85019nav

USNS LYNCH

70485

JUNE 8-28, 1985

ANNE TREHU - USGS

AL BALLARD (NORDA)

NAVIGATION LOG

Carolina Trough

85019
LYNC
704-85
104663

#85019nav

U.S.G.S.
INTEGRATED NAVIGATION SYSTEM
AND
NORTHSTAR LORAN-C NAVIGATION LOG

SHIP USNS LYNCH

CRUISE NO. LYNCH 70485

DATE JUNE 8, 1985 —

CHIEF SCIENTIST AL BALLARD (NORDA)

CAROLINA TROUGH
LYNCH 1985 NAVIGATION LINES

Carolina Trough

LY MAP: 35

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	FIX TIME	LATITUDE ± DEGREES ± MINUTES	LONGITUDE ± DEGREES ± MINUTES	TYPE	QUAL.
85	06	09									
85	06	09	1916		200	6.8		34 02.06	76 56.58		
			2026					33 57.05	76 02.91		u1
			2125					33 57.47	76 01.53		s1
			2336					33 49.02	76 12.03		u2
	06	10	0121					33 40.85	76 20.96		u3
			0316					33 32.99	76 30.11		u4
			0317					33 33.01	76 30.07		u5
			0516					33 25.00	76 39.02		u6
			0659					33 17.19	76 48.15		u7
			0831					33 08.84	76 56.74		u8

TAPE #	START	END	COMMENTS AND OBSERVATIONS	PAGE 1
			1515 local - 1915Z get underway (finally)	
			delay of ~21 hours due to problem w/ ship's	
			fuel line.	
			STA at station U1 - line 4 2000-2030Z, June 9	
			Planned station positions:	
			①- 33°57' 76°03', ②- 33°49' 76°12', ③ 33°41' 76°21'	
			④- 33°33' 76°30', ⑤- 33°25' 76°39', ⑥- 33°17' 76°48'	
			⑦- 33°09' 76°56.5'	
			6/9	
1	X		start Disc #1 (19:16Z) 6 min to deploy 1st OBIP	
depths				
494m			OBIP #1 deployed U1 has ranging →	(C3)
509			deployed S1 LYNN	
470			#2 deployed U2 →	(A1)
445			#3 deployed U3	(A8)
419			#4 deployed U4 } same station	(C4)
419			#5 deployed U5 } 1st ranging	(A2)
390			#6 deployed U6	(C6)
362			#7 deployed U7	(A3)
375			← #8 deployed U8 has ranging →	(C5)
#1	X		6/10 08:34Z End Disc #1	
#2	X		6/10 08:36:10 start Disc #2 clock reset	
			positions to transpond from.	
			IBM clock for NAV is 2 sec slower than	
			ship clock used for shot instant (DISK #2)	

TAPE #	START	END	COMMENTS AND OBSERVATIONS	PAGE 2

transponding to instrument 118 from several sites.

1) lat 33° 9.3858 → 9.4034
   lon. 76° 56.4248 → 56.4244
   range 1174, 1181, 1189, 1191
2) lat 33° 9.5267 → 33° 9.5382
   lon 76° 56.0536 → 76° 56.0605
   range 1699, 1705, 1709, 1715
3) lat. 33° 8.3546 → 8.3578
   76° 56.3873 → 56.3594
   range 1194, 1193, 1192, 1192, 1191
4) lat. 33° 8.7824 → 8.8017
   76° 57.4013 → 57.3994
   range 1018, 1018, 1017, 1016, 1016, 1016
5) lat 33° 9.0868 - 9.1011
   long 76° 57.2067 - 57.2141
   866, 867, 868, 869, 869

water depth = 365 m.

getting into position for line 4.

range to 116 (OBS. 56)
33° 26.3844 76° 38.0685 range 2588.

desired shot times.

shooter's 10s warning = desired time − 10s − fuse time.

LINE 4

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	depth ~~FIX~~ M TIME	NAVIGATION LATITUDE ± DEGREES	LATITUDE MINUTES	LONGITUDE ± DEGREES	LONGITUDE MINUTES	TYPE	QUAL.
85	06	10	1200	4									
			1207			Bubble Pulse							
			1214										
			21										
			28				380						
			35				380	33	9.45	76	55.65		
			42				378		9.78		55.05		
			48	12.960			377		10.40		54.55		
			56	30.710		X	377		11.03		53.97		
			1303				375		11.65		53.36		
			10	02.153		X	375		12.12		52.71		
			17	00.578		X	373		12.92		52.07		
			25	08.330		X	373		13.59		51.46		
			31				372		14.27		50.85		
			38				372		14.94		50.22		
			45	03.065		.192 .270	370	33	15.57	76	49.55		
			52	51.765		.155 .262	368	33	16.20	76	48.84		
			58	56.862		.150 .260	370		16.84		48.12		
			1406	09.470		.160 .258	370		17.49		47.42		
			13	05.723		.148 .262	370		18.13		46.73		
			20				370		18.73		46.13		
			27				371		19.34		45.44		
			34	05.100		.163 .275	374		20.00		44.74		
			41				375		20.62		44.00		
			48	25.955			378		21.22		43.27		
			58	58.620		.155 .275	381		21.81		42.53		
			1502	56.885		.157 .29	385		22.40		41.76		
			09	28.102		.160 .300	387		22.98		41.00		
			16				388	33	23.55	78	40.24		
			23										

.155 average bubble pulse when b.p. not measured.

10 sec warning time.

shot phone 167 ft. behind ship —

PAGE 4

TAPE #	START	END	COMMENTS AND OBSERVATIONS			
			fuse of 6 ft - burn in air - 40 sec / foot.			
			≈ 2 min burntime.			
			-4 min +1 m 50 s.	HR/MIN/SEC	burntime x 2 min	MIN/SEC
			1226	H_2O		off
#1			1231, 1232/50	12:33:09	08	35:17 no shot phone
#2			1239, 1240/50 no shot phone	12:41:08	28	43:35 - delayed shot
#3			1244 1245/50	12:46:04	09	48:13
#4			1252, 1253/50	12:54:16	14	56:30
#5			1259, 1300/40	13:00:52	05	02:57 no shot phone
#6			1306, 1307/40	13:07:51	11	10:02
#7			1313, 1314/40	13:14:51	09	17:00
#8			1320, 1321/40	13:21:51	18	24:09
#9			1327, 1328/40	13:28:50	00	30:50 no shot phone
#10			1334, 1335/40			no shot
#11			1341, 1342/40	13:42:50	12	45:02
#12			1348, 1349/40	13:49:50	01	51:51
#13			1555, 1556/40	13:56:50	06	58:56
#14			1402, 1403/45	14:03:55	14	06:09
#15			1409, 1410/45	14:10:57	07	13:05
#16			1416, 1417/45	14:17:56	09	20:07 no paper record for shot phone shot phone digitized
#17			1423, 1424/45	14:24:55	08	27:03
#18			1430, 1431/45	14:31:59	05	34:04
#19			1437, 1438/45	14:38:55	03	40:58 no paper record shot digitized
#20			1444, 1445/45	14:46:30	-04	48:26
#21			1451, 1452/45	14:52:56	03	54:59
#22			1458, 1459/45	14:59:55	01	01:56
#23			1505, 1506/45	15:07:27	01	09:28
#24			1512, 1513/45	15:13:58	no shot	
			Line stopped - permission suspended —			

(7 kts through water)

LINE 4

YR	MO	DAY	Z TIME	LINE #	SHIPS COURSE	SPD	depth m ~~FIX TIME~~	NAVIGATION LATITUDE ± DEGREES ± MINUTES	LONGITUDE ± DEGREES ± MINUTES	TYPE	QUAL.
05	06	10	1530					.	.		
			37				400	.	.		
			44					.	.		
			51					.	.		
			58				410	.	.		
			1605					.	.		
			12					.	.		
			19				413	.	.		
			26					.	.		
			33					.	.		
			40					.	.		
			47					.	.		
			54				378	.	.		
			1701					.	.		
			08					.	.		
			15				373	.	.		
			22					.	.		
			29					.	.		
			36					.	.		
			43				363	.	.		
			50		1754		357	.	.		
			57				363	.	.		
			1804					.	.		
			11					.	.		
			18				360	.	.		
			25					.	.		
			32				359	.	.		
			39					.	.		
			46					.	.		
			53				355	.	.		

CD 401

TAPE #	START	END	COMMENTS AND OBSERVATIONS	PAGE 5
			H_2O off	
			1526, 1527/45	
			1533, 1534/45	
			1540, 1541/45	
			1547, 1548/45	
			still waiting for permission —	
			preparing for CTD —	
			1805 — CTD LINE 401 begins — go to depth of	
			~320 m.	
			1820 — finish CTD LINE 401	
			lat / lon 33° 28.8409 76° 36.7236	

LINE 4

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	depth ~~FIX~~ M ~~TIME~~	NAVIGATION LATITUDE ± DEGREES ±	LATITUDE MINUTES	LONGITUDE ± DEGREES ±	LONGITUDE MINUTES	TYPE	QUAL.
85	06	10	1900					33	30.61	76	35.45		
			07				355		.		.		
			14						.		.		
			21						.		.		
			28						.		.		
			35						.		.		
			42						.		.		
			49						.		.		
			56						.		.		
			2003				355		.		.		
			10						.		.		
			17						.		.		
			24						.		.		
			31						.		.		
			38				355		.		.		
			45						.		.		
			52						.		.		
			59						.		.		
			2106				355		.		.		
			13						.		.		
			20				390		.		.		
			27				407		.		.		
			34				420		.		.		
			41		2142		399		.		.		
			48				423		.		.		
			55				427	33	37.46	76	25.09		
			2202	57.461		.162 .268	430		38.48		23.90		
			09	25.335		.165 .273	433		39.51		22.68		
			16	03.122		.160 .293	437		40.48		21.55		
			23	06.040		.153 .273	445		41.45		20.38		

+15.23
.152
18.73
36.24

TAPE #	START	END	COMMENTS AND OBSERVATIONS
			Still waiting
#2		X	Disc WRITE OFF // drifting NE 2 knots
			End Disc 19:36
			Clearance granted to continue —
			Getting geared up to shoot again.
			Expect to be shooting around 2200 —.
			first shot will be # 25 —
#3	X		DISC #3 Start 21:31 Z

			HOD	2 mint	OFF
#25		2144, 2145/45			
#26		2151, 2152/45	21:52:55	04	54:59
#27		2158, 2159/45	21:59:54	03	01:57
28		2205, 2206/45	22:7:23	01	9:24
29		2212, 2213/45	22:13:55	07	16:02
30		2219, 2220/50	22:21:01	04	23:05

no paper records digitized

10kts through water

LINE 4

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SPD	depth FIX TIME	NAVIGATION LATITUDE ± DEGREES ± MINUTES	LONGITUDE ± DEGREES ± MINUTES	TYPE	QUAL.	
85	06	10	2230	06.320	.160 .290	451		33 42.46	76 19.16			37.92
			3707	822	.155 .288 .307	457		43.45	17.99			-46.93
			4358	980	.165 .293 .312	461		44.48	16.83			+ 6.12
			5100	935	.165 .295 .318	464		45.51	15.70			- 5.61
			5859	868	.165 .300 .322	467		46.54	14.60			+ 0.79
			2305			469		47.58	13.43			
			1230	634	.178 .325 .340	471		48.60	12.30			
			1859	082	.160 .292 .330	473		49.66	11.09			- 5.51
			2603	253	.165 .300 .330	477		50.71	09.90			19.52
			3305	748	.155 .280 .330	480		51.70	08.88			34.4
			4002	574	.162 .295	482		52.71	07.70			15.44
			4707	769	.160 .290 .325	485		53.75	06.48			46.6
			5400	080	.175 .318 .355	487		54.76	05.34			.48
85	06	11	0001	95.817	.158 .285 .345	490		55.77	04.16			34.94
85	06	11	0351									
			0400		2062.6			34 00.00	75 58.53			
			0420									
			0430									

TAPE #	START	END	COMMENTS AND OBSERVATIONS	H2O		Off	
#31			2226, 2227/50	22:27:59	06	30:05	
32			2233, 2234/50	22:35:00	07	37:07	
33			2240, 2241/50	22:41:59	-01	43:58	
34			2247, 2248/50	22:48:59	01	51:00	
35			2254, 2255/50	22:55:59	00	57:59	
36			2301, 2302/50	23:03:00	01	05:01	no paper record yes digital record
37			2308, 2309/50	23:10:34	-04	12:30	
38			2315, 2316/50	23:16:59	-01	18:58	
39			2322, 2323/50	23:23:59	03	26:02	
40			2329, 2330/50	23 30:59	06	33:05	
41			2336, 2337/50	23:37:59	03	40:02	
42			2343, 2344/50	23:45:00	07	47:07	
43			2350, 2351/50	23:52:00	-01	53:59	
44			2357, 2358/50	23:59:00	+05	01:05	

lat 33 55.8041 lon 76° 4.1428

00:01:05 end line 4 explosives

getting prepared for airgun shooting —

deploying airgun —

start airgun line course against Gulf Stream

towing at 6.5 knots —

will also be recording shot phone on camera & and analogue; streamer recorded digitaly and on LSR.

gun 125-150 ft behind ship —

Deploy streamer (Model 28420 - Deledyne (Universal) 350ft active element - 900 ft total. (550 ft cable) (let out all the way). 2 groups of 50 hydrophones

gun firing at only 1500 psi. Will try to get it up to 2000 psi.

(some sections lacking oil.) (weighting: 32 lbs ~ 50 ft in front of active section)

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	NAVIGATION FIX TIME	LATITUDE ± DEGREES ± MINUTES	LONGITUDE ± DEGREES ± MINUTES	TYPE	QUAL.
85	06	11	0450	4							
			0549		225	2.7		33 56.51	76 02.97		
			1238			0.4		33 57.92	76 00.4509		
			1311								
			1342								
			1626								

TAPE #	START	END	COMMENTS AND OBSERVATIONS	PAGE 8
			underway with all gear for airgun line —	
			pulling in AIR GUN - REPAIRS ??	
#3			0747 Disc write off (Recn = 7390) still here to	
			Broken AIR LINE at gun	
			decision to pull in Transxer	
			still working on airgun	
			- heading for 1st pickup (U1)	
#3			1330 Disc ON (Recn 7391)	
			- sm sphere #3 U1 transponding	
			transponding to instruments	
			range 1342, 1465, 1383	
			lat 33° 57.0248 → 57.0662 → 57.0467	
			lon 76° 1.8224 → 1.8837 → 1.7610	
			range 3602 → 3621 → 3639	
			lat 33° 57.2754 → 57.2928 → 57.2800	
			lon 76° 0.2733 → 0.2650 0.2888	
			1550 starting to navigate onto instruments	
			for pickup.	
			1620 U1 on surface (?)	
			33° 57.9334, 76° 1.4713 Pick up U1	
			1630 U1 on board - depth 550 m.	
#3	X		1628z end disk #3 start disk #4	
			moderately choppy seas - waves ~ 4 ft - wind ~ 10 kts.	
			1740 - Scripps release ? Command sent - no verification	
			received.	

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	NAVIGATION FIX TIME	LATITUDE ± DEGREES ± MINUTES	LONGITUDE ± DEGREES ± MINUTES	TYPE	QUAL.
85	06	11									
			2150		220	85		33 50.65	76 11.29		
85	06	12	0001					33 41.11	76 20.73		

2 kn 75
3 kt 100
4 Kts 125

TAPE #	START	END	COMMENTS AND OBSERVATIONS	PAGE 9
			1756 – Scripps OBS sighted	
			1801 – Lynn onboard (S1)	lon 75 59.9258 lat 33 58.7109
			1819 – heading for U2	
			2044 – homing in on U2	
			2100 – released	
			2140 – U2 onboard + tied down heading to U3	U2 depth 475m
			0000Z released U3	33° 41.1257 76° 20.7010 } ORT Slant range of 485m water depth of 45
			0020 – on board.	
			0030 – on our way.	
			0200 – approaching U5 site	3 kts (½ mile)
			0209 – depth 350m transponding to U5	
			0236 – Reposition ship	
			0248 Released ~~497m~~	33° 33.23 76° 30.11
			0310 onboard	
			0316 approaching U4 site	
			0320 ship traffic	
			0430 Approaching U4	
			0439 transponding	
			0444 Released 503 m	33° 33.2277 76° 30.0691
			0506 on board U5	

TAPE #	START	END	6/12/85 COMMENTS AND OBSERVATIONS
#4		X	End Disc #4 @ 6/12 05:48:18 9605 Recs
#5	X		Start Disc #5. 6/12 05:49 read errors — switched disc during loran reading
			06:37 Approaching U6 depth 4000m
			06:41 transponding
			06:58 Released 492m 33 25.0198
			76 38.9932
			07:24 onboard
			wind & Seas picking up
			07:37 c/c to next site 6kt — slow transfer
			next pickup daylite or when wind dies
			09:15 c/c 10° TO THE RIGHT
			10:00 circling U7 till light + wind decreases
			12:12 start Transponding to U7
			12:14 release U7 ? no go won't release
			13:08 attempt to transpond U7 no go Won't release
			loran down attempt for U7
			abandoned rough seas
			14:34 heading for 33°5' 75°35'
#5		X	disc #5 stopped printout stopped
			loran proc. not correctly
			locating position
			~~[illegible]~~
			1829 REDUCED SPEED TO REDUCE POUNDING

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	FIX TIME	LATITUDE ± DEGREES ± MINUTES	LONGITUDE ± DEGREES ± MINUTES	TYPE	QUAL.	
85	06	13										
								31° 59.9	76° 17.6			U1
			1730					32° 11.2930	76° 11.4844			U2
			1938					32° 22.774	76° 4.004			U3
850614			0003					~~32° 34°~~	~~76°~~			KAREN
								32 34.33	~~75~~ ~~55~~			
									75 55.35			
85	06	14										
			0342					32 38.63	75 48.58			
			1137					32 55.4	75 40.3			Phred

TAPE #	START	END	6/13 COMMENTS AND OBSERVATIONS
			02:10 Z Weather & wind bad
			C - moving slowly towards S. end of line #2
			22 n.mi @ 195° speed 2.5 knots
#6	X		Disc #6 started 11:28 Z
			getting prepared for line #2
			beginning line #2 33°0' 76°17.5'
			end #2 33°6' 75°35'
			every 12 miles OBM goes over
			1303 Z holding position for start line #2
			1538 Z ~~[illegible]~~ U1 deployed (A1)
			OBS U2 deployed (A8) water depth ~ 2~~350~~430 m.
			OBS U3 deployed (A2). water depth. ~ 2330.
			Scripps Karen. 2650 m. 32° 34.33 75° 55.35
#6	X		6/14/85 0049 Z END Recov = 9610
#7	X		6/14/85 0049 Z START
			6/14 0342 drifting 32° 38.63' 75° 48.58 C-38° 1.7 knts
			1157 Phred over 75° 40.8 32° 55.4
			3225 m -

Line #2

YR	MO	DAY	TIME Z	LINE	SHIPS MS COURSE	SHIPS BP SPD	depth m FIX TIME	NAVIGATION LATITUDE ± DEGREES	LATITUDE ± MINUTES	LONGITUDE ± DEGREES	LONGITUDE ± MINUTES	TYPE	QUAL.
85	06	14	0300				3239		.		.		
			0307		07.775	.155 .128	3223	32	53.31	75	41.05		
			0313		59.216	.165 .125	3218		52.95		41.35		
			21		—		3214		52.21		41.93		
			28		—		3220		51.67		42.35		
			35		—		3220		51.09		42.62		
			42		02.140	.157 .280	3227		50.48		42.92		
			49		04.972	.160 .289	3233		49.89		43.32		
			56				3212		49.29		43.80		
	conflict		0503		57 10.230	.162 .292	.170 .300 3199		48.67		44.33		
			10				3178		48.06		44.87		
			17		20.470	.175 .310	3155		47.44		45.40		
			24		00.553	.16 .135	3137		46.83		45.95		
			31		11.330	.160 .289	3126		46.24		46.46		
			38		—		3113		45.72		46.93		
			45		—		3090		45.16		47.40		
			52		28.610	.162 .292	3037		44.56		47.89		
			59		—		3005		43.97		48.38		
			0506		11.259	.158 .278	2998		43.37		48.82		
			13		12.318	.16 .13	2978		42.76		49.24		
			20		—		2958		42.16		49.67		
			27		—		2941		41.55		50.10		
			34		—		2920		40.95		50.55		
			41		09.049	.160 .282	2893		40.36		51.00		
			48		19.888	.180 .326	2875		39.79		51.44		
			55		08.721	.156 .279	2853		39.20		51.90		
			0602		05.899	.155 .275	2835		38.62		52.36		
			09		—		2813		38.04		52.81		
			16		—		2792		37.46		53.28		
			23		02.009	.171 .306	2778		36.86		53.72		

COMMENTS AND OBSERVATIONS

TAPE #	START	END	2min	10sec.	in water	shot instant.		ship speed through water	
#1			1303	1304/45	13:04:55	11	7:06	6.3 kts.	
2			1310	1311/45	13:11:55	02	13:57		
3			1317	1318/45	13:18:55	-03	20:52	no paper yes digitize	
4			1324	1325/45	13:25:56	no explosion		no paper	
5			1331	1332/45	13:32:56	4	35:00	no paper	
6			1338	1339/45	13:39:56	4	42:00		6.3 kts
7			1345	1346/45	13:46:55	8	49:03		
8			1352	1353/45	13:53:56	12	56:08		7.3 kts
9			1359	1400/45	14:00:56	0	02:56		
10			1406	1407/45	14:7:55	-3	09:52		
11			1413	1414/50	14:15:19	0	17:19		7.5 kts
12			1420	1421/50	14:22:00	-1	23:59		
13			1427	1428/50	14:29:01	08	31:09		
14			1434	1435/50	14:36:00	no explosion			6.7 kts.
15			1441	1442/50	14:43:26	no explosion			7.0
16			1448	1449/50	14:50:22	5	52:27		7.2
17			1455	1456/50	14:57:01	no explosion			7.3
18			1502	1503/50	15:04:00	9	6:09		6.8
19			1509	1510/50	15:11:01	9	13:10		7.1
20			1516	1517/50	15:18:00	no explosion			7.1
21			1523	1524/50	15:25:00	no explosion			6.9
22			1530	1531/50	15:32:01	no explosion			7.0
23			1537	1538/50	15:39:01	6	41:07		7.0
24			1544	1545/50	15:46:01	17	48:18		7.0
25			1551	1552/50	15:53:01	6	55:07		7.0
26			1558	1559/50	16:00:01	+3	02:04		7.1
27			1605	1606/50	(misfire) 16:07:29	no explosion			
28			1612	1613/50	16:14:02	+3	16:05	no paper no digitize	7.1
29			1619	1620/50	16:24:02	-1	23:01		7.1

YR	MO	DAY	TIME	shot LINE #	SHIPS COURSE	SPD	instant FIX TIME	NAVIGATION LATITUDE ± DEGREES	± MINUTES	LONGITUDE ± DEGREES	± MINUTES	TYPE	QUAL.
85	06	19	1630	06	417	.155 .231	2243	32	36.27	75	54.18		
			39	59	180	.165 .298	2717		35.67		54.61		
			44				2692		35.05		55.01		
			51	02	196	.172 .309	2665		34.44		55.42		
			58	02	448	.167 .296	2637	32	33.87		55.80		
		19	05				2612		.		.		
			12	18	488	.170 .301	2592		32.62		56.68		
			19	25	781	.160 .259	2565		32.01		57.12		
			26	05	275	.159 .285	2540		31.41		57.55		
			33	06	507	.166 .296	2519		30.82		57.99		
			40	11	030	.173 .307	2499		30.22		58.45		
			47	07	639	.168 .298	2477		29.63		58.91		
			54				2455		29.05		59.38		
		18	01	07	947	.161 .290	2435		28.47		59.87		
			08	09	610	.16 .13	2418		27.89	76	00.34		
			15				2407		27.32		00.83		
			22	07	460	.163 .288	2395		26.74		01.31		
			29				2384		26.15		01.74		
			36	08	780	.158 .268	2372		25.54		02.15		
			43	05	252	1.65 1.25	2363		24.93		02.57		
			50				2354		24.33		03.01		
			57	08	287	.159 .287	2345		23.73		03.46		
		19	04	09	100	.166 .296	2335		23.14		03.91		
			11				2320		22.54		04.38		
19	15	2304	18	10	355	.160 .190	2284		21.94		04.84		
			25	07	699	.149 .221	2287		21.32		05.22		
			32	04	646	.165 .195	2297		20.71		05.61		
			39	35	328	.175 .308	2307		20.09		05.99		
			46	12	420	.165 .240	2317		19.48		06.38		
			53	07	199	.169 .241	2327		18.87		06.77		

COMMENTS AND OBSERVATIONS

TAPE #	START	END	-2 min	-10 sec	H2O		off		ship spd.
30			1626	1627/50	16:28:01	+3	30:04		7.2 kt
31			1633	1634/50	16:35:01	-4	37:57		7.2
32			1640	1641/50	early, 16:40:00	+6	42:06	outside window	7.0
33			1647	1648/50	16:49:00	0	51:00		6.9
34			1654	1655/50	16:56:01	-1	58:00		7.1
35			1701	1702/50	misfire, no deployment				
36			1708	1709/50	17:10:08		12:07		6.9
37			1715	1716/50	misfire 17:17:25	+1	19:26		7.0
38			1722	1723/50	17:24:01	+2	26:03		6.9
39			1729	1730/50	17:31:00	+4	33:04		6.9
40			1736	1737/50	17:38:00	+9	40:09		7.1
41			1743	1744/50	17:45:01	+7	47:08		6.9
42			1750	1751/50	17:52:02	+2	54:04		7.0
43			1757	1758/50	17:59:02	+5	18:01:07		7.2
44			1804	1805/50	18:06:04	+4	08:08		6.9 09.61
45			1811	1812/50	18:13:00	no explosion			6.8
46			1818	1819/50	18:20:02	4	22:06		7.0
47			1825	1826/50	18:27:01	4	29:05	no paper no digitize	7.0 analog
48			1832	1833/50	18:34:01	5	36:06		7.0
49			1839	1840/50	18:41:01	3	43:04		7.0
50			1846	1847/50	18:48:02	5	50:07		6.9
51			1853	1854/50	18:55:01	[illegible]	57:07		7.0
52			1900	1901/50	19:02:02	[illegible]	04:07		6.9
53			1907	1908/50	19:09:01		no explosion		7.0
54			1914	1915/50	19:16:01	8	18:09		7.0
55			1921	1922/50	19:23:00	6	25:25		7.0
56			1928	1929/50	19:30:00	4	32:04		6.9
57			1935	1936/50	19:37:27	6	39:33		7.0
58			1942	1943/50	19:44:01	10	46:11		7.0
59			1949	1950/50	19:51:00	6	53:06		6.9

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SPD	Depth m FIX TIME	NAVIGATION LATITUDE ± DEGREES ±	MINUTES	LONGITUDE ± DEGREES ±	MINUTES	TYPE	QUAL.
86	06	14	2000				2340	32	18.27	76	07.18		
			07	07	505	.168 .299	2347		17.67		07.58		
			14	14	060	.165 .295	2357		17.07		08.00		
			21	07	089	.158 .278	2368		16.47		08.38		
			28	08	192	.158 .280	2377		15.87		08.73		
			35	10	155	.160 .282	2387		15.26		09.08		
			42	07	990	.166 .300	2397		14.66		09.41		
			49	06	045	.161 .290	2403		14.06		09.72		
			56	07	800	.160 .282	2415		13.47		10.06		
			2200	07	639	.155 .286	2427		12.88		10.41		
			10	08	781	.162 .299	2440	32	12.28	76	10.75		
			17				2445		11.68		11.12		
			24	06	358	.161 .290	2447		11.07		11.46		
			31	05	630	.165 .299	2457		10.47		11.81		
			38				2470		09.88		12.15		
			45				2477		09.28		12.49		
			52	04	824	.160 .285	2483		08.68		12.82		
			59	06	452	.158 .280	2490		08.07		13.16		
			2306	09	098	.165 .293	2495		07.47		13.48		
			13	04	460	.160 .289	2501		06.88		13.81		
			20	08	761	.161 .291	2508		06.28		14.13		
			27	04	846	.167 .300	2515		05.67		14.43		
			34	09	189	.166 .298	2522		05.07		14.74		
			41	05	201	.160 .287	2528		04.46		15.03		
			48	03	436	.158 .278	2534		03.82		15.33		
			55				2539		03.18		15.66		
			2302	08	823	.170 .300	2547		02.52		16.02		
			09						.		.		
			16						.		.		
			23						.		.		

COMMENTS AND OBSERVATIONS

TAPE #	START	END	2 min	10 sec	H2O	off	Ship Speed
60			1956	1957/50	19:58:01	20:00:04	7.0 thru water
61			2003	2004/50	20:05:00	07:05	6.9
62			2010	2011/50	20:12:02	14:04	6.9
63			2017	2018/50	20:19:01	21:05	6.9
64			2024	2025/50	20:26:02	28:06	7.0
65			2031	2032/50	20:33:03	35:07	6.9
66			2038	2039/50	20:40:01	42:05	7.0
67			2045	2046/50	20:47:01	49:04	7.0
68			2052	2053/50	20:54:00	56:00	7.0
69			2059	2100/50	21:00:01	3:05	7.0
70			2106	2107/50	21:08:03	10:07	6.8
71			2113	2114/50	21:15:25	no explosion	7.0
72			2120	2121/50	21:22:01	24:06	7.0
73			2127	2128/50	21:29:01	21:31:05	7.0
74			2134	2135/50	21:36:00	21:38:03	7.0
75			2141	2142/50	21:43:01	DUD	7.0
76			2148	2149/50	21:50:02	21:52:04	7.0
77			2155	2156/50	21:57:00	21:59:05	6.9
78			2202	2203/50	22:04:01	22:06:07	6.7
79			2209	2210/50	22:11:01	22:13:03	6.8
80			2216	2217/50	22:18:00	22:20:07	6.9
81			2223	2224/50	22:25:00	22:27:03	6.8
82			2230	2231/50	22:32:02	22:34:07	6.9
83			2237	2238/50	22:39:02	22:41:03	6.8
84			2244	2245/50	22:46:00	22:48:02	6.7
85			2251	2252/50	BAD FUSE	redo next	6.8
86			2258	2259/50	23:00:04	23:02:07	6.7
87			2305	2306/50	no more TNT!		
88			2312	2313/50			
89			2319	2320/50			

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	NAVIGATION FIX TIME	LATITUDE ± DEGREES ± MINUTES	LONGITUDE ± DEGREES ± MINUTES	TYPE	QUAL.
85	06	14	2330								
			37								
			44								
			51								
			58								
85	06	15	0005								
			12								
			19								
			26								
			33								
			40								
			47								
			54								
			0601								
85	06	15	0100		025	5.0		31 56.61	76 20.01		
			0138					31 59.67	76 18.23		

TAPE #	START	END	COMMENTS AND OBSERVATIONS
			[illegible] H2O off ship speed
(10)			2326 [illegible]
(11)			2333 2334/50
			2340 [illegible]
			2347 2348/50
			[illegible]
(16)			
17			
#7		X	DISC #7 end 6/14 14:10 Z (RECN 9616) 6/14/85
#8	X		DISC #8 start 14:11 Z 6-14-85
			0050 Z Air in water
			Starting Line #2 Air Gun Line
			Shot phone out 165 ft. for explosives.
			67 ft. for airgun.
			Bubble from airgun takes ~ 5 sec to vent on
			surface w/ ship at 3.8 kts thru water —
			01:38 Air Gun NOT FIRING — hauling in
			Broken Air hose @ gun — back to the repair shop
#8		X	6/15 03:30 End RECN = 9598
#9	X		6/15 03:30 Start

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	NAVIGATION FIX TIME	LATITUDE ± DEGREES	LATITUDE ± MINUTES	LONGITUDE ± DEGREES	LONGITUDE ± MINUTES	TYPE	QUAL.
85	06	15											
			0408					32	06.91	76	12.93		
			0454					32	11.1	76	11.2		
			0520					32	13.51	76	10.17		
			0700					32	19.04	76	07.84		
			1310					32	52.39	75	41.84		
			1926					32	35.4	75	55.1		
85	06	16	0030					32	25.1	76	02.4		

CTD 201

TAPE #	START	END	COMMENTS AND OBSERVATIONS
			0403Z Air gun back in water 7.8 Nmiles on line
			0408 Z Restart line
			0454 Z Passing over U2
			0520 Z AIR GUN Problem low pressure <500 PSI
			0700 Z AIR GUN BACK ON LINE
			0745 Passing U3
			0952 Passing Karen
			1310 Z pulling in airgun + streamer
			1312 Z heading for Phred
			1340 Z near Phred - depth 3225 -
			1342 Z .004 miles 32° 55.4622 7° 40.2493
			~ 1500 Z Phred on surface.
			1550 Phred on board.
			6/15/85
#9	X		Disc #9 end 16:58:52 out at (9655)
#10	X		Disc #10 start 16:58:53
			1915 Picking up KAREN —
			1926 KAREN released —
			2013 Karen in site
			2032 Karen on board
			2234 CTD LIN201 finished —
			Approaching U3 : 2½ miles
			0054 released (2348m) 32° 23.0278
			76° 03.6438
			0126 Surfaced // Bearing 225°
			0152 Alongside Range 1.00 Bearing 226 32° 23.4508
			76° 03.1499
			0155 Hooked

TAPE #	START	END	COMMENTS AND OBSERVATIONS
			0202 C/C to U2 14.2 miles C-210°
			0343 Rng 1.0 nmi U2
			0347 Stopping ship to transponder (2442m depth)
			0354 Released Rng 2442 32° 11.4187 76° 11.3292
			0426 Spotted // Bering 230°
			0523 snagged OBS ; 0525 OBS on board. 32° 12.4866 76° 10.0749
			0700 Approaching W1 Rng 1.5 nmi
			0707 Stopping ship (2520m depth)
10	x		? over flow !!! Disc #10 (0623Z) No operator on duty monitor!!!
6/16/85 11	x		start 0711Z Disc #11
			07:20 Released (Rng 2563m) 32 00.0833 76 17.5186
			0756 Surfaced Bering 160°
			0820 hooked - 32° 00.0880 76° 17.1629.
			0830 C-335 transit to Line 4 74 nmiles
			1600 33° 9.05 76° 56.89 495m. range 350 water depth.
			1601 released
			1620 33° 9.00 76° 56.92 OBS caught 1/8
			1623 OBS on board

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	FIX TIME	LATITUDE ± DEGREES ± MINUTES	LONGITUDE ± DEGREES ± MINUTES	TYPE	QUAL.
85	06	16									
85	06	20									
			1048					33 25.81	75 59.28		U1.5
			1125					33 25.78	75 58.84		U1.0
			1318					33 26.68	75 56.69		
			1912					33 01.26	76 16.20		U2
			2240					33 25.98	75 58.47		

TAPE #	START	END	COMMENTS AND OBSERVATIONS
#11		X	End 6/16/85 20:35 Recn= 9654
12	X		start 6/16/85 20:43
			6/16/85 2050 still trying to release U7, line 4
			33° 17.19 / 76° 48.15 UP14
			2230 still trying!
6/17/85			0003 — to the barn
6/20/85			
#13	X		Disc 13 start 08:33 Z heading for line #1
			deployed U1.5 ~~510~~m. depth 2010m
			deployed U1.0 ~~587~~m 2087m
			Range Position
			U1.5 1850 33 25.83 75 58.69
			Scripps 1311Z Karen 2350m.
			→ Change of plan-permitting problems
			1834 change in plans
			deploy A2 1912Z 1280 depth M
#13	X		rec # 9597 → END 6/20/85 21:53
#14	X		Start 6/28/85 21:53
			Recovery U1.0

2250 750

~~.83~~ ~~.83~~ ~~.46R~~ ~~.47R~~ .75R

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	FIX TIME	NAVIGATION LATITUDE ± DEGREES	LATITUDE ± MINUTES	LONGITUDE ± DEGREES	LONGITUDE ± MINUTES	TYPE	QUAL.	
85	06	20	2328						.		.			
			2341					33	26.79	75	55.48			
			2345					33	26.90	75	55.25			
									.		.			
									.		.			
									.		.			
85	06	21							.		.			A1 with
			0427					33	25.28	75	59.22			~~C6~~ release
									.		.			
			0445						.		.			
									.		.			
			0908					32	50.62	75	59.66			KAREN
									.		.			
			1117						.		.			
			1118						.		.			
			1815					33	15.06	76	37.37			C3
									.		.			
			2023						.		.			
									.		.			
									.		.			
									.		.			
									.		.			
			2141					33	26.30	76	39.44			Phred
									.		.			
			2200						.		.			
									.		.			
									.		.			
									.		.			
			2331					33°	24.21	76°	52.75			C4
									.		.			

TAPE #	START	END	COMMENTS AND OBSERVATIONS
14			SIGHT OBJ – HEAD 260° FOR OBJ.
			HOOK OBJ – FROM RELEASE PT – 2.63 nmi. at 252°
			OBJ ON BOARD. FROM DROP PT. 3.1 nmi at 250°
			Evening – nice sunsets but worst time of day for pickups. Can't see the strobes and can't see the colors –
			OBJ A1 w/ C-6 release (changing) 2050m WAYPOINT 12 – HIT THE WATER.
			HEAD FOR WAYPOINT 13 NEXT – 32°50.5 N 76°W.
			UPDATE NAV TIME – WAS 6 SEC. SLOW AT 04:45:20
			DROP SCRIPPS OBJ (KAREN) CURRENT ~ 2 KB @ 55° DEPTH – 2575m.
			HEAD FOR WAYPOINT 14 – 33°15'N 76°38'W
14		X	11:17:57
15	X		11:18 START DISK.
			deployed C3 depth 533
			2023 Sat fix 33 23.97 76 39.55
			Loran says 33 23.96 76 38.99
			Loran has been giving warnings but seems to be holding up on.
			33°26.376 76°39.435 Phred in water 21:41 352m.
			underway to station for C4
			at 2241 sat ⇒ 33° 24.918 76°48.042 INS ⇒ 33°25.0543 76°47.46
			33° 24.2109 76° 52.7472 C4 in the water 250m.

LINE 1

85 06 22

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SPD	FIX TIME	LATITUDE ± DEGREES	± MINUTES	LONGITUDE ± DEGREES	± MINUTES	TYPE	QUAL.
85	06	21	0400	0	042				.		.		
			07						.		.		
			14						.		.		
			21						.		.		
			28						.		.		
			35		0220				.		.		
			42		0335				.		.		
			49						.		.		
			56		0500			33	19.20	76	35.81		
			0503						.		.		
			10		0554				.		.		
			17		0556				.		.		
			24						.		.		
			31		0953				.		.		
			38		1124				.		.		
			45						.		.		
			52						.		.		
			59		1445				.		.		
			0606		1610				.		.		
			13						.		.		
85	06	23	20		0331				.		.		
			27		0332				.		.		
			34		0531				.		.		
			41		0600				.		.		
			48		0608				.		.		
			55		1611				.		.		
			0702		1653				.		.		
			09		1656				.		.		
			16		1657				.		.		
			23						.		.		

GD 320

130
180
310

TAPE #	START	END	COMMENTS AND OBSERVATIONS (PAGE 20)
15		X	0042 end disk 15, start disk 16
16	X		0027 Sat ⇒ 33° 20.307 76° 47.853 DNS ⇒ 33° 20.42 76° 47.95
			0111 Sat ⇒ 33° 17.76 76° 43.90 ins 33° 17.80 76° 43.63
			release C3
			hooked C3.
			CTD LIN320
			preparing to deploy CW — 9.994 – 10.003 Hz
			START MANUVERING TO START CW LINES. – 2.5 KTS.
			START DEPLOYING CW TRANSDUCERS
			PASS 1 MILE WEST OF PT. 1 – 33°15'N 76°38'W
			START TURN FOR LINE AT PT 2 (33° 26' 76°39.5')
16		X	Disc 16 end 13:50 27
17	X		Disc 17 start 13:55
			turning 33° 13.2 76° 57.7
			turning 33 20.6 76° 45.0 new course
17		X	Disk 17 ended.
18	X		Disk 18 started
			UPDATE NAV TIME.
			START 180° TURN
			END TURN.
			reduce speed to 3 knots to pull in CW source —
			CW on deck.
18			end disk 18
19			start disk 19.

85 06 23

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	FIX TIME	LATITUDE ± DEGREES	LATITUDE ± MINUTES	LONGITUDE ± DEGREES	LONGITUDE ± MINUTES	TYPE	QUAL.	
85	06	23	07 30	1913Z				32	51.01	75	58.84			LYNN
			32	2100										
			34	2110										
			41											
850624			48											
			0805	0327Z				32	22.84	76	43.62			KAREN
			12											
			19	0517Z				32	13.47	76	50.68			AB ←
			26											
			33	0526				32	13.50	76	50.66			CTD 107
			40	0546				32	13.76	76	50.65			
			47											
			54	0611				32	14.14	76	50.58			←
			0901											
			08	0620										
			15	0621										
			22											
			29	0636				32	14.44	76	49.45			←
			36											
			43	0734				32	12.99	76	50.08			←
			50											
			57											
			1004											
			8											
85	06	24	25											
			32											
			39											
			46											
			53											

TAPE #	START	END	COMMENTS AND OBSERVATIONS
19			ready for Scripps deploy (Lynn) ≈ 2580 m depth
			KAREN sinfoded
			KAREN hooked
			[illegible]
			SIO OBS DEPLOYED (KAREN) - DEPTH - 1087 meters.
—			USGS OBS DEPLOYED (A8) - DEPTH - 1125 meters. 32.2245 76.8447
			CTD LIN101 IN WATER.
			CTD AT BOTTOM.
—			TRANSPOND TO OBS (A8) - 1408
19		X	END DISK 19
20	X		START DISK 20.
—			TRANSPOND TO OBS (A8) - 2285 ±5
—			TRANSPOND TO OBS (A8) - 1813
21		X	6/24/85 1946Z
22	X		6/24/85 1947Z
~~24~~	~~X~~		~~6/25/85 Z~~
			SWITCHED TO SECOND LOG BOOK

YR	MO	DAY	TIME	LINE #	SHIPS COURSE	SHIPS SPD	NAVIGATION FIX TIME	LATITUDE ± DEGREES ± MINUTES	LONGITUDE ± DEGREES ± MINUTES	TYPE	QUAL.
05	06	21	1100					.	.		
			07					.	.		
			14					.	.		
			21					.	.		
			28					.	.		
			35					.	.		
			42					.	.		
			49					.	.		
			56					.	.		
			1203					.	.		
			10					.	.		
			17					.	.		
			24					.	.		
			31					.	.		
			38					.	.		
			45					.	.		
			52					.	.		
			59					.	.		
			1306					.	.		
			13					.	.		
			20					.	.		
			27					.	.		
			34					.	.		
			41					.	.		
			48					.	.		
			55					.	.		
			1402					.	.		
			09					.	.		
			16					.	.		
			23					.	.		

A8 at 32 13.47 76 50.68

GMT DAY	MO	YR	TIME	LINE #	SHIPS COURSE	SPD (bubble pulse)	FIX TIME	WATER DEPTH (m)	NAVIGATION LATITUDE ± DEGREES	± MINUTES	LONGITUDE ± DEGREES	± MINUTES	TYPE
24	06	85	1201	58.207		.168 .308	1125		32	13.75	76	50.39	
			08	—			1120			14.64		49.78	
			15	—			1115			15.36		49.24	
			22	—			1112			16.06		48.73	
			29	01.608		.178 .322	1107			16.76		48.22	
			36		?		1105			17.45		47.70	
			43	—			1102			18.15		47.18	
			50	03.545		.217 .405	1098			18.84		46.66	
			57	08.769		.163 .300	1095			19.53		46.14	
			1304	05.209		.178 .332	1093			20.23		45.62	
			11	07.690		.172 .312	1090			20.92		45.09	
			18	07.106		.165 .308	1088			21.63		44.55	
			25	—			1085			22.33		44.02	
			32	13.462		.190 .312	1083			23.04		43.46	
			39	00.803		.170 .312	1082			23.74		42.94	
			46	24.505		.165 .300	1081			24.40		42.45	
			53	12.484		.170 .312	1080			25.07		41.94	
			1400	11.209		.158 .292	1079			25.75		41.43	
			07	04.142		.150 .272	[illegible]			26.42		40.90	
			14	11.410		.152 .285	[illegible]			27.12		40.43	
			21	09.241		.160 .293	[illegible]			27.82		39.96	
			28	02.940		.155 .282	[illegible]			28.52		39.49	
			35	05.539		.160 .288	[illegible]			29.22		39.02	
			42	—			1068			29.91		38.54	
			49	01.462		.165 .302	[illegible]			30.61		38.05	
			56	00.361		.165 .300	[illegible]			31.31		37.58	
			1503	58.580		.168 .308	1066			31.90		37.14	
			10	52.900			1066			32.68		36.56	
			17	58.772		.168 .308	1067			33.37		36.07	
			2400	49.8		.170 .312	1069			34.05		35.57	

LINE 1 Beautiful weather - calm flat.

TAPE #	START	END	-4 2min	+1 10sec	COMMENTS AND OBSERVATIONS H_2O	2min(±)	Hf	spd H_2O Kts	
#1			1157	1158/50	11:59:02	-2	12:00:58	7.2	
2			1204	1205/50	12:06:00		no explosion	6.1	
3			1211	1212/50	12:13:02	-5	14:57	5.9	no paper digitized
4			1218	1219/50	12:20:00	-10	21:50	5.6	no paper no digitize
5			1225	1226/55	12:27:04	-3	29:01	5.6	
6			1232	1233/55	12:34:05	-3	36:02	5.5	
7			1239	1240/55	12:41:06	-12	42:54	5.6	no paper digitize
8			1246	1247/55	12:48:06	-3	50:03	5.6	
9			1253	1254/55	12:55:07	+1	57:08	5.8	
10			1300	1301/55	13:02:06	-1	04:05	5.6	
11			1307	1308/55	13:09:05	+2	11:07	5.6	
12			1314	1315/55	13:16:05	+2	18:07	5.5	
13			1321	1322/55	13:23:05	-13	24:52	5.5	no paper no digitize
14			1328	1329/55	13:30:07	+6	32:13	5.7	
15			1335	1336/55	13:37:06	-4	39:02	5.1	
16			1342	1343/55	13:44:05	+9	46:14	5.3	
17			1349	1350/55	13:51:06	+6	53:12	5.5	
18			1356	1357/50	13:58:08	+4	14:00:12	5.6	
19			1403	1404/50	14:05:02	+2	07:04	5.3	
20			1410	1411/55	14:12:05	+6	14:11	5.3	
21			1417	1418/50	14:19:08	+1	21:09	5.6	
22			1424	1425/50	14:26:00	+3	28:03	5.4	
23			1431	1432/50	14:33:02	+3	35:05	5.5	
24			1438	1439/50	14:40:01	-1	41:54	5.5	no paper
25			1445	1446/50	14:47:00	+1	49:01	5.6	
26			1452	1453/50	14:54:01	-1	56:00	5.7	
27			1459	1500/50	15:01:01	-4	02:57	5.6	
28			1506	1507/50	15:08:01	-9	09:53	5.6	missed first arrival but it bumped on paper.
29			1513	1514/50	15:15:00	-1	16:59	5.5	
30			1520	1521/50	15:22:00	+1	24:01	5.5	

GMT DAY	GMT MO	GMT YR	GMT TIME	LINE #	SHIPS COURSE	SHIPS SPD	NAVIGATION FIX TIME	LATITUDE ± DEGREES	LATITUDE ± MINUTES	LONGITUDE ± DEGREES	LONGITUDE ± MINUTES	TYPE
24	06	85	1531	56.8	870	.155 .285	1070	32	34.74	76	35.03	
			38	03.3	310	.190 .312	1071		35.43		34.59	
			45	03.9	000	.165 .302	1073		36.14		34.11	
			52	—					36.83		33.64	
			59	00.5	20	.170 .312	1077		37.51		33.17	
			1606	—			1080		38.19		32.74	
			13	30.0	09	.168 .302	1081		38.95		32.26	
			20	—			1083		39.71		31.78	
			27	59.3	77	.173 .320	1096		40.44		31.28	
			34	01.0	82	.158 .291	1097		41.14		30.78	
			41	06.3	43	.162 .295	1104		41.83		30.28	
			48	1.3	05	.150 .278	[illegible]		42.52		29.77	
			55	11.9	78	.160 .293	[illegible]		43.21		29.26	
			1702	01.8	87	.168 .310	1130		43.90		28.75	
			09	02.8	70	.157 .287	1143		44.57		28.26	
			16	02.8	30	.158 .287	1157		45.23		27.70	
			23	03.9	90	.158 .292	1168		45.91		27.19	
			30	03.1	86	.170 .315	1177		46.61		26.69	
			37	03.4	53	.172 .318	1185		47.30		26.22	
			44	00.3	90	.163 .300	1189		48.01		25.76	
			51	07.5	80	.172 .320	1192		48.71		25.31	
			58	03.1	10	.163 .300	1196		49.42		24.86	
			1805	01.1	31	.170 .312	1202		50.10		24.36	
			12	01.9	32	.168 .305	1208		50.79		23.86	
			19	58.7	45	.170 .295	1215		51.47		23.36	
			26	04.0	18	.160 .290	1220		52.16		22.86	
			33	06.6	93	.155 .285	1225		52.85		22.35	
			40	10.2	10	.162 .298	1228		53.55		21.85	
			47	09.8	83	.163 .298	1231		54.25		21.35	
			54	06.2	82	.163 .300	1235		54.94		20.86	

COMMENTS AND OBSERVATIONS

TAPE #	START	END	2 min	10 sec	H_2O	2 min (+-)	MO	Spd kts	
31			1527	1528/50	15:29:01	-4	30:57	5.5	
32			1534	1535/50	15:36:01	+2	38:03	5.4	
33			1541	1542/50	15:43:00	+3	45:03	5.5	
34			1548	1549/50	15:50:00		NO EXPLOSION.	5.5	
35			1555	1556/50	15:57:00	0	59:00	5.5	
36			1602	1603/50	16:04:00	-4	05:56	5.7	NO PAPER DIGITIZE OK
37			1609	1610/50	16:11:25	+5	13:30	6.7	
38			1616	1617/50	16:18:00	-5	19:55	6.5	NO PAPER DIGITIZE OK.
39			1623	1624/50	16:25:00	0	16:27	6.0	
40			1630	1631/50	16:32:00	+1	34:01	5.9	
41			1637	1638/50	16:39:02	+4	41:06	6.0	
42			1644	1645/50	16:46:09	+7	48:16	6.1	
43			1651	1652/50	16:53:04	7	55:11	5.9	
44			1658	1659/50	17:00:03	-1	02:02	6.0	
45			1705	1706/50	17:07:02	+1	09:03	6.0	
46			1712	1713/50	17:14:05	-2	16:03	6.0	
47			1719	1720/50	17:21:02	+2	23:04	5.9	
48			1726	1727/50	17:28:02	+1	30:03	6.0	
49			1733	1734/50	17:35:01	+3	37:04	6.0	
50			1740	1741/50	17:42:02	-2	44:00	5.9	
51			1747	1748/50	17:49:02	+5	51:07	6.0	
52			1754	1755/50	17:56:01	+1	58:02	6.1	
53			1801	1802/50	18:03:01	+1	05:02	6.0	
54			1808	1809/50	18:10:02	0	12:02	5.9	
55			1815	1816/50	18:17:01	-2	18:59	6.1	
56			1822	1823/50	18:24:02	+1	26:03	6.0	
57			1829	1830/50	18:31:02	+4	33:06	6.0	
58			1836	1837/50	18:38:01	+8	40:09	6.0	
59			1843	1844/50	18:45:01	+8	47:09	6.0	
60			1850	1851/50	18:52:03	+5	54:08	6.1	

GMT DAY	MO	YR	TIME	LINE #	SHIPS COURSE	SPD	WATER DEPTH TIME	NAVIGATION LATITUDE ± DEGREES ±	MINUTES	LONGITUDE ± DEGREES ±	MINUTES	TYPE	AL.
24	06	85	1901	09.813		.172 .320	1235	32	55.62	76	20.41		
			0807	.388		.158 .289	1235		56.29		19.99		
			1506	.310		.163 .300	1237		56.96		19.53		
			2259	.515		.170 .312	1243		57.64		19.00		
			2908	.915		.168 .308	1251		58.34		18.43		
			3603	.260		.163 .303	1261		59.04		17.82		
			43				1273		59.73		17.22		
			5002	.419		.162 .300	1283	33	00.38		16.68		
			5703	.121		.172 .315	1312		01.05		16.14		
			2004				1326		01.70		15.57		
			1102	.735		.162 .300	1344		02.38		15.04		
			1807	.542		.162 .295	1380		03.09		14.50		
			25				1400		03.80		13.98		
			3201	.642		.158 .288	1374		04.52		13.49		
			3902	.626		.156 .290	1377		05.25		13.01		
			4602	.305		.162 .300	1387		05.99		12.49		
			5305	.886		.158 .292	1402		06.73		11.98		
			2100	00.884		.160 .292	1402		07.47		11.48		
			0704	.260		.165 .305	1420		08.20		10.97		
			1408	.390		.163 .302	1439		08.94		10.46		
			2105	.943		.163 .302	1455		09.69		09.95		
			2805	.703		.148 .272	1475		10.44		09.47		
			3506	.098		.158 .292	1490		11.18		09.00		
			4209	.808		.158 .292	1505		11.94		08.52		
			4914	.570		.165 .305	1530		12.69		08.00		
			5607	.750		.160 .292	1555		13.42		07.48		
			2203	07.352		.155 .287	1580		14.15		07.03		
			10						14.89		06.59		
			1706	.798		.030 .060			15.62		06.12		
			2409	.652		.163 .307	1640		16.39		05.66		

COMMENTS AND OBSERVATIONS

TAPE #	START	END	2 MIN	10 SEC	H_2O	DIFF ±	OFF	SPD (KTS)
61			1857	1858/50	18:59:00	+7	01:09	5.9
62			1904	1905/50	19:06:00	+7	08:07	6.0
63			1911	1912/50	19:13:00	+6	15:06	6.2
64			1918	1919/50	19:20:01	-1	22:00	6.5
65			1925	1926/50	19:27:00	+7	29:07	6.0
66			1932	1933/50	19:34:00	+2	36:02	6.8
67			1939	1940/50	19:41:00	-4	42:56	6.2 no paper
68			1946	1947/50	19:49:00	+2	50:02	6.2
69			1953	1954/50	19:55:00	+2	57:02	6.2
70			2000	2001/50	20:02:00	-4	03:56	6.2 no paper
71			2007	2008/50	20:09:01	+1	11:02	6.3
72			2014	2015/50	20:16:01	+5	18:06	6.3
73			2021	2022/50	20:23:00	+2	25:02	6.3
74			2028	2029/50	20:30:01	+1	32:02	6.2
75			2035	2036/50	20:37:00	+3	39:03	6.1
76			2042	2043/50	20:44:01	0	46:01	6.3
77			2049	2050/50	20:51:00	+5	53:05	6.2
78			2054	2055/50	20:58:00	+1	21:00:01	6.3
79			2103	2104/50	21:05:01	+6	21:07:07	6.3
80			2110	2111/50	21:12:01	+7	21:14:08	6.2
81			2117	2118/50	21:19:00	+5	21:21:05	6.3
82			2124	2125/50	21:26:00	+5	21:28:05	5.9
83			2131	2132/50	21:33:03	+2	35:05	5.9
84			2138	2139/50	21:40:02	+7	42:09	5.9
85			2145	2146/50	21:47:14	0	49:14	5.7
86			2152	2153/50	21:54:01	+6	56:07	5.5
87			2159	2200/50	22:01:05	+1	03:06	5.5
88			2206	2207/50	22:08:01	∞	dud	5.3
89			2213	2214/50	22:15:02	charge NO explosion	17:07	5.3
90			2220	2221/50	22:22:01		24:09	5.4

GMT DAY	MO	YR	TIME	LINE #	SHIPS COURSE	SPD	WATER DEPTH / FIX TIME	NAVIGATION LATITUDE ± DEGREES	± MINUTES	LONGITUDE ± DEGREES	± MINUTES	TYPE	AL.
24	06	85	31	12.	392	.162 .300	1663	33	17.06	76	05.16		
			38	07.	522	.168 .308	1683		17.79		04.66		
			45	14.	300	.035 .065	1702		18.54		04.14		
	2.		52	08.	270	.155 .288	1722		19.29		03.62		
			59	07.	678	.148 .282	1750		20.04		03.05		
		23	06	04.	185	.148 .260	1785		20.78		02.48		
			13	34.	868	.163 .305	1827		21.53		01.93		
			20	—			1867		22.26		01.44		
			27	05.	500	.152 .282	1908		23.02		00.86		
			34	06.	877	.162 .300	1957		23.78		00.31		
			41	06.	013	.150 .280	2013		24.56	75	59.74		
			48	10.	687	.170 .315	2065		25.34		59.15		
			55	—					26.13		58.56		
25	06	85	002	10.	673	.168 .309	2150		26.94		57.95		
			09						.		.		
			16						.		.		
			23						.		.		
			30						.		.		
			37						.		.		
			44						.		.		
			51						.		.		
			58						.		.		
25	06	85	81 05						.		.		
			12						.		.		
			19						.		.		
			26						.		.		
			33						.		.		
			40						.		.		
			47						.		.		
			54						.		.		

COMMENTS AND OBSERVATIONS

TAPE #	START	END	2 min	10 sec	AO	off		Spd Kts
91			2227	2228/50	22:29:00	+11	31:11	5.3
92			2234	2235/50	22:36:01	+6	38:07	5.3
93			2241	2242/50	22:43:01	∞	dud	5.5
94			2248	2249/50	22:50:01	+8	52:09	5.5
95			2255	2256/50	22:57:01	+6	59:07	5.2
96			2302	2303/50	23:04:02	+1	06:03	5.4
97			2309	2310/50	23:11:29	+5	13:34	5.3
98			2316	2317/50	23:18:01	+4	20:05	5.3 no paper digitizing
99			2323	2324/50	23:25:01	+4	27:05	5.3
100			2330	2331/50	23:32:02	+5	34:07	5.3
101			2337	2338/50	23:39:03	+3	41:06	5.4
102			2344	2345/50	23:46:01	+9	48:10	5.3
103			2351	2352/50	23:53:07		dud	5.3
104			2358	2359/50	00:00:02		02:10	5.3

FINISH LINE 1

GMT DAY	MO	YR	TIME	LINE #	SHIPS COURSE	SPD	~~WATER DEPTH~~ FIX TIME	NAVIGATION LATITUDE ± DEGREES ±	MINUTES	LONGITUDE ± DEGREES ±	MINUTES	TYPE
25	06	85	0901	09.	372	.158 .280	2587	32	51.04	75	59.07	
			0810	9.	952	.160 .290	2556		51.71	76	00.00	
			1507	4.	11	.170 .312	2503		52.33		00.94	
			2212	3.	18	.165 .300	2405		52.94		01.91	
			2912	0.	18	.168 .310	2325		53.56		02.96	
			3600	4.	10	.163 .298	2245		54.13		04.08	
			4302	9.	68	.158 .285	2180		54.70		05.17	
			5010	2.	62	.163 .300	2107		55.23		06.21	
			5659	1.	50	.158 .288	2043		55.80		07.23	
			1004 02	1.	47	.165 .305	1958		56.39		08.21	
			11				1880		56.99		09.17	
			1801	7.	98	.160 .288	1810		58.00		10.11	
			2502	2.	82	.162 .298	1748		58.22		11.04	
			3203	7.	70	.153 .278	1680		58.84		11.97	
			3910	2.	02	.160 .295	1600		59.43		12.95	
			4603	3.	20	.172 .313	1507	33	00.05		13.99	
			5304	8.	22	.165 .300	1410		00.66		15.00	
			1100 02	2.	10	.163 .295	1310		01.28		16.04	
			0701	5.	40	.172 .322	1202		01.90		17.08	
			1414	2.	06	.168 .302	1095		02.53		18.12	
			2105	3.	10	.165 .295	1002		03.17		19.20	
			2805	8.	92	.172 .312	930		03.81		20.28	
			35	1.	84	(60 from reflection)	880		04.49		21.35	
			4206	8.	72	.160 .290	837		05.17		22.41	
			4904	6.	15	.168 .305	804		05.85		23.46	
			56						06.54		24.52	
			1203 00	2.	31	.172 .315	750		07.22		25.56	
			1006	4.	08	.172 .310	728		07.87		26.63	
			1705	5.	25	.172 .312	707		08.50		27.72	
			2430	7.	67	.163 .297	686		09.13		28.76	

LINE 3 beautiful weather ✓ calm flat ✓

NAV TIME 6 SEC SLOW.

PAGE 5

COMMENTS AND OBSERVATIONS

TAPE #	START	END	2 min	10 sec	H_2O		off	Spd Kts
1			0857	0858/50	8:59:00	+9	9:01:09	10.1
2			0904	0905/50	9:06:01	+9	08:10	9.2
3			0911	0912/50	9:13:00	+7	15:07	9.6
4			0918	0919/50	9:20:00	+12	22:12	9.4
5			0925	0926/50	9:27:00	+11	29:11	10.3
6			0932	0933/45	9:33:55	+5	36:00	10.3
7			0939	0940/45	9:40:55	+7	43:02	10.5
8			0946	0947/45	9:48:03	+7	50:10	9.6
9			0953	0954/45	9:54:54	+4	56:58	9.7
10			1000	10001/45	10:01:54	+7	04:01	9.6
11			1007	1008/45	10:08:55	0	10:55	9.5 NO PAPER digiting
12			1014	1015/50	10:16:00	+1	18:01	9.6
13			1021	1022/50	10:22:59	+3	25:02	9.5
14			1028	1029/50	10:30:00	+3	32:03	9.6
15			1035	1036/50	10:37:00	+10	39:10	9.9
16			1042	1043/50	10:44:01	+11	46:12	10.3
17			1049	1050/50	10:51:01	+4	53:05	10.3
18			1056	1057/50	10:57:59	+2	11:00:01	10.3
19			1103	1104/50	11:04:59	+2	07:01	10.3
20			1110	1111/50	11:12:12	+2	14:14	10.2
21			1117	1118/50	11:19:00	+5	21:05	10.2
22			1124	1125/50	11:26:03	+2	28:05	10.1
23			1131	1132/50	11:32:58	+4	35:02	10.3 no paper
24			1138	1139/50	11:40:02	+4	42:06	10.2
25			1145	1146/50	11:47:01	+3	49:04	10.1
26			1152	1153/50	11:54:01		No Explosion	10.1
27			1159	1200/50	12:01:00	+1	03:01	10.3
28			1206	1207/50	12:08:00	0	10:00	10.2
29			1213	1214/50	12:15:02	+3	17:05	10.1
30			1220	1221/50	12:22:26	+4	24:30	10.1

GMT DAY	MO	YR	TIME	LINE #	SHIPS COURSE	SPD	WATER DEPTH FIX TIME (from PDR)	NAVIGATION LATITUDE ± DEGREES ±	MINUTES	LONGITUDE ± DEGREES ±	MINUTES	TYPE	AL.
25	06	85	1231	08.	630	.166 .302	672	33	09.77	76	29.76		
			38	08.	408	.160 .290	655		10.43		30.72		
			45	08.	394	.162 .293	637		11.09		31.66		
			52	06.	760	.158 .290	620		11.73		32.61		
			59	08.	289	.158 .286	605		12.35		33.56		
			1306	12.	303	.162 .292	587		12.96		34.50		
			13	12.	912	.163 .298	570		13.55		35.42		
			20	—			—		14.13		36.38		
			27	—			535		14.75		37.28		
			34	26.	942	.190 .345	518		15.36		38.19		
			41	04.	628	.163 .293	502		15.92		39.10		
			48	58.	020	.158 .288	485		16.35		40.10		
			55	—			—		16.81		41.09		
			1402	58.	808	.170	450		17.30		42.03		
			09	02.	484	.158	433		17.78		43.00		
			16	06.	774	.172	413		18.29		43.94		
			23	—			390		18.84		44.86		
			30	12.	584	.170	365		19.37		45.76		
			37	13.	635	.168	340		19.92		46.65		
			44	07.	430	.165	323		20.58		47.48		
			51	03.	430	.160	306		21.26		48.27		
			58	04.	393	.148	294		21.87		48.64		
			1505	06.	940		282		22.54		49.41		
			12	06.	184		273		23.24		50.66		
			19	—			—		23.88		51.48		
			26	09.	042		251		24.37		52.36		
			33						.		.		
			40						.		.		
			47						.		.		
			54						.		.		

NAV TIME 6 SEC. SLOW

COMMENTS AND OBSERVATIONS

TAPE #	START	END	2min	10sec	H_2O		off		Spd.
31			1227	1228/50	12:29:02	+6	31:08		10.1
32			1234	1235/50	12:36:01	+7	38:08		9.5 ←
33			1241	1242/50	12:43:02	+6	45:08		9.5
34			1248	1249/50	12:50:02	+6	52:08		9.5
35			1255	1256/50	12:57:02	+6	59:08		9.6
36			1302	1303/50	13:04:02	+10	06:12		9.6
37			1309	1310/50	13:11:02	+10	13:12		9.5
38			1316	1317/50	13:18:03		No Emission.		9.4
39			1323	1324/50	13:25:31	-13	27:18	NO PAPER NO DIGITIZE.	9.5
40			1330	1331/50	13:32:28	-1	32:27		9.5
41			1337	1338/45	13:38:59	+5	41:04		9.4
42			1344	1345/45	13:45:56	+2	47:58		9.7
43			1351	1352/45	13:52:55		MISFIRE - NO DROP.		
44			1358	1359/45	13:59:57	+1	01:58		9.7
45			1405	1406/45	14:06:58	+4	09:02		9.6
46			1412	1413/50	14:14:04	+2	14:06		9.8
47			1419	1420/50	14:21:04	+1	23:05	NO PAPER OR DIGITIZE.	9.7
48			1426	1427/50	14:28:05	+8	30:10		9.6
49			1433	1434/50	14:35:02	+12	37:14		9.6
50			1440	1441/50	14:42:04	+1	44:09		9.8
51			1447	1448/50	14:49:02		51:03		9.9
52			1454	1455/50	14:56:00		58:03		9.7
53			1501	1502/50	14:03:03		05:06		9.5 no digitize
54			1508	1509/50	14:10:04		12:05		9.5
55			1515	1516/50	NO GO				
56			1522	1523/50	14:24:04		26:08		9.5
			extra	ammo	15:29:12		31:56		
							38:31		
							42:38		

GMT DAY	MO	YR	TIME	LINE #	SHIPS COURSE	SPD	NAVIGATION FIX TIME	LATITUDE ± DEGREES	± MINUTES	LONGITUDE ± DEGREES	± MINUTES	TYPE	CAL.
25	06	85											
250685													
			1840Z										
			2032Z										
			2234										
			2235										
260685													
			0619					32	13.53	76	50.55		
			0621						.54		.52		
			0623					32	13.55	76	50.48		
			0638					32	13.70	76	50.18		
			0727					32	14.63	76	49.37		
			0917					32	23.25	76	43.24		
			0928					32	23.36	76	43.02		
			1500					32	51.54	75	57.54		
			1825					33	1.93	76	14.87		

TAPE #	START	END	COMMENTS AND OBSERVATIONS
			1543Z Picking up of OBS's from second leg starting
CH			33° 24.0667 76° 52.6447 413m
			33° 24.9850 76° 51.1139 OBS USGS picked up
			picking up Phred 33° 27.7554 76° 36.1446 on board
22			end disk
23	X		start disk.
			~~Transponds to USGS OBS - A8~~
			Release OBS - USGS A8 NO RESPONSE.
			TRY RELEASE AGAIN - NO RESPONSE.
			OBS FINALLY RESPONDS TO RELEASE - 1183 m DEPTH (FROM DENTRON DECK UNIT)
			SIGHT OBS - ~ 330° TRUE.
			HOOK OBS - ON BOARD AT 0749Z. 1.6 mi. @ 222° FROM RELEASE PT.
			SIGHT SCRIPPS OBS. - ~100 METERS OFF STARBOARD. 0.55 mi. @ 218° FROM RELEASE PT.
			OBS (KAREN) ON BOARD.
23		X	Disc end #23 at ≈1120Z
24	X		Disc #24 start at ≈ 1120Z
			Scripps OBS Lynn picked up (retrieved)
			A2 Picked Up. (1741Z 1388M released)

GMT DAY	MO	YR	TIME	LINE #	SHIPS COURSE	SPD	NAVIGATION FIX TIME	LATITUDE ± DEGREES	± MINUTES	LONGITUDE ± DEGREES	± MINUTES	TYPE	INIT.
26	06	85	2056						.		.		
27	06	85	0123						.		.		
			0124						.		.		
			0500					33	19.91	76	44.91		C
			0504					33	19.94	76	44.86		AC
									.		.		
			0637						.		.		
									.		.		
			0700					33	19.15	76	42.16		
									.		.		
			0733					33	19.80	76	45.04		
			0932						.		.		
			0954						.		.		
			1030						.		.		
			1450						.		.		
			1526						.		.		
									.		.		
			1518						.		.		
			1600						.		.		
									.		.		
									.		.		
									.		.		
									.		.		
									.		.		
28	06	85	0103						.		.		
			0107						.		.		
BACKLOG			0106						.		.		
			0128						.		.		
			0140						.		.		
			0141						.		.		
			0155						.		.		

TAPE #	START	END	COMMENTS AND OBSERVATIONS	PAGE 8
24			underway with CW source —	
24		x	end disk 24	
25	x		begin disk 25	
			33° 19.91 76° 44.91 C4 deployed - 375m.	
			A8 deployed. 375m.	
			RESET NAV TIME.	
			WINDOW OPENS ON OBJ - STILL 2.5 mi FROM OBJ SITE - VERY ROUGH SEAS. 10-15 KT WINDS.	
			CLOSEST APPROACH TO OBJ DROP SITE - 272 METERS AWAY.	
			LORAN OUT - STORM IN THE AREA - CONTINUE SAME HEADING.	
			LORAN BACK.	
			START TURN TO LINE 3-2	
25		x	end Disc #25 6/27/85	
26	x		start disc #26	
			turn WPt #2	
			airgun stopped to refuel compressors. weather calmed down - night seas.	
			airgun back on line —	
			Towing gun at 5-6 kts through the water - speed over bottom very variable because of currents —	
			COMPRESSOR ACTING UP - STOP SHOTS WHILE WORKING ON IT.	
			START TURN AT WAYPOINT 5 FOR LINE TO WP 4 - THIS WILL BE ROUGH!	
			STARTED SHOOTING AGAIN.	
			STOP SHOTS TO CHANGE FUEL FILTER ON COMPRESSOR.	
			FIRING SHOTS AGAIN.	
			SHOTS OFF AGAIN - MORE COMPRESSOR WORK.	
			SHOTS ON AGAIN.	

GMT DAY	MO	YR	TIME	LINE #	SHIPS COURSE	SPD	NAVIGATION FIX TIME	LATITUDE ± DEGREES ±	MINUTES	LONGITUDE ± DEGREES ±	MINUTES	TYPE	AL.
28	06	85	0342						.		.		
			0413						.		.		
			0417						.		.		
			0415						.		.		
			0550						.		.		
			0615						.		.		
			0751						.		.		
			0807						.		.		
			0912						.		.		
			0934						.		.		
			1110						.		.		
									.		.		
			1453	z					.		.		
									.		.		
			1537					32° 25.74		75° 58.15			
			1545						.		.		
									.		.		
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TAPE #	START	END	COMMENTS AND OBSERVATIONS	PAGE 9
26			START TURN AT WAYPOINT 4 TO WP 1.	
26		X		
27	X			
			redefine point 4 to 33° 12.11 76° 30.53	
			stop airgun.	
			airgun & streamer on deck.	
			release A8	
			A8 on board.	
			release C4	
			C4 on board.	
			giving up on A3 after a final try	
			2218m C6 released	
			A2 w/ co release.	
			C6 on board	
			Scripps Transducer Onboard!	
			Heading for Connecticut	