CRUISE NUMBER 9809

DAILY LOG

INSTITUTE OF OCEAN SCIENCES

OCEAN PHYSICS

DATE May 4 - 11, 1998

VESSEL J. P. Tully

PROJECT La Perouse, Globec, CRD
Juan de Fuca, Barkley Canyon,
El Nino

Captain: J. Anderson First Officer: Duke Schneider

Second Officer: Pat. Murphy Third Officer:

Cruise Participants / Agencies: OSAP, + UBC

Scientific Personnel: Party Chief: Tom Juhász 8/16 A

Name	Watch	Cabin	Name	Watch	Cabin
Bernard Minkley	16/20 00/04	E			
Dario Stucchi	16/20 00/04	G			
John Love	8/12 20/24	D			
Dave Spear	8/16	C			
Doug Anderson	12/16 20/24	F			
Jane Eert	12/16 20/24	H			
Aaron Minkley	16/20 00/04	E			

Second leg of cruise: Party Chief:

Name	Watch	Cabin	Name	Watch	Cabin

Data logging system: Unit no.: FS01 / 586-2

Program Name: Program version:

CTD deck unit make: model: serial no.:

Computer make: model: serial no.:

1st CTD make: model: serial no.: 0443

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: offset:

Comments: Cond. Pri 1763

Sec 1766

✓ Temp Pri 2095

✓ Sec 2142

Trans 182 D

2nd CTD make:_____ model:_____ serial no.: OH37

Temperature sensor model:_____ serial no.: Pri Cond: 1748

coefficients: slope:_____ offset: Sec Cond: 1764

Conductivity sensor model:_____ serial no.: Pri Temp: 2106

coefficients: slope:_____ offset: Sec Temp: 2062

Pressure sensor range:_____psi serial no.:_____

coefficients: FSP:_____dB offset:_____

Transmissometer model:_____ serial no.:_____

coefficients: slope:_____ offset:_____

Winches:

1. make: Swan model: 329 serial no.: 1482 use: Prime CTD
2. make: " model: 329 serial no.: 1307 use: CTD Bionees
3. make: " model: 515 serial no.: 589 use:_____
4. make:_____ model:_____ serial no.:_____ use:_____
5. make:_____ model:_____ serial no.:_____ use:_____
6. make:_____ model:_____ serial no.:_____ use:_____
7. make:_____ model:_____ serial no.:_____ use:_____

Salinometer: make:_____ model:_____ serial no.:_____

SAIL System:

Program version:_____ Time zone:_____

Sampling interval:_____sec

CTF module no.:_____serial no.:_____

Remote temperature model:_____ serial no.:_____

Flow sensor model:_____ serial no.:_____

Other sensors: (special for this cruise)

Name:_____ module ID:_____ serial no.:_____

Name:_____ module ID:_____ serial no.:_____

Name:_____ module ID:_____ serial no.:_____

Comments:_____

ADCP Setup:

Program version:_____ number of depth bins:_____

Time zone:_____ bin length (2x):_____

Sampling interval:_____sec pulse length:_____

Blank beyond transmit:_____ pings per ensemble:_____

Pulse cycle time:_____

% pings good threshold:_____

Comments:_____

Date	Time (PDT)	
May 5	0530	- load last items on vessel
	0615	- depart I.O.S. for Esquimalt and fuelling
		- Dave Spear to bring WASP fish tag mounting plates, pinger receiver, and double release drop links and assemblies and other items yet unknown
	1030	- arrived Esqui. for fuelling.
		- waiting for Dave to join ship along with missing items
	1600 - 1630	- fuelling complete
		- Dave Spear joins ship with equipment
		- depart for CRD moorings for recovery, service + redeployment.
	-1742	- on station CRD5 - M
		- very noisy - coming out of generator mode and moving back on station
		- not hearing mooring - change to dunking transducer
		- 130, 130, 134 ranges 139
	-1755	- sent ACEH - received positive response
	-1756	- on surface.
	-1825	- all on board being cleaned
		- some fishing line tangled around release and pinger but not around RCM's.
	-1830	- on station CRD5A - M
		- range 328 m 327 m 331 m, 332 m
	-1832	- sent AEFG - received positive response
	-1833	- on surface.

1) The header files 0001.hdr, 0003.hdr, 0004.hdr + 0006.hdr have hex data strings in fields for System Upload time, NMEA Latitude + Longitude!
0005.hdr has ASCII fields but they do not appear to be correct.

2) From within SeaSave Win95 version or SeaCon (DOS version) we cannot convert file 0001.dat to 0006.dat
Error message says that 0001.DAT (nwords = 8, nfreq = 5, nvolt-words = 2) differs from 0001.con

3) Primary and Secondary Salinity sensors differ by about 0.09 PSU Temperature sensors agree. Bernard took both conductivity sensors apart and examined them. No obvious problems were observed in the physical state of the conductivity sensors.

4) System time was incorrect. It was one hour out. Bernard reset the system time.

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YEAR: 1998 | MONTH: MAY | SHIP: TULLY | CRUISE: 9809 | PAGE: OF

DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC) *	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS
6	CRD5	CTD	05:31	BE	1			* Note times are not in UTC						data file
6	CRD5	CTD		BO	1			system clock is one hour						NMEA.DAT 05:31
6	CRD5	CTD		EN	1	48 23.88	123 20.73	3455						
6	CRD6	CTD		BE	2	48 23.73	123 20.83							
6	CRD6	CTD		BO	2	48 23 74	123 20.79							
6	CRD6	CTD		EN	2	48 23 76	123 20 76							
6	CRD7	CTD	0600	BE	3					06:00				
6	CRD7	CTD	6:00	BO	3	48 23 56	123 20 60	3433						
6	CRD7	CTD	6:02	EN	3	48 23 55	123 20 61							Offset for cc salinity approx .02 too low
6	CRD8	CTD	6:20	BE	4	48 23 48	123 21 19	3502		06:20				
6	CRD8	CTD	6:24	BO	4	48 23 47	123 21 15							
6	CRD8	CTD	6:26	EN	4	48 23.53	123 21.16							
6	CRD1	CTD	6:49	BE	5	48 24.08	123 23.42	3903		06:49				
6	CRD1	CTD		BO	5	48 24 05	123 23.38							
6	CRD1	CTD	6:53	EN	5	48 24 05	123 23 37							
6	CRD2	CTD	7:11	BE	6	48' 23.92	123 24.18	403	63m.	07:11				Up+down together.
6	CRD2	CTD	7:14	BO	6									
6	CRD2	CTD		EN	6									

CAST TYPE - BOT - bottle cast; CTD - ctd; MOR - mooring; ROS - rosette; NET - net haul; DRF - drifter; USW - sea water loop

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POSITION CODE - RAD - RADAR; GPS - GLOBAL; LOR - LORAN

Date	Time (PDT)	
May 5	2052	- launched CRD5A-N at position 48° 23.420' 123° 20.050' in 85.5 m water corrected for draft.
	2148	- launched CRD5-N at position 48° 23.780' 123° 21.030' in 54 m water corrected for draft.
		- proceed to complete CTD (only) stations CRD 1 - 8 and hope to occuppy Juan de Fuca Stations along JF3 and JF2A lines.
May 6	0730	- looking for mooring site JF3A-A
		- setting up mooring
	1046	- deployed mooring JF3A-A at position 48° 17.820' 124° 00.010' in 187.25 m of water corrected for draft.
		- set up ADCP mooring JF2C-A for deployment
		- after set up complete - performed a float test on the system - the water line was app. 2/3 up from bottom of buoy - see photographs - based on this, decided to add 2 glass balls into system above the releases and to counter this a 100 lb piece of chain to the anchor. - see mooring drawing
	1438	- deployed JF2C-A in 188 m water (corrected) at position 48° 21.227' 124° 12.184'
		- stayed on site for 10 min to see if mooring remained in place.
		- depart for LB Line near shore end.

May 6, 98 1830 T/Sal recorder shut down - too many bubbles creating unusable data

Starting with cons #10 a different configuration file was used.
Con file = 9809NEW.CON it has the updated conductivity coeffients for sensor #1763 and the fluorometer was included.
The more up to date cond. calibrations reduced the differences between primary + sec. to about 0.03 - 0.04 PSU.

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6	CRD3	CTD	0736	BE	0007	4823.50	12324.01			68.5				Using DOS - SeaSave
			07:38	BO										Salinity diff between primary + secondary
				EN										of ≃ 0.09 PSU
6	CRD4	CTD	07:57	BE	0008	4824.15	123 24.89			61m				too large!!
			07:59	BO										
				EN										
6	RR-TES	ROS	10.21	BE	0009	48 17.08	123 37.24			187	1-8			CTD/rosette cast
				BO										for cal samples
			1036	EN										near Church Is
7	LB01	ROS	01.49	BE	0010	48 4044	124 5955		34m		9-12			Start of watch
			01:51	BO										bottle #1 did not fire
			01:55	EN										∴ no sample #9
7	LB02	ROS	02:35	BE	0011	48° 39.04	125° 2.50		57m		13-17			bottle #1 did not fire again
			02:37	BO										∴ no sample #13
				EN										

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* Replaced pylon hub assembly and tried to fire bottle #1 on deck.
  It worked!

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DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS
7	LB03	CTD	0324	BE	0012	48 37 51	125 05.93	GPS						*see note opposite
7	LB03	CTD		BO	0012									
7	LB03	CTD		EN	0012	48 37 500	125 05 930	GPS						
7	LBØ4	ROS	0407	BE	0013	48 35 86	125 08 49							
7	LBØ4	ROS	0415	BO	0013	48 35 80	125 08 46	GPS			18 - 24	7		
7	LBØ4	ROS	0418	EN	0013	48 35 760	125 08 430							
7	LBØ5	CTD	0511	BE	0014	48 34 00	125 12 20	GPS	105					
7	LBØ5	CTD	0514	BO	0014	48 33 96	125 12 19							
7	LBØ5	CTD	0517	EN	0014	48 33 93	125 12 19							
7	LB06	ROS	0558	BE	0015	48 31 91	125 15 84		118					
7	LBØ6	ROS		BO	0015	48 31 85	125 15 56			113.	25-31	7		
7	LBØ6	ROS	0609	EN	0015	48 31 85	125 15 56							Sprayit # 3 open
7	LBØ7	CTD	07:09	BE	0016	48 28.69	125 22.37		157m.					Watch change ↓
7	LBØ7	CTD	07:14	BO	0016									
7	LB07	CTD	07:19	EN	0016									
	LB08	ROS	08:08	BE	0017	48 25.21	125 28.80		140m.		32-39			
	LB08	ROS	08:13	BO	0017	48 25.19	125 28.88							
	LB08	ROS	08:28	EN	0017									

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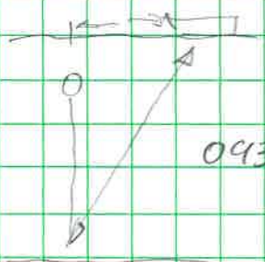
Date	Time PDT	
May 7	0855	- on station ENP4-A for recovery - gale force winds
	0900	- range — no reply
	0900	- sent ABD XPND ON - range 1514, 1519, 1521 app. 766 m distant.
	0900 - 0910	- ranged on XT6000 got 2407, 2409 ranges unit seems to be working. - range with I:O = 1713 m. app 1100 m distant.
		- moving closer.
	0930	- range 1330 m — right on top drifting off to good release position.



	0932	- range 1358 m. - sent ABCD — received positive response
	0934	- sighted on surface. (top)
	0947	- bottom floats surface
	1130	- all on board - cleaning up

1300 Seawater loop running again using top pump. Repairs made & de-bubbler reset (used methylene chloride to repair plexiglass chamber).

	1552	- launched ENP4-B at 48° 39.410' 126° 39.100' in 1327 m uncorrected depth (for speed of sound = app. 1314 m corrected depth)
		NB: - we had not complete a CTD deep enough to enter a speed of sound correction CTD profile into sounder. - depth was selected by historical data
	1615	- head for LE04 to deploy 2 Argos drifting buoys.

Drifter Launch at station LE04

7/5/98

20304 launched at 18:46 PDT 48° 56.443'N 126° 14.883'W
but went into wheel and destroyed the drogue
Surface scott's float and instrument float recovered.
PTT 20304 appears to be still operational.
During deployment we did not have any forward movement on the ship and when we threw the drogue over the stern the ship moved back over the drogue and pulled it into the propellors. We asked for a kick ahead but it was too late to save the drogue.

Magnet applied at 1932 PDT 7/5/98 to turn PTT off.

6003 launched at 19:00 PDT 48° 56.435'N 126° 14.533

started logging to new file called 6003.raw + 6003.csv in the tracking program.

Drifter Recovery on 10/5/98 of #6003

Recovery at: 14:00 PDT at 48° 47.440'N 126° 08.420'W
Used the GONIO uplink and tracker program to get close to the latest hourly GPS position. The GONIO DF gave good bearing while 1-2 miles away but began to wander as we got closer. GONIO picked up drifter message out as far as 4 n.mile from drifter.

Recovery was accomplished on the starboard side well away from the stern. We tied off the buoy and let the ship drift off bringing the drogue to the surface and then filling with air. It was relatively easy to pull out of the water once it surfaced.

Jane spotted the drifter main buoy. The sub surface float was also at the surface indicating that the drogue may be improperly ballasted.

Turned off 6003 by applying magnet again at 15:06 PDT
First attempt failed.

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DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS
7	LB09	ROS	09:17	BE	18	48 21.96	125 35.02		151m		40-48			
			09:21	BO		48 21.96	125 35.08							
			09:35	EN		48 21.92	125 35.32							end of watch
8	LDØ1	ROS	0426	BE	19	49 00 05	125 43 42							~~*0443NEW.CON *~~ ~~used~~
8	LDØ1	ROS		BO	19/20			GPS	36		49 - 52			
8	LDØ1	ROS	0432	EN	20	49 0 06	125 43 44							
8	LDØ2	ROS	0520	BE	21	48 58 56	125 46 82							CTD 02,SAL, BONGO
8	LDØ2	ROS		BO	21				44		53 - 56			
8	LDØ2	ROS	0525	EN	21	48 58 580	125 46 600							Bongo to 35m
8	LDØ3	CTD	07:04	BE	22	48 56.52	125 50.65		49m					Watch change
8	LDØ3	CTD	07:06	BO	22	48 56.54	125 50.68							Conf file 0443NEW.CON
8	LDØ3	CTD	07:09	EN	22									
8	LD04	ROS	08:04	BE	23	48 53.25	125°57.10		64m					
			08:06	BO	23	48 53.28	125 57.13				57-61			
			08:13	EN	23	48 53.35	125 57.20							
8	LD04	NET	08:57		24	48 53.42	125 56.98		62m					BONGO
						Some sample left in	net							First attempt aborted
														Second attempt successful.

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Date	Time PDT	
May 8	0802	-on station A1-2 for recovery
		-ranges 617, 621 = 368 m distant
		-moving closer for release.
	0820	-on station again
		-range 505 m 504 m = 156 m distant
		-drifting off to be app 200 m away
		-range 508 512 522 = 205 m distant
	0825	-sent ADFH received positive response
	0827	-sighted on surface
		-recovered, cleaned up and set up for redeployment
	1256	- launched A1-AA at position
		48° 31.950'
		126° 12.270'
		in 497 m of water corrected for depth.
	1324	- on station A2 for recovery.
		-ranges 490 -492 - too near on top.
		-drifting off for release.
		-498 range = 105 m distant.
		500
		505 = 133 m
		518 = 176 m
	1329	- sent ABEH - received positive response
		-range 337 -rising? - this is wrong
	1335	- not on surface sent ABEH again. received positive response.
		-moving back onto position.
	1350	- near deployment position -app. 200 m away acc. bridge
		-range 491 → 650 m ranges as we drift off
		-heard 2 pingers very strong
		-sent ABEH 3 more times + received positive responses.
		-conclusion mooring is intact, in place but release is not letting go - why??
		-Dario is on bridge during this operation and using Argos DF unit for indication of mooring coming up.

Date	Time	PDT	
May 8	1408		- moved back directly over station.
			- listening with pinger receiver + release ranging 488 m 487m 486m 486 485
			- we are directly over top!
			- sending ABEH + ranging as we drift off range 489, 490, 492, 496, 497 500 = 113 m distance range 509
			- sent ABEH positive response range 519 523 drifting off
			- sent ABEH positive response range 537, range 540, 545
			- sent ABEH positive response. range 563. range 597.
			- mooring not rising - no Argos signal on surface.
	1420		- set up for drag - 2 lengths of chain + 1 length of giffoyd grapples + 1 hook
	1605		- mooring cut free and sighted on surface.
	1700		- while recovering drag cable winch stalled out by extremely heavy load. - I decide to cut drag cable - situation too dangerous - in agreement with Captain. - load was lowered down to bottom and wire cut. DGPS { 48° 30.350' / 126° 11.790' } position cable went to bottom GPS { 48° 30.331' / 126° 11.773' } in lab.
			- stop operations for supper.
	1835		- mooring recovered and cleaned
			- release hook is open + drop link missing. What happened?? ① the release repeatedly released, confirmed but did not surface ② recovery was definitely as a result of the dragging ③ during the drag something very heavy was caught + partially lifted ④ the release had an open hook on recovery after being on surface for 1½ hours.

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DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS
8	LD05	CTD	10:01	BE	25	48 49.77	126 3.68		9/m					
			10:03	BO		49.81	3.69							
			10:07	EN		49.85	3.68							
8	LD06	ROS	11:07	BE	26	48 46.34	126 10.24		137m		62-69	8		
			11:11	BO		46.36	10.28							
			11:21	EN		46.39	10.41							
9	LD07	CTD	0610	BE	27	48 42 64	126 17 10							Wild wire at start
			0629	BO		48 42 70	126 17 29	GPS	530					of cast more weight?
			0644	EN		48 42 87	126 17 53							
9	LD08	CTD	0839	BE	028	48 39.02	126 23.27		763m					Large swell, wind 30 kt
			0854	BO		48 39.16	126 23.44							
			0906	EN		48 39.27	126 23.62							
9	LD09	CTD	1057	BE	029	48 35.75	126 29.89		1059					
			11:19	BO		48 35.92	126 30.18							
			11:36	EN		48 36.13	126 30.43							
10	LB16	ROS	0536	BE	030	48 037	126 16 90							Problems with 2nd
	LB16	ROS	0620	BO		47 59 40	126 16 26				70-90	21		Cond sensor?
	LB16	ROS		EN										Also carosel faulty.

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see over

9/5/98 local.

(1) Many bottles did not fire. The mis-fires occured in a random manner. We replaced the hub assembly coclad all bottles and fired them all, but not all actually closed. Many mis-fired but the click of the solenoid was heard. We determined the problem to be in the carosel. We removed the carosel and discovered that the cable & bulk head connector pins were green. Water at some point got into the carosel connector.

Carosel S/N: 0138 replaced with # 0137

Carosel cable cleaned and regreased, Carosel bulk head connector pins cleaned. Worked on cast at LBIS.

(2) Noise in the secondary salinity turned out to be caused by noise in both the secondary temperature and conductivity. When we played back the archived data we also noted that the fluorometer under went a sudden shift part way up the upcast.

10/5/98 local.

We discovered the fluorometer had failed because it had been overpressured. The pressure rating was 600 bars and we took it to 2800 m, three time more than its rated pressure. Upon inspection we discovered that the fluorometer optics were shattered, the pressure housing was filled with sea water and some clear-jel was in the plumbing. The problems we noted in the T+C sensors above may be related to the failure of the fluorometer.

Date	Time PDT	
May 8	2024	- launched A2-AA in 503 m depth at 48° 29.070' 126° 13.070'
	2100	- back at A1-AA to range on mooring directly over mooring position ranges 503, 504, 505, 503, 498, 496, 495 as we drift over site.
	2105	- head of for CTD/Rosettes on LD Line
May 9	0800	- on station. BC03-B - range - no response
	0810	- sent BCE - range 725 m. 726 m. - moving closer.
	0820	- back on station - range 705 m., 708 m. = 500 distant. - check mooring position - we are off station. bridge using wrong waypoint.
	0830	- at the real position of the mooring - range 699 699 = 425 m distant. 698 702 698 - on station but still too far away - has it been moved? - we are drifting away - we are going 2 cables up from our present position against our drift. ie we go north - stopped 765 range 773 779 777 776 772 787 746 drifting closer 728 → 695 → 682 → 680 → 683 - by triangulation established a likely position app. 1 cable NW of deployment position. - moving to this site. - ranges 636, 624 → 603 → 589 → drifted to closest point 568 → 572
	0935	- 0574 sent release code ACFG - received range. positive response ranges 454 418.
	0937	- sighted on surface - recover + service for redeployment.

over

- the mooring (BC03-B) was moved app 200-300 m off station
- on recovery the bottom instrument showed signs of damage
  - orientation pin bent
  - body band elongated
  - gimbal rod knock loose from vane casing

NB - the mooring was lifted and moved by the bottom instrument being caught in presumably fishing gear.

Date	Time PDT	
May 9	1320	- deployed BC03-C at 48° 20.99' 125° 56.37' in 548 m corrected for draft
	1612	- deployed BC02-C at 48° 22.31' 125° 58.57' in 550 m water corrected for draft
	1809	- deployed BCWASP at 48° 24.878' 125° 56.837' in 239 m water corrected for depth.
	1820	- depart for LB16 to complete LB line in bound.
May 9	2200 app.	- we notice hydraulic oil all over back deck. - apparently the crane developed a problem (?) and oil was streaming out of it as it rested in the crutch - engineers got onto the problem and the decks were cleaned up. - the Rosette also needed to washed down by the pressure washer.
May 10	0800	- on station BC01 for deployment - crane still being worked on - conclusion = there is no problem the leak was only due to accumulated oil in the crane body
	1200	- Upon checking specification of the Wetlabs Flashpack Flowmeter, the Flowmeter that was mounted on the CTD during deep station LB16 was checked, and found to be flooded. This introduced material into the pump ducting, and is likely the cause of the noise on the secondary temperature and conductivity sensors on 0448. Specs of the flowmeter indicate a maximum depth capacity of 600 m. The CTD was lowered to approximately 1800 m on LB16, which caused the quartz cell to implode and flood the flowmeter. D.A.

Date	Time PDT	
May 10	1047	- deployed mooring BC01-C in 401 m depth (corrected for draft) at position: 48° 23.950' 125° 54.760'
	1100	- head of to recover drifting buoy near LE04 as per positions received by Argos
	1630	- gave ship (Master) a list of mooring position for issue as Notice to Shipping and Notice to Mariners through CCG Vessel Traffic control

x note re #32: Secondary T+C interchanged

DAILY LOG

OCEAN PHYSICS

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DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS
10	LB15	ROS	0934	BE	31	48 4.46	126 8.64		1575		91 — 100			Noise on 2nd salinity starting at 600m on down cast
			1005	BO		48 4.83	126 8.72							Noisier on the upcast. Transmissio shifted!
			10:41	EN		5.22	8.88							
11	U1	ROS	0059	BE	32*	48 55.19	125 30.97		25m.		101 — 109	9		Changed configuration file to
			0100	BO	See note	55.18	30.97							0443TRAN.CON because we removed the failed Fluorometer
				EN										
11	U3	ROS	01:33	BE	33	48 56.29	125 32.03		14					Leads on 2nd T+C Flipped
			01:35	BO		5					110 — 116	8		Doug N. rectified this for this cast #.
			01:41	EN		56.24	32.02							Cancelled U5 due to
														Crab traps obstructing passage.
11	LB10	CTD	0612	BE	34	48 18 63	125 41 30		153					
			0614	BO		48 18 63	12541 32							
			0618	EN		48 18 600	125 41 340							
		ROS	0723	BE		48 15 21	125 48 19							
	LB11	ROS		BO	35				212		117 — 127	11		
		ROS	0741	EN		48 15240	125 48 470							

CAST TYPE - BOT - bottle cast; CTD - ctd; MOR - mooring; ROS - rosette; NET - net haul; DRF - drifter; USW - sea water loop

TIME CODE - BE - beginning time of cast; BO - bottom time of cast; EN - end of cast; DE - deployment time; MR - messenger release; RE - recover mooring

POSITION CODE - RAD - RADAR; GPS - GLOBAL; LOR - LORAN

Date	Time	PDT

May 11 1000 app. arrive mouth of Barkley Sound + Bamfield to pick up buoys & lines of EO3-Z-2 from Bamfield Lifeboat Station.

1225 - recover Tzartus Is. TG-B using ships launch
- required 2 release commands to be sent before mooring surfaced.
- call ping strong signal - release response was weak though.
- could hear pinger

1227 - mooring came up heavily overgrown with small barnacles

- prepared mooring on deck for redeployment

1401 - deployed mooring Tzartus Is. TG-C in 16 m depth showing on sounder at 48° 53.760', 125° 05.880'

1430 - proceed to Port Alberni for science crew change
- preparing equipment for offloading

1700 - arrive Port Alberni
1730 - complete science crew change
- passenger van, pick up truck and box van head back for I.O.S

DAILY LOG

OCEAN PHYSICS

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DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS
11	LB12	ROS	08:21	BE	36	48 12.98	125 52.23		506m		128-143	16		
			08:29	BO		48 12.98	125 52.37							
				EN										
11	LB13	CTD	09:29	BE	37	48 10.65	125 56.35		915m					
			09:43	BO		48 10.65	125 56.58							
			09:57	EN		48 10.71	125 56.85							
11	LB14	ROS	10:32	BE	38	48 8.32	126 0.13		1197					
			10:50	BO		48 8.08	126 0.21				144-162	19		
			11:30	EN		48 7.71	126 1.03							

CAST TYPE - BOT - bottle cast; CTD - ctd; MOR - mooring; ROS - rosette; NET - net haul; DRF - drifter; USW - sea water loop

TIME CODE - BE - beginning time of cast; BO - bottom time of cast; EN - end of cast; DE - deployment time; MR - messenger release; RE - recover mooring

POSITION CODE - RAD - RADAR; GPS - GLOBAL; LOR - LORAN