May 19, 82

81034rpt

81034

Vessel: OCEANUS

Cruise No.: OC104

Dates of Operation: 1030 Sept. 25 - 0700 Oct. 2, 1981

Area of Operations: Georges Bank, Lydonia Canyon

Objectives: The objectives of the OCEANUS cruise were:

1. Recover 2 tripods and 4 subsurface moorings
2. Deploy 2 tripods, 6 subsurface moorings (2 with deep instrument packages)
3. Set 2 surface marker buoys
4. Collect surface grab samples at A, Q, and LCA for biology
5. Collect surface grab samples on shelf and slope adjacent to Lydonia Canyon
6. Deploy and recover an experimental water sampling system
7. Collect surface grab samples around Station K

Personnel:

Brad Butman, U.S. Geological Survey
Mike Bothner, U.S. Geological Survey
John Larson, U.S. Geological Survey
Frank Musialowski, U.S. Geological Survey
Marlene Noble, U.S. Geological Survey
Carol Parmenter, U.S. Geological Survey
Larry Poppe, U.S. Geological Survey
Rose Petrecca, Woods Hole Oceanographic Institute
Rick Rendigs, U.S. Geological Survey
Polly Shoukimas, U.S. Geological Survey
Bill Strahle, U.S. Geological Survey
Arnie Tanner, U.S. Geological Survey

Equipment: Northstar Loran-C 6000
Gifft echo-sounder
XBT
Neil Brown Inst. Systems CTD and rosette sampler with LED transmissometer
AMF acoustic command system
Van Veen grab (.1 m^2 and .04 m^2)

Navigation: All latitude-longitude were computed from Northstar 6000 Loran C using stations W and Y and program 5101.

Narrative:

Sept. 25	1030	Depart Woods Hole. Steam to LCA
	2230	Arrive LCA. No surface buoys
		Start bathymetry at LCP
Sept. 26	0300	Complete bathymetry at LCP
	0620	Start biology grabs at LCA
	0800	Complete grabs
		Setup for surface buoy deployments
	0900	Deploy western buoy B
	0945	Deploy eastern buoy P
	1030	Deploy experimental tripod. (mooring 238) ← Deploy 229
	1130	Depart LCA for LCP
	1215	Arrive LCP
	1305	Deploy surface buoy O
	1345	Deploy surface buoy A
	1425	Deploy tripod (mooring 237)
	1450	Disable tripod. Underway to LCL
	1535	Arrive LCL
	1607	Recover tripod (mooring 224)
		Underway to LCA
	1710	Arrive LCA. Recover subsurface mooring 225
	1820	Recover tripod (mooring 223)
	1845	Underway to LCB
	1925	Arrive LCB
	1950	Recover subsurface mooring (mooring 226)
	2100	Underway to LCE
	2140	Arrive LCE
	2155	Fire release
	2230	Recover subsurface mooring (mooring 228)
	2300	Deck secured
Sept. 27	0030	Start surface grab samples around Lydonia Canyon
	0345	Complete grab samples
	0700	At Station LCI
	0815	Fire release mooring 227
	0900	Subsurface mooring 227 on deck
		Setup to deploy mooring 233
	1225	Deploy subsurface mooring 233
	1410	Deploy deep instrument package (mooring 234)
	1530	Complete ranges to mooring 233 and 234
		Underway to LCB
	1630	Arrive LCB. Prepare to deploy deep instrument package (mooring 231)
	1750	Deploy mooring 231
		Setup for subsurface mooring 230
	2125	Anchor away mooring 230
	2315	Complete ranges to mooring 230 and 231
		Both disabled. Underway to grab site.

Sept. 28	0030	Arrive grab site
	0345	Complete grabs
	0800	Arrive LCE. Setup to launch subsurface mooring 232
	1030	Start tow into position
	1125	Anchor away. Range to 232
	1130	Underway to LCL
	1235	Arrive LCL
	1330	Recover surface buoy V
	1415	Surface buoy R on deck. Underway to LCP
	1550	Subsurface mooring 236 away
	1650	Underway to GBA
	1900	Grab samples of GBA
	2130	Start grab samples around GBK
Sept. 29	0130	Stop grab samples. Decks awash. Secure operations
	0830	Resume grab equations
	1600	Complete grab samples
	1713	Start CTD transect
Sept. 30		Continue CTD transect
Oct. 1	0300	Complete CTD transect
	0800	Setup to recover tripod, mooring 238
	0900	Tripod on deck
	1000	CTD and bottle cast at LCA
	1130	Arrive LCO
	1341	Mooring 235 away
	1400	Underway to Station Q
	2230	Start grab at Station Q
	2315	Complete grabs at Q. Underway to Woods Hole
Oct. 2	0700	Arrive Woods Hole

Cruise summary and highlights:

All current moorings and tripods were recovered as planned. All grab samples and CTD stations were also completed. Preliminary analysis of data tapes from the moored instruments indicates all instruments worked well.

Tabulated Information:

Days at sea: 8
Moorings recovered: 7
Moorings deployed: 10
Surface buoys recovered: 2 (2 lost)
Surface buoys deployed: 2
CTD stations: 35
XBT stations: 25
Surface salinity samples: 56
Bathymetric survey at LCP: 2255 Sept. 25 - 0246 Sept. 26 1981
Surface grab samples: 58

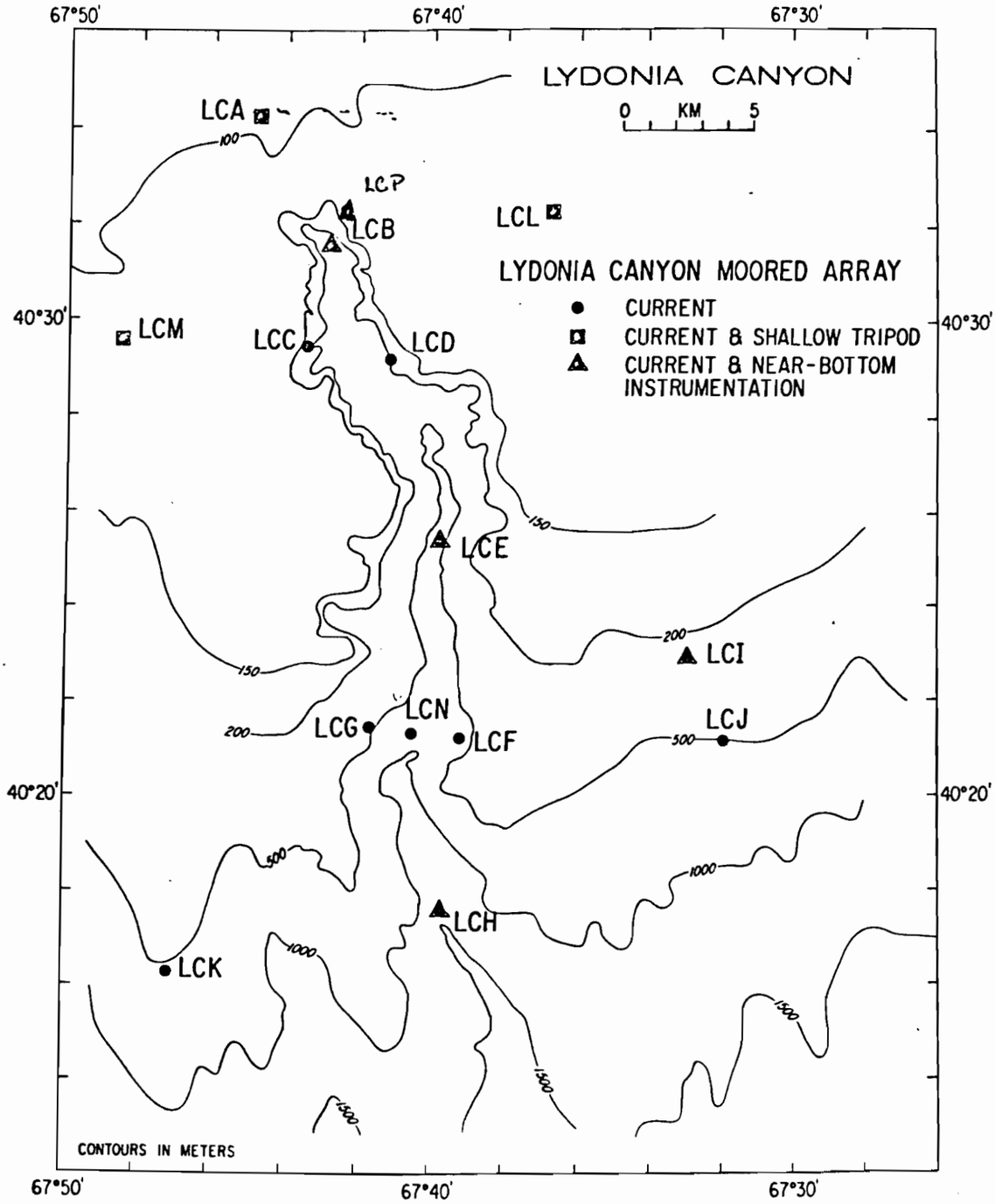

Figure 1. Mooring locations around Lydonia Canyon. Instruments deployed at LCA, LCB, LCE, LCI, LCP, and LCO in OC 104.

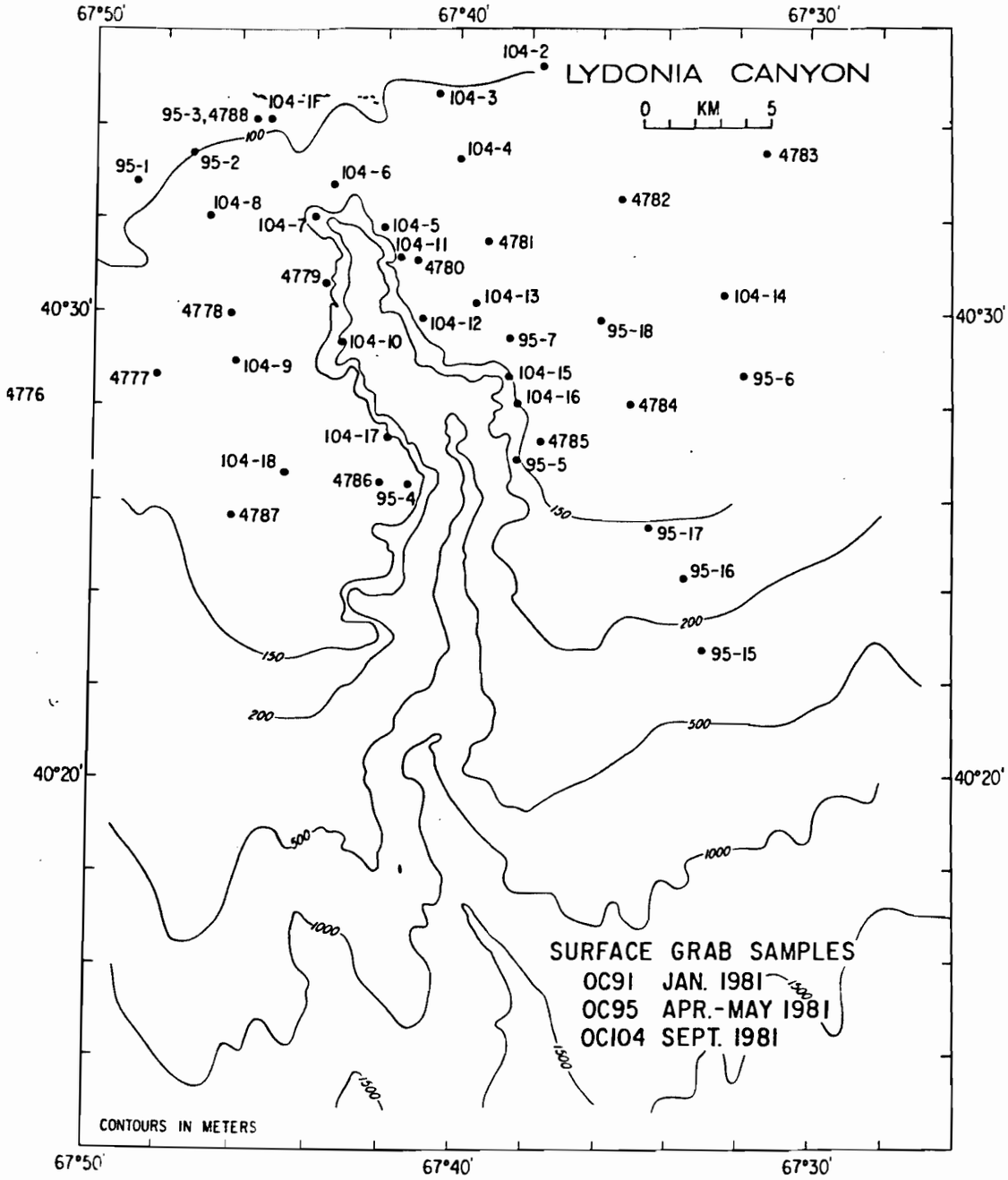

Figure 2a. Sampling stations around Lydonia Canyon

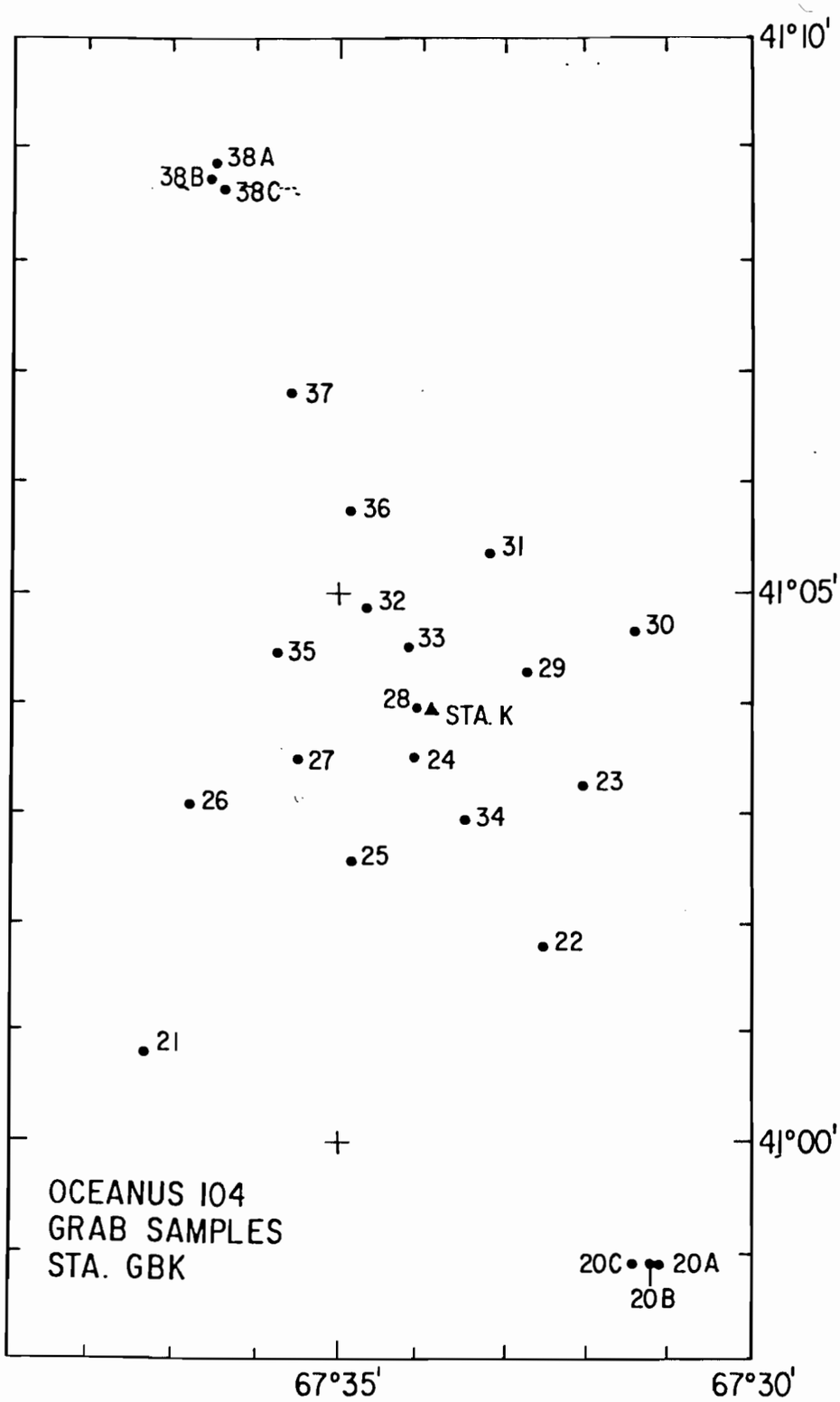

Figure 2b. Sampling stations around station GBK

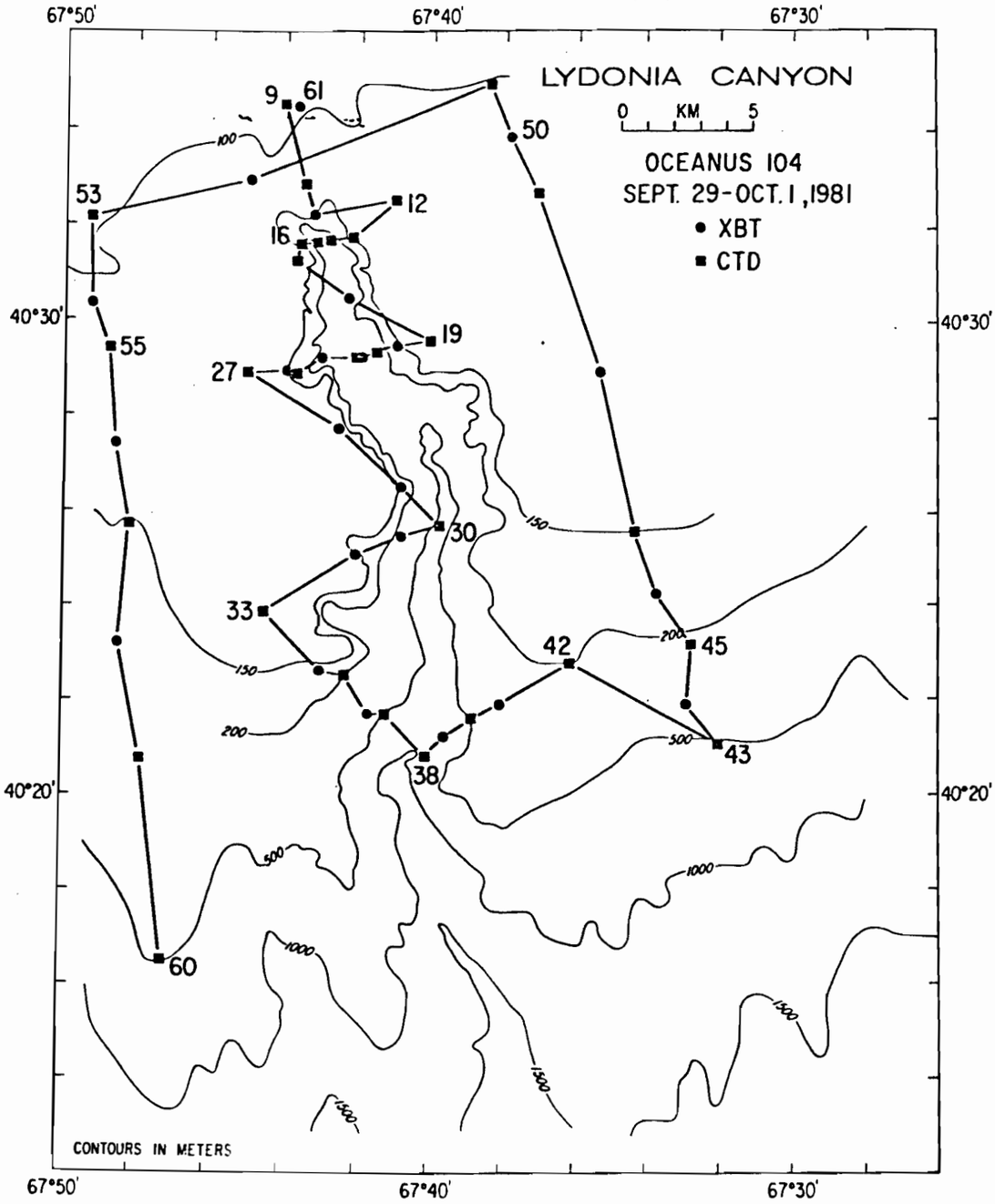

Figure 3. Hydrographic stations

MOORING 230
STATION LCB, CANYON AXIS
LATITUDE : 40° 31.5' N
LONGITUDE : 67° 42.7' W
DEPTH : 295 M

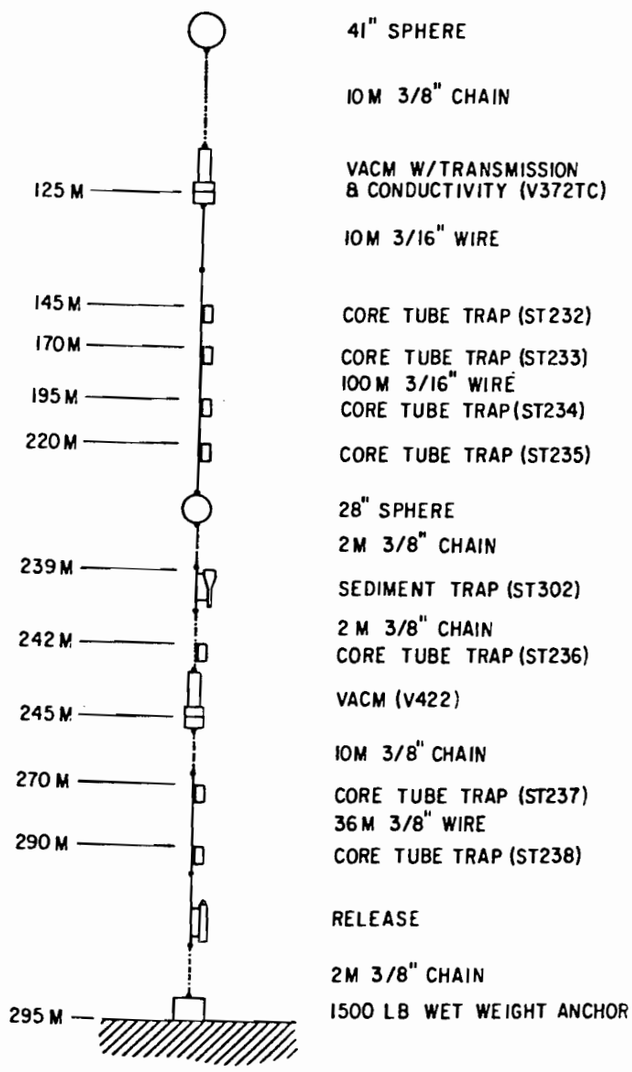

Figure 4a. Mooring Schematic

MOORING 231
STATION LCB, CANYON AXIS
LATITUDE : 40° 31.5' N
LONGITUDE : 67° 42.8' W
DEPTH : 290M

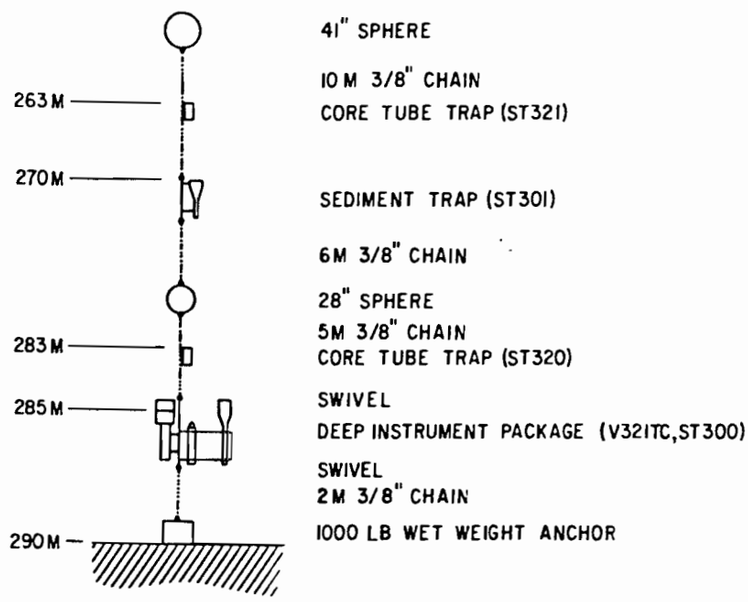

Figure 4b. Mooring Schematic

MOORING 232
STATION LCE, CANYON AXIS
LATITUDE : 40° 25.4' N
LONGITUDE : 67° 39.8' W
DEPTH : 590 M

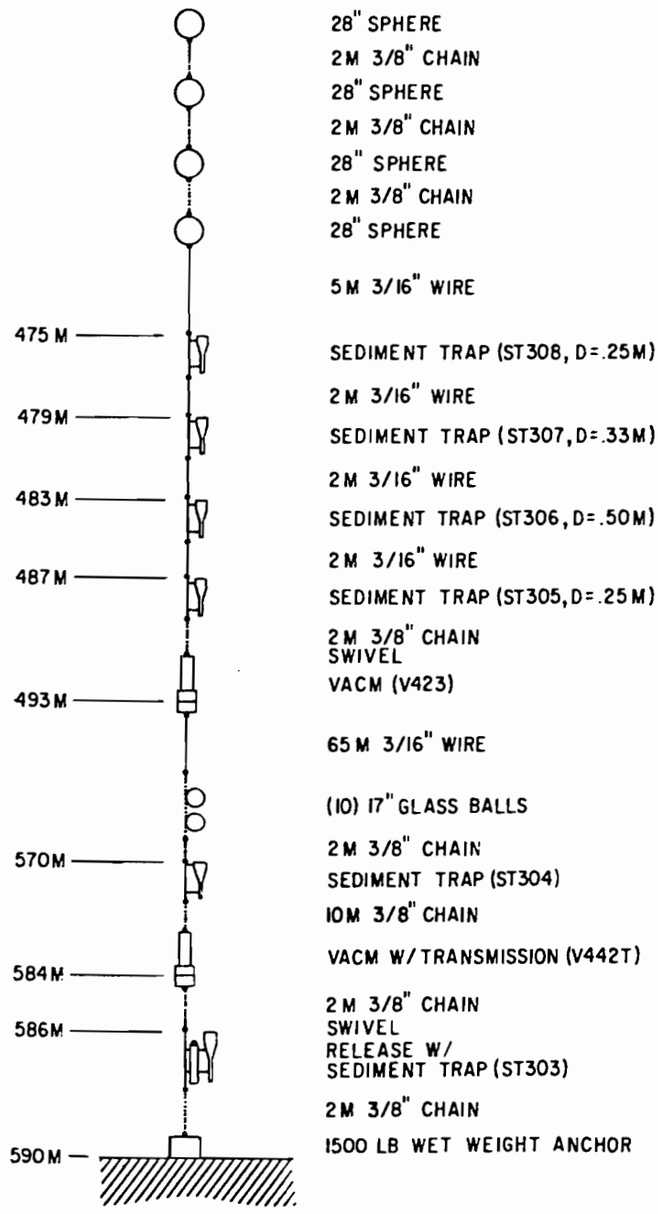

Figure 4c. Mooring Schematic

MOORING 233
STATION LC1, SLOPE
LATITUDE : 40° 23.0' N
LONGITUDE : 67° 33.0' W
DEPTH : 251 M

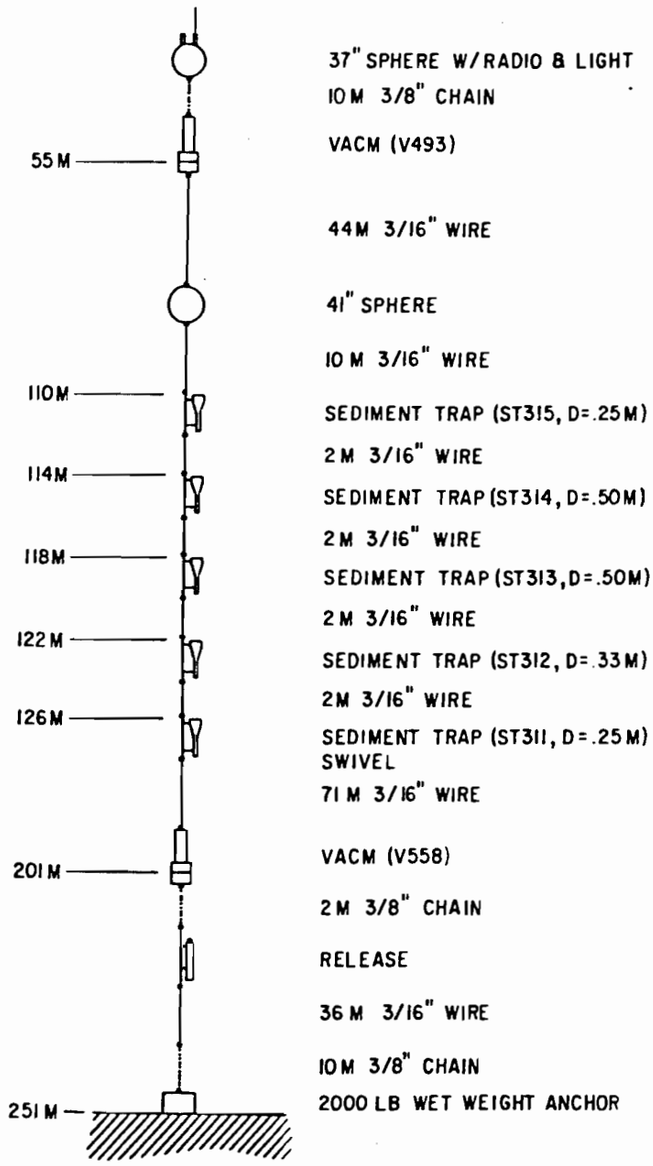

Figure 4d. Mooring Schematic

MOORING 234
STATION LCI, SLOPE
LATITUDE: 40° 23.1' N
LONGITUDE: 67° 32.6' W
DEPTH: 247 M

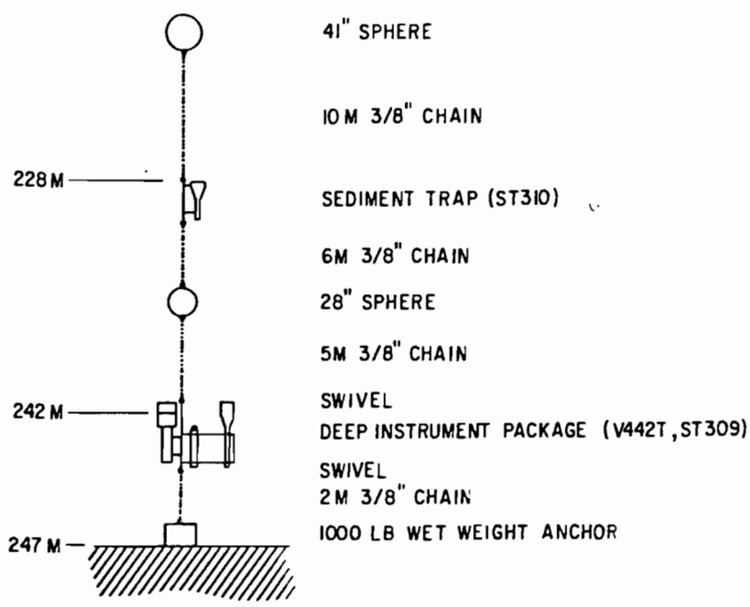

Figure 4e. Mooring Schematic

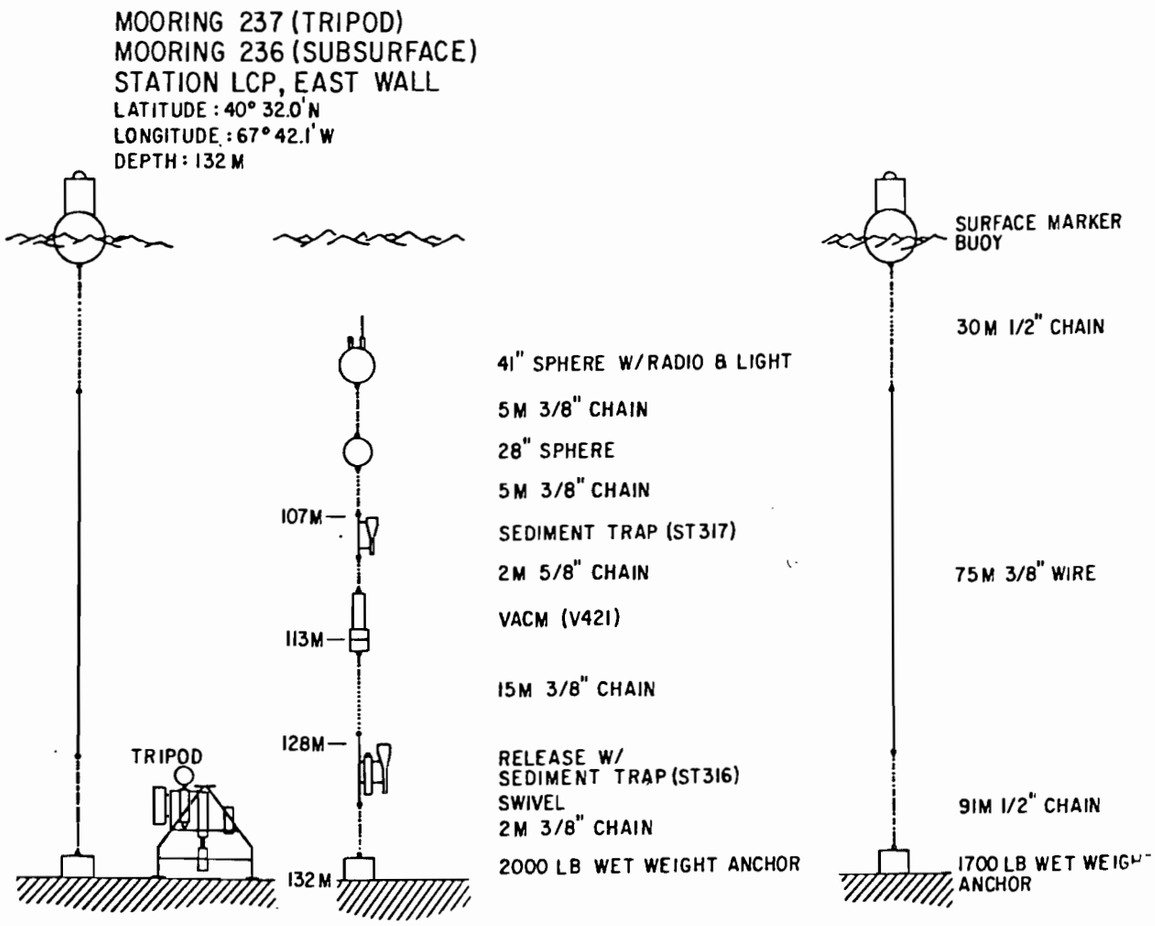

Figure 4f. Mooring Schematic

Hydrographic Stations

Station	Date	Time	Latitude	Longitude	Depth	XBT	CTD	SS
1	9/29/81	1715	41°08.41	67°36.97	54		X	X
2		1832	41°03.22	67°34.77	60		X	X
3		1910	40°59.27	67°36.76	67		X	X
4		2004	40°54.84	67°38.75	71	X		X
5		2034	40°51.54	67°38.75	71		X	X
6		2111	40°47.55	67°40.33	72	X		X
7		2145	40°43.59	67°41.71	73		X	X
8		2227	40°39.00	67°43.72	77	X		X
9		2308	40°34.48	67°44.14	101		X	X
10		2326	40°32.94	67°43.61	128		X	X
11		2341	40°32.30	67°43.31	165	X		X
12		1156	40°32.68	67°41.04	126		X	X
13	9/30/81	0030	40°31.88	67°42.05	137		X	X
14		0101	40°31.78	67°42.83	240		X	X
15		0126	40°31.64	67°43.07	255		X	X
16		0151	40°31.51	67°43.31	207		X	X
17		0215	40°31.32	67°43.76	140		X	X
18		0235	40°30.54	67°42.37	300	X		
19		0251	40°29.74	67°40.15	145		X	X
20		0316	40°29.60	67°41.10	155	X		X
21		0332	40°29.65	67°41.50	190		X	X
22		0345	40°29.39	67°41.81	315	X		X
23		0353	40°29.39	67°42.18	405		X	X
24		0600	40°29.40	67°43.02	190	X		X
25		0611	40°28.90	67°43.82	145		X	X
26		0627	40°29.03	67°43.94	140	X		X
27		0648	40°28.55	67°45.01	135		X	X
28		0720	40°27.78	67°42.60	157	X		X
29		0737	40°26.74	67°41.05	265	X		X
30s		0801	40°25.77	67°39.77	460		X	X
E			40°25.73	67°40.41	380			
31		0832	40°25.64	67°40.89	225	X		
32		0841	40°25.10	67°42.14	130	X		X
33s		0902	40°23.91	67°44.64	137		X	X
E			40°23.89	67°44.87				
34		0931	40°22.66	67°43.12	169	X		X
35		0940	40°22.49	67°42.50	205		X	X
36		1006	40°21.73	67°41.61	450	X		X
37s		1012	40°21.62	67°41.25	555		X	X
37E			40°21.61	67°41.63	495			
38s		1055	40°20.89	67°40.22	925		X	X
38E			40°20.83	67°40.55	1040			
39		1144	40°21.24	67°39.69	763	X		X
40s		1157	40°21.64	67°38.65	530		X	X
40E			40°21.55	67°38.96				
41		1238	40°21.90	67°38.20	315	X		X
42		1258	40°22.87	67°36.20	217		X	X
43s		1354	40°21.08	67°31.98	550		X	X
43E			40°21.07	67°32.14				

44		1445	40°21.92	67°32.38		X		X
45		1508	40°23.12	67°32.73	245		X	
46		1604	40°24.33	67°33.75	180	X		X
47		1629	40°25.66	67°34.30	157		X	X
48		1728	40°29.11	67°35.59	140	X		X
49		1818	40°32.78	67°37.09	120		X	X
50		1849	40°33.94	67°37.75	108	X		X
51		1908	40°35.01	67°38.22	100		X	X
52		2008	40°33.23	67°44.94	117	X		X
53		2042	40°32.26	67°49.45	100		X	X
54		2112	40°30.32	67°49.31	113	X		
55s		2124	40°29.44	67°48.83	117		X	X
55E			40°29.42	67°49.04	117			
56		2153	40°27.42	67°48.82	133	X		X
57		2212	40°25.67	67°48.34	155		X	X
58		2244	40°23.21	67°48.51	154	X		X
59s	10/1/81	0033	40°20.74	67°47.89	195		X	X
59E		0043	40°20.65	67°48.14				
60		0127	40°16.57	67°47.22	480		X	X
61		1022	40°34.54	67°43.75	100			

Sample Log

OCEANUS 104

Station	Latitude	Longitude	Water Depth	Sampler	Purpose
104-1A (LCA)	40°34.12	67°45.34	99	.04 VV	Bio
104-1B	40°34.05	67°45.38	99	.04 VV	Bio
104-1C	40°34.16	67°45.33	99	.04 VV	Bio
104-1D	40°34.08	67°45.45	99	.04 VV	Bio
104-1E	40°34.09	67°45.37	99	.04 VV	Bio
104-1F	40°34.10	67°45.35	99	0.1 VV	Texture Chem
104-2	40°35.27	67°36.74	100	.1 VV	Texture Chem
104-3	40°34.69	67°40.60	100	.1 VV	Texture Chem
104-4	40°33.31	67°39.99	107	.1 VV	Texture Chem
104-5 (LCP)	40°31.83	67°42.10	135	.1 VV	Texture Chem
104-6	40°32.72	67°44.49	129	.1 VV	Texture Chem
104-7	40°32.03	67°43.99	195	.1 VV	Texture Chem
104-8	40°32.03	67°46.84	110	.1 VV	Texture Chem
104-9	40°28.96	67°46.09	128	.1 VV	Texture Chem
104-10	40°29.42	67°43.24	185	.1 VV	Texture Chem
104-11	40°31.19	67°41.62	138	.1 VV	Texture Chem
104-12	40°29.96	67°41.00	145	.1 VV	Texture Chem
104-13	40°30.24	67°39.52	137	.1 VV	Texture Chem
104-14	40°30.43	67°32.40	133	.1 VV	Texture Chem
104-15	40°28.68	67°38.59	195	.1 VV	Texture Chem
104-16	40°28.07	67°38.36	155	.1 VV	Texture Chem
104-17	40°27.40	67°41.98	142	.1 VV	Texture Chem
104-18	40°26.65	67°44.74	141	.1 VV	Texture Chem
104-19A(GBA)	40°51.00	67°24.46	85	.1 VV	Texture Chem
104-19B	40°51.06	67°24.44	85	.04 VV	Bio
104-19C	40°51.08	67°24.45	85	.04 VV	Bio
104-19D	40°51.10	67°24.50	85	.04 VV	Bio

Station	Latitude	Longitude	Water Depth	Sampler	Purpose
104-19E	40°51.05	67°24.34	85	.04 VV	Bio
104-19F	40°51.08	67°24.36	85	.04 VV	Bio
104-20A(GBK)	40°58.88	67°31.46	70	.1 VV	Texture Chem
104-20B(GBK)	40°58.85	67°31.23	70	.1 VV	Texture Chem
104-20C(GBK)	40°58.84	67°31.14	70	.1 VV	Texture Chem
104-21(GBK)	41°00.83	67°37.39	66	.1 VV	Texture Chem
104-22(GBK)	41°01.78	67°32.57	64	.1 VV	Texture Chem
104-23(GBK)	41°03.30	67°32.02	62	.1 VV	Texture Chem
104-24(GBK)	41°03.55	67°34.07	62	.1 VV	Texture Chem
104-25(GBK)	41°02.58	67°34.85	63	.1 VV	Texture Chem
104-26(GBK)	41°03.11	67°36.81	60	.1 VV	Texture Chem
104-27(GBK)	41°03.52	67°35.45	60	.1 VV	Texture Chem
104-28(GBK)	41°03.98	67°34.05	61	.1 VV	Texture Chem
104-29(GBK)	41°04.33	67°32.72	60	.1 VV	Texture Chem
104-30(GBK)	41°04.71	67°31.40	60	.1 VV	Texture Chem
104-31(GBK)	41°05.36	67°33.18	60	.1 VV	Texture Chem
104-32(GBK)	41°04.88	67°34.70	60	.1 VV	Texture Chem
104-33(GBK)	41°04.41	67°34.32	60	.1 VV	Texture Chem
104-34(GBK)	41°02.93	67°33.49	53	.1 VV	Texture Chem
104-35(GBK)	41°04.48	67°35.78	60	.1 VV	Texture Chem
104-36(GBK)	41°05.78	67°34.87	58	.1 VV	Texture Chem
104-37(GBK)	41°06.82	67°35.62	56	.1 VV	Texture Chem
104-38A(GBK)	41°08.85	67°36.50	54	.1 VV	Texture Chem
104-38B(GBK)	41°08.72	67°36.55	54	.1 VV	Texture Chem
104-38C(GBK)	41°08.63	67°36.40	54	.1 VV	Texture Chem

Station	Latitude	Longitude	Water Depth	Sampler	Purpose
104-39A(GBQ)	41°29.55	70°12.52	67	.04 VV	Bio
104-39B	40°29.59	70°12.58	67	.04 VV	Bio
104-39C	40°29.49	70°12.50	67	.04 VV	Bio
104-39D	40°29.52	70°12.52	67	.04 VV	Bio
104-39E	40°29.58	70°12.56	67	.04 VV	Bio
104-39F	40°29.50	70°12.54	67	.04 VV	Bio

OC 104

Moorings Recovered

Mooring	Station	Type	Date
223	LCA	T	9/26
224	LCL	T	9/26
225	LCA	SS	9/26
226	LCB	SS	9/26
227	LCI	SS	9/27
228	LCE	SS	9/26
238	LCA	T	10/1

Moorings Deployed

229	LCA	T	9/26
230	LCB	SS	9/27
231	LCB	DP	9/27
232	LCE	SS	9/28
233	LCI	SS	9/27
234	LCI	DP	9/27
235	LCO	P	10/1
236	LCP	T	9/26
237	LCP	T	9/26
238	LCA	T	9/26

Appendix I

Bridge Log

Vessel OCEANUS

Cruise 104

LORAN LOG

Page 1

25 SEPT 1981

Date	Z Time	Z Sta.	TYPE +/-.	FIM Reading	N Latitude	W Longitude	Remarks
	1039	1439	—	Depart Woods Hole			
	LORAN C SET ON 9960 W-Y (14-43)						
	1200	1600	RA VIS		41-27.0	70-17.5	BUOY A 21 ⊖
	1410	1810	VIS		41-26.0	69-43.0	"GRS" ⊖ C/C 090°g
	1424	1824	—	—	—	—	C/C 087°g
	1500	1900	LC		41-25.88	69-29.08	N/S 6000
	1540	1940	LC		41-25.70	69-17 13	C/C 126°g
	1618	2018	LC		41 20.36	69.07.84	1630-1640 C/C TRAFFIC
	1700	2100	LC		41.15.03	68 59.81	
	1800	2200	LC		41.06.41	68.46.47	1800 C/C 124°g
	1900	2300	LC		41.00.21	68.33.20	
	2000	2400	LC		40-53.9	68-18.8	C/C 130G.
	2100	0100	LC		40-46.4	68-06.1	
	2200	0200	LC		40-38.4	67-52.5	
	2220	0220					V'S ABOUT STA 'LCA'
	2240	0240			40-34.2	67-44.7	S/C 135G. 4.0KN START
							BATHYMETRY RUN
	SAT	26	SEPT		1981		
	0000	0400	LC		40-32.61	67-42.50	
	0100	0500	LC		40-31.56	67 42.25	
	0136	0536	LC		40 32.78	67 41.03	A/S F/W BATHY RUN
	0228	0628	SAT	27³	40-32.43	67-43.43	
	0245	0645	LC		40 32.00	67 43.36	F/W BATHY RUN #2
	0332	0732	LC		40-31.17	67-43.58	Y/W FOR 'LCA' VAR C/S

Vessel OCEANUS

Cruise 104

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	SATURDAY, SEPT 26, 8
	0400	0800	LC		40 31.97	67.44.28	0400 C/C
	0500	0900	LC		40.34.38	67.44.89	0500 H.T. -'LCA'
							0600 CME MULTIPLE
							MUD GRABS
	0800	1200					U/S ABOUT STA 'LCA'
	0902	1302	LC		13462.3 43424.0	46-34.3 67-44.3	SET BUOY 'B'
					24997.6 60122.5		
	0941	1341	LC	13460.2 43423.7			SET BUOY 'P' 0.4MI E OF
				24997.5 60122.8			
	1029	1429	LC	13458.5 43424.1	46-34.4	67-43.5	SET TRIPOD 0.2MI. E OF
				24997.5 60122.9			
	1109	1509	LC	13460.9 43424.2	46-34.3	67-44.0	SET TRIPOD BETWEEN 'B' &
				24997.5 60122.6			
	1200	1600	LC		40-32.00	67-42.13	NOON POSIT
	1304	1704	LC		40 32.20	6742.22	SET BOUY # 'O'
	—						
	1342	1742	LC		40-31.91	67 41.89	SET BOUY 'A'
	1422	1822	LC		40 32.02	6742.06	SET TRIPOD
	1600	2000	LC		40 32.37	6736.34	RECOVERING TRIPOD AT LC
	1634		LC		40.32.21	67.36.37	1634 TRIPOD AOD
							S/C 290° - 160 RPM

TO SITE 'A'

Vessel OCEANUS

Cruise 104

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+4	GMT			NORTH	WEST	SATURDAY SEPT 26, 8
	1705	2105	LC		40.34.03	67.44.45	1705 HT @ SITE 'A'
							1733 - RECOVER VERTICA
							SEDIMENT SAMPLER
	1815	2215	LC		40.34.15	67.44.92	1815 TRIPOD ALONG SID
	1900	2300	LC		40.32.87	67.44.15	1851 END STA S/C 144°
							TO "LCB"
				SIMULFIX			
	1930	2330	Sat	39³	40.31.95	67.42.52	
	1930	2330	MASTER 711 S1 650 S2 540	"	31.46	" 43.16	7000 NORTHSTAR S1 S3
	1930	2330	MASTER 740 S1 720 S2 660	"	31.48	" 42.86	6000 NORTHSTAR S1 S3
	1930	2330	MASTER S1 S2	"	31.02	" 42.20	360 INTERNAV S1 S3
					40 31.6	67.42.9	1950 H.T. 'LCB'
							V/C - RANGING
	2005	0005					PICK UP SUBSURFACE MOO
	2056	0056					MOORING ONBOARD
	2104	0104	LC		40- 31.7	67-42.7	S/C 15TG, 160RPM FOR SITE
	2140	0140	LC		40-25.7	67- 39.7	H.T. AT SITE 'E'
	2205	0205					PICK UP SUBSURFACE-MO
	2232	0232					MOORING ONBOARD
	2327	2327	LC		40-25.7	67 39.3	S/C 10TG, 150RPM

Vessel [illegible]

Cruise [illegible]

LORAN LOG

Page 1

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
9-27	0036	0436	LC		40-35-28	67-36.74	GRAB SITE #1 ON BOTTOM
—	—						
	0107	0507	LC		40-34.71	67-40.63	G.S. #2 ON BOTTOM
	—				13444.7	43424.3	
	0132	0532	LC		40-33.31	67-40.01	G.S. #3 ON BOTTOM
	—				13447.7	43-415.9	
	0209	0609	LC		40 31.84	67 42.10	G.S. #4 ON BOTTOM
	—				13462.5	43408.7	
	0241	0641	LC		40-32.73	67 44.50	GS. #5 ON BOTTOM
	—				13469.2	43415.1	
	0308	0708	LC		40-32.02	67-43.99	G.S. #6 ON BOTTOM
	—				13469.9	43410.7	
	0337	0737	LC		40 32.05	67-46.77	G.S. #7 ON BOTTOM
	—				13482.2	43412.6	
	0419	0819	LC		40 28.97	67 46.10	GS #8 ON BOTTOM
	—				13491.2	43394.3	
	0457	0857	LC		40 29.41	67 43.25	GS #9 ON BOTTOM
	—				13477.1	43 395.3	
			SIMULFIX				
	0456	0856	Sat	12^3	40 29.347	67.43.433	(SLIGHTLY LOW SAT FIX BUT ACCURACY IS PROBABLE)
	0456	0856	SNR	M 640 C 670 Y 880	4029.38	67 43.53	NORTHSTAR 7000
	0456	0856	SNR	M 640 C 650 Y 550	4029.41	67.43.24	NORTHSTAR 6000
	0456	0856			4028.57	67.42.40	INTERNAV 360 (IN SECO[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		15 [illegible]	[illegible]	[illegible]	15.	0. [illegible]	

Vessel OCEANUS

Cruise 104

LORAN LOG

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SUN 9-27-81

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	SUNDAY SEPT 27, 1981
	0538	0938	LC		40 31.17	67 41.64	GS #10 ON BOTTOM
					13463.1	43404.5	
	0602	1002	LC		40 29.97	67 41.01	GS #11 ON BOTTOM
					13465.3	43397.4	
	0623	1023	LC		40 30.24	67 39.54	GS #12 ON BOTTOM
					13457.8	43398.1	
							0644 END GRAB
							SAMPLING STA'S S/C 145° @
							160RPM
	0720	1120	LC		40 23.11	67 33.10	0712 C/C 140° @ 0720 HT
							@ 'LC1'
	0824	1224					PICKUP SUBSURFACE MOOR
	0905	1305			40 - 23.2	67 - 33.2	MOORING OUTBOARD
	1020	1420					CMC LAUNCH OF MOORING #2
	1200	1600	LC		40 23.28	67 33.09	NOON POS.T
	1221	1621	LC		40 22.97	67 32.98	LAUNCH SUBSURFACE
	—				13458.7	43353.8	MOORING # 233
	1407	1807			40 23.10	67 32.60	LAUNCH SUBSURFACE
	—				13456.6	43353.6	MOORING # 234
	16						

Vessel [illegible]

Cruise [illegible]

LORAN LOG

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[illegible] 5-27-51

Date	Time	Sta.	TYPE +/-.	Reading	Latitude	Longitude	Remarks
	1600	2000	LC		40.27.85	67.38.00	
	1629	2029	LC		40.31.49	67 43.17	
	1745	2145	LC		40.31.53	67.42.79	1745 - DEEP TRIPOD
							PACKAGE #231 @ 'LCB'
	1800	2200	LC		40.31.93	67.43.37	OVERSIDE
	AT SPEED	OF	C.S. KT		INTERVAL 360		[illegible]
	1900	2300	LC		40 32.35	67.44.07	
	2000	2400			ENGAGED	IN LAUNCHING	MOORING # 230
	2126	0126	LC	13 466.6 24 998.1 43407.1	40-31.5'	67-42.7	ANCHOR OVER
	2138	0138					V4/S + H.T. RANGING ON MOOR
	2312	0312	LC		40-31.7	67-43.0	S/C098G 130RPM
	2340	0340					C/C101G.

Vessel [illegible]

Cruise [illegible]

LORAN LOG

[illegible] 9-25-8[illegible]

Date	Time	Sta.	TYPE +/-.	Reading	Latitude	Longitude	Remarks
9-25							
	0036	0436	LC		40-30.47	67-32.49	G.S. #1 ON BOTTOM
	—				13427.1	43395.5	SAMPLE N.G.
	0043	0443	LC		40-30.43	67-32.40	G.S #1 TAKE 2
	—				13426.8	43395.3	
	—						G.S. #2 ON BOTTOM
	0136	0536	LC		40 28 62	67-38.66	" " " "
	—				13460.5	43388.3	
	0144	0544	LC		40-28.67	67-38.59	G.S. #2 TAKE 2
	—				13460.0	43388.6	
	0216	0616	LC		4028.06	67 38.33	G.S #3 ON BOTTOM
	—				13461.3	43384.8	
	0236	0636	SAT	36[4]	40-28.09	67-40.79	
	0257	0657	LC		40 27.40	67 42.00	G.S. #4 ON BOTTOM
	—				13479.6	43383.0	
	0331	0731	LC		40-27.66	67-44.74	G.S. #5 ON BOTTOM
	—				13494.3	43380.2	
	0340	0740	LC		40 26.60	6744.60	F/W SCIENCE H.T
	NORTH	STAR	6000	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]		(SNR's	[illegible]	[illegible]	[illegible]
	[illegible]						
	0500	0900			40.26.31	67.43.39	

Vessel OCEANUS

Cruise 104

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+4	GMT			NORTH	WEST	MONDAY SEPT 28, 198
			SIMULFIX				
	0552	0952	Sat	39³	40.26.233	67.42.946	SATELLITE
	0552	0952		M 690 W 670 Y 575	40 26.33	67 43.08	7000
	0552	0952		M 630 W 610 Y 540	40 26.35	67.42.83	6000
	0552	0952		W -30B Y -6DB	40.25.54	67.42.15	360 (IN SECONDS)
	0700	1100	LC		40.26.90	67.42.43	0700 S/C 121° a -5.0
	0733	1133	DR		40.26.6	67.39.6	0733 AT
	0934	1334	LC		40-26.7	67-39.1	V4S - CMC LAUNCH OF MOORING #
	1123	1523	LC	13478.3 25000.3	40-25.4	67-39.9	LFT GO ANCHOR.
				43370.4			
	1130	1530					V4S RANGING ON MOORIN
	1200	1600	LC		4027.84	67 38-59	NOON POSIT
	1548	1948	LC		40-31.95	67-42.05	LAUNCH SUBSURFACE MOORING AT 'LCP'
	—	—	—	—	13461.9	43409.3	—
			SIMULFIX				
	1622	2022	Sat	38⁴	40.31.886	67.42.235	
	1622	2022	LC	M 790 W 780 Y 715	40 31.95	67.42.32	7000
	1622	2022	LC	M 775 W 780 Y 770	40 31.96	67.42 03	6000
	1622	2022	LC	M -30B X -10B Y -7DB	40 31.31	67 41.26	360 (IN SECONDS)

Vessel OCEANUS

Cruise 104

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+4	GMT			NORTH	WEST	MONDAY SEPT 28, 1981
	1653	2053	CC		40-31.42	67-41.48	1653 S/C 033° -160 RP
	1800	2200	LC		40 40.78	67-33.36	1815 C/C 048°
							1825 C/C 029°
	1900	2300	LC		40-49.33	67-26.23	1826 C/C 031°
							1911 H.T. @ GBA'
			SIMULFIX				
	1938	2338	Sat	29	40-51.127	67-24.616	
	1938	2338	LC	M 650 W 500 Y 500	4051 26	67 25 35	7000
	1938	2338	LC	M 730 W 670 Y 600	4051.11	67-24.60	6000
	1938	2338	LC	M -300 W Y	4050 40	67 23 55	360
	1946	2346	LC		40-51.01	67-24.50	6.5 @ 'GBA' - BOTTOM
	2055	0055	LC		40-51.1	67-24.4	FIN GRABS S/C 325°C 150RPM
	2152	0152	LC		40-58.9	67-31.5	HIT GRAB #20
	2245	0245	LC		40-58.8	67-31.1	FIN GRA S/C 325°C 150RPM
	2310	0310	LC		41-00.9	67-32.5	HIT GRAB #21
	2320	0320					V 4/5
	2333	0333	LC		41-01.87	67-32.95	HIT GRAB #22
	2335	0335					V 4/5
	0000	0400	LC		41 01.96	67 32.18	

Vessel [illegible]

Cruise [illegible]

LORAN LOG

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TUES 9-29-81

Date	+4 Time	E Sta.	+/-.	Reading	N Latitude	W Longitude	Remarks
	0032	0432	LC		41 03-31	67 32 03	G.S. # 23
	—				99600.0	43578.7	
	0108	0508	LC		41-02.73	67 43 49	G.S # 24 #A
	—				99600.0	43576.7	
	0115	0515	LC		41 02.56	67 33.37	G.S # 24 #B
	—				99600.0	43575.7	
	0122	0522					SCIENCE CANCELLED WORK DUE TO ROUGH WX ON DECK
	0200	0600	LC		41-00.72	67-29.95	
	0300	0700	LC		40-57.78	67-23.37	C/C 295° C/S 125 RPM
	0315	0715	—				C/C 315°
	0400	0800	LC		40.57.84	67.25.09	
	0500				40.57.49	67.26.04	
				SIMULFIX			
	0502	0902	Sat	16²	4057.466	67.26.122	
	0502	0902	LC	M 690 W 660 Y 560	40.57.89	6727.67	7000
	0502	0902	LC	M 720 W 700 Y 580	4057.48	67.26.07	6000
	0502	0902	LC	M -300 W -100 Y -1000	4056.56	67 25.22	360
		T.D.S	OF	[illegible] SETS VERY	CLOSE -	EXCESSIVE 7000 [illegible]	
		(1.25 [illegible])		7000	NAVIGATION ON	W & Y - CHECKED -	
		SET	SHIFT	[illegible] &	TURNED [illegible]	W & Y	LOCKED ON - [illegible]
		SIMULAR		- SEE [illegible]	SIMULAR		

Vessel OCEANUS

Cruise 104

LORAN LOG

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Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+4	GMT			NORTH	WEST	TUESDAY, SEPT 29, 81
				SIMUL FIX			
	0520	0920	Sat -	-72 3	40.57.208	67.26.533	
	0520	0920	LC	M 680 W 640 Y 520	40.57.78	67.27.93	7000
	0520	0920	LC	M 680 W 660 Y 580	4057.39	67.26.42	6000
	0520	0920	LC	M -4DB W -1DB Y -9DB	4056 55	67.25.44	360
		1.2	MI	NORTHSTAR 7000	[illegible]	—	T.D.S OF [illegible]
	3 SETS	VERY	CLOSE,				
	0600	1000	LC		40.57.41	67.27.31	
	0700	1700	LC		40.57.82	67.29.23	
	0800	1200	LC		40-58.5'	67-31.8	
	0830	1230	LC		40-59.5'	67-32.4	S/C 350G, 140RPM
	0907	1307	LC		41-03.47	67-33.9	H.T. GRAB #25
	0922	1322					FIN SIA - V C/S
	0939	1339	LC		41-02.53	67-34.80	H.T. GRAB #26
	0957	1357					FIN SIA V C/S
	1008	1408	LC		41-03.08	67-36.75'	H.T. GRAB #27
	1018	1418					FIN SIA, V C/S
	1032	1432	LC		41-02.51	67-35-42	H.T. GRAB #28
	1044	1444					FIN SIA. V C/S
	1054	1454	LC		41-03.92	67-31.01	H.T. GRAB #29
	1103	1503					FIN SIA V C/S
	1113	1513			41-04.30	67-32.73	H.T. GRAB # 30
	1121	1521					V C/S

Vessel OCEANUS

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LORAN LOG

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1981

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
29 SEPT	+4	GMT			N	W	
	1132	1532	LC		41-04.69	67-31.38	H.T. GRAB # 31
	1140	1540					V/S
	1155	1555	LC		41-05.28	67-33.28	H.T. GRAB # 32
	1204	1604	LC		41 05-35	67-33.16	GS #32 ON BOTTOM
	1231	1631	LC		41-04.88	67-34.69	GS # 33 ON BOTTOM
	1250	1650	LC		41-04.41	67-34.31	G.S. # 34 on Bottom
	1320	1720	LC		41-02.92	67-33.48	G.S # 24 on Bottom
	1405	1805	LC		41-04.49	67-35 77	G.S. # 35 on Bottom
	1434	1834	LC		41-05 83	67-34.92	G.S. # 36 on Bottom
	1439	1839	LC		41-05.79	67-34.87	G.S. # 36 B on Bottom
	1511	1911	LC		41-06.83	67-35.62	G.S. # 37 on Bottom
	1614	2014	LC		41.08.85	67.36.51	GS # 38 on Bottom
	1629	2029	LC		41.08.65	67.36 50	# 38B
	1642	2042	LC		41.08 62	67.36.50	# 38C
	1719	2119	LC		41.08.48	67.36.88	1719 CTD #1 AT DEPTH
	1818		DR		41.03	6734	1818 HT CTD STA
	1830	2230	LC		41-03.2	6734.9	CTD # #2
	1835	2235					FIUSIA S/C 196°
	1905	2305	LC		4059.30	67.36.46	1905 NT CTD #3
							1910 CTD AT DEPTH 1930
							END STA S/C 175°y
	2000	2400	LC		40-55.6	67-38.7	
	2030	0030	LC		40 51.5	67 38.7	H.T. CTD #4
	2044	0044					FIUSIA S/C 192° [illegible]

Vessel OCEANUS

Cruise #104

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
29SEPT	+4	GMT			N	W	
	2100	0100	LC		40-49.2	67-39.9	[illegible]
	2137	0137	LC		40-43.6	67-41.6	H.T. CTD #5
	2155	0155			~~40-34.~~		[illegible]
	2303	0303	LC		40-34.45	67-44.09	H.T. CTD #6
	2320	0320					V [illegible]
							CTD [illegible]
							[illegible]
	2352	0352	LC		40-32.66	67-40.77	H.T. CTD #7
	0000	0400	LC		4032.73	67 41.12	MIDNIGHT POSIT
	0034	0434	LC		40 31.90	67 42.03	H.T CTD # 13
	0105	0505	LC		40 31.73	67 42.71	H.T CTD # 14
	0132	0532	LC		40 31.60	67 43.00	H.T CTD # 15
	0154	0554	LC		40 31.46	67 43.33	H.T. CTD # 16
	0217	0617	LC		40 31.25	67 43.76	H.T. CTD # 17
	0255	0655	LC		40 29.65	67 40.12	H.T CTD # 19
	0330	0730	LC		40 29.60	67 41.42	H.T CTD # 21
	0405	0420	LC		40.29.41	67.42.25	H.T CTD # 23
	0500	0900	LC		40 29.12	67.41.89	0420 - CTD PROBLEMS
							STANDING BY ~0550 S/V
							317° @ 6.0 KT
	0610	1010	LC		40.29.01	67 43.58	H.T CTD # 25
	0637	1037	LC		4028.73	67.44.69	H.T CTD # 27
	0754	1154	LC		40-25.8	67-39.7	H.T CTD # 28

Vessel OCEANUS

Cruise #104

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
SEPT 30	+4	GMT			N	W	
0928	1228						FINSTA S/C 2210
	0958	1258	LC		40-23.9	67-44.6	H.T. CTD # 29
	6915	1315					FINSTA S/C 1306
	0937	1337	LC		40-22.5	67-42.5	H.T. CTD # 30
	0956	1356					FINSTA S/C 1356
	1009	1409	LC		40-21 163	67-41 127	H.T. CTD # 31
	1039	1439					FINSTA S/C 1436
	1050	1450	LC		40-20.92	67 40.23	H.T. CTD # 32
	1136	1536					FINSTA S/C 0000
	1152	1552	LC		40-21.66	67-38.66	H.T. CTD # 33
	1200	1600	LC		40-21.63	67-38.75	NOON POSIT
	1303	1703	LC		4022.83	67 36.25	H.T. CTD # 42
	1312	1712	—				F/W STA
	1351	1751	LC		40-21.20	67-31.74	H.T. CTD # 43
	1430	1830	—				F/W STA
	1505	1905	LC		40-23.14	67-32.72	H.T. CTD # 45
	1544	1944	—				F/W STA
	1636	2036	LC		40.25.64	67.34.32	CTD # 47
	1700	2100	LC		40 27.10	67.34.96	
	1816	2216	LC		40.32.83	67.37.06	CTD AT 'LCL' # 49

Vessel OCEANUS

Cruise 104

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+4	GMT			NORTH	WEST	WED, SEPT 30, 1981
	1907	2307	LC		40.35.07	67.37.99	1907 CTD #### S1
				SIMULFIX			
	1910	2310	Sat	64	4036.155	67.38.905	LOW SAT - GOOD DATA PROBA
	1910	2310	LC	M 730 W 740 Y 640	4035.06	67.38.44	7000
	1910	2310	LC	M 760 W 770 Y 70[illegible]	4035.07	67.38.07	6000
	1910	2310	LC	M -1 DB W -1 DB Y -6 DB	40.34.37	67.37.31	360
							1922 END CTD #### #S1
				SIMULFIX			S/C
	1948	2348	Sat	224	40-34.354	67-43.699	WRONG CO+SPD ?!
	1948	2348	LC	M 670 W 600 Y 700	4033.98	67.42.37	7000
	1948	2348	LC	M 770 W 690 Y 670	40.33.96	67.42.07	6000
	1948	2348	LC	M -1 DB W -1 DB Y -6 DB	4033.33	674129	3600
	2000	2400	LC		40-33.5'	67-43.8	
	2035'	0035'	LC		40-33.3	67-49.4	H.I. CTD # S2
	2052	0052					FIN STA S/C 165°C
	2118	0118	LC		40-29.5	67-48.8	H.I. CTD # S3
	2138	0138					FIN STA S/C 168G.
	2207	0207	LC		40-25.7	67-48.3	H.I. CTD # S4
	2226	0226					FIN STA S/C 170G

Vessel [illegible]

Cruise [illegible]

LORAN LOG

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THURS 10-1-81

Date	Time (+4)	Sta. (=)	+/-.	Reading	Latitude (N)	Longitude (W)	Remarks
10-1							
	0027	0427	LC		40-20-76	67-47.76	CTD STA # 59 H.T.
	0050	0450	[illegible]	[illegible]			F/W STA
	0123	0523	LC		40-16.56	67-47.15	H.T CTD STA # 60
	0155	0555	—				F/W STA AWAITING FOR TRAFFIC TO CLEAR
	0235	0635	—				C/C 000°(9)
	0310	0710	LC		40-20.00	67 47.60	F/W XBT'S C/C 357 TO STA 'A'
	0400	0800	LC		40.25.32	67 47.05	
	0500	0900	LC		40 31.14	67.45 62	
	0519	0919	LC		40.33.10	67.45.18	0519 H.T. VICINITY OF
							BUOY FARM 'A'
			SIMUL FIX				
	0532	0932	Sat	9 4	40.32.623	67 44.968	
	0532	0932	LC	M 650 W 600 Y 510	40.32.96	67.45.36	7000
	0532	0932	LC	M 660 W 650 Y 630	40 32.95	67.45.05	6000
	0532	0932	LC	M -2 DB W -2 DB Y -7 DB	40.32.32	67.44.29	360
	0700	1100	LC		40.34.08	67.45.17	
	0850	1250					PICK UP TRIPOD
	1910	1310					TRIPOD ONBOARD
	1013	1413	LC		40-34.52	67-43.70	CMC ROSETTE STA
	1030	1430					ROSETTE ONBOARD
	1043	1443					C/S 150G, 160RPM

Vessel OCEANUS

Cruise #104

LORAN LOG

1981

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
OCT 1	+4	GMT			N	W	
	1130	1530			40-26.8	67-38.5'	U/S SETTING MOORING "233"
							AT SITE 'C'
	1133						
	1200	1600	LC		40-26.75	67-38.43	NOON POSIT
	1341	1741	LC		40-26.75	67-39.75	SET MOORING "OH"
	1400	1800	LC		40 27.05	67 40.25	F/W SCIENCE C/C 273°g C/C 205 RPM
	1500	1900	LC		40-27.96	67-57.40	C/C 275°g
	1600	2000	LC		40.28.29	68.14.60	1600 C/C 280°g
	1700	2100	LC		40.29.48	68.31.47	1700 C/C 282°g
				SIMULFIX			
	1910	2310	Sat	262 M 855 W 810 Y 790	40.29.678	68 34.368	
	1910	2310		M 840 W 810 Y 840	40.29.71	68.34.47	7000
	1910	2310		M 840 W 810 Y 840	40.29.75	68.34.26	6000
	1910	2310		M 44 00 W 00 00 Y 25 00	40.29.19	68 33.50	360
	1800	2200	LC		40.31.07	68.48.08	
							1915 C/C 276°
	1900	2300	LC		40.32.61	69.06.98	1942 C/C 271°
	2000	2400	LC		40-33.4	69-25.9	
	2100	0100	LC		40-32.7	69-44.4	C/C 260°C.
	2200	0200	LC		40-30.7	70-02.7	
	2237	0237	LC		40-29.54	70-12.57	H.T. FOR BOTTOM GEAR

Vessel OCEANUS

Cruise #104

LORAN LOG

1981

Date	Time	~~Sta.~~	+/-.	Reading	Latitude	Longitude	Remarks
2 OCT	+4	GMT			N	W	
	2332	0332	LC		40-29.7	70-12.6	FIN STA C/C 32[illegible]
	2	OCTOBER		1981			
	0000	0400	LC		40-35.92	70-18.34	
	0100	0500	LC		40 45.78	70-27.35	C/S 136 RPM
	0200	0600	LC		40-53.37	70-34.26	
	0300	0700	LC		41-00.92	70-41.27	C/S 150 RPM
	0330	0730	LC		41-04.86	70 45.00	C/C 322°g
	0400	0800	LC		41.08.86	70.49.19	
	0428	0828	LC		41.12.47	70.52.49	C/C 000°g NOMANS WHISTLE #2 2.0 mi 0→
							0441 C/C 357°g
	0500	0900	LC		41.17.46	70 52.54	0530 C/C 046°g 04 BY DEVILS BRIDGE BUOY
	0525	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
	0800	1000	LC		41.23.87	70.50.25	
	0712	1112	ARRIVE [illegible]		[illegible]	[illegible]	VOYAGE COMPLETE
							[illegible]