

CRN

93+12

DAILY LOG

INSTITUTE OF OCEAN SCIENCES
OCEAN PHYSICS

DATE

Apr. 30, 93 - May 10, 93

VESSEL

J. R. Tully

PROJECT

LAP/MASS/CRD

Captain: P. Frost First Officer: A. Combes
Second Officer: B. Pennel Third Officer: _____

Cruise Participants/Agencies: O. P. + O. Env.

Scientific Personnel: Party Chief: Tom Juhász
Name Watch Cabin Name Watch Cabin

Reg Bigham

Doug Sieberg

John Love

Bernard Minkley

Marie Robert

Darren Tuele

See attached.

Cabin + Watch Assignments

~~Second leg of cruise: Party Chief:~~

Doug. Yelland

~~Third leg of cruise: Party Chief:~~

Data logging system: Unit number: #2

CTD deck unit make: Guildline

Computer make: HP

Monitor make: Nec

Printer make: _____

Program version: 1.25

model: 87107 serial no.: 58995

model: Vectra 05/20 serial no.: 2938A05390

model: _____ serial no.: _____

model: _____ serial no.: _____

1st CTD make: Guildline

model: _____

serial no.: 53501

Temperature sensor

model: _____

serial no.: _____

coefficients: slope: _____

offset: _____

Conductivity sensor

model: _____

serial no.: _____

coefficients: slope: _____

offset: _____

Pressure sensor range: _____

psi

serial no.: _____

coefficients: FSP: _____

dB

offset: _____

Transmissometer

model: Seatech

serial no.: 78

coefficients: slope: _____

offset: _____

Comments: _____

2nd CTD make: Guildline model: serial no.: 58483
 Temperature sensor model: serial no.:
 coefficients: slope: offset:
 Conductivity sensor model: serial no.:
 coefficients: slope: offset:
 Pressure sensor range: psi serial no.:
 coefficients: FSP: dB offset:
 Transmissometer model: serial no.:
 coefficients: slope: serial no.:

WINCHES:

CTD	make: <u>Swan</u>	model: <u>329</u>	serial no.: <u>1307</u>
counter	make: <u>Reulis</u>	model:	serial no.:
HYDRO	make: <u>Swan</u>	model: <u>420</u>	serial no.: <u>1432</u>
counter	make: <u>Reulis</u>	model:	serial no.:
Spooling	make: <u>Swan</u>	model: <u>455</u>	serial no.: <u>1450</u>
Drag	make: <u>Swan</u>	model: <u>331</u>	serial no.: <u>1231</u>
Other CTD	make: <u>Swan</u>	model: <u>329</u>	serial no.: <u>1482</u>
Work (Spare)	make: <u>Swan</u>	model: <u>329</u>	serial no.: <u>1306</u>
Salinometer	make:	model:	serial no.:

SAIL System:

Program version: Time zone: GMT
 Sampling interval: 2 sec.
 CTF module no.: 13 serial no.: 101
 Remote temperature model: serial no.:
 Flow sensor model: serial no.:
 Other sensors: (special for this cruise)
 Name: module I.D.: serial no.:
 Name: module I.D.: serial no.:

Comments:

ADCP Setup:

Program version: number of depth bins:
 Time zone: bin length (2°):
 Sampling interval: 120 sec. pulse length:
 Blank beyond transmit: pings per ensemble:
 Pulse cycle time:
 Percent pings good threshold:

Comments:

Disk File: E:\Pingdata.001
9312

Cruise 9312

Date Time
(local)

Apr. 30 0810

Depart I.O.S. for acoustic
test mooring deployment.

Apr. 30 1030
position of release ship.

Deployed Acoustic Instr. Test Mooring
48 39.11 123 28.19 @ 17:33
in 51 m of water

- solving release deck unit problems. (in 3x Ranger)
- released sub surface portion of
mooring and recovered

- * - ship's ram not deployable - to be repaired.
- used rubber boat to tighten
ground line to surface marker
buoy
- Notice to Mariners was issued from
ship.

1100
1215
1130
1300

Brenda Waddell, Ian Perry, Dave MacKas join ship.
- depart Seavich Inlet for
Macaulay Point.

- altered cruise plan due to overtime
restrictions, new plan =
 - ① recover CRD
 - ② Mockness Tows.
 - ③ CRD + Juan de Fuca stations
to J-Buoy.

1545

- 5th rd ram + 12 kHz Xducer available
for use again - repair by ship's engineers.

Date

Time
PDT

Apr. 30

1605
1606

- on station CRD1-C for recovery
- sent CDF XPRND ON code while stopping on station.
- sent range command
208 m 208 m
211 m

1609

- sent release command
- release confirmed.
- sighted on surface.

1630

- onboard - demobilized.

NB - PCM's #9049 was deployed with PCM's vane and probably out of balance

- in addition the gimbal rod bearings were very stiff to rotate
- likely direction data from this instrument is unusable
- the gimbal rod was free when the instrument was deployed

Suspect nylon bearings + vane has swollen in water and may have too close tolerances in their set positions. See Andrusa about this.

1740

- Moccuss ready for deployment preparations by O. Env. people underway since they joined ship.

1853

- Moccuss in water towed at surface
- tilt tests completed.

2000

- Moccuss operations completed
- proceed to 1st CTD station CRD1

Date Time PST.

Apr. 30 2100 - Brenda, Ian, Dave, + Doug M.
leave ship
- proceed to CRDI for CTD's.

2120 - stopped on Stn CRDI - radio's (19A)
bombing program. Wrong deck unit.

2132 - CTD 001 to 65m -

2206 - CTD 002 to 65m. -

2226 - CTD 003 to 68m -

2244 - CTD 004 to 63m -

May 1st

00:00 - CTD 005 to ~145m

01:19 - CTD 006 to 165m

- loop salinity #1

- Hydro cast to 165m.

03:02 - CTD 007 to 182m

1255 - finished DISA - Run to BP

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1	CRDI	065	0415 48 23.86	123°23.80	001	0432				9.226			Radio bombing program CTD to bottom
			0442										
1	CRD 2	068	0500 48 24.07	123 23.480	002	0506				9.228			CTD to bottom
			0511										
1	CRD 3	068	0520 48 23.450	123 24.150	003	0526				9.193			CTD to bottom
			0530										
1	CRD 4	063	0541 48 24.190	123 24.820	004	0544				9.225			CTD to bottom
			0550										
1	D11A	165	48 13.992	123 29.763	005	0703				9.643			CTD to bottom
			0712										
1	D12A	174	0817 48 15.155	123 44.959	006	0819	001	0850	1003	9.946	1		CTD to bottom. Loop salinity sample Hydro cast to 165 m.
			0903							1020			
1	D13A	189	0959 48 17.775	124 00.075	007	1001				11.052			CTD to bottom
			1009										
1	D14A	185	1106 48 22.27	125 15.57	008	1106	002	1136	1072	10.550	2		CTD 175 m Hydro
			1143							1033			
1	D15A	240	1233 48 25.90	124 36.21	009	1235				10.463			CTD 240 m
			1253										
2	LBP8	2030 new file	0420 49 48.41	128°17.058	010	0426					3 (CAL.)		Cal Sample # 03 messenger sent 0503 CTD 010 to 2042 m
	LBP8	2030 Sounder	49 47.697	128 18.043	011	0513	0503		1970	1.952	4		CAL. FILE - 011 loop sample.
			0542							34.582			
	LBP7		0633 49°52.400	128°11.500	012	0637				9.655			CTD to 2000 m
			0736							31.756			

DATE, TIME PST. May 1 1993. Cont.

2120 - Arrive Stn LBP8

- assemble cal bottle, John looks @ sounder.

Consec 010-CTD to 2042 - deeper than sounder (and answer file) as sounder not corrected depth.

Consec 011 - Calibration file started @ 10 minutes after messenger, fairly large wire angle might slow mess. a bit, or a lot? File not closed right away (mistake) deepest depth is calibration depth. 1970 + m

major noise or hysteresis evident in uptrace in transmissivity. - could be loose? Slow winch down just in case. Looked OK, put more cable ties on connector wire.

T647	7.529	← obviously bottle tripped at or
T679	7.560	near surface, wire angle
P2107 S	-1.	may have been too great?

2242 - depart Stn.

2320 - Doug Yelland re-started ADCP, switch pushed 'off' by chain - not known when.

2330 - Stopped on LBP7
- cleaned and re-greased trans. connector.

0124 - Stopped on LBP6
- CTD to ~805 m

Hydro cast to 750 m
two digital thermometers and one digital pressure & 500 m. Pressure unit failed, read -1 db.

Date Time (local)

- 02/05/93 0855 - on station BP1.
- range 446, 328
469 distance 458 m
501
- moving closer.
0905 - range 467
461 distance 450 m
438
385
0907 - sent release - received positive response
- range 245 m distance 223 m
0910 - sighted on surface
0930 - onboard without incident.

1100 A Serious Safety Issue
- in the process of moving train wheel anchor in position for launch under the A-frame in moderate swell conditions (2m), a number of guy lines were used to steady the anchor from swinging. One of these guy lines was fed through a threaded eye bolt on deck positioned starboard side of the stern roller. During the evolution the this eye bolt stripped its threads and flew forward with the 10" snatch block it supported. This block + eye bolt flew toward the capstan operator, narrowly missing him. The operator dodged away from the flying block and had to leave the capstan. When he let the control lever go the capstan should have stopped - no deceleration control. This is very dangerous + unacceptable. The capstan continued to wind up the guy line pulling the train wheels into the capstan body. The capstan operator, to his credit, went back into a very dangerous situation and turned off the capstan. - continued -

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2	LBP6	785	0821 49 56.172 1000 12805.590	013	0838	13	0930		1048 9.673 1072 31.675		5		CTD to bottom (~805) In at 0900 Hydro cast → 750m
2	LBP5	1300	1032 50 00.073 1112 12800.112	014	1037				9.845 30.528				CTD to ~1280 (1)
2	LBP4	960	1134 50 01.49 1330 127 58.34	015	1139	15	1257		1003 10.066 1030 29.812		6		CTD Hydro 625m
2	LBP3	160	1350 50 03.27 1434 127 55.34	016	1355	16	1425		1031 9.814 1045 29.095		7		CTD 157 Hydro 155m
2	LBP2	95	1445 50 04.034 1456 127 54.264	017	1447				9.950 29.224				CTD to 91.6 m
2	LBP1	57	1513 50 46.86 1541 127 53.561	018	1517	18	1534		1100 10.058 1104 29.579		8		depth changing rapidly
3	LJ09	2512	0140 49 16.18 127 47.34	019	0146				9.812 32.066				CTD 2000m (1998) * Saved as LJ06
3	LJ09	1500	0243 49 16.11 127 47.58	020	/			2.441 34.505			09		CTD cal. 1490.6 2.442 file opened 0248-34.503 0252
3	LJ08	1724	0356 49 20.242 0620 127 40.850	021	0400	21	0533		1003 9.790 1035 32.022		10		CTD to 1700 problems with depth & pressure on ascent.
3	LJ07	1820	0643 49 24.070 0737 127 34.581	022	0651				9789 32.170				CTD to 1812.
3	LJ06	1038	0809 49 27.864 0945 127 28.630	023	0811	23	0915		1036 9.772 1064 32.202		11		CTD to 1050. Hydro cast
3	LJ05	1081	1013 49 31.614 1045 127 22.458	24	1016				9822 31.647				CTD to 1067

Safety Issue Cont'd.

- The total extent of the damage includes:
 - 2 pad eye threaded bolts
 - 2 threaded deck plugs stripped
 - 10" snatch block damaged
 - capstan body dented by trainwheel
 - hydraulic hose to capstan crushed.
- nature of danger
 - danger from airborne pad eye + snatch block.
 - danger from capstan out of control
 - danger from unsecured trainwheel clump anchor.
 - the capstan operator was in danger of being hit on 3 separate occasions.
- Recommendations

- Recommendations
 - check all threaded deck plugs.
 - put dead man controls on capstans
 - put small tugger winches (capstans) on board to guy out heavy loads.

May 2. 1335 (local) - started launch BPI-Q
1340 launched anchor 100.7 m water
corrected
50° 03.785 GPS
127° 53.916

1350 - proceed to LJ-line for CTD's
and hydroos.

LS09 % Calibration sample No. 9. Consec #20

T679 -	2.502	= 2.506
T572 -	2.494	2.505
P2107 -	-1.	

Date Time (local)

May 2 2030

- on cast #19 + #20 at L509 - noticed spiking in both transmissometer and pressure during up cast only.
- pressure spikes were near the surface only and when the winch was hauled in fast. - slowing winch stopped pressure spikes.
- transmissometer spikes only on up cast.
- regreased main connector + secured electrical leads on CTD.

After Sta L508 John Love and Doug Lieberg found faulty Transmissometer Rod. John changed lead and hopes that it solved problem. Will watch on next Sta.

OK.

May 3

0400 - CTD cast stopped, winch cable damaged
John to reterminate

0500 - Proceed with Hydro cast L504

0622 - CTD cable reterminated
- the cable was damaged when a loose
wrap app. 30m up from the probe
end got caught & cut in the gears
of the winch. Luckily the CTD was
not lost
- pulled new termination to 2500 lbs to set.

0825 - L502 CTD to 82, O₂ cast to 75m.

0913 - L501 CTD to bottom, O₂ cast to 50m.

0940 - Proceed to "Mooring E01"

1252 - arrive station E01-P for recovery

1304 - sent CDF XPOND "on" code

- range 378m

- 364m distance.

405m

- moving closer.

- app 1 cable away

176

214m

= 189m distance.

265m

= 250m "

297m

= 279m "

376m

= 362m "

1319 - sent release. - positive reply

93/05/03

1320 - on surface.

1508 - deployed mooring E01-Q at

49° 17.66' + 126° 37.28'
in 103.6m water.

1942. L604 CTD & O₂ cast.

2100 - L605 CTD to 282m.

2149 - L606 CTD to 999m.

2242 O₂ cast to 950m.

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3	LJ04	1117	49 35.528	127 16.852	25	1121							Winch woes
3	LJ04	135	1345	49 35.60	26	1351	26	1323	1065	9.859		12	Hydro 20515.
			1403	127 16.66					1086	31.782			New CTD Termination
3	LJ03	126	1435	49 39.07	27	1437	/	/	/	9.824		/	JOHN BROKE RED'S SIDE
			1450	127 11.07						31.451			CTD 153.2 CUTTERS. (NEW)
3	LJ02	83	1521	49° 42.733	28				1106	10.296		13	CTD 117.9
			1548	127° 05.367		1525	28	1543	1111	29.429			CTD to 82m.
			1608	49 44.42					1112	10.354			O2 cast
3	LJ01	67	1640	127 2.427	29	1613	29	1634	1117	28.954		14	CTD to bottom.
3	LG01		2345	49 20.71	30	2352	30	0005	1054	10.970		15	O2 cast.
				126 35.27					1060	32.090			proceed to fixing CTD.
4	LG00	27	0024	49 21.86	31	0025	/	/	/	11.052		/	CTD to bottom (45m)
			0028	126 34.17						29.598			O2 cast
4	LG02	102	0053	49 18.708	32	0056	32	0115		10.662		16	CTD
			0120	126 38.284						30.950			Hydro 100m
4	LG03	125	0155	49 14.92	33	0158	/	/	/	10.045		/	CTD only
			0207	126 43.57						31.801			
4	LG04	145	0239	49 11.37	34	0242	34	0311	1068	9.963		17/	CTD 140.6
			0320	126 49.27					1090	32.310		18	Hydro to 130 - LOOP
4	LG05	285	0359	49° 07.383	35	0401	/	/		10.075		/	CTD to 282m
				126° 55.393						32.205			
4	LG06	1013	0445	49° 23.520	36	0449	36	0542	1092	9.915		19	CTD to 999.6
			0615	127° 01.254					1114	32.315			O2 cast to 950m.

May 4th

00 00

- 2607: CTD to bottom.
- Had to wash CTD with water because of mud.
- Bernard takes the pinger in: not making any sound for the whole cast. Battery connector in pinger broken, black lead broken from pin.

02 07

Start another file for calibration bottle. Cons. number 39: had an error message. So new file = cons number 40.

- Stop logging at 0909 (UTC)

0800 PDT.

- on station mooring E03-Q for deployment.

1039 PDT.

- deployed mooring E03-Q at
- 49° 04.878
126° 56.906
in 500 m water depth corrected.

1100 PDT

- proceed to mooring A1-P for recovery.



Date Time (local)

May 4

1458

- on station mooring A1-P
- 319 m, 472 m, 460 m
472 m
- ranges < than depth - assume speed of sound corrections + we are immediately on top of mooring ie release 20m off bottom + 472 m range. = 492 m
- moving off to new location. 2 cables away

1508

- 593 range = 318 m distance
- moving farther

1510

- 948 m = 805 m distance

1512

- sent release BEGH
- received positive response
- ranges 947
943
941
946
959 961

1521

- on surface
- range on surface 795 m $\hat{=}$ distance

1645

- proceed to LD11 offshore LD-line for CTD's + hydros.

- Bottom finding pinger undergoing major internal fix.

May 4 1993

$$1500 = 1.6^{\circ} \\ = 1.69$$

7pm - arrive LDI
CTD 1550m
CTD cal 1500m

#679 - 2.475 2.479 plus cal. Sal.

#572 - 2.467 2.478

750 - leave station

2039

Started with -11 m pressure offset, fiddled with pressure bladder got it to -6.6 m (on deck)
During cast pressure locked up for 20 sec at same depth, 69 m.

Change CTD to Serial No. 58483 - no transmissometer
John says he'll look at 53501 in morning.

2106 -

Consec #43 CTD to 1430 m. Sounder was at 1455 m. The sound speed correction factor is $\frac{1}{1.017}$, $\therefore 1455 = 1430$ m. (Sounder $\times 0.9833334$)
The sounder is set at 1500 m/sec

assume the vel. of S here to be 1475 m/sec
 $25/1475 = 0.016949$ (1.7%) inverse 0.9833334

2230

Oz bottle cast to 1400 m.

DAILY LOG

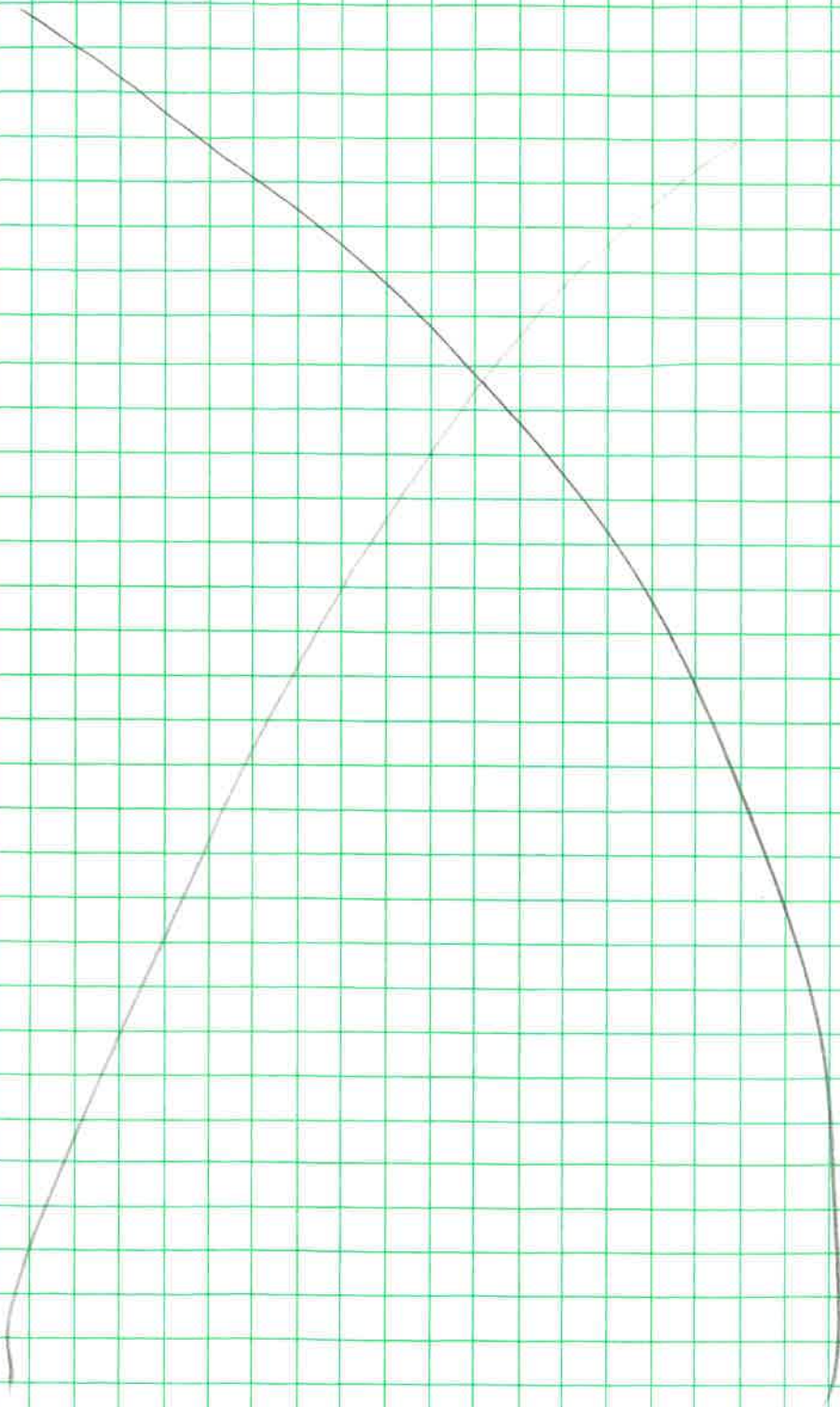
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4	LG07	1784	0656 0750	48°59.246 127°07.293	37	0701				9.861 32.111			CTD to bottom (1792) Hit the bottom No pinger trace
4	LG08	2085	0817	48°55.233 127°13.396	38	0829	0855			9.804 32.119			CTD to 2005 Send messenger at 2005 m
4	LG08		0948	48°55.336 127°14.213	40	0906		1922 34.590	1925 1919		20		File for bottle calibration Depth at beginning: 1976 m Stop logging at 0909
5	LD11	1600	0152	48°28.77 126°43.03	41	0153	/	/	/	10.320 32.312	/		CTD to 1
5	LD11	1500	0216 0248	48°28.62 126°42.73	42			2.471 34.515			2.474 34.517		mess @ 0218 CTD cal @ 1500 m
5	LD10	1479	0320 0607	48°32.311 126°36.660	43	0406	43 0530	/	1003 1035	10.293 32.310		21	SWITCHED TO SPARE CTD 16.58483 DUE TO WEIRD PRESSURE ON 53501.
5	LD09	1085	0640 0711	48°35.709 126°29.887	44	0643	/	/	/	10.069 32.230	/		Corrected depth 1067
5	LD08	757	0741 0857	48°39.163 126°23.256	45	0744	45 0832		1036 1061	10.202 32.304		22	CTD to 748 m Hydro cast
5	LD07	447	0929 0942	48°42.671 126°16.752	46	0930	/						CTD to 442
5	LD06	139	1016 1041	48°46.236 126°10.213	47	1017	47 1033		1062 1079			23	CTD to 137 m Hydro cast
5	LD05		1115	48°49.67 126°03.67	48	1118							CTD 89 m
5	LD04	62	1200	48°53.13 125°56.87	49	1200	49 1217		1080 1090			24	CTD 60 m Net Hydro

interlocking rubber floor mats for bottle room (8x12')
are required as floor is very slippery when wet.



MAY 5 '93

LD04 - CTD + Hydro SD + meters 520
1200 - Net Tow to 60m ~~520~~ Flow
Wine 15°

1240 - Leave STN

LD03

Date Time (local)

May 5 1145 - on station AI-Q for deployment

1330 - ready on deck with mooring.

1402 - deployed AI-Q $48^{\circ}32.033'126^{\circ}12.347'$
in 49.6 m of water.

CTD S3501 checked all connections

in pressure channel could not find
a problem. that would cause lock up and negative
reading. Changed the orientation of the Transmissometer,
re greased all connections, changed cable
on Transmissometer.

Tested CTD in lab - it worked OK all
channels.

Changed to S3501 config file computer
program.

Str - LC-11 Calibration 5700 Sample # 28
Calibration temperature -

T679 3.523 = 3.527

T572 3.501 = 3.512

P2107 -1.

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5	LD03	46	1309	485671	50	1310							CTD 42			
			1313	1255044												
5	LD02	42	1330	4858 29	51	1333					25		CTD 42			
			1359	1254701												
5	LD01	36	1415	4900 04	52	1417	52	1429	1101	1104	26		CTD 33			
			1439	12544 07												
7	AB03	45	1750	48 51.37	\								Bongo only - #3			
			1758	125 40.09												
6	LC12	2000	0005	4815 06	53	0013	53				27		LC-Line start LC12			
			0130	126 39.68												
6	LC11	1462	0224	4818.85	54	0228					/		CTD + Cal. bottle			
				12626.69												
6	LC11	1462	0302	4818.85	55	0302	0257		3.523	3.501	CAL	28	Cal file 8m above CTD			
			0325													
6	LC10	1265	0404	48°22.444	56	0406	56	0513.	1003	1033	29		CTD to 1239.6			
			0542	126°20.194												
6	LC09	625	0623	4825.960	57	0625	/	/	/	/	/		02 cast to 1200 m.			
				126°13.793												
6	LC08	202	0750	48°29.473	58	0754	58	0814	1035	1052	30		CTD to 622.7			
			0845	126°07.050												
6	LC07	130	0912	48°32.977	59	0914	/	/	/	/	/		BONGO NET Haul.			
			0921	126°00.469												
6	LC06	93	0955	48°36.588	60	0956	60	1025	1054	1062	31		CTD to 200m			
			1032	125°53.961												
													Hydro cast			
													BONGO NET 190 m			
													CTD to 120 m			
													hit bottom			
													CTD to 89.8			
													Bongo Net 80 m			
													Hydro cast			

May 5, 1993 P.D. time cont.

2325 - LC09 Ctd to 622.7 m, hit bottom (softly)
Sounder at time 638 - 639 plus heel.
= 3.3% error.

May 6 Thursday 93

0730 - LCO1 CTD Hydro 95m
0750 - Leave stru run to LCB

- 1103 - on station C1-Q for recovery.
1107 - sent BDH to turn XPOND on.
- 327m 329m 330m = 293 m distance
1114 - sent release BCDH
- positive response.
- 304 m 290m.
- on surface
1135 - on deck

1349 & 1359 ships GPS gave bad data to CSAIL

1440 - deployed mooring C1-Q at
48° 29.376' 125° 15.247'
in 153m water

1450 - proceed to LCB4 for plankton haul.

Stn LB16 CTD #66 to 1845m.
Calibration bottle 5 m above probe.
5% cal sample No 35
Temp.

No. T679	3.442 @ 1578	3.446
No. T572	3.431	3.442
PRESSURE P2107	-1.	

Stn LB15 CTD to 1545m
Calibration bottle 2m above probe
5% cal. sample No. 36

Temp:- No. T679 2.818 = 2.822
No. T572 2.809 = 2.820

- the bottom finding pinger was repaired
and back in use for LB-Line.

DAILY LOG

OCEAN PHYSICS

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YEAR		93		MONTH		5		TIME ZONE		UTC		SHIP		TU119		CRUISE		9312		PAGE		OF	
DAY	STATION IDENTIFICATION	DEPTH SOUNDING (m)	SHIP STOP/START TIME	LATITUDE/ LONGITUDE	STD CONSEC. #	STD TIME	HYDRO C	MESSENGER TIME	HYDRO SALINITY #	OXYGEN #	SURFACE TEMPERATURE/ SALINITY	LOOP SALINITY #	NOTES										
6	LC05	65	1105 4839.92	61 1106	/	/	/	/	/	/	/	/	CTD 63 Net #8										
			1120 1254718																				
6	LC04	165	1157 4843.48	62 1200	62					1063	32		CTD 165 Hydro 150										
			1235 1254068							1080													
6	LC03	134	1307 4846.96	63 1310	/	/	/	/	/	/	/	/	CTD										
			1318 1253438																				
6	LC02	109	1335 48 48.83	64 1335	64	1352				1084	33		CTD/Hydro to 100m										
			1400 125 31.33							1096													
6	LC01	95	1424 48 50.50	65 1430	65	1445				1097	34		CTD 96m Hydro										
			1450 125 27.89							1105													
6	LCB3	134	1630 48 34.57	-	-	-	/			-	-		Bongo #9										
			1650 125 30.51																				
6	LCB4	80	2314 48 31.98	-	-	-	-						Bongo #10 to 70m										
			2330 125 35.34																				
7	LCB6	355	0142 48 22.76	/	/	/	/						Bongo #11 to 250m										
			0200 126 03.78																				
7	LB16	1825	0433 48° 00.458	66 0440	/						CAL 35		Calibration bottle on wire 5 m above CTD										
			126° 16.775																				
7	LB16	1839	0543 47° 59.838	67 0516	/	0509	/	/	/	/	/	/	1578 m } 7 min 2356 } 50 sec. 34.535										
			0627 48 04.25								CAL 36		Cal bottle 2m above probe										
7	LB15	1464	126 08.28	68 0632																			
7	LB15		0726	69 0701		0653				2818 2809			CALIBRATION FILE										

0812 CTD + Hydro 430m

Temp = T451 5.238 5.241
T647 5.240 5.248

- 0827 - station LB08 CTD # 76 Hydro # 76
- winds 35 knots. 3-5 m seas
 - marginal for hydro's - complete hydrom anyway.
 - ship can not use bow thruster because bow is coming out of the water too much and the thruster motor may get damaged. When you need the thruster you can't use it. Ship's Div. has struck again.

- 0942 - station LB07 CTD # 77
- winds up to 45-50 knots.
 - marginal for all operations
 - the low system is small, not very deep and should be improving by afternoon.
 - suspend hydro's until winds + seas subside to 35 knots and less.

- 1134 - station LB04 CTD # 80 Hydro # 80
- hydro casts were resumed after winds dropped to below 30 knots.

- 1400 - en route Sta LB01 to LA01
- decide to complete LA Line using the WOCE spare CTD winch and wire on starboard side
 - setup transmissometer comparison/calibration casts at the end of LA-Line.

YEAR	93	MONTH	5	TIME ZONE	UTC	SHIP	Tully	CRUISE	93-12	PAGE	OF		
DAY	STATION IDENTIFICATION	DEPTH SOUNDING (m)	SHIP STOP/START TIME	LATITUDE/ LONGITUDE	STD CONSEC. #	STD TIME	HYDRO #	MESSENGER TIME	HYDRO SALINITY #	OXYGEN #	SURFACE TEMPERATURE/ SALINITY	LOOP SALINITY #	NOTES
7	LB14	1179	0805 0954	48°08.429 125°59.121	70	0811	70	0915	1003 1033		37		CTD to 1150 Hydro cast
7	LB13	900	1014 1045	48°10.604 125°55.270	71	1019	/	/	/		/		CTD to 875
7	LB12	454	1107 1210	48°12.85 125°51.78	72	1111	72	1152	1054 1079		38		CTD to 500m Hydro to 430m
7	LB11	207	1230 1306	48°15.19 125°47.80	73	1233	73		1080 1101		39		CTD to 200m
7	LB10	154	1340	48°18.49 125°41.42	74	1342	/	/	/		/		CTD 154
7	LB9	149	1425 1500	48°22.01 125°34.72	75	1428	75	1445			40		CTD 149 Hydro 125m 30° angle
7	LB08	133	1527	48°25.329 125°28.356	76	1529	76	1554	1130 1154		41		CTD to 130m O ₂ cast to 125m
7	LB07	155	1647 1652	48°28.784 125°22.051	77	1646	/	/	/		/		CTD
7	LB06	113	1735 1745	48°32.314 125°15.369	78	1738	/	/	/		/		CTD to 110. HYDRO CANCELLED T.J.
7	LB05	97	1808 1813	48°34.04 125°11.980	79	1810	/	/	/		/		CTD to 95.
7	LB04	109	1834 1855	48°35.719 125°08.533	80	1836	80	1850	1132 1158		42		CTD to 105m. O ₂ cast to 100m
7	LB03	93	1910 1922	48°37.475 125°05.396	81	1915	/	/	/		/		CTD to 81.4

YEAR	1993	MONTH	MAY	TIME ZONE	UTC	SHIP	TULLY	CRUISE	93-12	PAGE	OF		
DAY	STATION IDENTIFICATION	DEPTH SOUNDING (m)	SHIP STOP/START TIME	LATITUDE/ LONGITUDE	STD CONSEC #	STD TIME	HYDRO CONSEC #	MESSENGER TIME	HYDRO SALINITY #	OXYGEN #	SURFACE TEMPERATURE/ SALINITY	LOOP SALINITY #	NOTES
7	LB02	57	1940 48°39.051 1956 125°02.186	82	1942	82	1951	/	1106 1110	/	43		CTD to 47m Hydro cast to 45m
7	LB01	35	2010 48°40.430 2029 124°59.582	83	2012	83	2024	/	1111 1114	/	44		CTD to 27 Hydro to 25m
7	LA01	264	2207 48°28.651 2315 124°43.525	84	2227	84	2304	/	1003 1025	/	45		CTD to 255 Hydro to 250
7	LA02	312	0002 48°26.05 0056 124°51.23	85	0006	85	0044		1026 1042		46		CTD 308m HYDRO to 290m
8	LA03	113	0133 48°22.83 0144 124°57.77	86	0139	/	/	/	/	/	/		CTD-113
8	LA04	165	0218 48°19.31 0249 125°04.35	87	0221	87	0242		1045 1142		47		CTD Hydro
8	LA05	129	0330 48°15.58 0340 125°10.96	88	0334	/	/	/	/	/	/		CTD-127m. LONG LONG - FILE
8	LA06	107	0414 48°12.644 0447 125°17.264	89	0418	88	0434	/	1054 1062	/	48		CTD - 103 O2 cast to 100m
8	LA07	115	0518 48°09.27 0529 125°23.94	90	0520	/	/	/	/	/	/		CTD to 105m
8	LA08	142	0603 48°05.75 0631 125°30.50	91	0606	91	0622	/	1063 1079	/	49		CTD to 132m. O2 cast to 125m.
8	LA09	870	0706 48°02.338 0724 125°37.078	92	0708	/	/	/	/	/	/		CTD to .?
8	LA10	941	0800 47°59.120 125°43.514	93	0803	/	/	/	/	/	/		CTD to 928

May 8th

0147

First cast done

Calibration bottle : salinity # 50

Depth - 830 m.

T679: 4.022 °C = 4.026

T572 4.015 °C 4.026

0228

Second cast done

Salinity #52

Depth 622

T679: 4.588 °C = 4.593

T572: 4.583 °C = 4.594

0348

3rd cast done

Third calibration

Depth 903

T679 3.872 °C = 3.876

T572 3.866 °C 3.877

Date Time (PDT)

May 8

1139

- deployed mooring JF1-Q
at 48° 03.264' 125° 18.828'
in 279 m. of water.

- mooring partially deployed when
rotor from #5391 was knocked
out by crane hook. Pulled instrument
back on board - check tape, replaced
rotor + continued deployment

- 20 knot winds but large swell
made deployment difficult.

May 8

1442

- deployed mooring IF3-Q
at $48^{\circ}15.519'N$ $125^{\circ}12.160'$
in 223 m of water.
- without incident.
- swell reduced.

DAILY LOG

OCEAN PHYSICS

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[illegible]

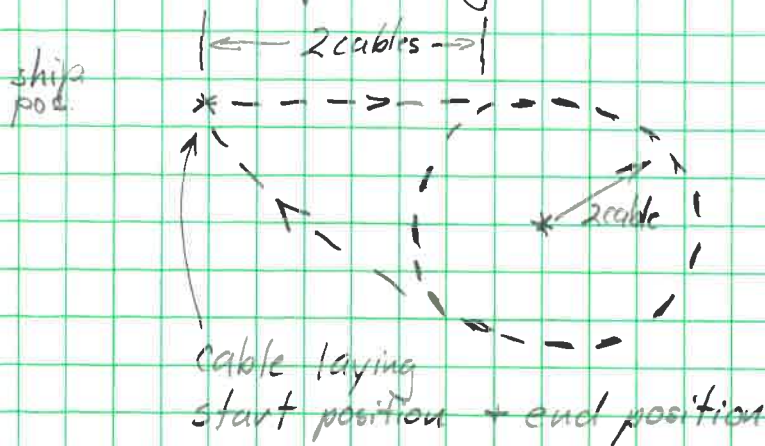
0800 hrs PDT May 9, 93

- on station CRDI-B for recovery.
- deployed ram (stbol)
- hooked up IO deck gear.

0807 - sent repeated XPD commands.
- with no response

0812 - sent release command no response
- " " " " "
- " " " " "

- 0815
- set up for drag recovery.
 - set up drag course



0900 - ready on deck - move to cable laying
start position

0910 - laying cable

0912 - on bottom ship begins to move.

0935 - app. 2000m out stopped paying out
start hauling in at cable laying end point.

0945 - sighted on surface.

1005 - drag completed successfully

- a lot of garbage pulled up by grapples.

- drag brought outboard

- surface buoy recovered by rubber boat.

- recovered SS30 RCM → Acoustic Release

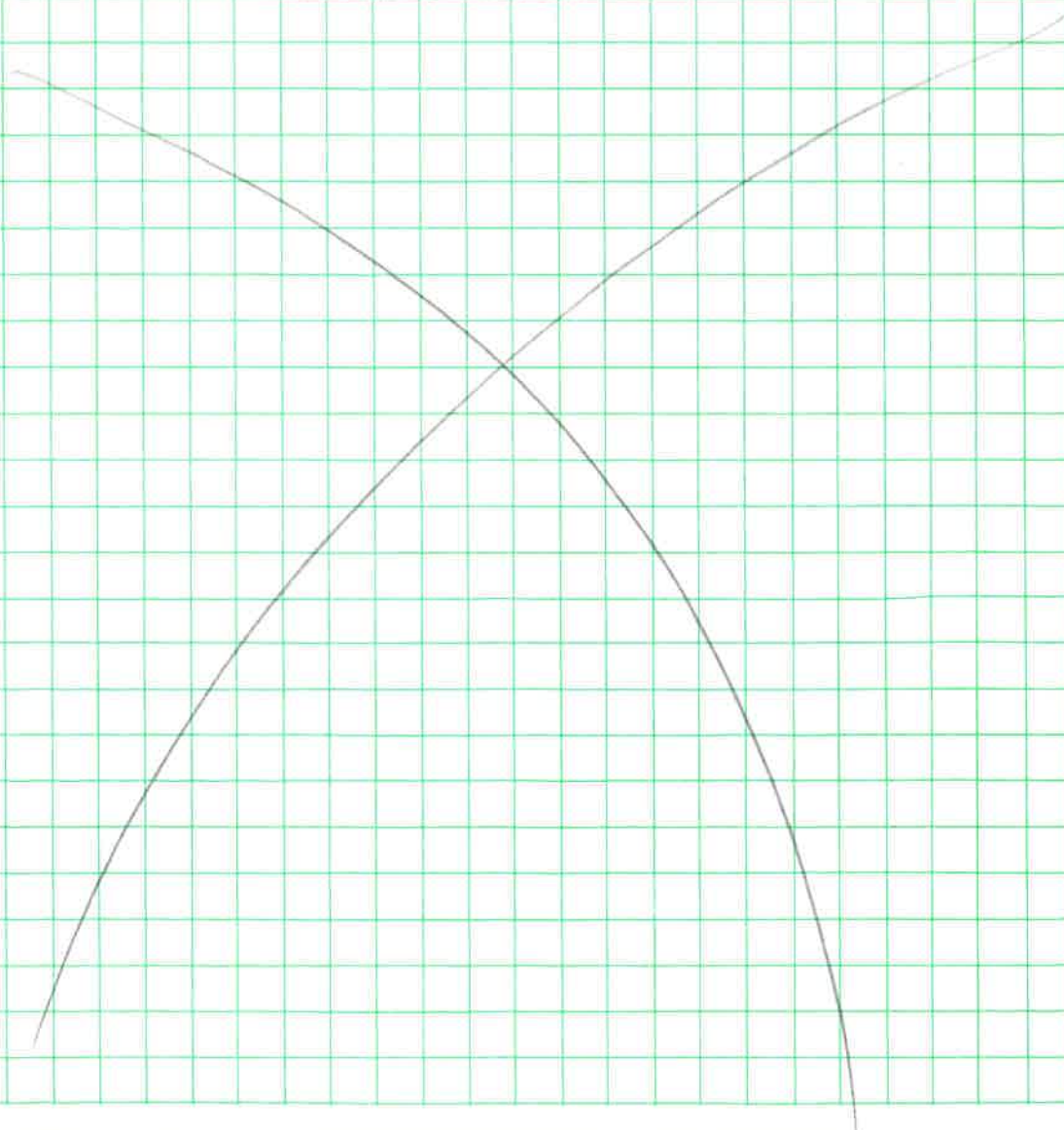
- pinger had been totally pulled
off, battery and all, on previous
drags.

Date Time (PDT)

May 9 1010 - mooring outboard. + being cleaned
- drag - cleaned up
- start setup for deployment
CRDI-D - back on original location.

1249 - deploy CRDI-D at
48° 23.893'
123° 24.187'
in 61 m of water.

1410 - in to CFB Esquimalt
- "D" jetty
- cruise over



[illegible]