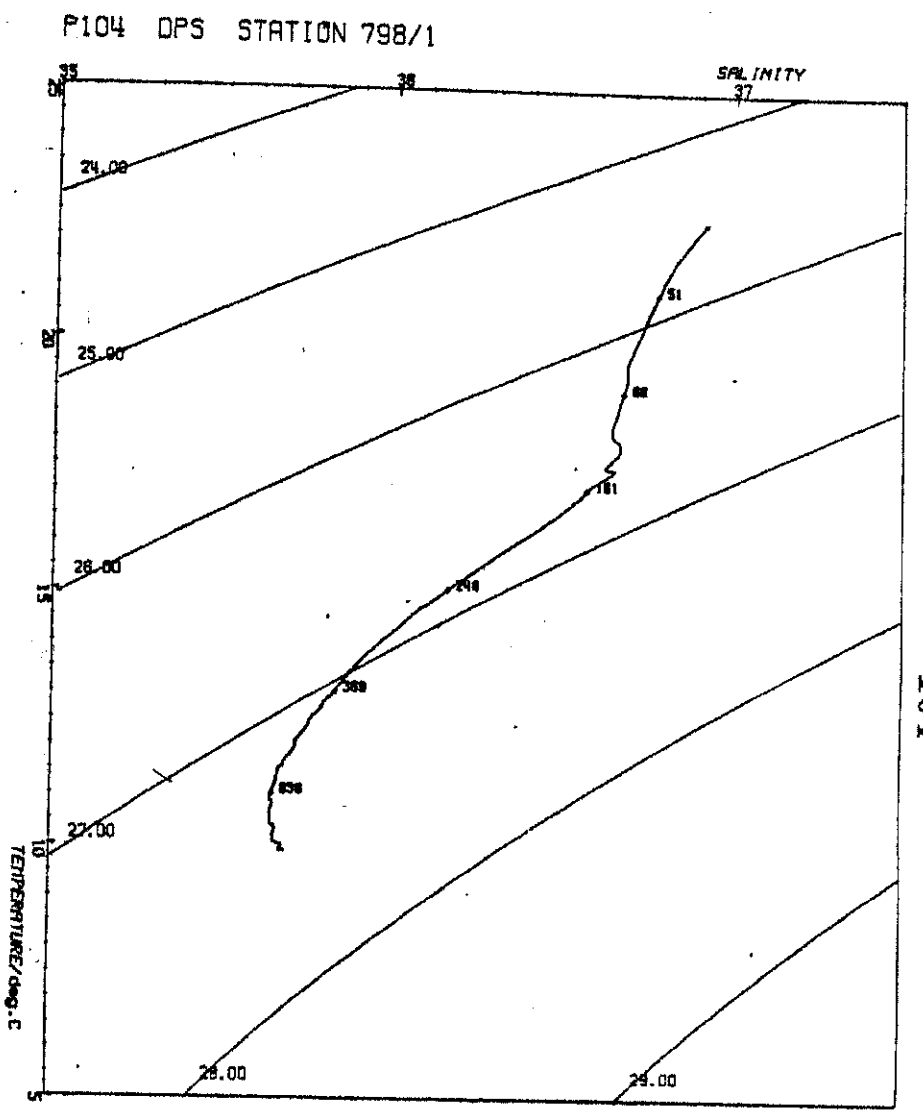

P104 OPS STATION 797/1
SALINITY
TEMPERATURE/deg.C
24.00
25.00
26.00
27.00
28.00
29.00

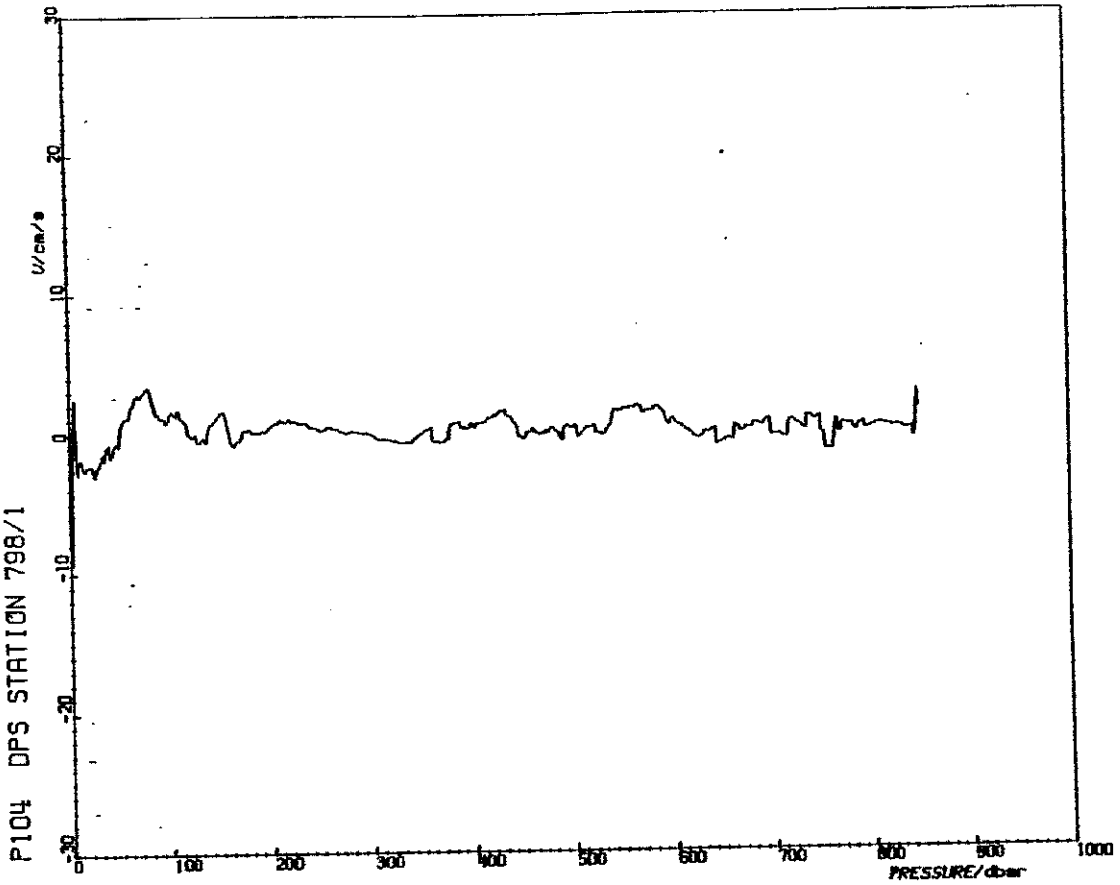

P104 OPS STATION 797/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C

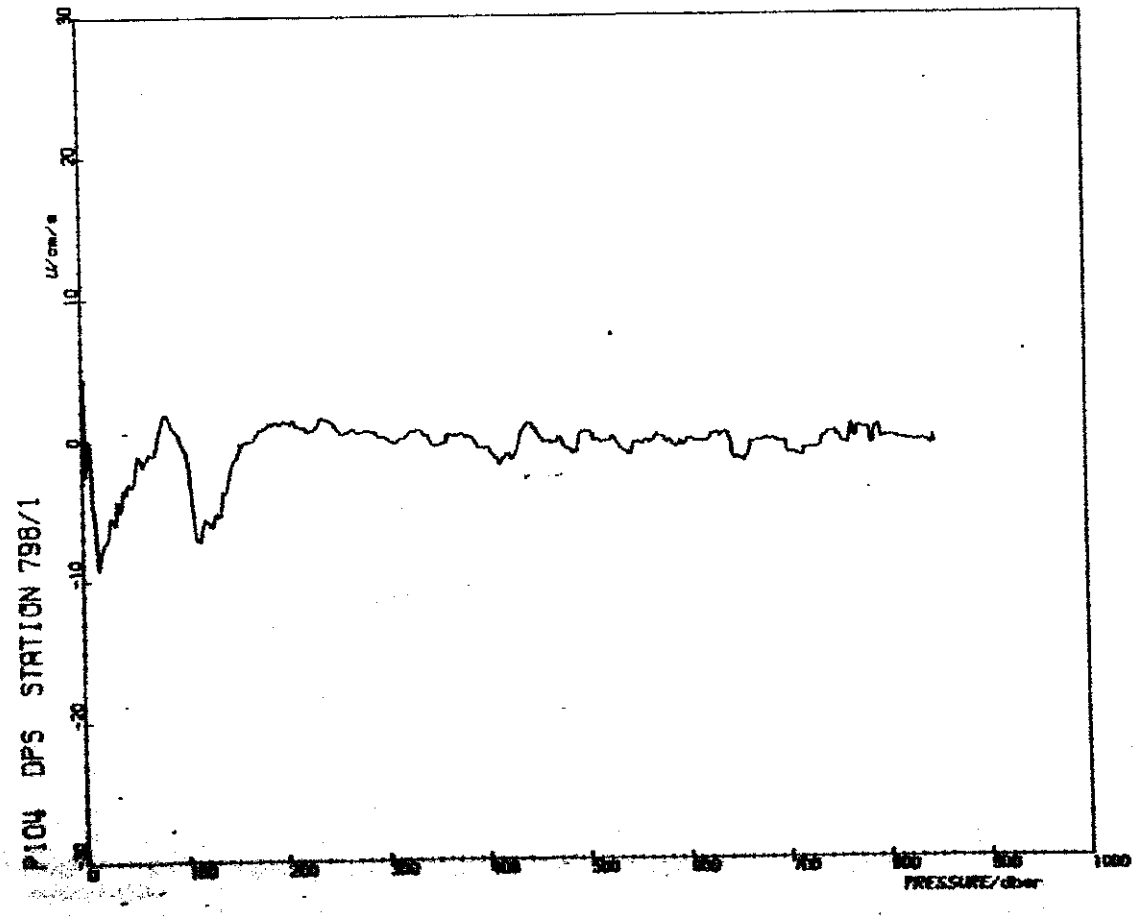

P104 DPS STATION 797/1
u/cm/s
PRESSURE/dbar

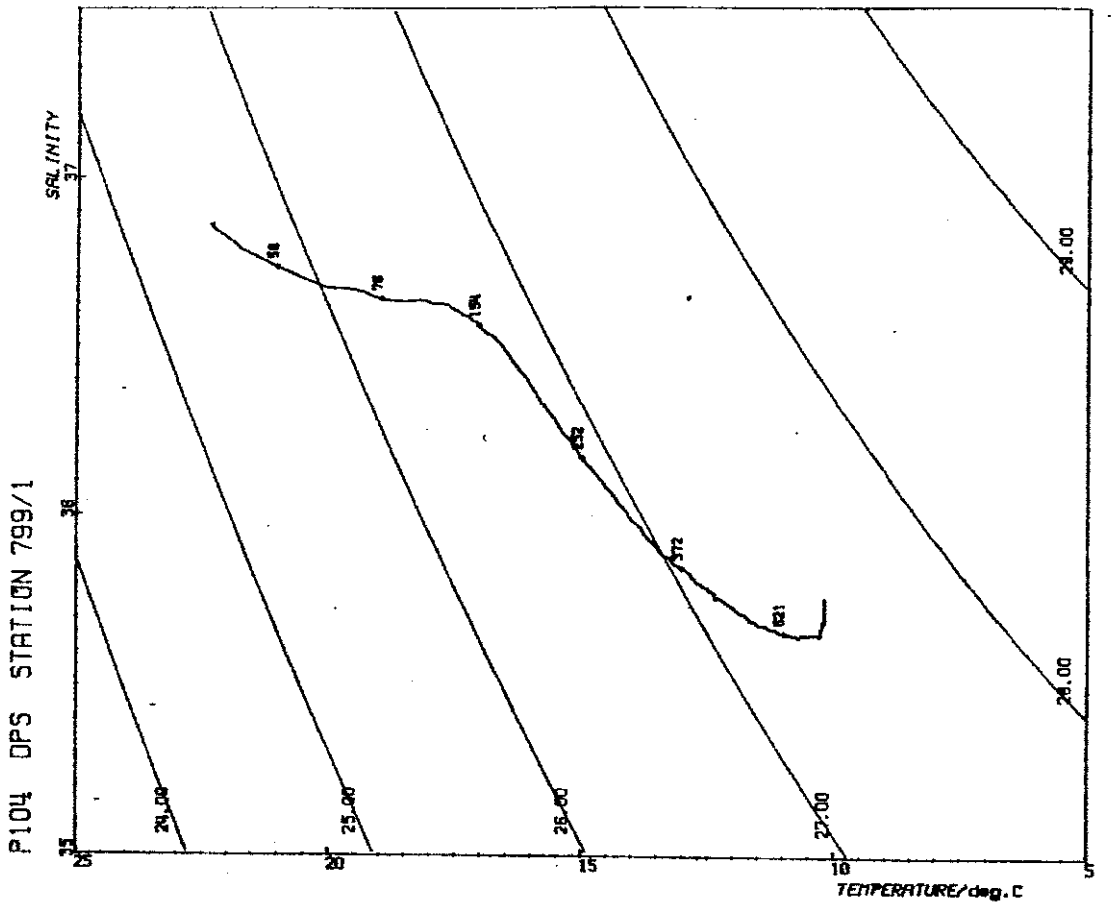

P104 DPS STATION 797/1
u/cm/s
PRESSURE/dbar

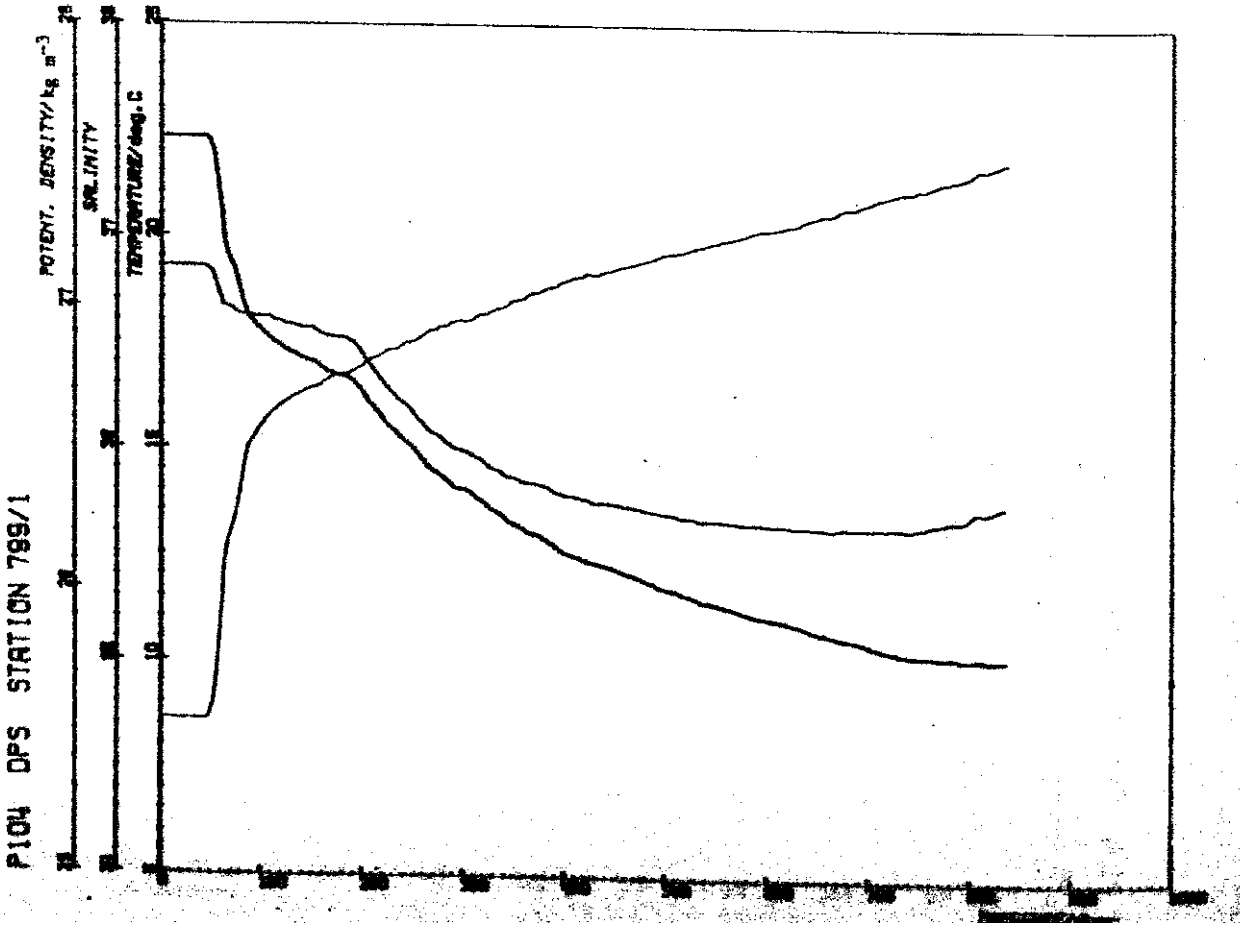

P104 OPS STATION 798/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C


P104 OPS STATION 798/1
SALINITY
24.00
25.00
26.00
27.00
28.00
29.00
TEMPERATURE/deg.C

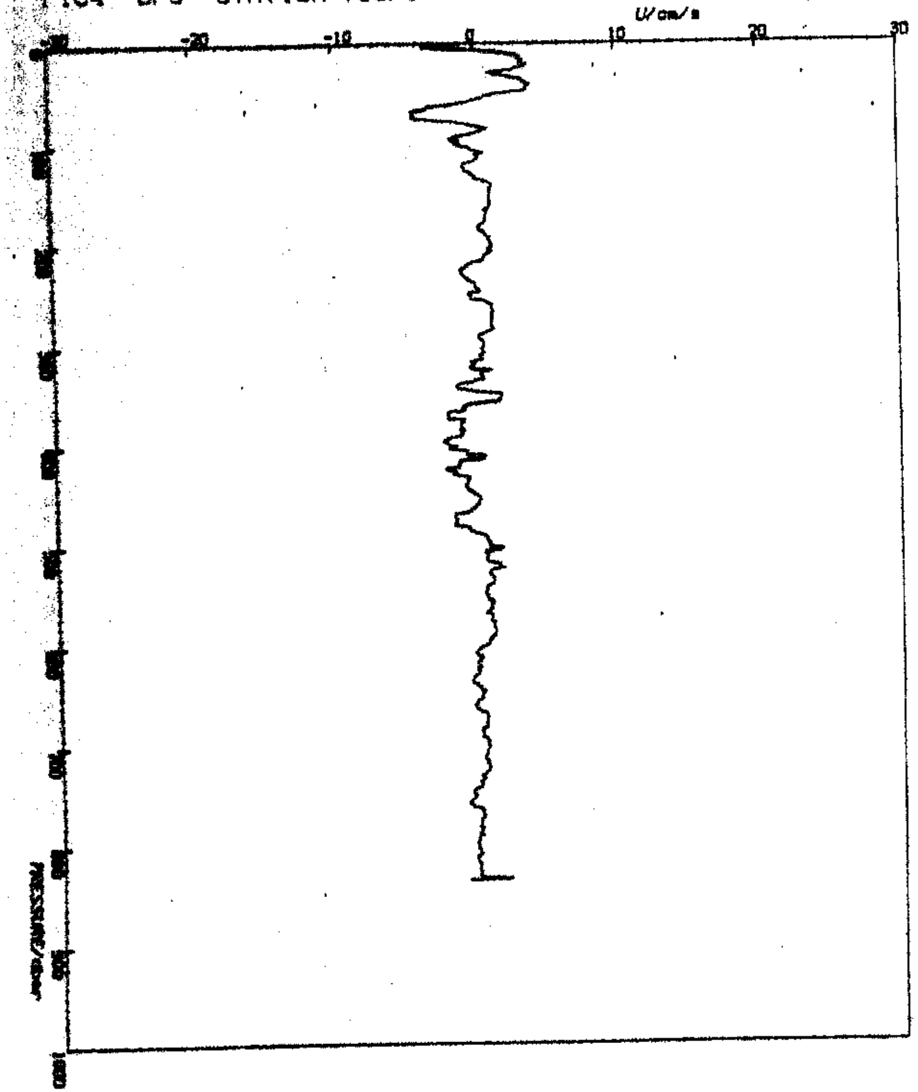

P104 DPS STATION 798/1
W/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar


P104 DPS STATION 798/1
W/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

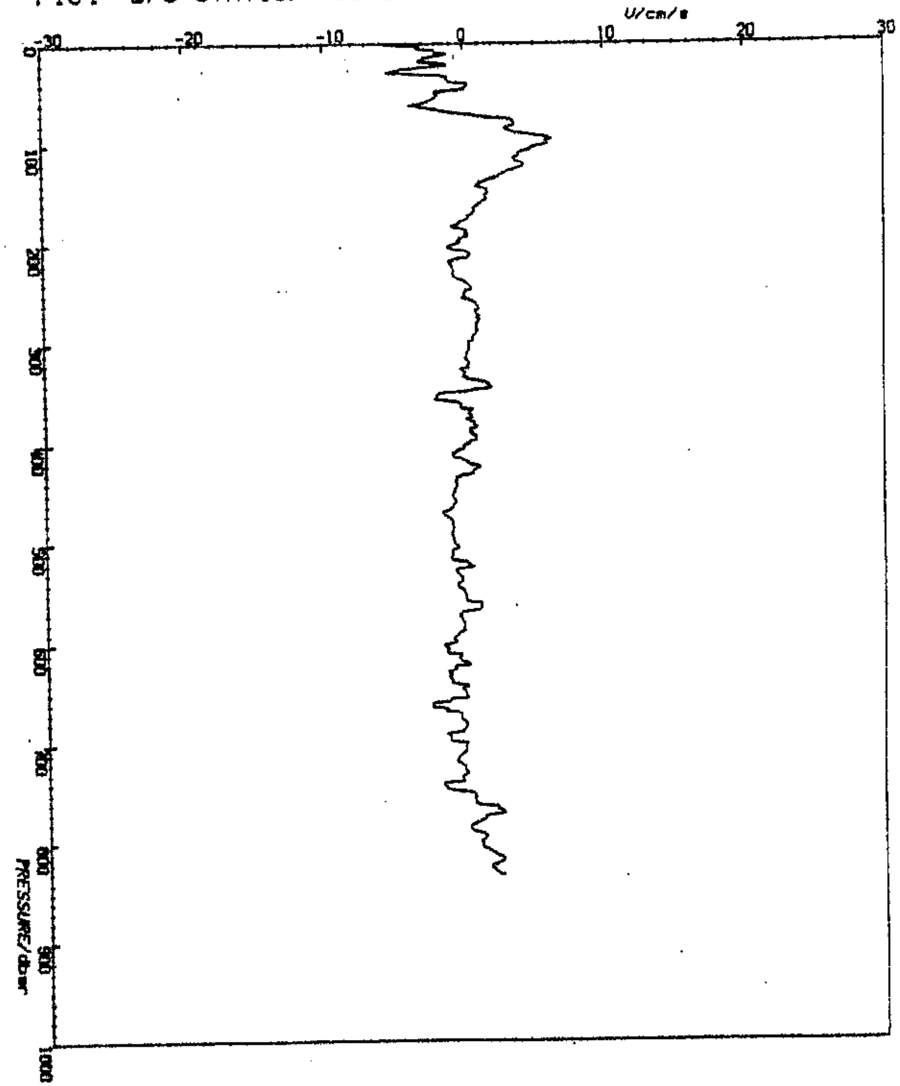

P104 DPS STATION 799/1
SALINITY
TEMPERATURE/deg.C
20.00
25.00
26.00
27.00
28.00


P104 DPS STATION 799/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C

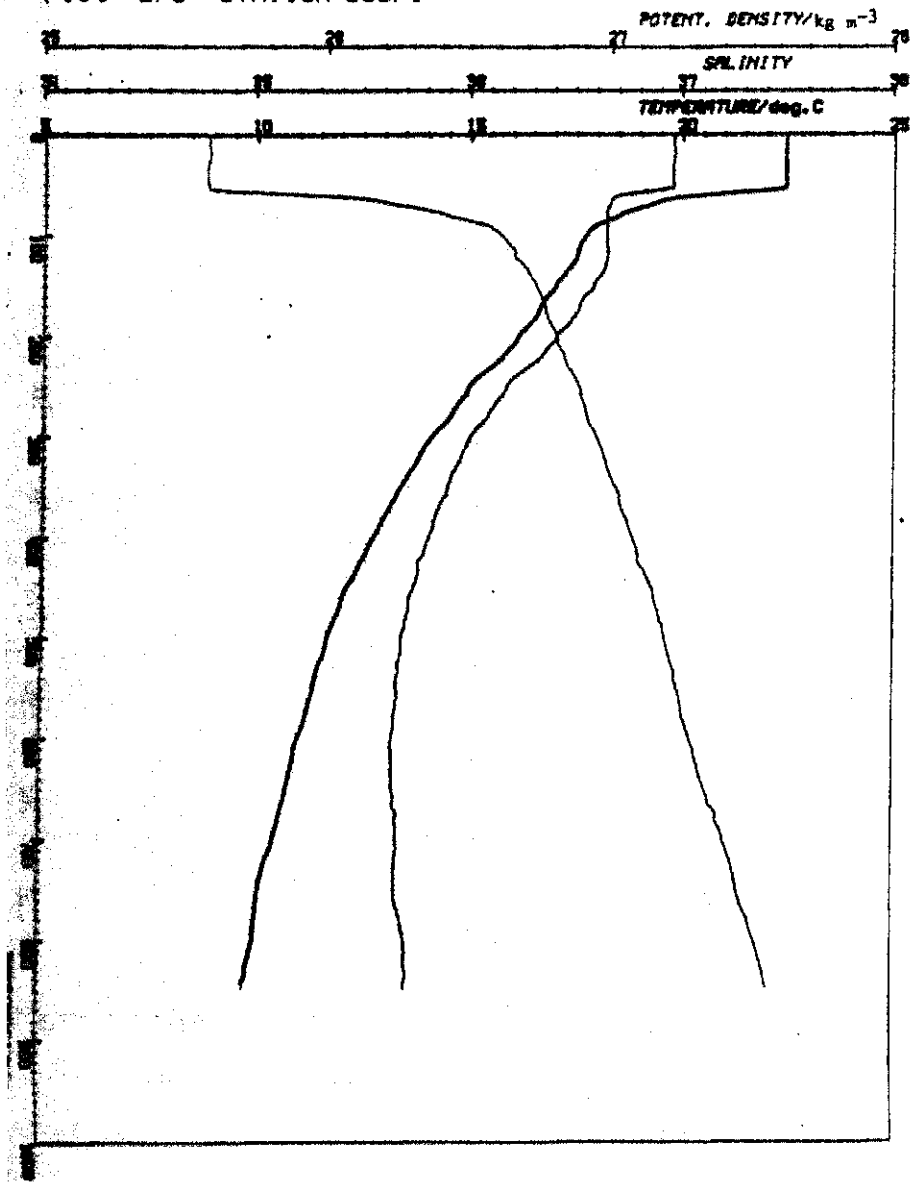
P104 DPS STATION 799/1



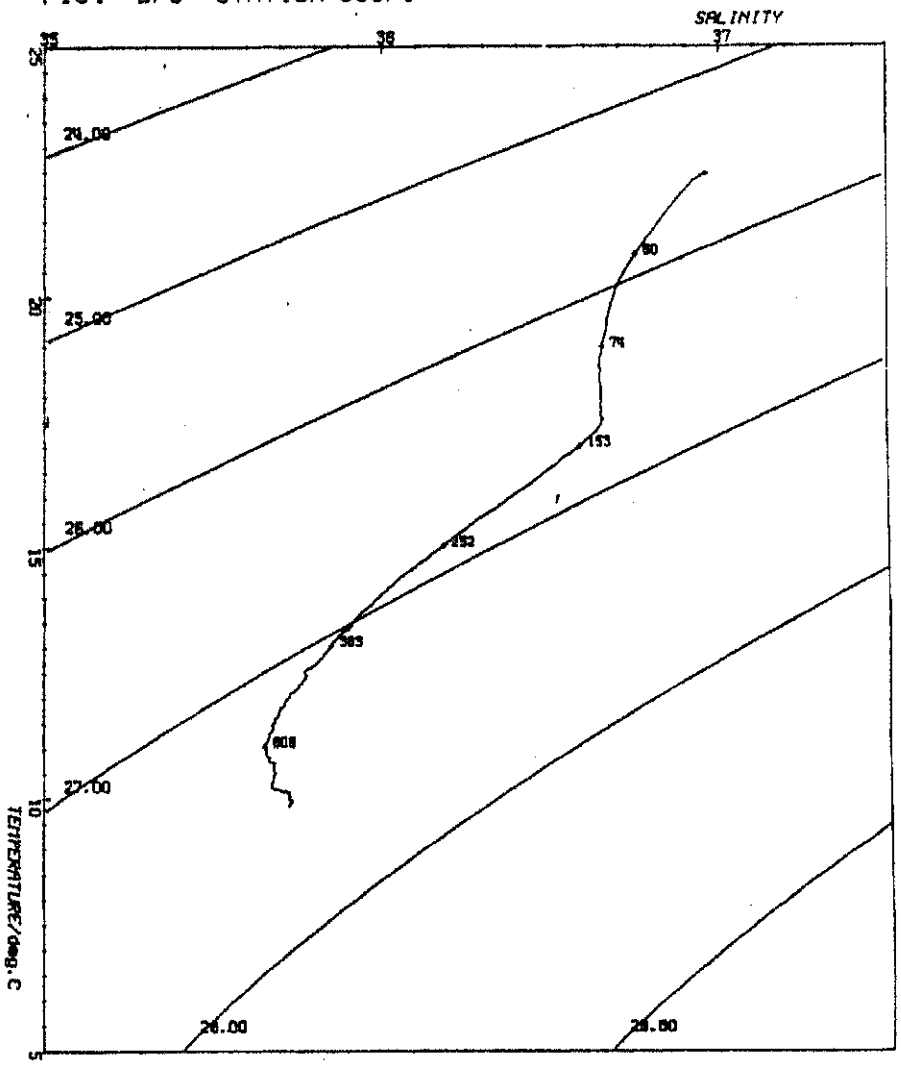
P104 DPS STATION 799/1



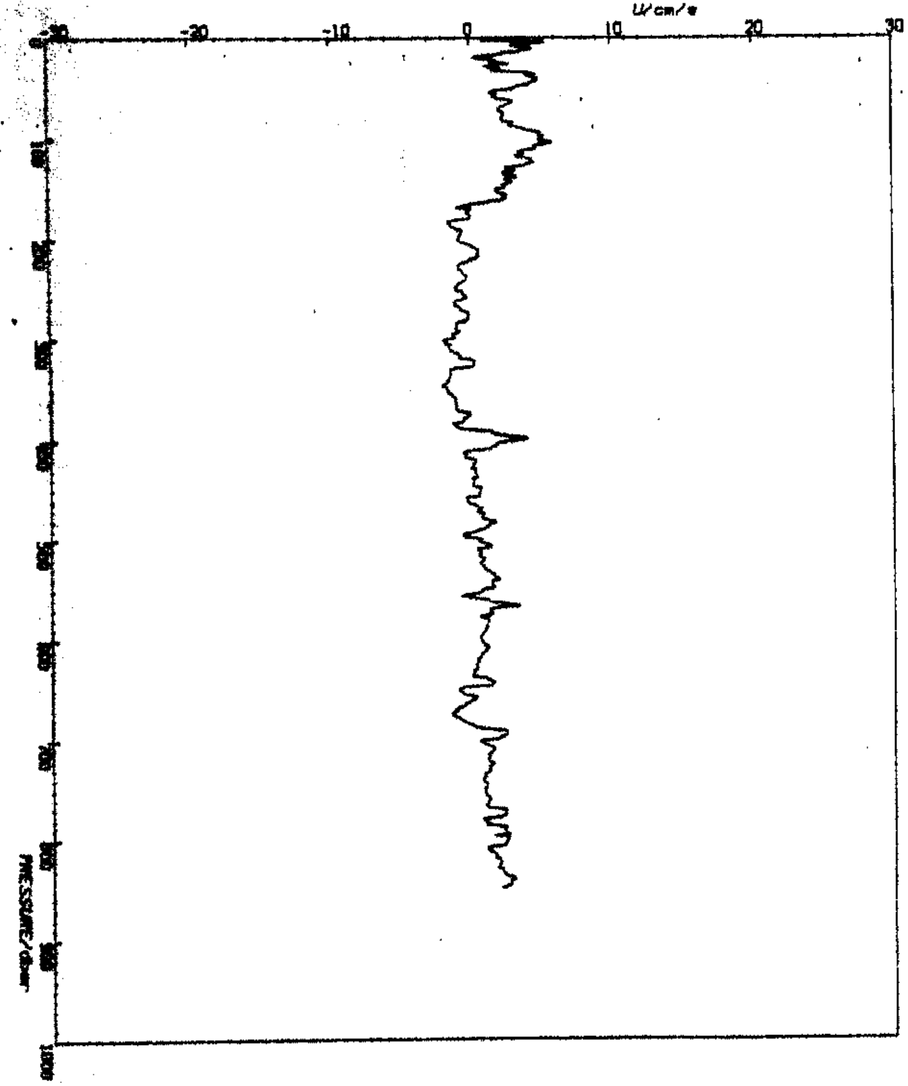
P104 DPS STATION 800/1



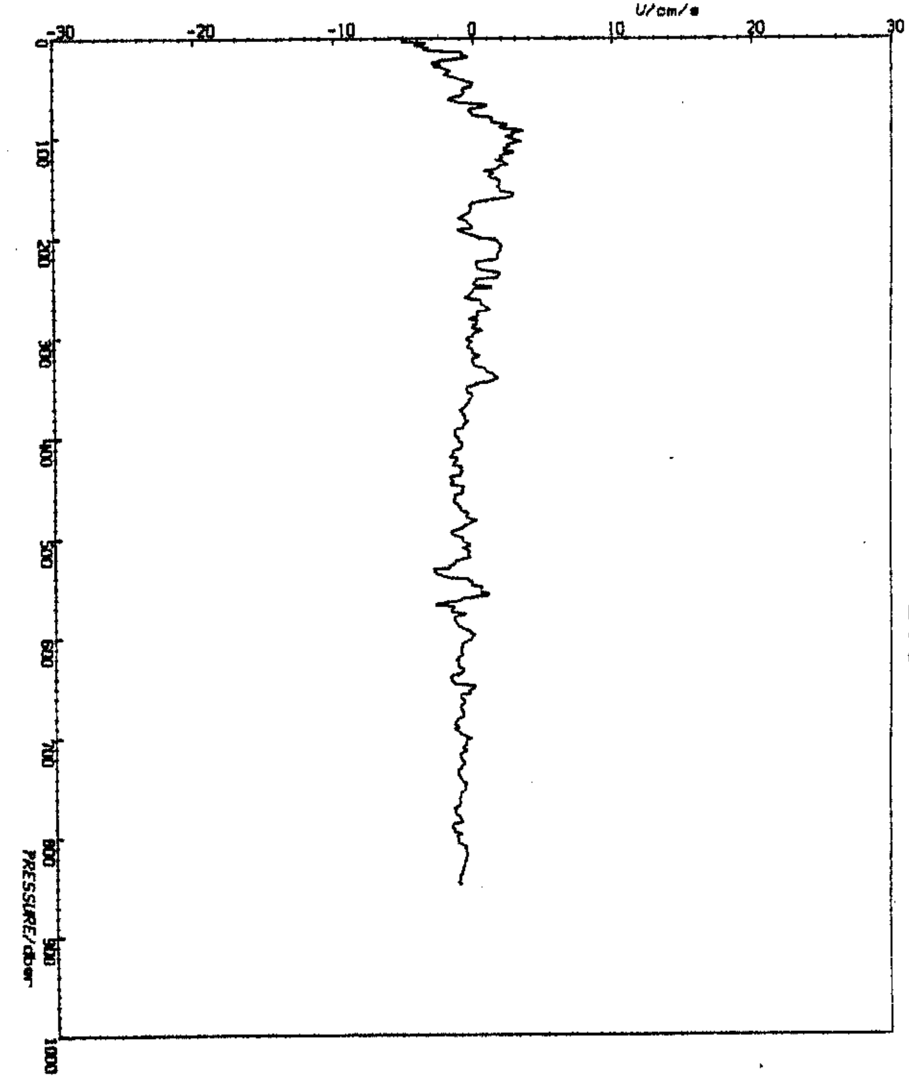
P104 DPS STATION 800/1



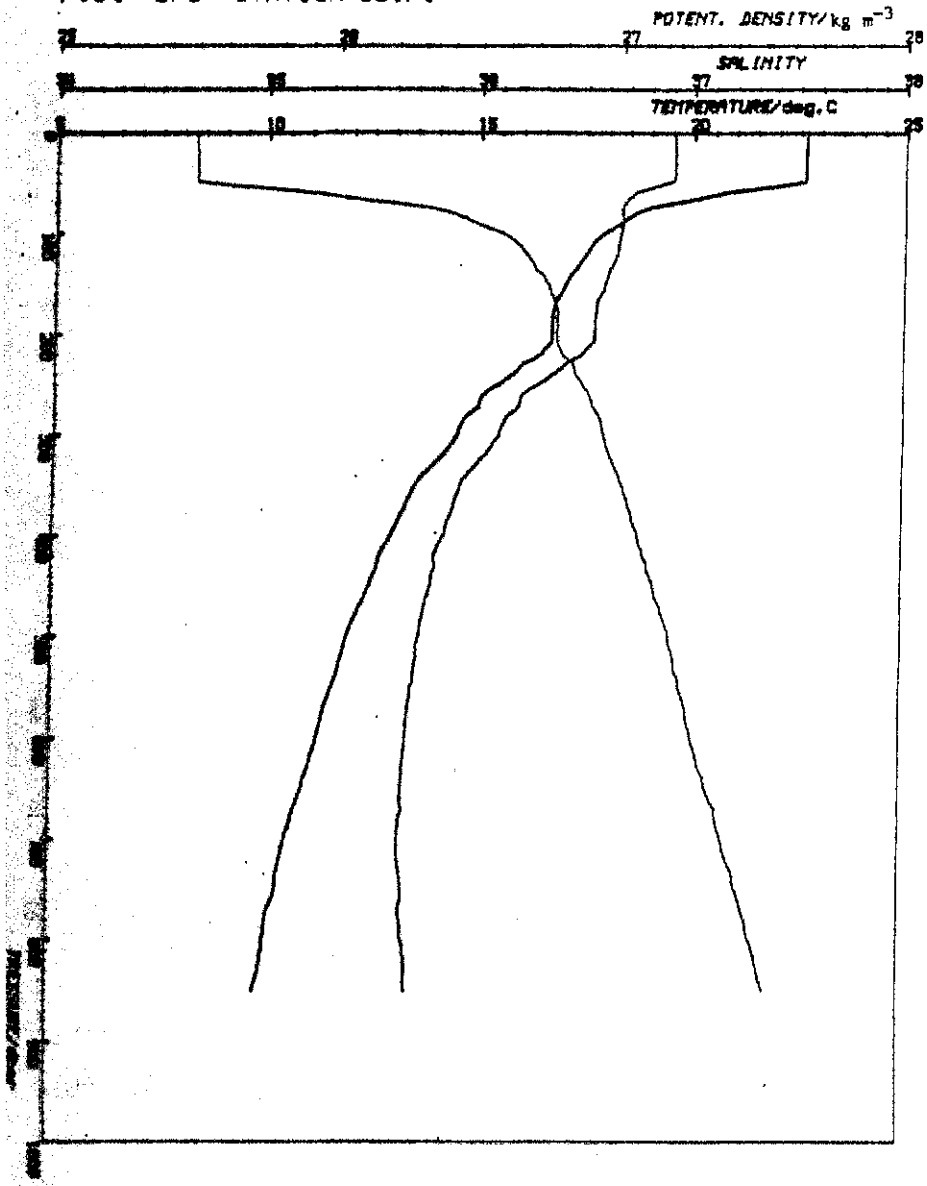
P104 DPS STATION 800/1



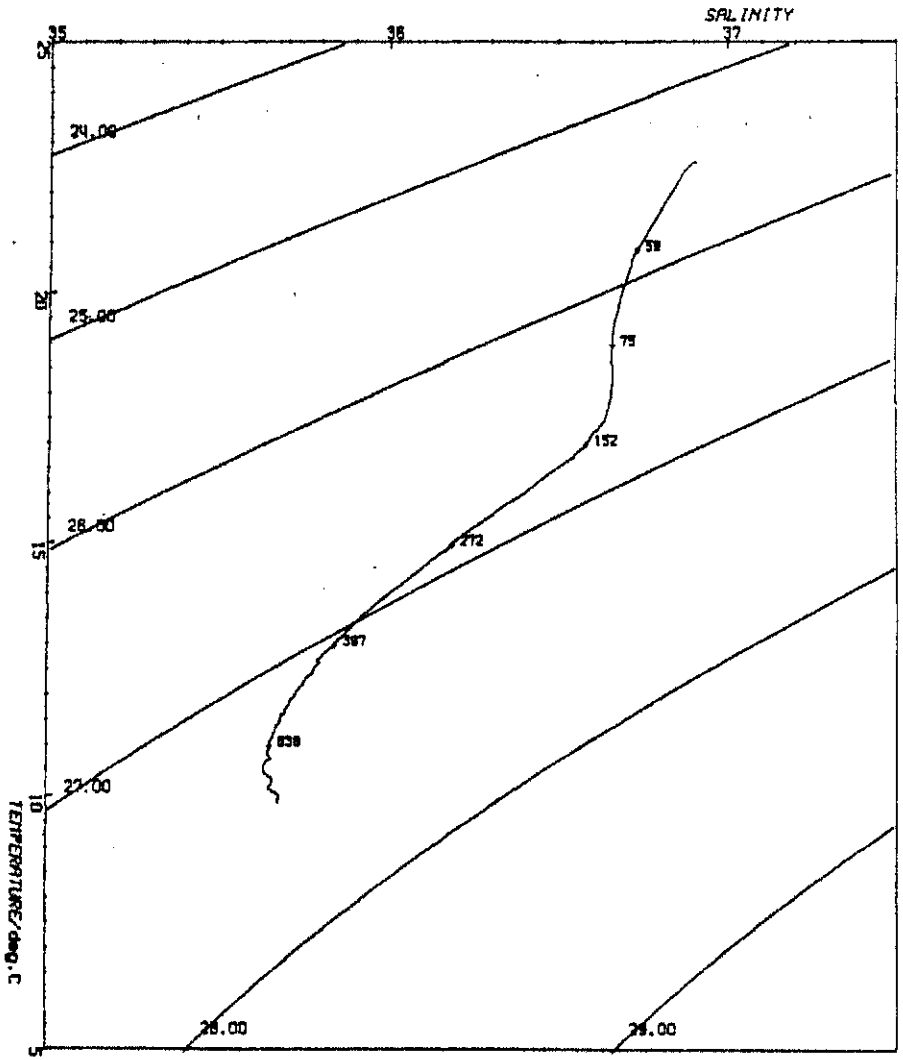
P104 DPS STATION 800/1



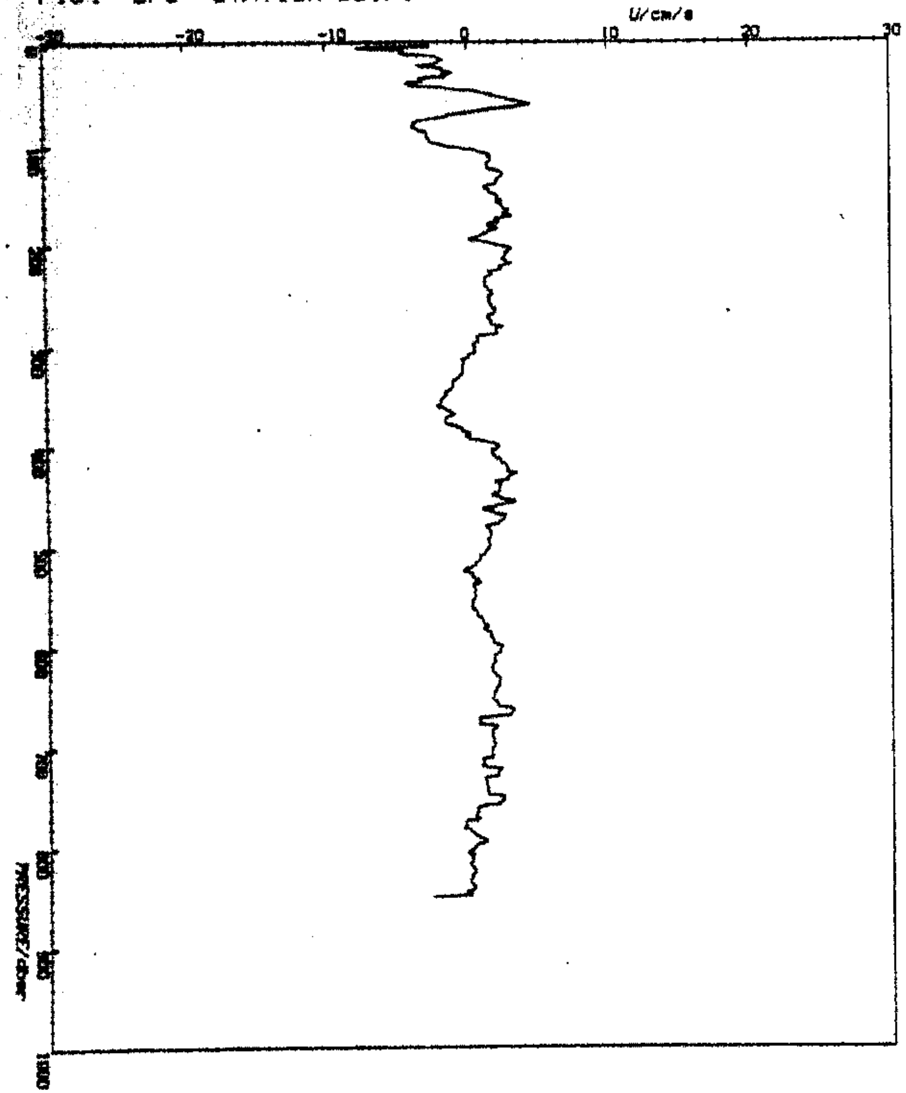
P104 DPS STATION 801/1



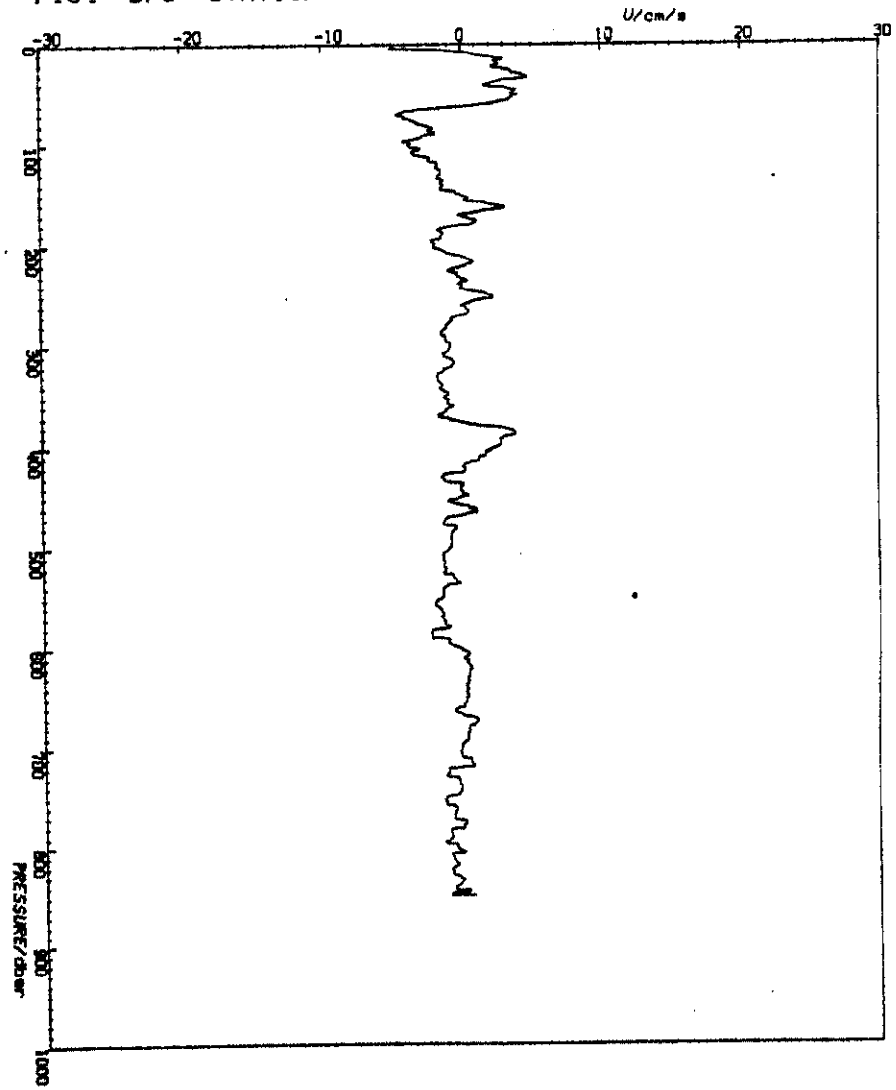
P104 DPS STATION 801/1

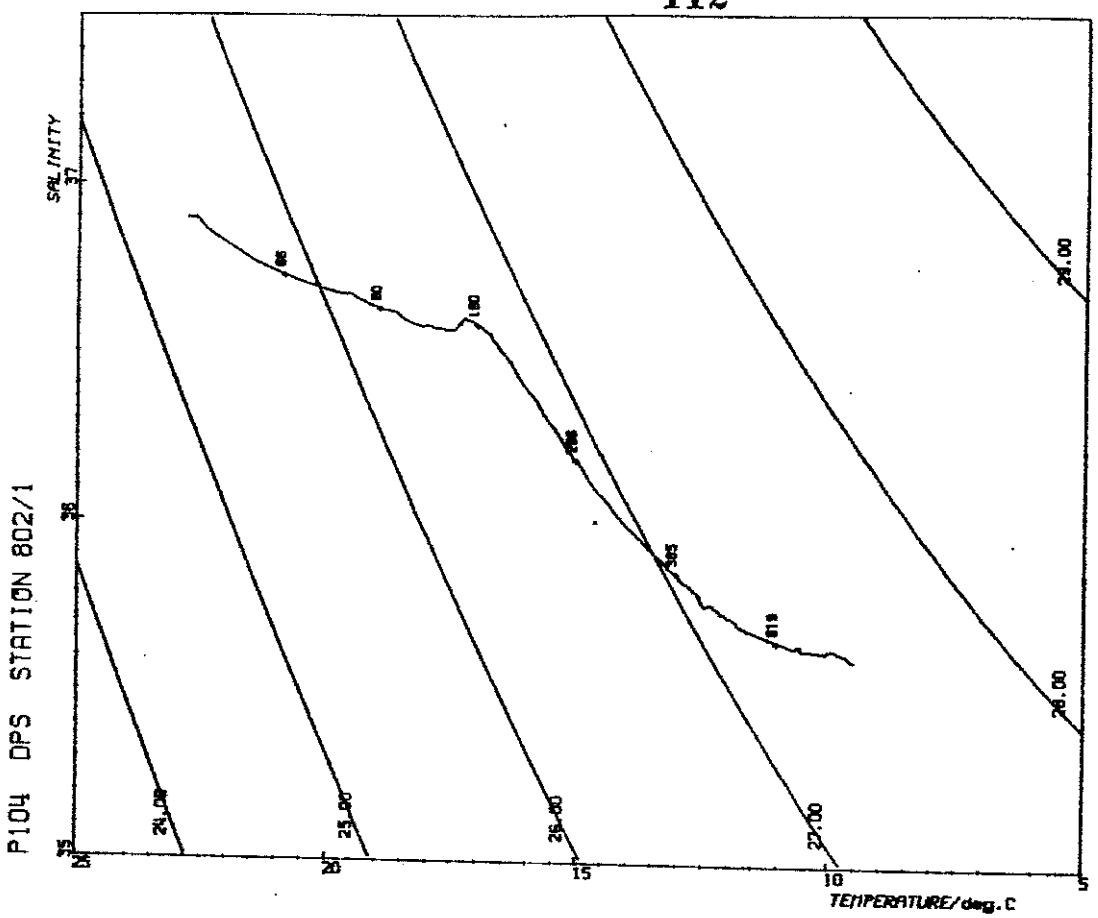


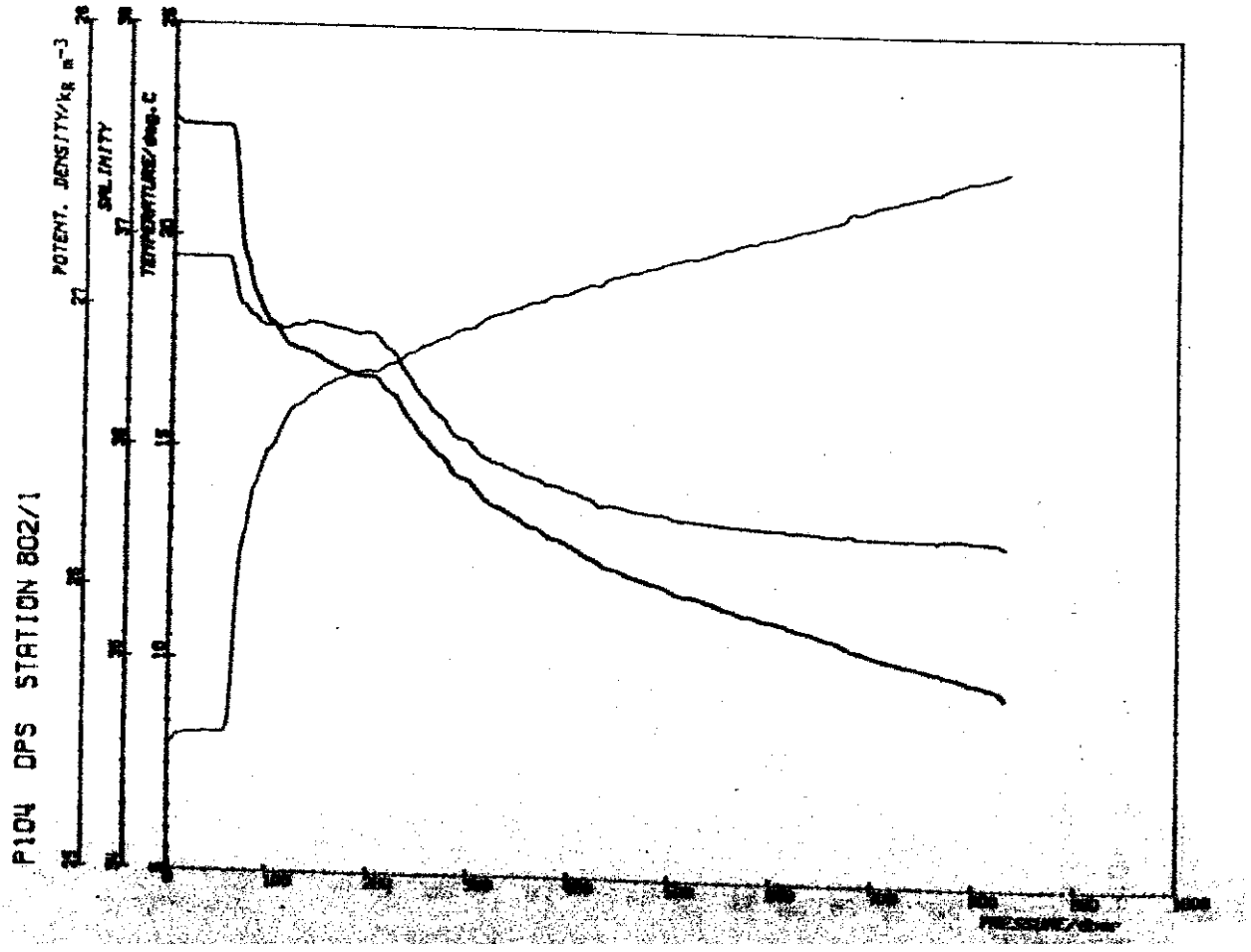
P104 DPS STATION 801/1



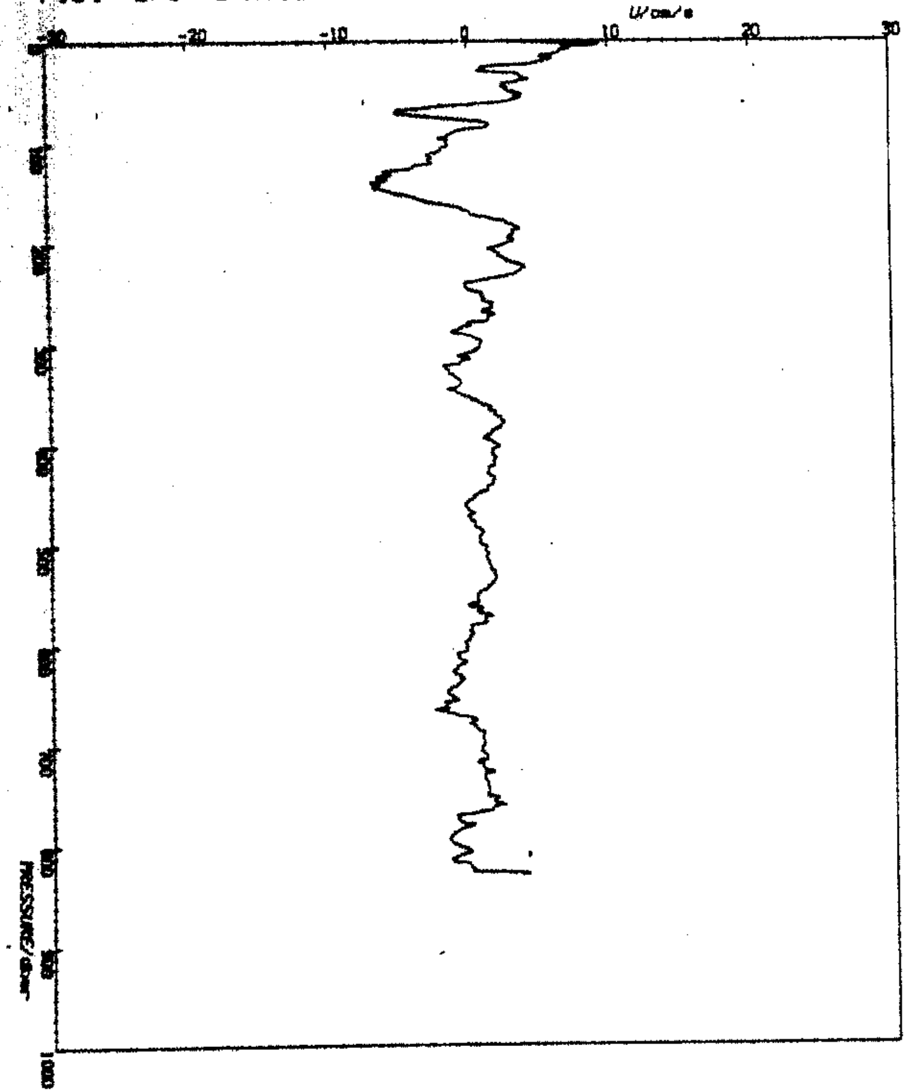
P104 DPS STATION 801/1



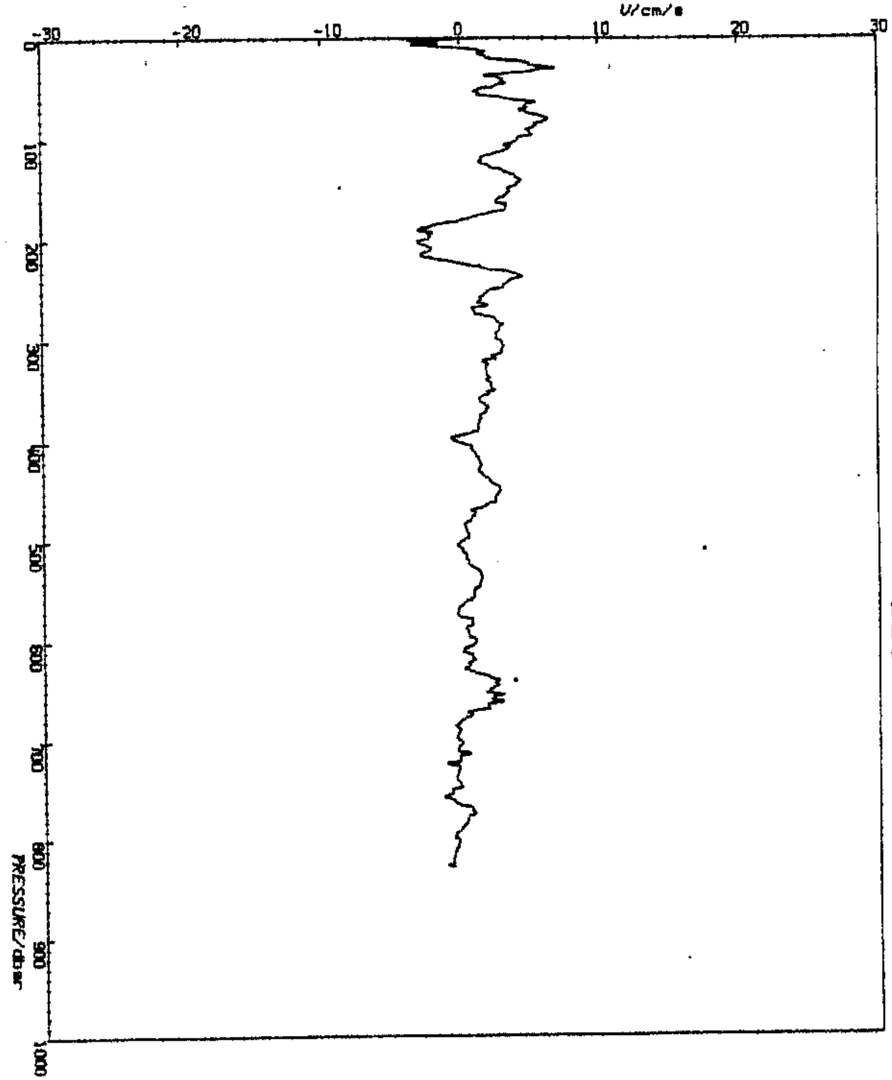

P104 DPS STATION 802/1
SALINITY
TEMPERATURE/deg.C
26.00
25.00
26.00
27.00
26.00


P104 DPS STATION 802/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C

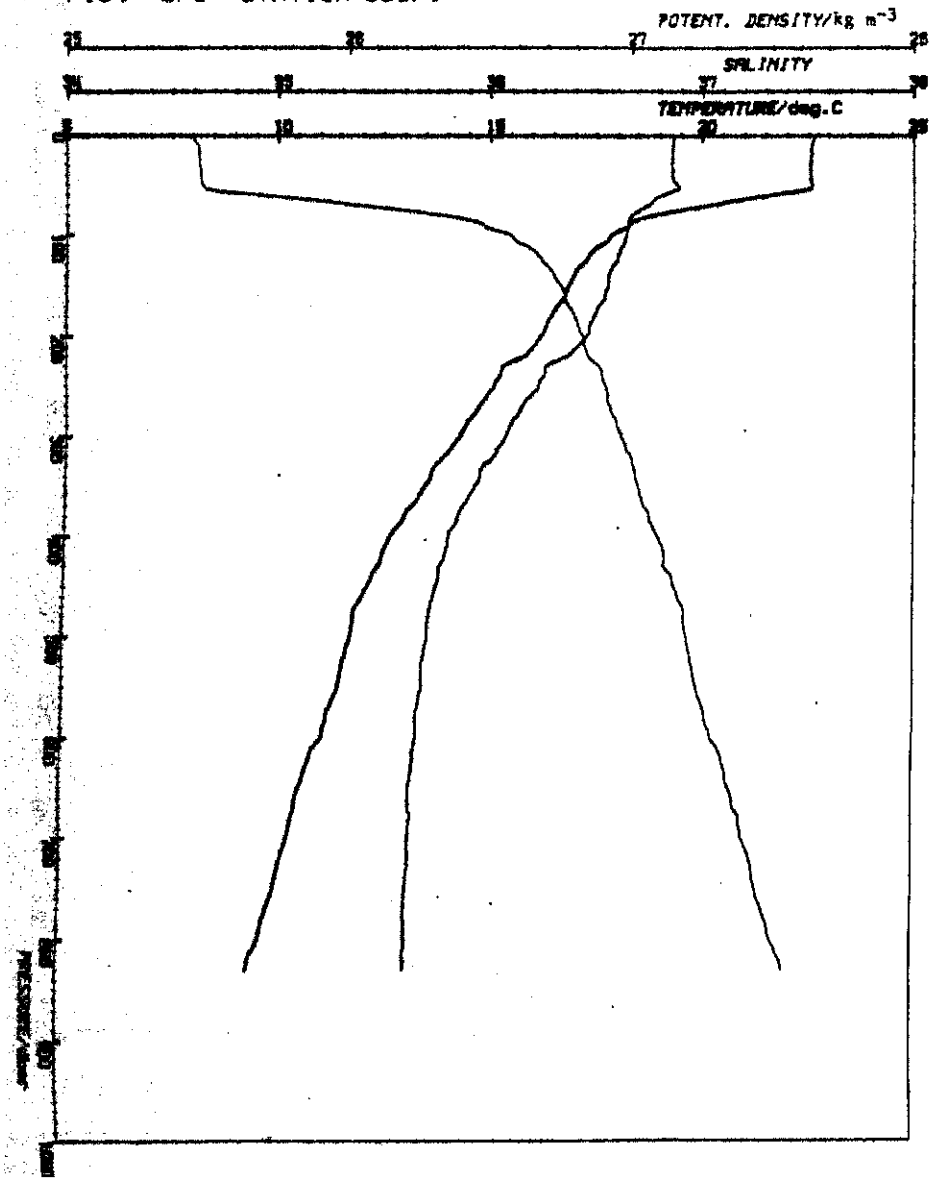
P104 DPS STATION 802/1



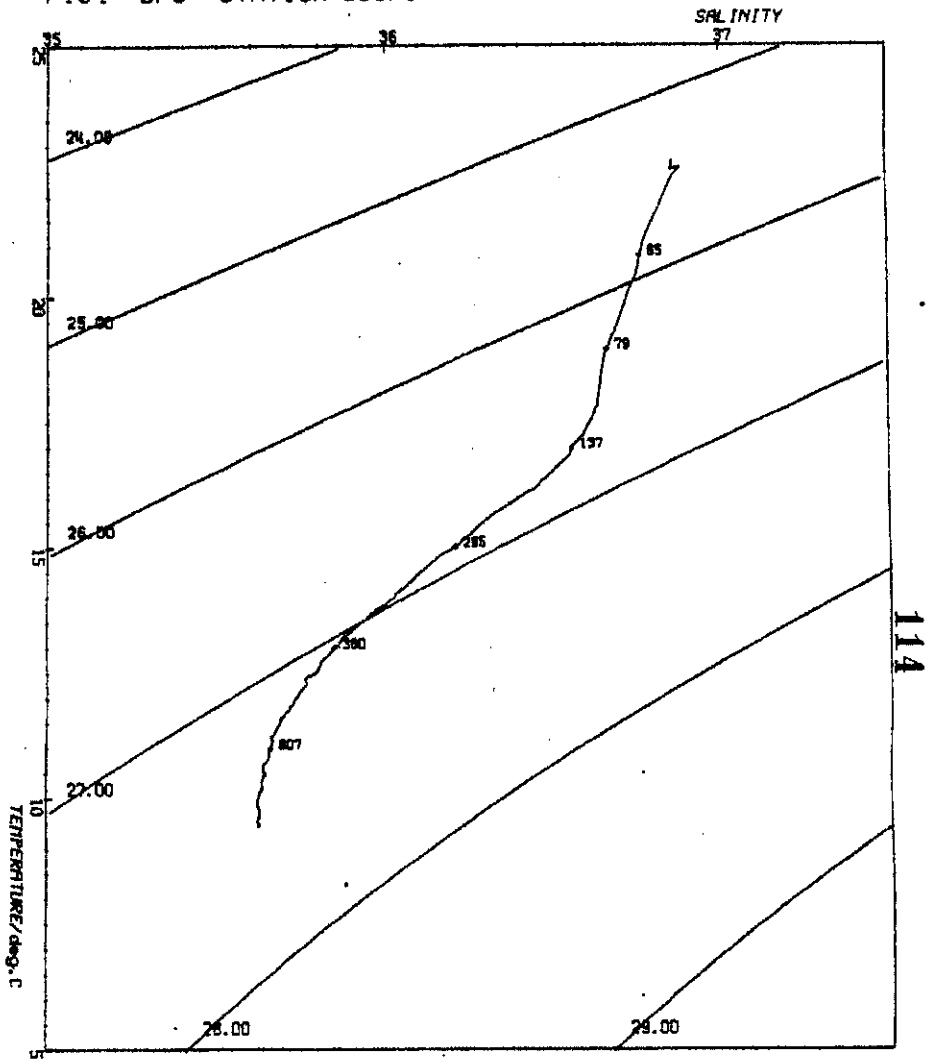
P104 DPS STATION 802/1

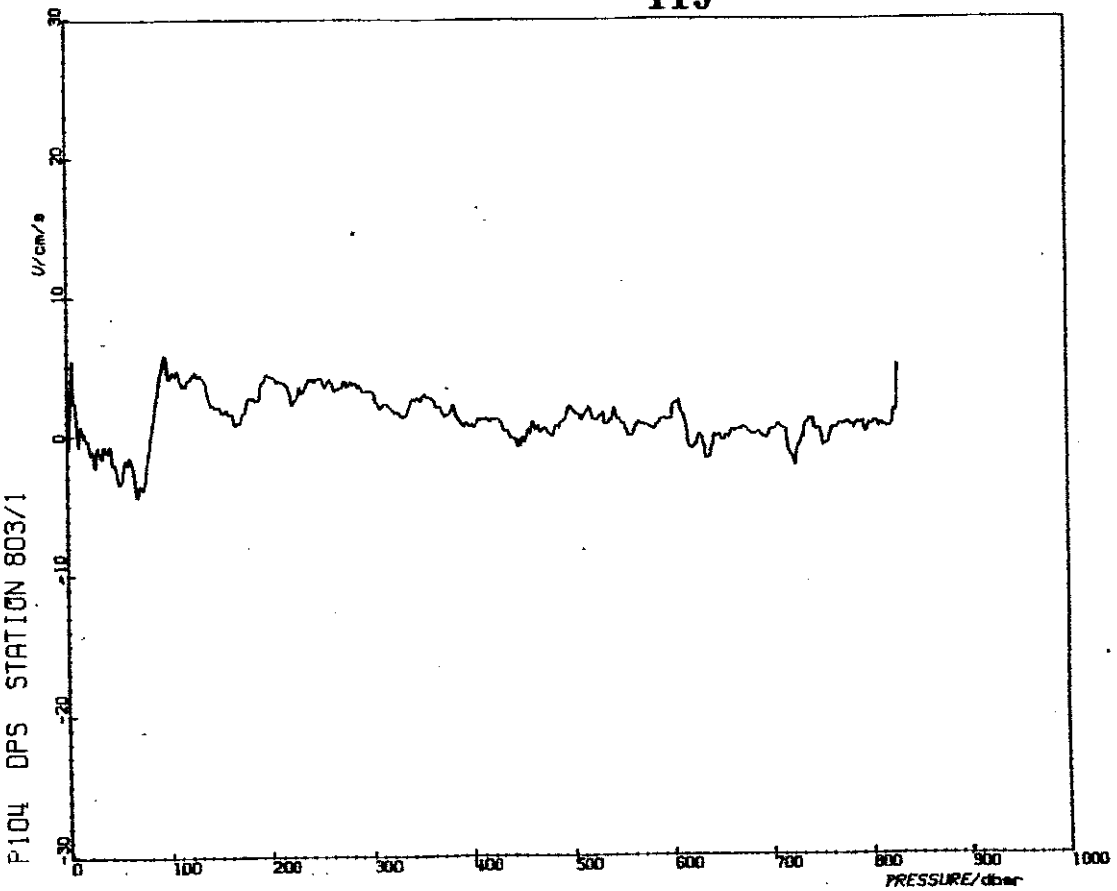


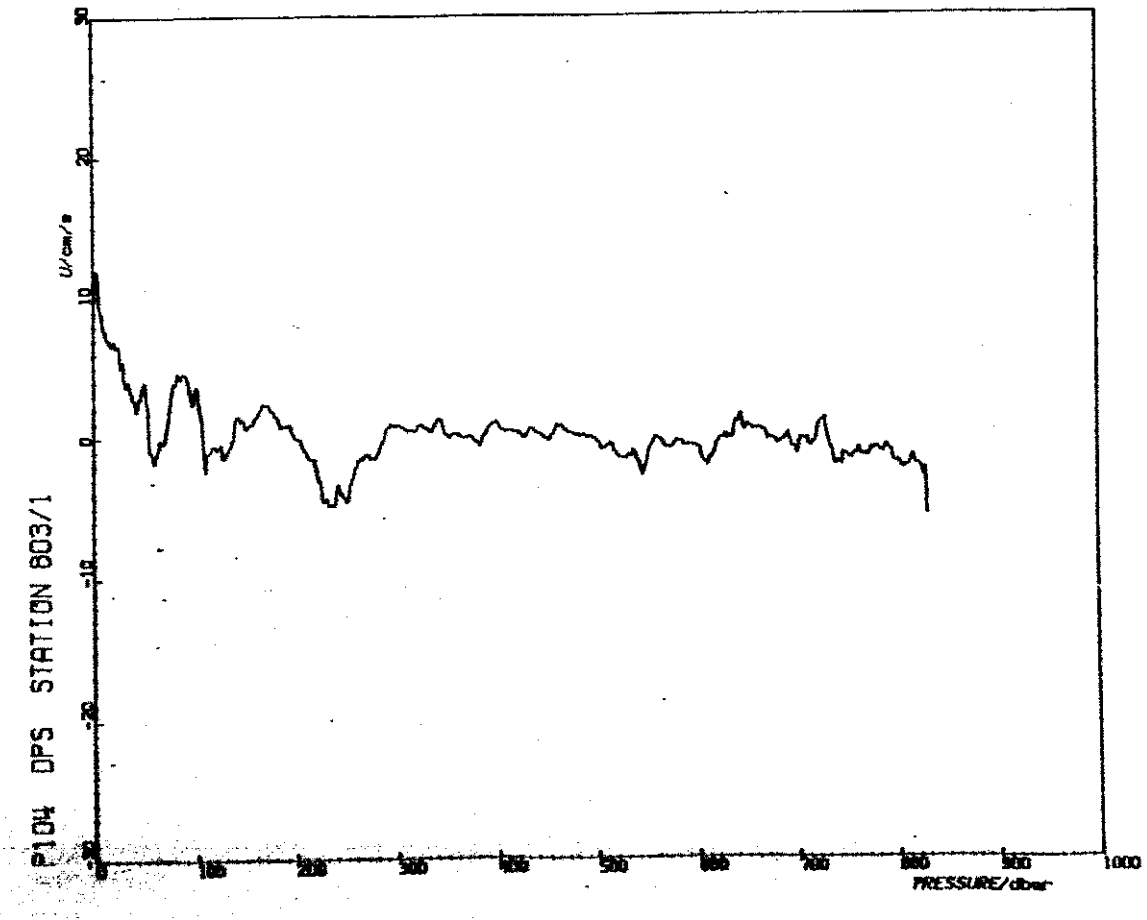
P104 DPS STATION 803/1

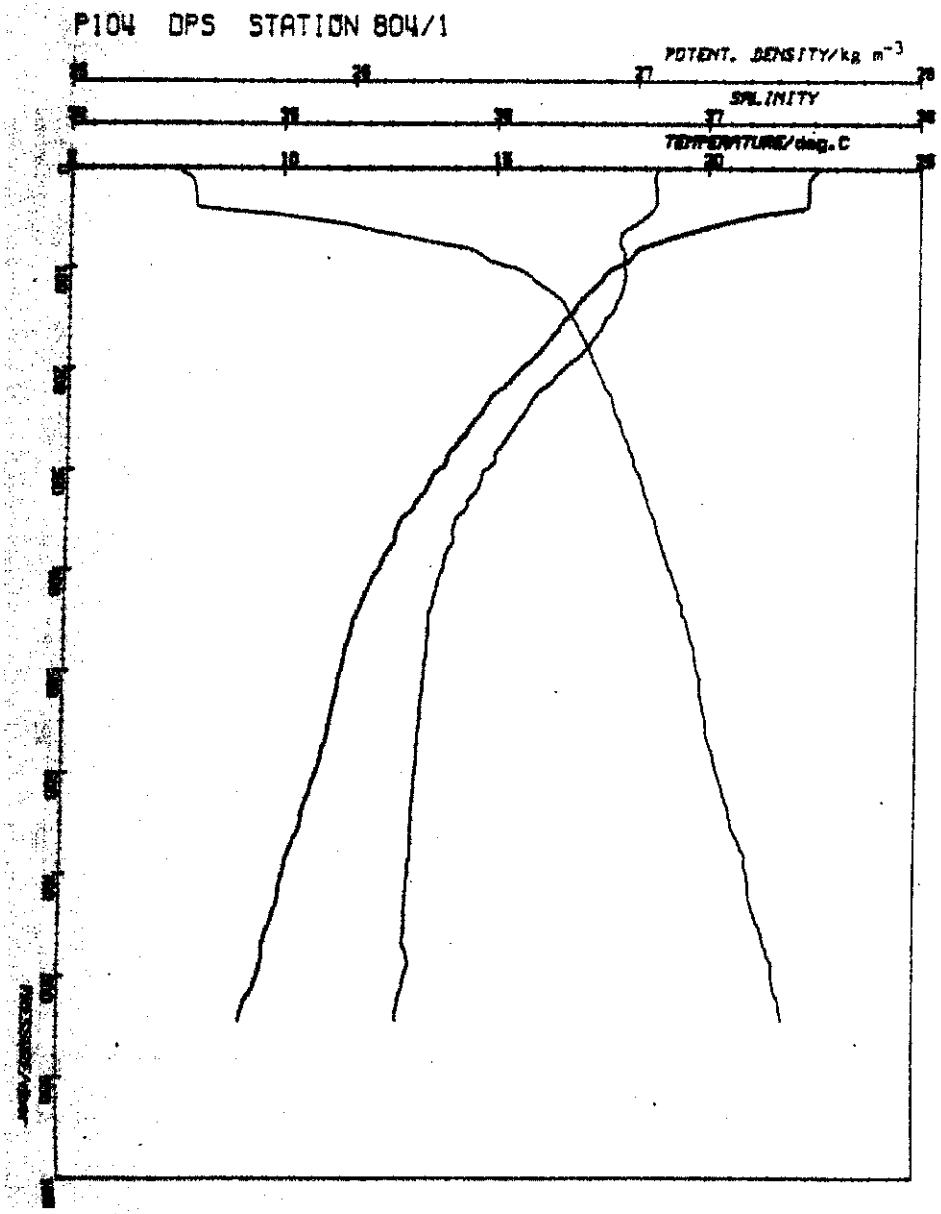


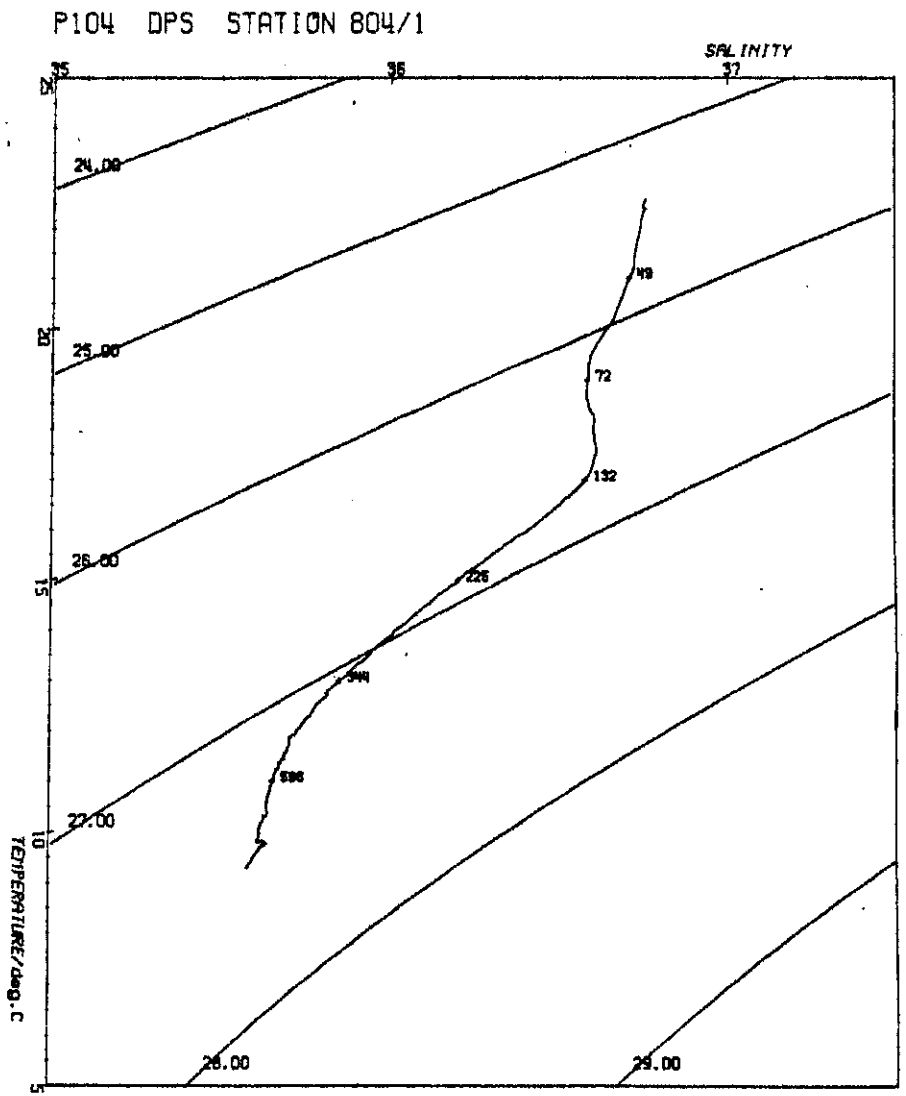
P104 DPS STATION 803/1



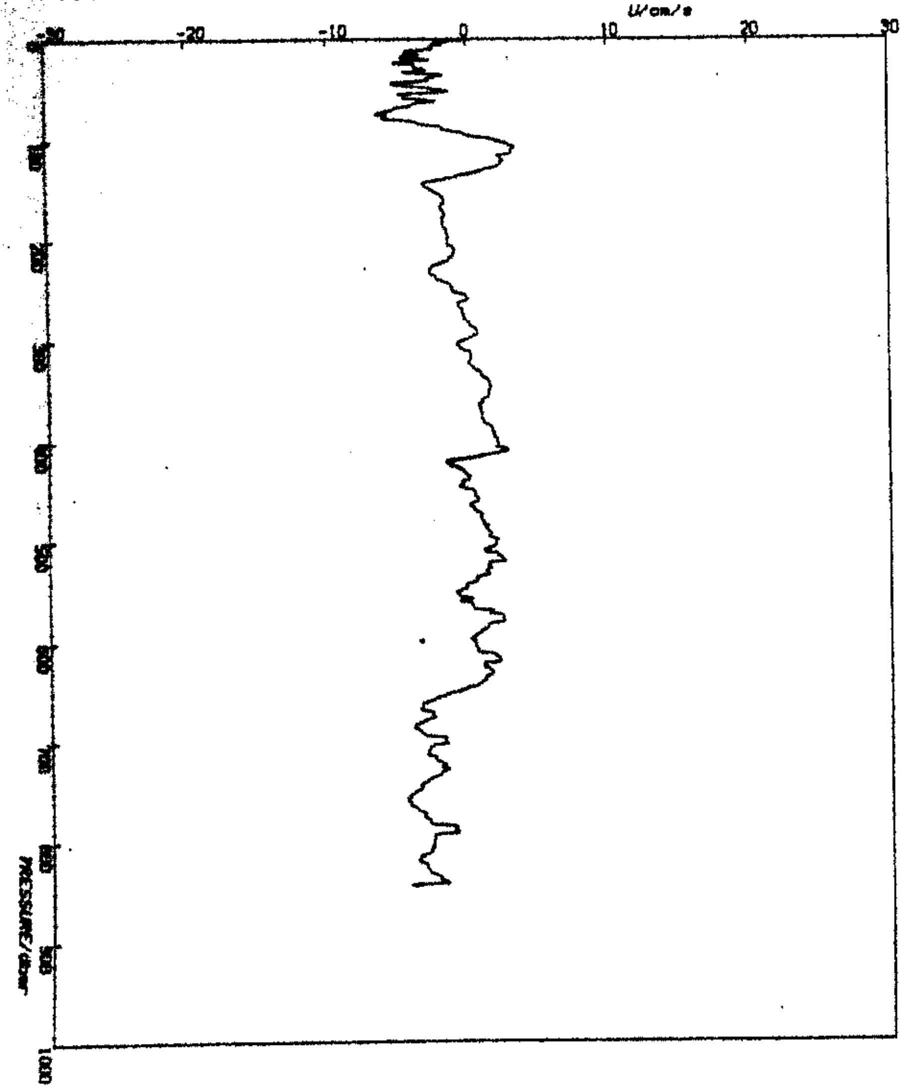

P104 DPS STATION 803/1
U/cm/s
PRESSURE/dbar
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000


P104 DPS STATION 803/1
U/cm/s
PRESSURE/dbar
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000

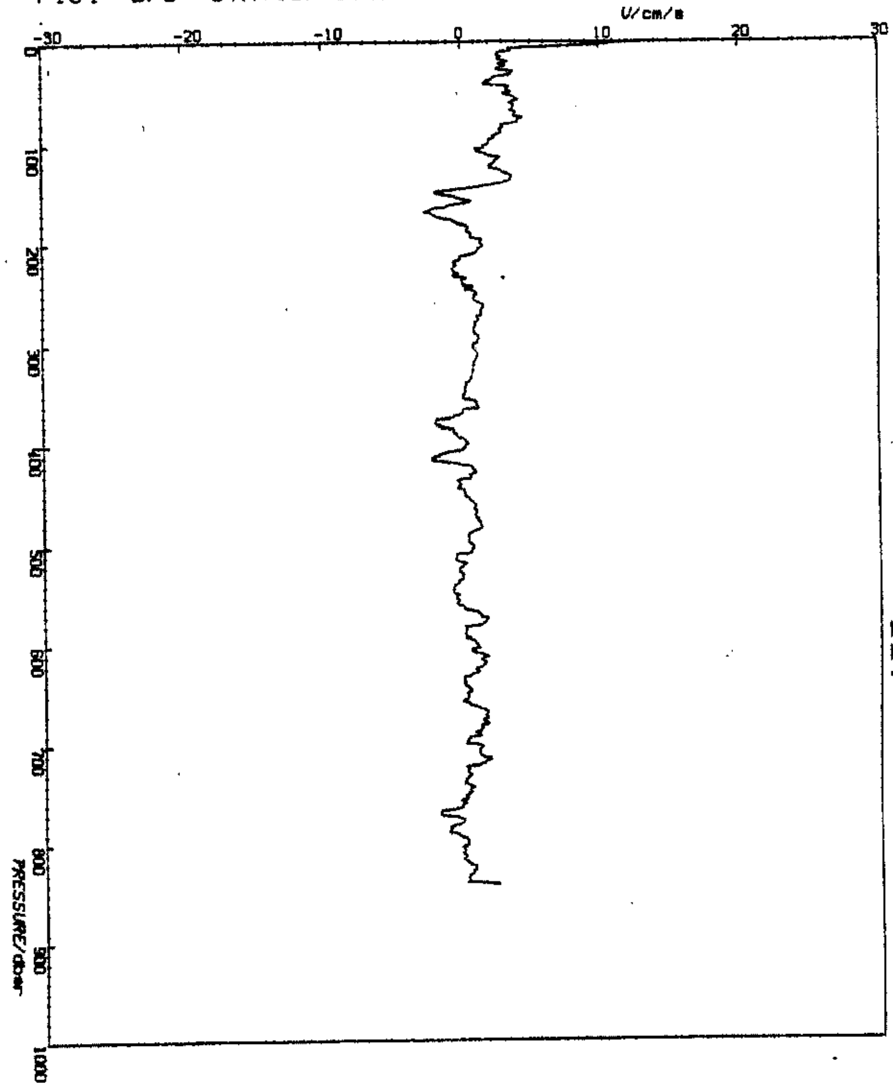

P104 DPS STATION 804/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C


P104 DPS STATION 804/1
SALINITY
24.00
25.00
26.00
27.00
TEMPERATURE/deg.C
49
72
132
226
344
596

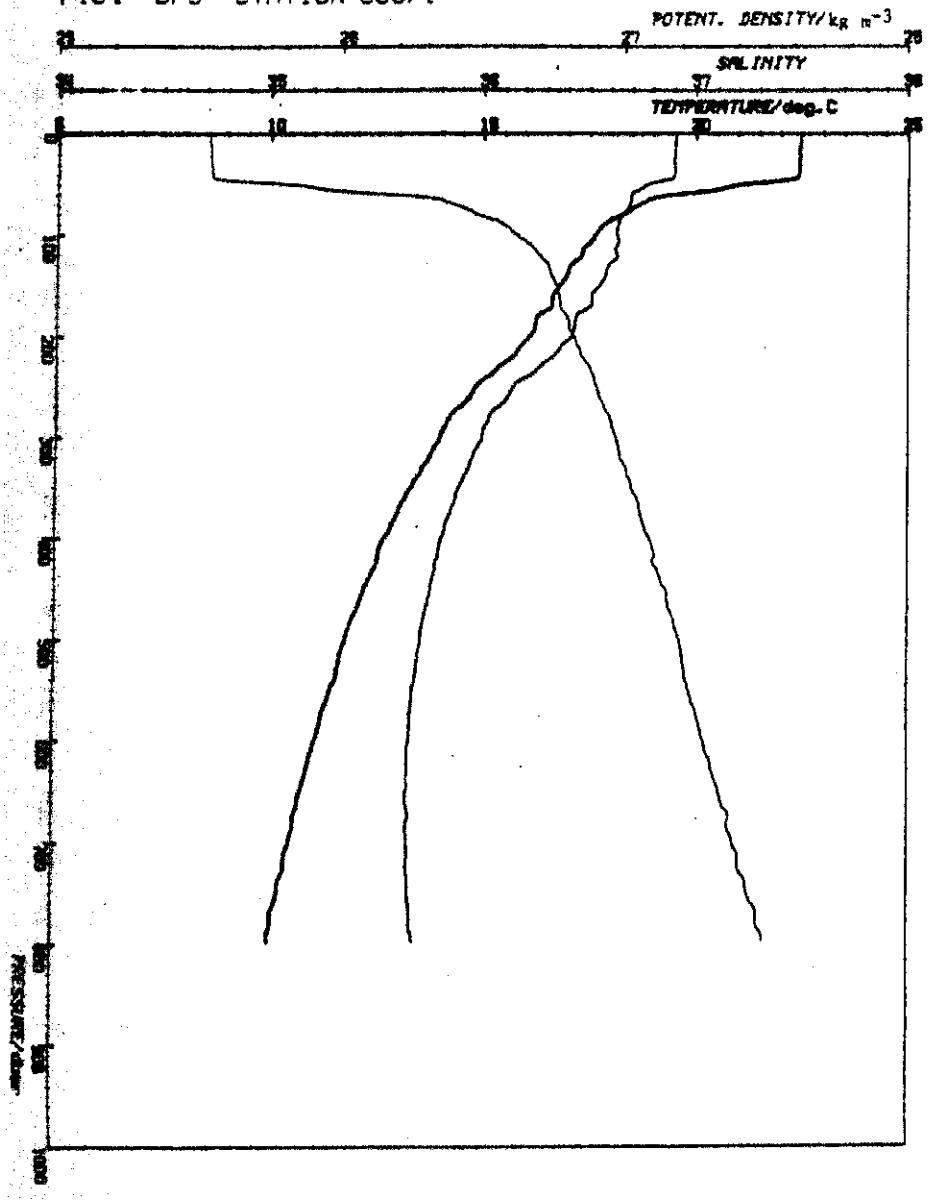
P104 DPS STATION 804/1



P104 DPS STATION 804/1



P104 DPS STATION 805/1



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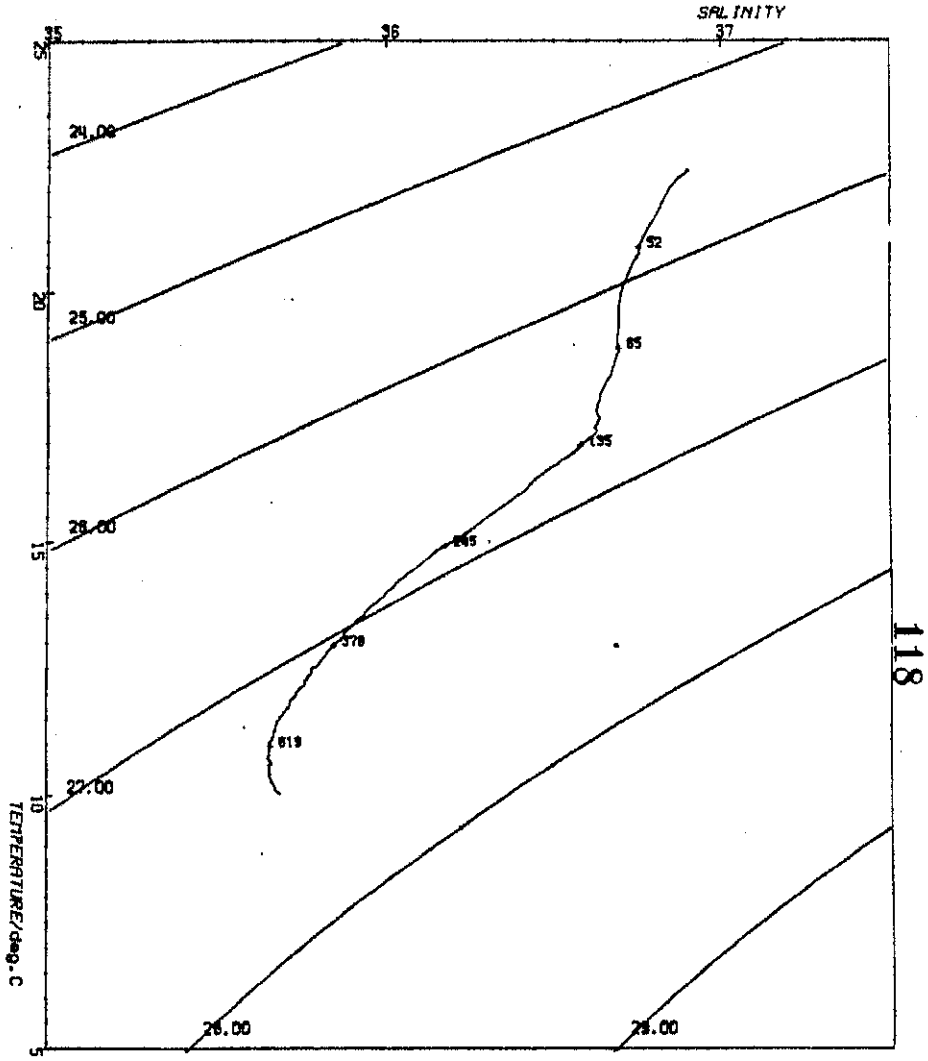

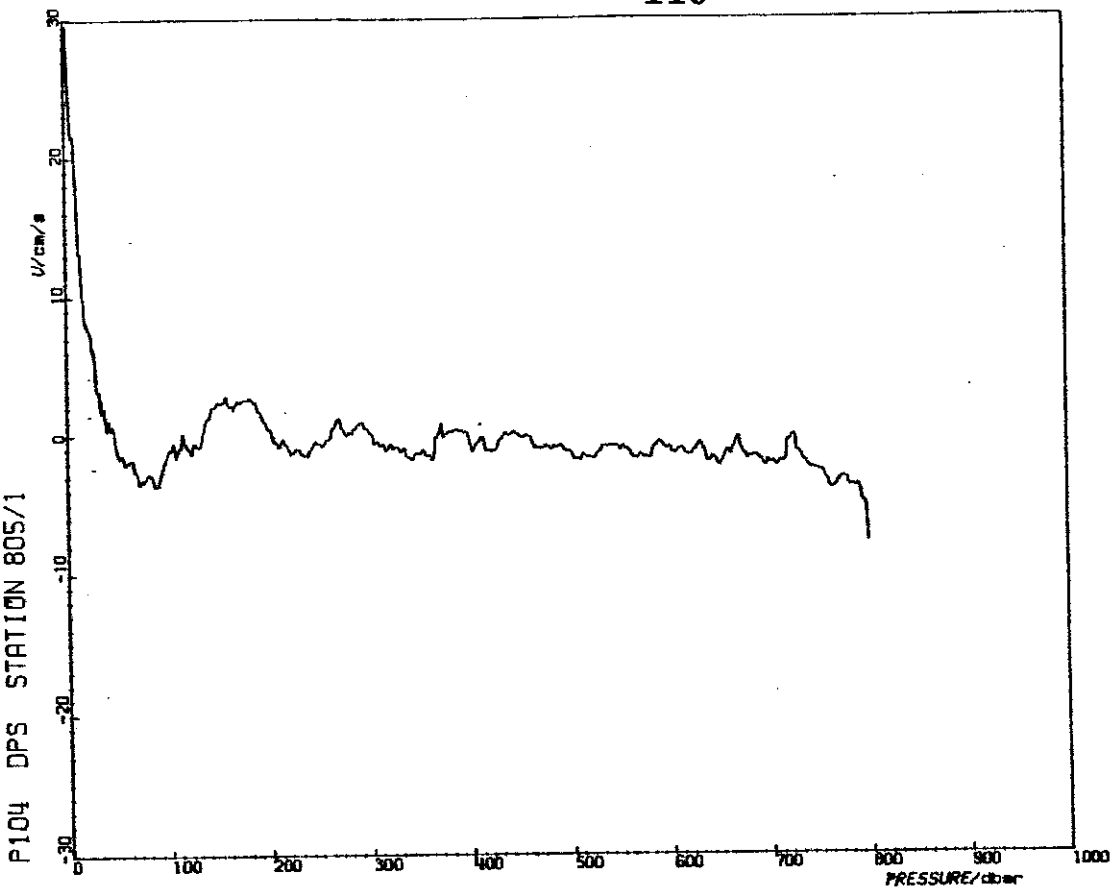
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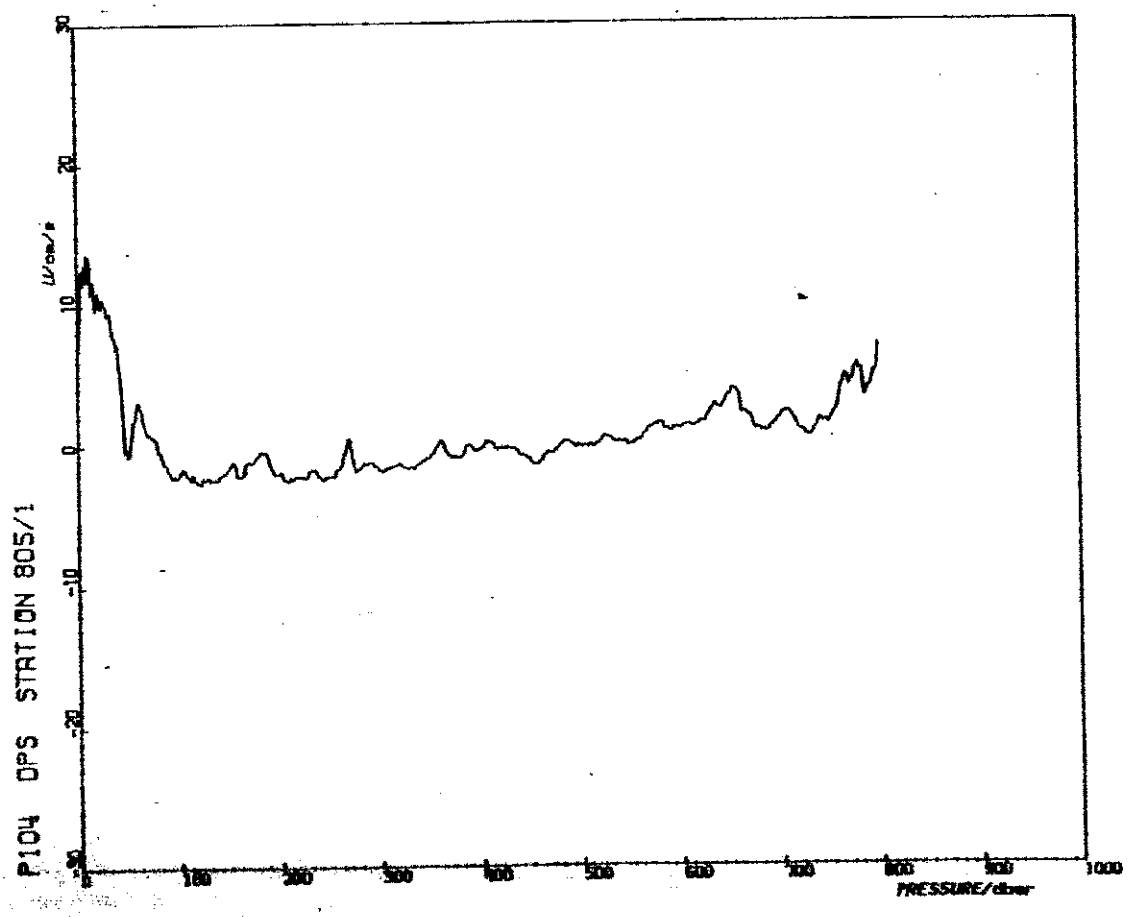
PRESSURE/dbar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PRESSURE/dbar

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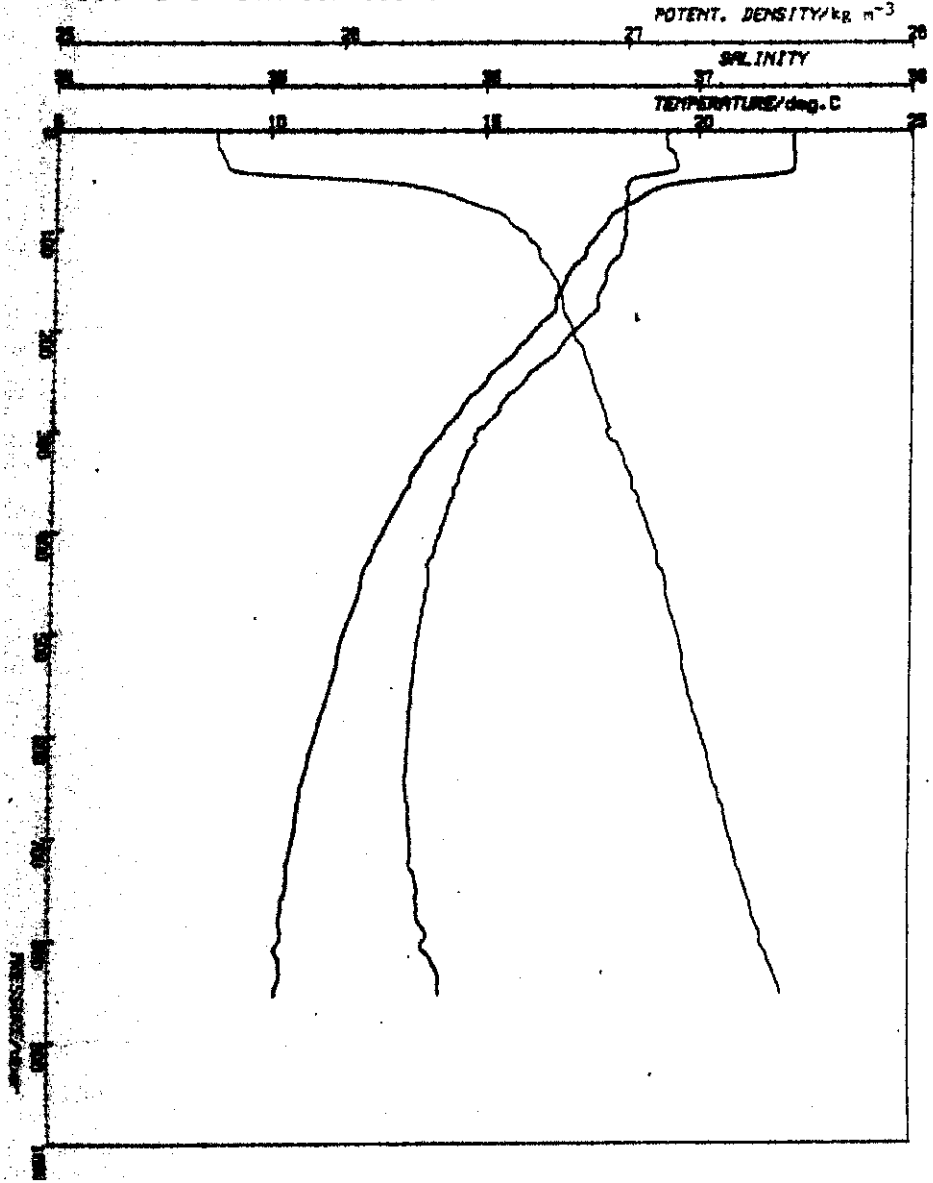

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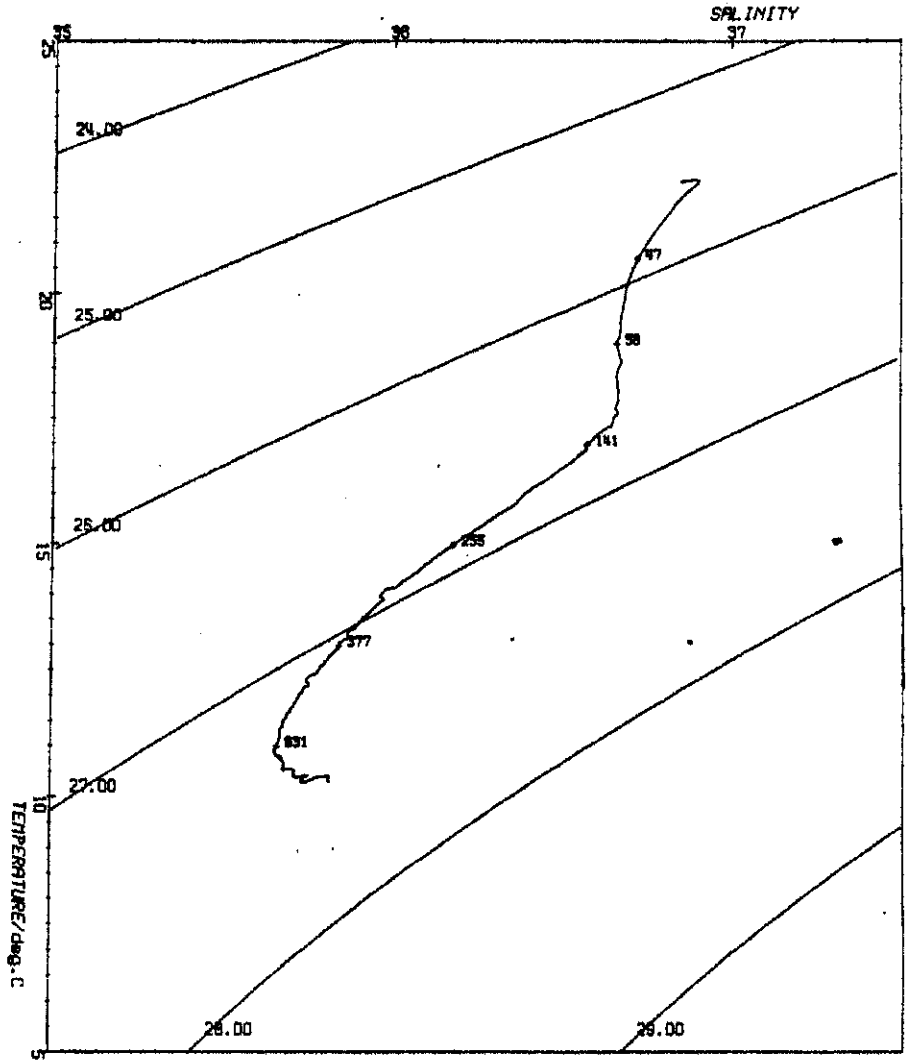

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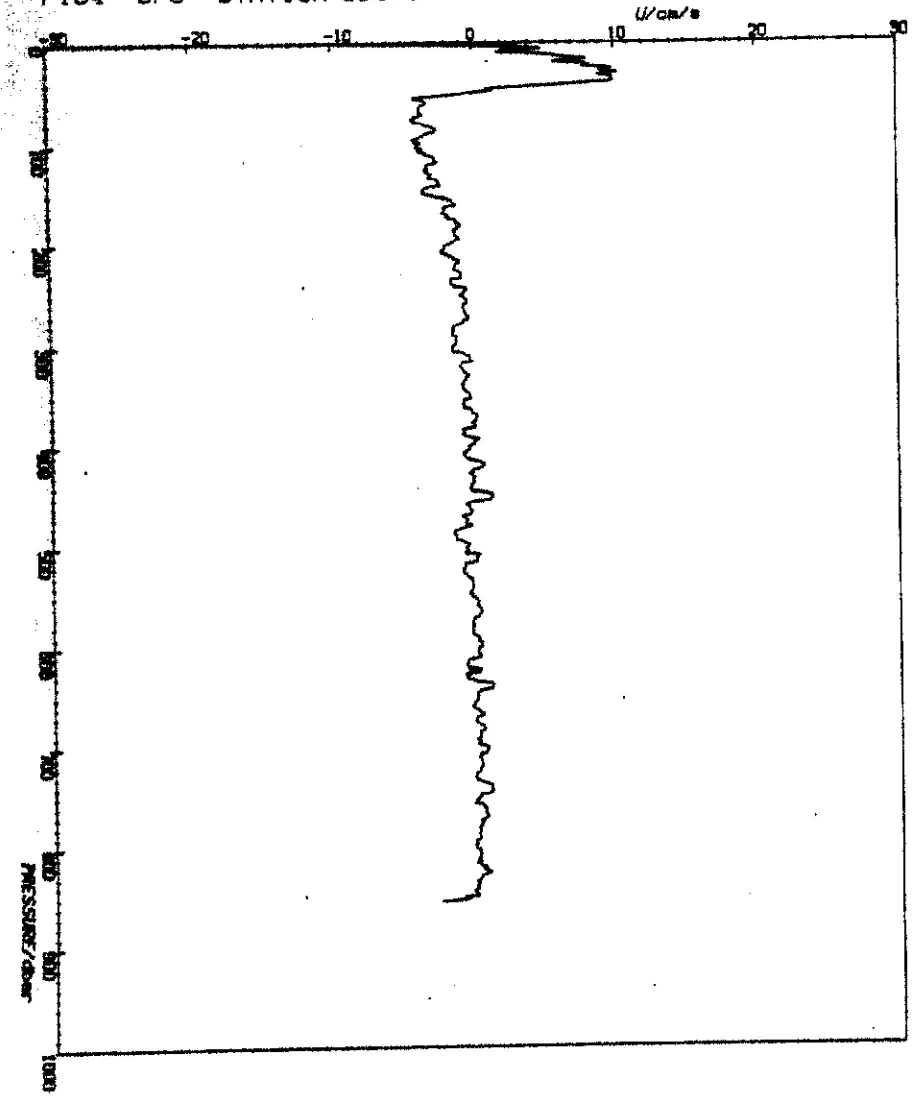

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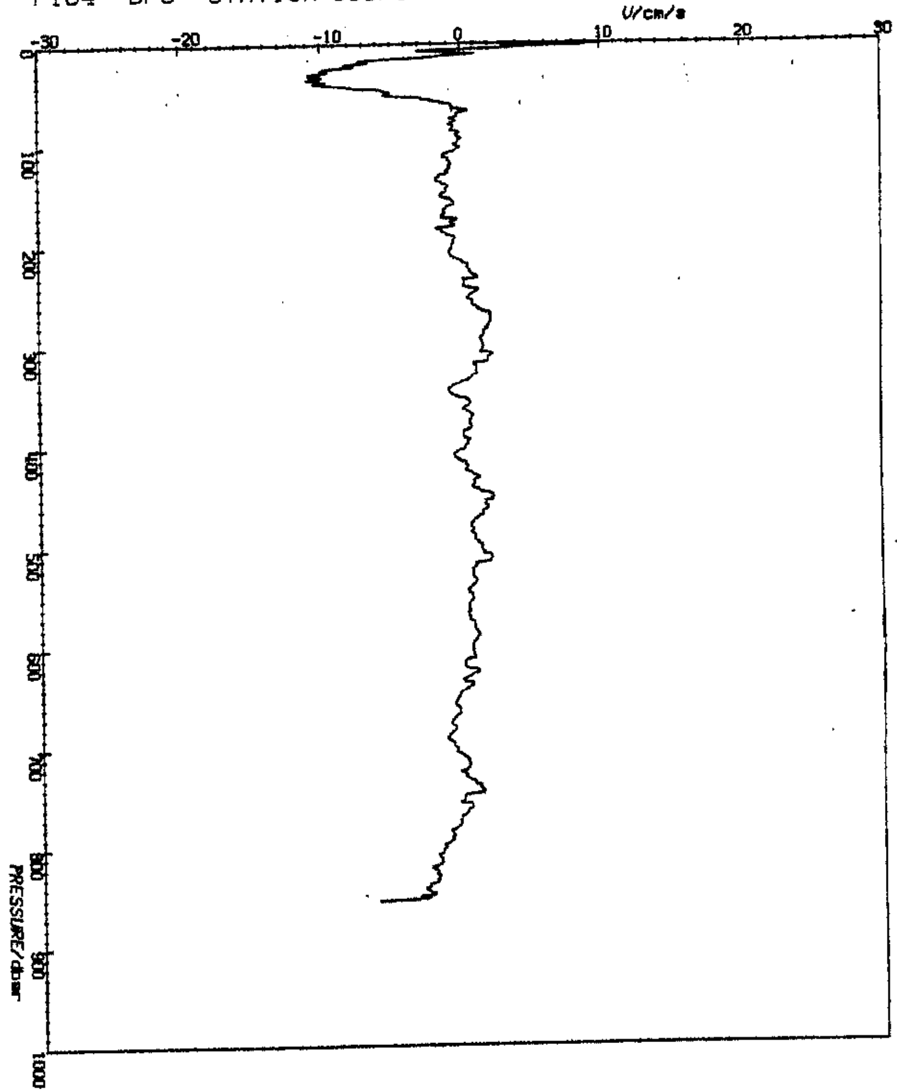

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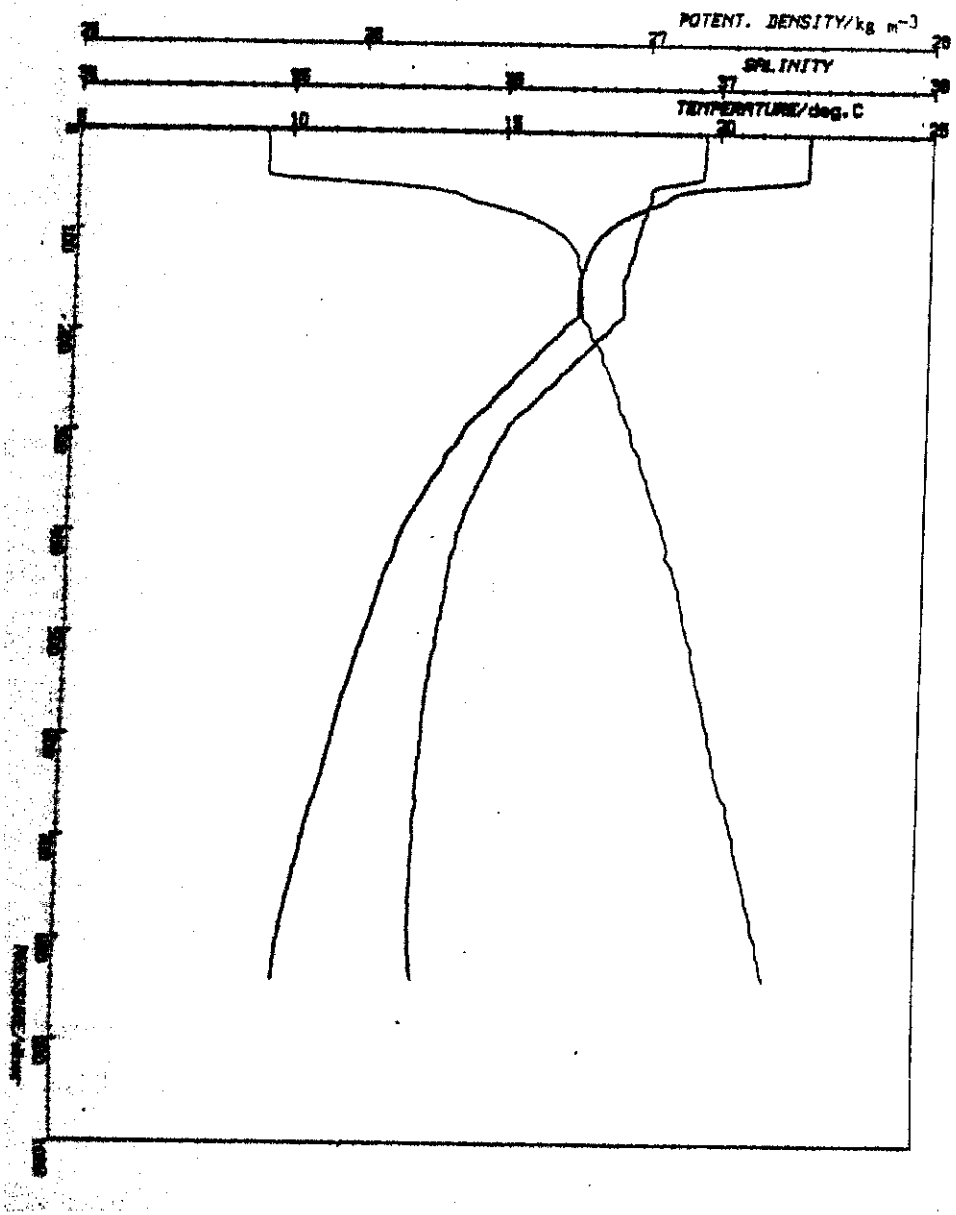

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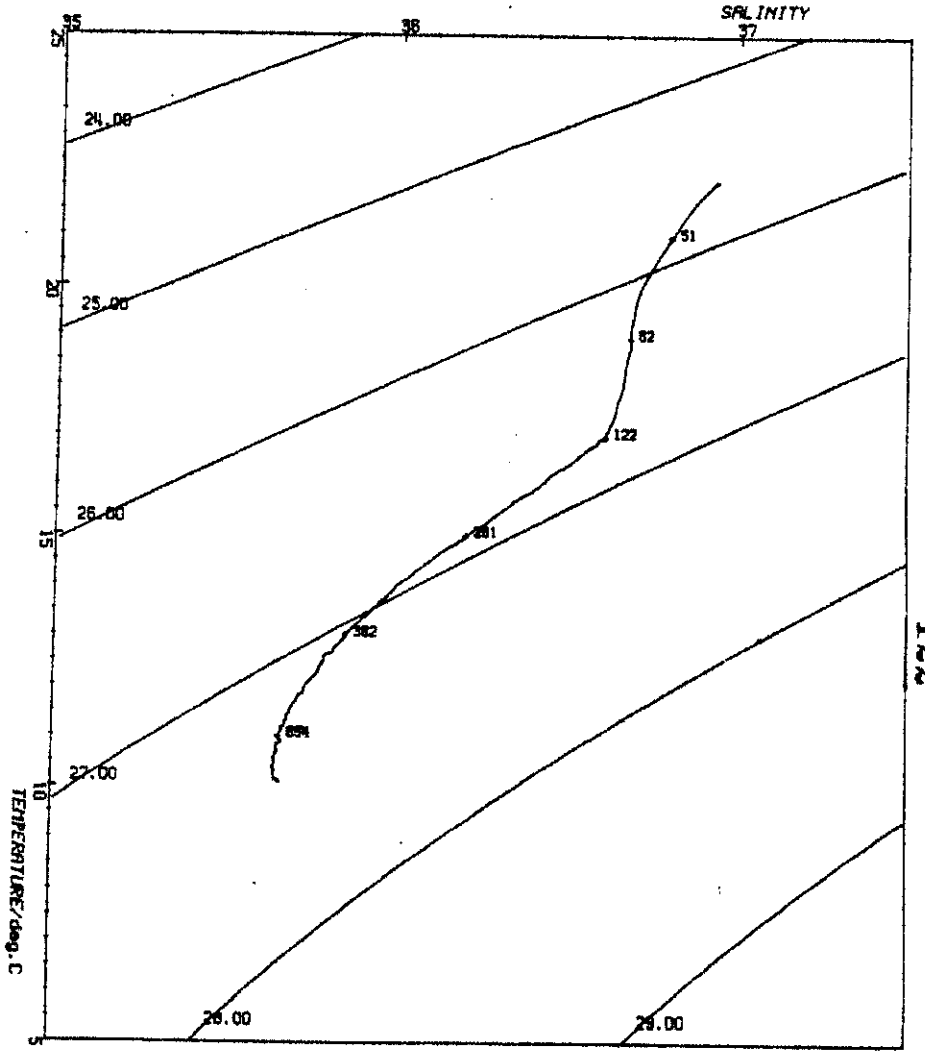
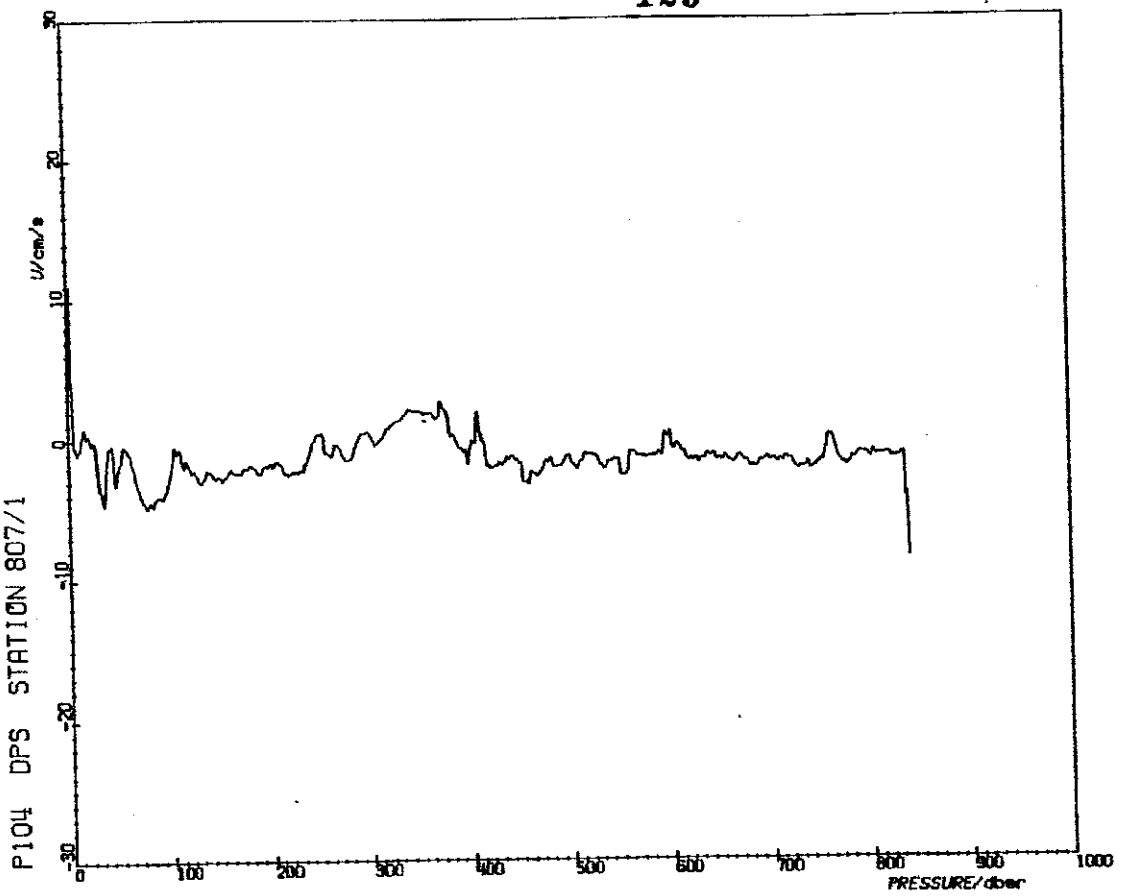
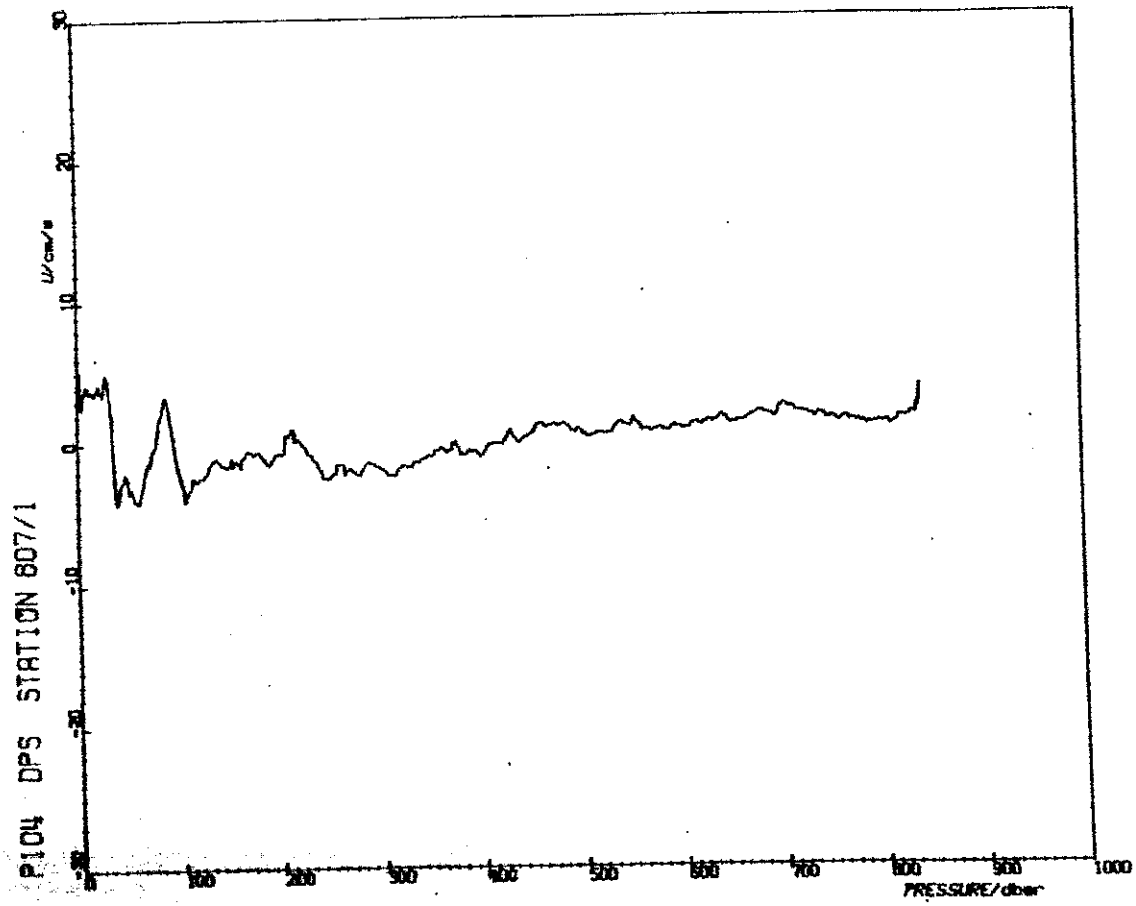



P104 DPS STATION 807/1
u/cm/s
PRESSURE/dbar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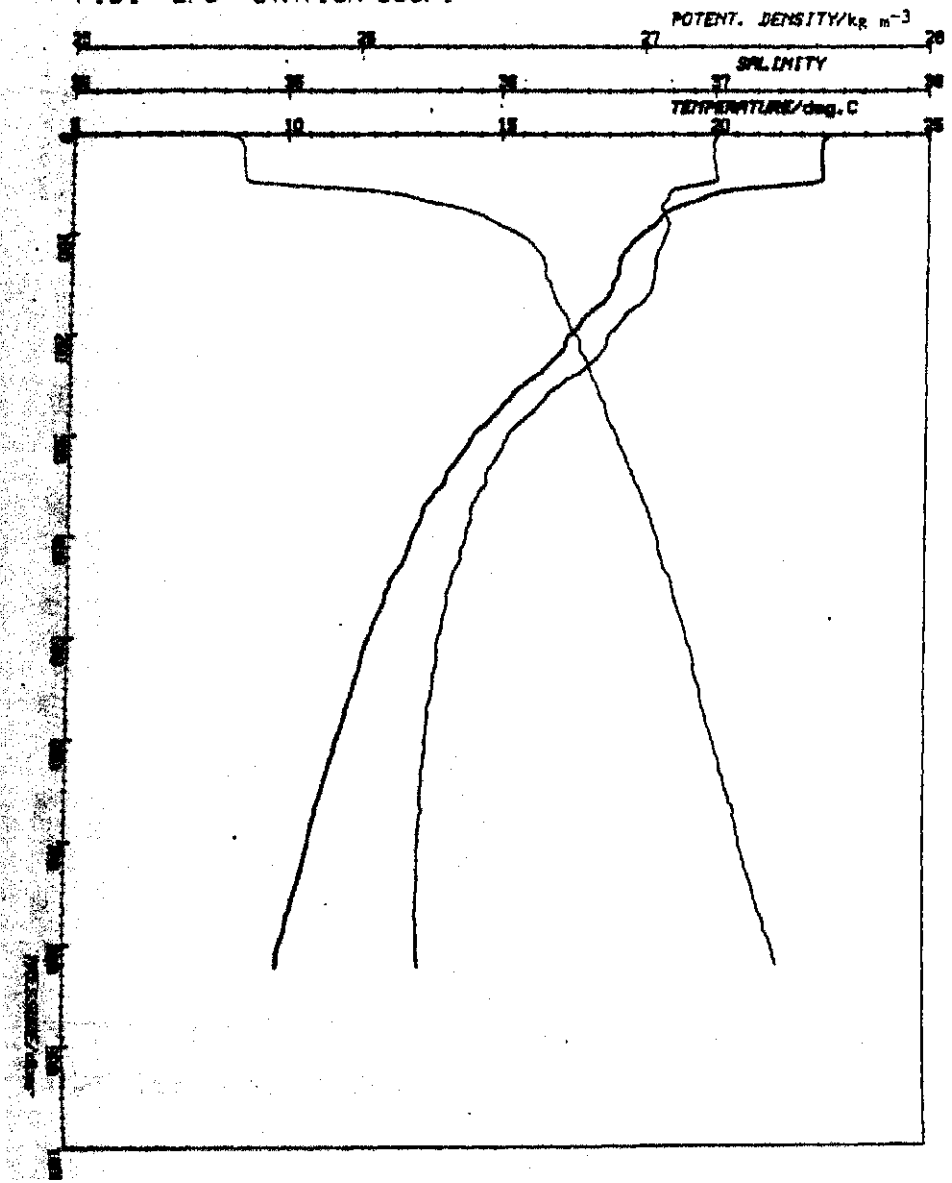
u/cm/s
PRESSURE/dbar

P104 DPS STATION 808/1



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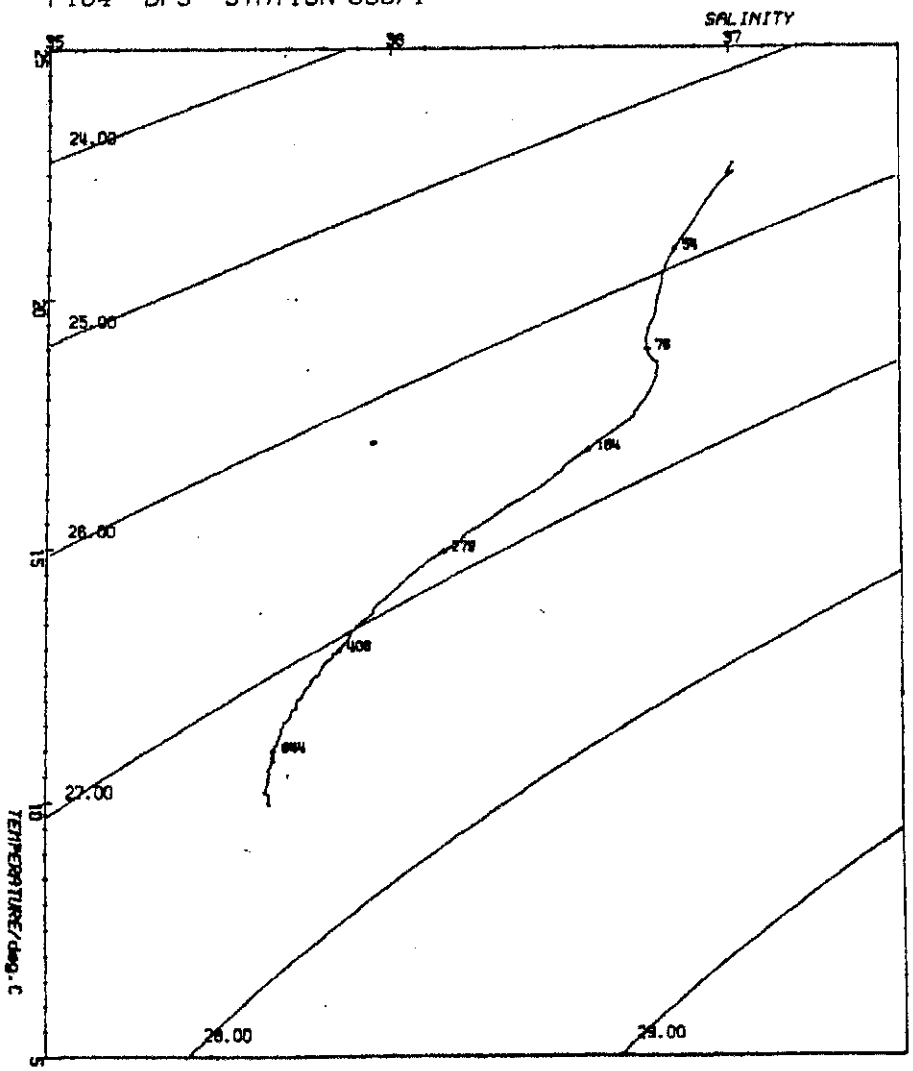
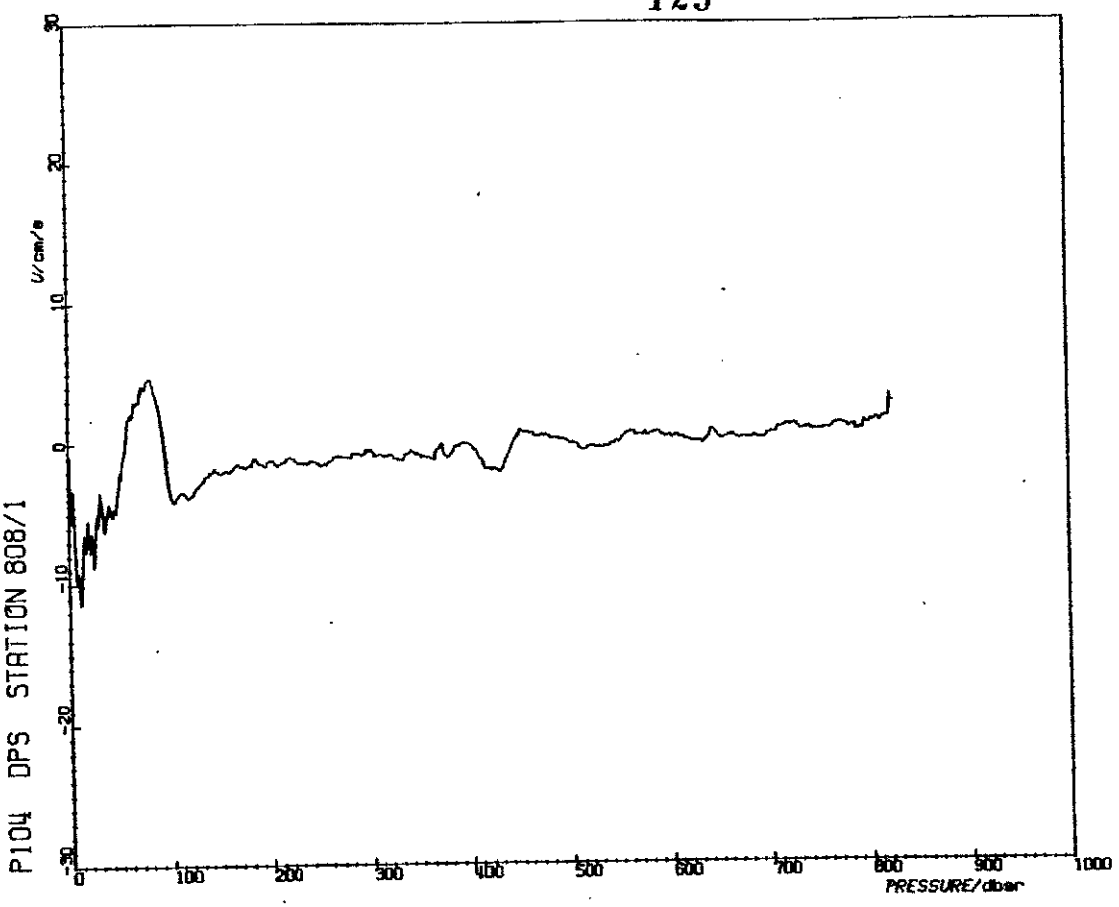
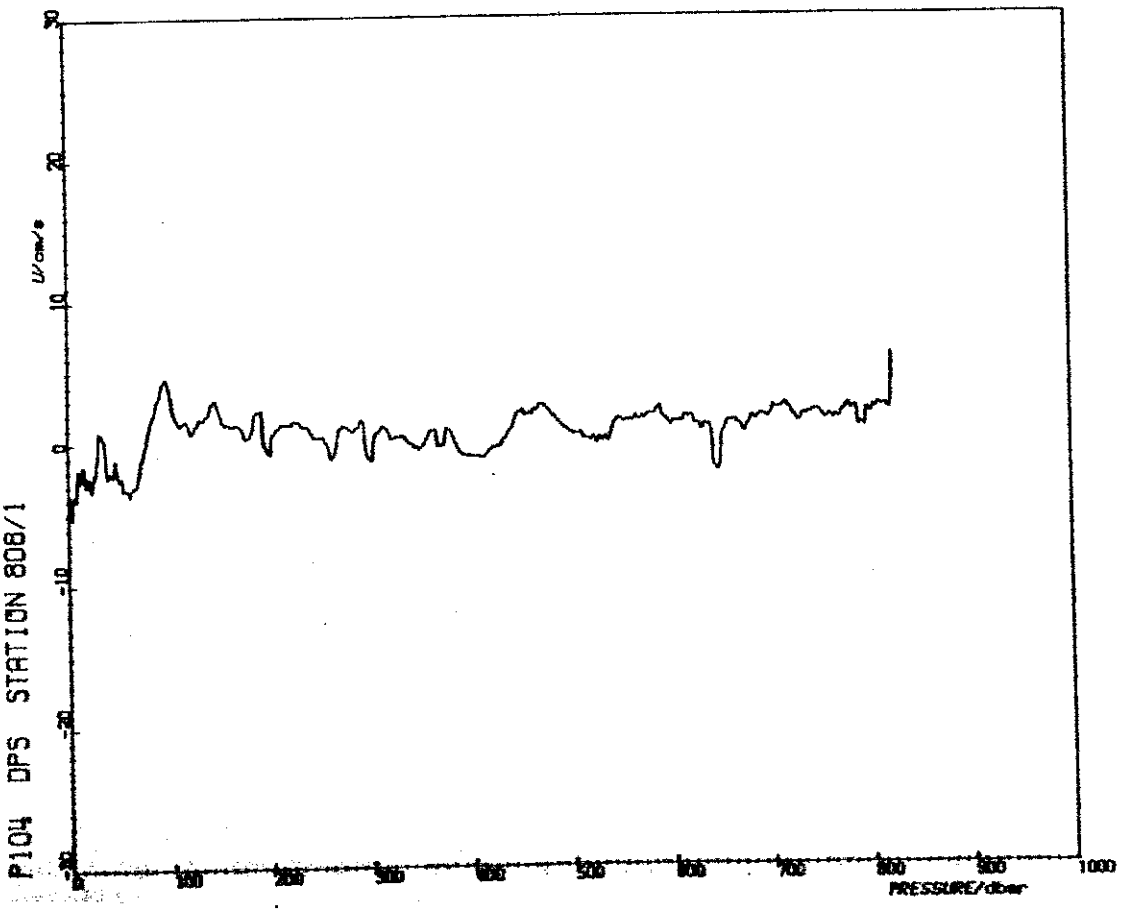
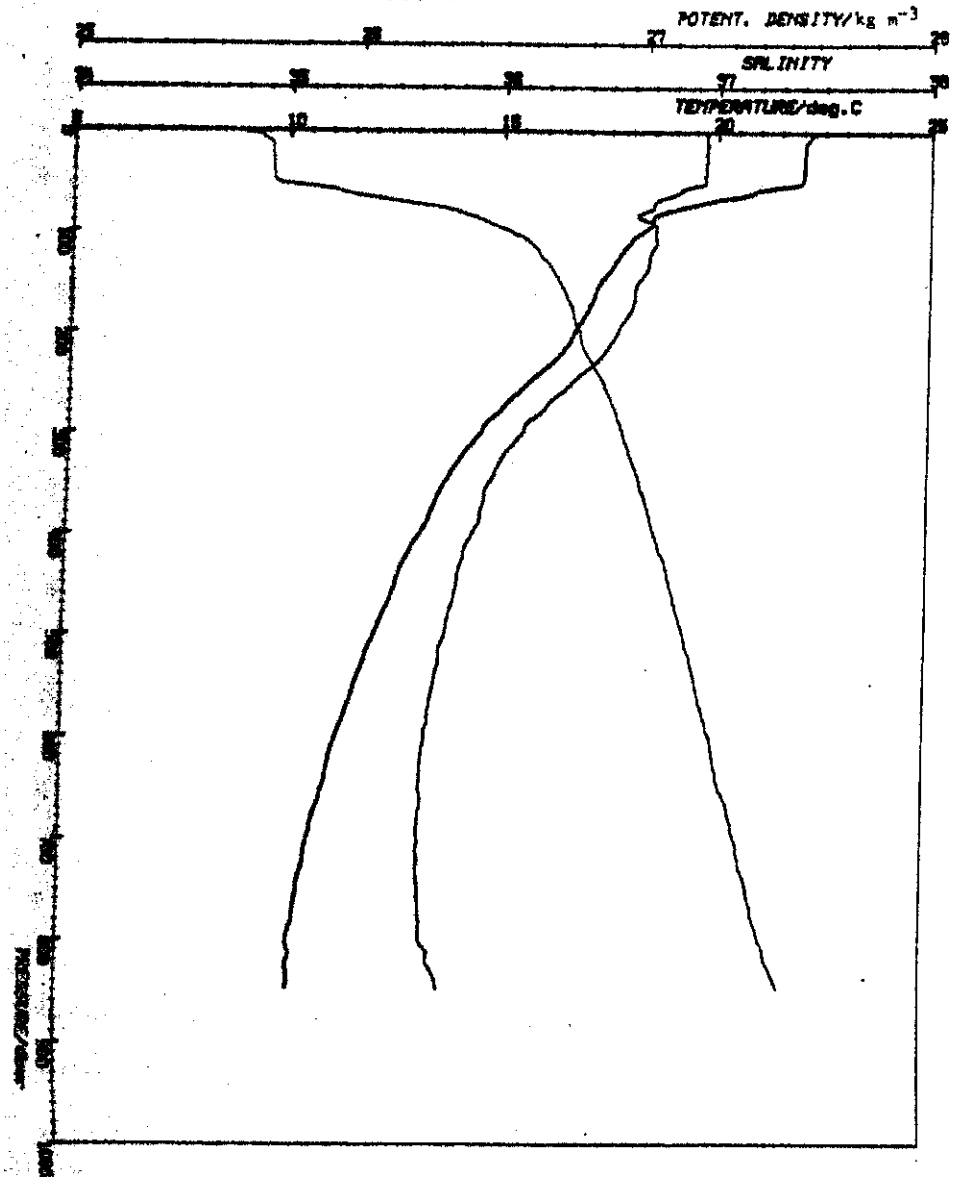


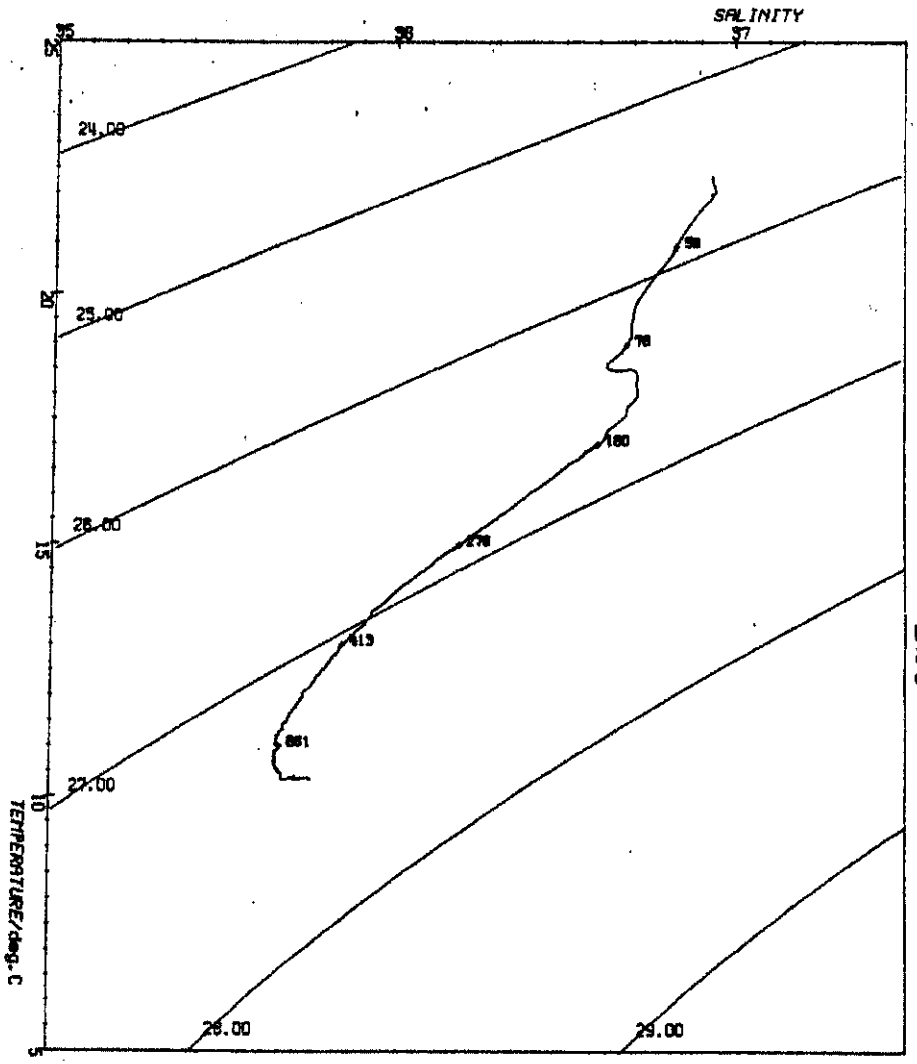

P104 DPS STATION 808/1
u/cm/s
PRESSURE/dbar
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000

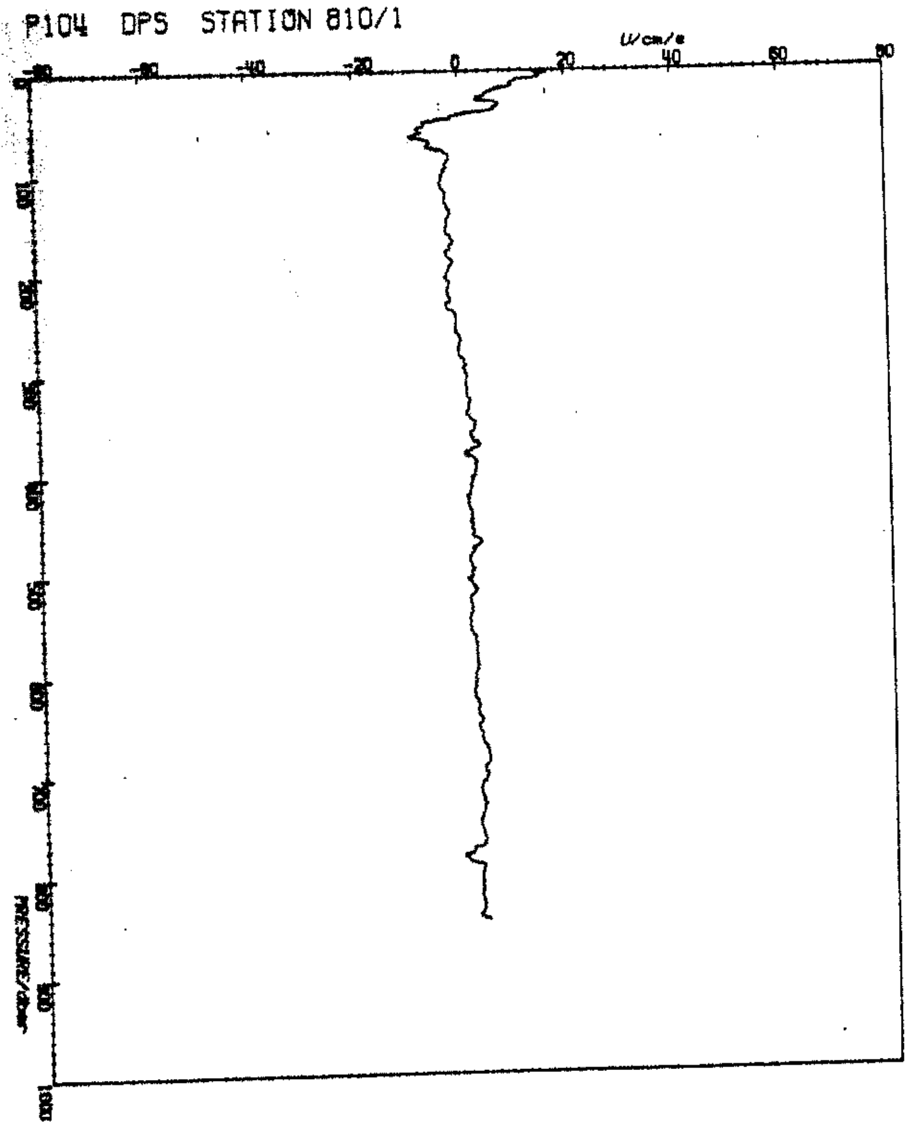

P104 DPS STATION 808/1
u/cm/s
PRESSURE/dbar
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000

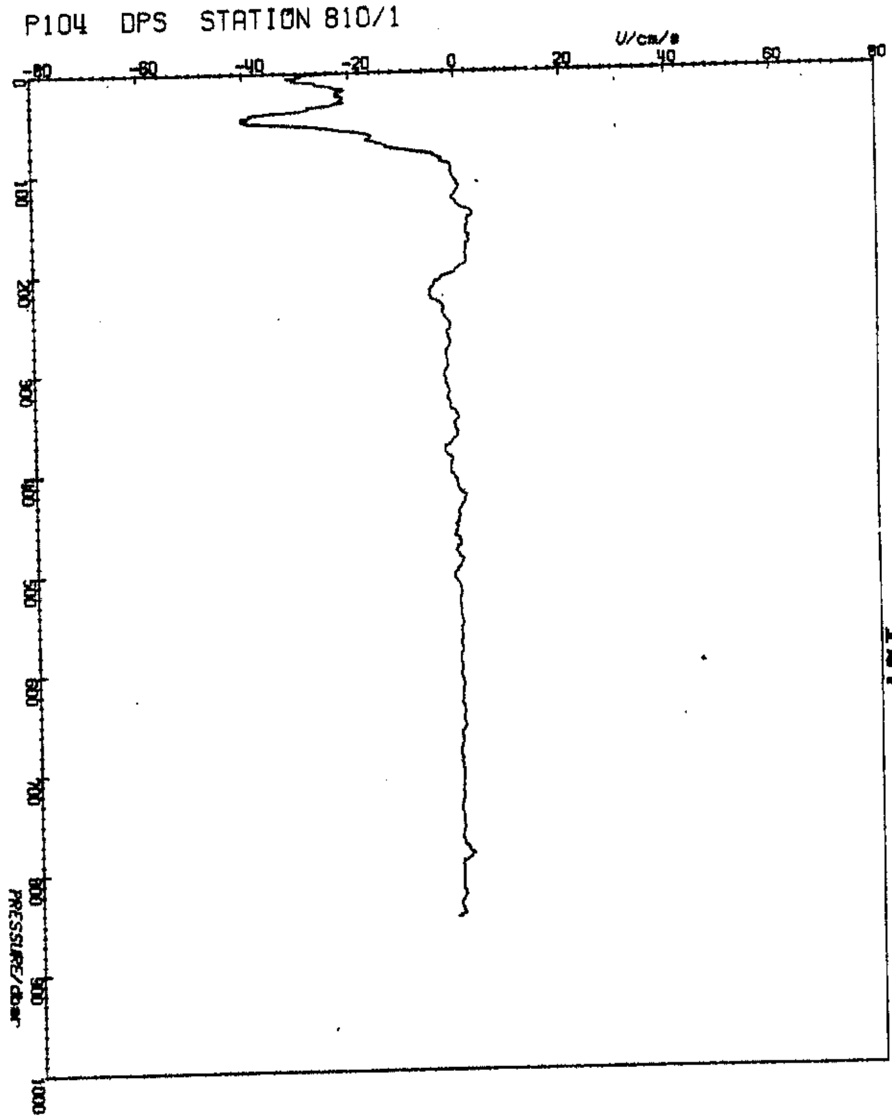
P104 DPS STATION 810/1



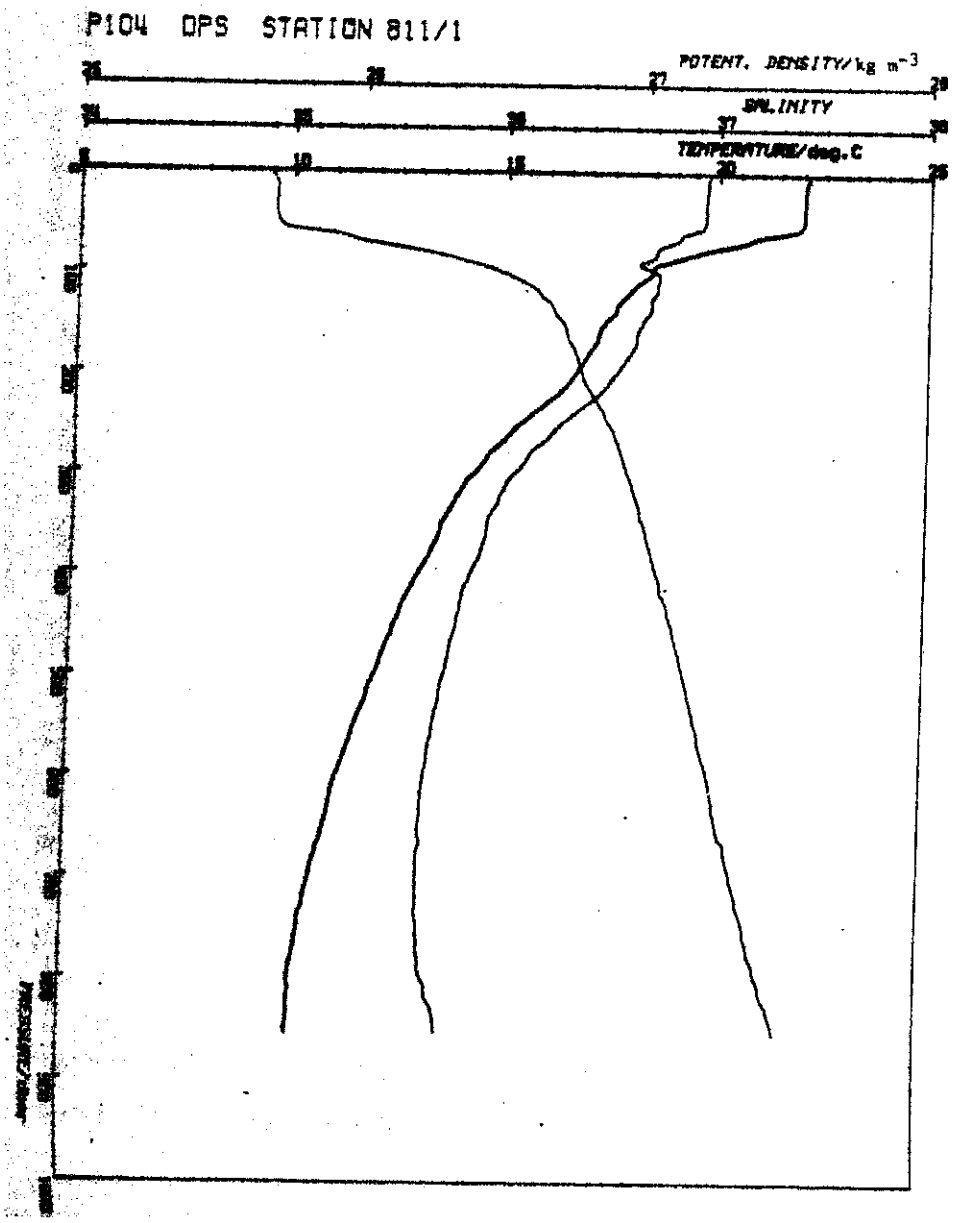
P104 DPS STATION 810/1

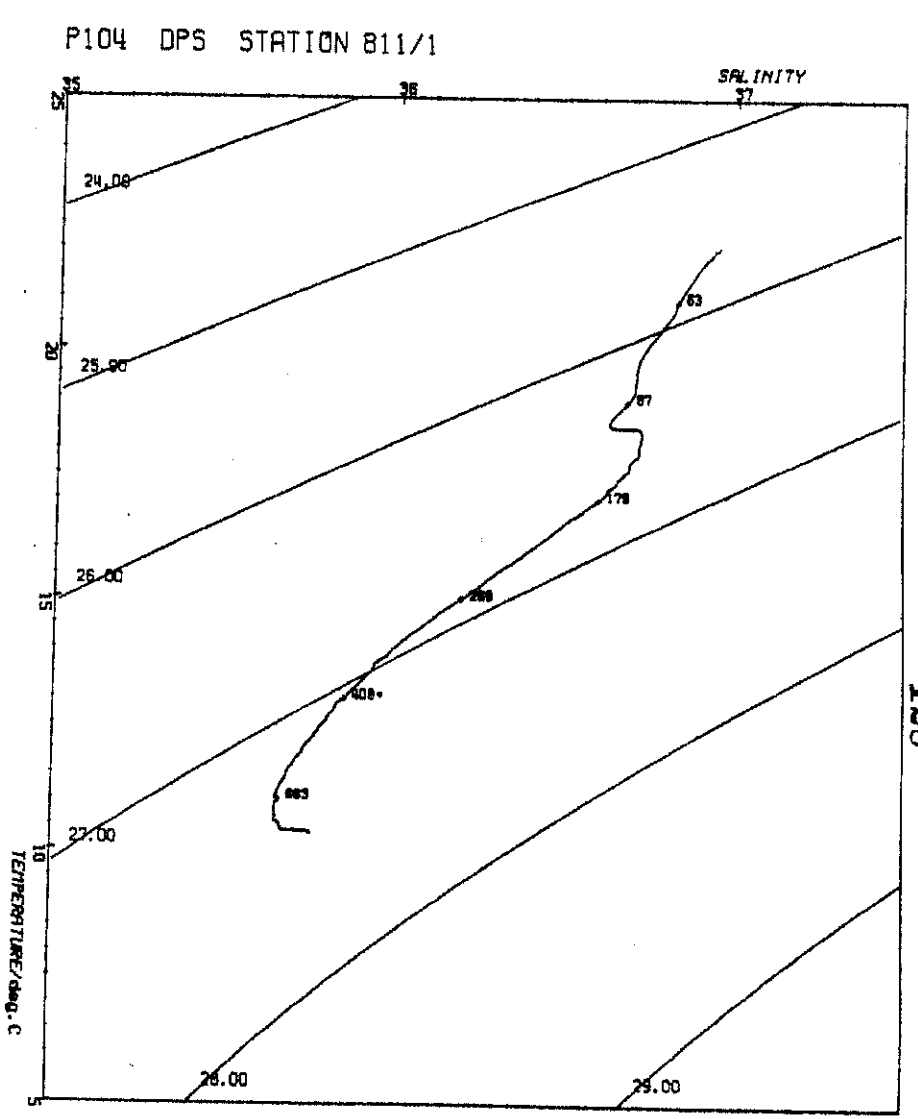


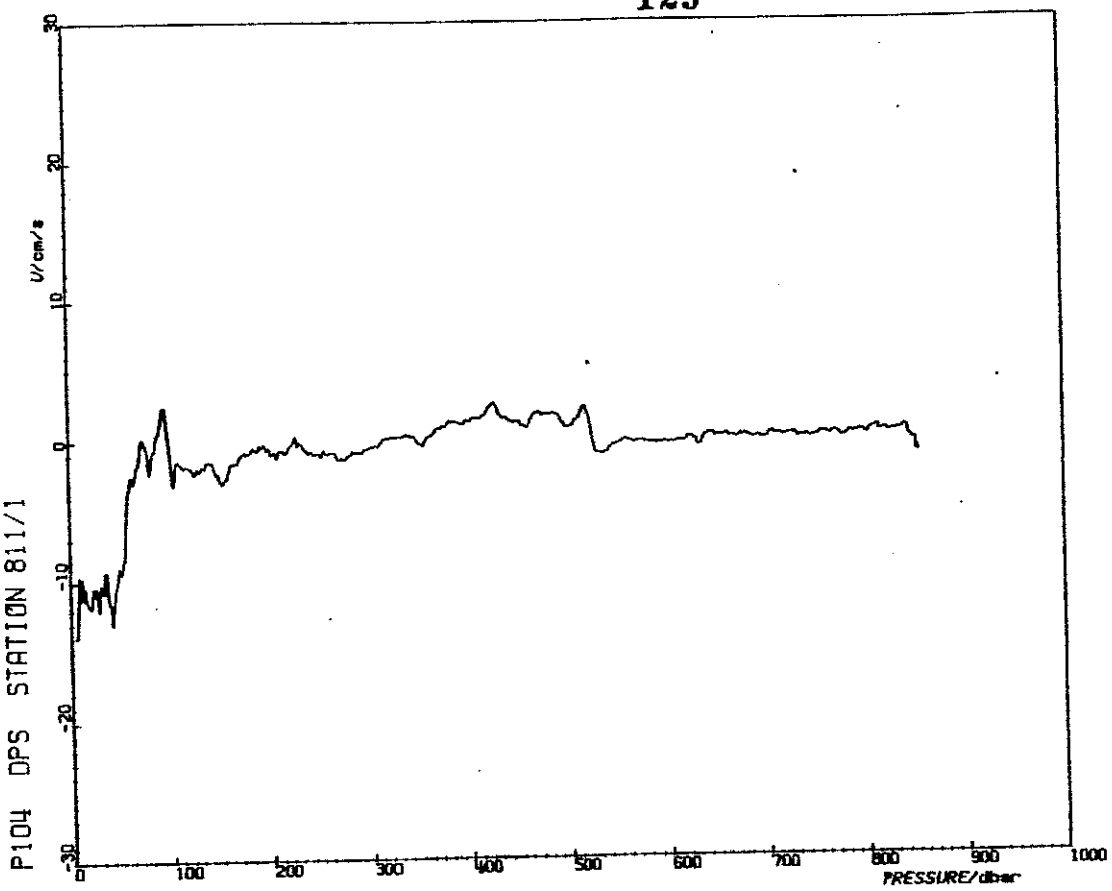

P104 DPS STATION 810/1
U/cm/s
-80
-60
-40
-20
0
20
40
60
80
PRESSURE/dbar

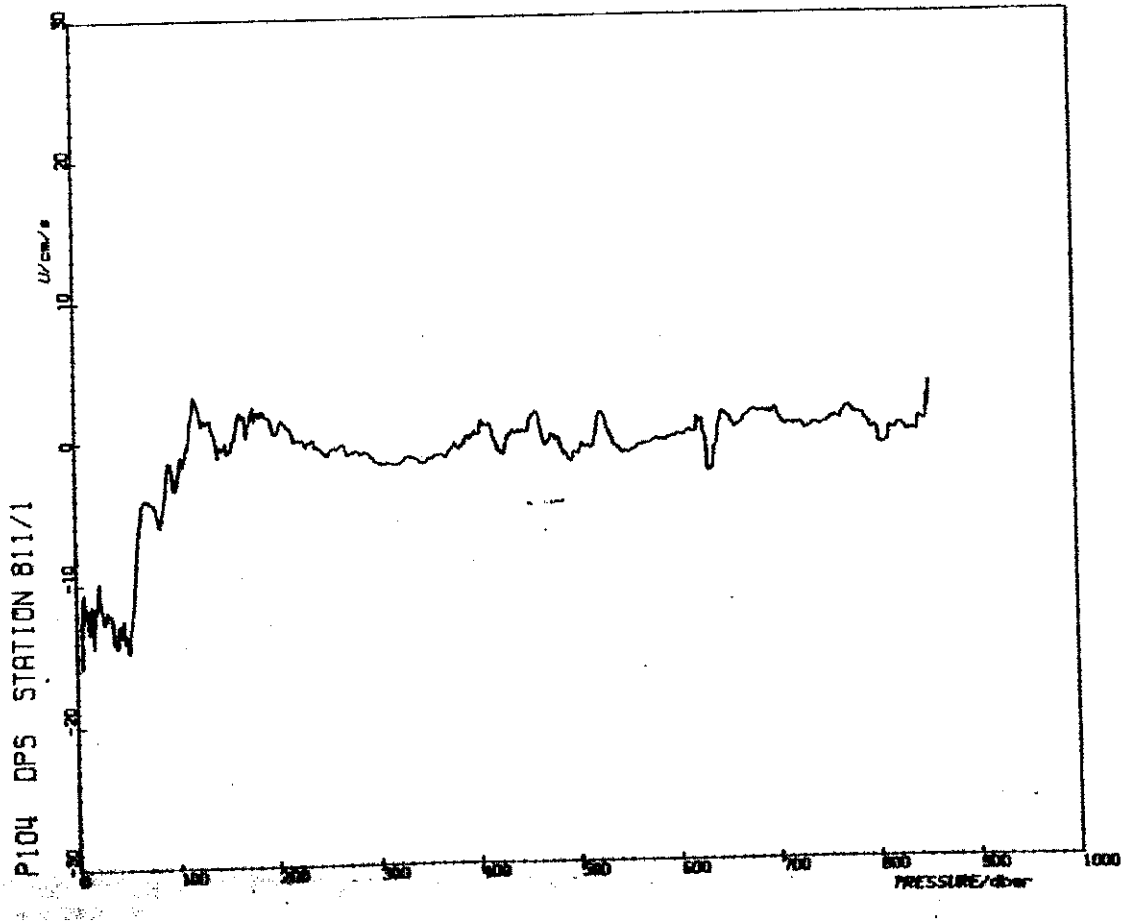

P104 DPS STATION 810/1
U/cm/s
-80
-60
-40
-20
0
20
40
60
80
PRESSURE/dbar

127

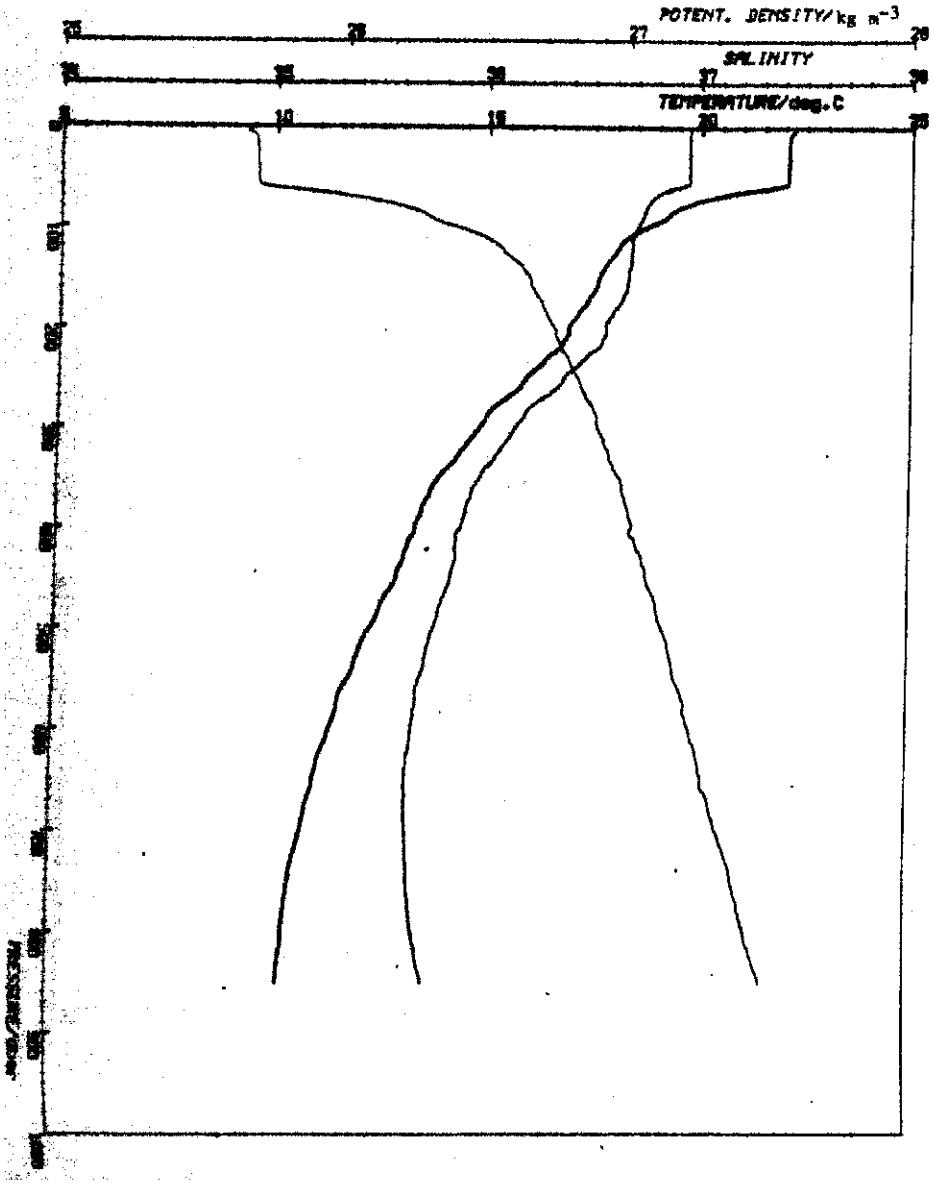

P104 DPS STATION 811/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C
PRESSURE/dbar


P104 DPS STATION 811/1
SALINITY
24.00
25.00
26.00
27.00
28.00
29.00
63
87
178
288
408
663
TEMPERATURE/deg.C

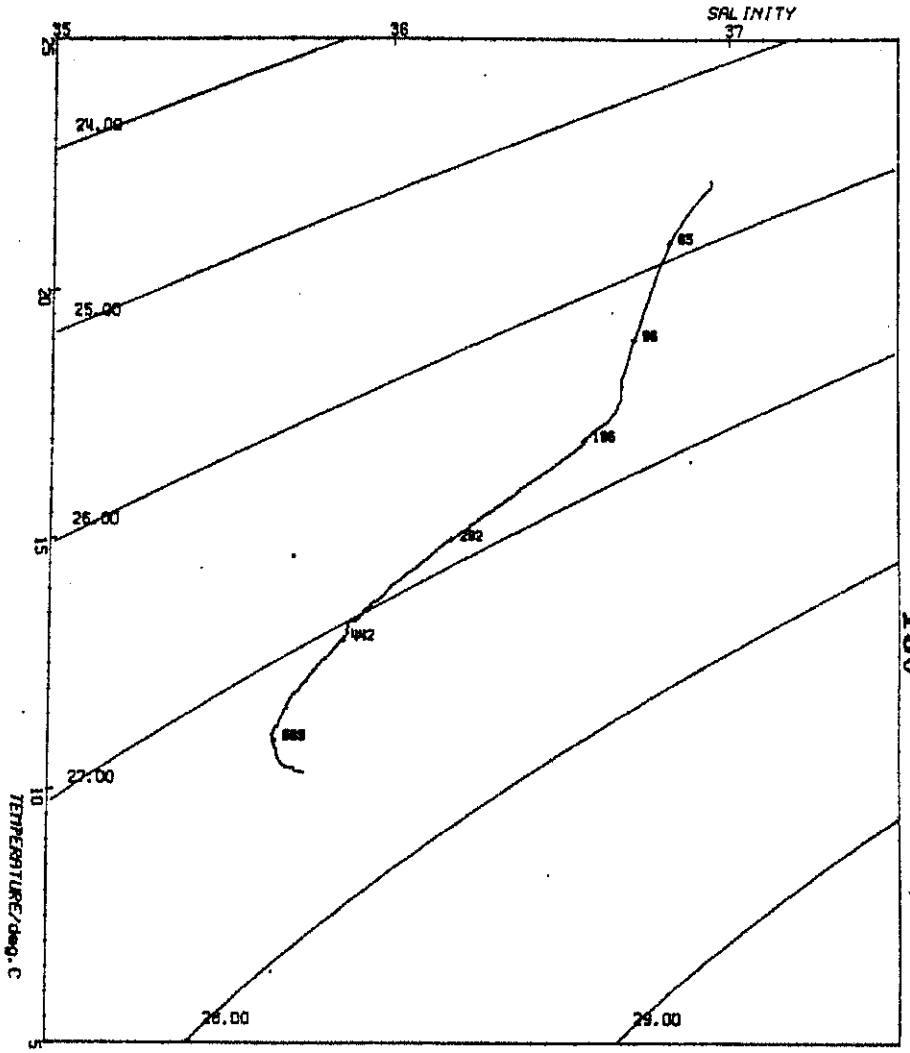

P104 DPS STATION 811/1
u/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

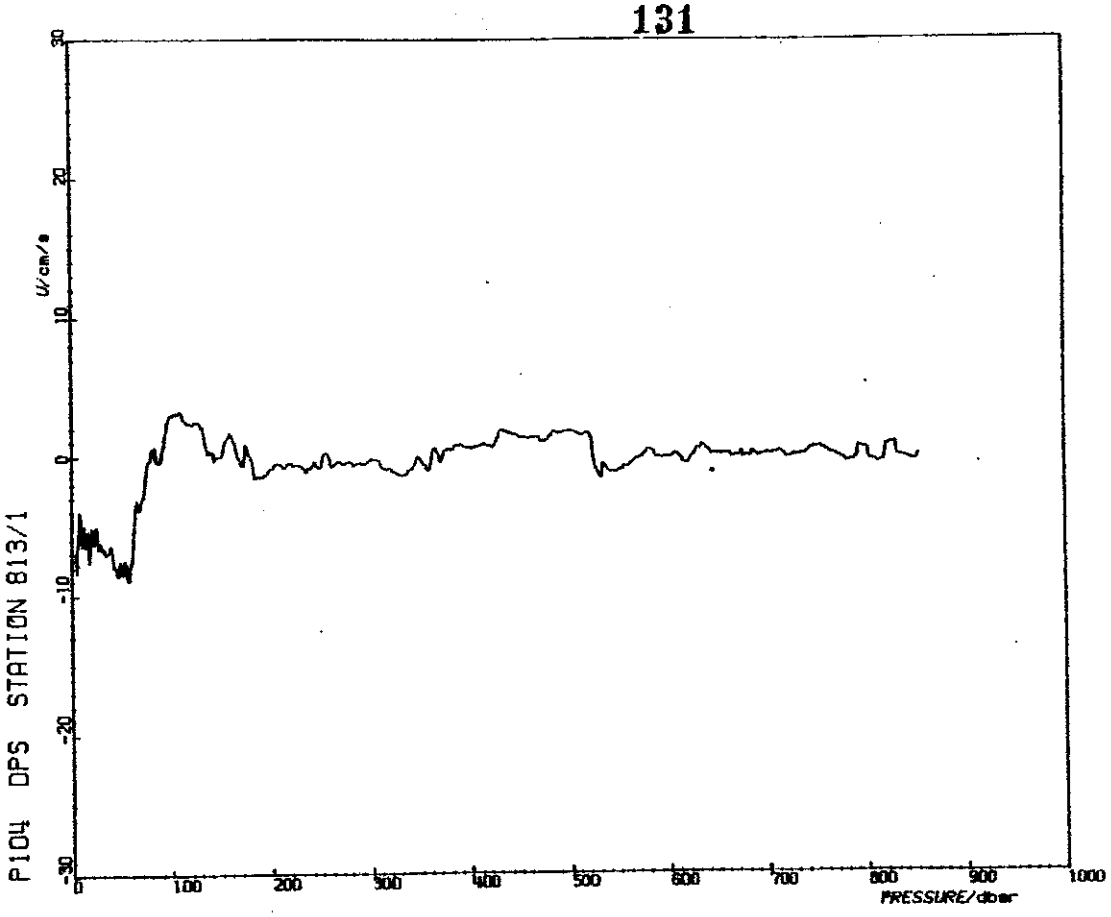

P104 DPS STATION 811/1
u/cm/s
30
20
10
0
-10
-20
-30
1000
PRESSURE/dbar

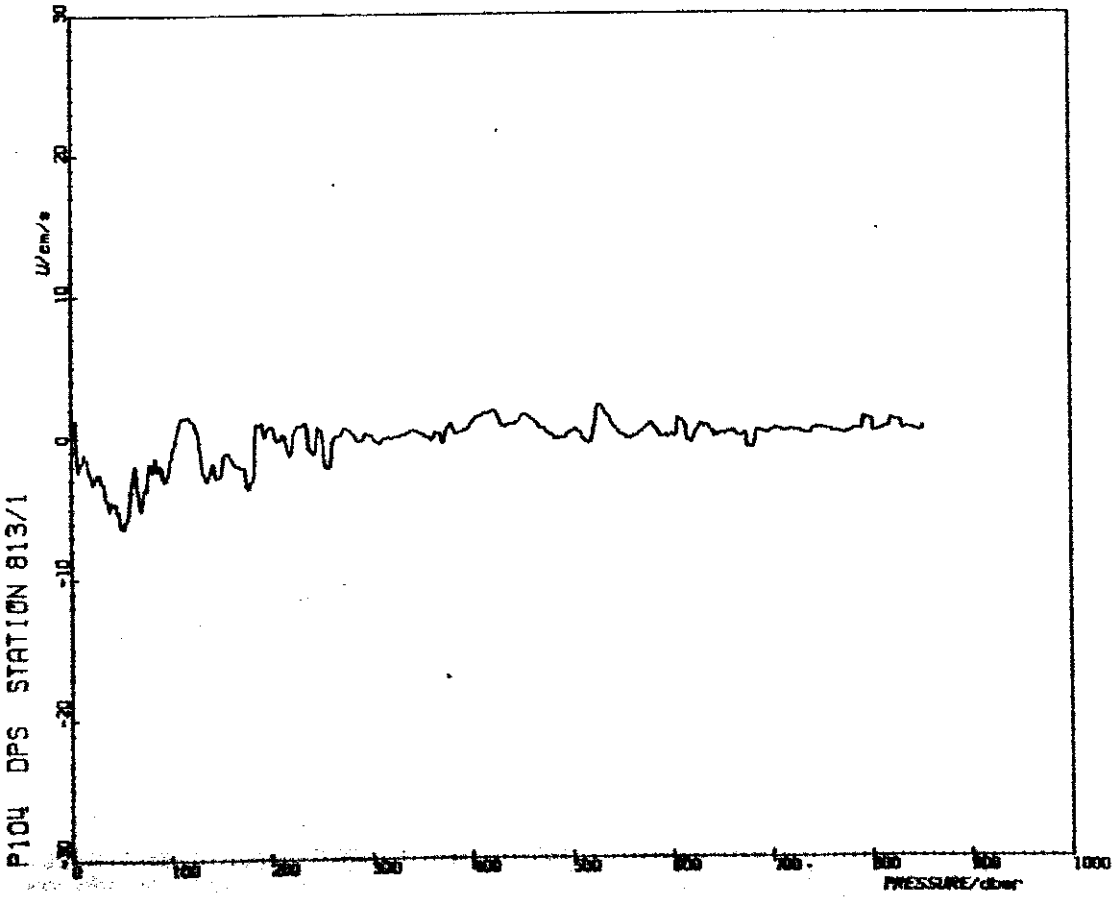
P104 DPS STATION 813/1



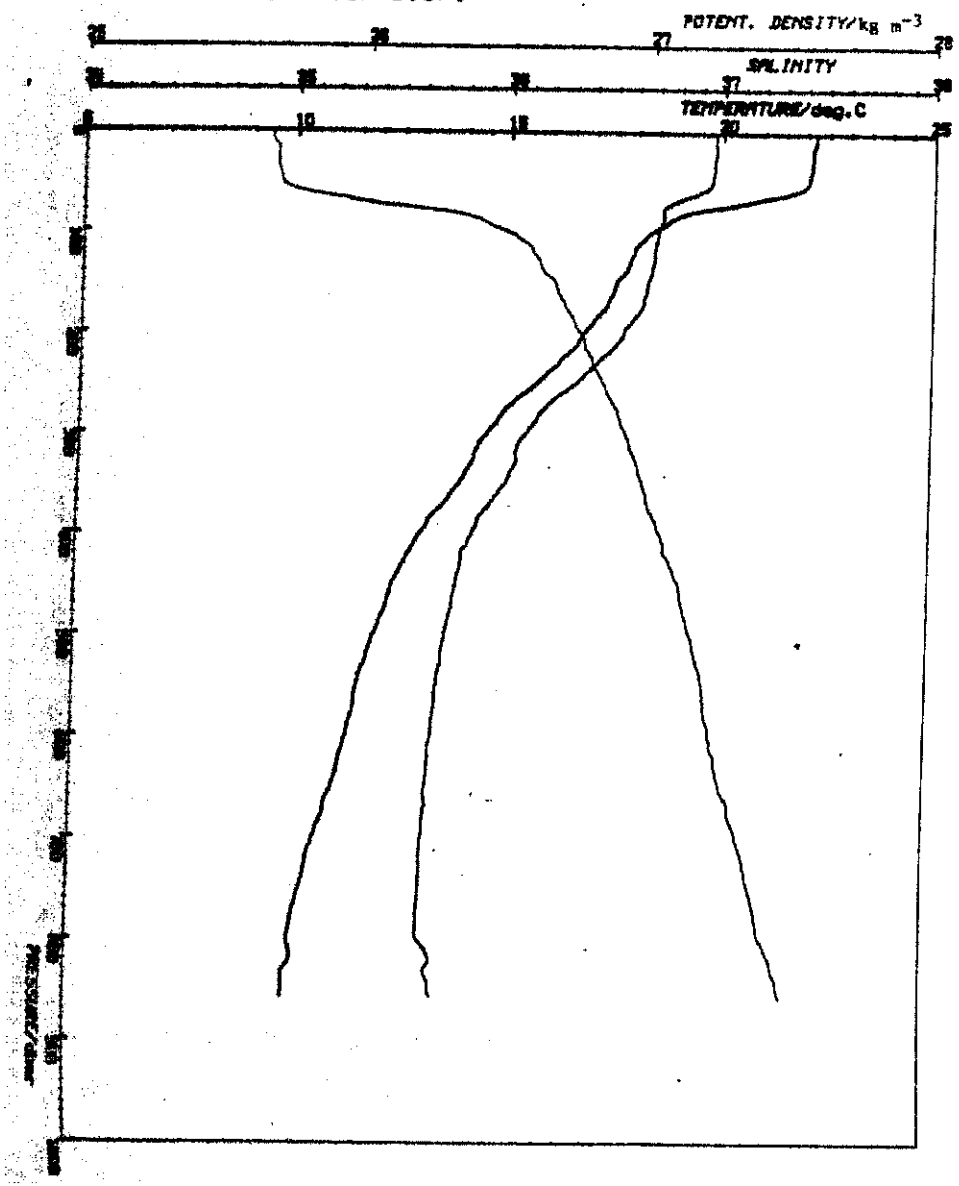
P104 DPS STATION 813/1



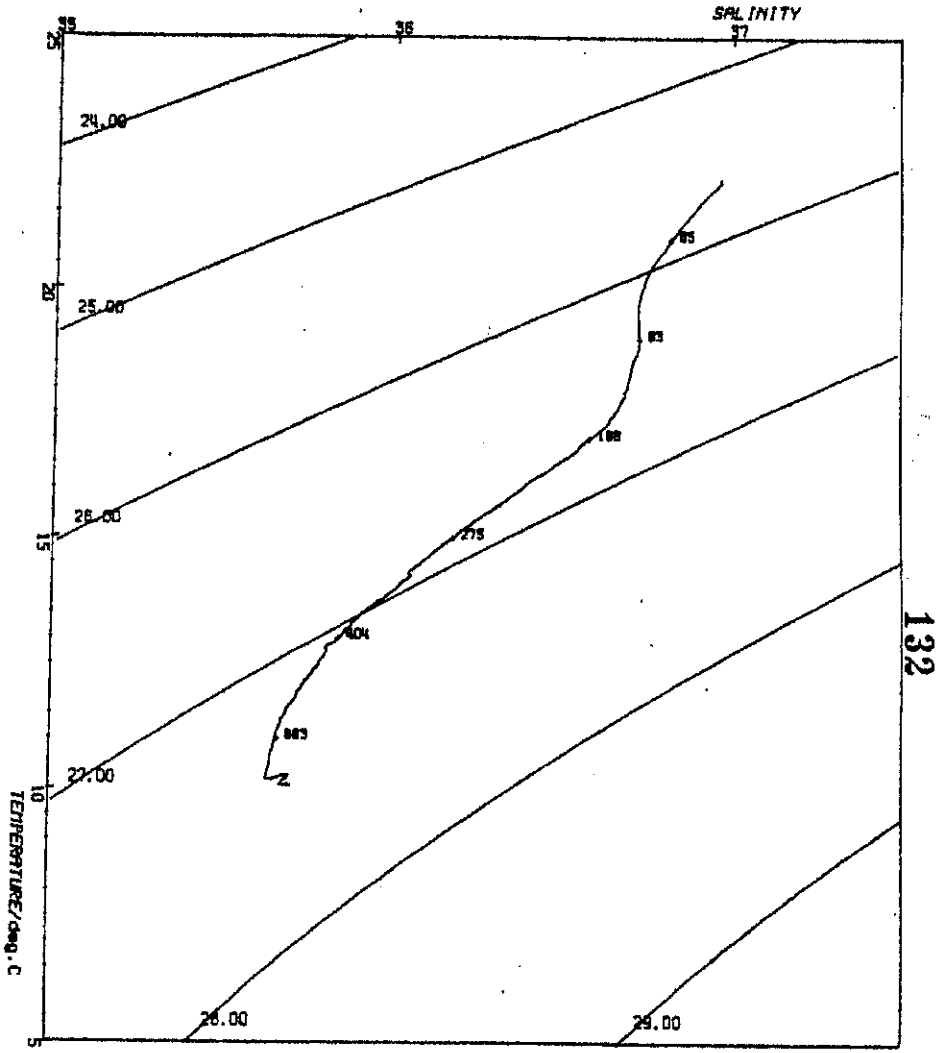

P104 DPS STATION 813/1
u/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

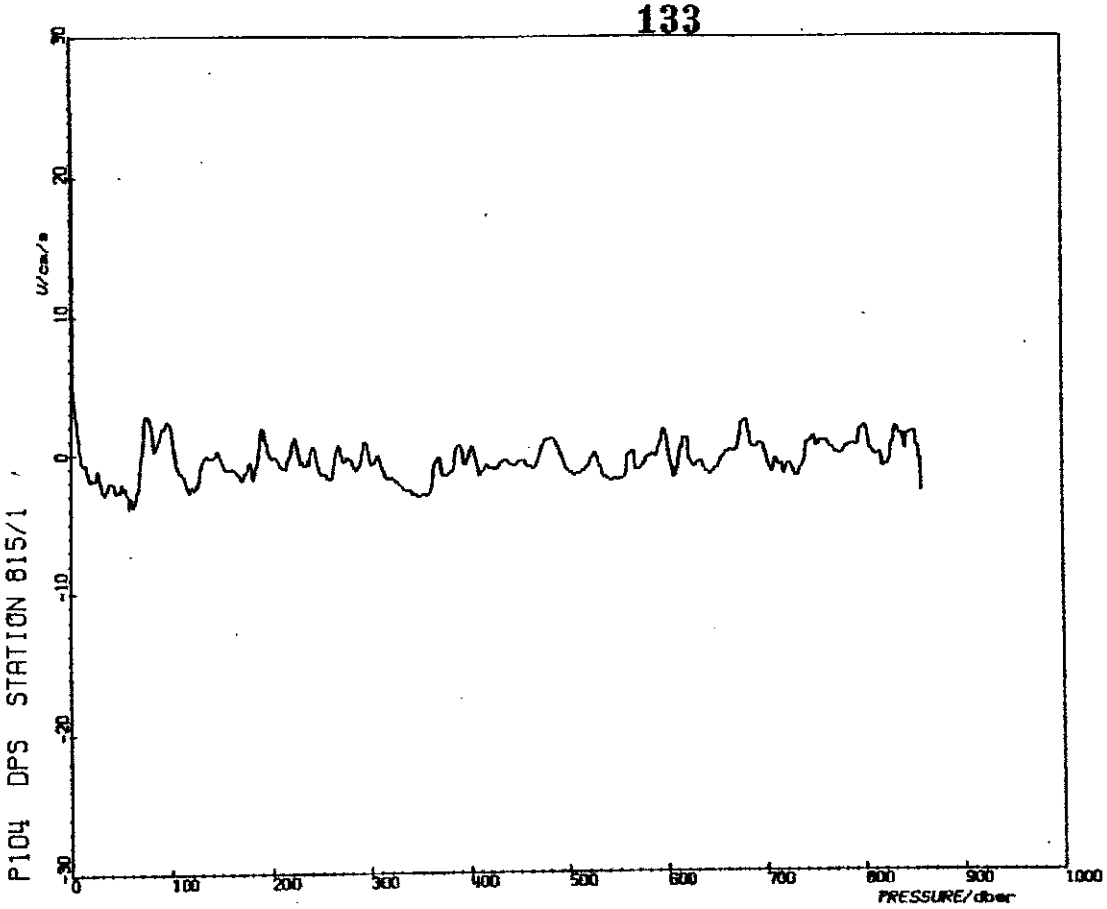

P104 DPS STATION 813/1
u/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

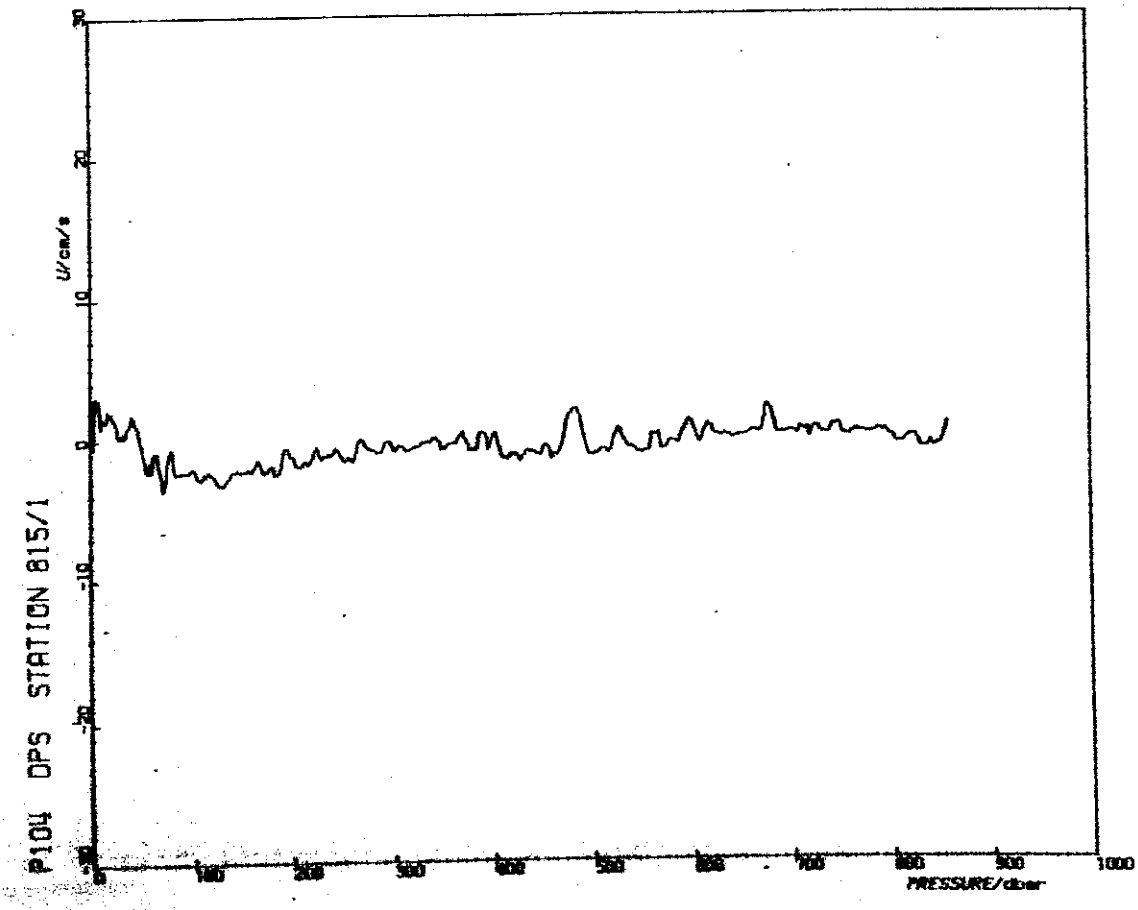
P104 DPS STATION 815/1



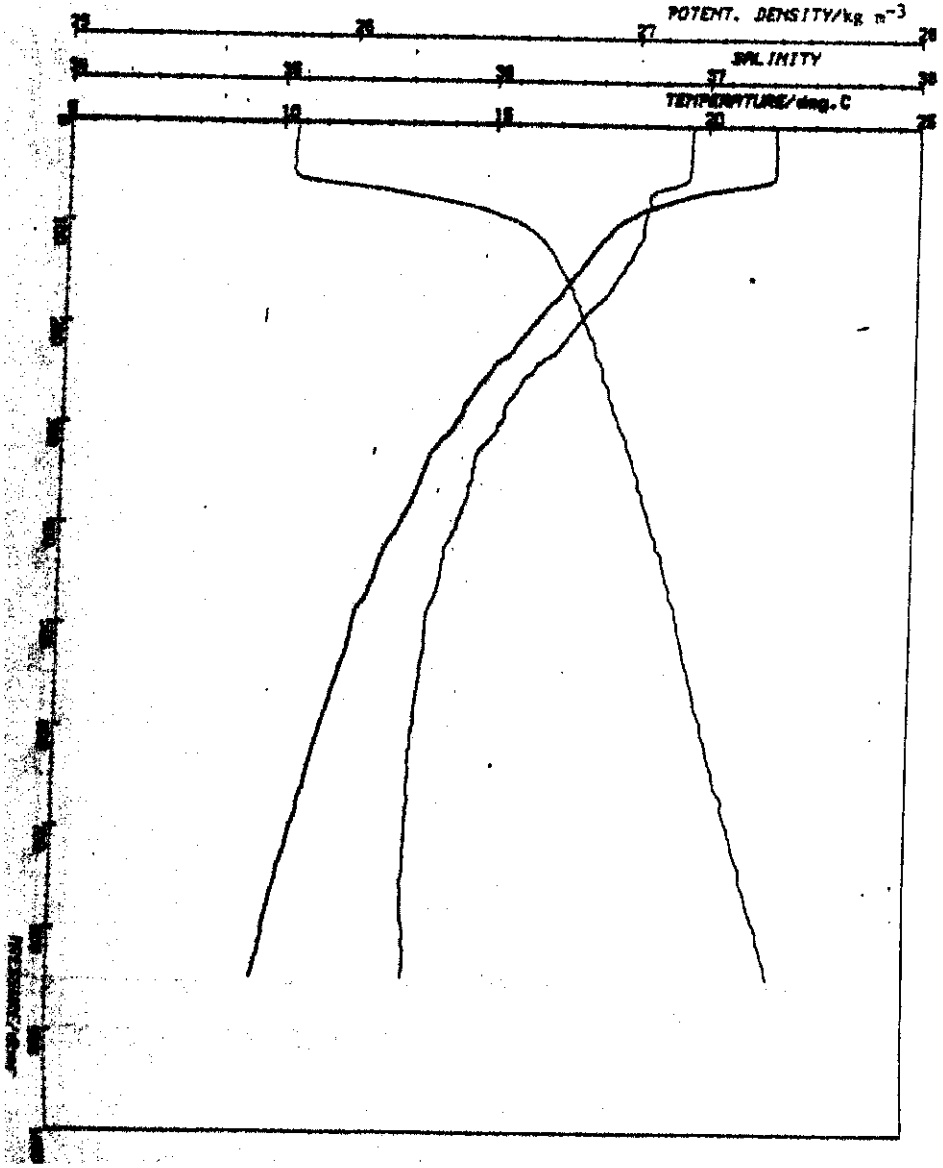
P104 DPS STATION 815/1



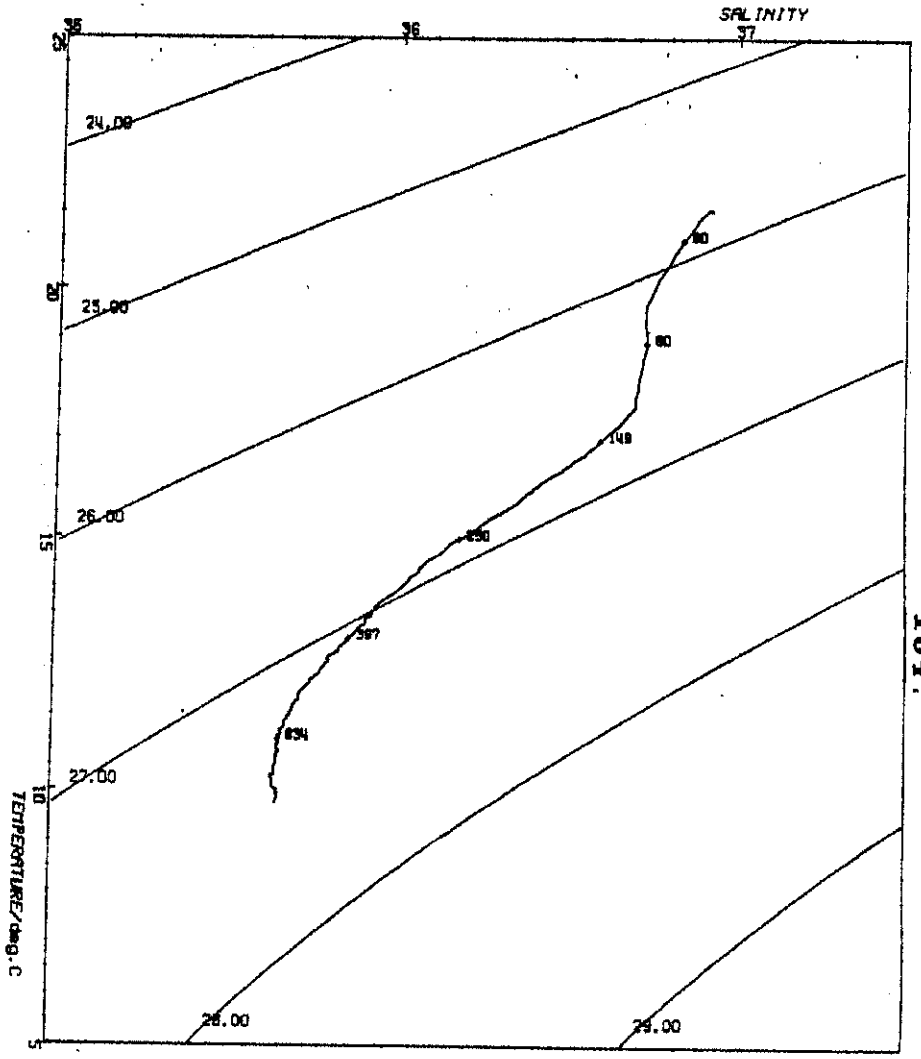

P104 DPS STATION 815/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

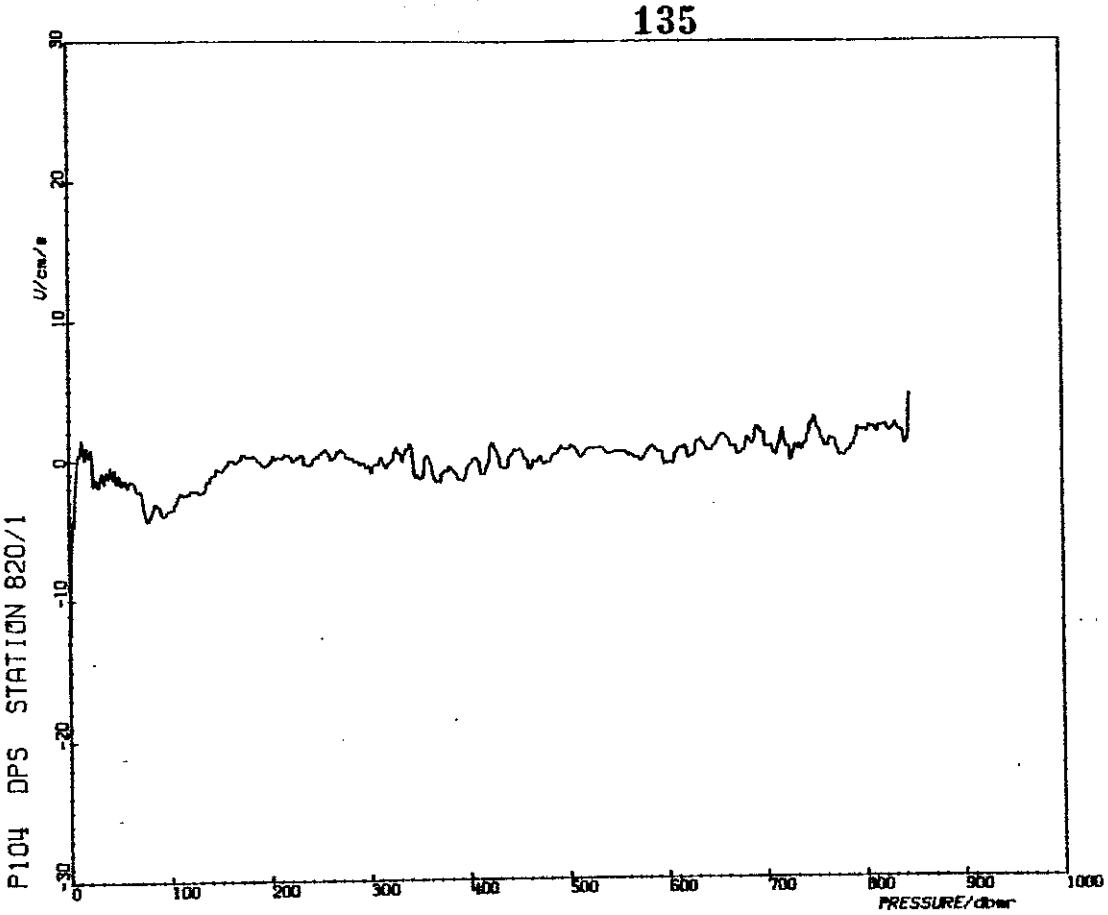

P104 DPS STATION 815/1
U/cm/s
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000
PRESSURE/dbar

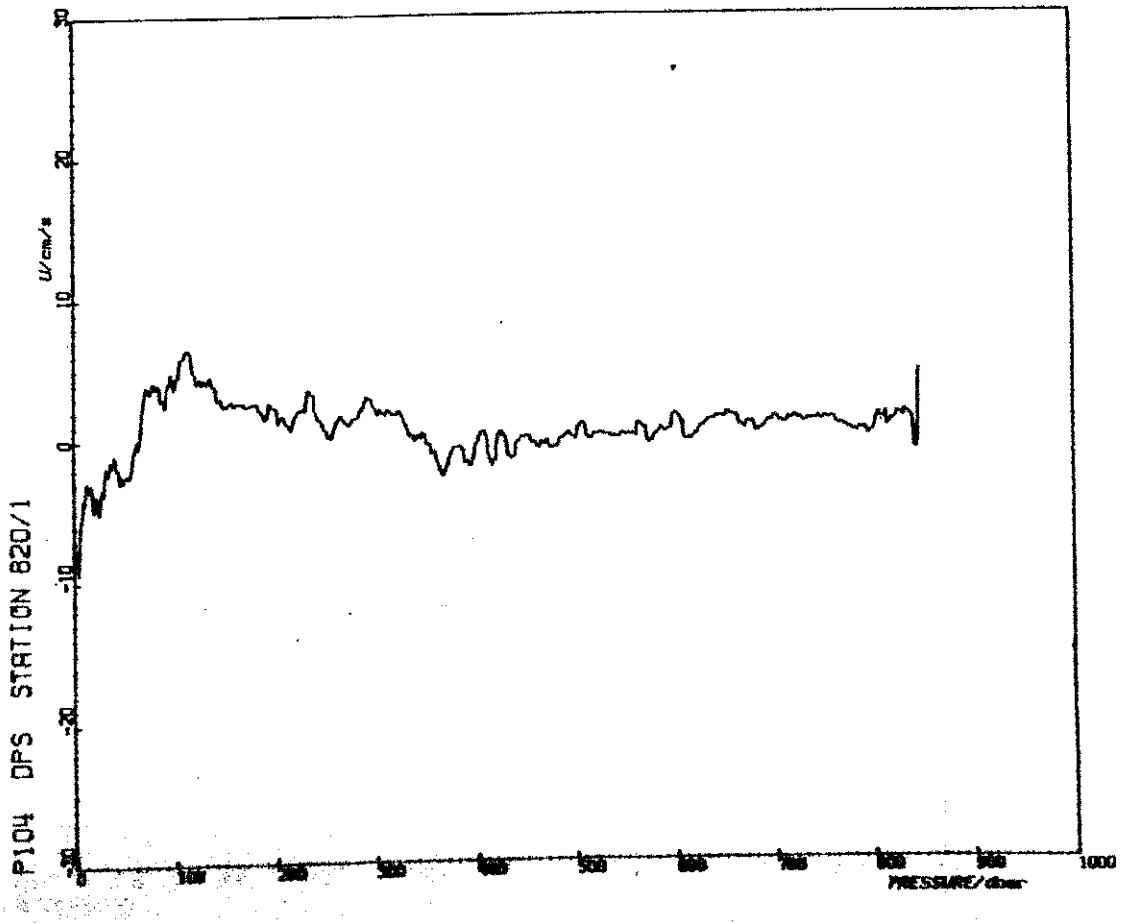
P104 DPS STATION 820/1

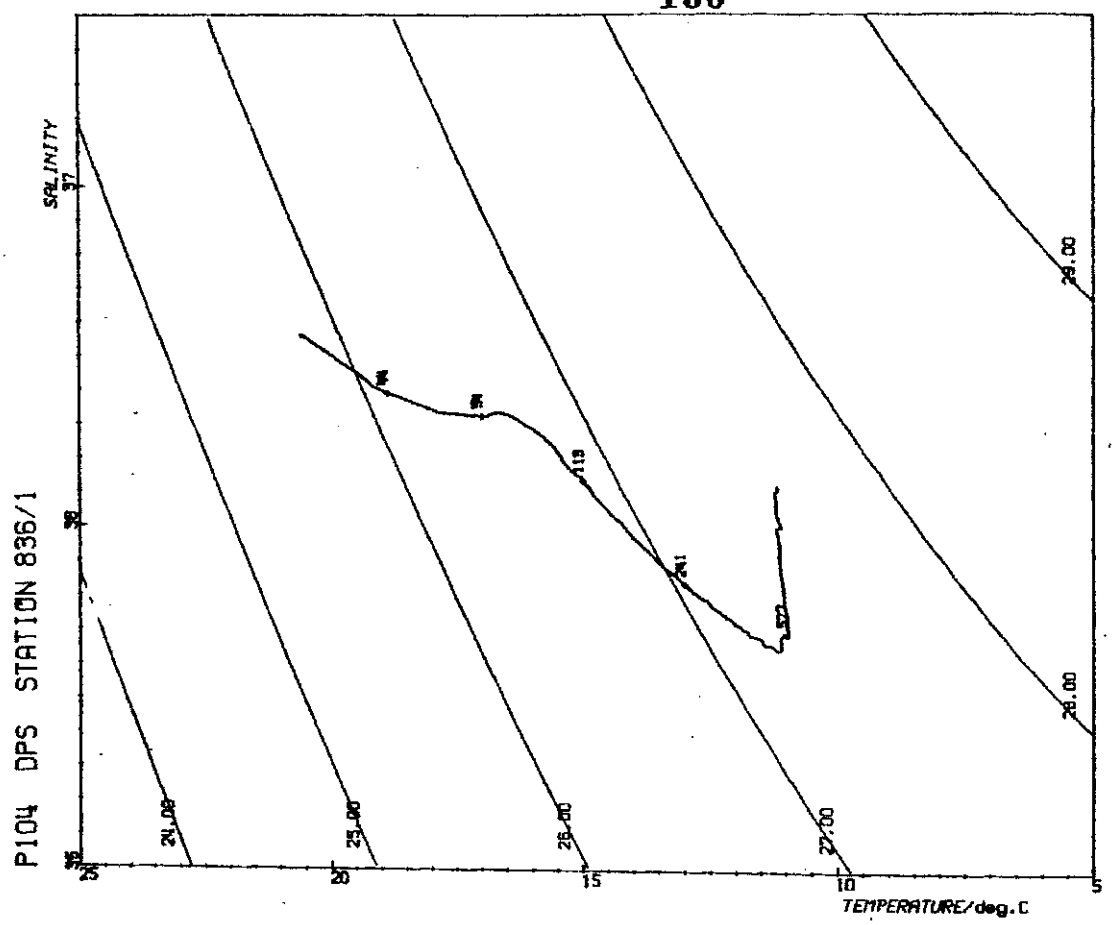


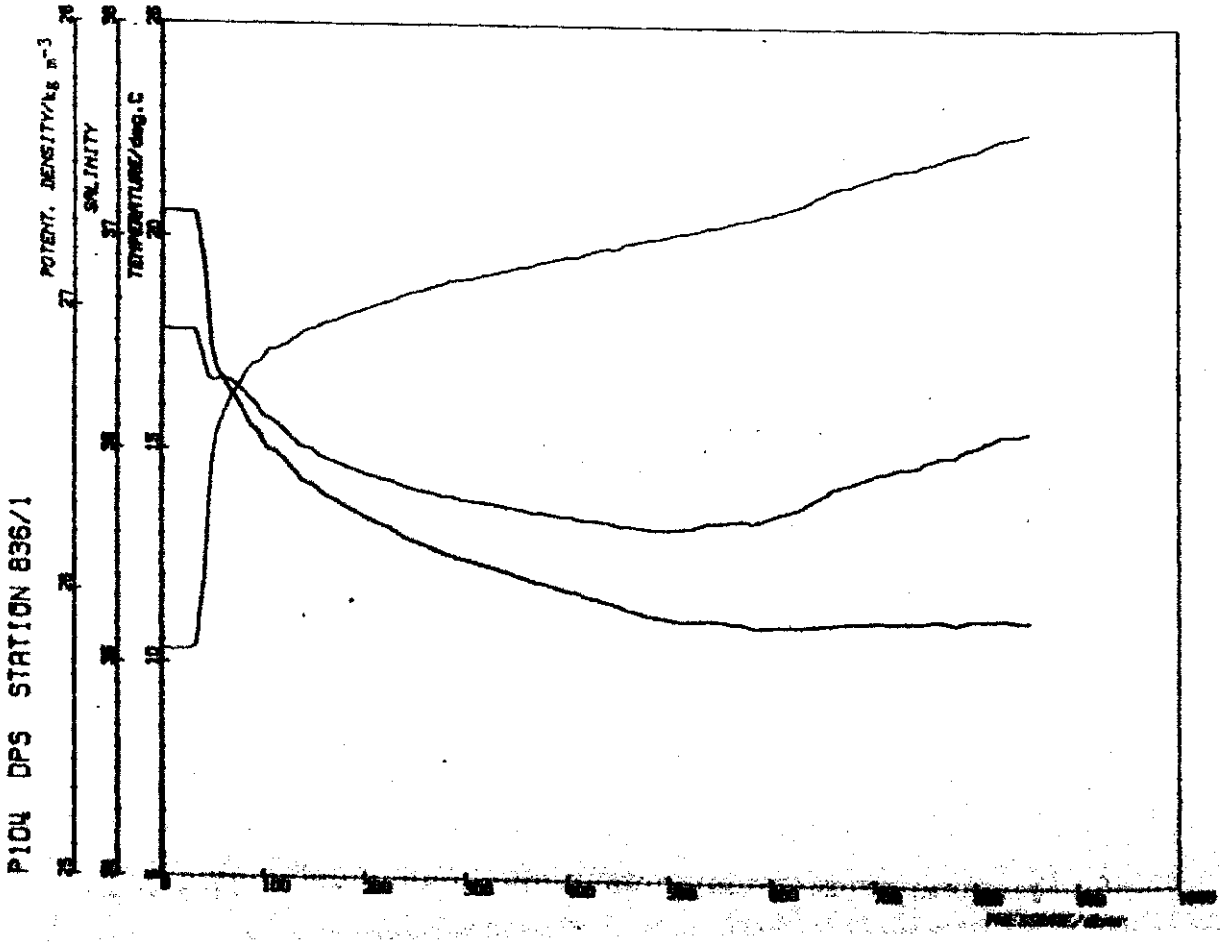
P104 DPS STATION 820/1



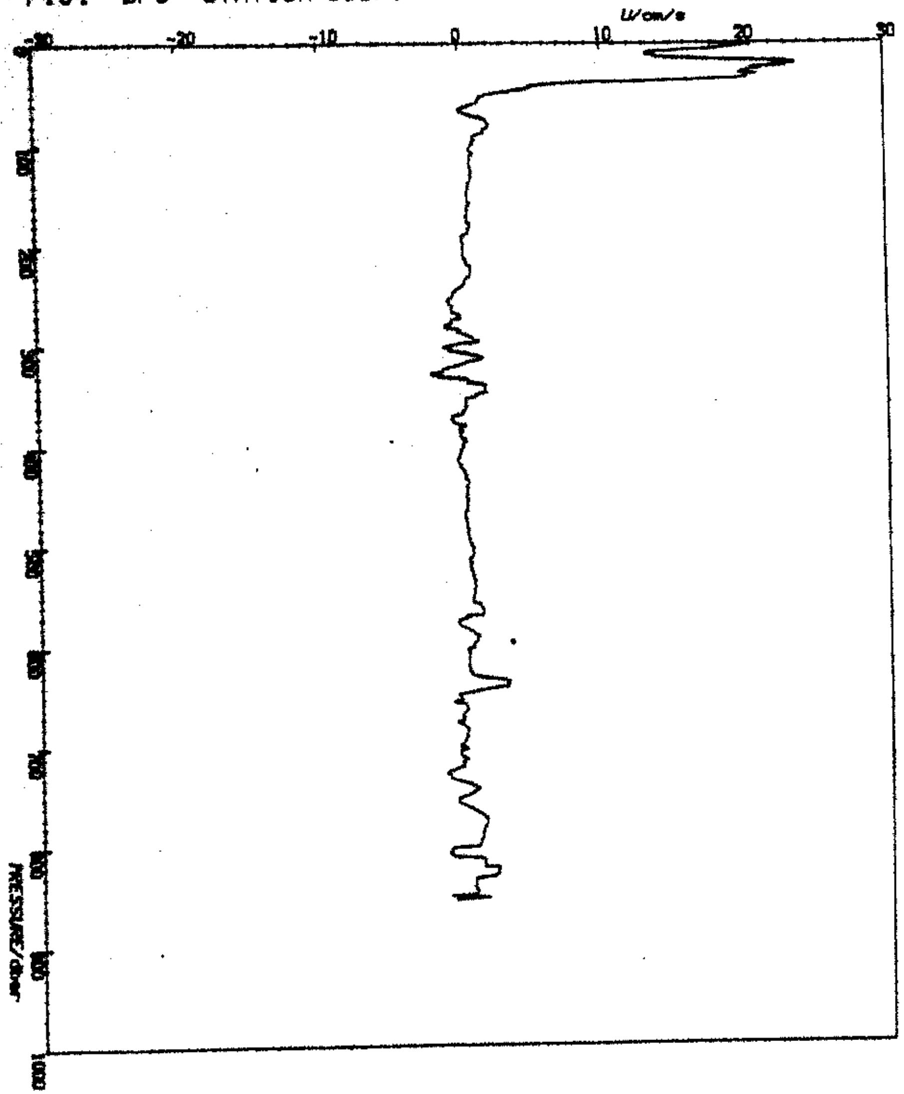

P104 DPS STATION 820/1
U/cm/s
PRESSURE/dbar
30
20
10
0
-10
-20
-30
0
100
200
300
400
500
600
700
800
900
1000


P104 DPS STATION 820/1
U/cm/s
PRESSURE/dbar
30
20
10
0
-10
-20
-30
1000

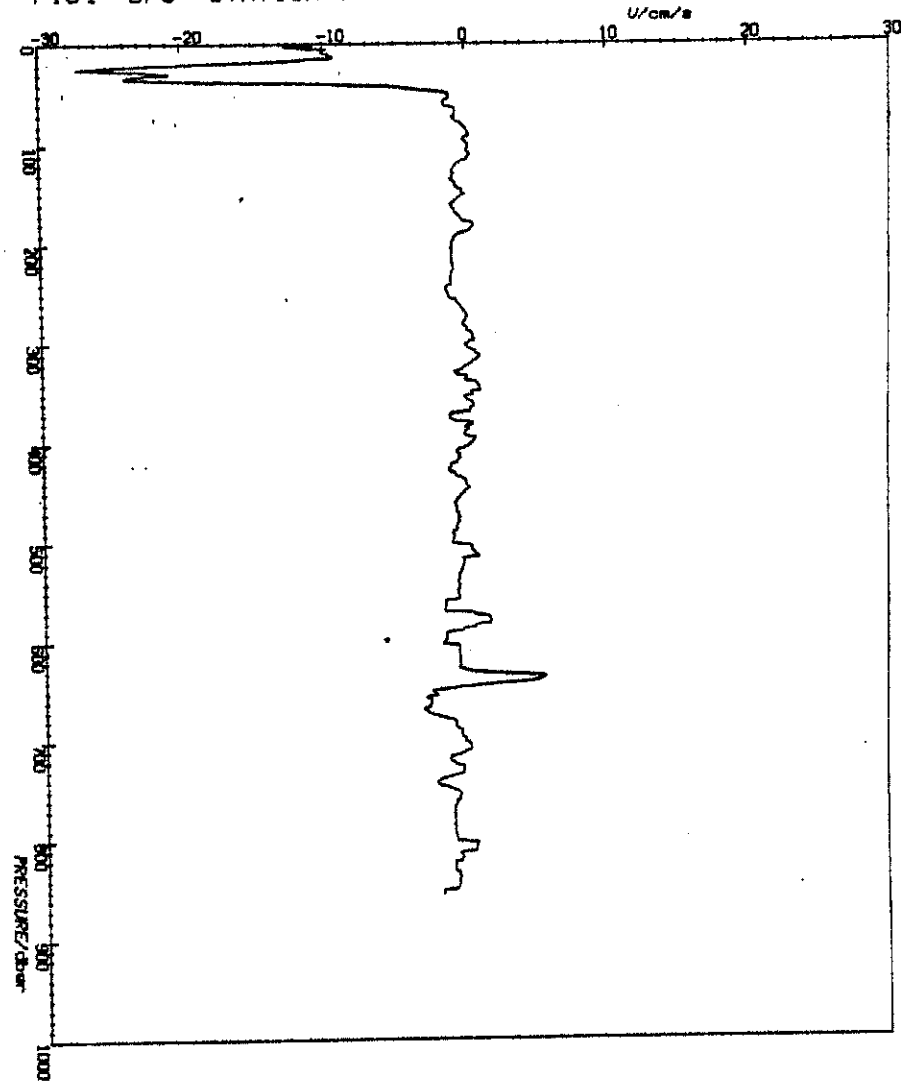

P104 DPS STATION 836/1
SALINITY
TEMPERATURE/deg.C
24.00
25.00
26.00
27.00
28.00


P104 DPS STATION 836/1
POTENT. DENSITY/kg m-3
SALINITY
TEMPERATURE/deg.C

P104 DPS STATION 836/1



P104 DPS STATION 836/1



3.3 DPS sections

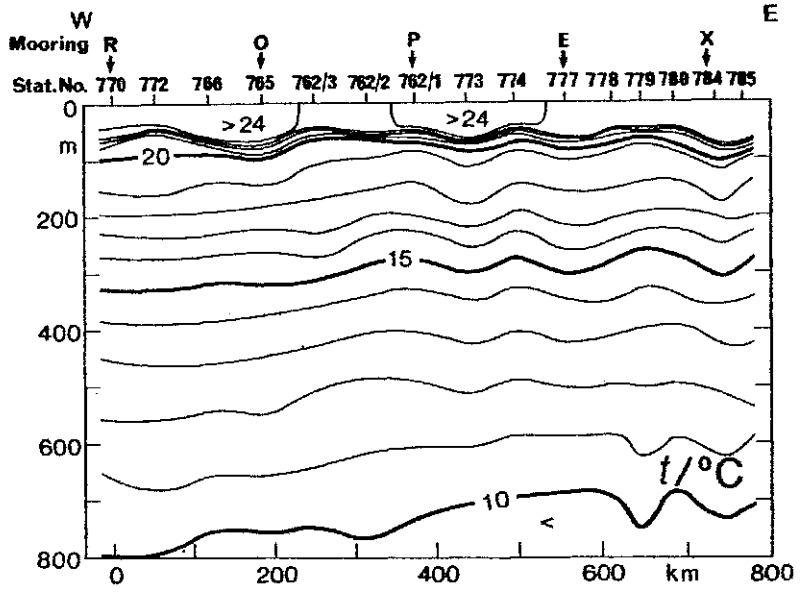


Fig. 3.4 (a)

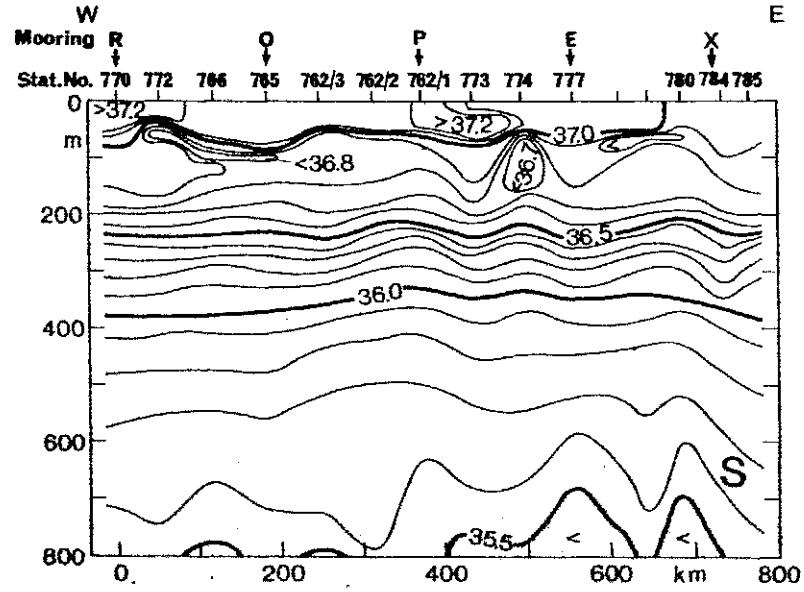


Fig. 3.4 (b)

Temperature (a) and salinity (b) distribution on a zonal section (28°N), west of the Canary Islands. Letter R, O, P, E, X represent long term thermistor chain moorings deployed during "Poseidon" cruise 104/3 (cf. Table A.1). Data were obtained by DPS as shown in Figures 3.1.

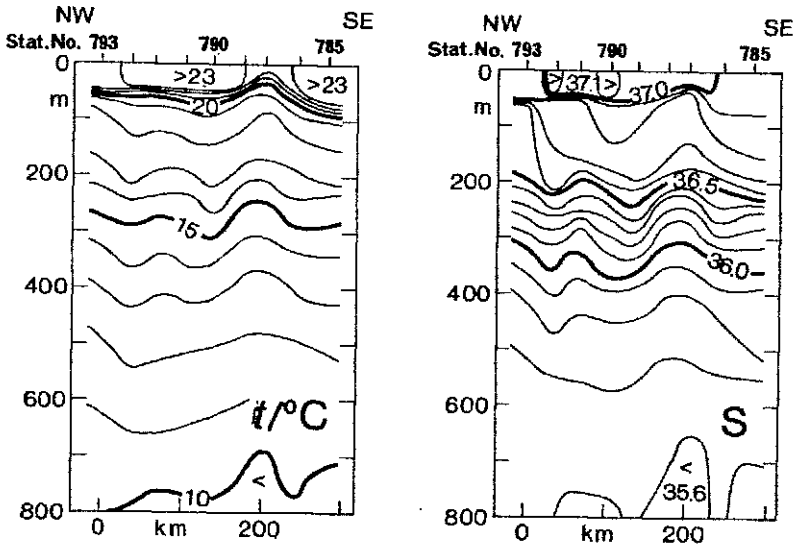


Fig. 3.5: Temperature (a) and salinity (b) distribution on a DPS section towards the north west from the Canary Islands.

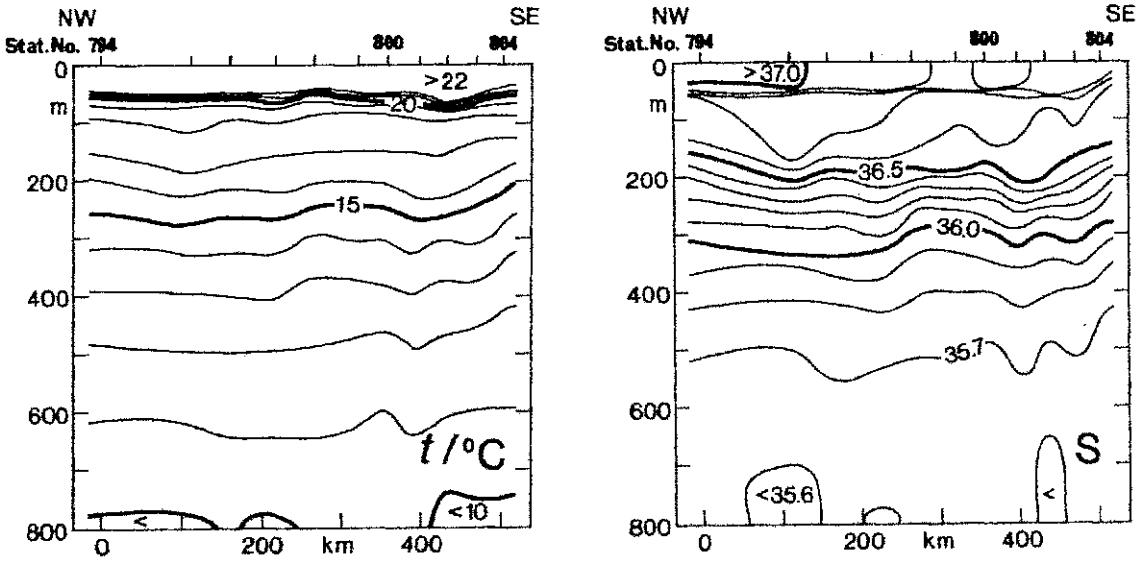


Fig. 3.6: Temperature (a) and salinity (b) distribution on a DPS section towards the south east from Madeira.

4. XBT measurements (W. Zenk)

4.1 Description, data acquisition, register

XBT drops down to 750 m were performed on two sections. A list of all XBT stations is given in Table 4.1. The first section was started (XBT 118) south east of Santa Maria in the Azores and followed a straight course towards the Canary Islands. At about half way the direction was changed at XBT 157, now heading towards the middle position of a meridionally situated string of five thermistor chain moorings (R,O,P,E,X) at 28°N. It ended at a total length of 1.2 Mm with XBT 176. Its position coincides with mooring location "P" (cf. Table A.1).

The second 0.5 Mm long section investigated the thermal structure north (XBT No. $\geq$ 187) and south of Madeira (XBT No. $<$186). A synoptic error was introduced by the port call in Funchal. Having no more XBT probes the section had to be stopped at XBT 202, unfortunately before a subtropical frontal zone could be identified on our northbound XBT section.

Both XBT sections were carried out to get more information about the subtropical frontal zone (Käse and Siedler, 1982) and will, with their close spacings, complement our CTD and thermistor chain data set. In most cases hourly drops were made while the ship was in transit. Interruptions at CTD and DPS stations as well as at mooring position 276 (between XBT 147 and 148) were inevitable.

Sixty percent of the XBT data were collected by a microprocessor supported acquisition system, based on a similar system used by Dr. Emery of UBC, Vancouver, Canada. This system, which is based on a CBM 8032 personel computer, will be described elsewhere. The rest of the XBT data was sampled by the traditional Sippican strip chart recorder and digitized on board. The complete XBT register is presented in Table 4.2. Codes (J,S) represent CBM or chart recorder collected profiles.

In Fig. 4.1 and 4.2 we present all XBT data in the form of two vertical temperature sections. For related information on the thermal structure of the upper Canary Basin partly obtained on the same tracks by XBT probes, the reader is referred to the Table 4.1.

Location	Time	References
Iberian Peninsula-Canary Islands	July 1978 March 1980 Nov 1980) March 1981)	Henke (1979) Henke and Zenk (1980) Knoll et al. (1982)
Azores-Canary Islands, Iberian Peninsula -Canary Islands	July 1981 April 1982	Käse et al.(1984) Müller and Zenk (1983)
Azores-Canaries, adjacent regions	March 1982 March 1983	Siedler et al.(1984) Peters et al. (1984)

Table 4.1: Publications describing XBT sections on similar track lines as obtained during "Poseidon" cruise 104/3, 4.

Stat. No.	Date 1983	CUT	Position φ	Position λ	Uncorr. Depth (m)	XBT No.
696	17 Oct	15.00	37°04'N	25°01'W	0608	118J
697	17 Oct	16.00	36°51'N	24°52'W	2609	119J
696	17 Oct	17.00	36°42'N	24°45'W	3096	120J
699	17 Oct	18.00	36°33'N	24°38'W	3576	121J
700	17 Oct	19.00	36°25'N	24°30'W	3477	122J
701	17 Oct	19.30	36°20'N	24°27'W	3511	123J
702	17 Oct	20.00	36°17'N	24°22'W	3079	124J
704	17 Oct	23.00	36°10'N	24°15'W	4380	125
705	18 Oct	00.00	36°00'N	24°07'W	4451	126S
706	17 Oct	01.00	35°52'N	24°00'W	4352	127S
707	18 Oct	02.00	35°44'N	23°53'W	4083	128S
708	18 Oct	03.00	35°36'N	23°45'W	4807	129S
709	18 Oct	04.00	35°29'N	23°37'W	4249	130S
710	18 Oct	05.00	35°21'N	23°30'W	4319	131S
711	18 Oct	06.00	35°13'N	23°22'W	4804	132S
712	18 Oct	07.00	35°05'N	23°14'W	5000	133S
713	18 Oct	08.00	34°57'N	23°07'W	4822	134S
715	18 Oct	16.00	34°49'N	23°01'W	5109	135
716	18 Oct	20.00	34°42'N	22°58'W	9999	136J
717	18 Oct	21.00	34°32'N	22°51'W	5172	137J
718	18 Oct	22.00	34°23'N	22°46'W	5187	138J
719	18 Oct	23.00	34°14'N	22°39'W	4823	139J
720	19 Oct	00.00	34°04'N	22°32'W	5273	140
721	19 Oct	00.10	34°04'N	22°31'W	5303	141S
722	19 Oct	01.00	33°56'N	22°23'W	5326	132S
723	19 Oct	02.00	33°47'N	22°20'W	5306	143S
724	19 Oct	03.00	33°38'N	22°12'W	5277	144S
725	19 Oct	04.00	33°28'N	22°06'W	5272	145S
726	19 Oct	05.00	33°13'N	22°00'W	5146	146S
727	19 Oct	05.40	33°13'N	21°57'W	5234	147S
732	20 Oct	17.07	33°08'N	21°53'W	5236	148S
733	20 Oct	18.00	33°00'N	21°49'W	5184	149S
734	20 Oct	19.00	32°52'N	21°43'W	5163	150S
735	20 Oct	20.00	32°44'N	21°38'W	5111	151S
736	20 Oct	21.00	32°31'N	21°25'W	5061	152S
737	20 Oct	22.00	32°23'N	21°20'W	5010	153S
738	20 Oct	23.00	32°14'N	21°15'W	4984	154S
739	21 Oct	00.00	32°05'N	21°10'W	4951	155S
740	21 Oct	01.00	31°52'N	21°00'W	4880	156S
742	21 Oct	05.00	31°39'N	20°53'W	4841	157S
743	21 Oct	06.00	31°23'N	21°01'W	4879	158S
744	21 Oct	07.00	31°21'N	21°26'W	4886	159S
745	21 Oct	08.00	31°11'N	21°10'W	4887	160S
746	21 Oct	09.05	30°57'N	21°15'W	4896	162S
747	21 Oct	10.15	30°48'N	21°18'W	4898	165S
748	21 Oct	11.00	30°38'N	21°22'W	4895	166S
749	21 Oct	12.00	30°28'N	21°26'W	4900	167

Table 4.2: XBT Register

Stat. No.	Date 1983	CUT	Position φ	Position λ	Uncorr. Depth (m)	XBT No.
750	21 Oct	13.00	30°16'N	21°30'W	4908	168J
751	21 Oct	14.00	30°06'N	22°32'W	4901	169J
752	21 Oct	15.00	30°00'N	21°36'W	4916	170J
754	21 Oct	19.00	29°40'N	21°43'W	4890	171J
755	21 Oct	21.00	29°21'N	21°53'W	4874	172J
756	21 Oct	23.30	29°00'N	22°02'W	4884	173J
757	22 Oct	01.04	28°33'N	22°11'W	4861	174J
758	22 Oct	03.00	28°18'N	22°18'W	4884	175J
759	22 Oct	04.50	27°58'N	22°26'W	4864	176J
808	31 Oct	15.06	31°29'N	15°47'W	4384	177J
809	31 Oct	15.50	31°37'N	15°54'W	4389	178J
810	31 Oct	17.05	31°44'N	16°02'W	4391	179J
812	31 Oct	19.50	31°51'N	16°09'W	4387	180J
713	31 Oct	20.50	32°00'N	16°17'W	4390	181J
814	31 Oct	22.35	32°08'N	16°24'W	4308	182J
815	01 Nov	00.32	32°15'N	16°32'W	3830	183J
816	01 Nov	01.25	32°21'N	16°38'W	2335	184J
817	01 Nov	02.03	32°27'N	16°43'W	2931	185J
818	01 Nov	02.54	32°33'N	16°50'W	2056	186J
821	05 Nov	22.05	32°49'N	17°24'W	1434	187J
822	05 Nov	23.05	32°53'N	17°21'W	3020	188J
823	06 Nov	00.30	33°08'N	17°18'W	3551	189J
824	06 Nov	01.35	33°20'N	17°12'W	3903	190S
825	06 Nov	02.03	33°26'N	17°11'W	4006	191S
826	06 Nov	03.27	33°33'N	17°09'W	4102	192J
827	06 Nov	04.03	33°45'N	17°05'W	4181	193J
828	06 Nov	05.04	33°55'N	17°02'W	4224	194J
829	06 Nov	06.05	34°04'N	16°53'W	4248	195J
830	06 Nov	07.05	34°16'N	16°56'W	4085	196J
831	06 Nov	08.10	34°25'N	16°53'W	2187	197J
832	06 Nov	09.15	34°35'N	16°50'W	2111	198J
833	06 Nov	10.20	34°44'N	16°47'W	2100	199J
834	06 Nov	11.15	34°54'N	16°44'W	2269	200J
834	06 Nov	11.20	34°55'N	16°44'W	2230	201J
835	06 Nov	12.15	35°04'N	16°41'W	2803	202J
835	06 Nov	12.15	35°04'N	16°41'W	2803	202J
835	06 Nov	12.15	35°04'N	16°41'W	2803	202J
835	06 Nov	12.15	35°04'N	16°41'W	2803	202J
835	06 Nov	12 15	35°04'N	16°41'W	2803	202J
835	06 Nov	12 15	35°04'N	16°41'W	2803	202J

Table 4.2: XBT Register (continued)

4.2 XBT sections

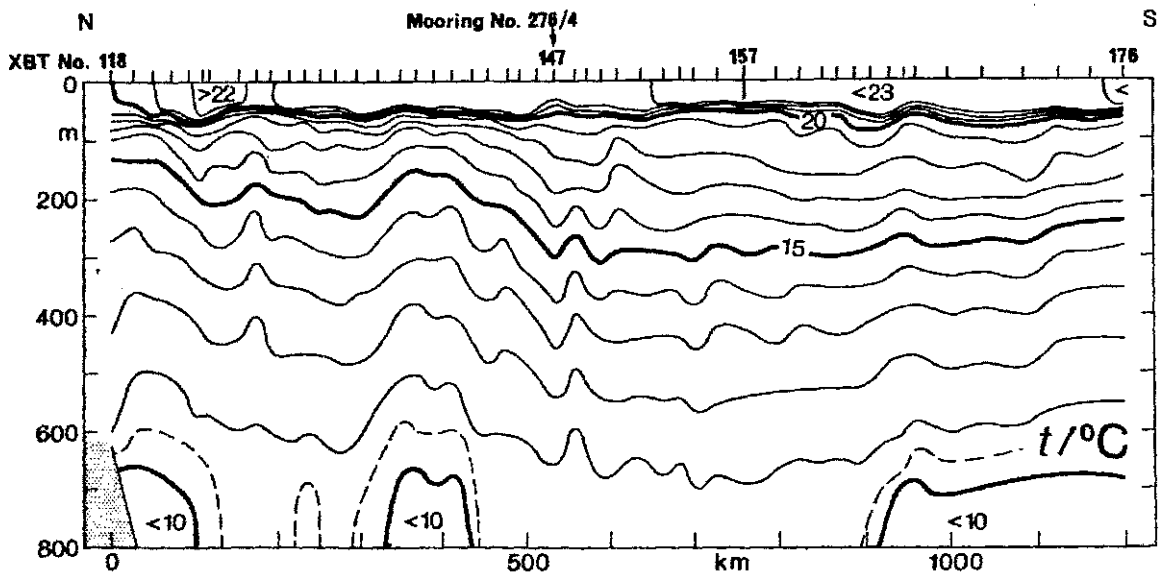


Fig. 4.1 XBT section from Santa Maria in the Azores towards the centre of the zonal section (28°N) shown in Fig. 3.2. Positions of mooring position 276/4 (cf. Müller, 1984) and the turning point at XBT No. 157 are included.

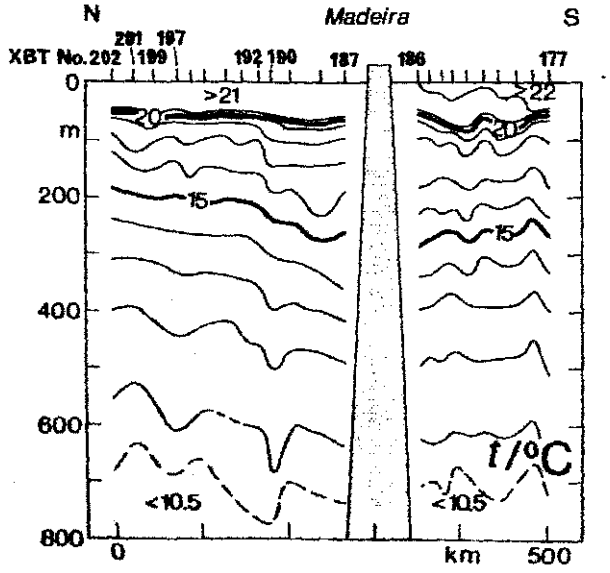


Fig. 4.2 XBT section south and north of Madeira.
Note: Due to the port call in Funchal a synoptic error of 5 days occurred between the two parts south and north of the island.

5. Surface data (W. Zenk)

We present surface temperature and salinity data in two different ways:

a) Simultaneous temperature and salinity series from 17 October - 10 November 1983 are displayed in Fig. 5.1. Temperature was measured in approximately 3 m depth by the water thermometer belonging to the ship-board meteorological data aquisition system. The salinity originates from a separate thermosalinograph. Its salinity data were merged on line with the data stream of the meteorological data logger. The latter system had been incorporated into the aquisition system by Dr. Uhlig. Apparently some calibration problems occurred with this system as can be detected by comparison with the included check values. These values were obtained from discrete water samples. The reader should be cautious in using absolute values of the continuous series shown. Instead he should consider only relative variations as scale estimates of actual horizontal gradients. Detailed improvements on the recording systems are in progress.

b) The analog thermosalinograph data from the Canary Basin have been digitized at a nominal distance of 10 nautical miles and transformed into geographical coordinates. In contrast to the digital salinity data the analog data showed a systematic linear offset which could be easily corrected according to the salinity of the reference water samples. The separate thermometer of the thermosalinograph, used here, showed good agreement with the corrected water thermometer of the meteorological data logger. Surface density distribution was calculated from the digitized temperature and salinity data. In Fig. 5.2 we present the objectively mapped quasi-synoptic temperature, salinity and density fields from the Canary Basin. Characteristic rms error ranges are included. A zonal and meridional correlation length of 200 km was found to resolve best the meso-scale features and the ocean wide gyre field. Tests were performed with 50, 100 and 300 km length scales. For details of the applied interpolation technique see Hiller and Käse (1983).

Figure 5.1 a) Surface temperature (3 m depth) time series
b) Surface salinity time series with salinometer check values. For details see text.

Figure 5.2) Objective maps (Hiller and Käse, 1984) of surface (a) temperature [°C], (b) salinity [practical salinity units] and (c) σ_t [kg m^{-3}] according to the continuous thermosalinograph record. Data were digitalized every 18.5 km (10 nautical miles). A correlation scale of 200 km was chosen in all cases. Positions of islands and of mooring 276 (anchor) are shown approximately. Dashed areas indicate ranges where the parameters exceeded the following rms errors: (a) 0.2 K, (b) 0.05 practical salinity units and (c) 0.05 kg m^{-3}.

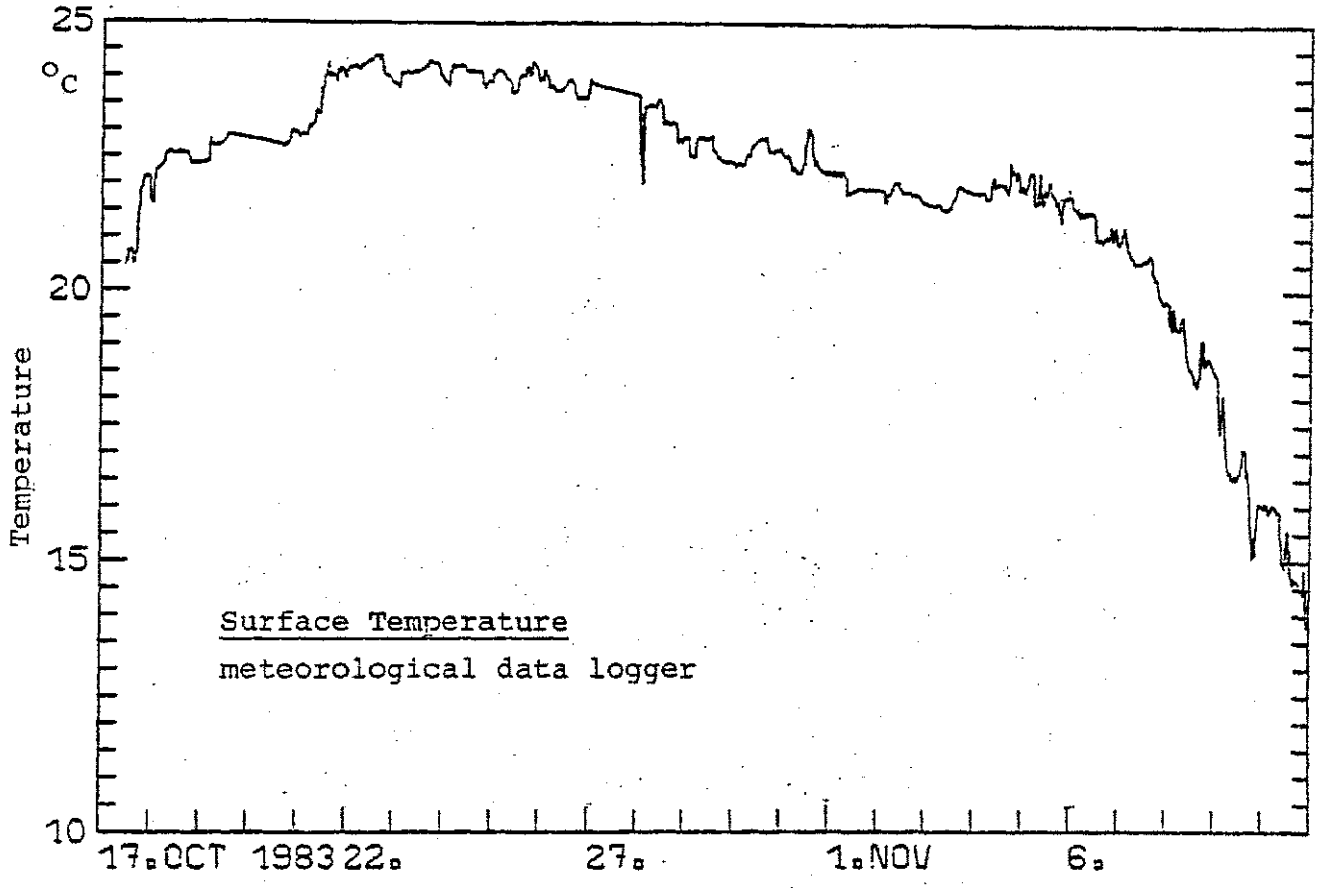


Fig. 5.1a

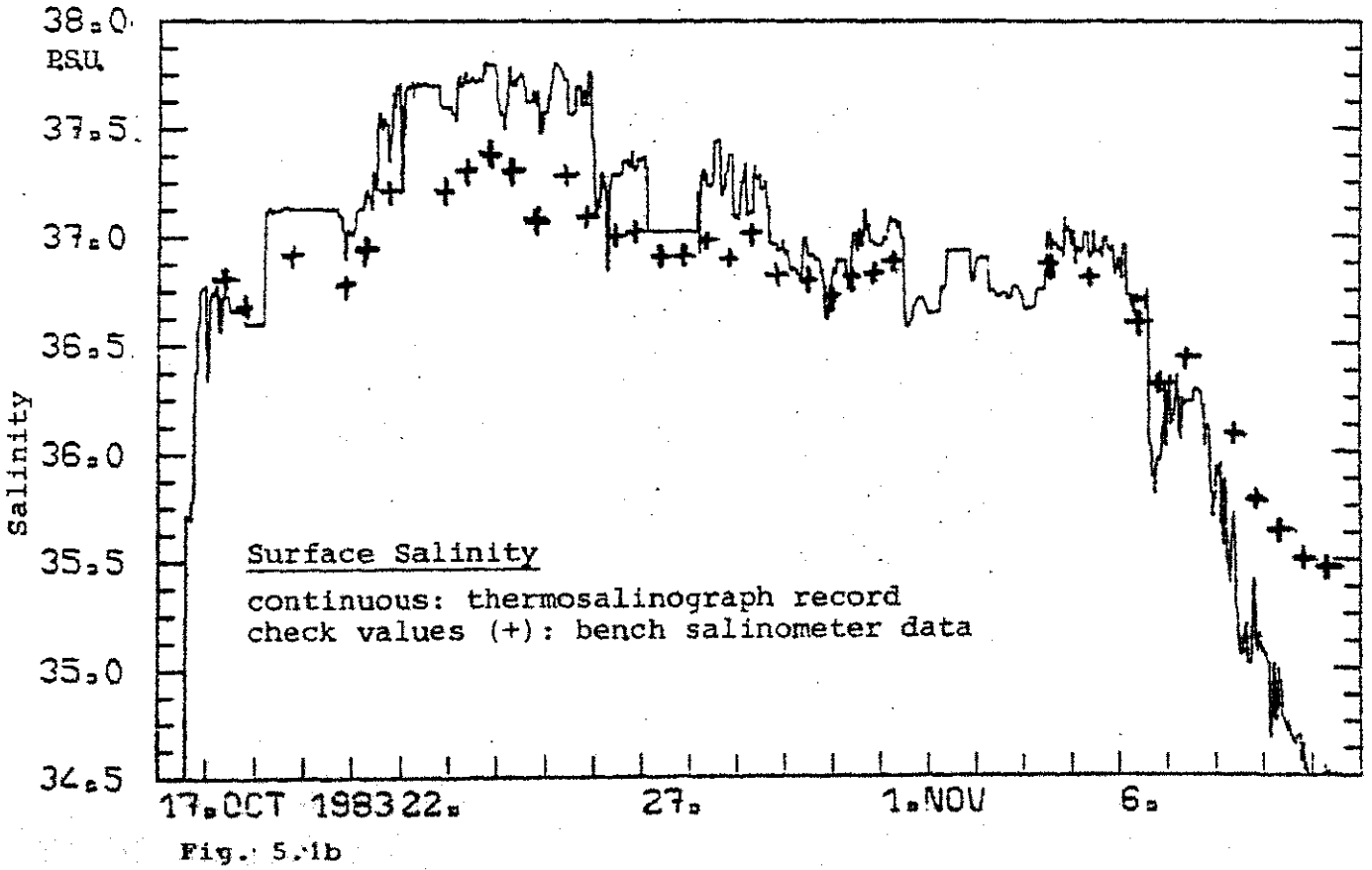


Fig. 5.1b

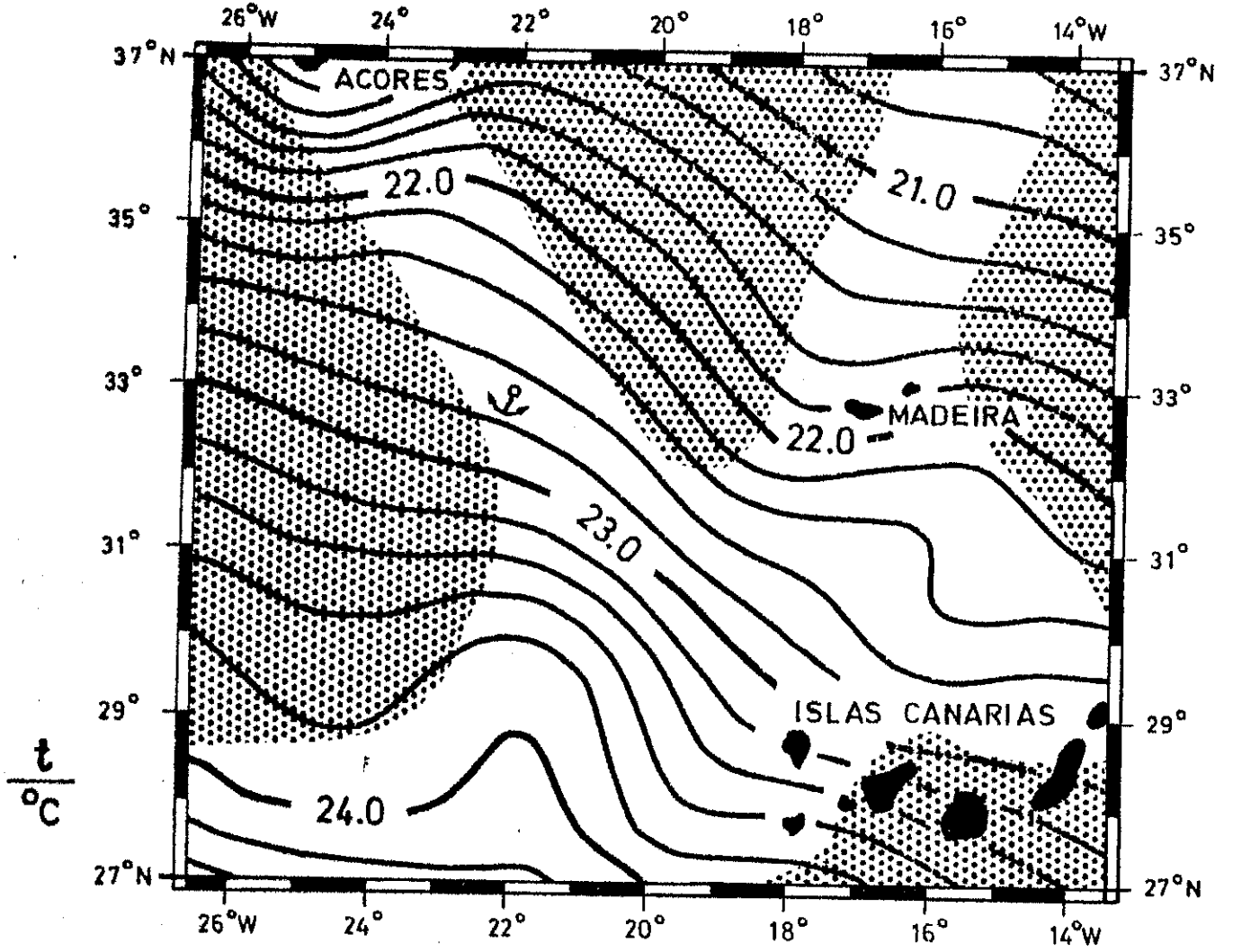

26°W
24°
22°
20°
18°
16°
14°W
37°N
35°
33°
31°
29°
27°N
ACORES
22.0
21.0
22.0
MADEIRA
23.0
ISLAS CANARIAS
24.0
t
°C

Fig. 5.2 a

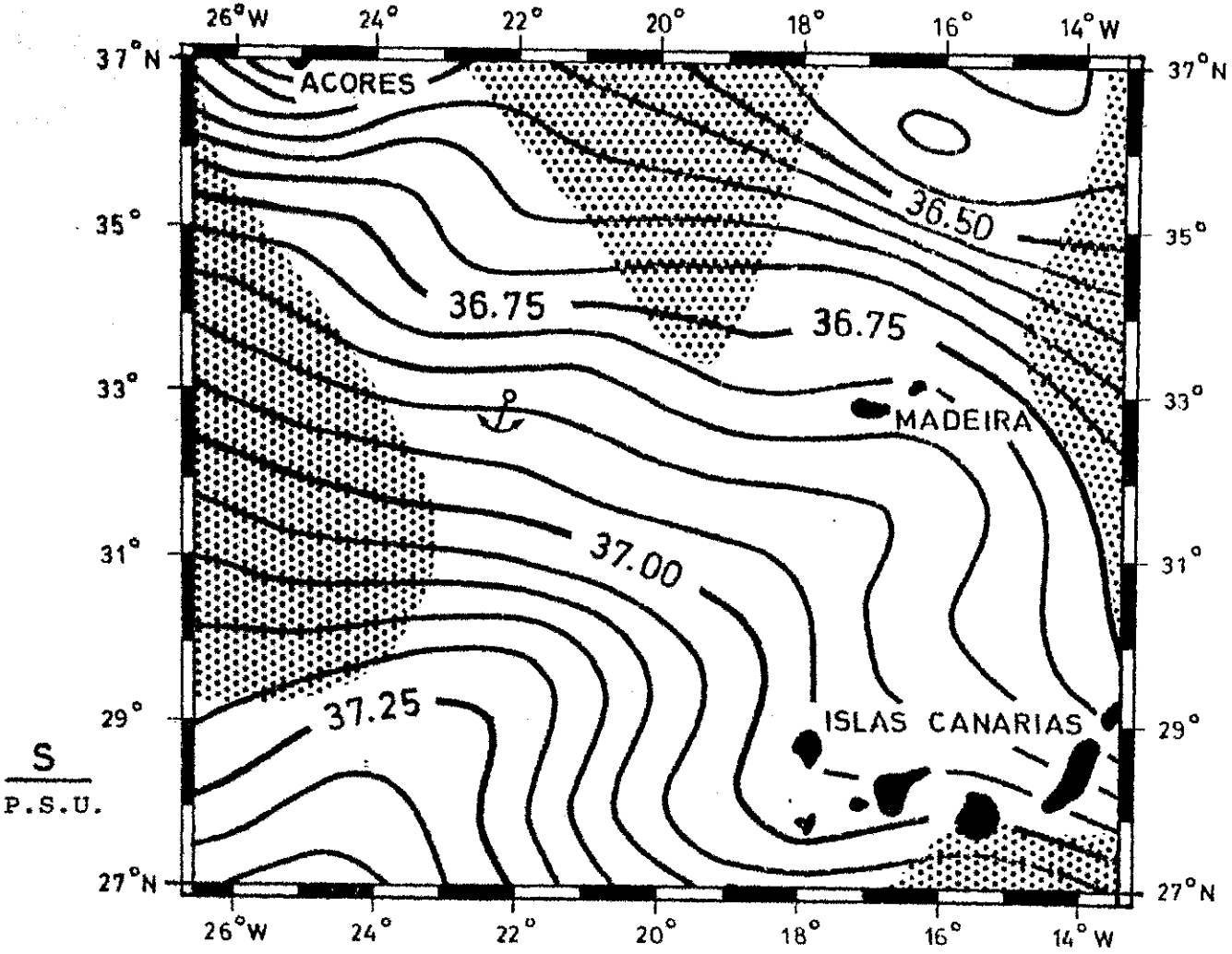

26°W
24°
22°
20°
18°
16°
14°W
37°N
35°
33°
31°
29°
27°N
ACORES
36.50
36.75
36.75
MADEIRA
37.00
37.25
ISLAS CANARIAS
S
P.S.U.

Fig. 5.2 b

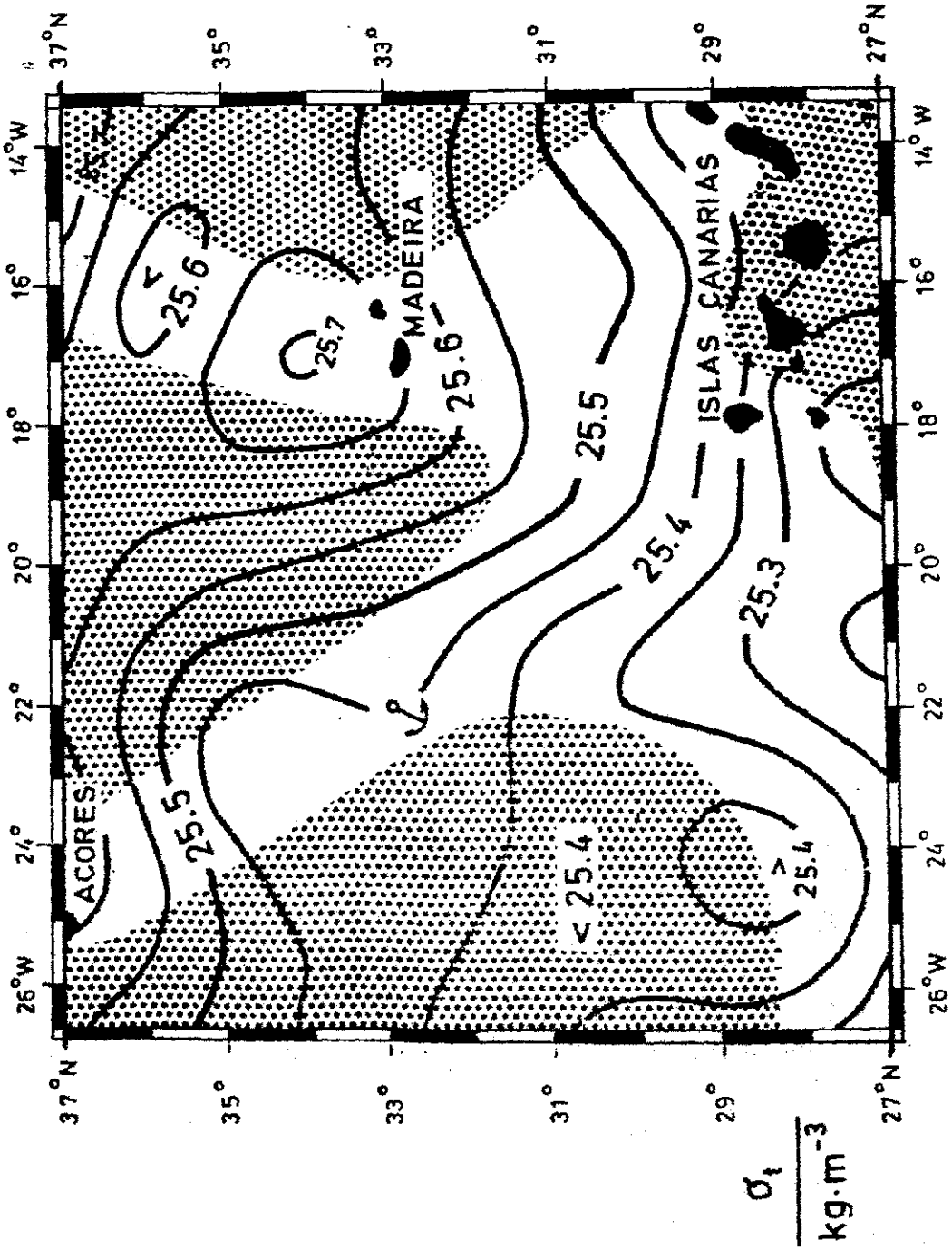

37°N
35°
33°
31°
29°
27°N
14°W
16°
18°
20°
22°
24°
26°W
ACORES
MADEIRA
ISLAS CANARIAS
25.6
25.7
25.6
25.5
25.4
25.3
25.5
< 25.4
> 25.4
σ_t
kg·m^{-3}

Fig. 5.2 c

6. GEK measurements (W. Dasch and R. Wittstock)

During leg 4 of the cruise, GEK measurements (geomagnetic electrokinetograph) were carried out continuously from the ship under way (von Arx, 1950,1962). The GEK system used here is under development at the Institute of Applied Physics, Kiel University, as part of the Warmwassersphäre research program. The prototype system was operating reliably over more than 2000 nautical miles. The two electrodes were towed near the surface behind the ship. The distance between the electrodes was 50 m in the configuration 30 m/80 m. To check the zero point of the observed GEK signals the electrodes were towed hourly for several minutes in the configuration 30 m/30 m (i.e. 30 m behind the ship). Time variation of the zero-point was small.

The electrochemical potential picking electrodes of the silver/silver-chloride type worked without problems. A menbrane was used to seperate the outer (i.e. the maritime solution) from the inner electrolyte, defining a stable electro-chemical potential inner solution. The good drift characteristics and ruggedness made these electrodes easy-to-use parts of the system. A strip chart recorder for the GEK voltage was used continuously. In addition data were logged on floppy disk. Cruising at distances 200 nautical miles off the coast, the ship's position was stored as well by means of a DECCA navigation receiver every minute. The GEK hardware operated without failure from Funchal/Madeira to the English Channel.

The stored data have been edited and are presented as track lines (Fig.6.1 and 6.2). In Fig. 6.1 we show the result of a small scale survey south of Madeira. The relation between east-west and north-south GEK signals demonstrates on the average a SSW flowing current in the square ABCD. For preliminary results the calibration formula

$$E = k \cdot v \cdot L \cdot H_z, \qquad 1 < k < 1.5$$

was used, with

E = potential difference [mV]

v = ocean current velocity component [cm s^{-1}]

L = distance between the towed electrodes [m]

H_z = vertical component of the earth magnetic field [$V \cdot s \cdot m^{-2}$]

k = correction factor (here: k = 1.2 = const)

The GEK track line towards the English Channel is shown in Fig. 6.2.

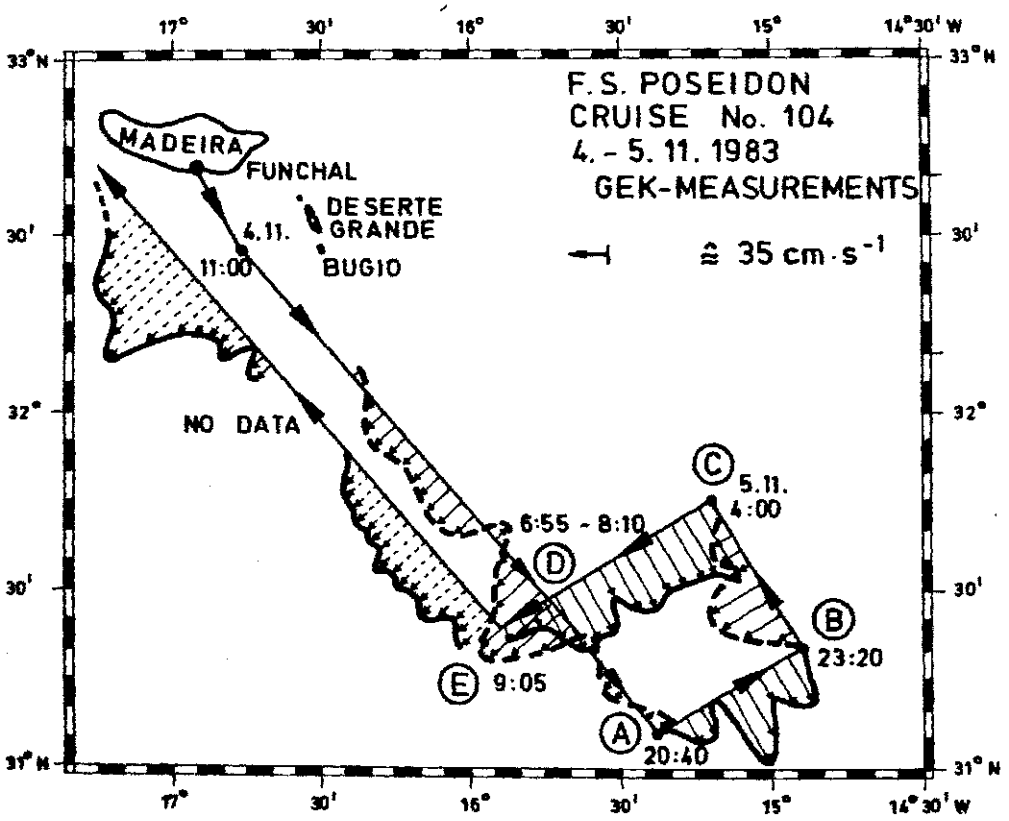


Fig. 6.1: The GEK track lines south of Madeira

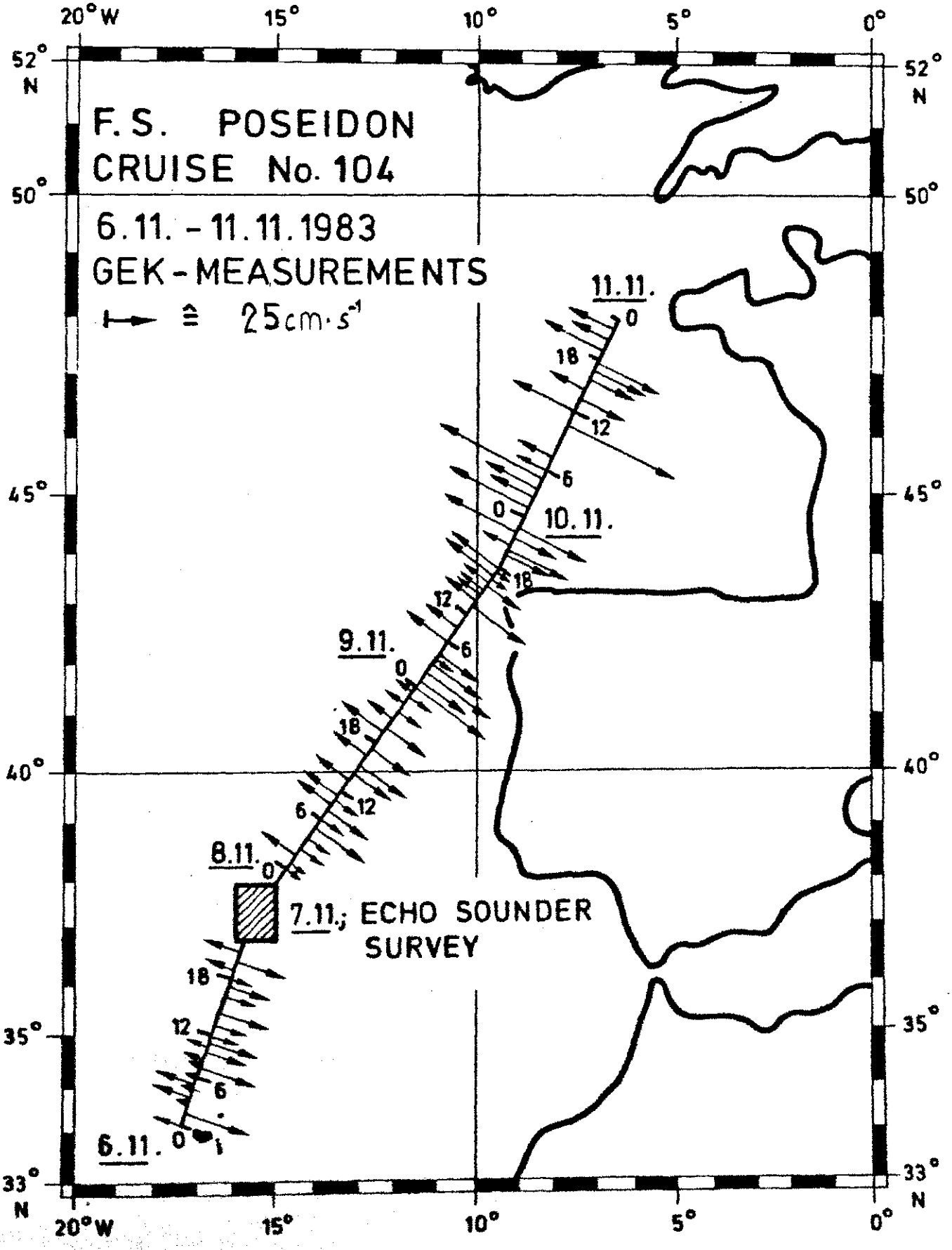


Fig. 6.2: The GEK track line on the return leg of POSEIDON.

7. Tracer measurements (P. Schlosser)

Samples for measurements of tritium and ^3He were collected on 6 stations and were stored using standard procedures (Weiss et al., 1976; Weiss, 1968). Station locations are listed in Table 2.1 and are shown in Fig. 1.1. So far, ^3He samples have been measured by mass spectrometry (Clarke et al., 1976) and are reported in terms of the helium isotope anomaly δ^3He, defined by

$$\delta^3He = \left(\frac{(^3He/^4He)_{sample}}{(^3He/^4He)_{air}} - 1\right) \cdot 100\ \%$$

Precision is ±0.2 % or better. ^4He values are available, but may have a systematic error of up to 5 % caused by underextraction of the samples, and are not reported. The δ^3He values have not yet been corrected for tritium decay during storage time but an upper limit for the correction is .2 % only. δ^3He values are presented in table 7.1 and in form of a north-south section (together with the corresponding salinity section) in Fig. 7.1.

Station (Position)	P [dbar]	δ^3He [%]
771		
(27°57.7'N	12	-1.23 ±0.03
26°29.9'W)	50	-1.37 ±0.03
	151	-0.22 ±0.16
	201	1.66 ±0.03
	252	4.48 ±0.16
24 Oct 1983	324	4.86 ±0.30
	473	7.82 +0.30
	652	8.22 ±0.30
837		
(37°21'N	72	-0.51 ±0.16
15° 54'W)	150	1.16 ±0.16
	222	3.90 ±0.16
	399	6.72 ±0.16
7 Nov 1983	875	7.73 ±0.16
	1006	6.43 +0.16
839		
(39°45'N	10	-0.54 ±0.16
13°20'W)	400	6.58 ±0.12
	601	8.60 ±0.12
	705	8.74 ±0.12
	801	7.80 ±0.12
8 Nov 1983	903	7.08 ±0.16
	1004	6.07 ±0.16
840		
(42°30'N	11	-1.16 ±0.12
10°20'W)	78	-0.51 ±0.12
	157	0.22 ±0.12
	244	0.79 ±0.12
	303	1.59 ±0.12
9 Nov 1983	401	3.25 ±0.12
	506	5.35 ±0.12
	602	7.30 ±0.12
	904	7.01 ±0.12

Table 7.1 δ^3He Register

Station (Position)	P [dbar]	δ^3He [%]
841 (44°35'N 08°52'W) 9 Nov 1983	73	-0.79 ±0.12
	225	0.94 ±0.12
	300	1.16 ±0.18
	401	3.47 ±0.18
	610	6.36 ±1.12
	802	8.02 ±0.12
	906	7.08 +0.12
	1002	7.3 ±0.18
842 (47°12'N 06° 56'W) 10 Nov 1983	11	-1.52 ±0.18
	73	-0.79 ±0.18
	222	0.79 ±0.18
	302	1.73 ±0.18
	396	3.32 ±0.18
	499	5.13 +0.18
	598	8.09 ±0.18
	703	8.09 ±0.18
	796	7.95 ±0.18
	902	7.88 ±0.18
	1003	7.44 ±0.18

Table 7.1 δ^3He Register (continued)

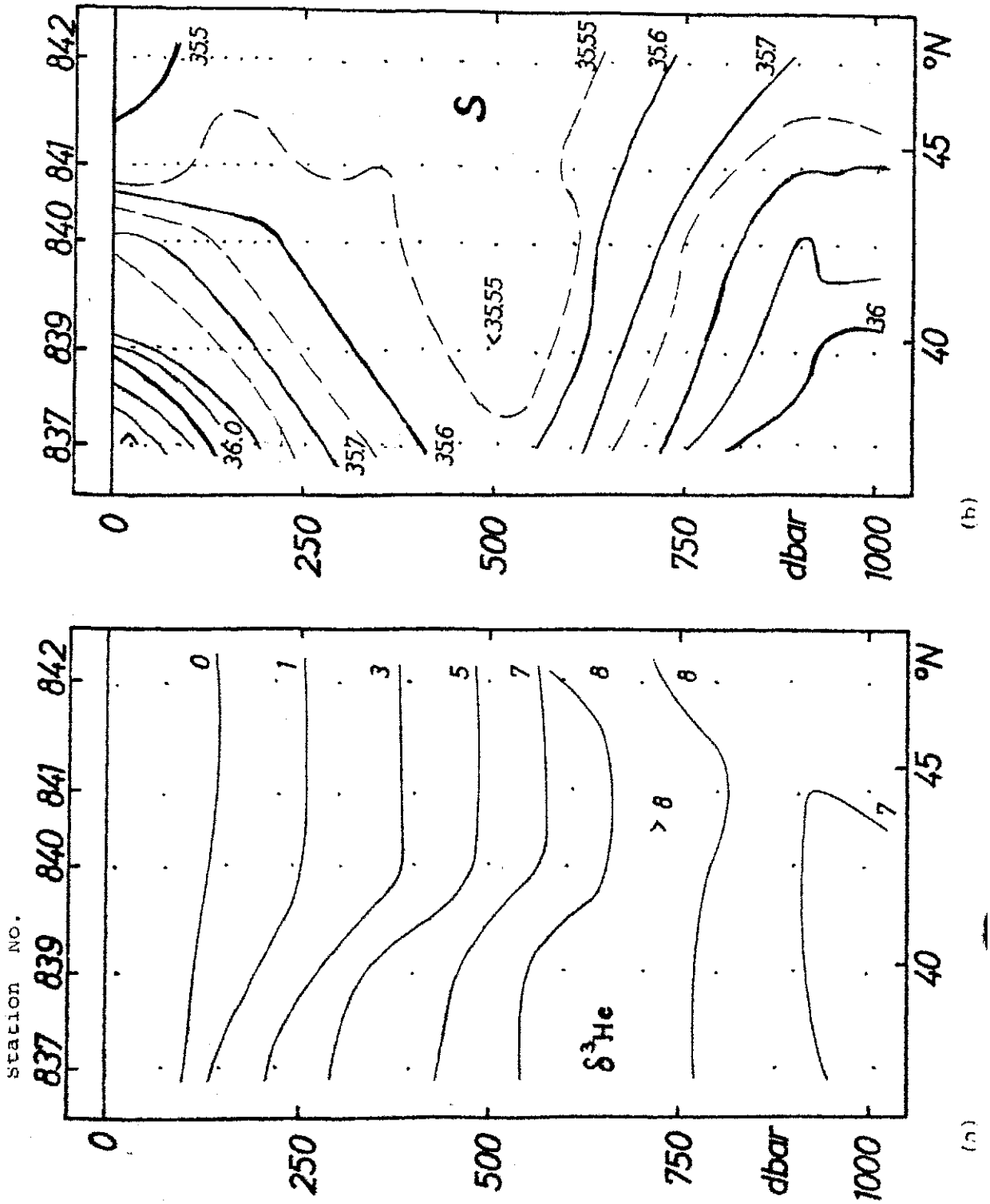


Fig. 7.1 Vertical distribution in the upper 1000 dbar of (a) the helium isotope anomaly δ^3He [%] and (b) salinity [practical salinity units] on the north-bound return leg of "Poseidon", covering the Iberian Basin and the Bay of Biscay. Station positions are given in Fig. 1.1. Salinity data were calculated from CTD data presented in Fig. 2.1.

Acknowledgements

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References

Von ARX, W.S. (1950): An electromagnetic method for measuring the velocities of ocean currents from a ship under way. Papers in Phys. Oceanog. and Meteor., Vol. 11, pp. 1-62 (Cambridge and Woods Hole, Mass.).

Von ARX, W.S. (1962): An introduction to physical oceanography Reading, Mass. (u.a.) Adison-Wesley.

BREITENBACH, J. (1985): Die drahtgeführte Stromprofilsonde DPS. Ber Inst. f. Meereskunde Kiel, in preparation).

CLARKE, W.B., JENKINS, W.J., and Z. TOP (1976): Determination of tritium by mass spectrometric measurement of ^{3}He, Int. J. Appl. Rad. Isotopes, 27, 512-522.

FOFONOFF, N.P. and R.C. MILLARD Jr. (1984): Algorithms for computation of fundamental properties of seawater. UNESCO Techn. Pap. in Marine Science, 44.

HENKE, M. (1979): A ten megameter Atlantic XBT section. Polymode News, No. 59.

HENKE, M. and W. ZENK (1980): Megameter Atlantic XBT sections II. Polymode News, No. 77.

HILLER, W. and R.H. KÄSE (1983): Objective analysis of hydrographic data sets from mesoscale surveys, Ber. Inst. f. Meereskunde, 116, 78 pp.

KÄSE, R.H. & G. SIEDLER (1982): Meandering of the subtropical front southeast of the Azores. Nature, 300, (5889) 245-246.

KÄSE, R., W. ZENK, T.B. SANFORD and W. HILLER (1984): Currents, Fronts and Eddy Fluxes in the Canary Basin. Progr. Oceanogr., 14, 231-257.

KNOLL, M., W. ZENK & E. BAUER (1982): Some XBT-observations on the thermal structure of the Warmwassersphäre in equatorial and lower latitudes of the eastern Atlantic. Dtsch. Hydrogr. Z. 35 (2), 73-81.

KROEBEL, W., P. DIEHL, L. GINZKEY, K.-H. MAHRT, J. RATHLEV, R. SIARA, Th. SCHULZ (1976): Die Kieler Multisonde der Jahre 1975/76, ihre Sensoren, Parameter mit Ergebnissen von Datenaufnahme und Perspektiven für ihre Auswertung. Proc. Interocean '76, Düsseldorf, Ref. No. IO 76-402, p. 1034-1046.

KUHN, H., D. QUADFASEL, F. SCHOTT & W. ZENK (1980): On Simultaneous Measurements with Rotor, Wing and Acoustic Current Meters, Moored in Shallow Water. Dtsch. Hydrogr. Z., 33, (1), 1-18.

MÜLLER, T. & W. ZENK (1983): Some Eulerian current measurements and XBT-sections from the North East Atlantic October 1980 - March 1982 - A Data Report - Ber. Inst. f. Meereskunde, Kiel, Nr. 114, 145 S.

MÜLLER, T. (1984): Eulerian current measurements from the North East Atlantic, March 1982 - October 1983 - A Data Report - Ber. Inst. f. Meereskunde, Kiel, 127, 99 pp.

PETERS, H., J. SCHMIDT, G. SIEDLER (1984): Data report "Meteor" cruises 60 and 64. Ber. Inst. f. Meereskunde, Kiel, in preparation.

SARMIENTO, J.L., C.G.H. ROOTH and W. ROETHER (1982): The North Atlantic Tritium distribution in 1982. J. Geophys. Res., 687, 8047-8056.

SIEDLER, G. (1982): SI-Einheiten in der Ozeanographie SI Units in Oceanography Ber. Inst. f. Meereskunde, Kiel, Nr. 101, 30 pp.

SIEDLER, G., W. ZENK and W.J. EMERY (1984): Strong current events related to a subtropical front in the Northeast Atlantic. J. Phys. Oceanogr. (submitted).

SY, A. (1983): Warmwassersphäre. Handling and processing of hydrographic data, technical report. Ber. Inst. für Meereskunde, Kiel, 111, 86 pp.

WEISS, R.F. (1968): Piggy back samplers for dissolved gas studies on sealed water samples, Deep-Sea Res., 15, 695-699.

WEISS, R.F., Roether, W., and G. BADER (1976): Determination of blanks in low-level tritium measurement, Int. J. Appl. Rad. Isotopes, 27, 217-255.

Appendix

In addition to the table given below, we refer to Müller's (1984) data report in which time series and derived quantities of the recovered moorings no. 2764 have been issued.

IfM No.	Location φ	Location λ	Date 1983	*)	Uncorrect. Depth [m]
293 "X"	28°01.0'N	18°20.2'W	27 Oct	↓	3700
294 "E"	28°01.4'N	20°24.1'W	26 Oct	↓	4575
297 "R"	27°59.5'N	26°30.8'W	24 Oct	↓	5035
295 "P"	27°59.6'N	22°23.6'W	22 Oct	↓	4860
296 "O"	28°00.0'N	24°27.6'W	23 Oct	↓	5162
276/5	33°10.8'N	21°55.4'W	20 Oct	↓	5230
276/4	33°10.7'N	21°55.4'W	19 Oct	↑	5250

*) ↓ = deployed, ↑ = recovered,

Table A.1: "Poseidon" cruise 104/3:
Location of recovered and deployed moorings.