Belgian Impuls Program

GLOBAL CHANGE

RV BELGICA CRUISE 93/22

PARTICIPATING LABORATORIES FROM :

ULB - MUMM - VUB - ULg - SUDO - IFREMER

MUMM contribution

Sampling stations position and depth.

General trackplot.

SCTD data : temperature, salinity, depth.

PRELIMINARY REPORT

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Belgian Impuls Program

GLOBAL CHANGE

RV BELGICA CRUISE 93/22.

Preliminary Data

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1. Position of the SCTD stations.

The RV Belgica cruise 93/22 took place from 22 September until 06 October 1993. During the first leg of the cruise 14 stations were sampled. The RV Belgica remained for 24 hours at the stations 3 and 4 and another 8 hours at station 5. These stations correspond to the OMEX stations 1, 2 and 3 respectively (Goban's Spur area). After these stations the Belgica zigzagged (see Figure 2) along the French continental shelf. Meanwhile,the stations 6 to 14 were sampled during a 2 to 4 hours stop. The Belgica berthed at Lorient from 29 September till 03 October. The departure was delayed due to the very bad weather conditions.

During the second leg, the intended deployment of the IFREMER benthic lander and sediment trap moorings at the Meriadzek Terrace as well as the measurements and sampling at the "La Chapelle Bank" (station 17) had to be cancelled due to the persisting bad weather conditions. The RV Belgica touched at Brest on 04 October for the debarkation of the IFREMER participants and instruments. The Belgica berthed at Zeebrugge on 06 October.

Table 1 gives the position, the waterdepth, the date and the time of the SCTD vertical profiles. All these profiles have been taken with the Sea-Bird SBE9 SCTD system.

Figure 1 gives a map with the position of the sampling stations while figure 2 shows a trackplot of the cruise.

In figures 3 and 4 the surface temperature and salinity are plotted in function of time. These data are acquired with the Sea-Bird SBE21 thermosalinograph. The newly installed Turner Designs fluorometer functioned well stand alone. However, the continuous data during the transects had to be omitted due to the corrosion of the seawater supply connections.

Table 1. Position SCTD stations GLOBAL CHANGE 93/22.

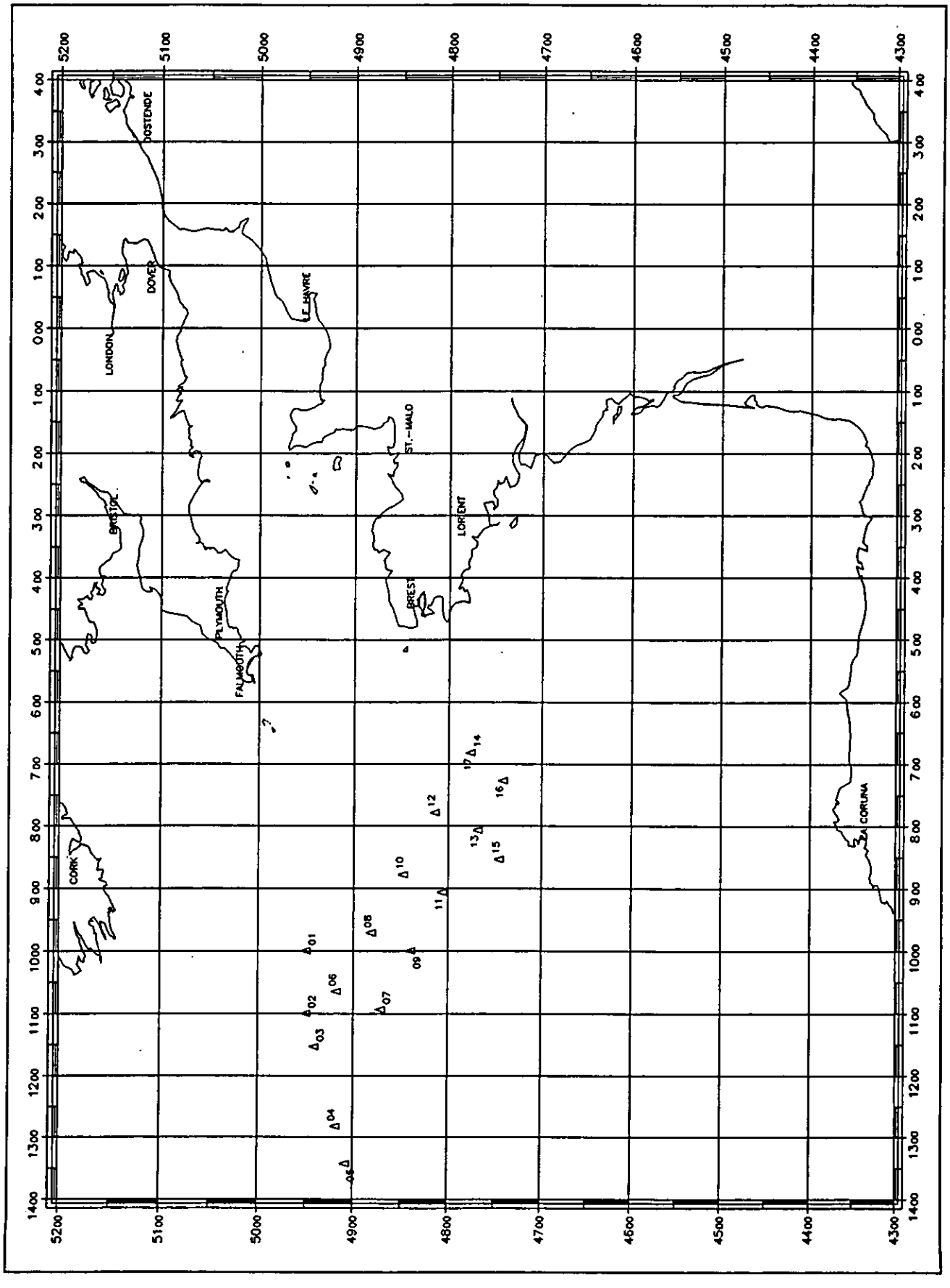
Station number	Date 1993	Time of V.P.(1)	Latitude	Longitude	Water Depth [m]	Data file
01A	23.09	18h19	N 49 30.18	W 09 59.77	153	GLCH01A
01B	23.09	20h27	N 49 30.14	W 09 59.62	156	GLCH01B
01C	23.09	20h45	N 49 30.22	W 09 59.63	155	GLCH01C
02A	24.09	01h12	N 49 29.94	W 11 00.01	188	GLCH02A
03A	24.09	06h29	N 49 24.47	W 11 35.59	767	GLCH03A
04A	25.09	09h41	N 49 13.14	W 12 47.81	1358	GLCH04A
04B	25.09	14h35	N 49 15.36	W 12 48.21	1360	GLCH04B
04C	25.09	17h46	N 49 15.67	W 12 48.65	1364	GLCH04C
04D	25.09	19h21	N 49 11.44	W 12 44.22	1294	GLCH04D
04E	25.09	21h55	N 49 13.67	W 12 47.36	1340	GLCH04E
05A	26.09	07h12	N 49 05.32	W 13 22.17	>2200	GLCH05A
05B	26.09	10h08	N 49 06.59	W 13 25.04	>2200	GLCH05B
05C	26.09	11h23	N 49 07.67	W 13 25.72	>2200	GLCH05C
05D	26.09	15h28	N 49 07.40	W 13 25.31	>2200	GLCH05D
05E	26.09	18h03	N 49 08.17	W 13 27.45	>2200	GLCH05E
05F	26.09	19h36	N 49 08.91	W 13 29.06	>2200	GLCH05F
06A	27.09	06h30	N 49 11.14	W 10 38.96	159	GLCH06A
06B	27.09	07h38	N 49 10.20	W 10 38.14	158	GLCH06B
07A	27.09	11h01	N 48 43.22	W 10 55.93	1073	GLCH07A
07B	27.09	12h37	N 48 43.06	W 10 54.66	1073	GLCH07B
08A	27.09	18h34	N 48 48.77	W 09 42.95	176	GLCH08A
09A	27.09	21h54	N 48 24.07	W 10 00.02	>2200	GLCH09A
09B	27.09	23h03	N 48 24.02	W 10 00.07	>2200	GLCH09B
10A	28.09	06h28	N 48 28.70	W 08 46.87	154	GLCH10A
11A	28.09	09h51	N 48 03.90	W 09 04.23	1870	GLCH11A
12A	28.09	16h05	N 48 09.16	W 07 47.04	192	GLCH12A
13A	28.09	20h11	N 47 40.69	W 08 03.80	1155	GLCH13A
14A	29.09	02h28	N 47 46.22	W 06 49.48	168	GLCH14A

Remarks:

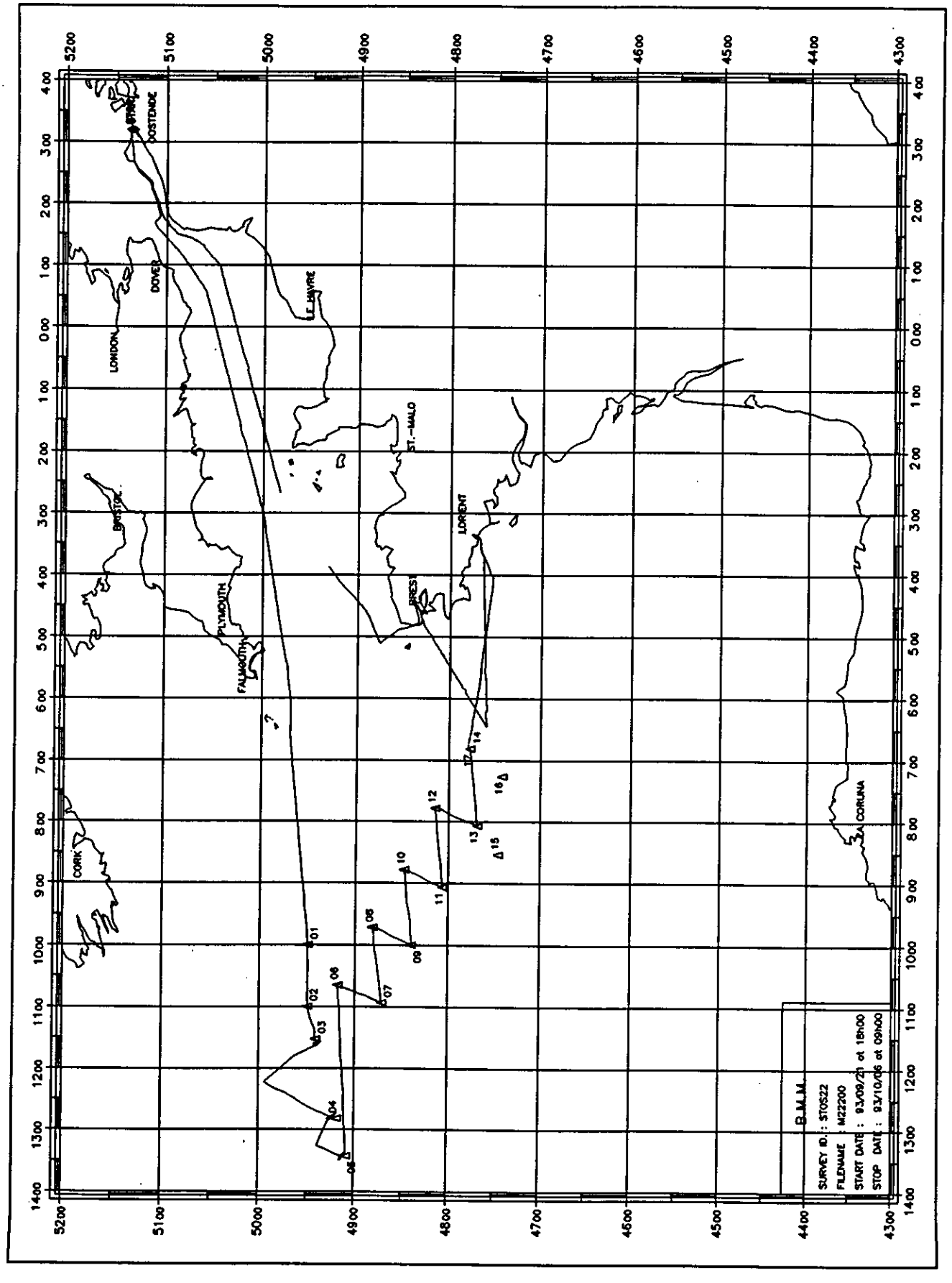
(1) The time noted is the starttime of the vertical profile.

(2) From 23.09 till 25.09 the time is summertime (GMT + 2).
From 26.09 on the used time is wintertime (GMT + 1).

Figure 1. SCTD sampling stations Global Change R/V Belgica cruise 93/22.

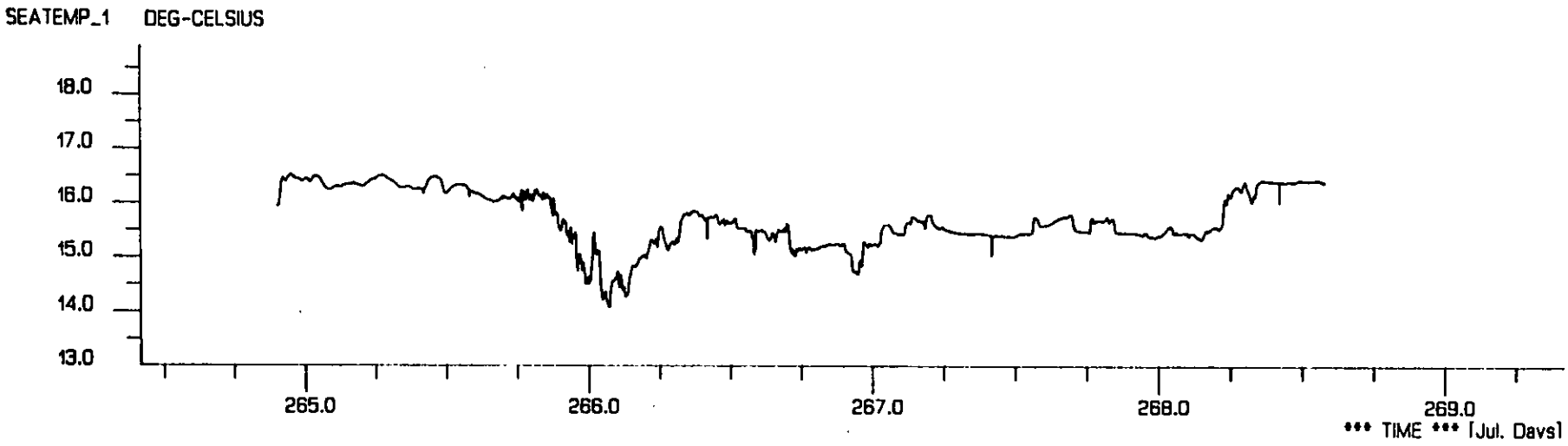


2. General trackplot of RV BELGICA cruise 93/22.(Figure 2)



Survey ID : GLOBAL CHANGE 1993. Startdate : 21.09.93. **MUMM – Meetdienst Oostende.**

File name : 032201 Stopdate : 25.09.93.



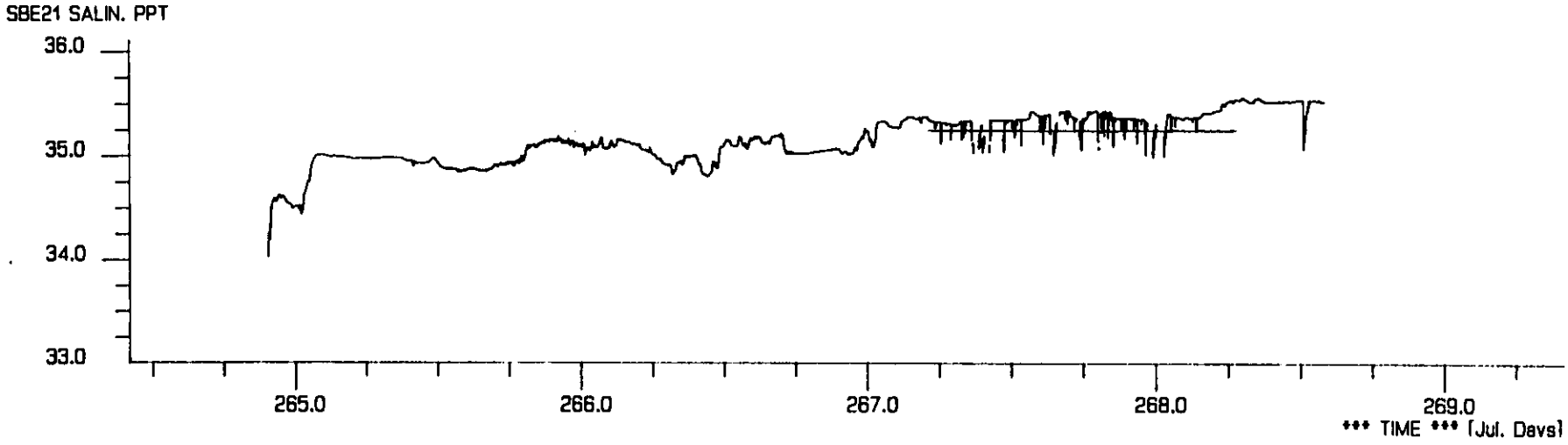


Figure 3.a. The passage Zeebrugge - Station 4.

Survey ID : GLOBAL CHANGE 1993. Startdate : 25.09.93. **MUMM – Meetdienst Oostende.**

File name : 032202 Stopdate : 29.09.93.

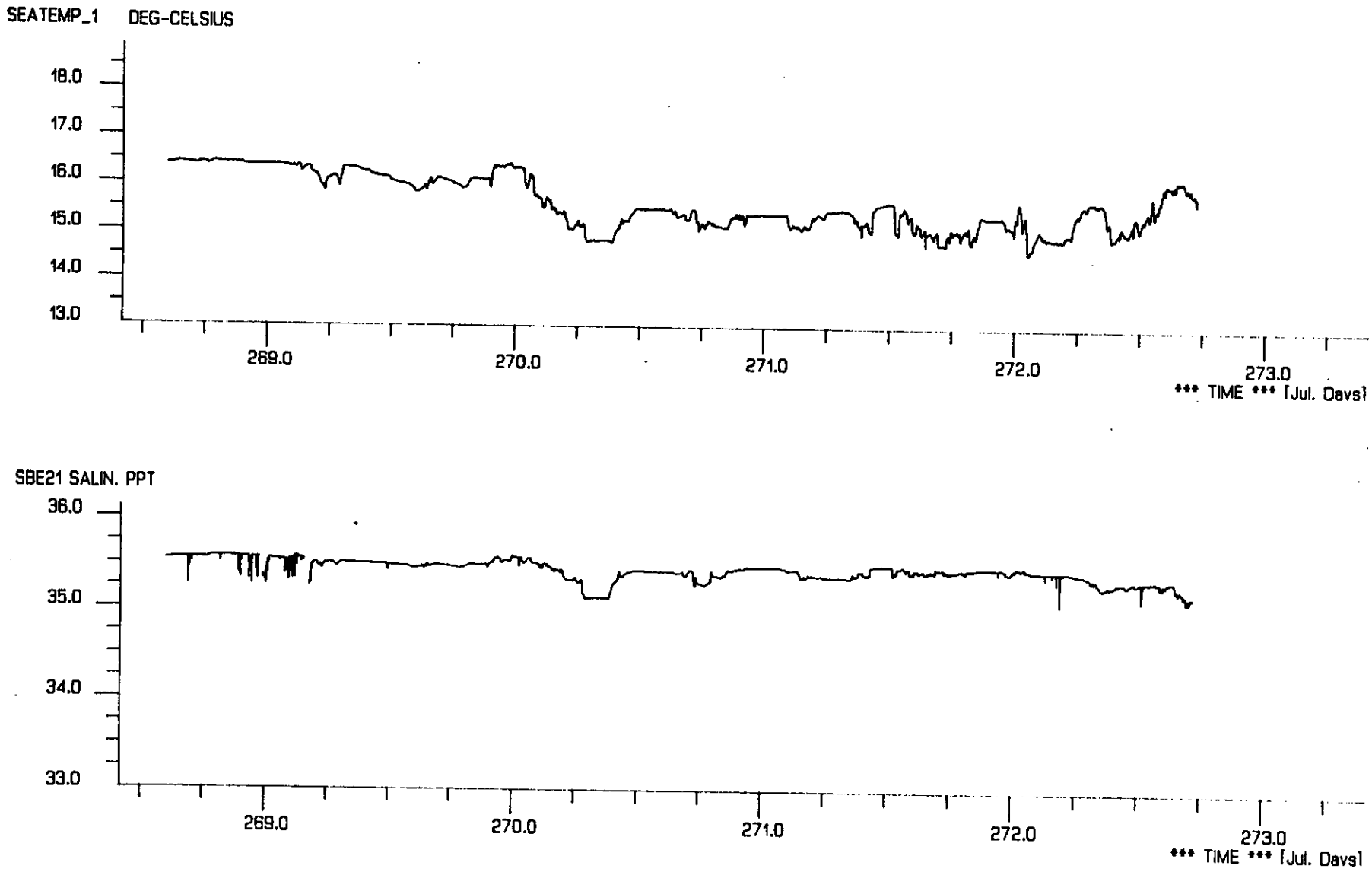


Figure 3.b. The passage Station 4 - Lorient.

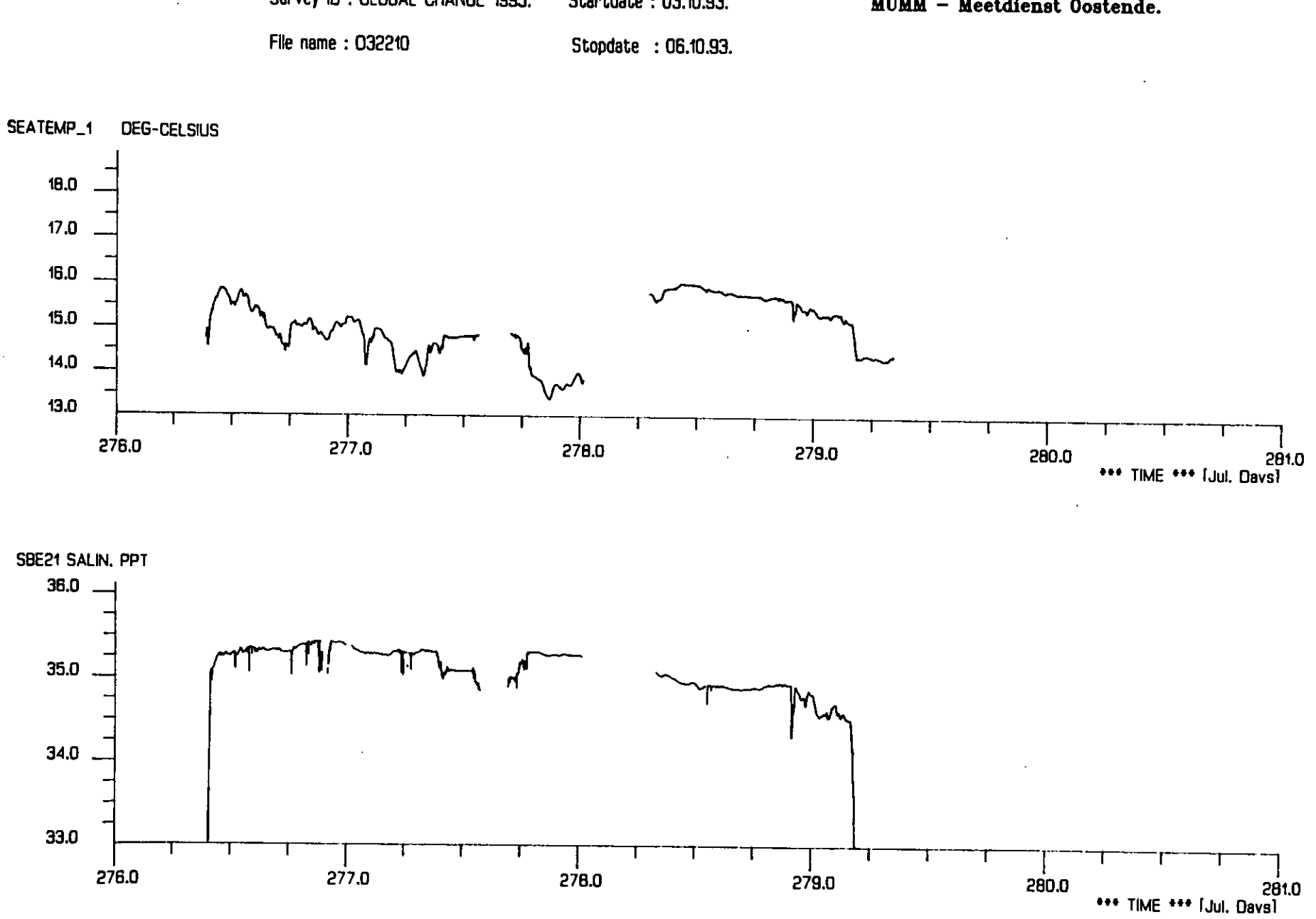


Figure 4. The passage Lorient - Zeebrugge (via Brest).

4. Sea-Bird SBE9 SCTD data at the sampling stations.

In tables 2 to 29 the SCTD values are listed each time the water sampling bottles were closed. The sampling depth, the type of bottle and the number of bottles that were closed are also indicated.

In the figures 5 to 54 the SCTD downcast profiles are presented.
The SCTD profiles have been taken with the Sea-Bird SBE Model 9 profiler.

The dissolved oxygen (DO) values as well as the pH data measured by the Sea-Bird Model 9 SCTD-system are raw data only.

A comparison of the MUMM oxygen data (Sea-Bird SBE09) with the ULg oxygen data (Winkler method) gives an average difference (MUMM values - ULg values) of +0.19 ml/l or +3.23 %. The standard deviation amounts to 0.17 ml/l or 2.88 %.

The analysis of the pH data gives an average difference of +0.013 pH (MUMM data - ULg data) with a standard deviation of 0.042 pH.

No real trend has been found in the differences between the MUMM and the ULg data. As a consequence, the MUMM data have not been adapted.

Table 2

Profile: Station 01 A

Date: 23.09.93

DOWNCAST: starttime: 18h19

Bathy depth: 153 m

sampling			SCTD values					
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	pH	density sig. Θ
Surf.	Ni	1	1.41	15.01	35.13	6.30	8.25	26.07
10	Ni	1	9.94	14.77	35.12	6.18	8.26	26.12
20	Ni	1	19.3	14.75	35.12	6.19	8.26	26.12
30	Ni	1	29.9	14.73	35.13	6.10	8.26	26.13
40	Ni	2	39.67	14.72	35.13	6.06	8.26	26.13
50	Ni	1	48.7	14.56	35.14	5.94	8.24	26.18
60	Ni	1	59.8	14.34	35.17	5.87	8.21	26.25
80	Ni	1	79.7	10.56	35.42	5.64	8.07	27.18
100	Ni	1	99.5	10.55	35.42	5.66	8.07	27.18
120	Ni	1	118.9	10.51	35.41	5.73	8.07	27.19
140	Ni	1	137.9	10.49	35.41	5.55	8.07	27.09
Surface			3.15	14.98	35.13	6.01	8.24	26.08
Bottom			142.7	10.49	35.41	5.57	8.07	27.19

GO : GO FLO 10 liter sampling bottle.
NI : NISKIN 10 liter sampling bottle.
GOT : GO FLO 10 liter sampling bottle teflonised and tap altered (SUDO).

Table 3

Profile: Station 01 B

Date: 23.09.93

DOWNCAST: starttime: 20h27

Bathy depth: 156 m

sampling			SCTD values					
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	pH	density sig. Θ
10	Ni	1	9.71	14.88	35.16	6.14	8.26	26.12
Surface								
Bottom								

Table 4

Profile: Station 01 C

Date: 23.09.93

DOWNCAST: starttime: 20h45

Bathy depth: 155 m

sampling			SCTD values					
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	pH	density sig. Θ
Surf.	Ni	4	3.08	15.10	35.17	6.36	8.26	26.08
30	Ni	1	29.1	14.84	35.15	6.23	8.22	26.13
100	Ni	1	100.1	10.55	35.42	5.70	8.09	27.18
100	GoT	6	100.1	10.55	35.42	5.70	8.09	27.18
Surface			2.64	15.08	35.16	6.26	8.25	26.08
Bottom								

Table 5

Profile: Station 02 A

Date: 24.09.93

DOWNCAST: starttime: 01h12

Bathy depth: 188 m

sampling			SCTD values					
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	pH	density sig. Θ
Surf.	Ni	2	3.19	15.42	35.44	6.14	8.29	26.22
10	Ni	1	10.3	15.36	35.43	6.13	8.29	26.27
20	Ni	1	19.7	15.17	35.43	6.10	8.28	26.27
30	Ni	1	29.6	14.45	35.44	6.01	8.25	26.44
40	Ni	1	39.5	13.73	35.45	6.00	8.22	26.60
60	Ni	1	59.8	11.91	35.51	6.02	8.16	27.00
80	Ni	1	79.8	11.52	35.49	6.03	8.14	27.09
100	Ni	1	98.8	11.36	35.49	6.06	8.13	27.09
125	Ni	1	123.8	11.22	35.48	6.08	8.12	27.12
150	Ni	1	148.8	10.99	35.47	5.94	8.10	27.15
175	Ni	1	173.2	10.95	35.47	5.70	8.09	27.15
Surface			2.60	15.46	35.44	5.93	8.27	26.21
Bottom								

Table 6

Profile: Station 03 A

Date: 24.09.93

DOWNCAST: starttime: 06h29

Bathy depth: 767 m

sampling			SCTD values					
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	pH	density sig. Θ
Surf.	Ni	6	2.12	15.32	35.42	6.18	8.29	26.22
20	Ni	1	20.1	15.34	35.42	6.15	8.30	26.22
40	Ni	1	39.4	15.34	35.42	6.18	8.29	26.22
60	Ni	1	59.2	13.85	35.47	6.10	8.23	26.58
80	Ni	1	79.8	11.70	35.53	6.16	8.16	27.06
120	Ni	1	118.9	11.15	35.47	6.25	8.14	27.12
150	Ni	1	147.9	11.01	35.46	6.08	8.14	27.13
Surface			3.66	15.34	35.43	6.00	8.29	26.23
Bottom			196.7	10.96	35.47	6.06	8.13	27.15

Table 7

Profile: Station 04 A

Date: 25.09.93

DOWNCAST: starttime: 09h41

Bathy depth: 1356 m

sampling			SCTD values					
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	pH	density sig. Θ
Surf.	Ni	2	2.84	16.26	35.58	6.03	8.33	26.13
20	Ni	1	20.0	16.27	35.58	6.13	8.33	26.13
40	Ni	1	38.7	16.24	35.57	6.22	8.32	26.13
65	Ni	5	64.7	14.29	35.57	6.10	8.26	26.57
80	Ni	1	79.3	12.55	35.62	6.11	8.21	26.97
130	Ni	1	129.8	11.93	35.59	6.21	8.19	27.06
180	Ni	1	178.5	11.58	35.55	5.96	8.17	27.10
Surface			2.34	16.27	35.57	5.78	8.32	26.13
Bottom			198.8	11.52	35.54	5.89	8.17	27.11

Table 8

Profile: Station 04 B

Date: 25.09.93

DOWNCAST: starttime: 14h35

Bathy depth: 1360 m

sampling			SCTD values					
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	pH	density sig. Θ
Surf.	Ni	1	3.18	16.30	35.59	5.97	8.31	26.14
10	Ni	1	9.72	16.30	35.59	5.95	8.32	26.14
20	GoT	1	19.4	16.30	35.59	5.98	8.32	26.14
30	Ni	1	28.8	16.30	35.59	6.04	8.32	26.14
40	GoT	1	39.4	16.24	35.58	6.02	8.30	26.14
65	Ni	1	63.0	12.62	35.60	6.04	8.21	26.94
70	GoT	1	68.0	12.49	35.62	6.05	8.20	26.98
80	Ni	1	79.6	12.29	35.62	6.09	8.19	27.02
100	GoT	1	99.2	11.93	35.57	6.10	8.18	27.05
130	GoT	1	128.9	11.64	35.54	6.15	8.17	27.08
150	Ni	1	148.2	11.67	35.56	6.09	8.16	27.09
180	GoT	1	178.9	11.48	35.54	5.94	8.15	27.11
Surface			2.40	16.27	35.58	5.94	8.29	26.14
500 m			496.8	40.45	35.43	5.92	8.09	27.22

The Niskin bottle at 80 meter was not closed.

Table 9

Profile: Station 04 C

Date: 25.09.93

DOWNCAST: starttime: 17h46

Bathy depth: 1364 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
20	Ni	1	19.2	16.31	35.60	6.12	26.14
40	Ni	1	39.6	16.27	35.59	6.16	26.14
70	Ni	1	69.3	12.51	35.61	6.19	26.97
100	Ni	1	98.6	12.04	35.60	6.22	27.05
130	Ni	1	128.7	11.68	35.56	6.19	27.09
180	Ni	1	178.6	11.43	35.53	5.93	27.09
Surface			2.32	16.31	35.60	6.47	26.14
Bottom							

Table 10

Profile: Station 04 D

Date: 25.09.93

DOWNCAST: starttime: 19h21

Bathy depth: 1294 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
300	Ni	1	296	11.21	35.51	5.90	27.14
300	GoT	1	296	11.21	35.51	5.90	27.14
500	Ni	1	494	10.65	35.47	5.60	27.22
500	GoT	1	494	10.65	35.47	5.60	27.22
700	Ni	1	693	9.61	35.37	5.17	27.32
700	GoT	1	693	9.61	35.37	5.17	27.32
900	Ni	1	893	8.56	35.39	4.89	27.51
900	GoT	1	893	8.56	35.39	4.89	27.51
1100	Ni	1	1087	8.15	35.49	5.03	27.66
1100	GoT	1	1087	8.15	35.49	5.03	27.66
1250	Ni	1	1237	6.54	35.28	5.51	27.72
1250	GoT	1	1237	6.54	35.28	5.51	27.72
Surface			3.28	16.32	35.62	5.94	26.15
Bottom			1237	6.54	35.28	5.51	27.72

Table 11

Profile: Station 04 E

Date: 25.09.93

DOWNCAST: starttime: 21h55

Bathy depth: 1340 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
200	Ni	2	197	11.58	35.55	6.00	27.10
300	Ni	2	297	11.21	35.52	5.98	27.15
400	Ni	2	395	10.84	35.47	5.94	27.18
500	Ni	2	495	10.51	35.43	5.88	27.21
600	Ni	2	594	10.16	35.40	5.73	27.25
700	Ni	2	692	9.67	35.38	5.31	27.32
Surface			1.92	16.27	35.61	5.89	26.15
Bottom							

Table 12

Profile: Station 05 A

Date: 26.09.93

DOWNCAST: starttime: 07h12

Bathy depth: >2200 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
Surf.	Ni	3	3.20	16.21	35.55	5.94	26.12
50	Ni	6	49.8	16.22	35.54	5.80	26.12
80	Ni	1	79.8	12.31	35.35	5.97	26.96
120	Ni	1	119.7	11.47	35.51	6.06	27.09
180	Ni	1	177.7	11.15	35.48	5.96	27.12
Surface			1.87	16.23	35.55	5.76	26.12
200			200.7	11.08	35.47	6.00	27.13

Table 13

Profile: Station 05 B

Date: 26.09.93

DOWNCAST: starttime: 10h08

Bathy depth: >2200 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
400	GoT	1	397	10.76	35.46	5.85	27.19
400	Ni	1	397	10.76	35.46	5.85	27.19
600	GoT	1	593	10.08	35.38	5.46	27.25
600	Ni	1	593	10.08	35.38	5.46	27.25
900	GoT	1	890	8.80	35.38	4.88	27.46
900	Ni	1	890	8.80	35.38	4.88	27.46
1100	GoT	1	1087	7.56	35.39	5.19	27.66
1100	Ni	1	1087	7.56	35.39	5.19	27.66
1200	GoT	1	1186	6.70	35.28	5.46	27.70
1200	Ni	1	1186	6.70	35.28	5.46	27.70
1595	GoT	1	1577	4.12	34.94	6.39	27.74
1595	Ni	1	1577	4.12	34.94	6.39	27.74
Surface			3.95	10.07	35.54	5.92	26.14
Bottom							

Table 14

Profile: Station 05 D

Date: 26.09.93

DOWNCAST: starttime: 15h28

Bathy depth: >2200 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
10	GoT	1	9.60	15.97	35.53	5.97	26.16
10	Ni	1	9.60	15.97	35.53	5.97	26.16
50	GoT	1	49.5	15.32	35.49	5.89	26.28
50	Ni	1	49.5	15.32	35.49	5.89	26.28
80	GoT	1	79.9	12.15	35.56	5.92	27.00
80	Ni	1	79.9	12.15	35.56	5.92	27.00
120	GoT	1	119.3	11.49	35.50	5.94	27.08
120	Ni	1	119.3	11.49	35.50	5.94	27.08
180	GoT	1	177.0	11.02	35.43	6.01	27.11
180	Ni	1	177.0	11.02	35.43	6.01	27.11
300	GoT	1	298	10.55	35.38	5.88	27.16
300	Ni	1	298	10.55	35.38	5.88	27.16
Surface			4.80	16.00	35.53	5.75	26.16
Bottom							

Table 15

Profile: Station 05 C

Date: 26.09.93

DOWNCAST: starttime: 11h23

Bathy depth: >2200 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
3	Ni	2	3.45	15.92	35.53	5.87	26.17
Surface							
Bottom							

Table 16

Profile: Station 05 E

Date: 26.09.93

DOWNCAST: starttime: 18h03

Bathy depth: >2200 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
10	GoT	1	9.74	15.80	35.50	5.91	26.18
Surface							
Bottom							

Table 17

Profile: Station 05 F

Date: 26.09.93

DOWNCAST: starttime: 19h36

Bathy depth: >2200 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
Surf.	Ni	2	2.87	15.98	35.53	6.12	26.16
20	Ni	2	20.8	15.95	35.53	6.07	26.17
50	Ni	2	50.3	15.59	35.50	6.08	26.23
80	Ni	2	79.2	11.92	35.56	6.05	27.05
120	Ni	2	119.6	11.44	35.49	6.07	27.08
180	Ni	2	177.9	11.09	35.44	5.94	27.11
Surface			3.73	15.98	35.53	5.79	26.16
Bottom							

Table 18

Profile: Station 06 A

Date: 27.09.93

DOWNCAST: starttime: 06h30

Bathy depth: 159 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
Surf.	Ni	4	2.02	14.67	35.17	6.22	26.17
20	Ni	2	19.87	14.68	35.17	6.21	26.17
50	Ni	2	50.5	14.70	35.16	6.16	26.16
80	Ni	2	78.9	11.67	35.48	5.90	27.03
145	Ni	2	143.3	11.04	35.47	5.53	27.14
Surface			1.37	14.69	35.17	5.91	26.17
Bottom			143.3	11.04	35.47	5.53	27.14

Table 19

Profile: Station 06 B

Date: 27.09.93

DOWNCAST: starttime: 07h38

Bathy depth: 158 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
Surf.	Ni	1	2.79	14.67	35.17	6.26	26.17
20	GoT	1	20.5	14.69	35.17	6.37	26.17
50	Ni	6	49.7	14.65	35.17	6.12	26.18
80	GoT	1	79.9	11.76	35.49	5.89	27.02
145	GoT	1	144.7	11.07	35.48	5.62	27.14
Surface			4.24	14.67	35.17	6.05	26.17
Bottom							

Table 20

Profile: Station 07 A

Date: 27.09.93

DOWNCAST: starttime: 11h01

Bathy depth: 1073 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
Surf.	Ni	2	3.30	15.38	35.48	6.05	26.26
40	Ni	2	40.3	15.36	35.48	6.03	26.26
20	GoT	1	20.1	15.36	35.48	6.07	26.26
100	Ni	2	99.2	12.51	35.52	5.82	26.90
100	GoT	1	99.2	12.51	35.52	5.82	26.98
150	Ni	2	148.9	11.86	35.54	5.94	27.04
200	GoT	1	199.1	11.37	35.51	5.91	27.11
200	Ni	1	199.1	11.37	35.51	5.91	27.11
Surface			5.73	15.37	35.48	5.94	26.26
Bottom							

Table 21

Profile: Station 07 B

Date: 27.09.93

DOWNCAST: starttime: 12h37

Bathy depth: 1073 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
70	Ni	1	70.2	15.03	35.47	5.83	26.33
300	Ni	2	297	10.97	35.49	5.81	27.17
300	GoT	1	297	10.97	35.49	5.81	27.17
600	Ni	2	594	10.30	35.47	5.36	27.28
600	GoT	1	594	10.30	35.47	5.36	27.28
800	Ni	2	793	9.75	35.54	5.00	27.43
1000	GoT	1	988	9.40	35.57	4.92	27.52
1000	Ni	2	988	9.40	35.57	4.92	27.52
Surface			4.72	15.36	35.47	5.96	26.26
Bottom							

Table 22

Profile: Station 08 A

Date: 27.09.93

DOWNCAST: starttime: 18h34

Bathy depth: 176 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
Surf.	Ni	2	2.81	14.98	35.42	6.27	26.30
50	Ni	1	49.2	14.90	35.43	6.12	26.33
20	GoT	1	19.3	14.96	35.41	6.35	26.30
80	Ni	2	79.5	14.51	35.46	5.95	26.44
80	GoT	1	79.56	14.51	35.46	5.95	26.44
120	Ni	2	119.6	11.88	35.51	5.86	27.01
160	GoT	1	158.2	11.45	35.51	5.68	27.09
160	Ni	2	158.2	11.45	35.51	5.68	27.09
Surface							
Bottom			163.9	11.45	35.51	5.69	27.09

Table 23

Profile: Station 09 A

Date: 27.09.93

DOWNCAST: starttime: 21h54

Bathy depth: >2200 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
Surf.	Ni	1	2.96	15.26	35.53	6.12	26.32
20	GoT	1	20.1	15.19	35.52	6.17	26.34
40	Ni	2	40.1	15.17	35.52	6.11	26.34
70	Ni	2	69.1	14.43	35.53	6.11	26.34
100	GoT	1	99.1	13.08	35.55	5.71	26.80
100	Ni	2	99.1	13.08	35.55	5.71	26.80
180	GoT	1	178.9	11.73	35.54	5.72	27.10
180	Ni	2	178.9	11.73	35.54	5.72	27.10
Surface			3.46	15.25	35.53	6.00	26.32
Bottom							

Table 24

Profile: Station 09 B

Date: 27.09.93

DOWNCAST: starttime: 23h03

Bathy depth: >2200 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
300	Ni	1	297	11.14	35.51	5.70	27.16
400	Ni	2	397	10.92	35.51	5.58	27.20
400	GoT	1	397	10.92	35.51	5.58	27.20
600	Ni	2	594	10.55	35.54	5.27	27.29
600	GoT	1	594	10.55	35.54	5.27	27.29
800	Ni	2	792	10.08	35.57	4.91	27.40
1000	GoT	1	989	9.58	35.65	4.70	27.55
1000	Ni	2	989	9.58	35.65	4.70	27.55
Surface			19.3	15.25	35.53	6.01	26.32
Bottom							

Table 25

Profile: Station 10 A

Date: 28.09.93

DOWNCAST: starttime: 06h28

Bathy depth: 154 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
Surf.	Ni	1	2.89	15.36	35.42	6.08	26.21
20	Ni	1	18.5	15.36	35.42	6.14	26.21
40	GoT	2	39.1	15.32	35.41	6.12	26.22
70	Ni	2	68.5	12.91	35.49	5.76	26.79
70	GoT	1	68.5	12.91	35.49	5.76	26.79
100	Ni	2	96.2	11.72	35.53	5.67	27.06
140	GoT	1	139.3	11.69	35.53	5.42	27.06
140	Ni	2	139.3	11.69	35.53	5.42	27.06
Surface			2.98	15.36	35.42	5.94	26.21
Bottom							

Table 26

Profile: Station 11 A

Date: 28.09.93

DOWNCAST: starttime: 09h51

Bathy depth: 1870 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
Surf.	Ni	1	3.50	15.50	35.55	5.95	26.29
20	GoT	1	21.0	15.47	35.55	5.96	26.29
35	GoT	1	34.7	15.24	35.53	5.94	26.33
70	Ni	1	69.7	14.27	35.48	5.72	26.51
100	GoT	1	99.5	12.73	35.55	5.57	26.88
150	Ni	1	148	11.66	35.55	5.74	27.09
200	GoT	1	197	11.34	35.54	5.75	27.14
400	Ni	1	396	11.02	35.55	5.52	27.21
600	GoT	1	593	10.63	35.54	5.30	27.28
750	Ni	1	741	10.23	35.56	5.10	27.36
875	GoT	1	865	9.80	35.59	4.93	27.46
1000	Ni	1	988	9.44	35.60	4.85	27.54
Surface			1.95	15.45	35.55	5.89	26.30
Bottom							

Table 27

Profile: Station 12 A

Date: 28.09.93

DOWNCAST: starttime: 16h05

Bathy depth: 192 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. θ
Surf.	Ni	1	2.94	14.82	35.49	6.31	26.39
20	GoT	1	20.3	14.59	35.51	6.26	26.46
40	Ni	2	39.4	14.40	35.51	6.13	26.50
60	Ni	2	59.5	14.01	35.51	5.87	26.58
80	GoT	1	79.2	13.25	35.52	5.69	26.74
120	Ni	2	118.9	12.41	35.55	5.69	26.74
180	GoT	1	178.3	11.87	35.56	5.51	27.06
180	Ni	2	178.3	11.07	35.56	5.51	27.06
Surface			3.0	14.61	35.51	6.11	26.45
Bottom							

Table 28

Profile: Station 13 A

Date: 28.09.93

DOWNCAST: starttime: 21h31

Bathy depth: 1155 m

sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
Surf.	Ni	1	4.4	15.21	35.52	5.95	26.33
20	GoT	1	20.2	15.21	35.52	5.93	26.33
70	GoT	1	69.4	13.94	35.54	5.57	26.62
120	Ni	1	118	11.98	35.57	5.66	27.04
200	GoT	1	198	11.54	35.57	5.72	27.12
400	Ni	1	395	11.14	35.57	5.51	27.20
500	GoT	1	495	10.78	35.52	5.43	27.23
600	Ni	1	593	10.39	35.49	5.22	27.28
750	GoT	1	743	10.10	35.58	4.77	27.40
825	Ni	1	816	10.05	35.63	4.71	27.45
900	GoT	1	890	9.89	35.69	4.62	27.53
1000	Ni	1	987	9.55	35.69	4.62	27.59
Surface			4.13	15.23	35.52	5.93	26.33
Bottom							

Table 29

Profile: Station 14 A

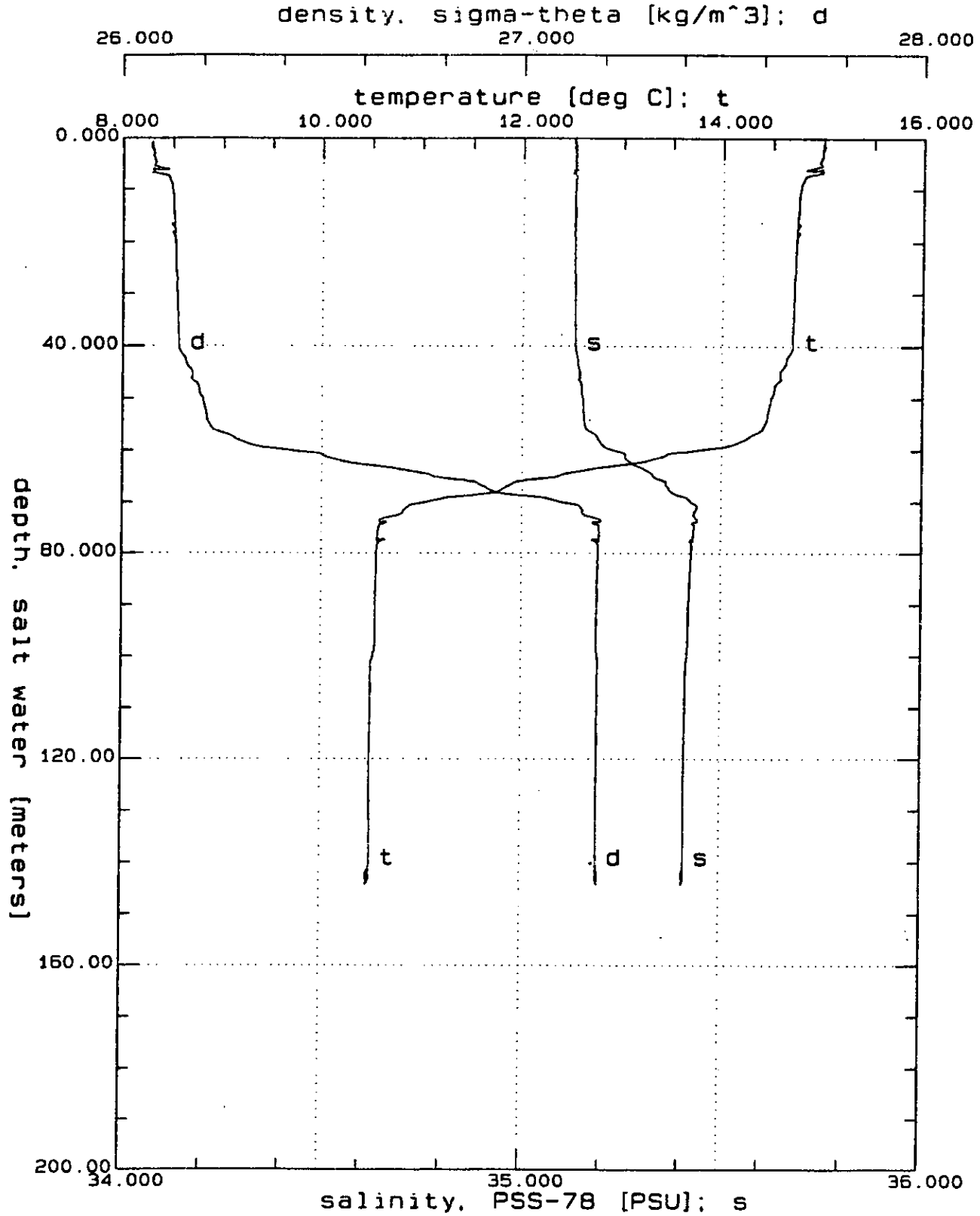
Date: 29.09.93

DOWNCAST: starttime: 02h28

Bathy depth: 168 m

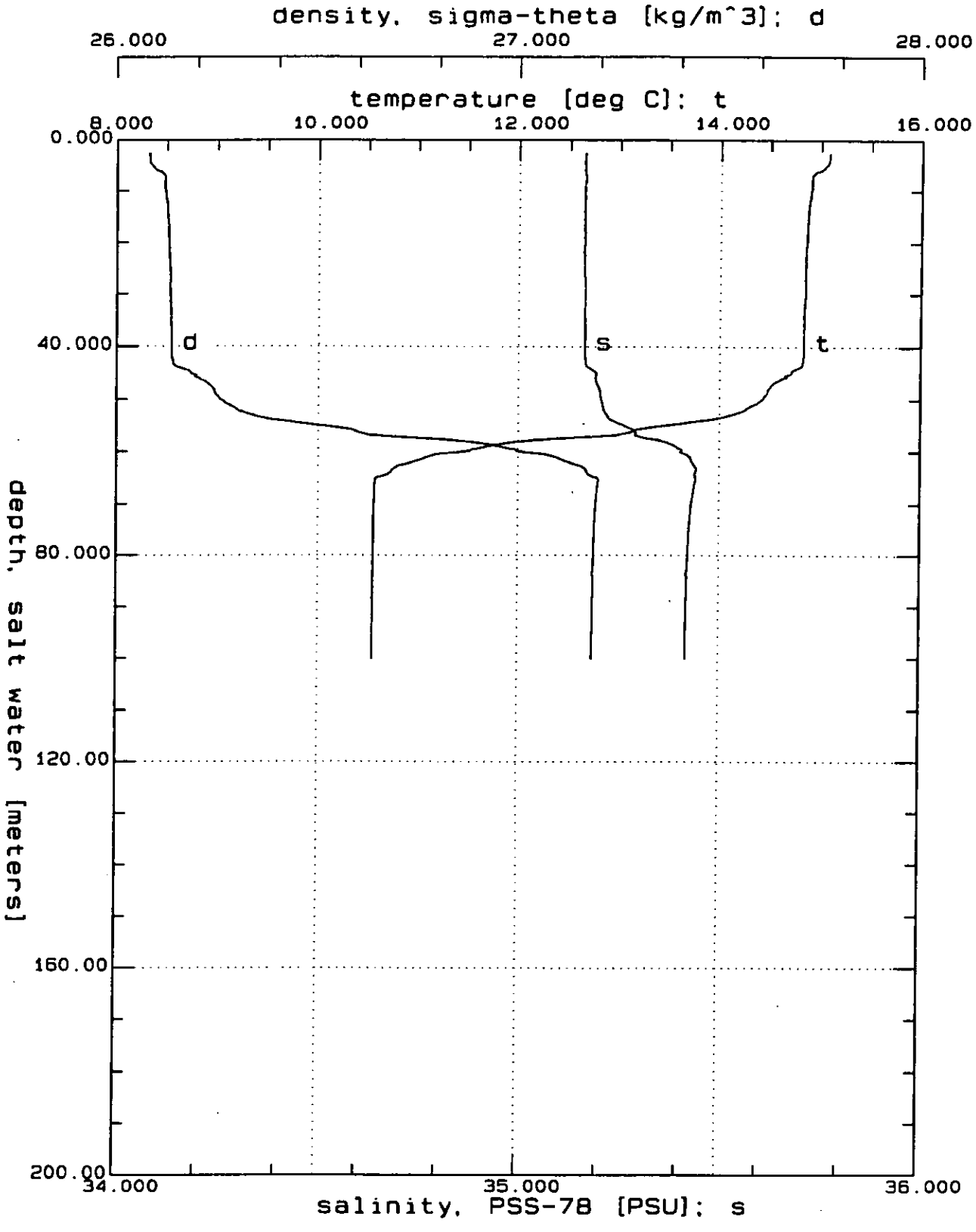
sampling			SCTD values				
depth	bottle type	no of bottles	depth (m)	temp. (°C)	salinity (ppt)	DO (ml/l)	density sig. Θ
Surf.	Ni	1	3.9	14.75	35.49	5.97	26.40
20	GoT	1	20.5	14.73	35.49	5.99	26.41
40	Ni	2	39.2	14.53	35.48	5.79	26.45
60	Ni	2	59.0	14.02	35.50	5.63	26.57
60	GoT	1	59.0	14.02	35.50	5.63	26.57
80	Ni	2	79.8	12.93	35.53	5.44	26.82
150	GoT	1	149.6	12.46	35.55	5.33	26.93
150	Ni	2	149.6	12.46	35.55	5.33	26.93
Surface			6.3	14.75	35.49	5.83	26.40
Bottom							

5. Sea-Bird SBE9 SCTD vertical profiles.



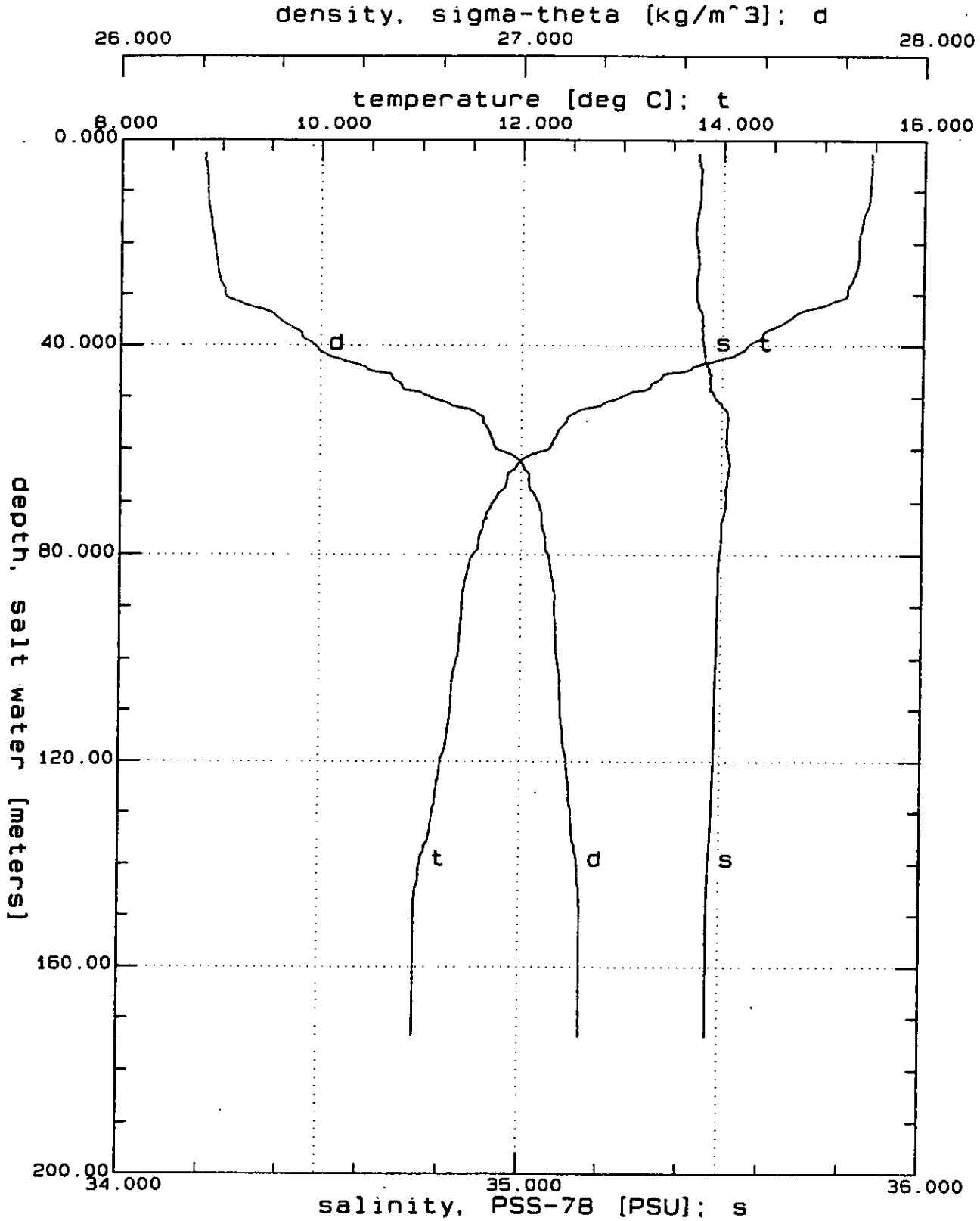
GLCH01A.CNV: Station 1 23.09.93 at 18h18.

Figure 5



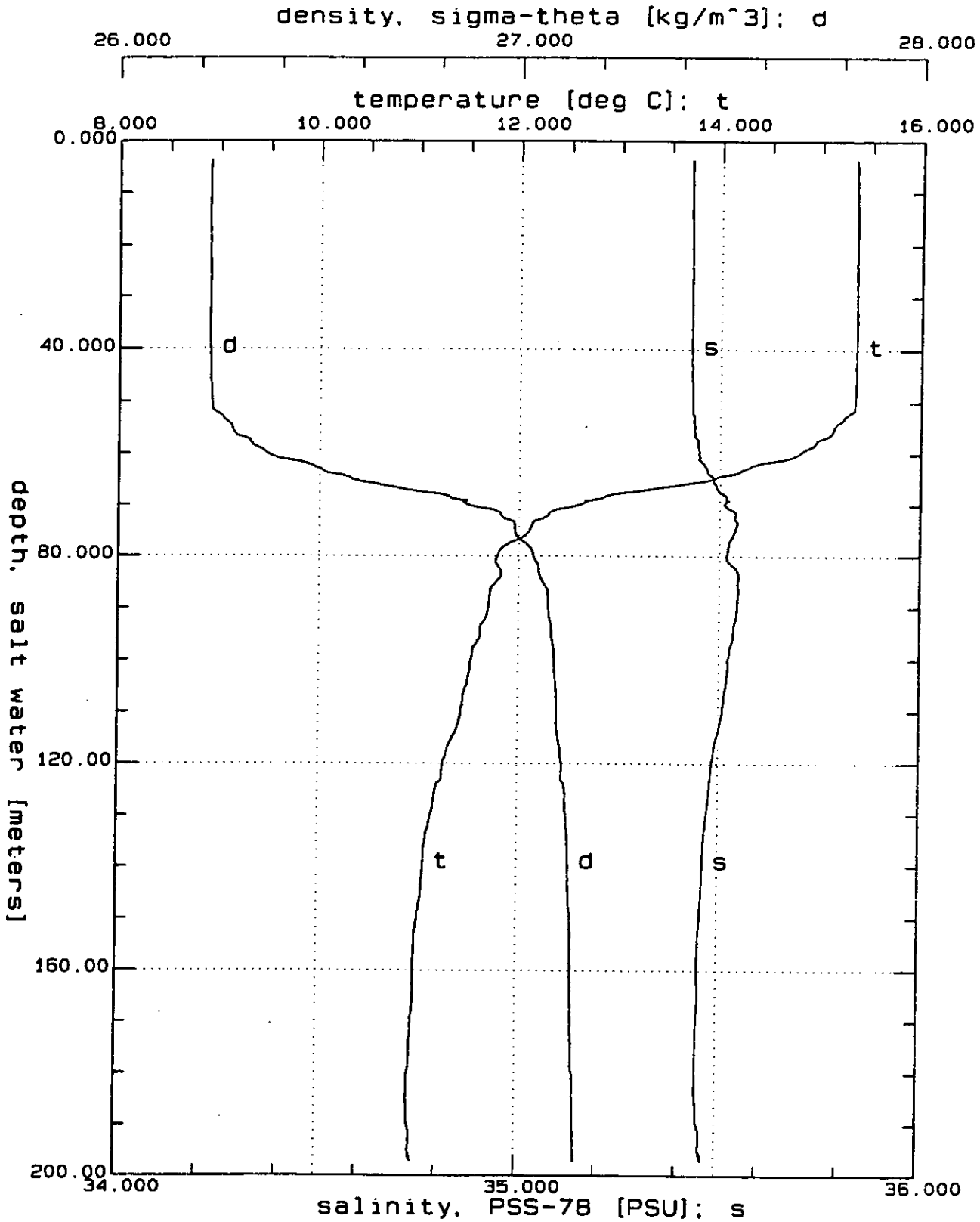
GLCH01C.CNV: Station 1C 23.09.93 at 20h45.

Figure 6



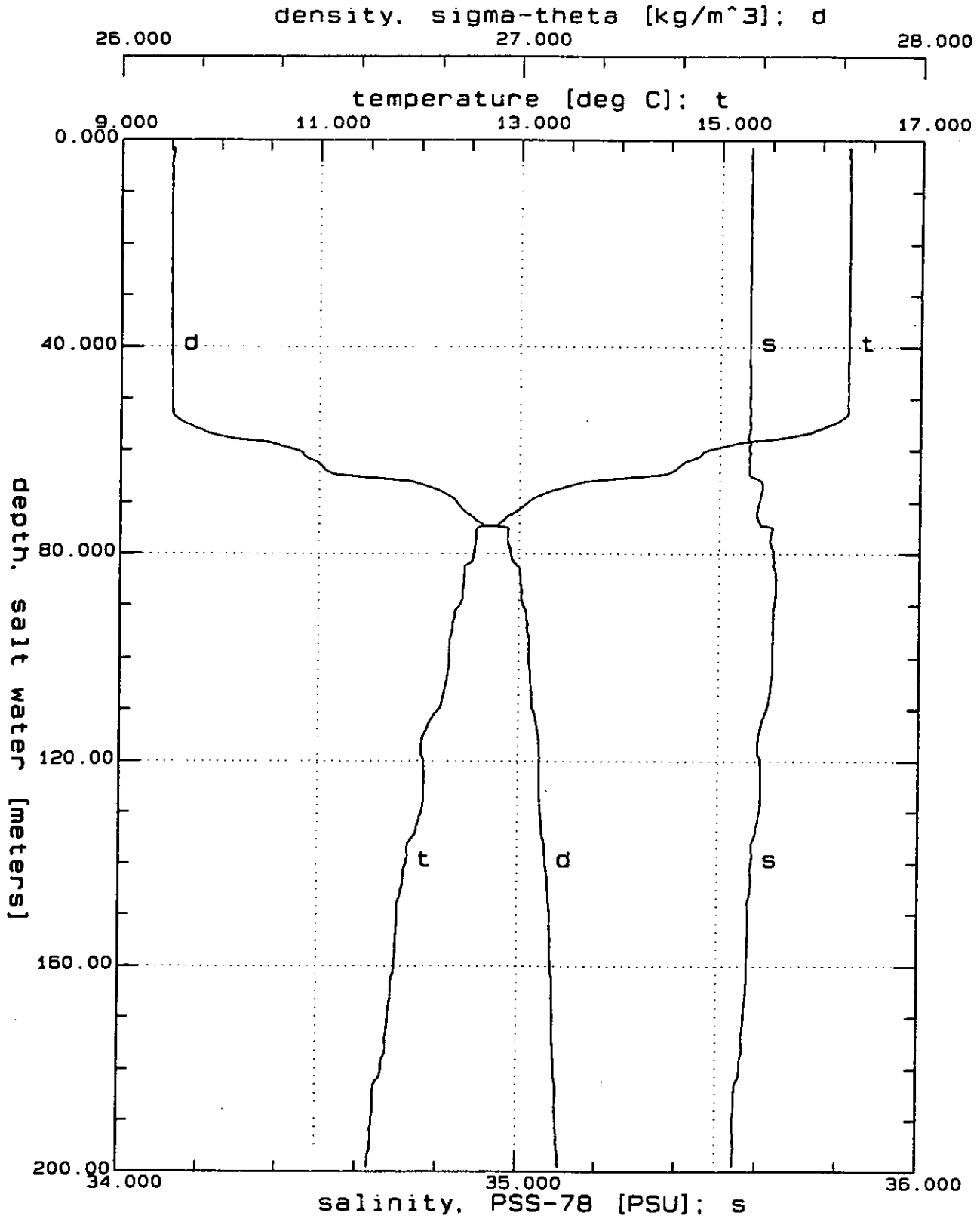
GLCH02A.CNV: Station 2 24.09.93 at 01h16.

Figure 7



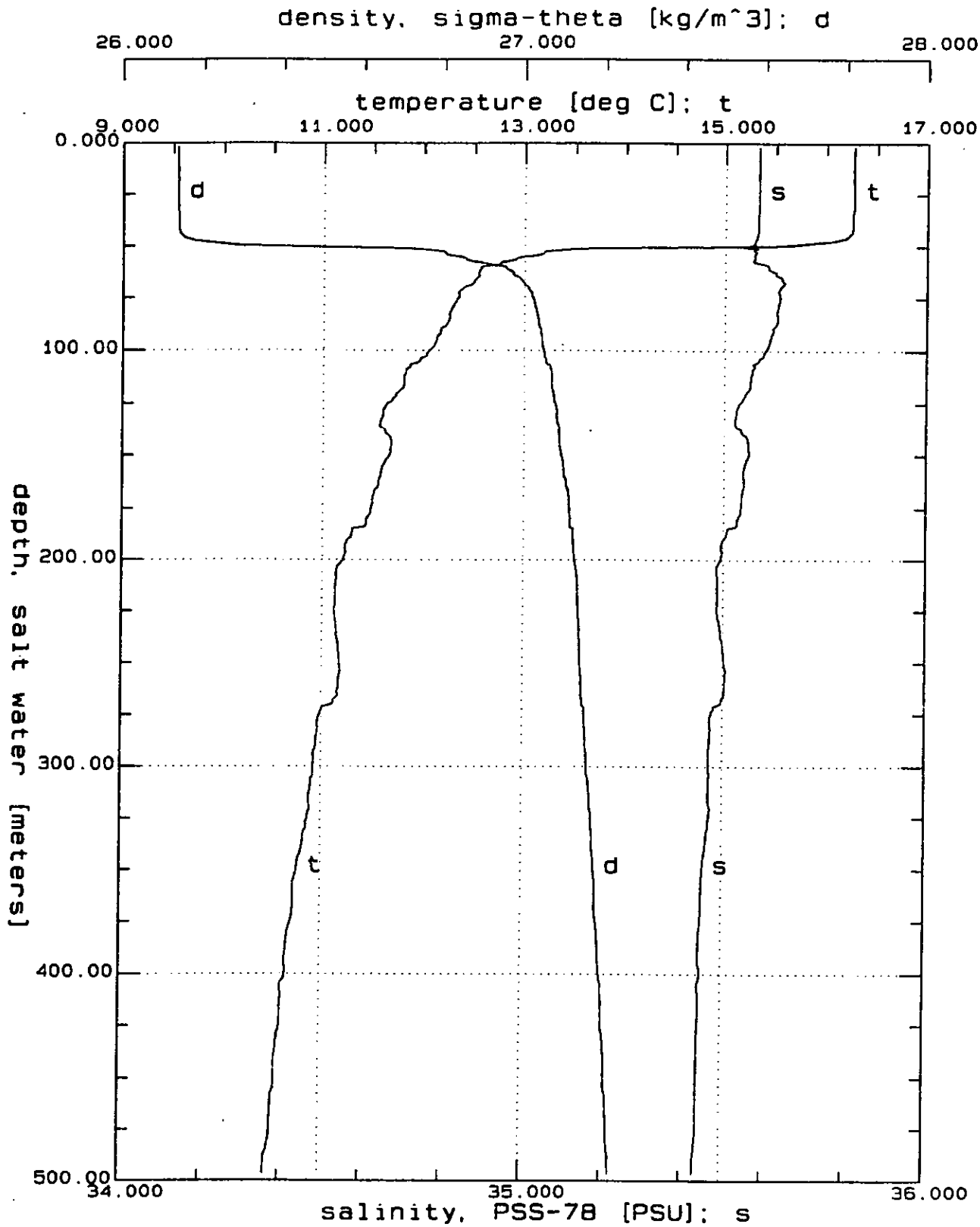
GLCH03A.CNV: Station 3 24.09.93 at 06h29.

Figure 8



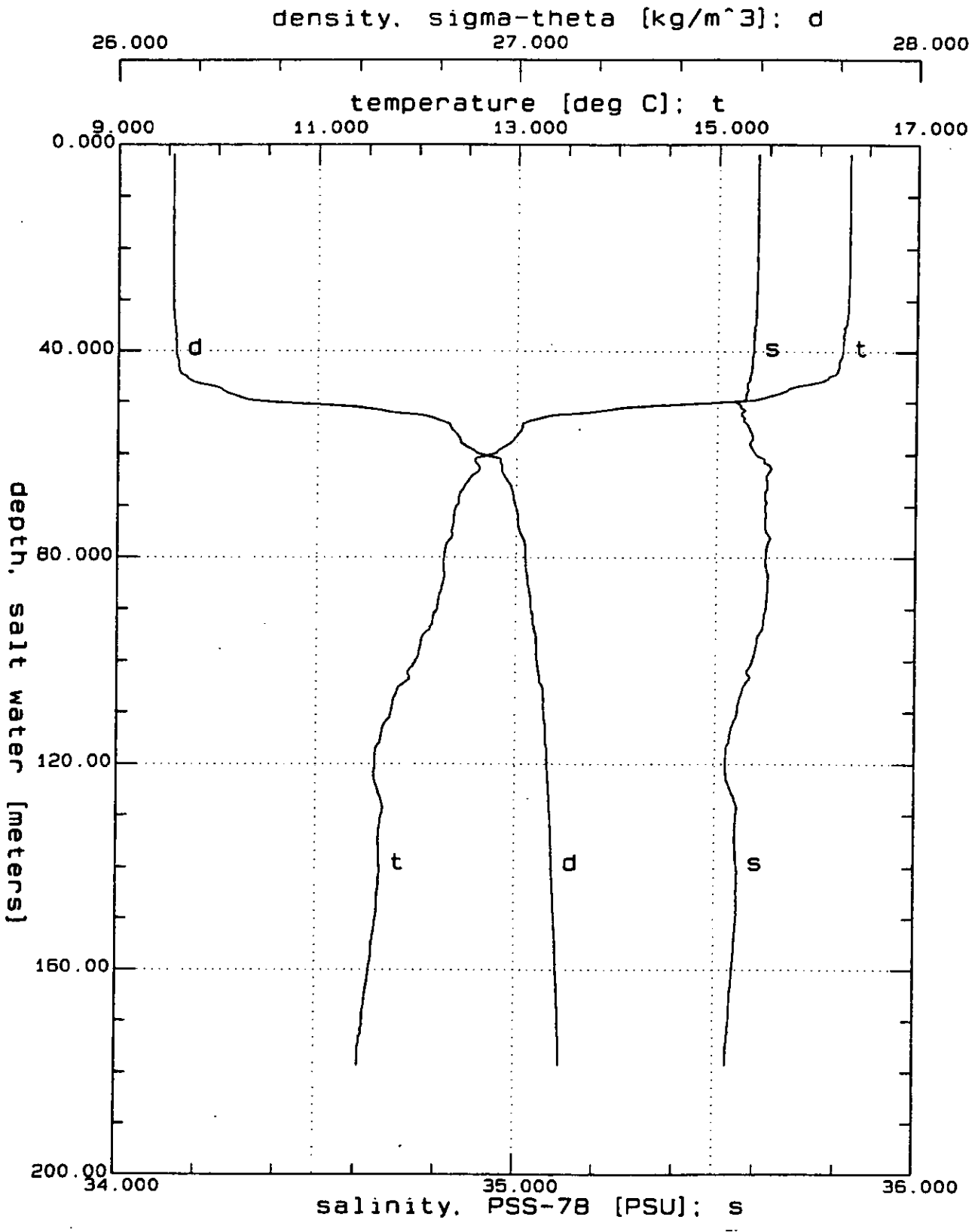
GLCH04A.CNV: Station 4 25.09.93 at 09h41.

Figure 9



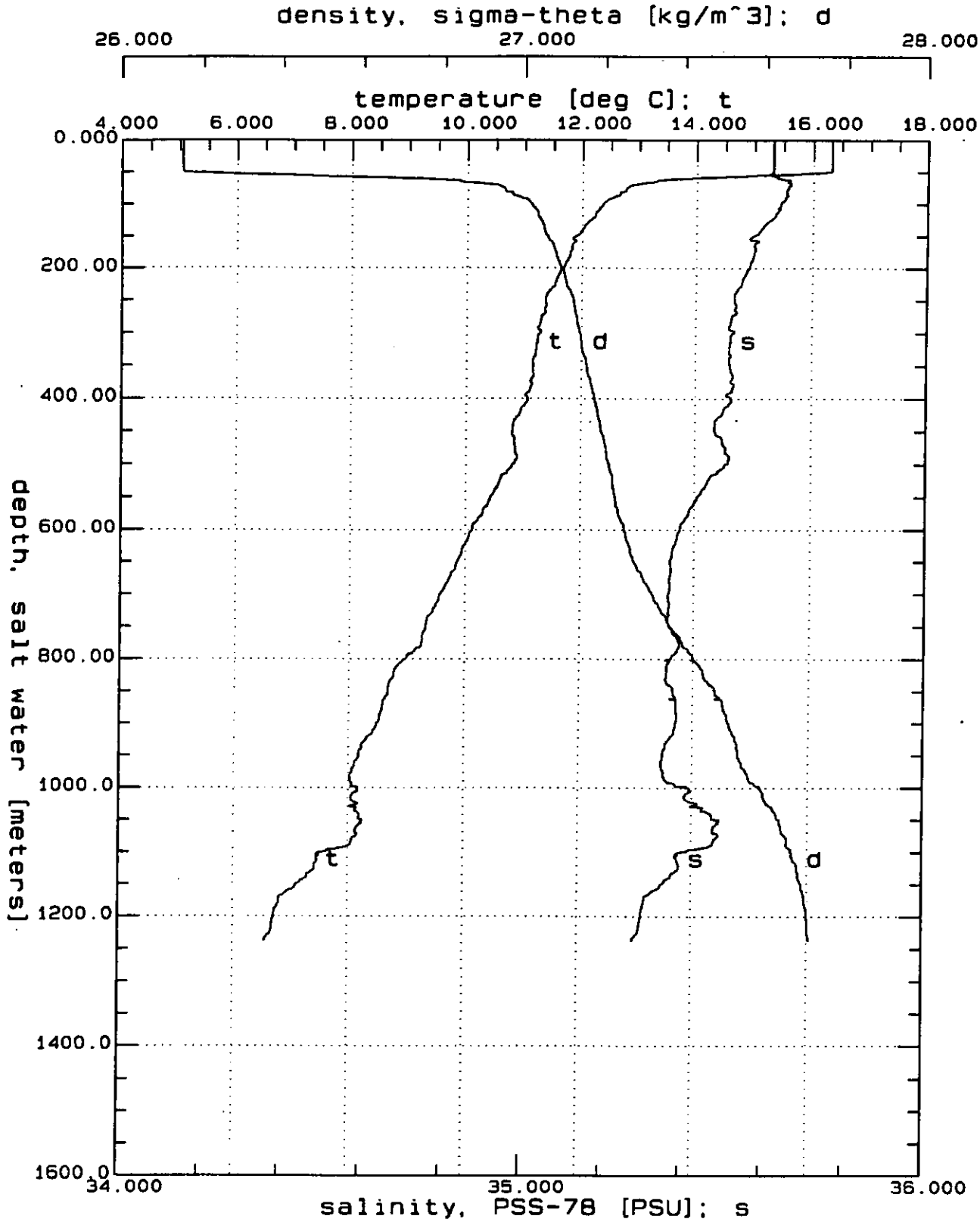
GLCH04B.CNV: Station 4B 25.09.93 at 14h35.

Figure 10



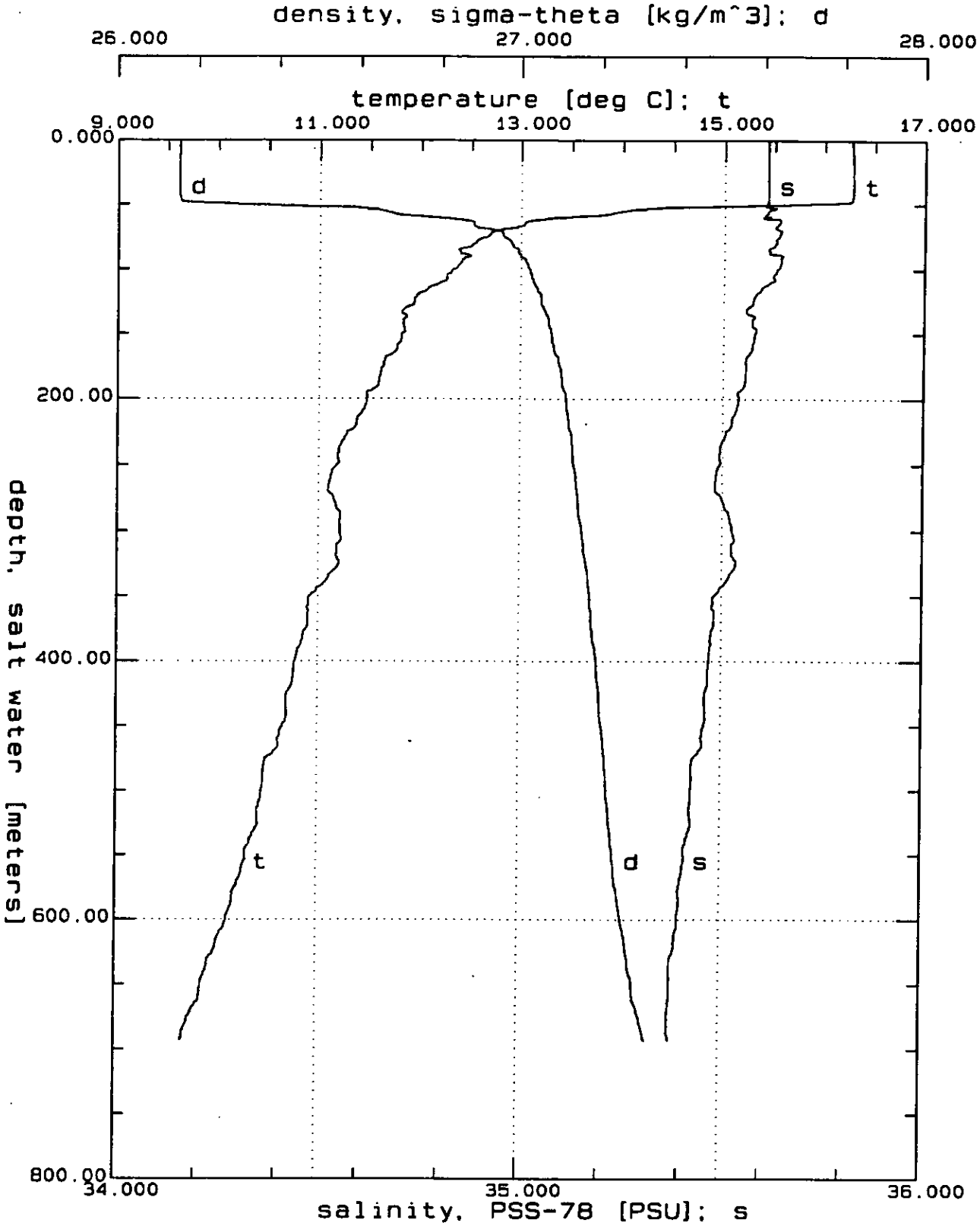
GLCH04C.CNV: Station 4C 25.09.93 at 17h46.

Figure 11



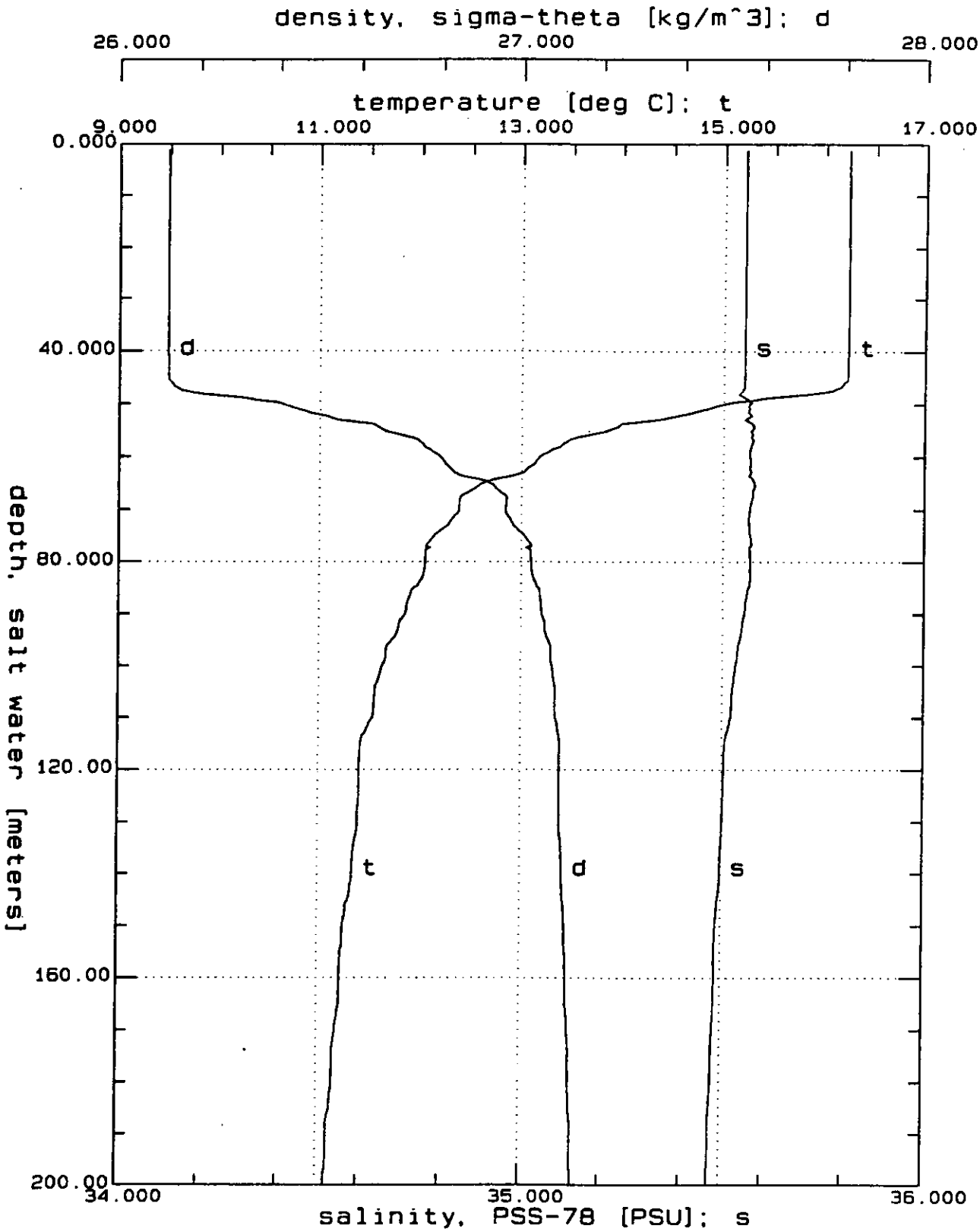
GLCH04D.CNV: Station 4D 25.09.93 at 19h21.

Figure 12



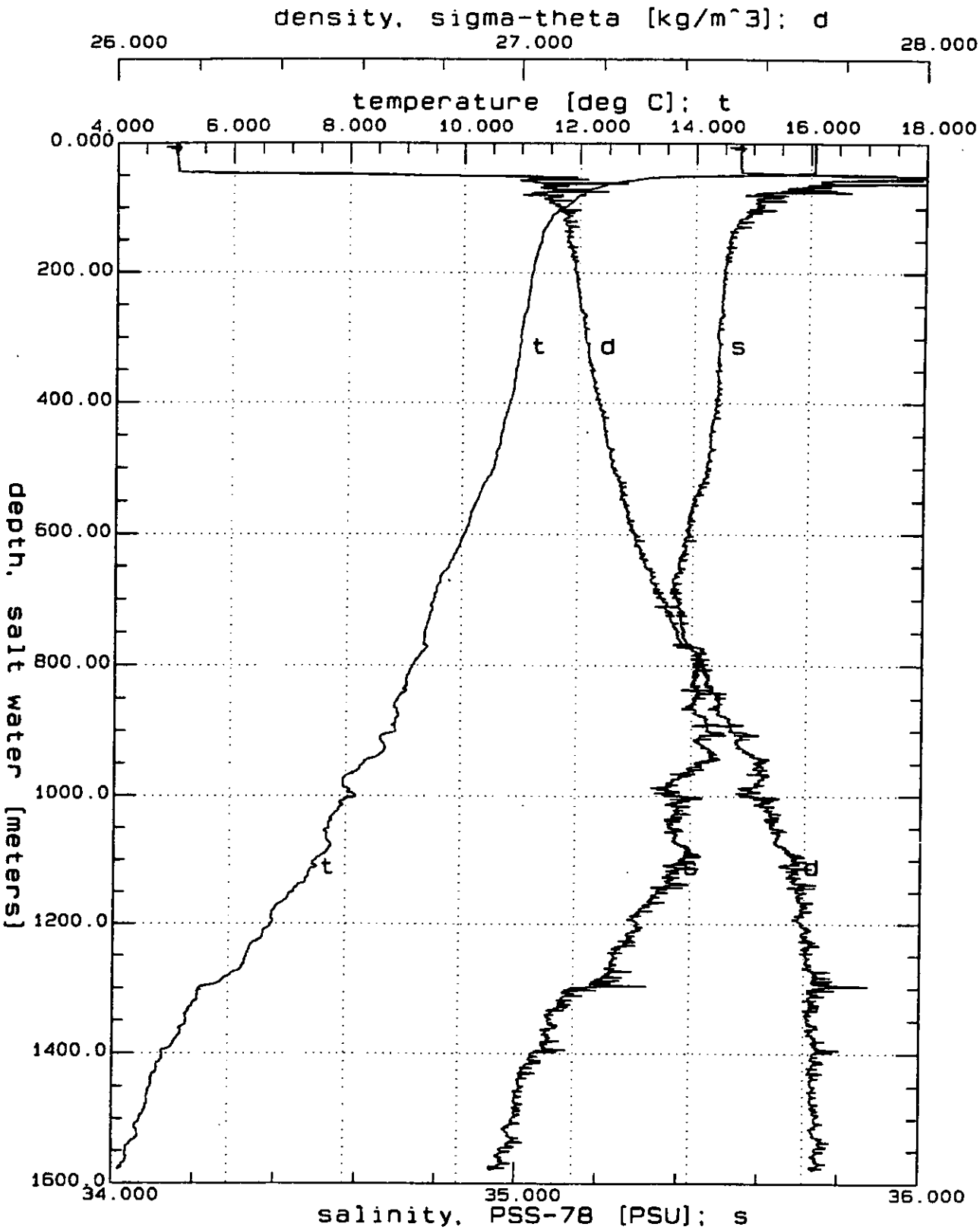
GLCH04E.CNV: Station 4E 25.09.93 at 21h55.

Figure 13



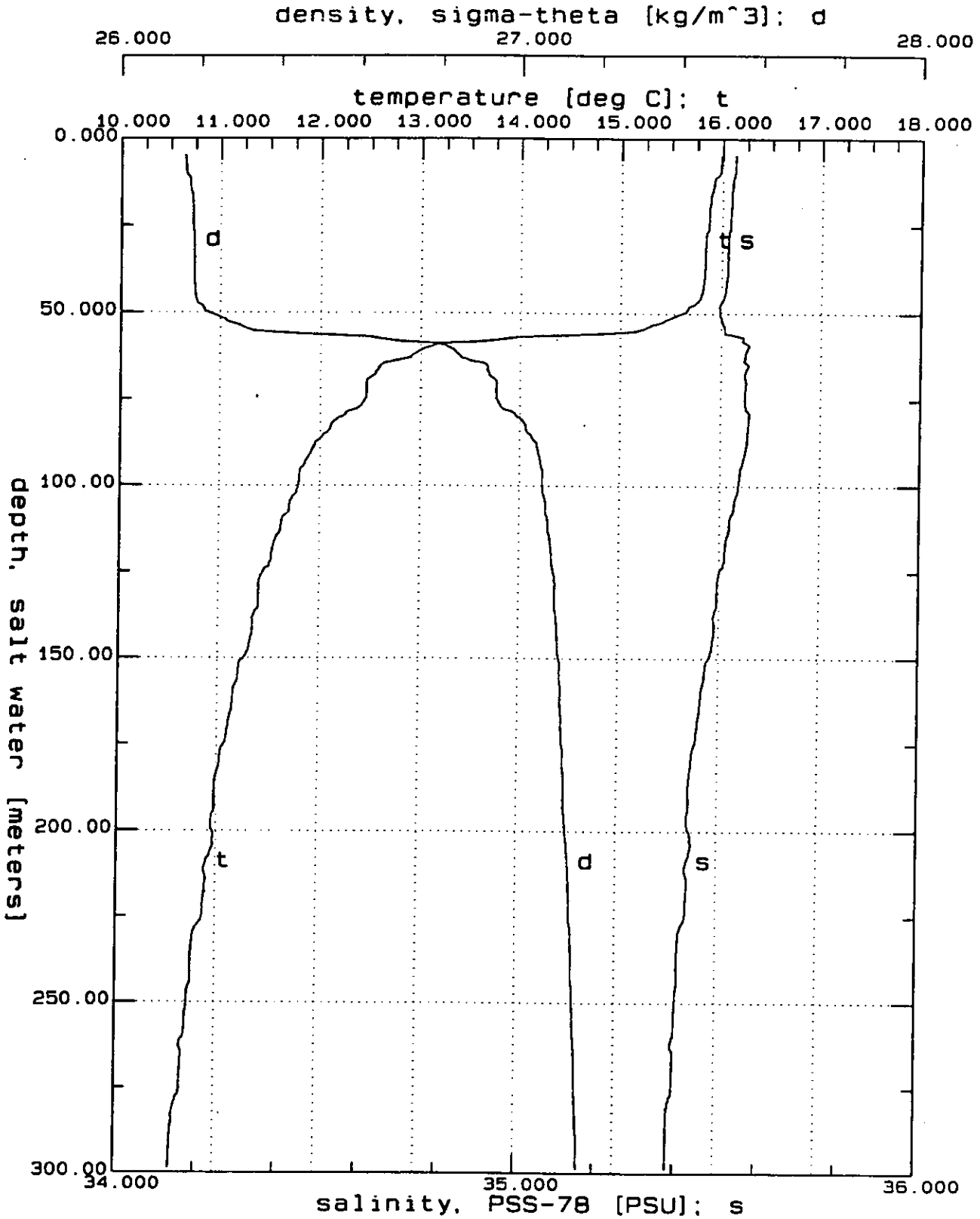
GLCH05A.CNV: Station 5A 26.09.93 at 07h12.

Figure 14



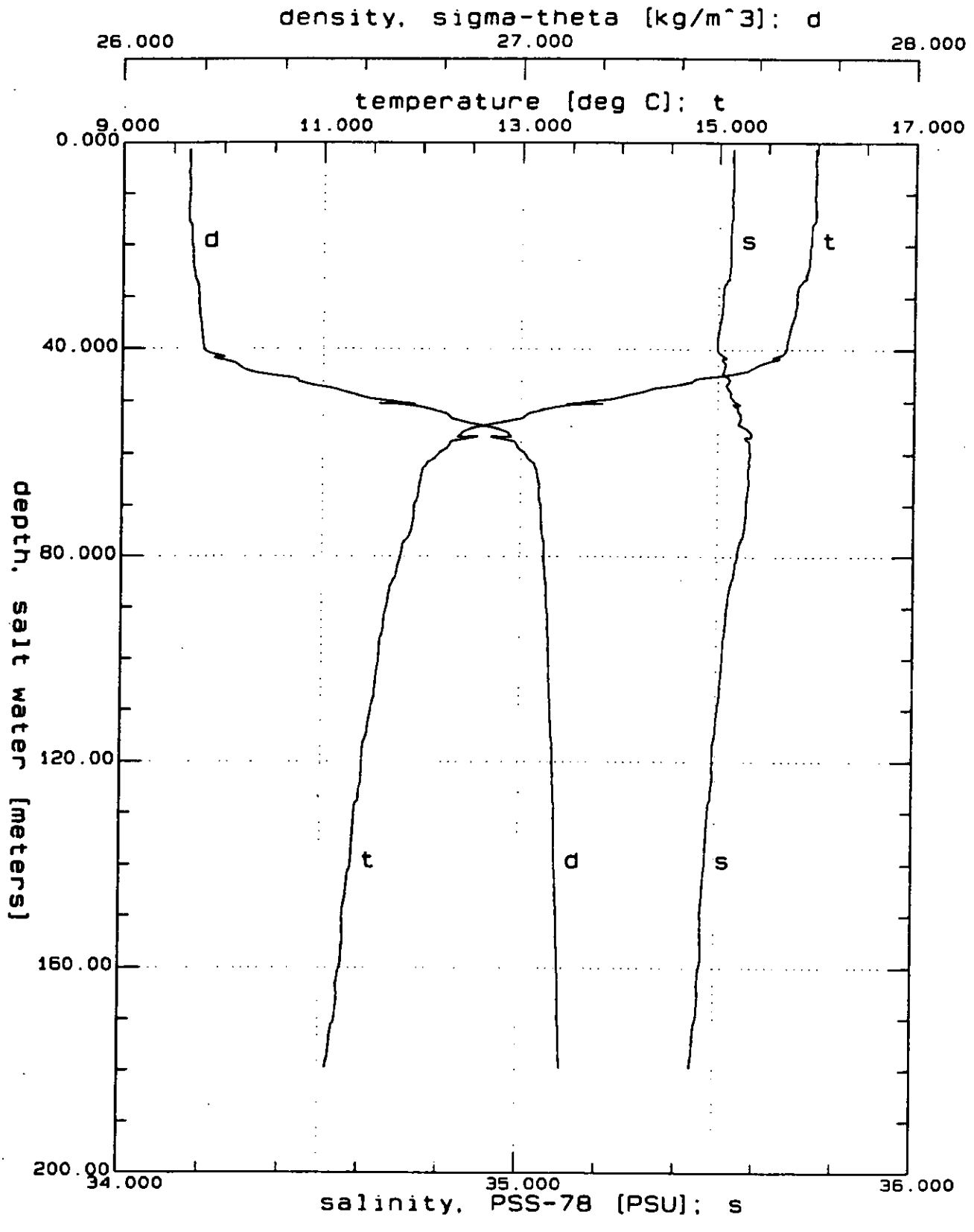
GLCH05B.CNV: Station 5B 26.09.93 at 09h06.

Figure 15



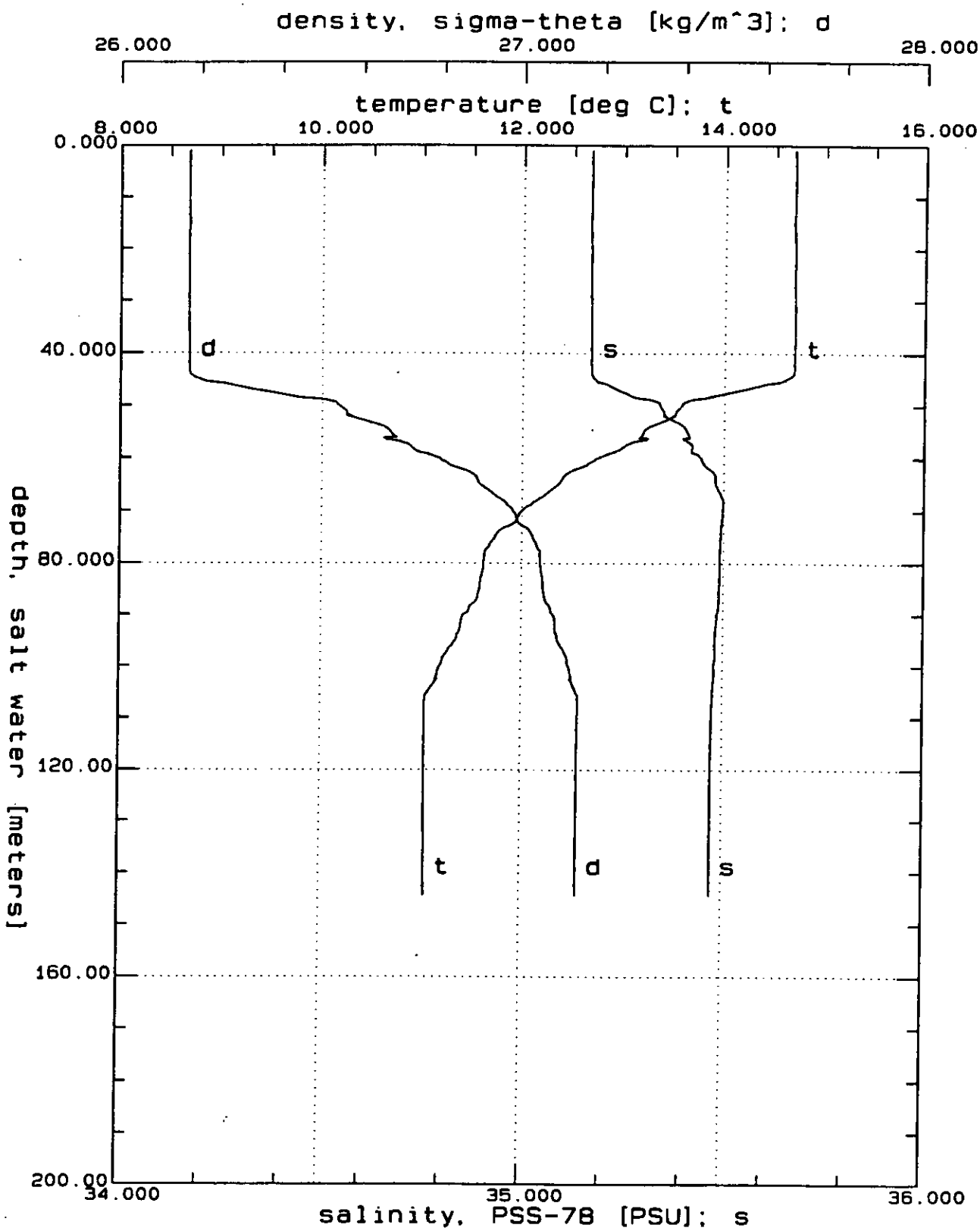
GLCH05D.CNV: Station 5D 26.09.93 at 15h26.

Figure 16



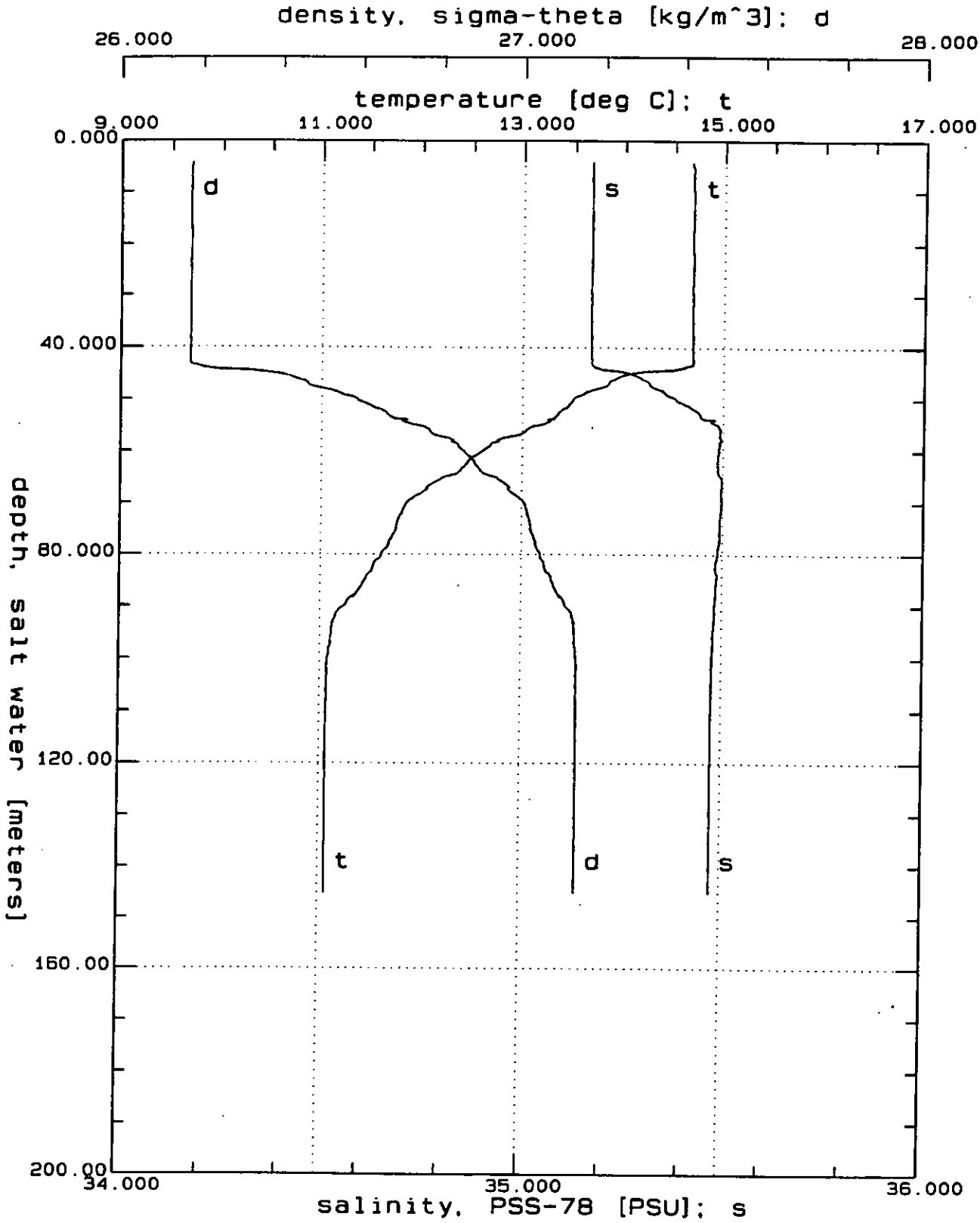
GLCH05F.CNV: Station 5F 26.09.93 at 19h36.

Figure 17



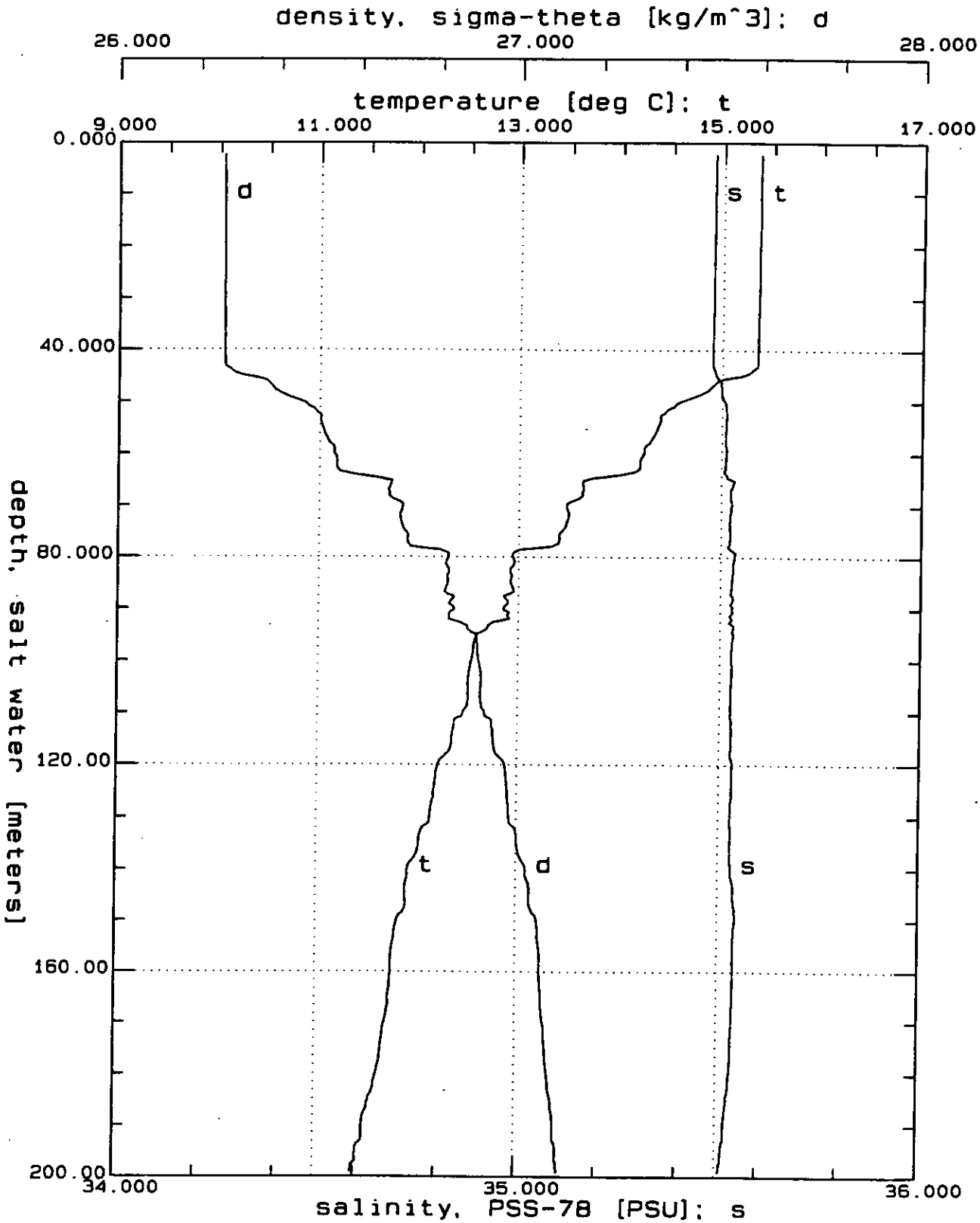
GLCH06A.CNV: Station 6A 27.09.93 at 06h30.

Figure 18



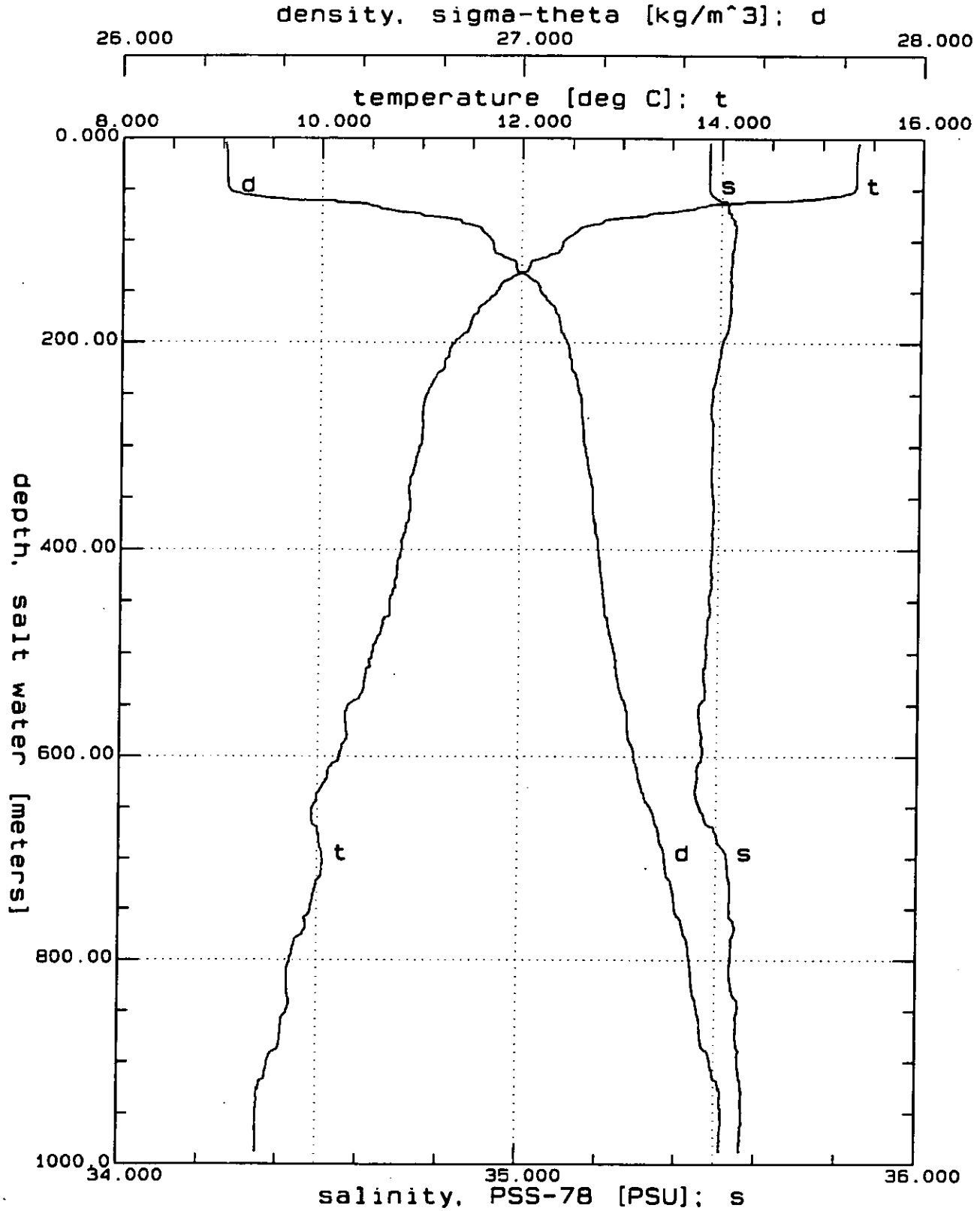
GLCH06B.CNV: Station 68 27.09.93 at 07h38.

Figure 19



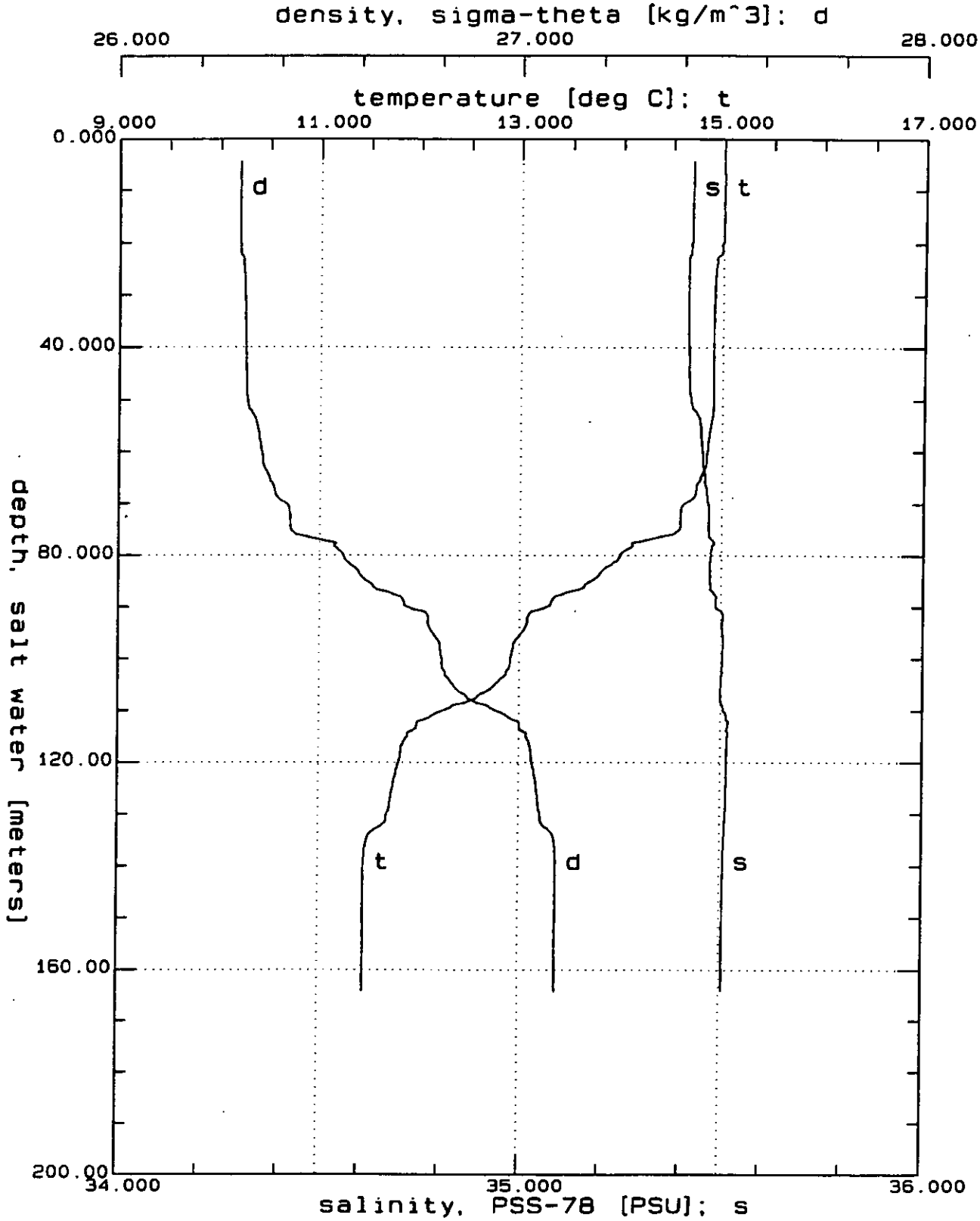
GLCH07A.CNV: Station 7A 27.09.93 at 11h01.

Figure 20



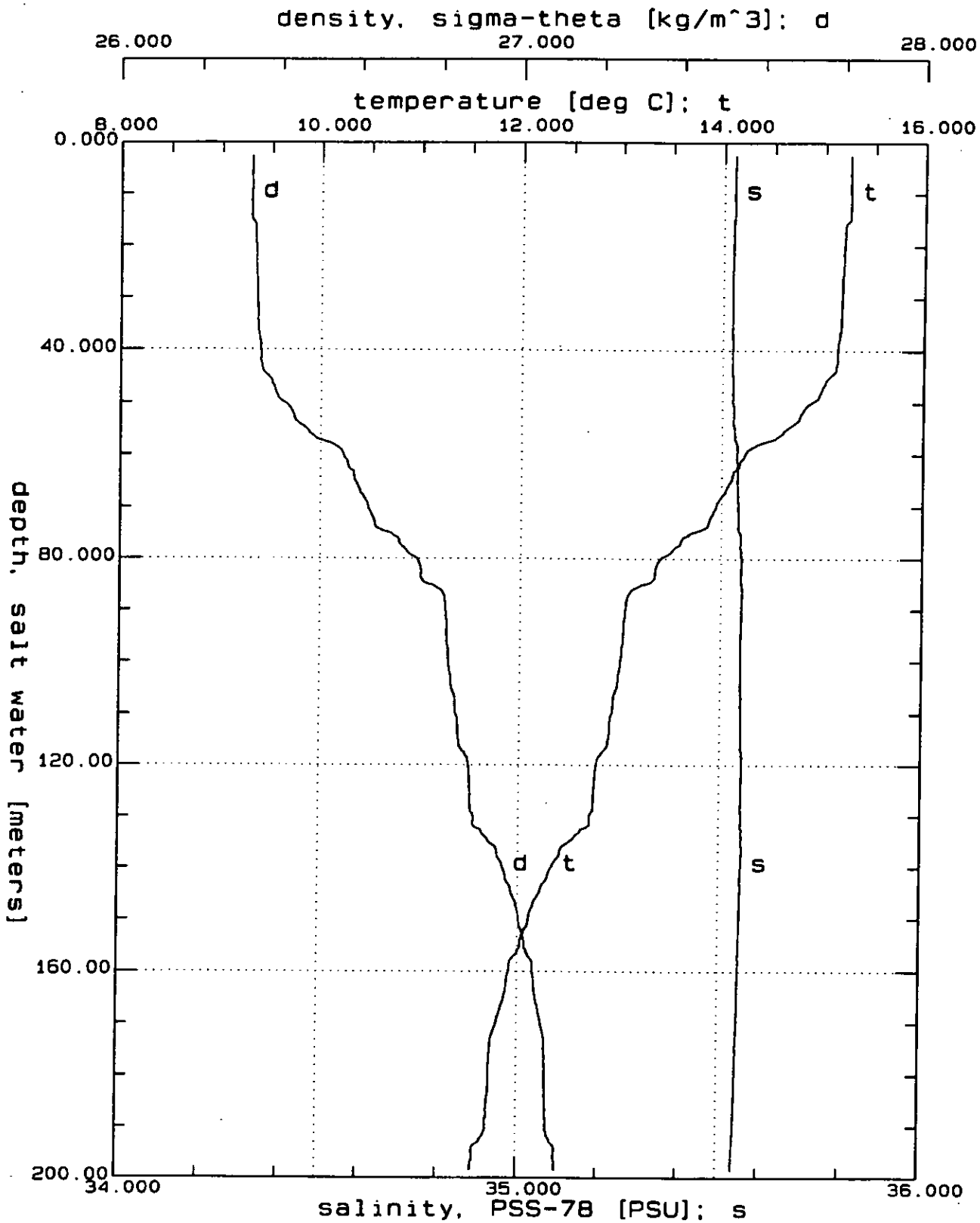
GLCH07B.CNV: Station 7B 27.09.93 at 12h37.

Figure 21



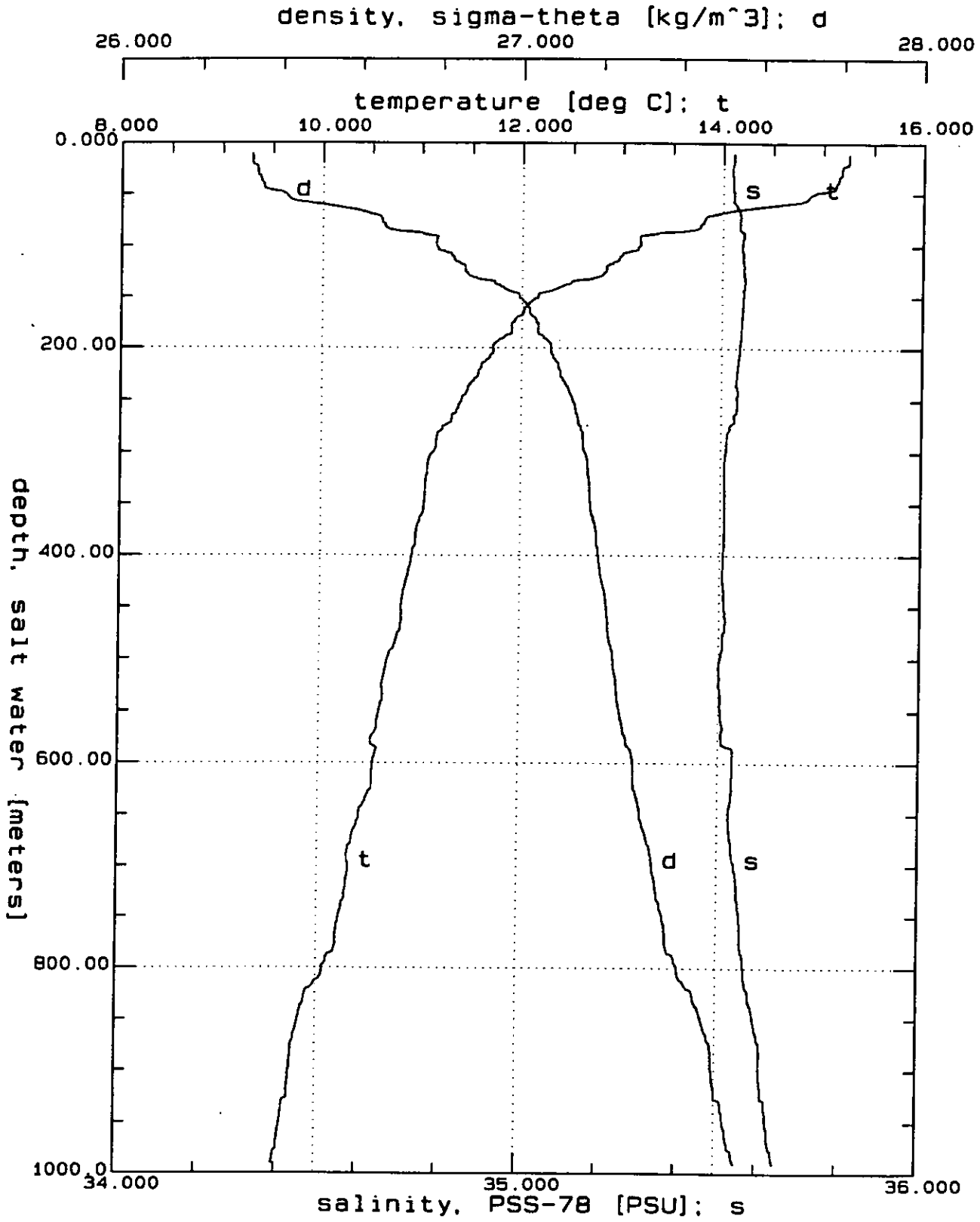
GLCH08A.CNV: Station 8A 27.09.93 at 18h34.

Figure 22



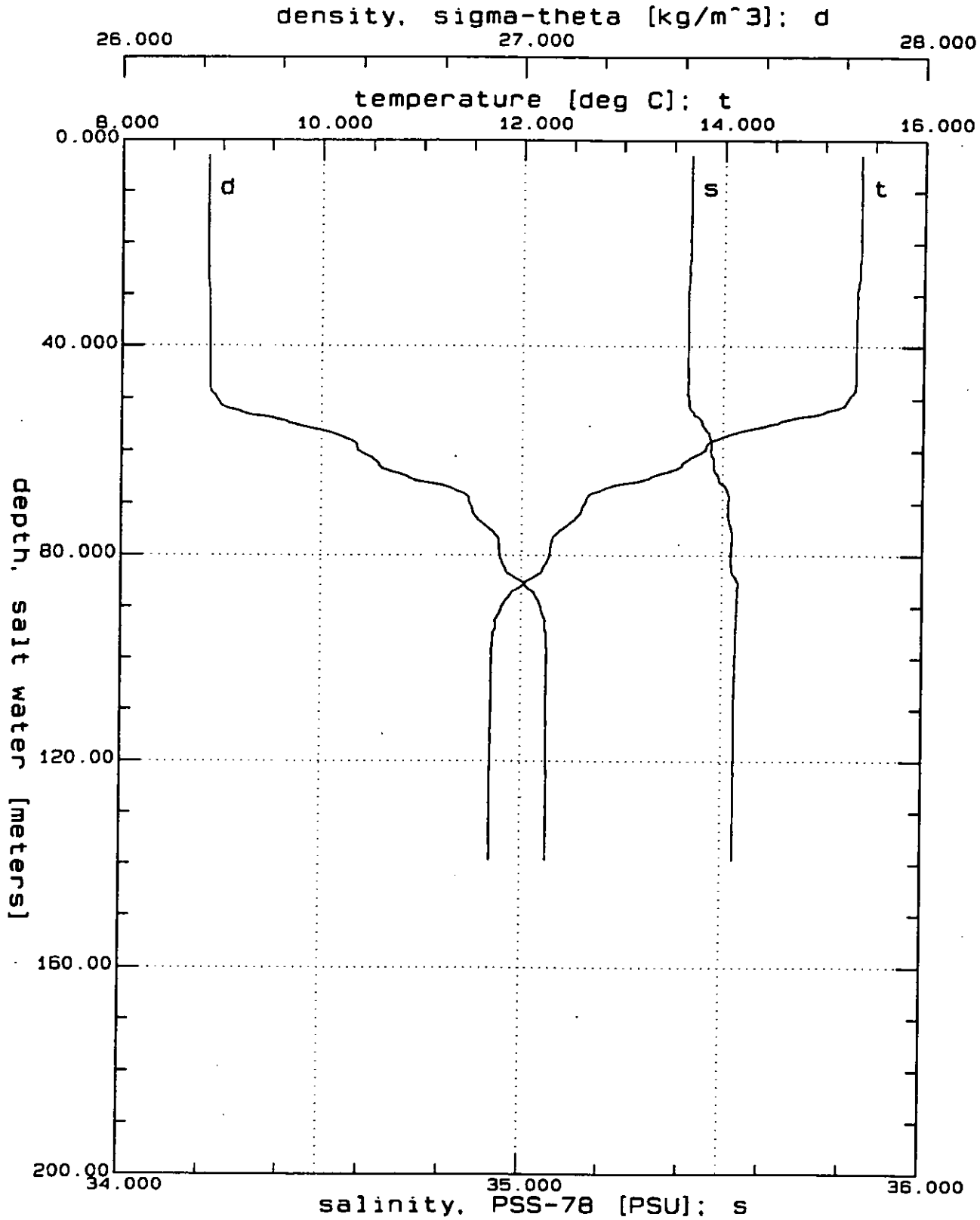
GLCH09A.CNV: Station 9A 27.09.93 at 21h54.

Figure 23



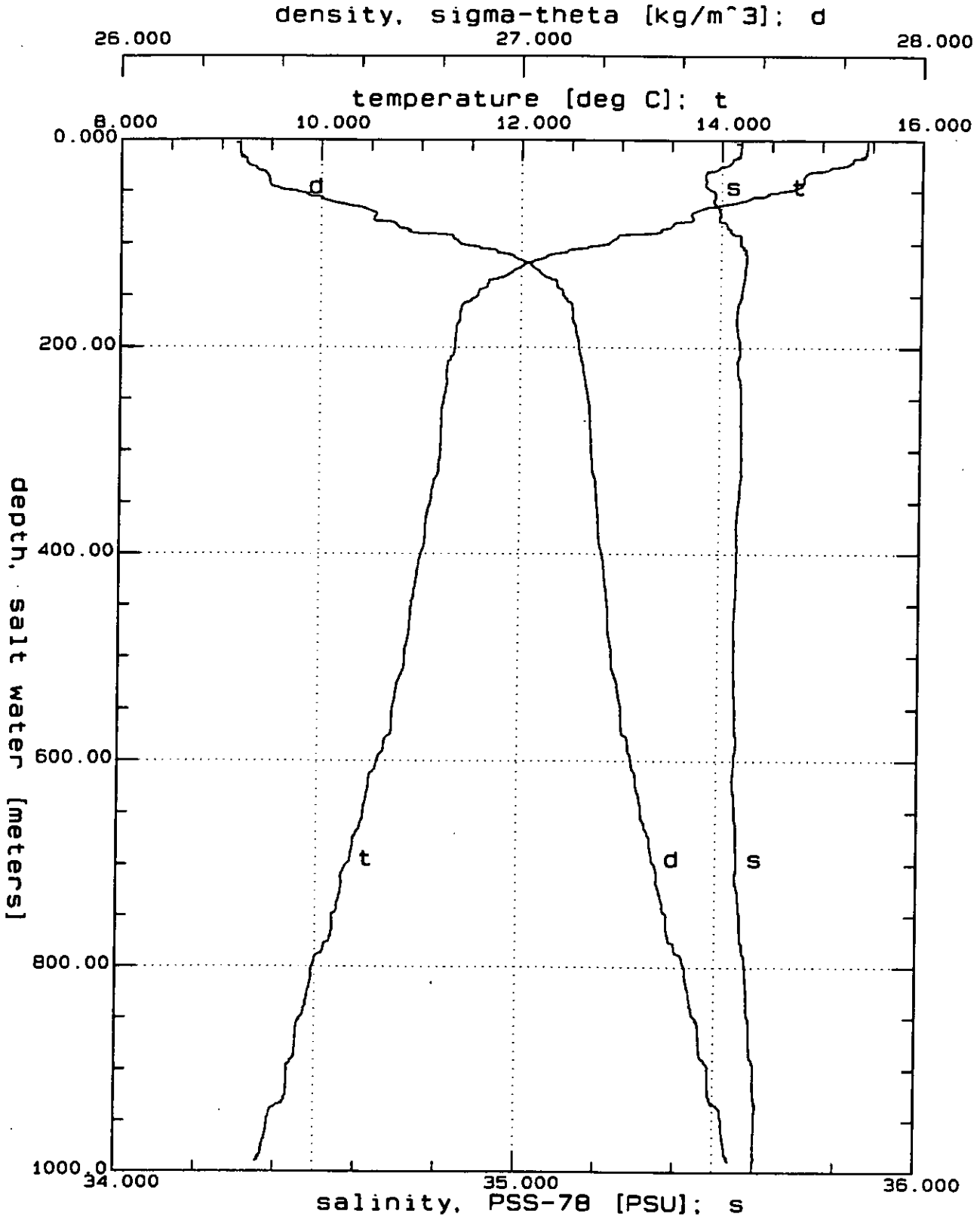
GLCH09B.CNV: Station 9B 27.09.93 at 23h03.

Figure 24



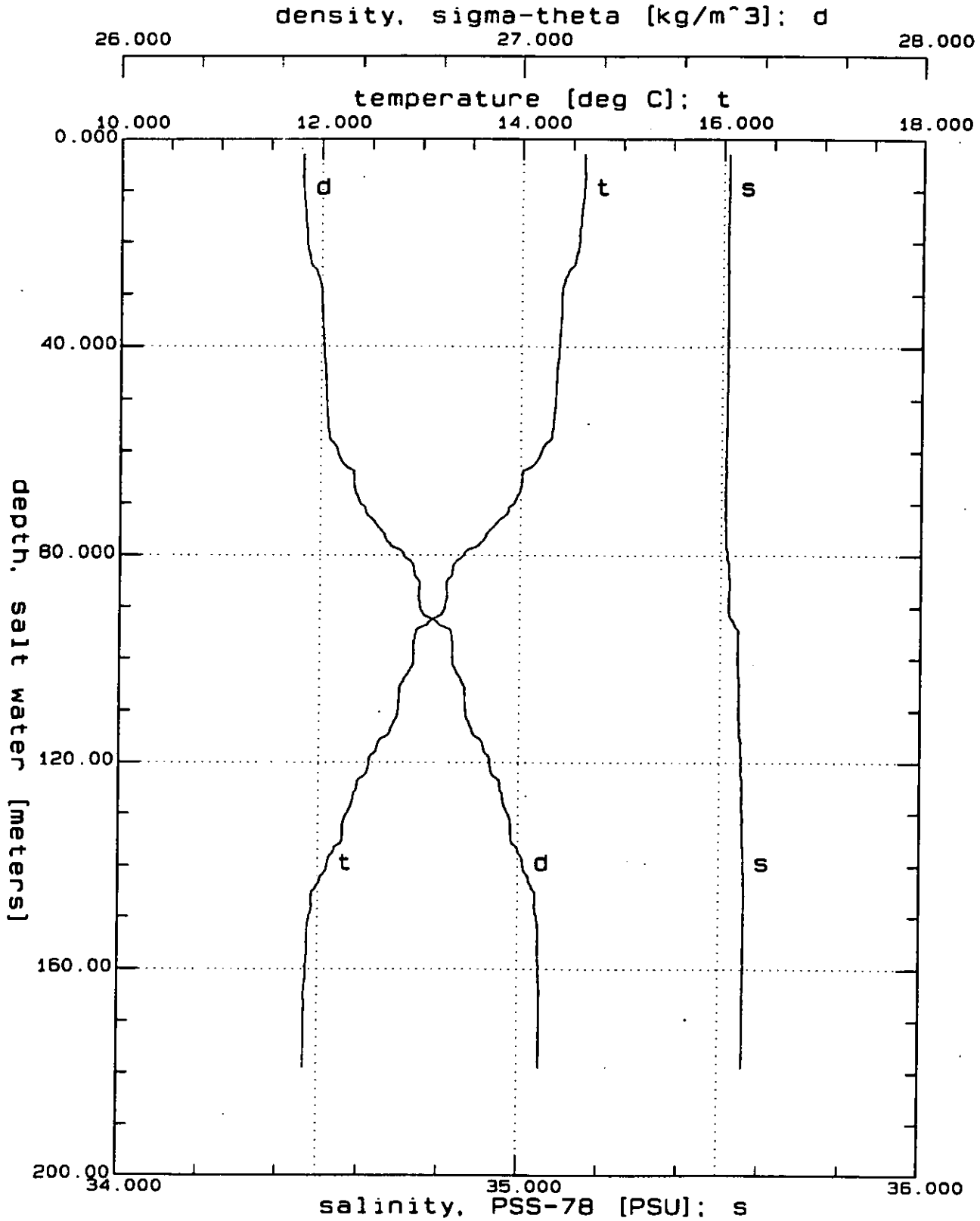
GLCH10A.CNV: Station 10A 28.09.93 at 06h28.

Figure 25



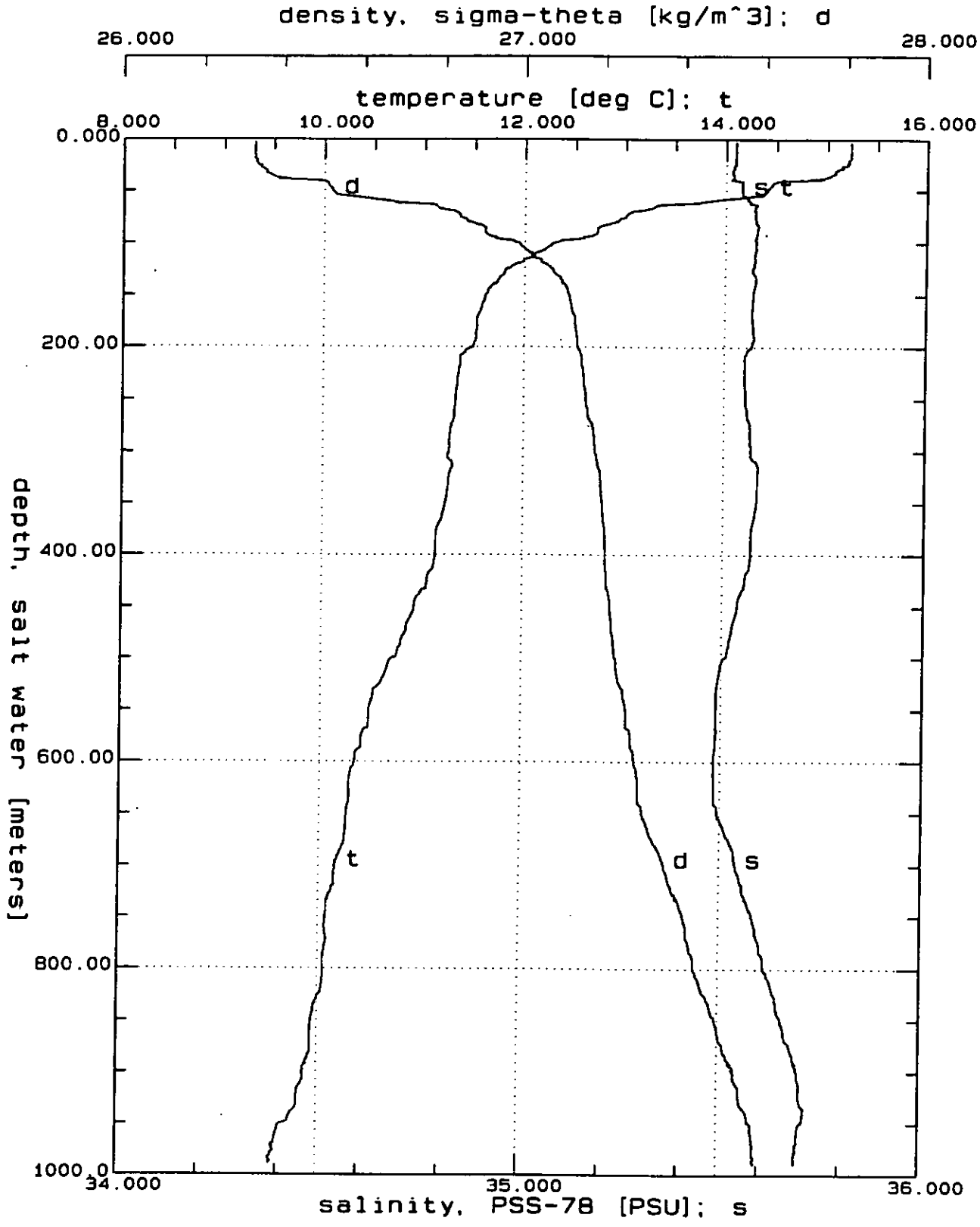
GLCH11A.CNV: Station 11A 28.09.93 at 09h51.

Figure 26



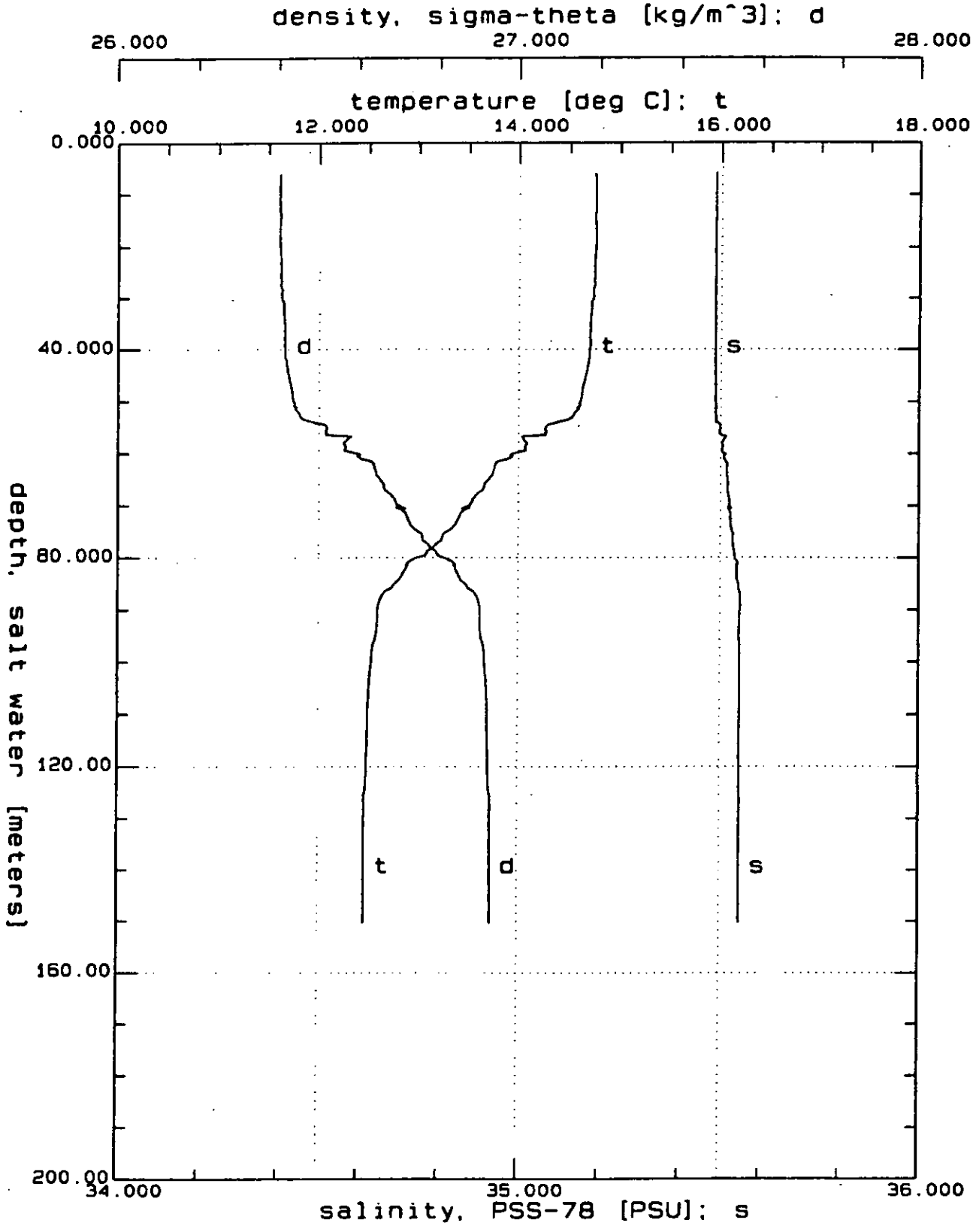
GLCH12A.CNV: Station 12A 28.09.93 at 16h05.

Figure 27



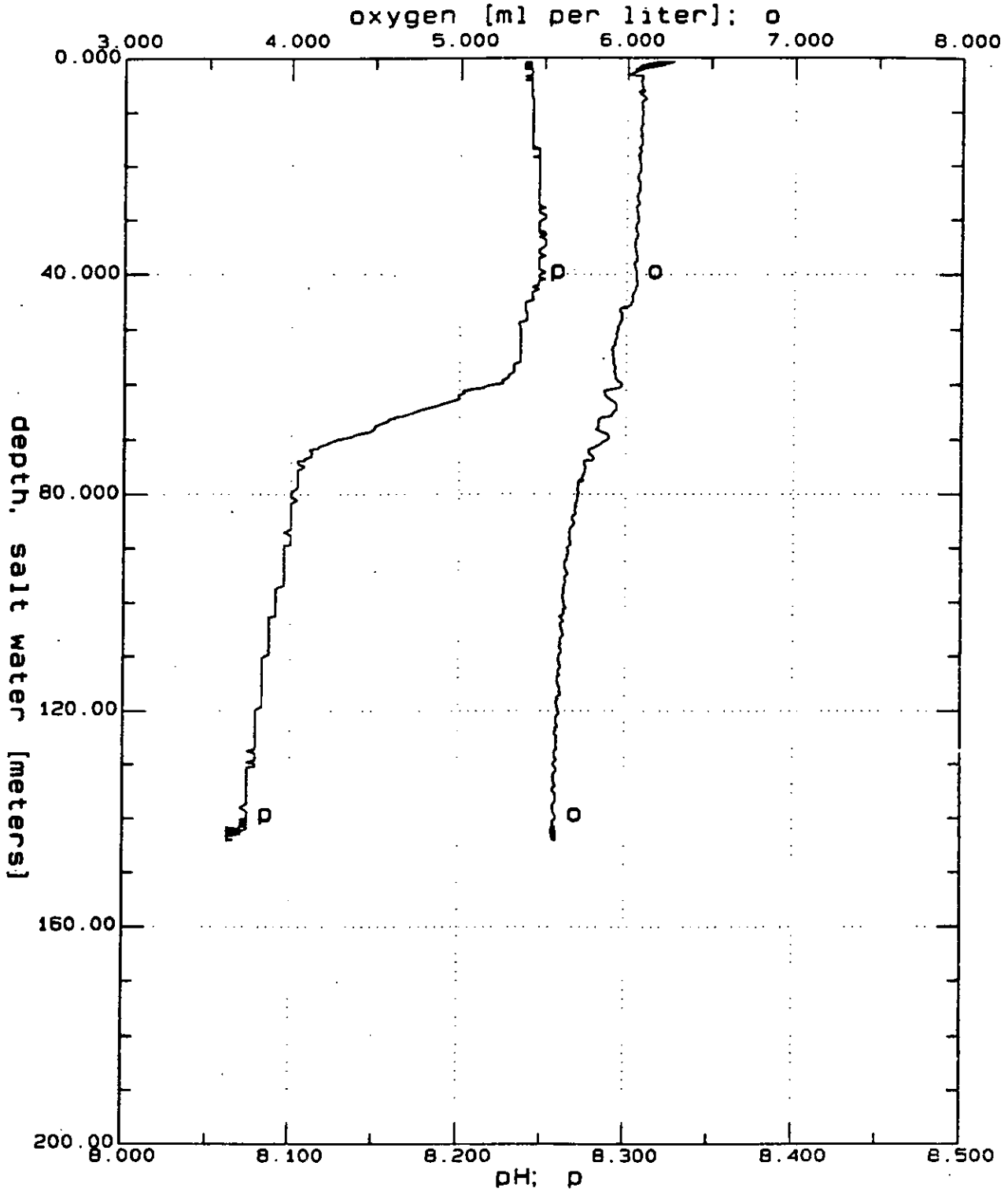
GLCH13A.CNV: Station 13A 28.09.93 at 20h11.

Figure 28



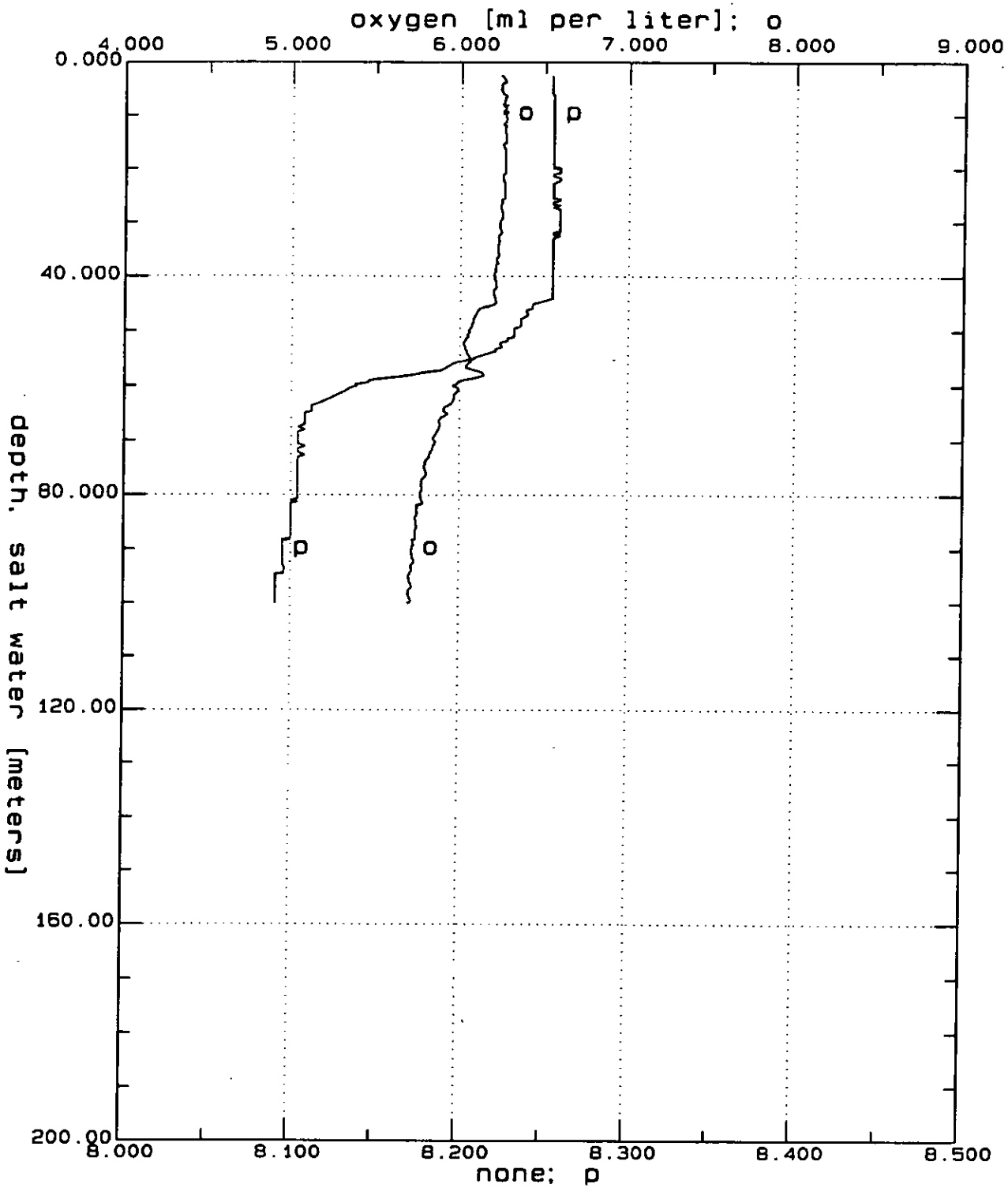
GLCH14A.CNV: Station 14A 29.09.93 at 02h28.

Figure 29



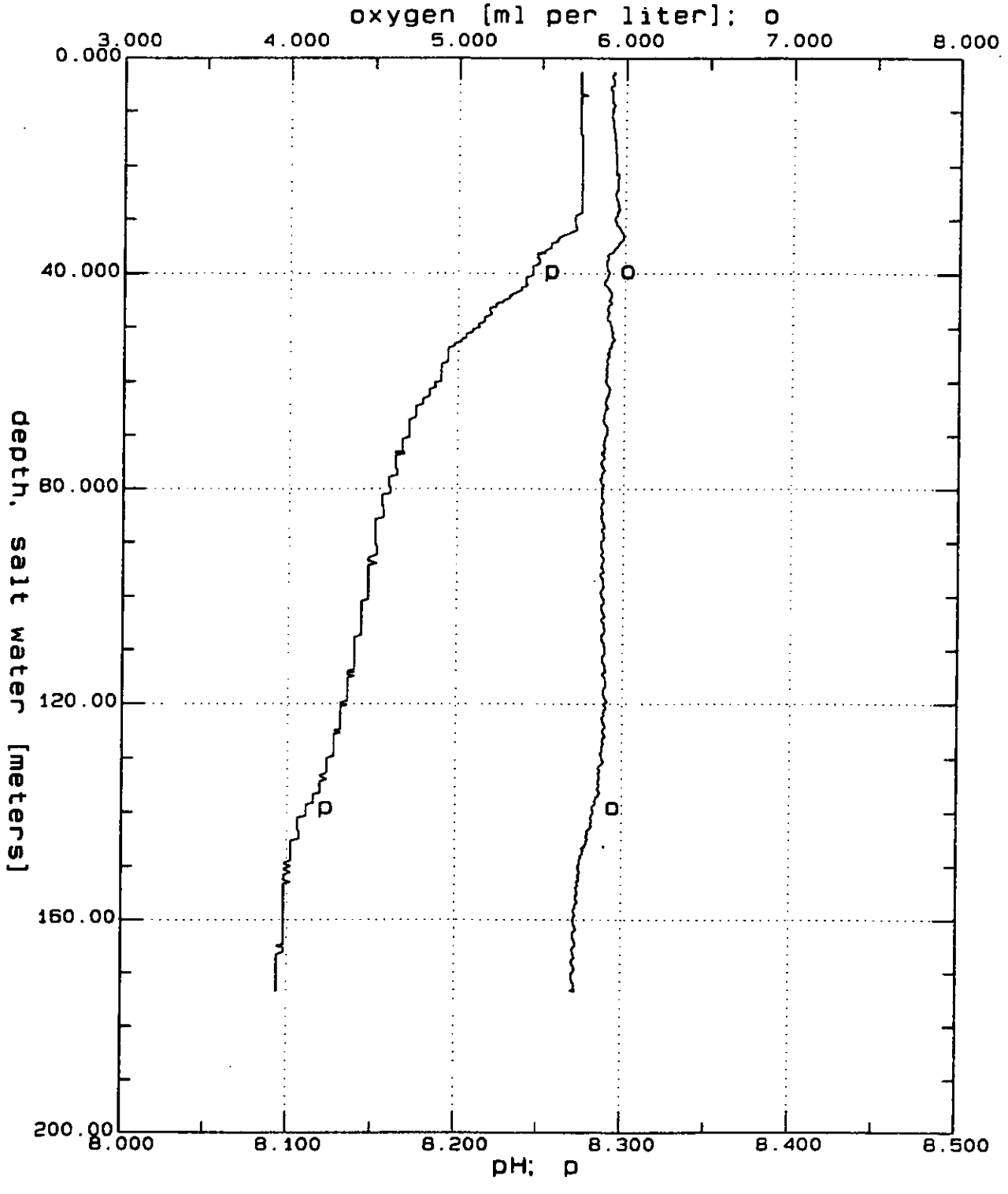
GLCH01A.CNV: Station 1 23.09.93 at 18h18.

Figure 30



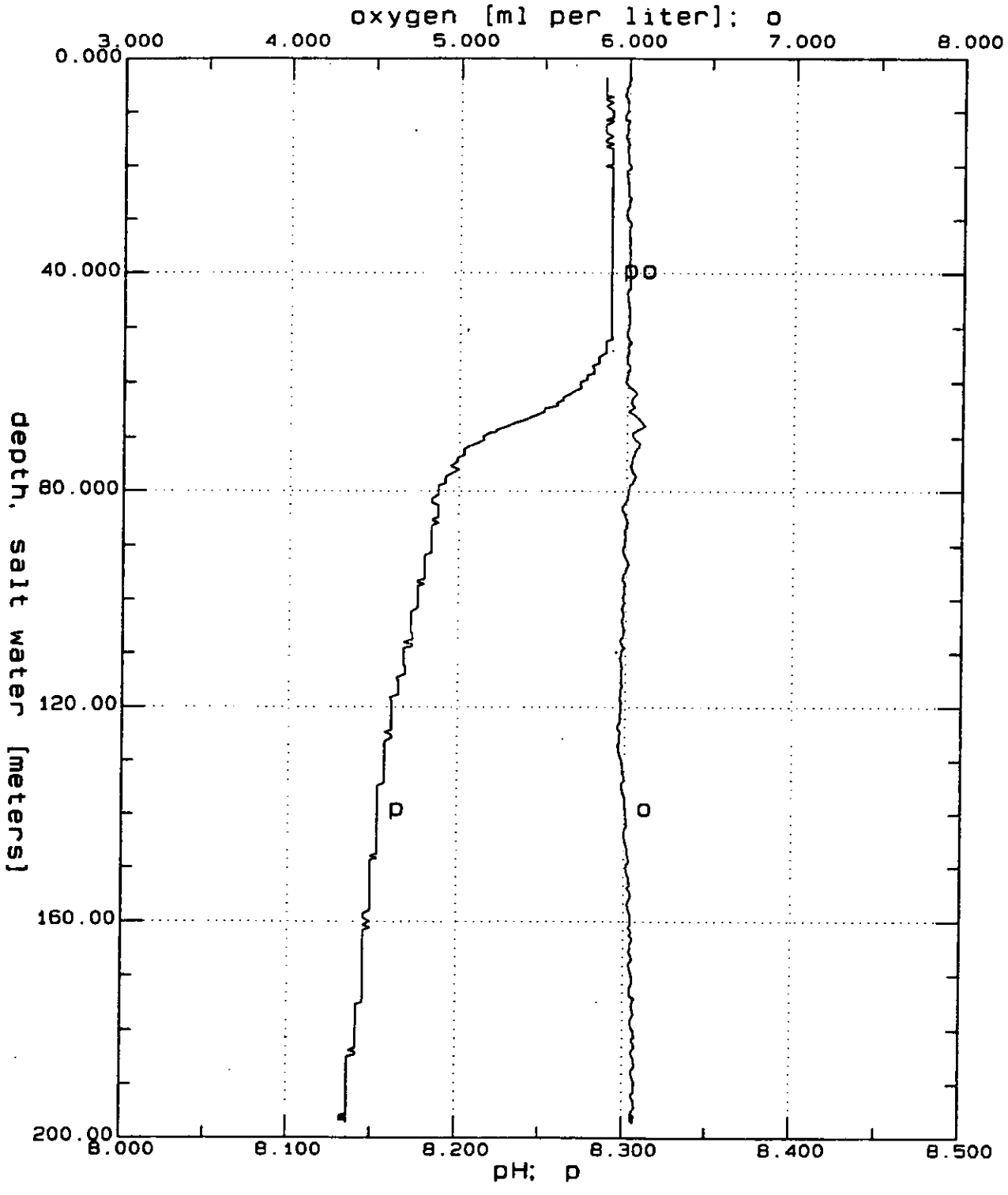
GLCH01C.CNV: Station 1C 23.09.93 at 20h45.

Figure 31



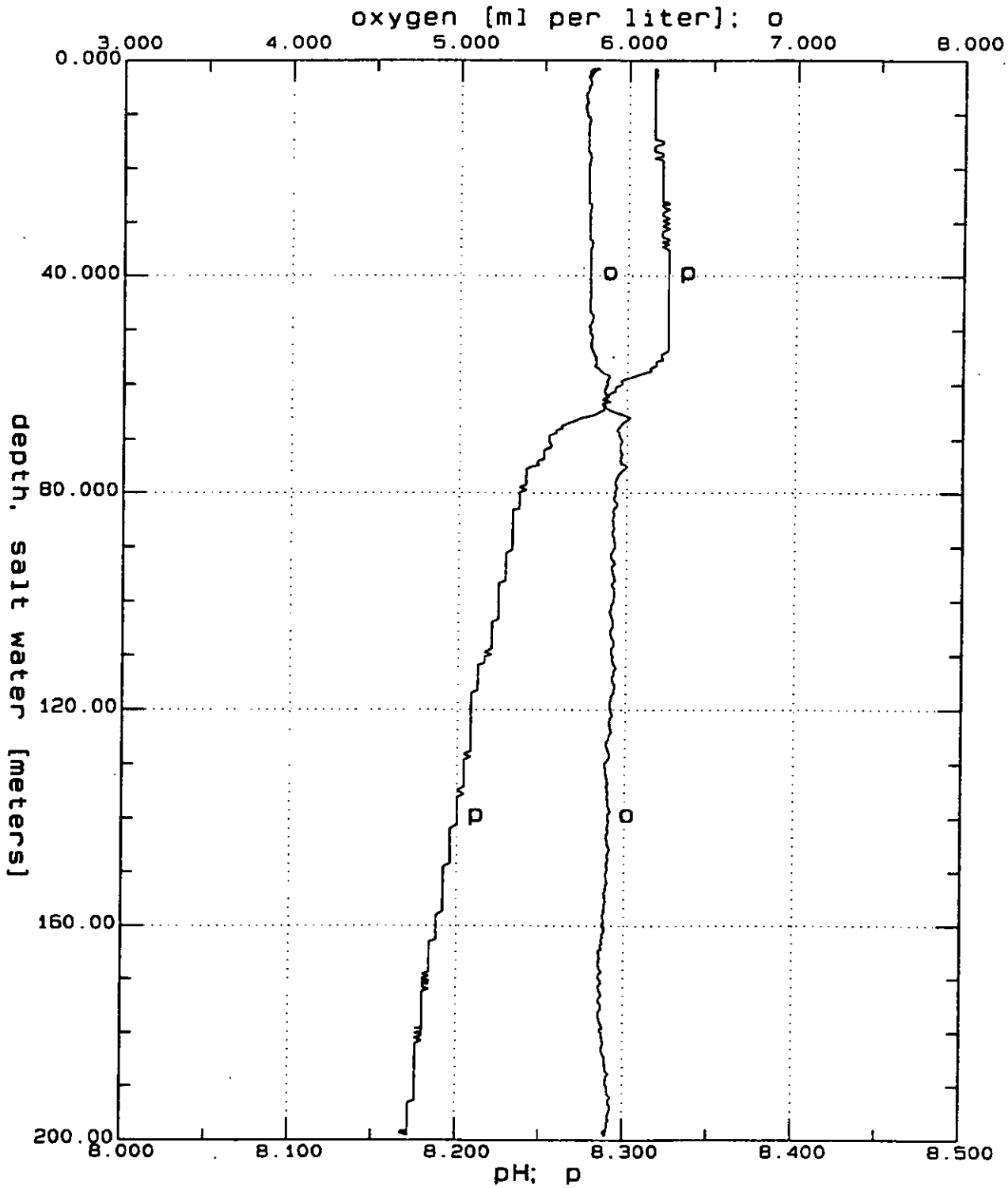
GLCH02A.CNV: Station 2 24.09.93 at 01h16.

Figure 32



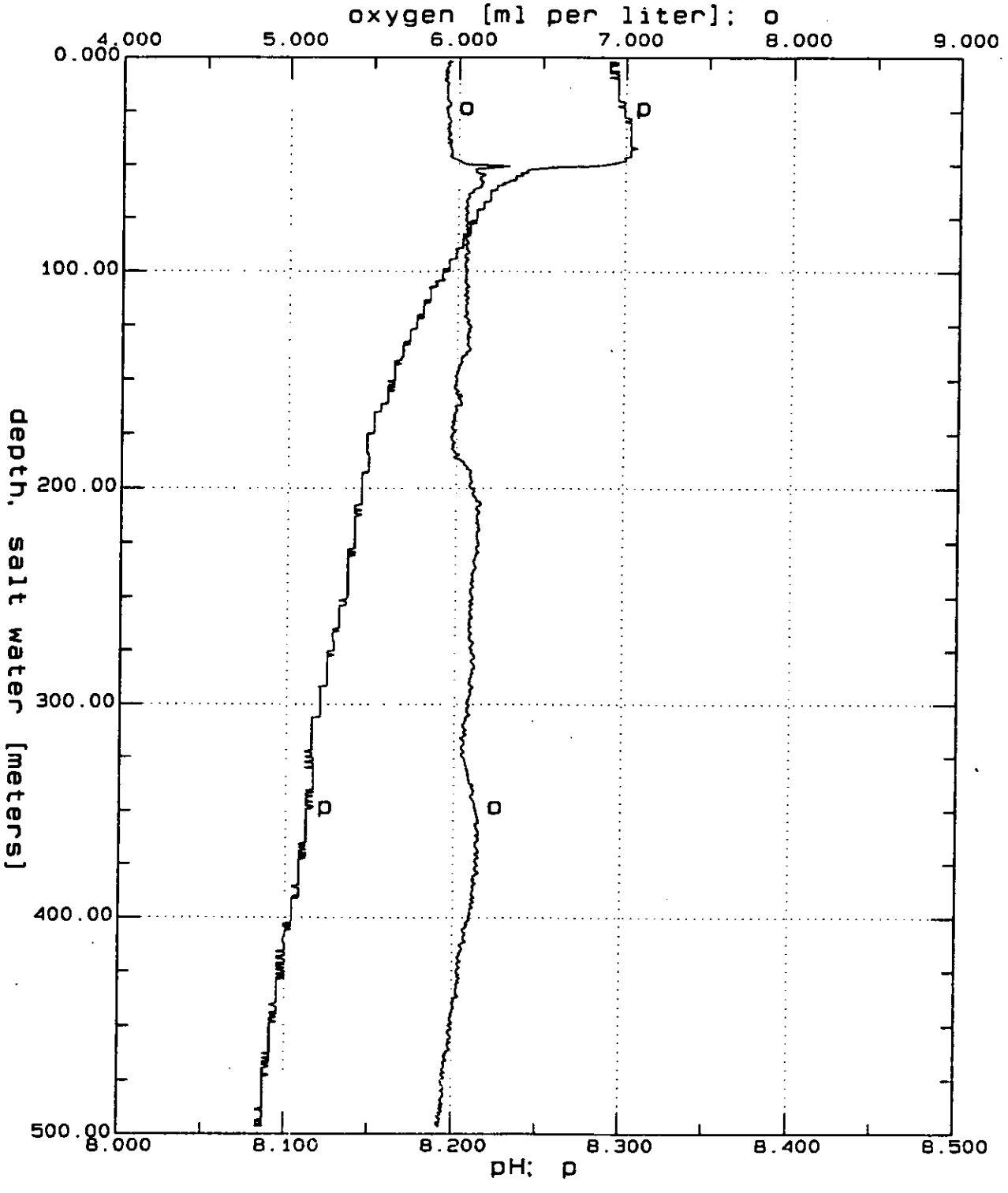
GLCH03A.CNV: Station 3 24.09.93 at 06h29.

Figure 33



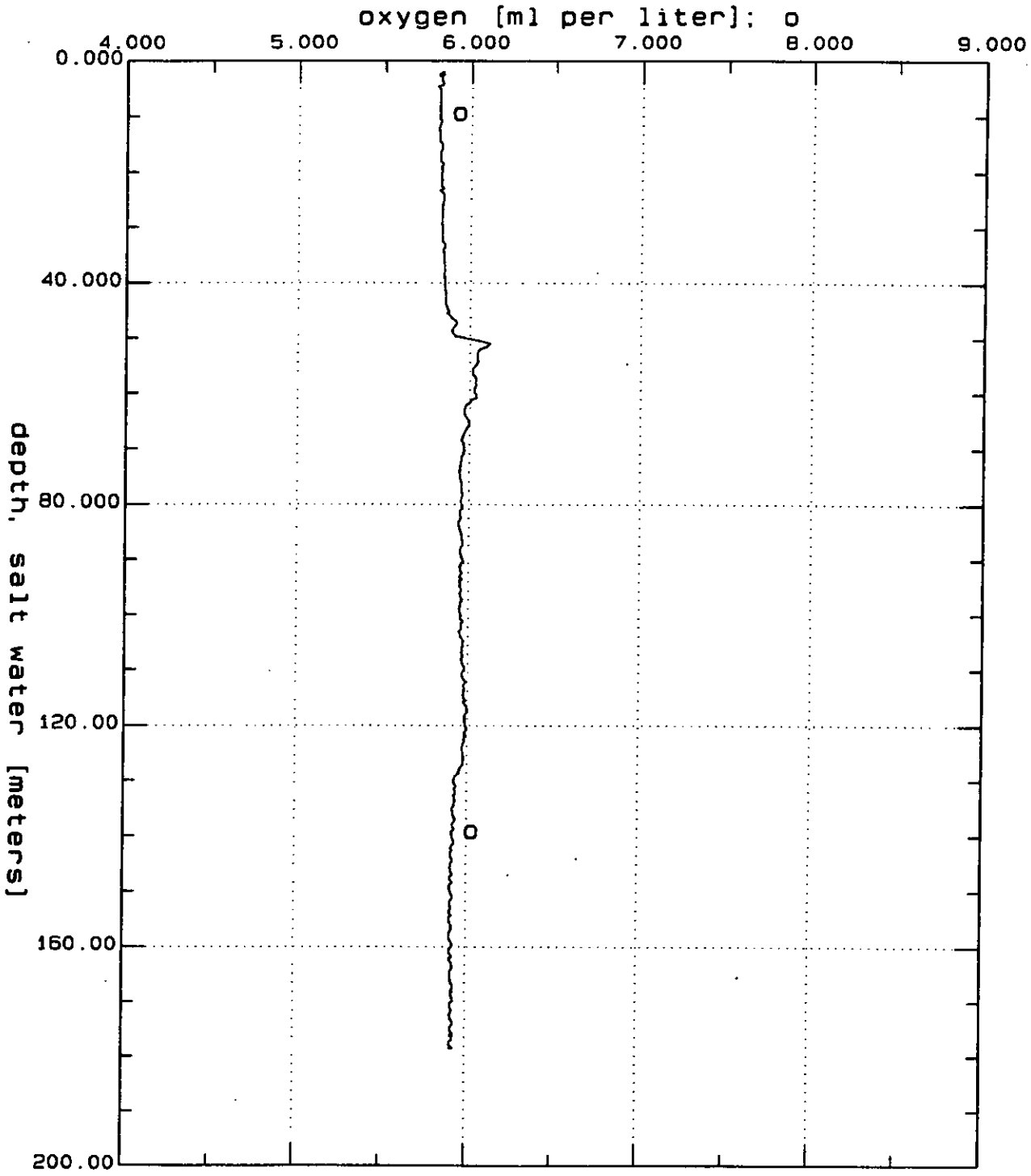
GLCH04A.CNV: Station 4 25.09.93 at 09h41.

Figure 34



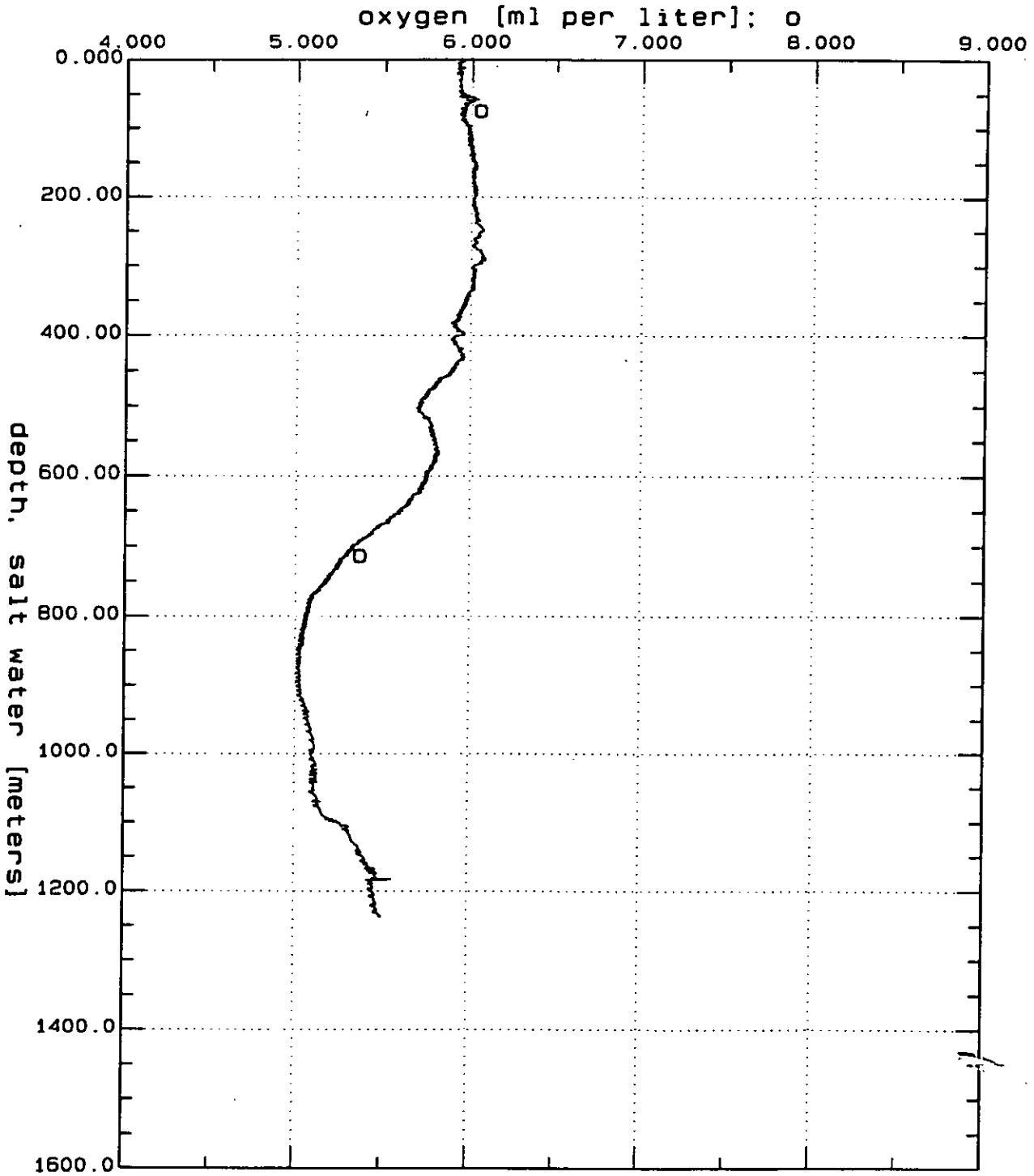
GLCH04B.CNV: Station 4B 25.09.93 at 14h35.

Figure 35



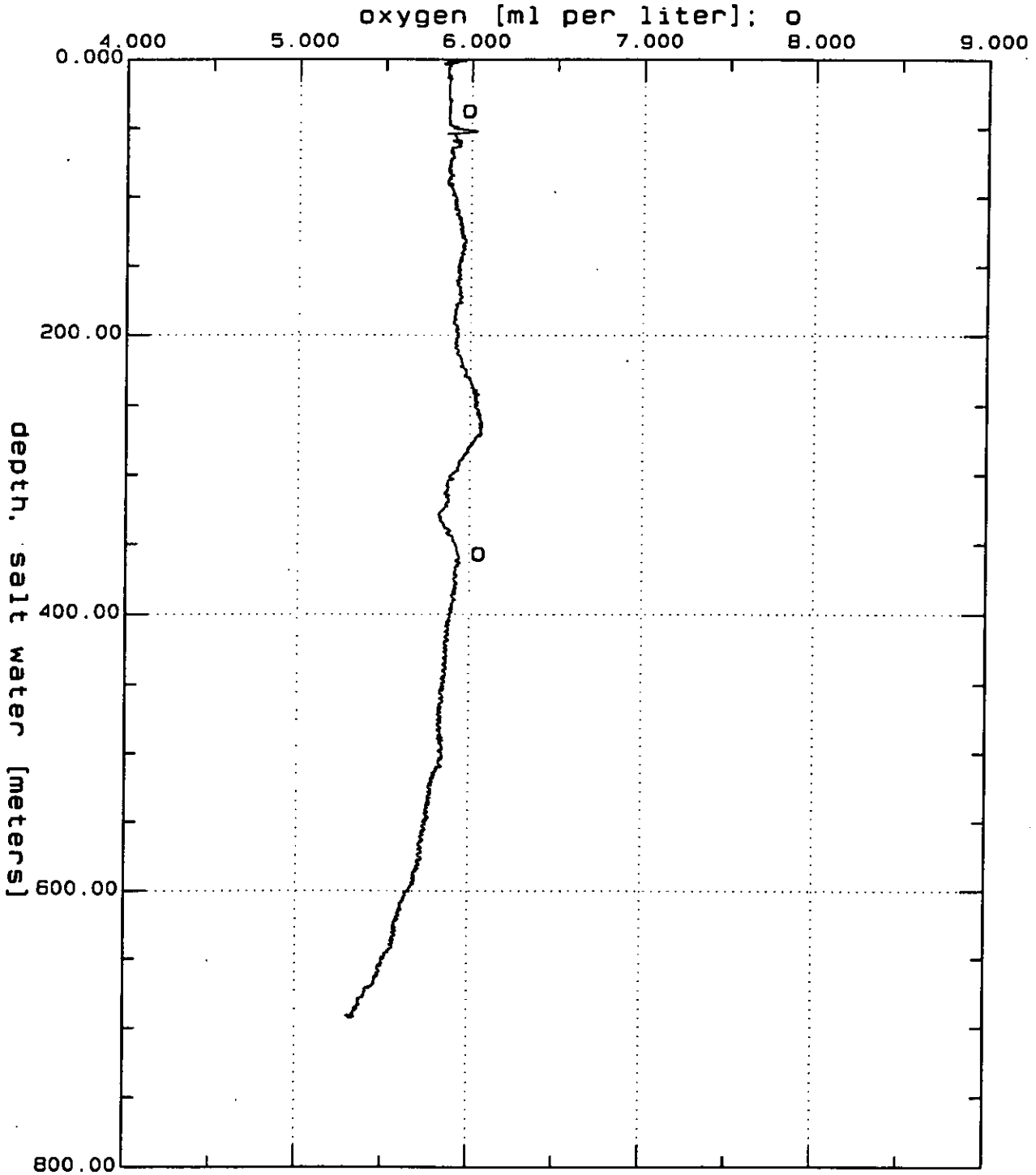
GLCH04C.CNV: Station 4C 25.09.93 at 17h46.

Figure 36



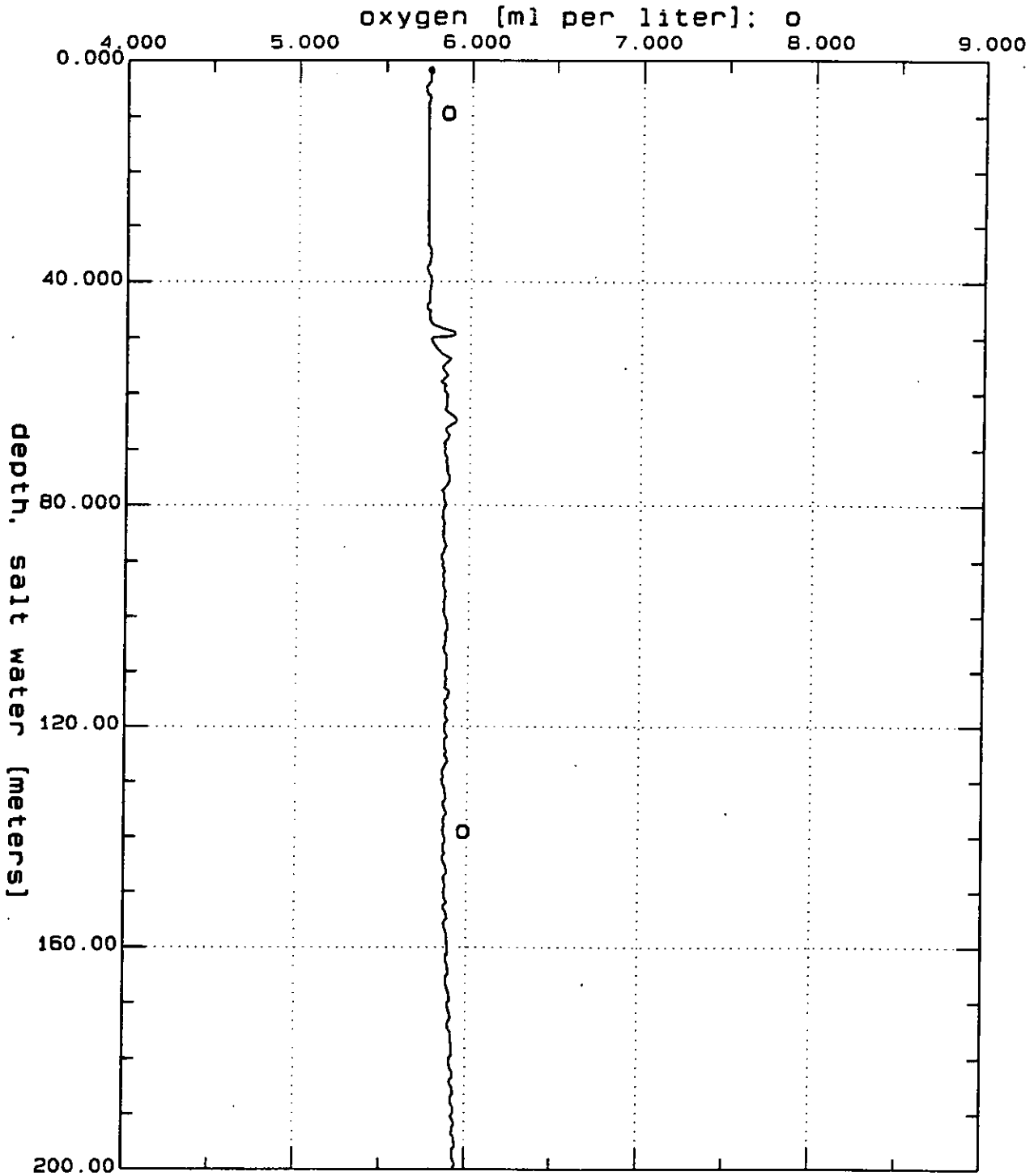
GLCH04D.CNV: Station 4D 25.09.93 at 19h21.

Figure 37



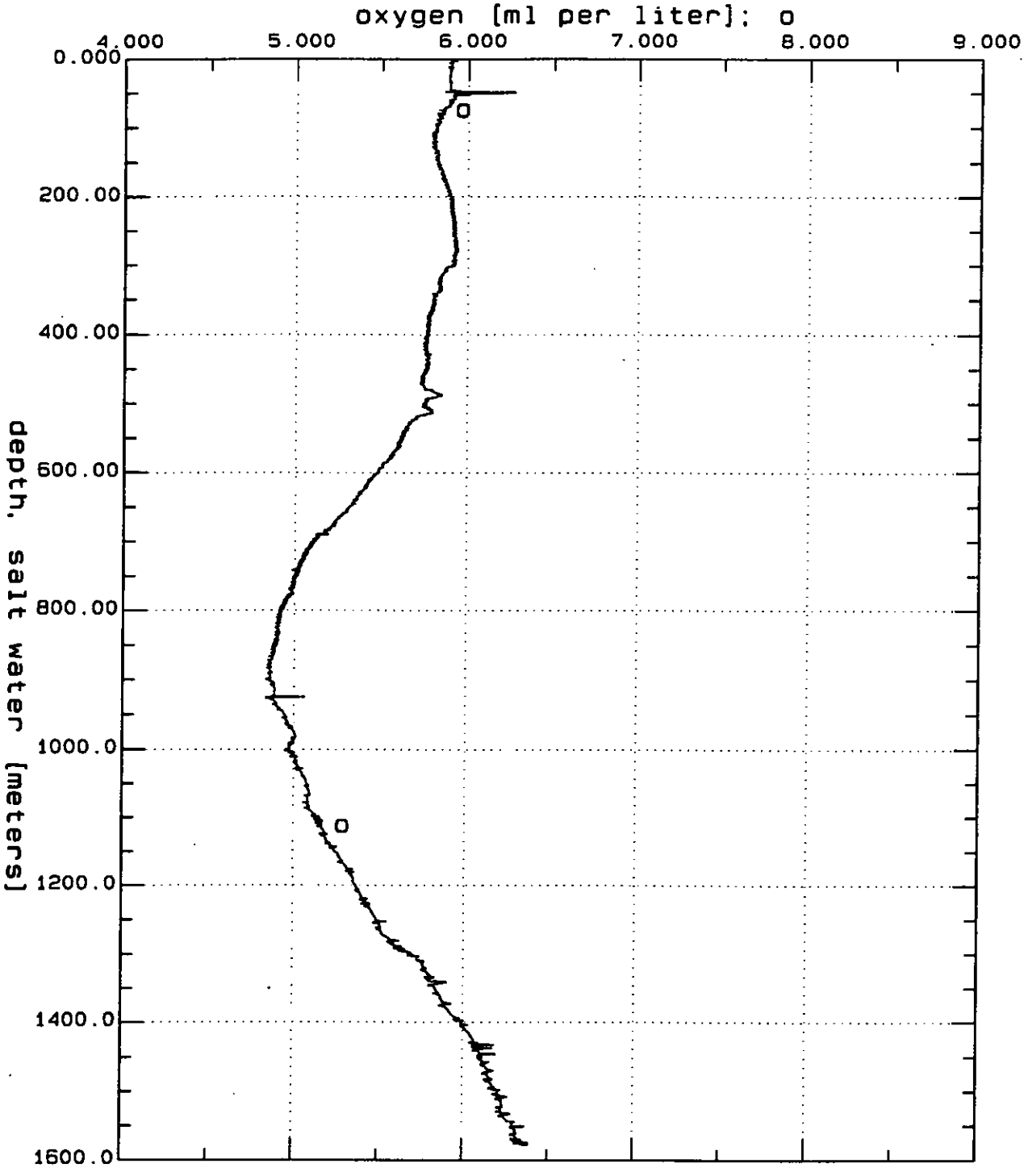
GLCH04E.CNV: Station 4E 25.09.93 at 21h55.

Figure 38



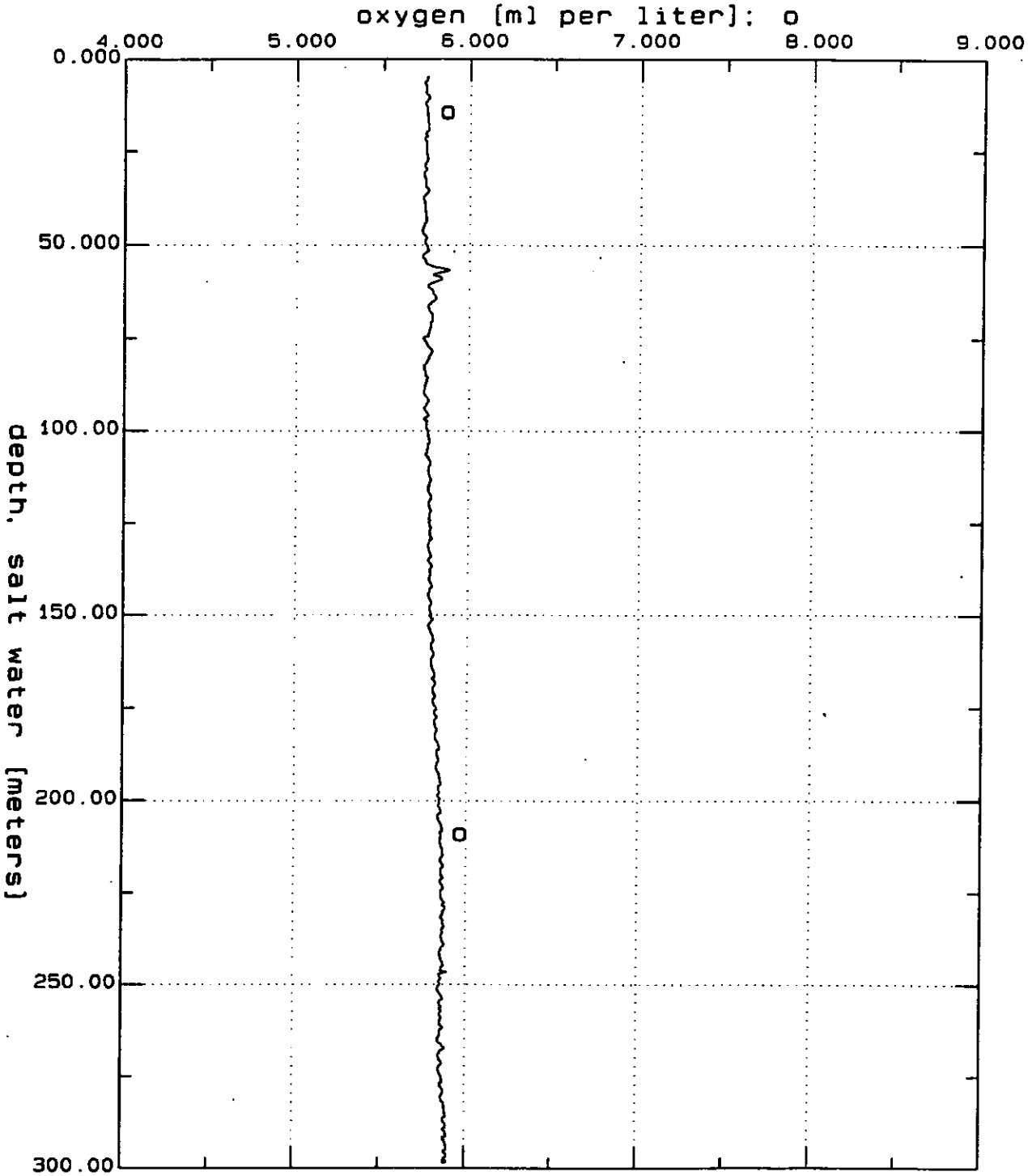
GLCH05A.CNV: Station 5A 26.09.93 at 07h12.

Figure 39



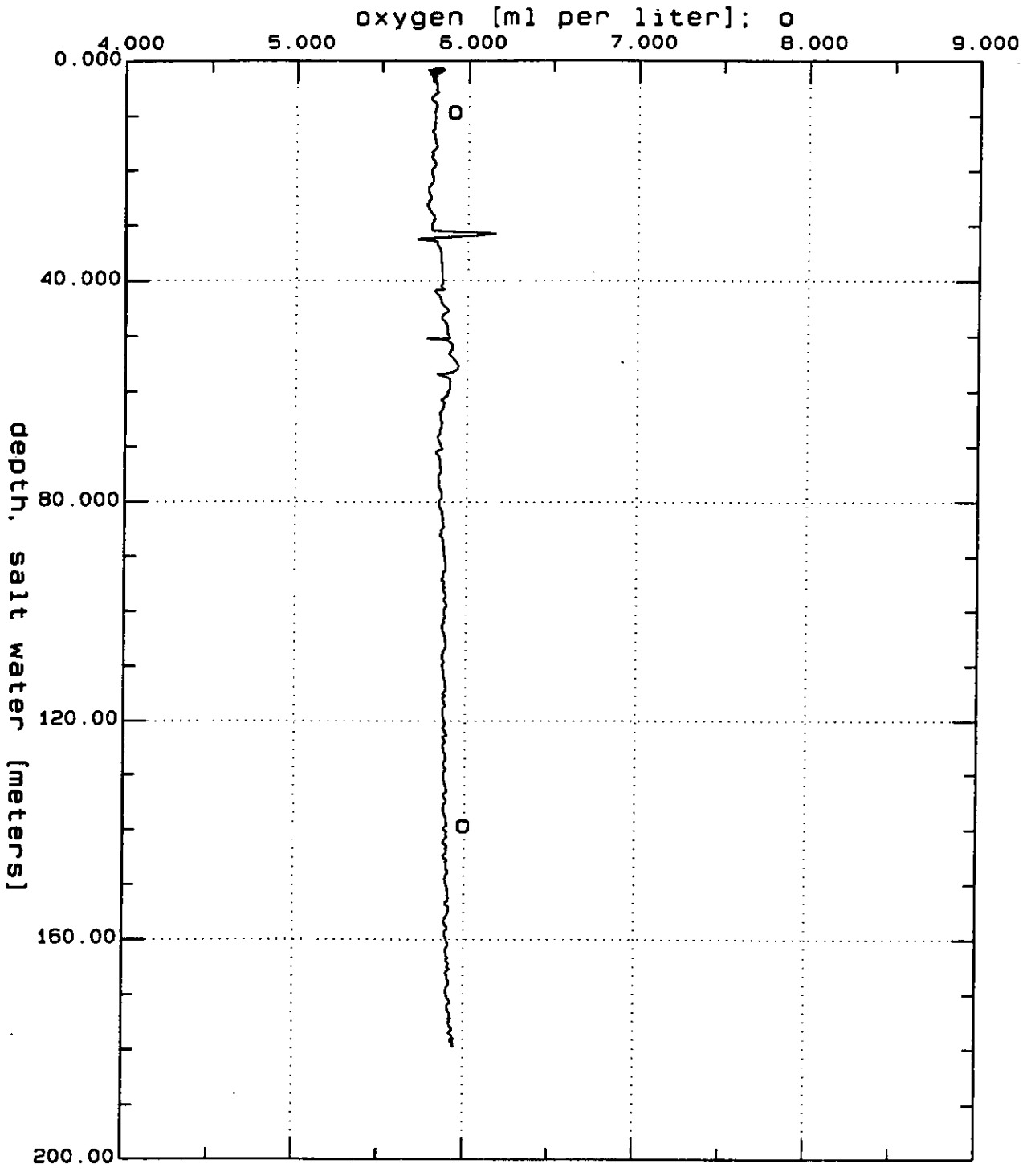
GLCH05B.CNV: Station 5B 26.09.93 at 09h06.

Figure 40



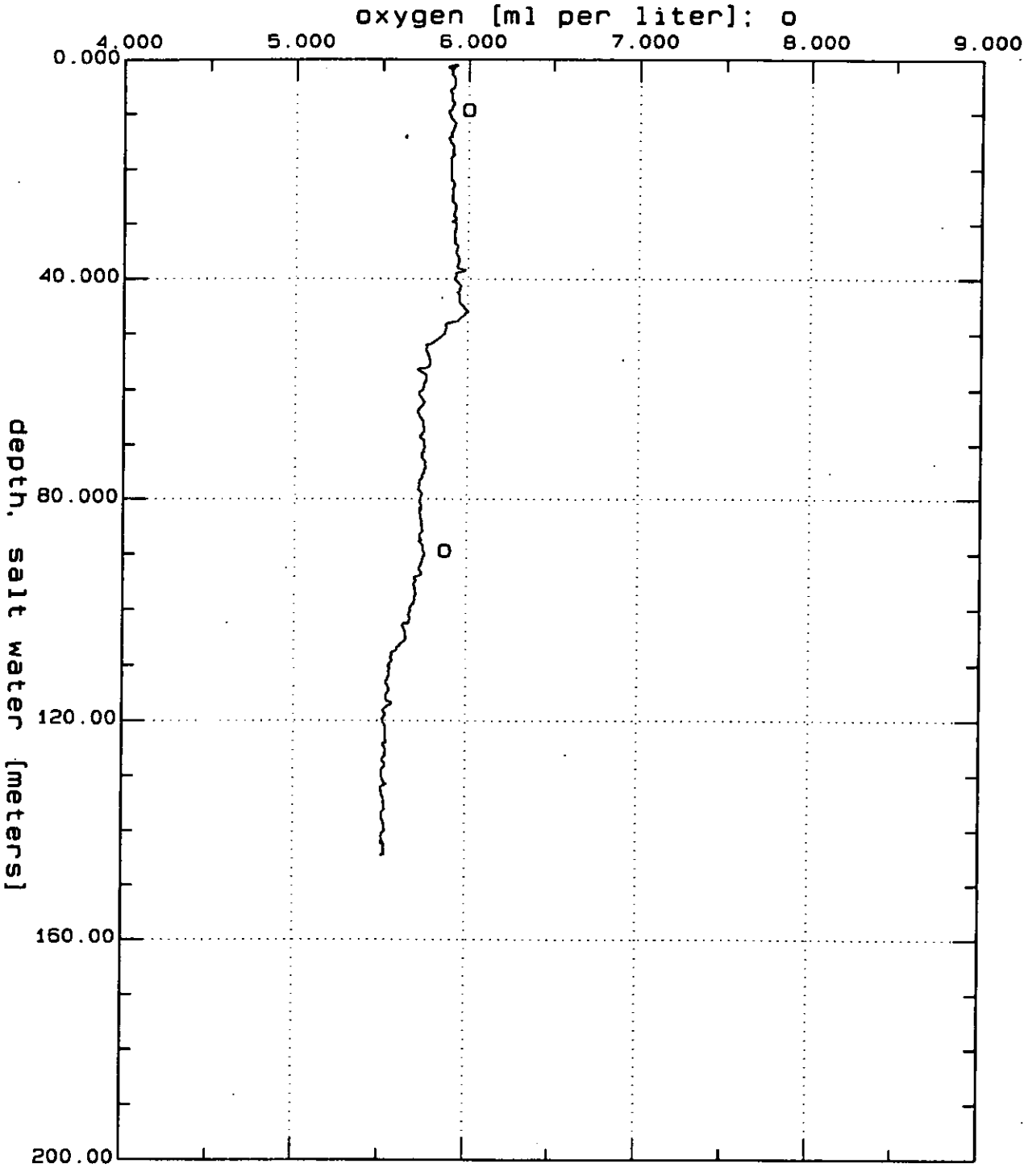
GLCH05D.CNV: Station 5D 26.09.93 at 15h26.

Figure 41



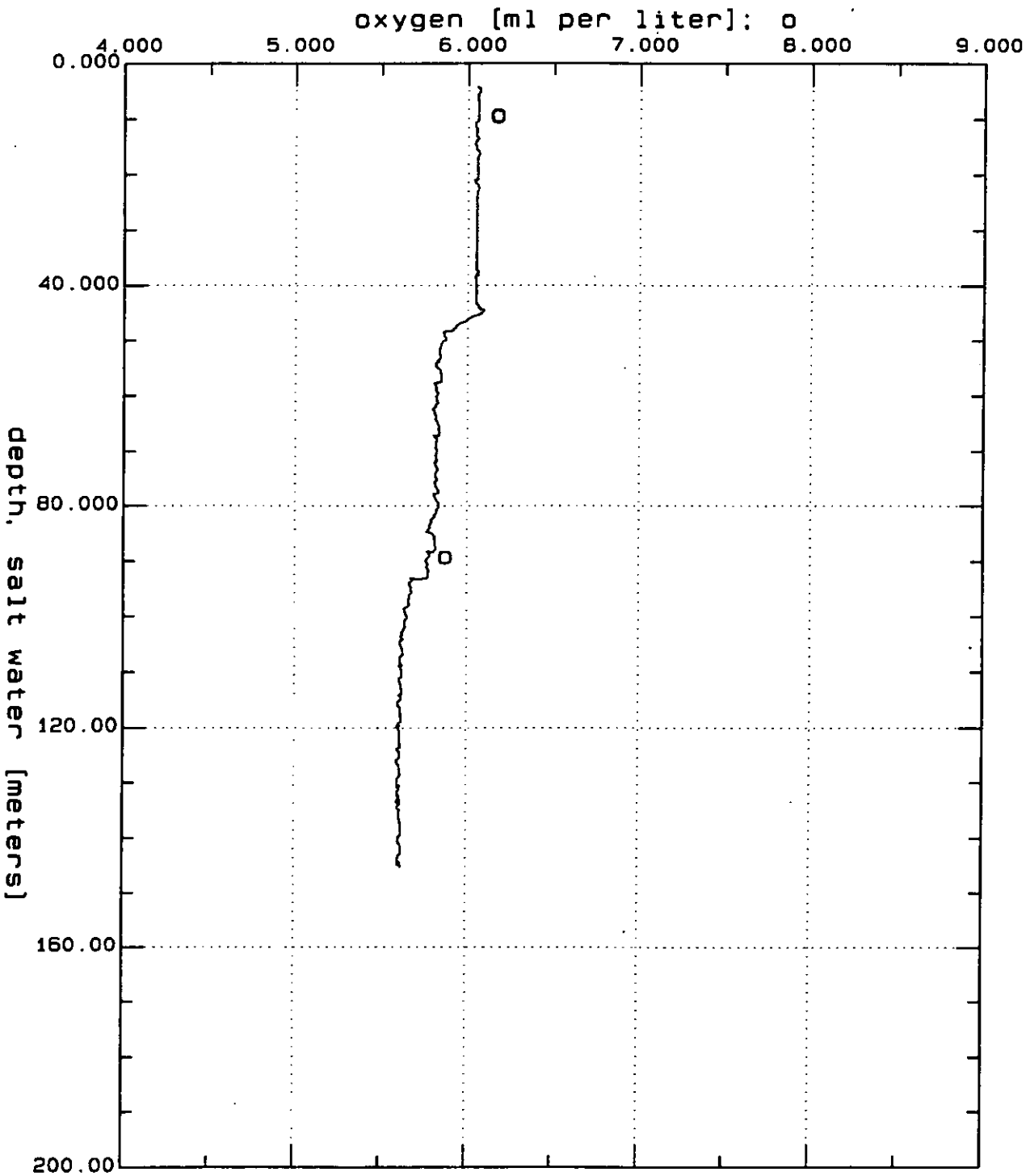
GLCH05F.CNV: Station 5F 26.09.93 at 19h36.

Figure 42



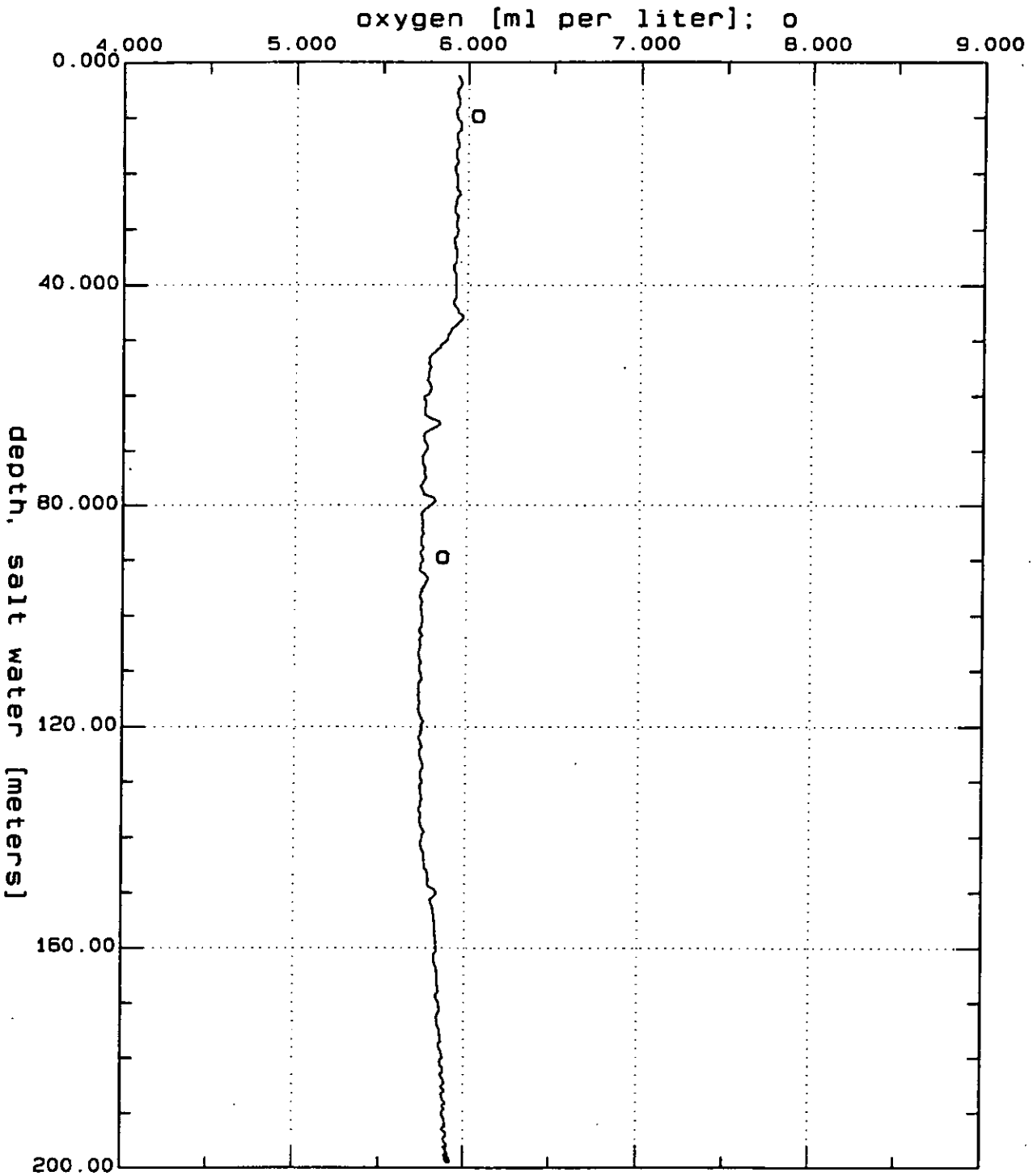
GLCH06A.CNV: Station 6A 27.09.93 at 06h30.

Figure 43



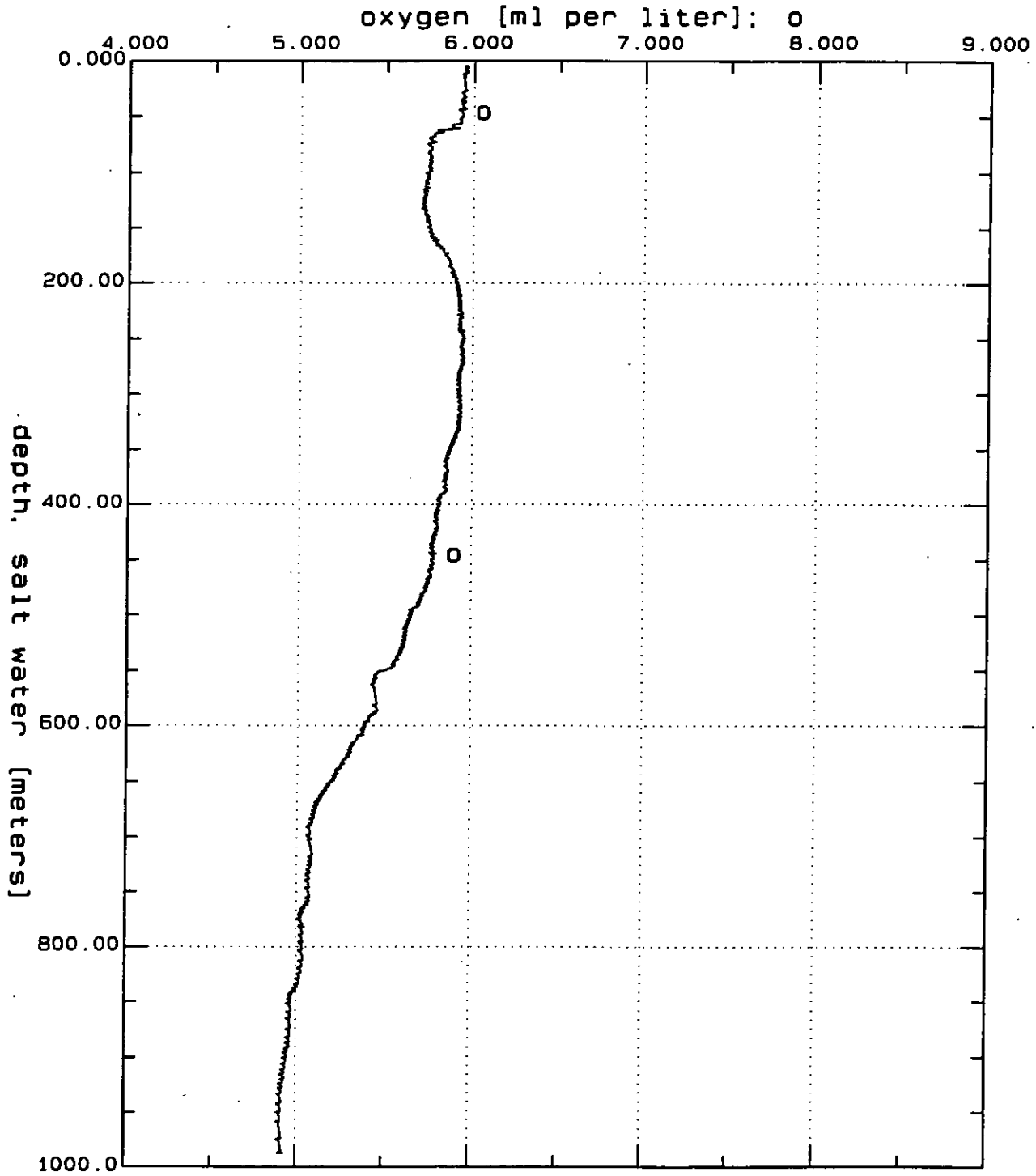
GLCH06B.CNV: Station 6B 27.09.93 at 07h38.

Figure 44



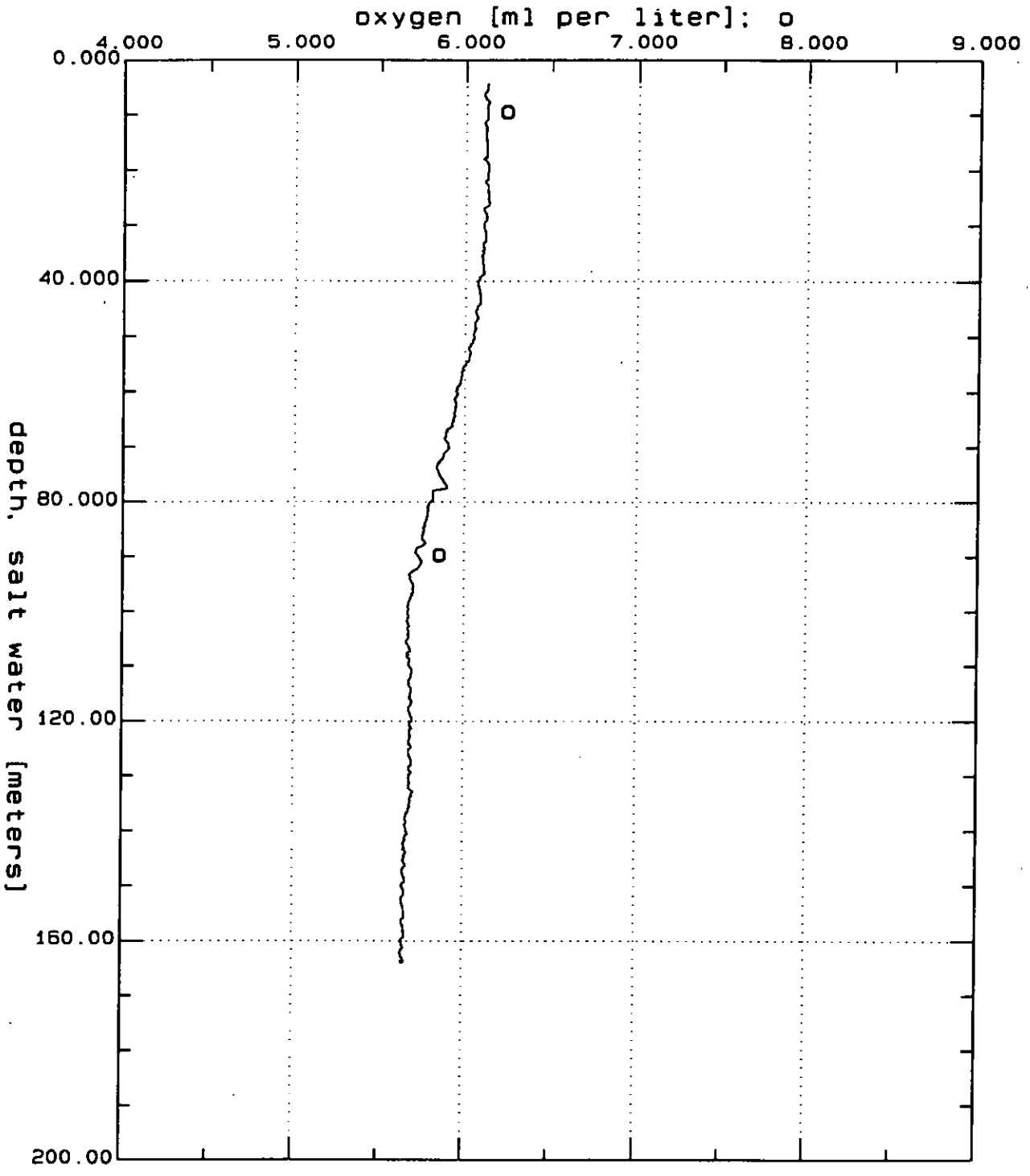
GLCH07A.CNV: Station 7A 27.09.93 at 11h01.

Figure 45



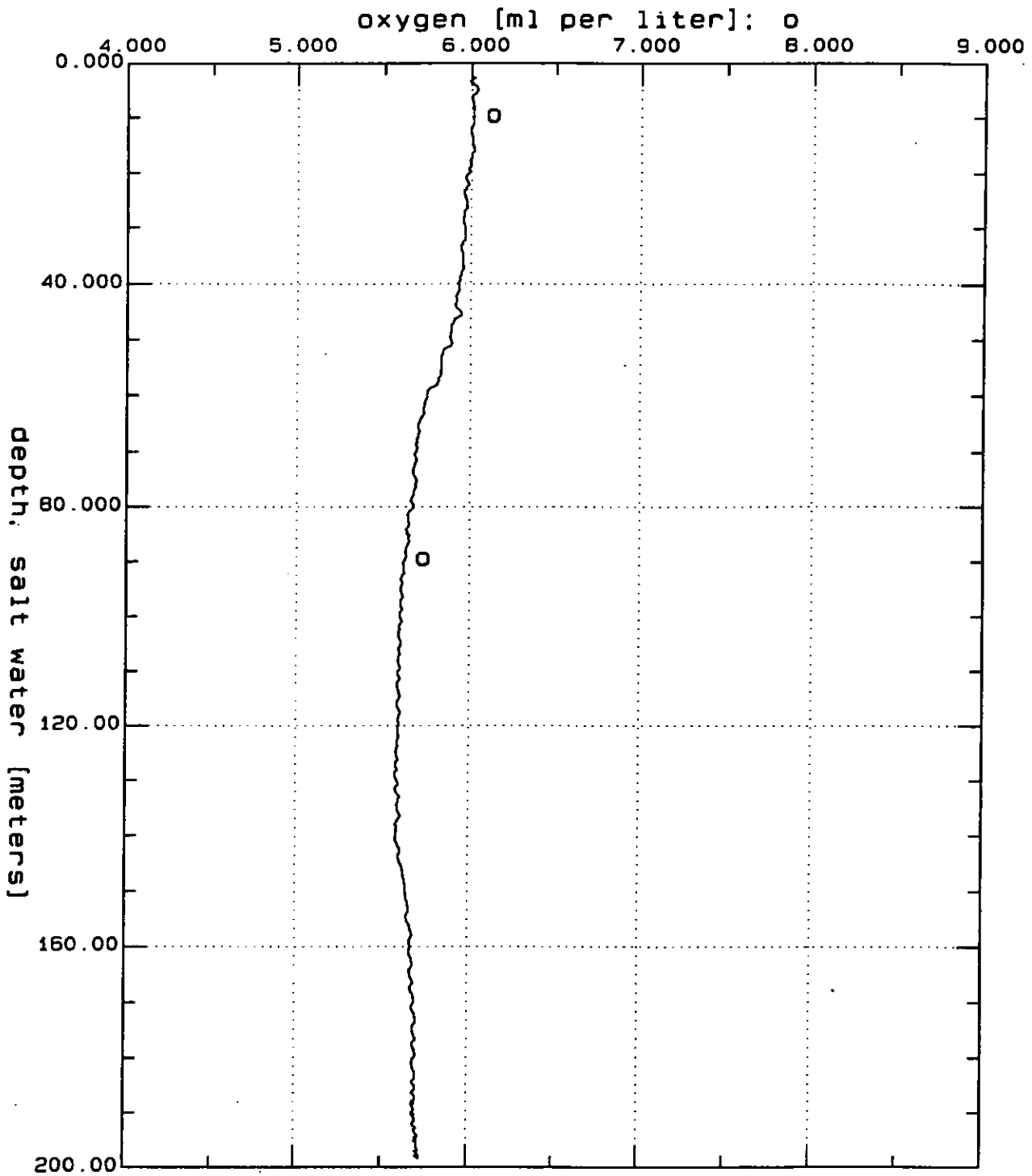
GLCH07B.CNV: Station 7B 27.09.93 at 12h37.

Figure 46



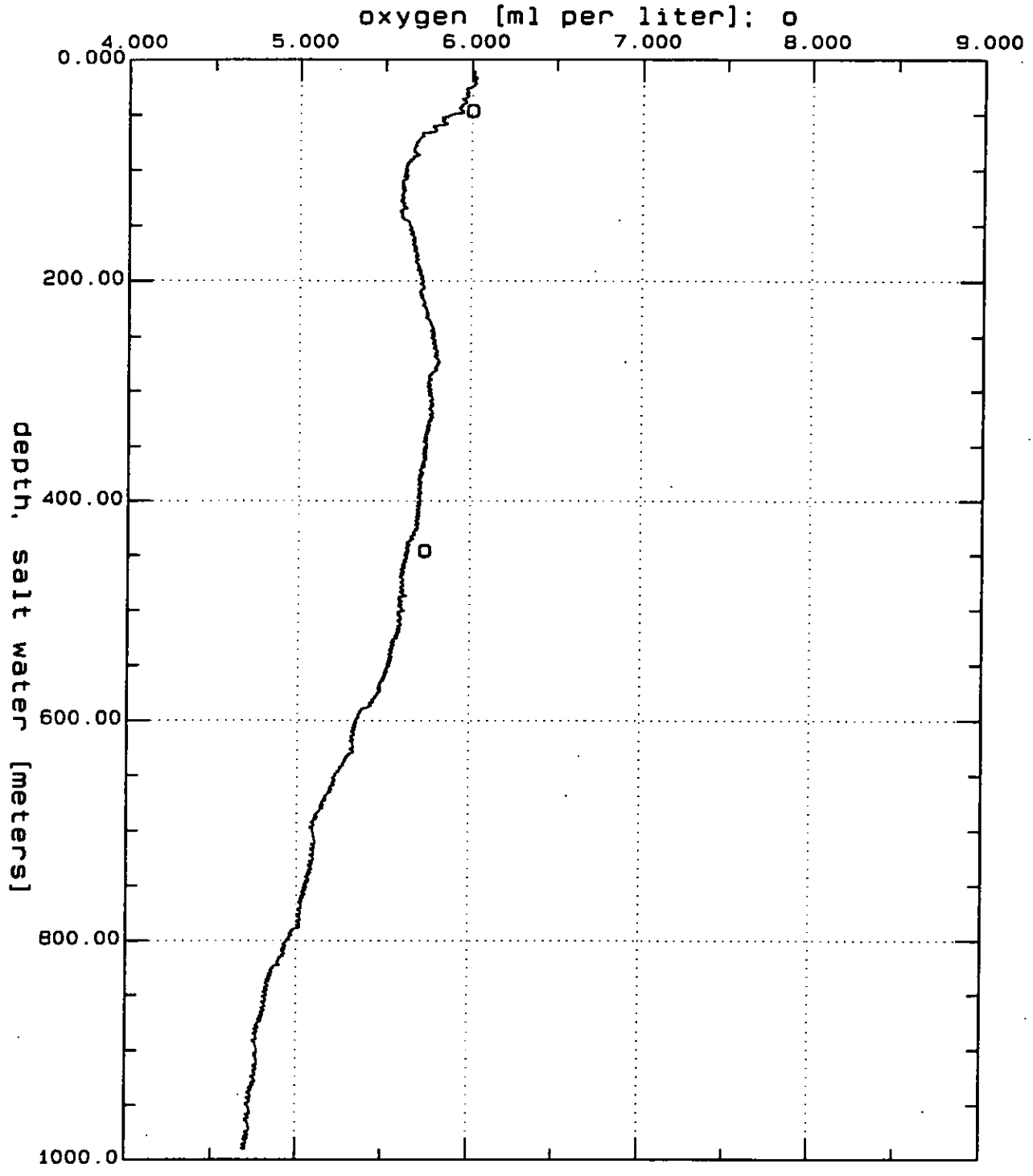
GLCH08A.CNV: Station 8A 27.09.93 at 18h34.

Figure 47



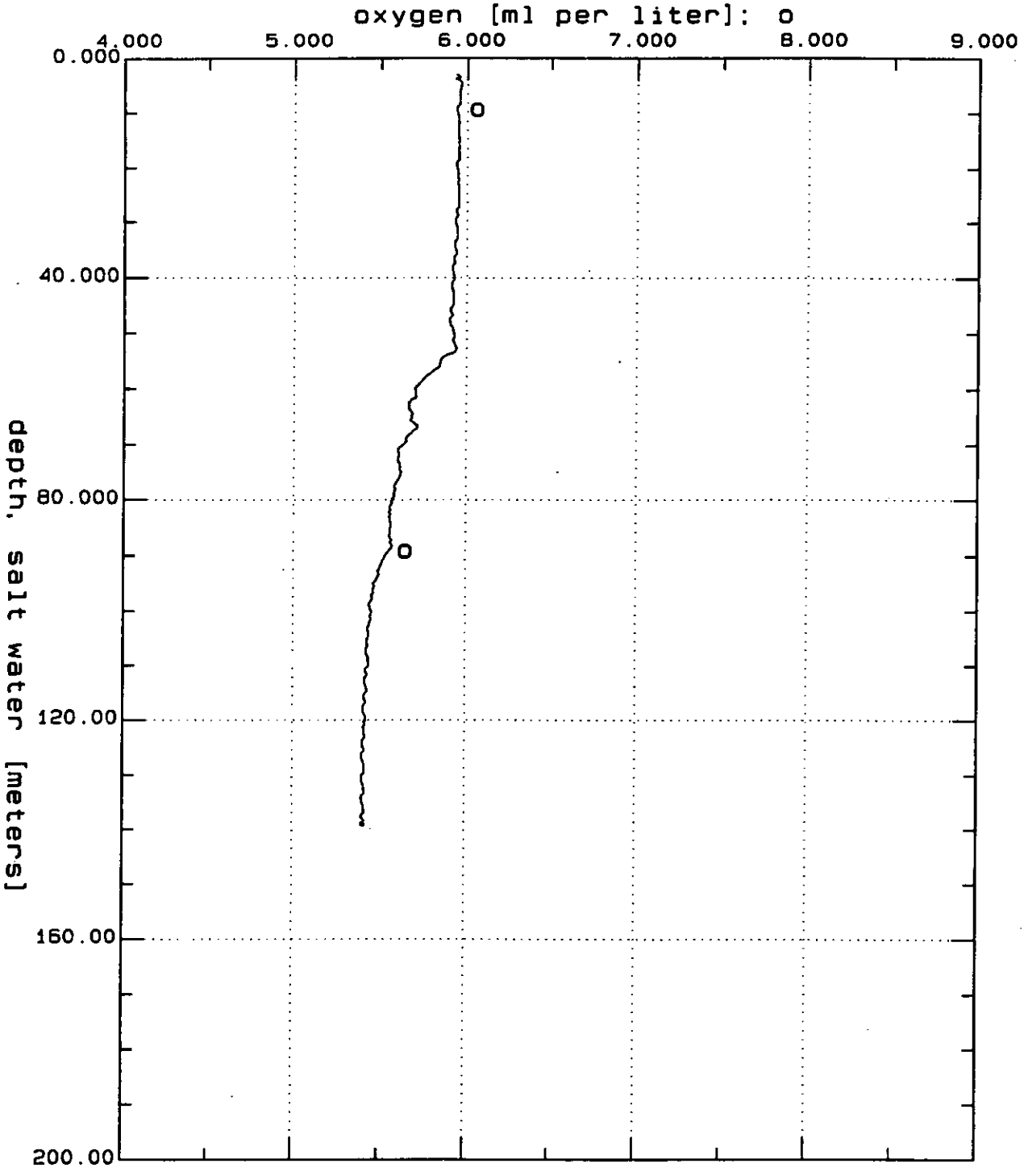
GLCH09A.CNV: Station 9A 27.09.93 at 21h54.

Figure 48



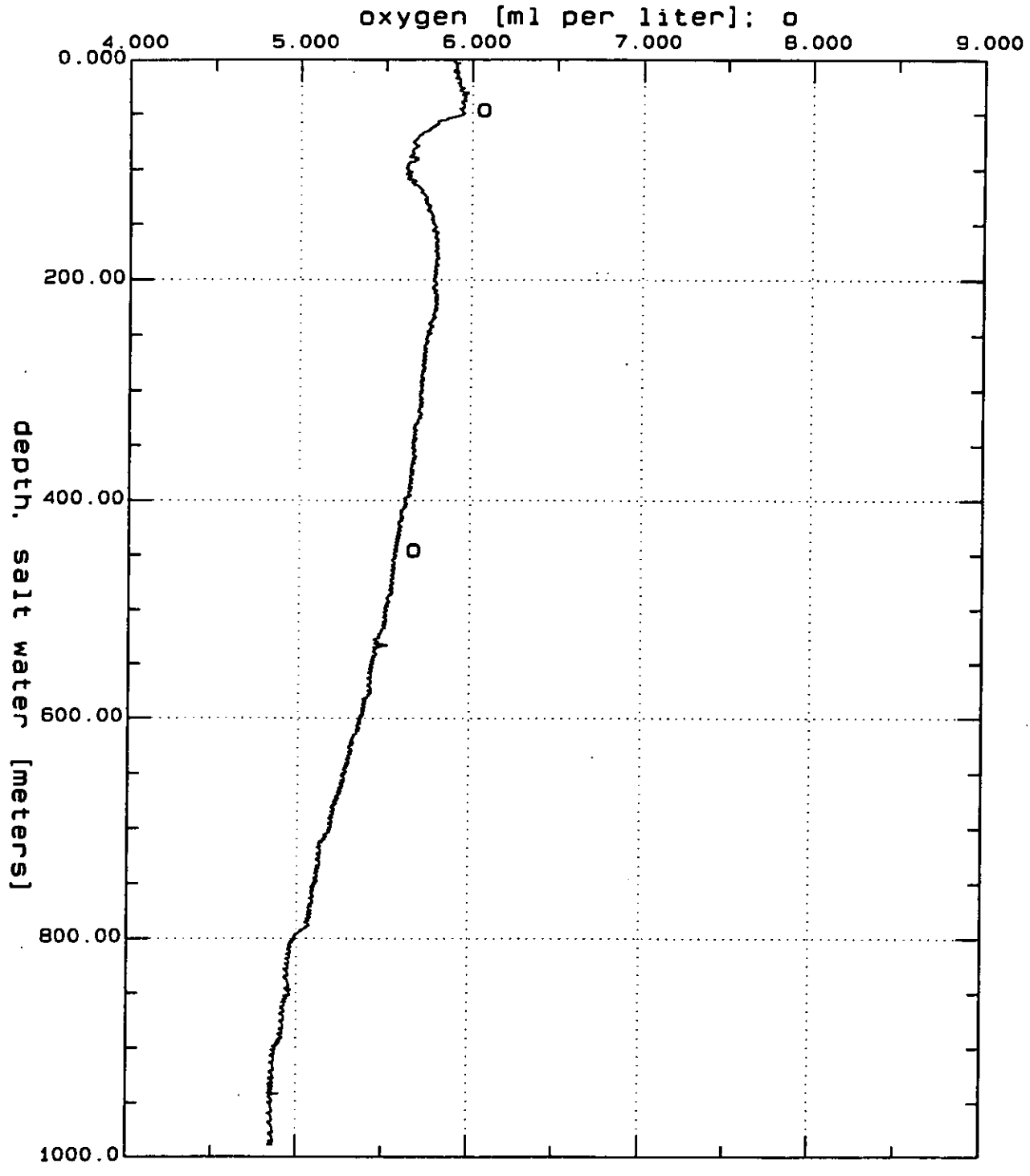
GLCH09B.CNV: Station 9B 27.09.93 at 23h03.

Figure 49



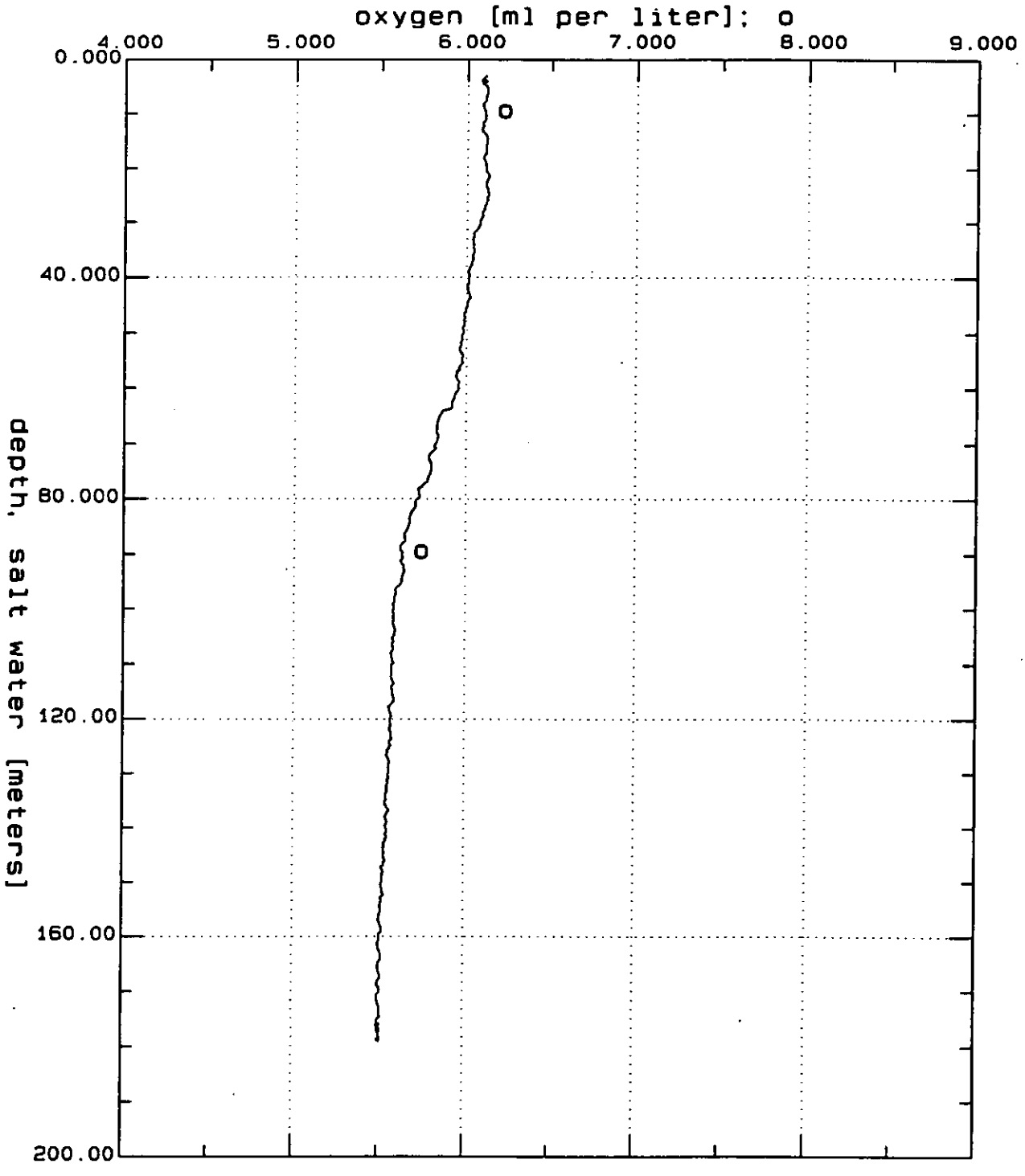
GLCH10A.CNV: Station 10A 28.09.93 at 06h28.

Figure 50



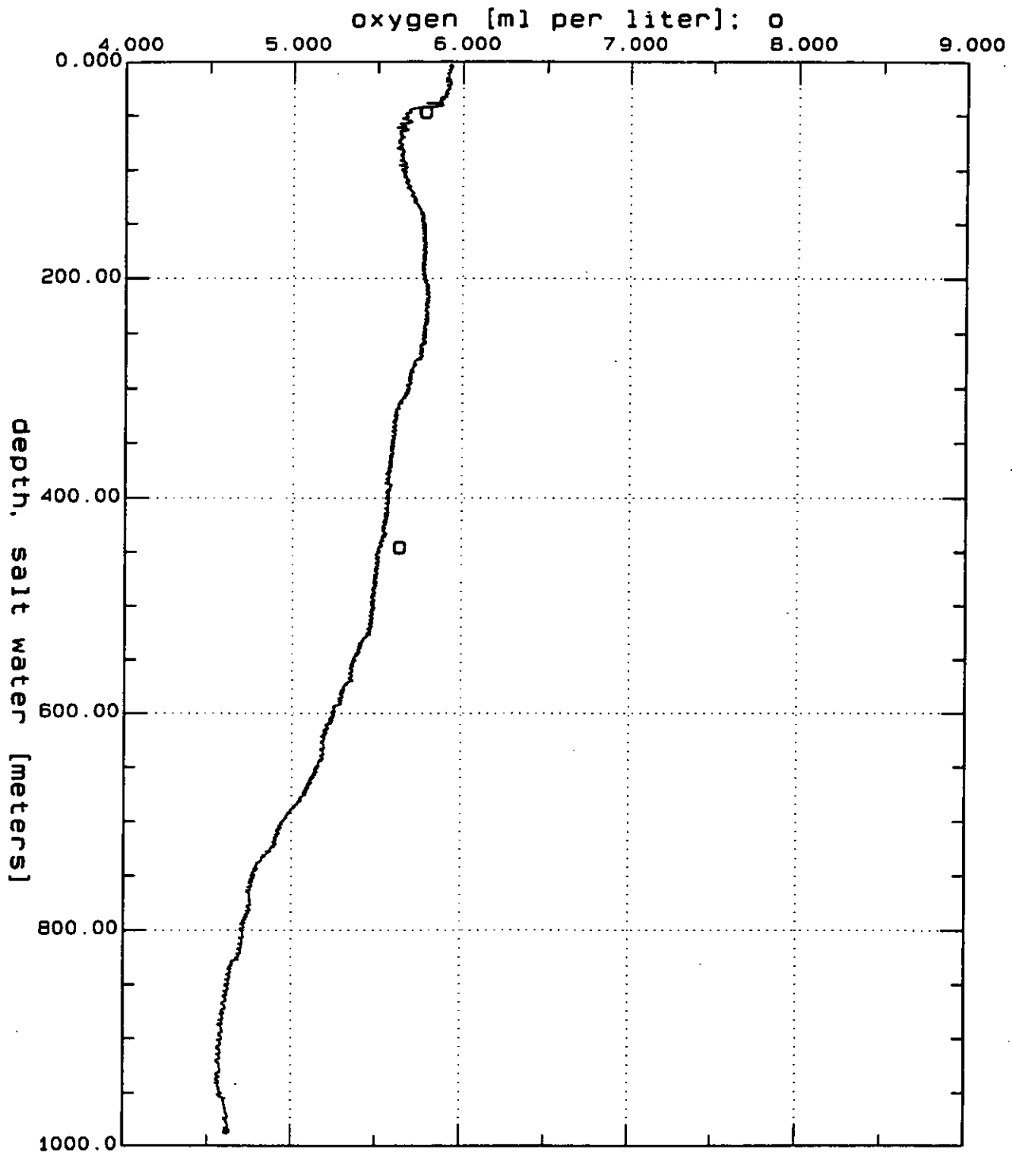
GLCH11A.CNV: Station 11A 28.09.93 at 09h51.

Figure 51



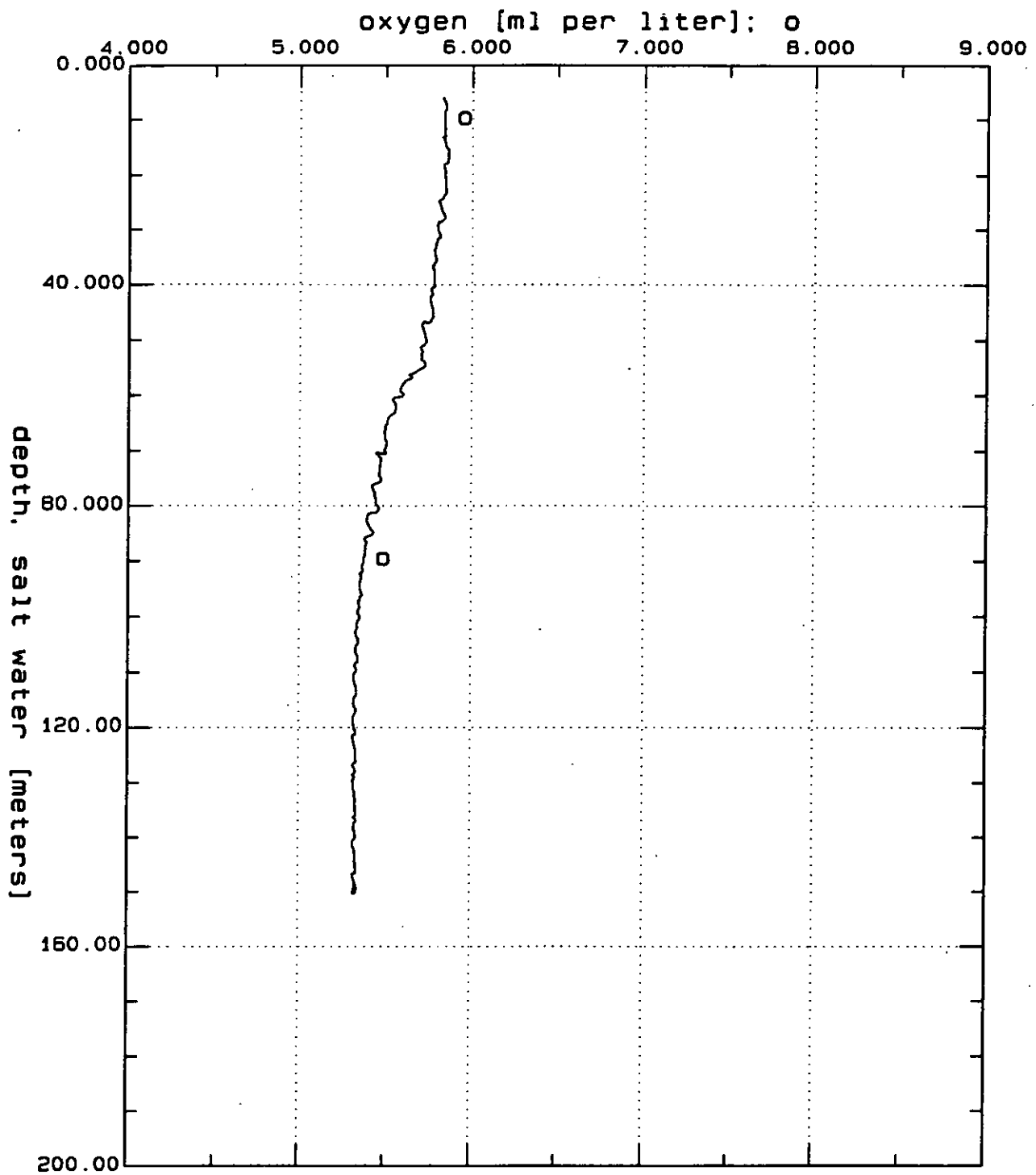
GLCH12A.CNV: Station 12A 28.09.93 at 16h05.

Figure 52



GLCH13A.CNV: Station 13A 28.09.93 at 20h11.

Figure 53



GLCH14A.CNV: Station 14A 29.09.93 at 02h28.

Figure 54