MARINE CREW SUPERVISORY REPORT

ON BEHALF OF

NAM HOLLAND BV

NORTH SEA DUTCH SECTOR

BLOCK FO3

TWO-VESSEL, QUAD-STREAMER, QUAD-SOURCE, FLIP-FLOP

GECO SIGMA (MASTER): GECO RHO (SLAVE)

9TH AUGUST TO 8TH SEPTEMBER 1989

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RP No. 89/0632

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SECTION 1: INTRODUCTION

1. INTRODUCTION

1.1 Objectives

The survey was designed to collect good quality 3D seismic data further to investigate and delineate areas of interest from earlier surveys. A 6 second record length was used to give good resolution around 3 or 4 seconds two-way time.

The programme consisted of 50 sail lines of identical length on an east/west heading. Each line was 26.935 km long, not including run-out.

This was a two-vessel, quad-streamer, quad-source operation. In this mode a single pass gathered data along 12 sub-surface lines.

Streamer positioning was via the use of compasses on each of the 4 streamers, acoustic networks for the head and tail of each cable and Pulse 8 positioning on all 4 of the tailbuoys.

Each vessel deployed a port and starboard source array which consisted of 3 sub-arrays firing on a flip-flop arrangement such that the master vessel (Geco Sigma) started with the starboard array followed by the same array on the slave (Geco Rho), then port master, port slave etc. With an 18.75 m shotpoint interval each array, therefore, fired every 75 metres.

Two chase boats were to be used to protect the streamers from shipping and to help monitor tailbuoy separation.

1.2 Conclusions

The survey started on 9th August 1989 upon mobilisation in Den Helder and was completed successfully on 8th September upon de-mobilisation in Den Helder.

Some delay was caused by a crew change on 23rd August and by a large amount of infill generated by mismatching of feathering due

to unpredictable tides or by untidy steering caused either by navigation instability or the said unpredictable tides.

There were lengthy delays caused by breakdowns or Pulse 8 and Hyperfix positioning hardware which either delayed the calibration of the navigation chains or halted production. The standard of onboard and shore back-up left much to be desired.

The failure of Contractor's equipment while on prospect accounted for 21.33% of the total survey time on Geco Sigma and 19.25% on Geco Rho.

Periods of inclement weather accounted for 10.25% of the total survey time on Geco Sigma and 12.50% on Geco Rho.

The standard of navigation data quality was marginal at times.

1.3 Parameters and Specifications

1.3.1 Energy Source

Source Type	: Airgun.
Volume	: 3162 cu.in.
No. of Sub-arrays	: 3.
Array Width	: 30 m with 15 m between sub-arrays.
Array Length	: 25 m.
Operating Pressure	: 2000 psi.
Source Depth	: 5.5 m $\pm$ 0.5 m.
Shot Interval	: 18.75 m. Each sub-array was fired every 75 m.
Pop Sequence (Geco Sigma positioned on the port side of Geco Rho)	: Geco Sigma starboard. Geco Rho starboard. Geco Sigma port. Geco Rho port.
Source Separation	: 50 m $\pm$ 5 m centre source to centre source.

1.3.2 Seismic Streamers

Depth of Streamer	: 7 m ± 1 m.
Length of Streamers	: 3200 m each.
Group Length	: 25 m.
No. of Channels	: 120 each cable.
No. of Waterbreaks	: At least 2 functional.
Near Source Offset	: Approximately 100 m.
Streamer Separation	: 100 m ± 10 m.
Vessel Separation	: 200 m ± 20 m.

1.3.3 Seismic Recording Parameters

Sample Rate	: 2 m/sec.
Record Length	: 6 seconds.
Low-cut Filter	: 3.5 Hz, 18 dB/octave.
Anti-alias Filter	: 180 Hz, 70 dB/octave.

1.3.4 Navigation

1.3.4.1 Radio Positioning

The primary navigation system in use was Hyperfix using stations Terschelling, H7, K7 and Borkum, both Frequency 1 and Frequency 2. Later K8 was also used.

The secondary navigation system was Syledis using Dan Survey's offshore chain stations Dan C, Gorm, B11/2 and, occasionally, Rolf.

1.3.4.2 In-sea Positioning

The Navtech acoustic system, plus 4 active tailbuoys, was used. Each vessel towed 2 floats, each fitted with a transceiver which relayed Pulse 8 positioning data to receivers on the vessel via UHF radio links. Each streamer was fitted with 13 Digicourse 396 compass birds for streamer shape evaluation.

1.3.5 3D Binning

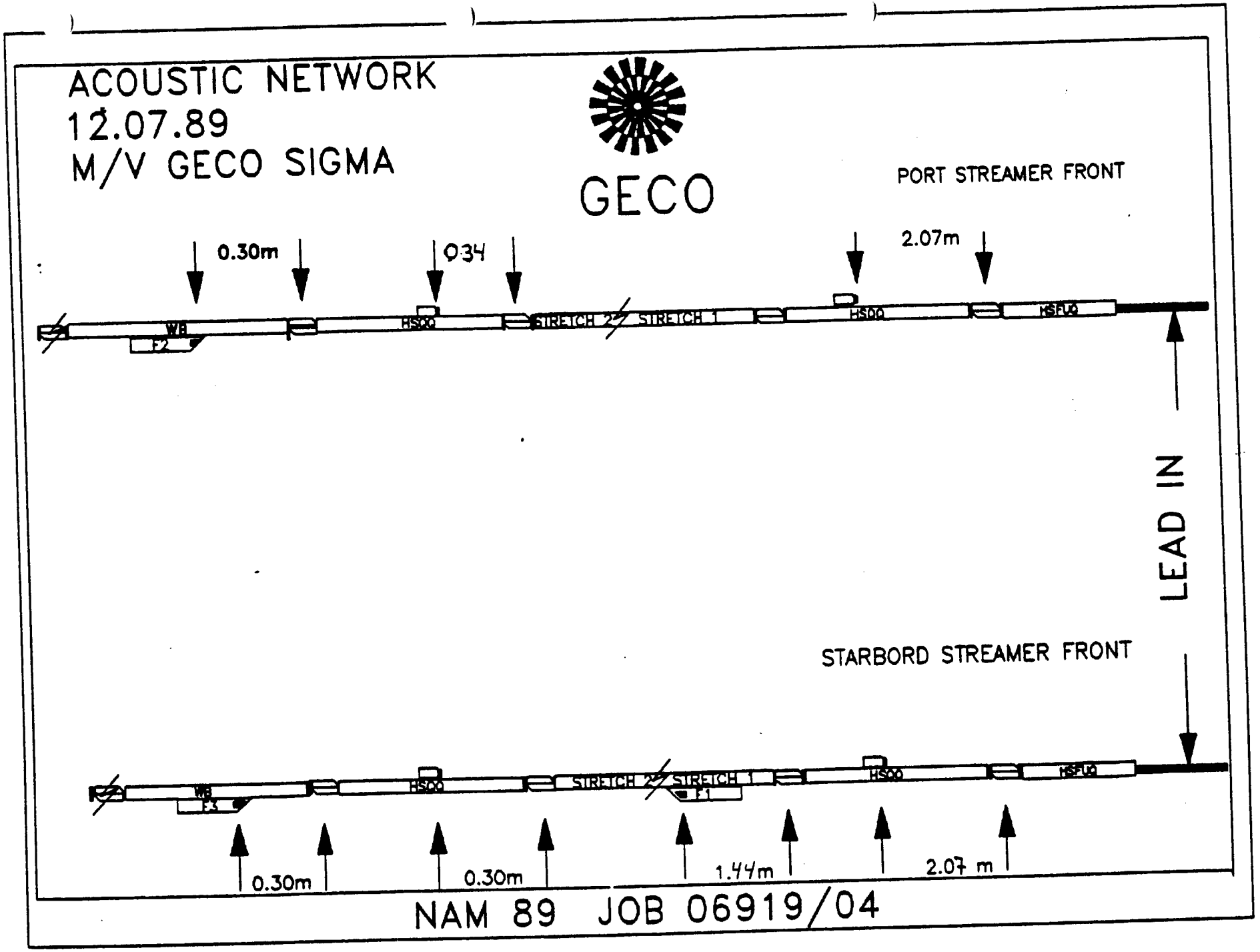
Bin Size	: 25 m in-line, 25 m cross-line.
No. of Offsets Monitored	: 120.
Nominal Fold	: 20.
Calculation of Trace Offset	: Radial distance between source and receiver.

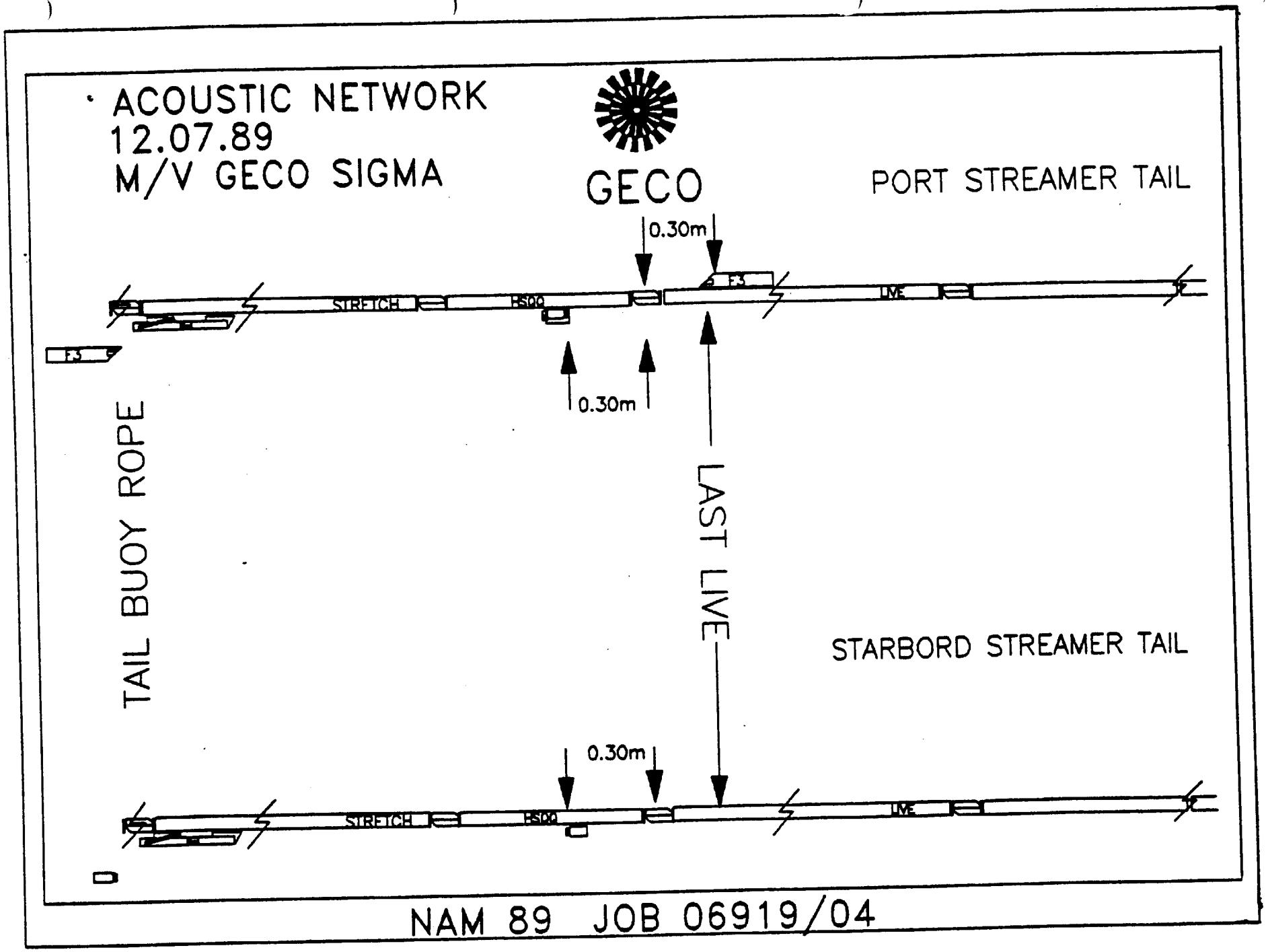
	%	Nom Fold	Min Fold
Bin Fill Specs = Near Quarter	60	5	3
= Near-Mid	60	5	3
= Mid-Far	60	5	3
= Far Quarter	60	5	3
Bin Fill Specs (min) Total	60	20	12

1.4 Offset Diagrams and System Diagrams

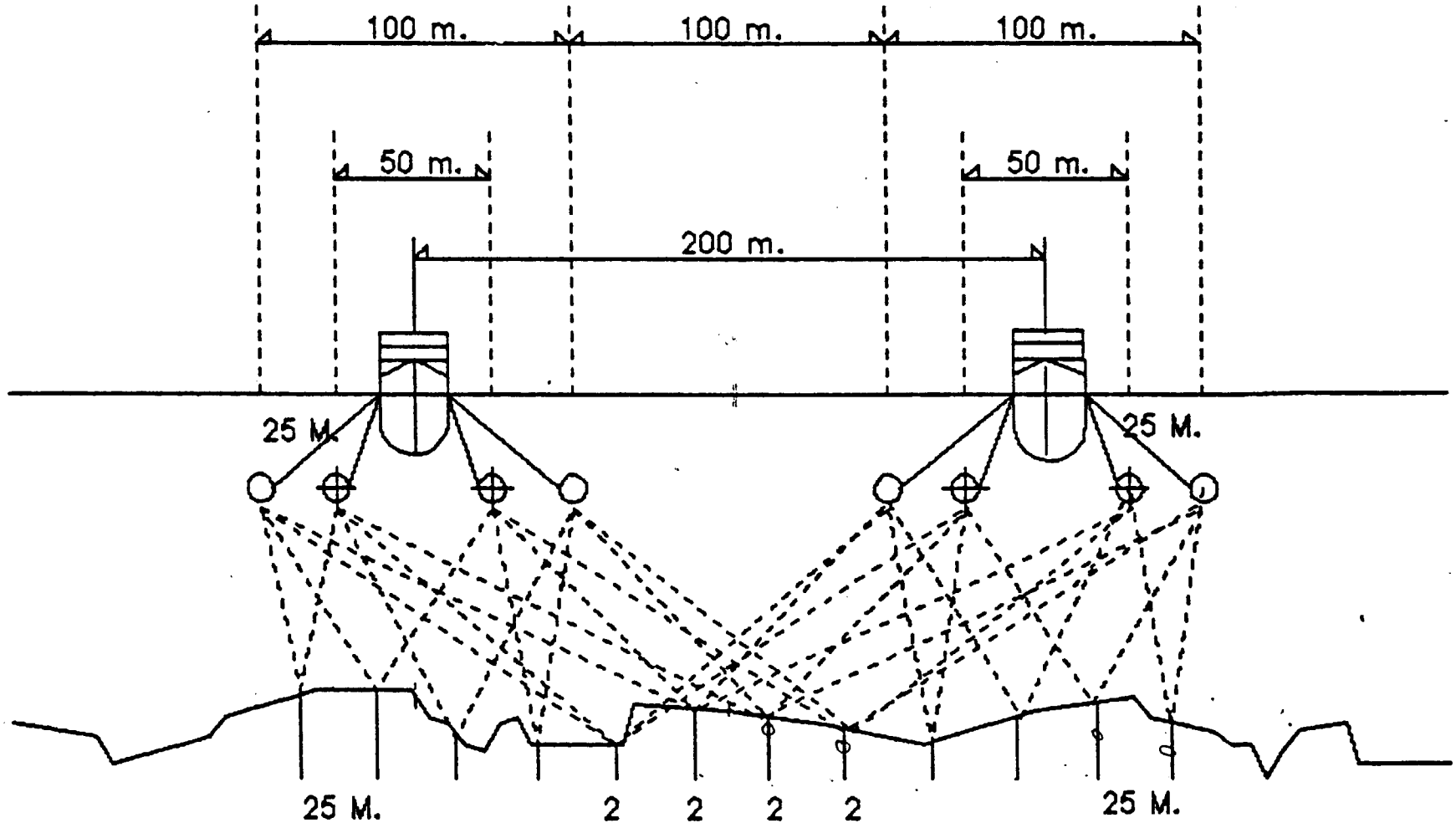
Please see the attached.

1.4.1 Geco Sigma

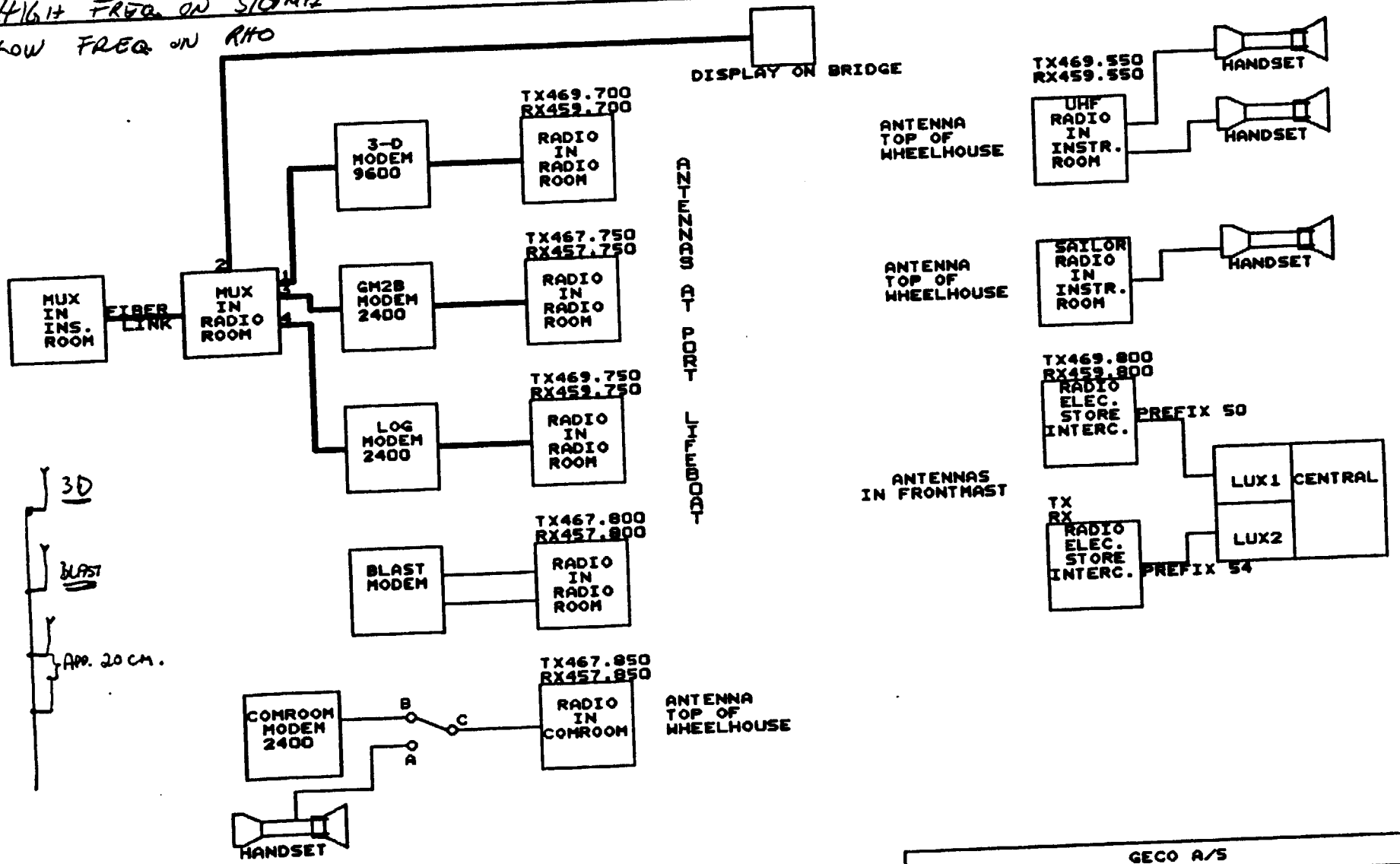

ACOUSTIC NETWORK
12.07.89
M/V GECO SIGMA
GECO
PORT STREAMER FRONT
0.30m
034
2.07m
WB
F2
HS00
STRETCH 2
STRETCH 1
HS00
HSFU0
LEAD IN
STARBORD STREAMER FRONT
WB
F3
HS00
STRETCH 2
STRETCH 1
F1
HS00
HSFU0
0.30m
0.30m
1.44m
2.07 m
NAM 89 JOB 06919/04


ACOUSTIC NETWORK
12.07.89
M/V GECO SIGMA
GECO
PORT STREAMER TAIL
0.30m
F3
STRETCH
HS00
LIVE
F3
0.30m
TAIL BUOY ROPE
LAST LIVE
STARBORD STREAMER TAIL
0.30m
STRETCH
HS00
LIVE
NAM 89 JOB 06919/04

DUAL VESSEL / QUAD SOURCE / QUAD STREAMER
M/V GECO SIGMA / M/V GECO KAPPA



HIGH FREQ ON SIGMA
LOW FREQ ON RHO



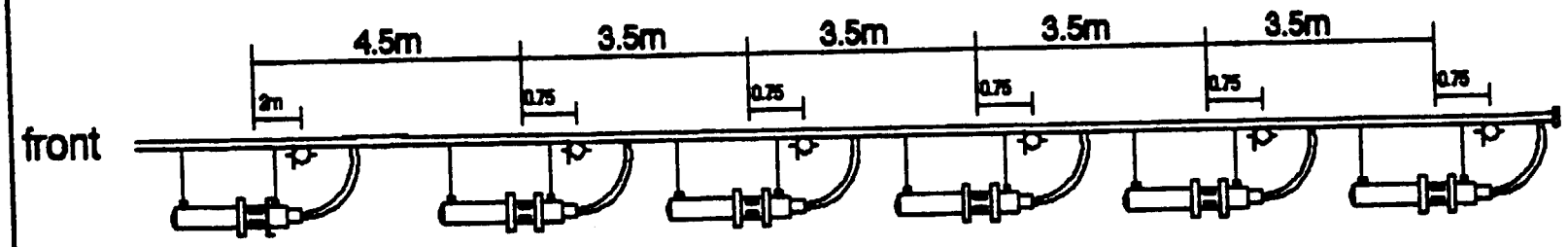
GECO A/S		
Title: RADIO'S AND MODEMS FOR NAM 89.SIGMA.		
Size: A	Document Number: 1	REV: 00
Date: April 13, 1989	Sheet 1 of 1	

gn3162

M/V GECO SIGMA
M/V GECO RHO

Source Configuration 3162 cu.in. Total Capacity

Stb 3	(500)	290	195	125	90	54	754
Stb 2	400	290	195	125	90	54	1154
Stb 1	500	290	195	125	90	54	1254



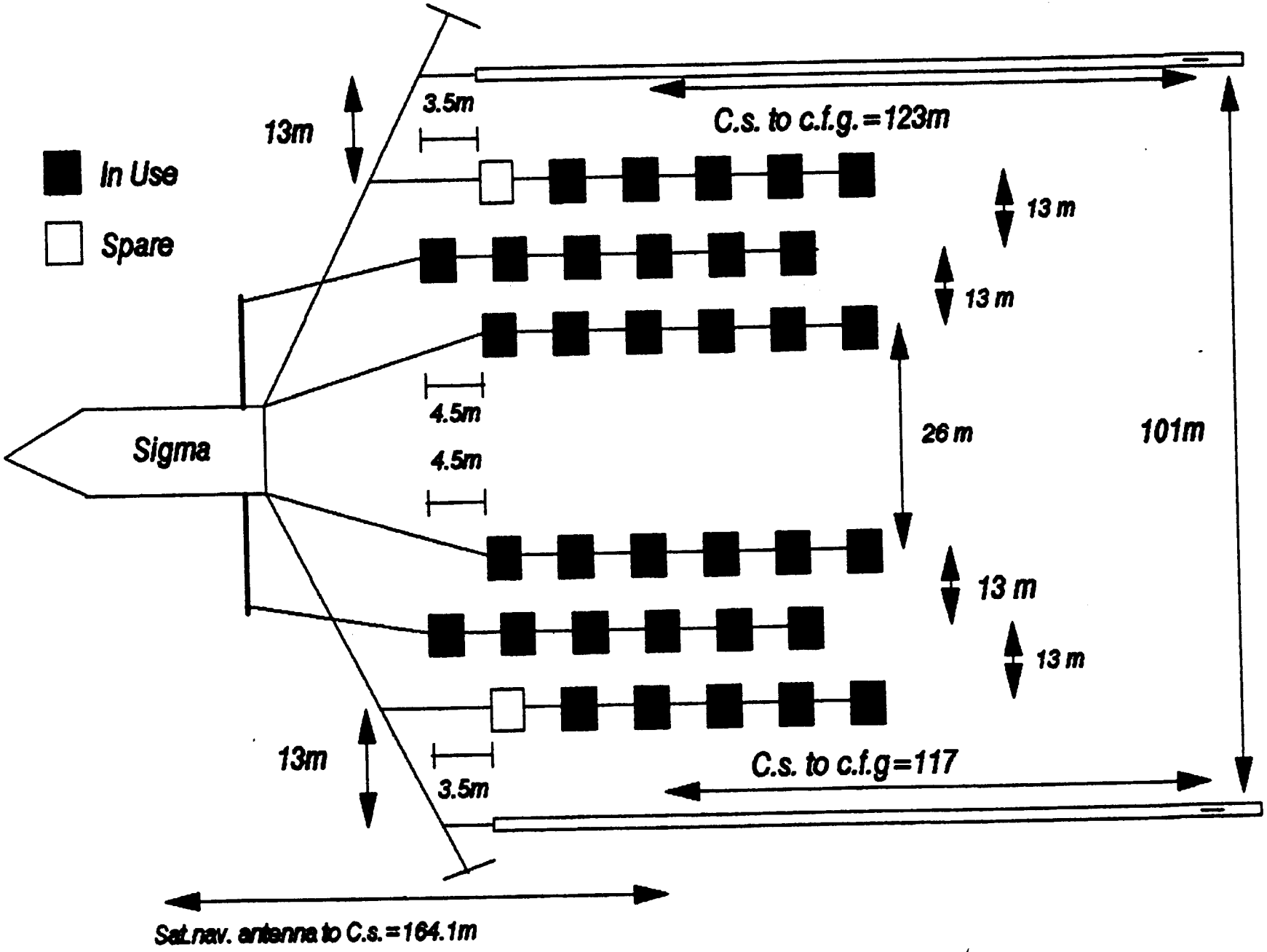
Port 1	500	290	195	125	90	54	1254
Port 2	400	290	195	125	90	54	1154
Port 3	(500)	290	195	125	90	54	754

-○- Near Field Hydrophone

AREA: F3

CLIENT : NEDERLANDSE(ARDOLIE MAATSCHAPPIJ b.v(

Towing Arrangement



M/V GECO SIGMA OFFSET CHECK START OF JOB:06917-05

DATE: 26-08-89 TIME: 12:15 After crew change.

speed..: 4.60 navtec streamer sep.: 103.00

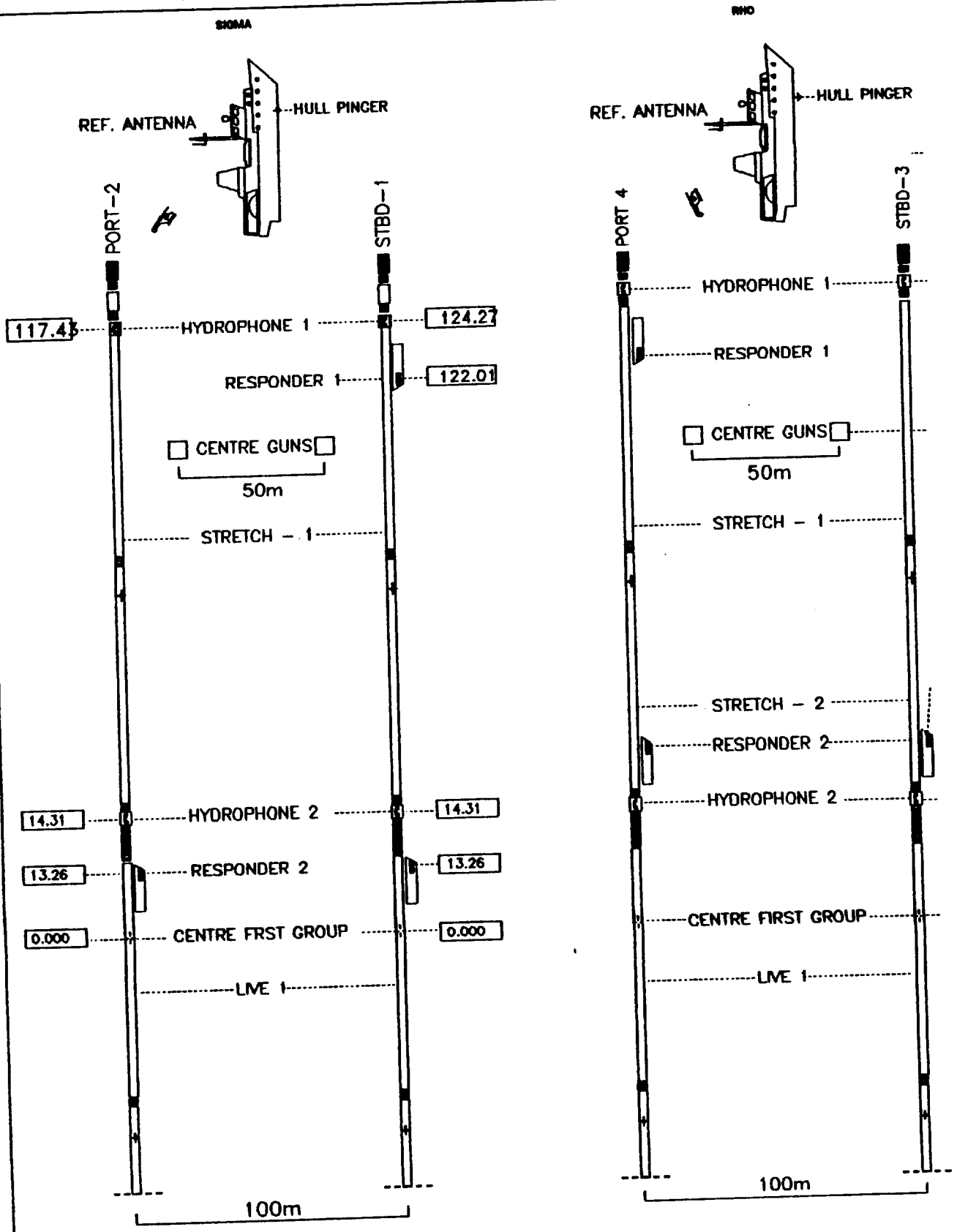
stb 3-1 112-wb1 stb	7.50ms	12.63m	stb streamer-stb 3
stb 2-1 103-112	7.50ms	12.46m	- stb 2 array
stb 1-1 100-103	7.70ms	12.78m	- stb 1 array
stb 1-1 100-200	16.00ms	25.92m	- port 1 array
port 1-1 200-203	7.00ms	11.66m	- port 2 array
port 2-1 203-212	6.55ms	10.94m	- port 3 array
port 3-1 212-wb1 port	7.25ms	12.24m	- to port streamer
summed streamer sep.....		98.63m	

stb 2-4(110) - stb wb2	73.15ms
stb 2-4(110) - port wb2	86.00ms
port 2-4(210) - stb wb2	84.50ms
port 2-4(210) - port wb2	70.10ms

stb 2-4 center source - stb wb 2.....:	109.64m
stb 2-4 center source - port wb2.....:	109.32m
port 2-4 center source - stb wb2.....:	105.24m
port 2-4 center source- port wb2.....:	101.14m
center source to stb center first group.....:	120.44m
center source to port center first group.....:	118.23m

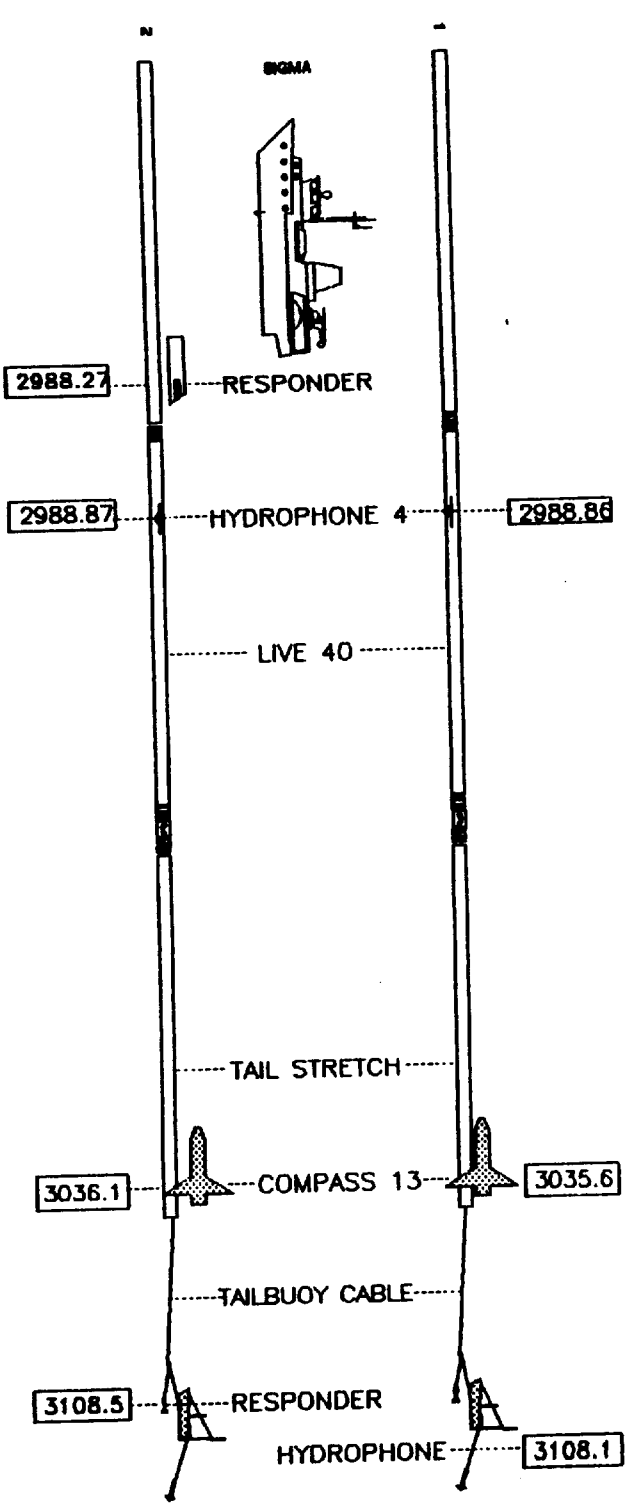
NAM 09 OFFSET DIAGRAM M/V GECO SIGMA RE. REFERENCE TO CENTRE FIRST GROUP

DATE 23/8/89

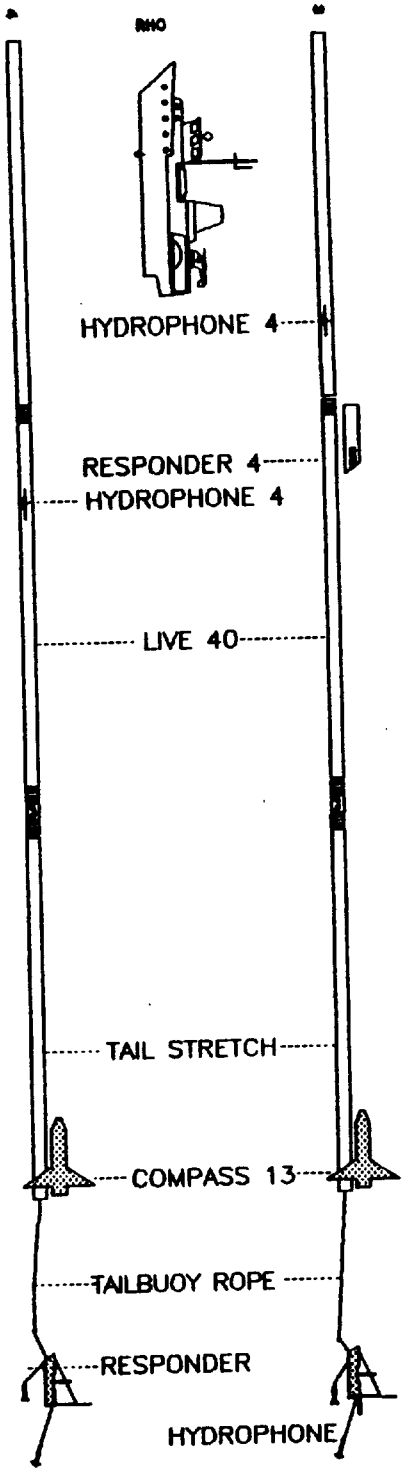


NAM 89 NAVTECH OFFSET DIAGRAM M/V GECO SIGMA REFRENCE TO CENTRE FIRST GROUP

DATE 24/9/99



QC REP. MS Lanham



NAV REP.....

CLIENT : NAM 89 * OFFSET CONFIGURATION * AREA :BLOCK F03
DATE :13.08.89 * * VESSEL : M/V GECO SIGMA
JOB# : 06919/05 * STARBORD STREAMER * S/E SEQ:

I D:	GUN / CABLE TO: SAT.ANT	OFFSET	CFG	NAVTECH TO: NAME	OFFSET	CFG	COMPASS TO: NAME	OFFSET	CFG
SATNAV ANT.		0.00							
STERN	30.10	30.10							
STERN TO CS	164.10	134.00							
CS TO CFG		123.80							
LEAD-IN		1.84	132.81						
WATERBRAKE		1.06	130.97						
HSQQ		3.05	129.91	S1H1	2.07	127.84			
STRETCH 1		53.75	126.86	S1R1	1.44	125.42			
STRETCH 2		58.50	73.11				BIRD-1	3.90	-68.51
HSQQ		1.05	14.61	S1H2	0.30	14.31			
WATERBRAKE		1.06	13.56	S1R2	0.30	13.26			
LIVE 1	287.90	75.00		CFG	12.50	0.00	BIRD-2	7.40	-4.40
LIVE 1	350.40								
WATERBRAKE	351.46	1.06	63.56						
LIVE 2	426.46	75.00	138.56						
LIVE 3	501.46	75.00	213.56				BIRD-3	2.47	216.73
LIVE 4	576.46	75.00	288.56						
LIVE 5	651.46	75.00	363.56						
LIVE 6	726.46	75.00	438.56						
LIVE 7	801.46	75.00	513.56				BIRD-4	2.48	516.74
LIVE 8	876.46	75.00	588.56						
LIVE 9	951.46	75.00	663.56						
LIVE 10	1026.46	75.00	738.56						
LIVE 11	1101.46	75.00	813.56				BIRD-5	2.48	816.74
LIVE 12	1176.46	75.00	888.56						
LIVE 13	1251.46	75.00	963.56						
LIVE 14	1326.46	75.00	1038.56						
LIVE 15	1401.46	75.00	1113.56						
LIVE 16	1476.46	75.00	1188.56				BIRD-6	7.30	1121.56
LIVE 17	1551.46	75.00	1263.56						
LIVE 18	1626.46	75.00	1338.56						
LIVE 19	1701.46	75.00	1413.56						
LIVE 20	1776.46	75.00	1488.56						
LIVE 21	1851.46	75.00	1563.56				BIRD-7	7.40	1496.66
LIVE 22	1926.46	75.00	1638.56						
LIVE 23	2001.46	75.00	1713.56						
LIVE 24	2076.46	75.00	1788.56						
LIVE 25	2151.46	75.00	1863.56						
LIVE 26	2226.46	75.00	1938.56				BIRD-8	2.37	1866.63
LIVE 27	2301.46	75.00	2013.56						
LIVE 28	2376.46	75.00	2088.56						
LIVE 29	2451.46	75.00	2163.56						
LIVE 30	2526.46	75.00	2238.56						
LIVE 31	2601.46	75.00	2313.56				BIRD-9	7.31	2246.57
LIVE 32	2676.46	75.00	2388.56						
LIVE 33	2751.46	75.00	2463.56						
LIVE 34	2826.46	75.00	2538.56						
LIVE 35	2901.46	75.00	2613.56						
LIVE 36	2976.46	75.00	2688.56				BIRD-10	7.30	2621.56
LIVE 37	3051.46	75.00	2763.56						
LIVE 38	3126.46	75.00	2838.56						
LIVE 39	3201.46	75.00	2913.56				BIRD-11	2.54	2841.80
LIVE 40	3276.46	75.00	2988.56						
HSQQ	3277.51	1.05	2989.61	S1H4	0.30	-2988.86			
STRETCH 3	3326.34	48.83	3038.44				BIRD-12	3.59	2993.90
STRETCH 3							BIRD-13	3.55	3035.59
HSQQ	3329.34	3.00	3041.44						
ROPE	3382.26	52.92	3094.36						
ROPE	3393.16	10.90	3105.26						
TAILBUOY	√3396.36	3.20	3108.46	F1H1	0.55	0.55			

**** GECO ****

CLIENT : NAM 89
DATE : 13.08.89
JOB# : 06919/05

* OFFSET CONFIGURATION *
PORT STREAMER

* AREA : BLOCK F09
* VESSEL : M/V GECO SIGMA
* S/E SEQ:

ITEM:	GUN / CABLE TO: SAT.ANT	OFFSET	CFG	NAVTECH TO: NAME	OFFSET	CFG	COMPASS TO: NAME	OFFSET	CFG
SATNAV ANT.		0.00							
STERN	30.10	30.10							
STERN TO CS	164.10	134.00							
CS TO CFG		118.20 ✓							
LEAD-IN		1.84	121.66						
WATERBRAKE		1.06	119.82						
HSQQ		3.05	118.76	S2H1	2.07	116.69			
STRETCH 1		49.90	115.71				BIRD-14	3.57	-61.54
STRETCH 2		51.20	65.81						
HSQQ		1.05	14.61	S2H2	0.34	14.27			
WATERBRAKE		1.06	13.56	S2R2	0.30	13.26			
LIVE 1	282.30	75.00		CFG	12.50	0.00	BIRD-15	2.55	-9.25
LIVE 1	344.80								
WATERBRAKE	345.87	1.07	63.57						
LIVE 2	420.87	75.00	138.57						
LIVE 3	495.87	75.00	213.57						
LIVE 4	570.87	75.00	288.57				BIRD-16	7.34	221.61
LIVE 5	645.87	75.00	363.57						
LIVE 6	720.87	75.00	438.57						
LIVE 7	795.87	75.00	513.57						
LIVE 8	870.87	75.00	588.57				BIRD-17	2.53	516.80
LIVE 9	945.87	75.00	663.57						
LIVE 10	1020.87	75.00	738.57						
LIVE 11	1095.87	75.00	813.57						
LIVE 12	1170.87	75.00	888.57				BIRD-18	7.30	821.57
LIVE 13	1245.87	75.00	963.57						
LIVE 14	1320.87	75.00	1038.57						
LIVE 15	1395.87	75.00	1113.57						
LIVE 16	1470.87	75.00	1188.57				BIRD-19	2.50	1116.77
LIVE 17	1545.87	75.00	1263.57						
LIVE 18	1620.87	75.00	1338.57						
LIVE 19	1695.87	75.00	1413.57						
LIVE 20	1770.87	75.00	1488.57						
LIVE 21	1845.87	75.00	1563.57				BIRD-20	7.30	1496.57
LIVE 22	1920.87	75.00	1638.57						
LIVE 23	1995.87	75.00	1713.57						
LIVE 24	2070.87	75.00	1788.57						
LIVE 25	2145.87	75.00	1863.57						
LIVE 26	2220.87	75.00	1938.57				BIRD-21	7.30	1871.57
LIVE 27	2295.87	75.00	2013.57						
LIVE 28	2370.87	75.00	2088.57						
LIVE 29	2445.87	75.00	2163.57						
LIVE 30	2520.87	75.00	2238.57						
LIVE 31	2595.87	75.00	2313.57				BIRD-22	7.40	2246.67
LIVE 32	2670.87	75.00	2388.57						
LIVE 33	2745.87	75.00	2463.57						
LIVE 34	2820.87	75.00	2538.57						
LIVE 35	2895.87	75.00	2613.57						
LIVE 36	2970.87	75.00	2688.57				BIRD-23	7.30	2621.57
LIVE 37	3045.87	75.00	2763.57						
LIVE 38	3120.87	75.00	2838.57						
LIVE 39	3195.87	75.00	2913.57				BIRD-24	2.48	2841.75
LIVE 40	3270.87	75.00	2988.57	S2R4	0.43-2988.14				
HSQQ	3271.92	1.05	2989.62	S2H4	0.30-2988.87				
STRETCH 3	3321.22	49.30	3038.92				BIRD-25	3.74	2994.06
STRETCH 3							BIRD-26	3.53	3036.09
HSQQ	3324.24	3.02	3041.94						
ROPE	3378.24	54.00	3095.94						
ROPE	3388.64	10.40	3106.34						
TAILBUOY	✓ 3391.84	3.20	3109.54	F2R1	0.48	0.48			

****** GECO ******

CLENT : N A M
DATE : 24.08.89
JOB NO: 06919/05

OFFSET CONFIGURATION

AREA : BL F-03
VESSEL: M/V GECO SIGMA

STARBOARD STREAMER

ITEM	GUN / CABLE: SAT.ANT	OFFSET	CFG	NAVTECH TO: NAME	OFFSET	CFG	COMPASS TO: NAME	OFFSET	CFG
SATNAV ANT		0.00							
STERN	30.10	30.10							
TO CS	164.10	134.00							
CS TO CFG		120.11							
LEAD-IN	T.P.	1.75	155.07						
WATERBRAKE		1.06	127.39						
HSQQ		3.02	126.33	S1H1	2.06	124.27			
STRETCH 1		49.73	123.31	S1R1	1.30	122.01			
STRETCH 2		58.97	73.58				BIRD-1	3.90	-68.98
HSQQ		1.05	14.61	S1H2	0.30	14.31			
WATERBRAKE		1.06	13.56	S1R2	0.30	13.26			
VE 1	284.21	75.00		CFG	12.50	0.00	BIRD-2	7.40	-4.40
LIVE 1	346.71								
WATERBRAKE	347.77	1.06	63.56						
LIVE 2	422.77	75.00	138.56						
LIVE 3	497.77	75.00	213.56						
LIVE 4	572.77	75.00	288.56				BIRD-3	2.47	216.73
LIVE 5	647.77	75.00	363.56						
LIVE 6	722.77	75.00	438.56						
LIVE 7	797.77	75.00	513.56						
LIVE 8	872.77	75.00	588.56				BIRD-4	2.48	516.74
LIVE 9	947.77	75.00	663.56						
LIVE 10	1022.77	75.00	738.56						
LIVE 11	1097.77	75.00	813.56						
LIVE 12	1172.77	75.00	888.56				BIRD-5	2.48	816.74
LIVE 13	1247.77	75.00	963.56						
LIVE 14	1322.77	75.00	1038.56						
LIVE 15	1397.77	75.00	1113.56						
LIVE 16	1472.77	75.00	1188.56				BIRD-6	7.30	1121.56
LIVE 17	1547.77	75.00	1263.56						
VE 18	1622.77	75.00	1338.56						
LIVE 19	1697.77	75.00	1413.56						
LIVE 20	1772.77	75.00	1488.56						
LIVE 21	1847.77	75.00	1563.56				BIRD-7	7.40	1496.66
LIVE 22	1922.77	75.00	1638.56						
LIVE 23	1997.77	75.00	1713.56						
LIVE 24	2072.77	75.00	1788.56						
LIVE 25	2147.77	75.00	1863.56						
LIVE 26	2222.77	75.00	1938.56				BIRD-8	2.37	1866.63
LIVE 27	2297.77	75.00	2013.56						
LIVE 28	2372.77	75.00	2088.56						
LIVE 29	2447.77	75.00	2163.56						
LIVE 30	2522.77	75.00	2238.56						
LIVE 31	2597.77	75.00	2313.56				BIRD-9	7.31	2246.57
LIVE 32	2672.77	75.00	2388.56						
	2747.77	75.00	2463.56						

LIVE 34	2822.77	75.00	2538.56					
LIVE 35	2897.77	75.00	2613.56					
LIVE 36	2972.77	75.00	2688.56				BIRD-10	7.30 2621.56
LIVE 37	3047.77	75.00	2763.56					
LIVE 38	3122.77	75.00	2838.56					
LIVE 39	3197.77	75.00	2913.56				BIRD-11	2.54 2841.80
LIVE 40	3272.77	75.00	2988.56					
HSQQ	3273.82	1.05	2989.61	S1H4	0.30	-2988.86		
STRETCH 3	3322.71	48.89	3038.50				BIRD-12	3.59 2993.90
STRETCH 3							BIRD-13	3.55 3035.65
HSQQ	3325.71	3.00	3041.50					
ROPE	3378.82	53.11	3094.61					
ROPE	3389.62	10.80	3105.41					
TAILBOUY	3392.82	3.20	3108.61	F1H1	0.55	0.55		

****** GECO ******

CLENT : N A M
DATE : 24.08.89
JOB NO: 06919/05

OFFSET CONFIGURATION

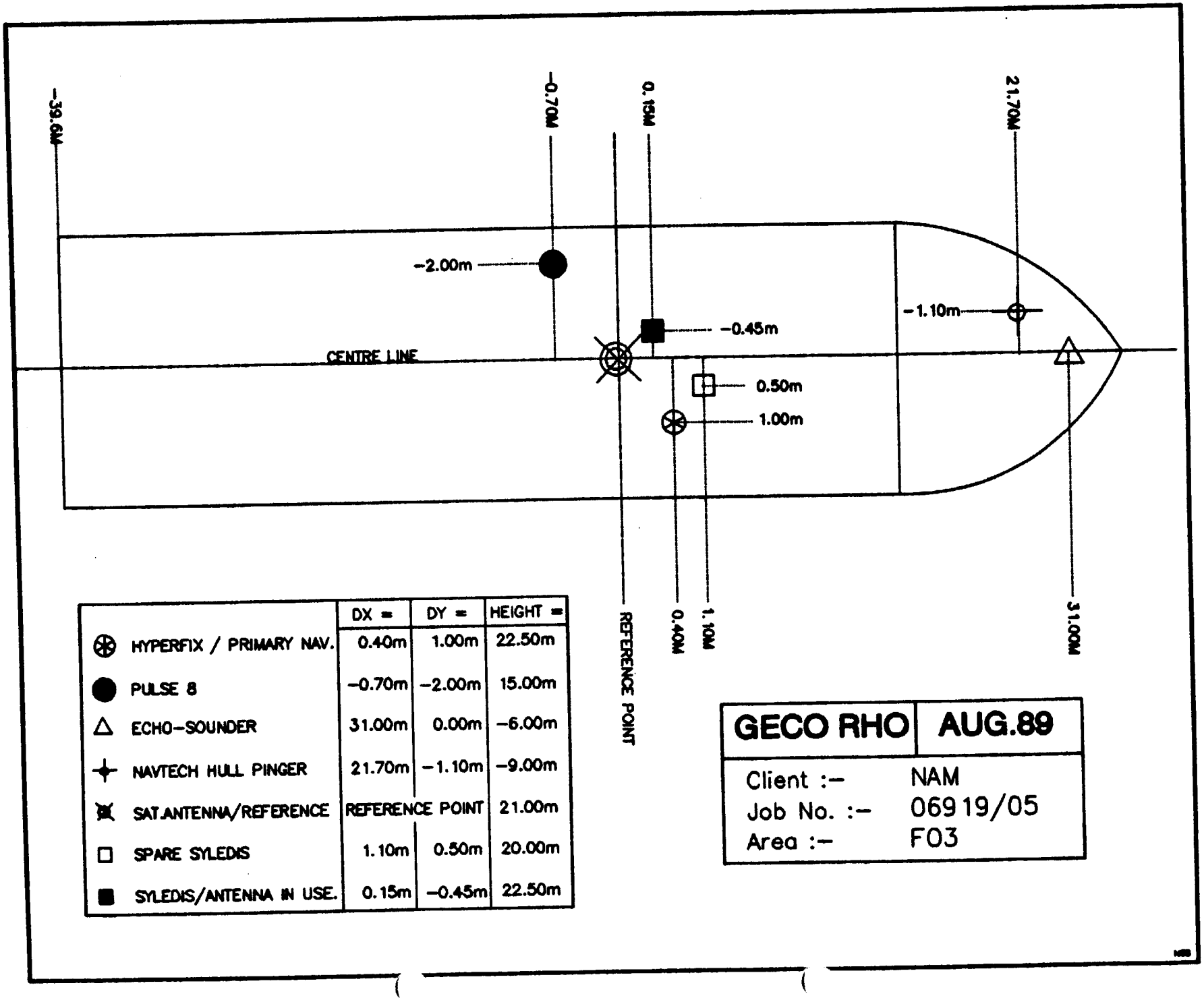
PORT STREAMER

AREA : BL F-03
VESSEL: M/V GECO SIGMA

ITEM	GUN / CABLE: SAT.ANT	OFFSET	CFG	NAVTECH TO: NAME	OFFSET	CFG	COMPASS TO: NAME	OFFSET	CFG
SATNAV ANT		0.00							
STERN	30.10	30.10							
TO CS	164.10	134.00							
CS TO CFG		118.90							
LEAD-IN	T.P.	1.84	160.60						
TERBRAKE		1.06	120.56						
HSQQ		3.05	119.50	S2H1	2.07	117.43			
STRETCH 1		50.74	116.45				BIRD-14	3.57	-61.44
STRETCH 2		51.10	65.71						
HSQQ		1.05	14.61	S2H2	0.30	14.31			
WATERBRAKE		1.06	13.56	S2R2	0.30	13.26			
LIVE 1	283.00	75.00		CFG	12.50	0.00	BIRD-15	2.55	-9.25
LIVE 1	345.50								
WATERBRAKE	346.57	1.07	63.57						
LIVE 2	421.57	75.00	138.57						
LIVE 3	496.57	75.00	213.57						
LIVE 4	571.57	75.00	288.57				BIRD-16	7.34	221.61
LIVE 5	646.57	75.00	363.57						
LIVE 6	721.57	75.00	438.57						
LIVE 7	796.57	75.00	513.57						
LIVE 8	871.57	75.00	588.57				BIRD-17	2.53	516.80
LIVE 9	946.57	75.00	663.57						
LIVE 10	1021.57	75.00	738.57						
LIVE 11	1096.57	75.00	813.57						
VE 12	1171.57	75.00	888.57				BIRD-18	7.30	821.57
IVE 13	1246.57	75.00	963.57						
VE 14	1321.57	75.00	1038.57						
LIVE 15	1396.57	75.00	1113.57						
LIVE 16	1471.57	75.00	1188.57				BIRD-19	2.50	1116.77
LIVE 17	1546.57	75.00	1263.57						
LIVE 18	1621.57	75.00	1338.57						
LIVE 19	1696.57	75.00	1413.57						
LIVE 20	1771.57	75.00	1488.57						
LIVE 21	1846.57	75.00	1563.57				BIRD-20	7.30	1496.57
LIVE 22	1921.57	75.00	1638.57						
LIVE 23	1996.57	75.00	1713.57						
LIVE 24	2071.57	75.00	1788.57						
LIVE 25	2146.57	75.00	1863.57						
LIVE 26	2221.57	75.00	1938.57				BIRD-21	7.30	1871.57
LIVE 27	2296.57	75.00	2013.57						
LIVE 28	2371.57	75.00	2088.57						
LIVE 29	2446.57	75.00	2163.57						
LIVE 30	2521.57	75.00	2238.57						
IVE 31	2596.57	75.00	2313.57				BIRD-22	7.40	2246.67
LIVE 32	2671.57	75.00	2388.57						
LIVE 33	2746.57	75.00	2463.57						
LIVE 34	2821.57	75.00	2538.57						
LIVE 35	2896.57	75.00	2613.57						
LIVE 36	2971.57	75.00	2688.57				BIRD-23	7.30	2621.57

LIVE 37	3046.57	75.00	2763.57					
LIVE 38	3121.57	75.00	2838.57				BIRD-24	2.48 2841.75
LIVE 39	3196.57	75.00	2913.57					
LIVE 40	3271.57	75.00	2988.57	S2R4	0.3	-2988.27		
HSQQ	3272.62	1.05	2989.62	S2H4	0.30	-2988.87		
STRETCH 3	3321.90	49.28	3038.90				BIRD-25	3.74 2994.06
STRETCH 3							BIRD-26	3.53 3036.07
HSQQ	3324.92	3.02	3041.92					
ROPE	3378.59	53.67	3095.59					
ROPE	3388.79	10.20	3105.79					
TAILBOUY	3391.99	3.20	3108.99	F2H1	0.48	0.48		

1.4.2 Geco Rho

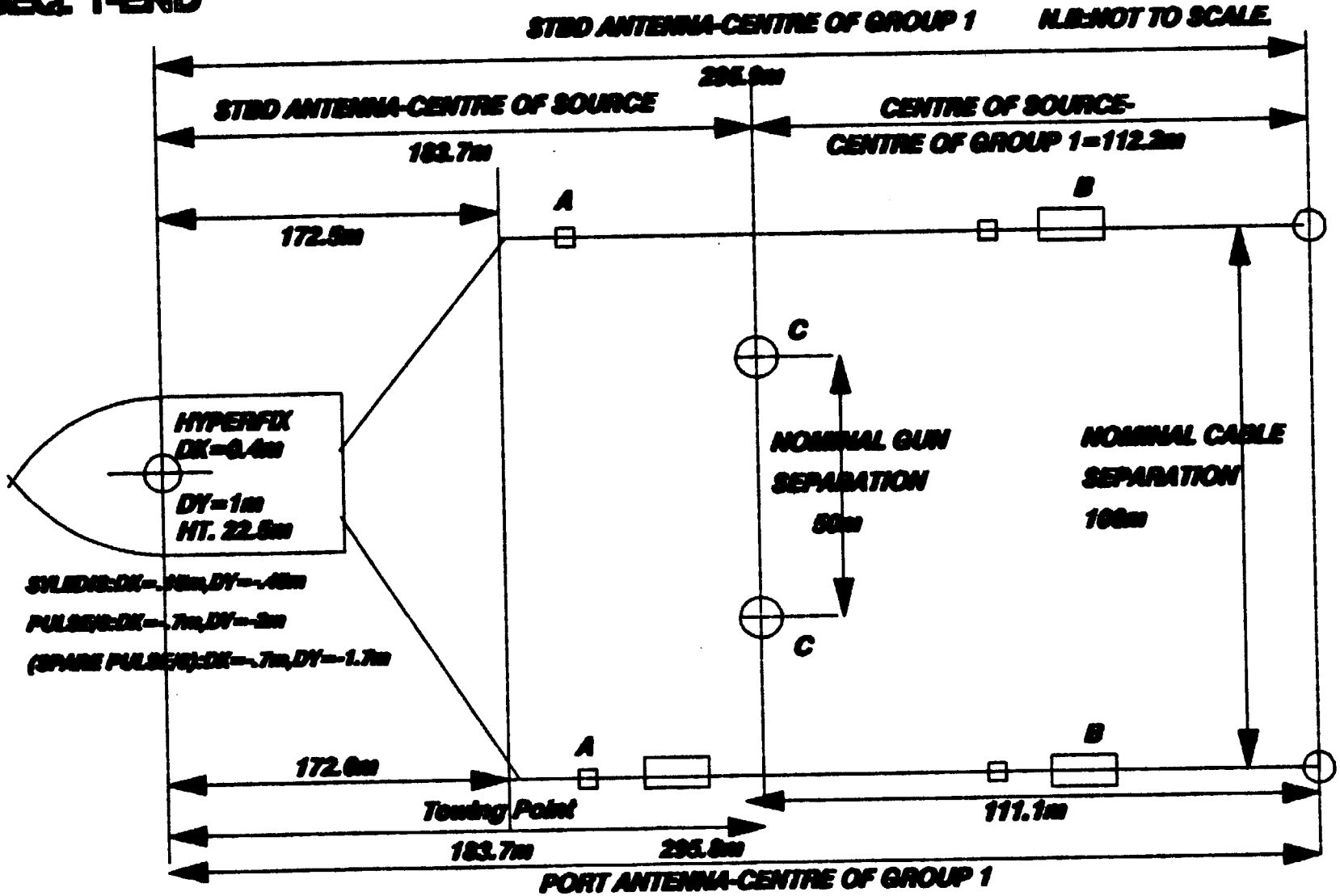


	DX =	DY =	HEIGHT =
HYPERFIX / PRIMARY NAV.	0.40m	1.00m	22.50m
PULSE 8	-0.70m	-2.00m	15.00m
ECHO-SOUNDER	31.00m	0.00m	-6.00m
NAVTECH HULL PINGER	21.70m	-1.10m	-9.00m
SAT.ANTENNA/REFERENCE	REFERENCE POINT		21.00m
SPARE SYLEDIS	1.10m	0.50m	20.00m
SYLEDIS/ANTENNA IN USE.	0.15m	-0.45m	22.50m

GECO RHO	AUG.89
Client :-	NAM
Job No. :-	06919/05
Area :-	F03

GECO RHO. CLIENT:NAM JOB NO:08819/05
SEQ: 1-END

OFFSET DIAGRAM #1
13 AUGUST 1999

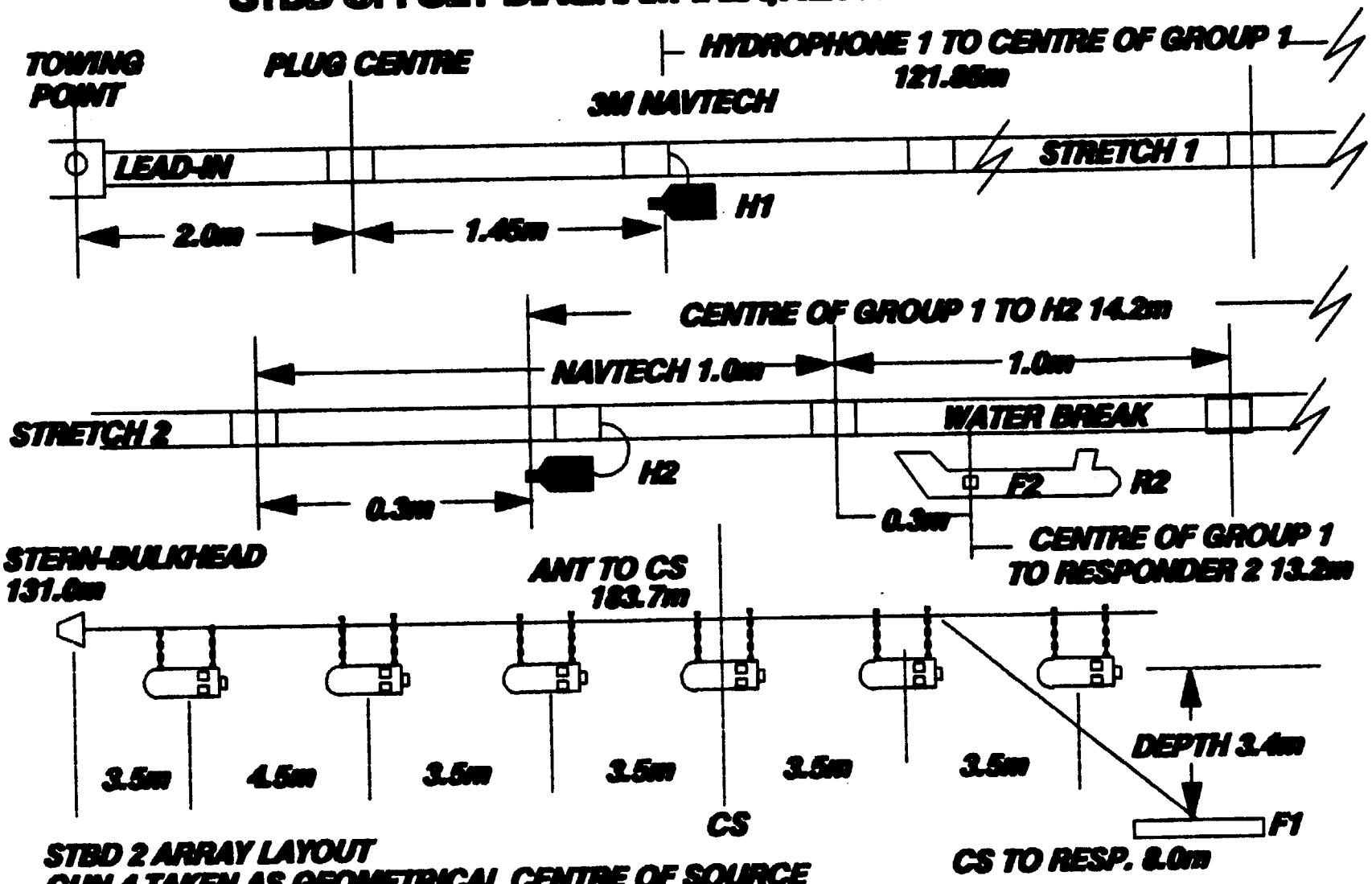


See diagram#2 for pos.hydrophones A,responders B & C.

CLIENT:NAM GECO RIO DATE 13/06/89

JOB NO:06819/05

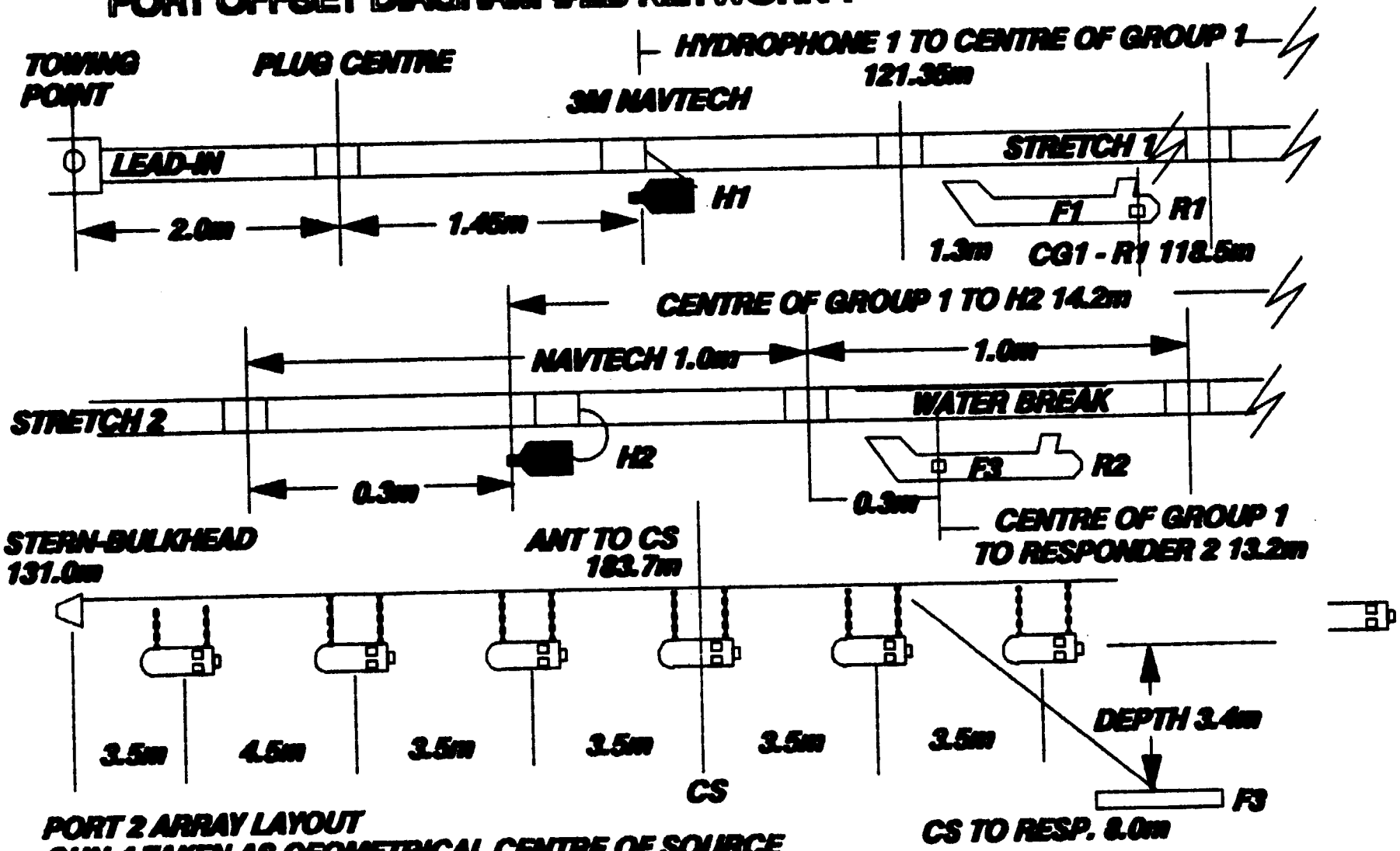
STBD OFFSET DIAGRAM #2A;NETWORK 1 SEQ: 1 - END



CLIENT :- NAM GECO RHO DATE 13/06/89

JOB NO:06819/05

PORT OFFSET DIAGRAM #2B NETWORK 1 SEQ: 1 - END



CLIENT :- NAM

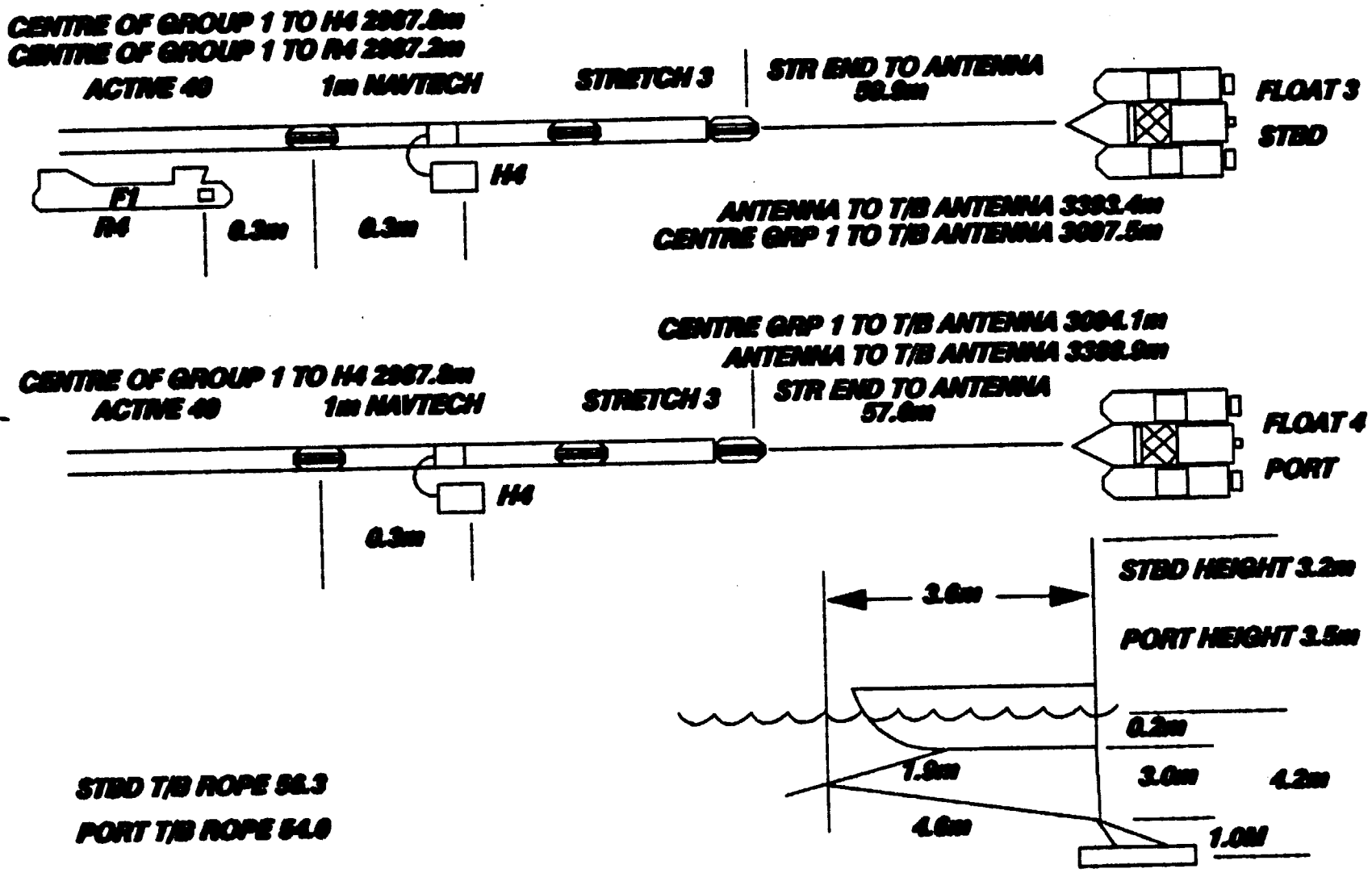
GECO RHO

DATE :13/06/89

JOB NO:06616/05

OFFSET DIAGRAM # 3

SEQ:1 - END

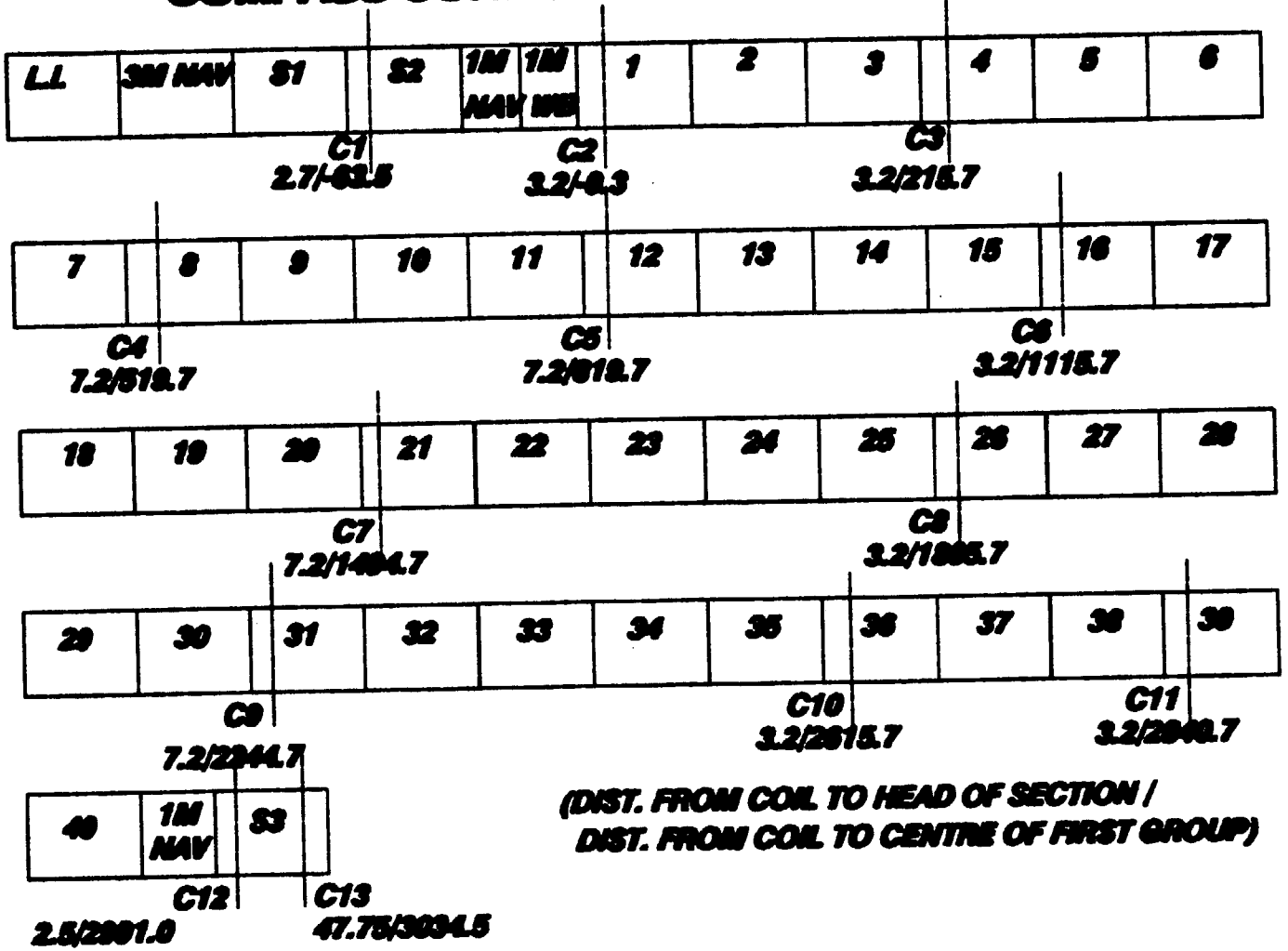


CLIENT : NAM
JOB NO:06616/05

GECO RIO
OFFSET DIAGRAM #4

DATE:13/06/89
SEQ: 1-END

COMPASS CONFIGURATION-STBD CABLE



(DIST. FROM COIL TO HEAD OF SECTION /
DIST. FROM COIL TO CENTRE OF FIRST GROUP)

CLIENT : NAM

JOB NO:06619/05

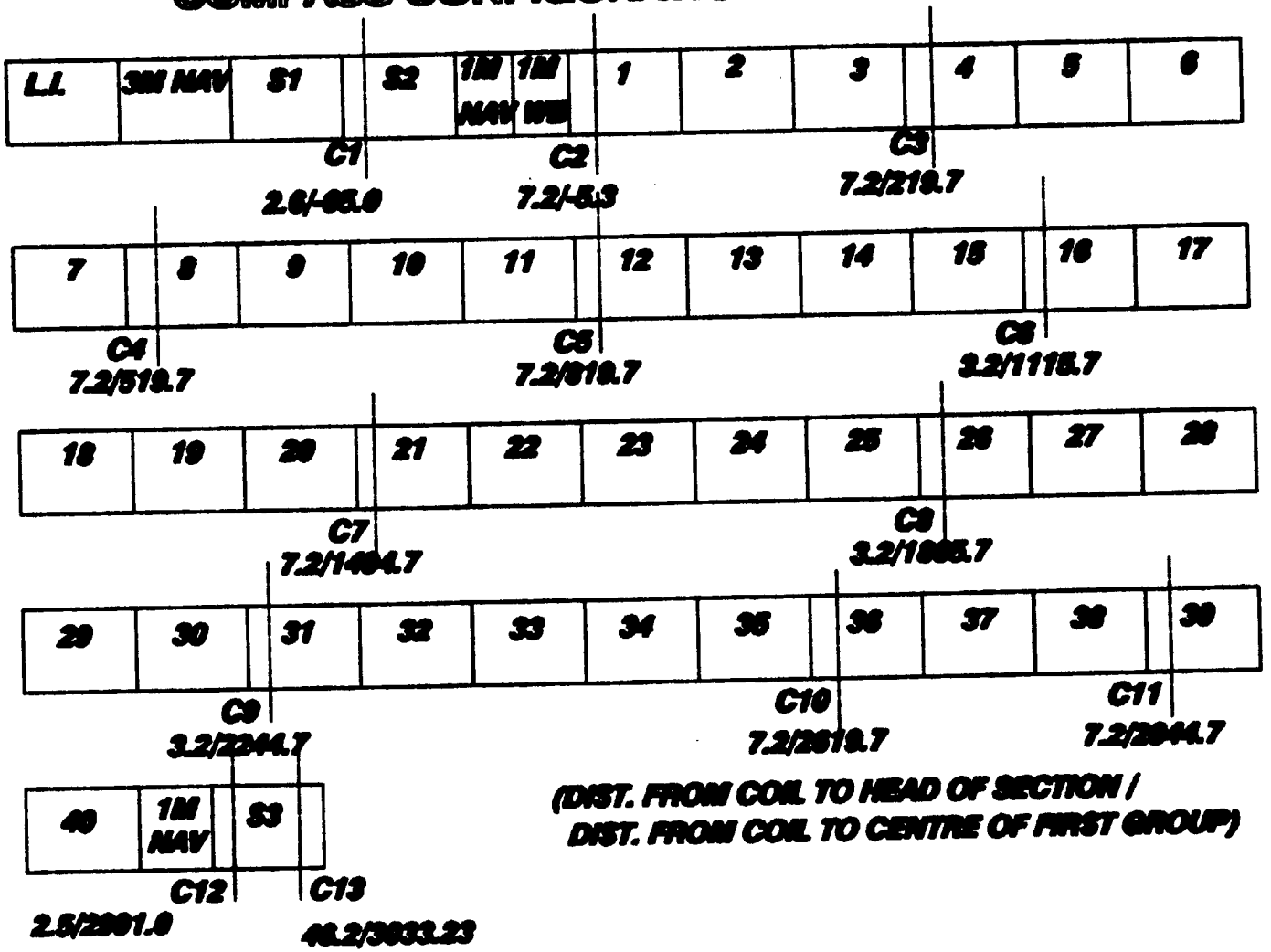
GECO RHO

OFFSET DIAGRAM #5

DATE : 13/06/96

SEQ: 1-END

COMPASS CONFIGURATION-PORT CABLE



↑ 041+

↓ 89-09-06 12:59 EIK NORWAY 04 ⊕
↑ 1332370 RHOX X
↓ GA+
↑ 004430846+

↓ 15.00
30846 NAM NL
↑ 1332370 RHOX X

FROM GECO RHO 06.09.89 TLX NO.575

TO   GECO UK
ATT : KIM FAIRWEATHER
CC : RICK DONOGHUE
CC : ROB NAYLOR

TO : NAM, ASSEN
ATT : C.CORSTEN / L.ZEIJLMAKER

PLEASE NOTE THE FOLLOWING OFFSET CHANGES WHICH ARE TO BE APPLIED TO DATA SHOT FOR NAM BY GECO RHO ON BLOCK K-7/K-8/K10/K11 DURING AUGUST 1989.

	STARBOARD CABLE	

SEQUENCE NO : 71-75	DOCUMENTED VALUE	= 118.5
	CORRECT VALUE	= 115.0
SEQUENCE NO : 76-95	DOCUMENTED VALUE	= 118.5
	CORRECT VALUE	= 115.0
	PORT CABLE	

SEQUENCE NO : 71-75	DOCUMENTED VALUE	= 115.6
	CORRECT VALUE	= 117.0
SEQUENCE NO : 76-95	DOCUMENTED VALUE	= 119.05
	CORRECT VALUE	= 117.0

REGARDS
PETER SHUTTLEWORTH

NNNN
⊕
↓ 30846 NAM NL
↑ 1332370 RHOX X
.....
↓ 89-09-06 13:03 176SEC

GECO RHO MARINE SURVEY INFORMATION

CLIENT: NAM
No: 6919-05

AREA: NETHERLANDS
PROSPECT: F-03

DATE: AUG/SEPT 1989
P/C: HOVLAND/SHUTTLEWORTH

SEISMIC INSTRUMENTS: DSS/DFS V
DSS Sensitivity: 20V/Bar
DFS 1: Stbd Ch 1 to 120, Aux 1 to 4
DFS 2: Port Ch 121 to 240
Record Length: 6 Sec
Sample Rate: 2mS
High Cut Filter: 180Hz/-72db
Low Cut Filter: 3.5Hz/18db

RECORDING SYSTEM: GDR 1000 Ver 3.2
Recording Format: 8015 GCR 6250BPI
Traces In/Out: 240/240 (No Summing)
Number Auxillaries: 4
Total Traces: 244
Auxillary 1: Timebreak
Auxillary 2: Stbd Waterbreak
Auxillary 3: Port Waterbreak
Auxillary 4: Not Used

GENERAL PARAMETERS
Shot Point Int: 18.75m Alternate
Shot Point Int: 75m/CDP Line
Fold Coverage: 20

NAVIGATION SYSTEM: NORSTAR
Primary Nav: Hyperfix / Cocktail
Secondry Nav: Syledis SB5
3D System: Omniseis
Acoustics: Navtech CLS/GLS

STREAMER TYPE: GECO HSSQ/GX600 x 2
Cable Seperation: 100m Nominal
Group Length: 25m
Hydrophones/Group: 40
Streamer Depth: 7m +/- 1m
Active Sections: 40 x 75m
Front Stretch: 2 x 50m
Tail Stretch: 50m
Acoustic Section: 2 x 1m, 1 x 3m
Waterbreak Section: 1m
Lead in Waterbreak: Not Recorded
Tailbuoy Rope: 50m

OFFSET TO CENTRE OF 1st GROUP

	PORT	STBD
Centre of Source:	-111.1m	-112.2m
Stern of Vessel:	-256.2m	-256.3m
Syledis Antenna:	-295.95m	-296.05m
Sat Nav Antenna:	-295.8m	-295.9m
Lead-In Waterbreak	-122.2m	-122.4m
Waterbreak 1:	-13.0m	-13.0m
Hull Pinger:	-322.1m	-323.2m
Navtech H1:	-121.4m	-121.9m
Navtech H2:	-14.2m	-14.2m
Navtech H4:	2987.8m	2987.8m
Navtech R1:	-118.5m	-
Navtech R2:	-13.2m	-13.2m
Navtech R4:	-	2987.2m
Compass 1:	-65.0m	-63.5m
Compass 2:	-5.3m	-9.3m
Compass 3:	219.7m	215.7m
Compass 4:	519.7m	519.7m
Compass 5:	819.7m	819.7m
Compass 6:	1115.7m	1115.7m
Compass 7:	1494.7m	1494.7m
Compass 8:	1865.7m	1865.7m
Compass 9:	2244.7m	2244.7m
Compass 10:	2619.7m	2615.7m
Compass 11:	2844.7m	2840.7m
Compass 12:	2991.0m	2991.0m
Compass 13:	3033.2m	3034.5m
Tail Antenna:	3094.1m	3097.5m

TWO BOAT INFORMATION
Streamer 1: Sigma Stbd
Streamer 2: Sigma Port
Streamer 3: Rho Stbd
Streamer 4: Rho Port
Source 1(A): Sigma Stbd
Source 2(B): Rho Stbd
Source 3(C): Sigma Port
Source 4(D): Rho Port
Firing Sequence: 1234(ABCD)

SOURCE TYPE: BOLT AIR GUN ARRAY
Volume: 3162 x 2
Operating Pressure: 2000 PSI
Depth: 5.5m +/- 0.5m
Array Width: 25m (Port & Stbd)
Array Length: 22m (Port & Stbd)
Separation (Cent Port-Stbd): 46m

Gun Volume (Cu.In.)				*Spare Gun	
S1G1	500	S2G1	400	S3G1	*500
S1G2	290	S2G2	290	S3G2	290
S1G3	195	S2G3	195	S3G3	195
S1G4	125	S2G4	125	S3G4	125
S1G5	90	S2G5	90	S3G5	90
S1G6	54	S2G6	54	S3G6	54

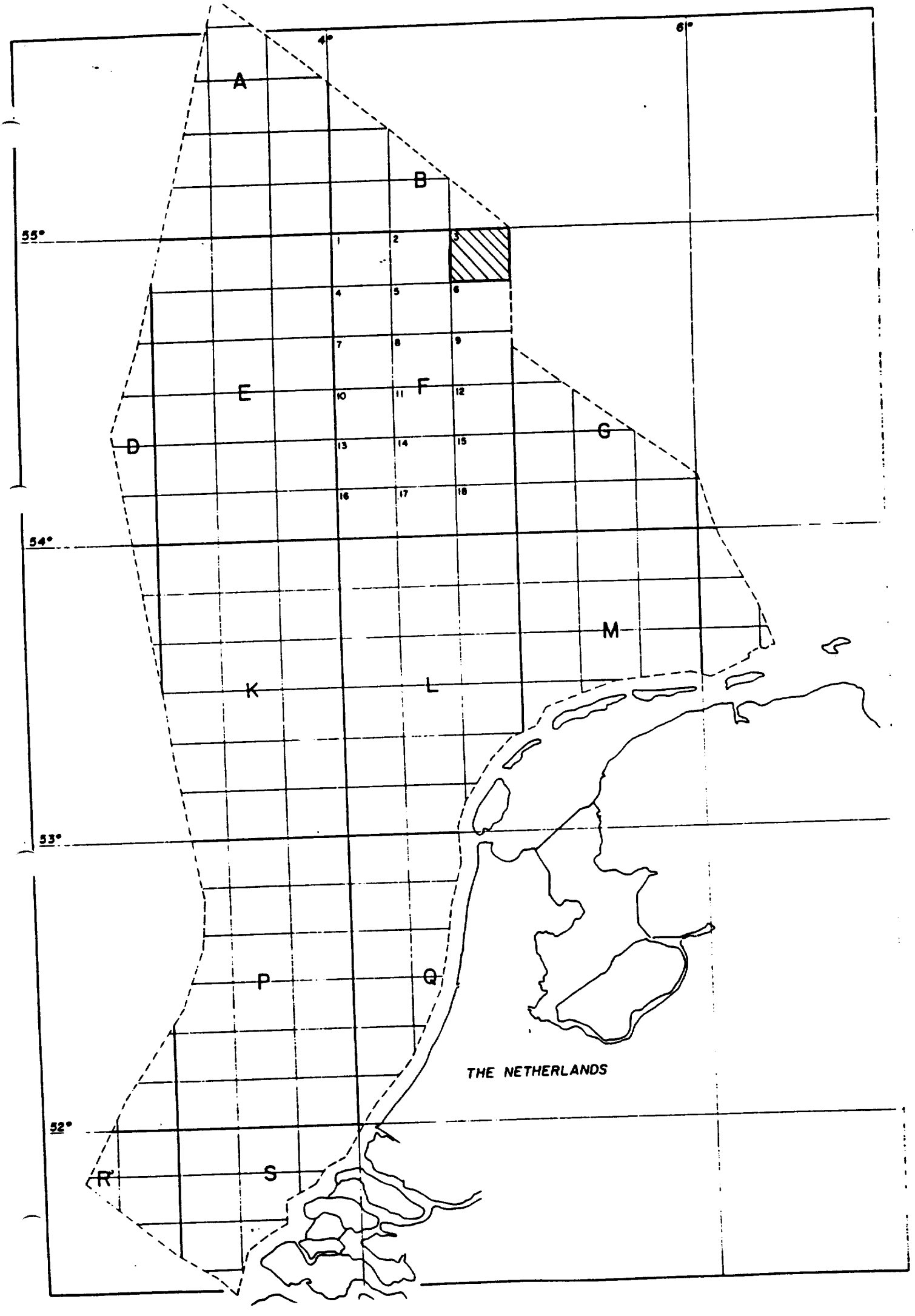
Port Arrays Identical to Starboard

ANCILLARY EQUIPMENT
Geco External Header: Vers 3.5
Near Trace Monitor: EPC 3202 Ch3/123
Echo Sounder: Honeywell Elac LAZ 72

COMPASS/BIRDS: DIGICOURSE 396-02
Integral Bird/Compass/Depth
No. Units: 13/Cable

COMPLETE PROSPECT. LINE SEQUENCES 01 TO 74.

1.5 Location Map


4°
6°
55°
54°
53°
52°
A
B
C
D
E
F
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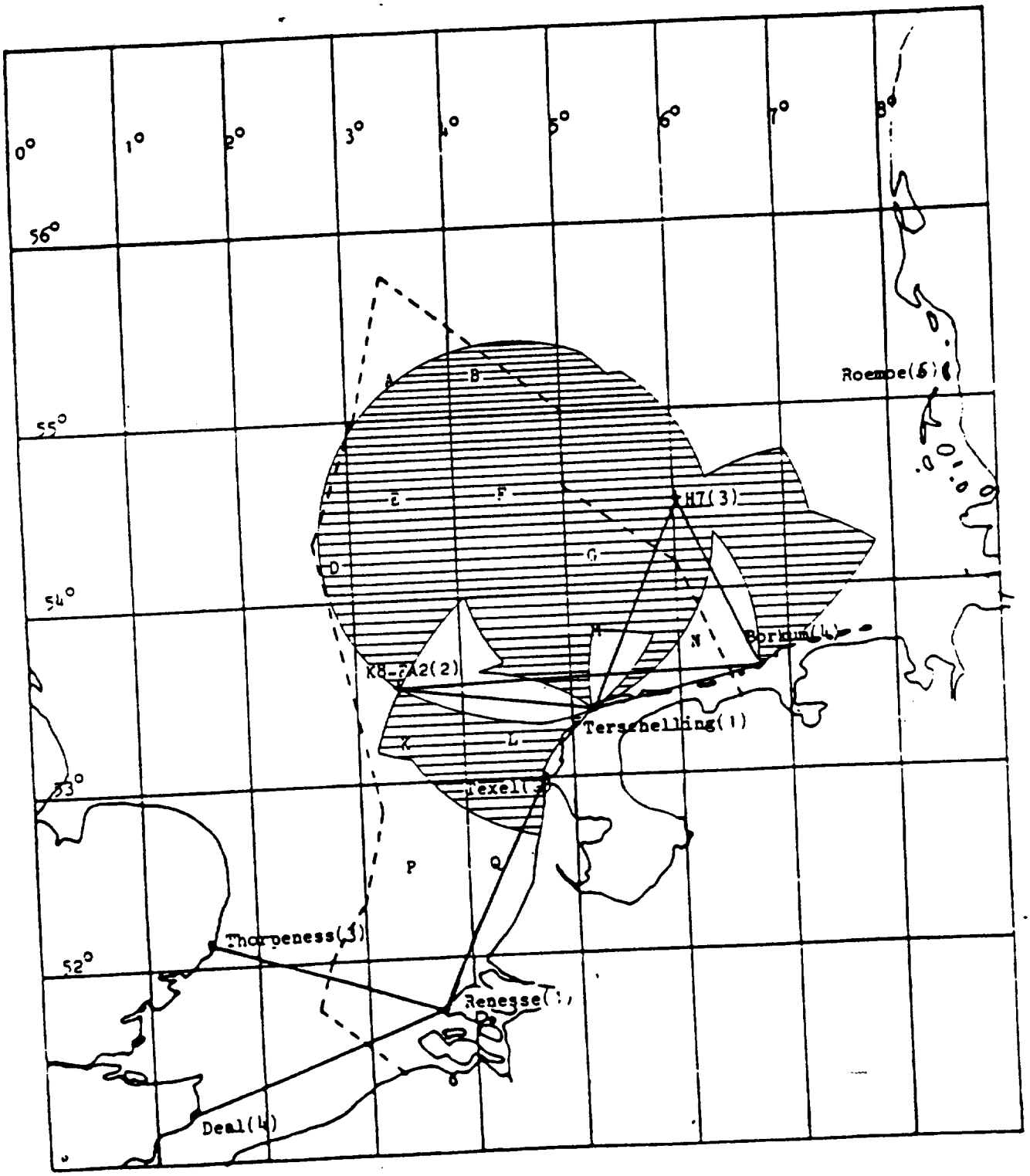
18
THE NETHERLANDS

Hyper-Fix CHAIN LAYOUT



NeSA

1.6 Survey Summary

The survey consisted of:

50 3D lines totalling 1346.750 km excluding run-outs.

Infill lines totalling	248.831 km (Geco Sigma)
	210.263 km (Geco Rho)

Final Production Totals

Planned 3D Sail Lines	1346.750 km
Actual Production Based on 3D Sail Lines	1346.750 km
Total Square Kilometre Coverage	404.025

The above figures do not include the run-outs. A 1.750 km (93 shots) run-out was used on all the prime lines and these are included in the following totals:

Production Based on 3D Sail Lines	1435.3124 km
Production Based on 3D Sub-lines (x 12)	17223.7500 km
Combined Accumulated Infill	459.094 km
Combined Vessel Infill as a Percentage of Total Combined Vessel Sail Line Production	15.993%

SECTION 2: DISCUSSIONS

2. DISCUSSIONS

2.1 Energy Source

The same energy source was used for this block as for all the previous work.

Each vessel towed 1 port and 1 starboard array, each of which consisted of 3 sub-arrays. The outside sub-array had 5 elements and the other 2 had 6 guns, giving a combined volume of 3162 cu.in. The nominal air pressure was 2000 psi.

A wide array tow of 50 metres from centre of starboard source to centre port source was used. A slight "V" formation was created by towing the centre sub-array 3.5 metres forward of the other 2 sub-arrays in that source.

The 4 sources were fired on a flip-flop basis starting, nominally, with the Geco Sigma's starboard array and then going to Geco Rho starboard, Geco Sigma port and Geco Rho port. One of these 3162 cu.in. arrays was fired every 18.75 m which meant that each separate array was fired every 75 m.

Prior to the start up of the block, and after the mid-block crew change, the geometry was measured, by means of cross-array shots, to confirm that there were no changes from the previous lines.

2.2 Streamer

Both vessels towed two 120 channel analogue streamers at a nominal depth of 7 metres. The group length and group separation were 25 m, giving an overall length of 3000 m.

The streamers on each vessel were towed in a wide spread with a separation of 100 metres between the 2 cables. The cross-line separation of the vessels was such that the inner streamers on each vessel were also positioned 100 m apart. The result was 4 streamers each separated from the next by 100 m.

Each streamer was positioned using 12 compasses and an active Pulse 8 tailbuoy. There were 13 compasses on the cables but only 12 were used at any time for onboard processing. Both the front and tail ends were located using acoustic networks. These consisted of Navtech hardware and transducers on each cable and tailbuoy. All 4 streamers were tied together using the acoustic networks at the head and tail of each streamer. The Geodetic Navigation Report gives more information on this system.

2.3 Navigation

Station co-ordinates and beacon delays can be seen in the Appendices of this report, Section 9.2. For complete navigation details please see the Geodetic Navigation QC Report for this block.

2.4 3D Binning

Both on-line and off-line binning, incorporating acoustics and compasses, were performed on board. Off-line processing was achieved using Geco's Omniseis system to produce plots of the coverage in each bin for each streamer segment.

To be able to achieve this, data was transferred between vessels every shot via modem and RF link. This data included all details which the partner vessel needed in order to produce its own full coverage plot for both vessels' coverage.

The streamer was divided into 4 equal segments for binning purposes. This division can be seen in Section 1.3.5 of this report. Radial binning was used with bin sizes of 25 x 25 metres and sail line separation of 300 metres.

With the 2 vessels recording 4 streamers with 4 sources on a flip-flop basis, 12 CDP lines (columns) were covered on each swath. Each vessel recorded its own 4 CDP lines plus 4 CDP lines between the vessels, which were duplicated.

2.5 Active Tailbuoys

One active tailbuoy was placed on the end of each streamer. It consisted of a metal float with a Pulse 8 transceiver and 2 banks of batteries continuously charged by 2 propeller-driven generators. The Pulse 8 signals were relayed back to the vessel via a UHF telemetry link and received on a normal Pulse 8 receiver. To complete the tail network an acoustic responder was towed below one tailbuoy and a hydrophone was towed below the second.

2.6 MicroMAX Onboard Processing System

A MicroMAX system had been installed on the Geco Rho and was used to process seismic data through to brute stack.

The system was operated and maintained by specialised Geco personnel, with the quality control decisions being made by the NAM onboard representative in consultation with the operator.

Its primary use on this prospect was to evaluate marginal lines affected by swell noise.

During these FO3 blocks the MicroMAX was also employed to analyse Geco DFS/DSS daily and monthly tests, confirm trace polarities, check spectral responses and to view raw shotplots on an automated basis when an intermittent problem with the data was suspected.

Considerable improvement in processed section quality was obtained when the velocity function was derived on board and compared with the "regional" velocity. In many cases the improvement was quite large. These velocity analyses, when used, have been documented and the comparisons included in the reports sent off to NAM.

SEG-Y tapes of MicroMAX processed sections for the FO3 blocks were evaluated by NAM in late August and declared satisfactory, apart from a minor problem with End of File Markers and a lack of documentation in the SEG-Y File Headers. However, the facility to transfer SEG-Y files by modem to NAM is still not available.

The Geco operators have all been competent and hard working, but Geco support for the MicroMAX system has been minimal. A major software upgrade was released over 6 months ago but still has not been made available, in spite of repeated requests by the NAM onboard representative. Crew change cross-over briefings between the operators have been short or non-existent.

Geco management seem to be unaware that the MicroMAX system, in many cases has been employed to QC (and accept) line segments where the problem was caused by Geco equipment or operational failures and which, otherwise, would have had to be re-shot at Geco's expense. The cost saving to Geco here was undoubtedly more than the cost of an entire MicroMAX system.

The author believes that onboard MicroMAX processing should be treated as a separate department on a par with seismic or navigation and with support to match.

Please see the Appendices, Section 9.6, for a log of MicroMAX activities during the current prospect area.

2.7 ECL Header Quality Control System

The ECL Header is a Toshiba PC-based hardware/software package designed to acquire seismic external header data, log it to disk and report on it.

1. Date Logging

Acquisition is via a simple 2-wire software-configurable RS-232 link. Any external header format can be accommodated, as the header definition is software-defined. Acquisition errors such as byte over-runs, or not enough data received, are reported on screen during logging.

Initially the data is recorded on to the hard disk drive and can be dumped later on to floppy or permanent back-up.

2. On-line Displays

Two fixed displays are currently implemented and can be toggled during logging.

One page shows local gun data, including error times, delay times, enabled volumes and gun status.

The second page shows cable depths and compass headings.

Both pages also display 16 operator-selectable data values, such as shotpoint and file number, inter-vessel timing clocks, manifold air pressure etc.

3. Line Re-runs

After the end of the line any portion of the data can be re-played with the same options as the on-line displays. This takes place at about three times shooting speed. Re-plays can be frozen, studied at leisure and then continued at any time.

4. File Conversion

After the end of the line, selected data can be converted and stored for graphic display.

5. Graphics Displays and Printouts

Up to 255 shots of any converted data can be graphed on to screen and dumped to printer for hard copy. Scaling of the graphs is automatic and is always set against shotpoint number as the horizontal scale.

6. File Export

Converted data can be further converted to Dbase III, de-limited ASCII, or non-de-limited ASCII formats for use by external packages such as Dbase III, Lotus 123, PrintGraph and FreeLance.

7. Usage and Results

As far as the author is aware the ECL Header is the only third-party header QC package available, although at least one oil company has developed an in-house system.

The first project for the package was this NAM two-boat, quad-streamer, quad-source prospect beginning in April 1989 and early code re-writes and operator unfamiliarity meant that it was not employed extensively until the beginning of July 1989.

From July about two lines per day were logged (50%). The internal graphics' package was used for hard copy when only short periods of data were suspect. However, the author plotted inter-vessel timing for each line logged, over the full line length, by converting the timing data into Lotus 123 format and using Printgraph. This involved about 30 minutes' work per line (please note that software revision will automate this in the next release).

Additional plots and statistical analyses were made on gun timings, cable depths, compass quality, air pressure, water depth, vessel heading and speeds. These took longer to generate.

One result of plotting inter-vessel timing over a whole line length is that the corrupted values due to gun mask transmission errors can be seen clearly. The quality of this GM2B telemetry link was poor on these blocks with errors running at 2% to 3%.

Investigations were also made into gyro differences, for calibrating system versus ship's gyro, looking at bottom speed versus water speed, cross-line speed and crab angles and for looking at navigation system jumps, shot-time intervals and numerous other nooks and crannies of seismic data acquisition.

8. Conclusions

The ECL Header QC system performs a uniquely useful function in that all data on the external header is logged accurately

and can be displayed on line, re-run off-line, re-processed, analysed, graphed and exported to external software packages.

The current version of the ECLH QC system is V2.2 and Exploration Consultants Limited are committed to software updates on a regular basis.

Development of the system is expected to be rapid over the next few months.

SECTION 3: QUALITY CONTROL

3. QUALITY CONTROL

3.1 Energy Source

Overall performance and reliability of the airguns was good on the Geco Rho but poor on the Geco Sigma.

It was possible for the arrays to get out of synchronisation and either for no arrays to fire or for 2 to fire together necessitating a re-set of the sequence from Geco Sigma. Generally this was caused by large fluctuations in inter-shot timing due to unstable navigation and generally it was accomplished by several lost records. The situation improved later in the prospect when lines were shot into the current such that ground speed was reduced and more tolerance of shotpoint interval fluctuations was available.

Once again the fact that all guns on each sub-array are fed from the same large airline proved costly to Geco with a whole sub-array having to be shut off for an airleak on an individual gun.

On several occasions portions of lines were edited out due to failure of only 1 gun on line.

It must be pointed out that the Geco Rho's guns seemed much more reliable than those on the Geco Sigma, probably due to the difference in the attitudes of the gun crews.

Towards the end of the survey Geco Sigma's guns gave a lot of problems. There was a large number of misfires, often on the same gun for more than one line and the crew seemed to be having problems with the wiring in the SWAG umbilicals.

Several lines on the survey were either started or finished with a reduced capacity gun array, although the specification was never exceeded on the lines accepted.

On two separate occasions, one on each vessel, short portions of lines were shot with more than the specified gun array volume due,

in both cases, to operator error. On the first occasion the section was processed using MicroMAX and no degradation of quality was visible and so the second occasion was also accepted.

The gun sensor outputs were monitored regularly on the Geco Rho but rarely on the Geco Sigma, which meant that on several occasions an individual gun was seen to drift out of tune on Geco Sigma. This probably accounts for the higher misfire rate on the Geco Sigma than on the Geco Rho.

The Observers on the Geco Sigma needed regular reminders about the need to switch off guns which were misfiring so that the misfire rate specification was not exceeded.

Any misfire statistics will be misleading as any gun that fired outside the specified window (1 ms on Geco Rho, 2 ms on Geco Sigma) was logged on the ECL Line Log as a misfire, although the Observer's Logs do not always agree with this. The Observers on the Geco Sigma were reluctant to log these timing errors at all but, eventually, they did.

A coded pattern called the "Gun Mask" which was a diagrammatic representation of each array was transmitted between vessels at every shot so that the computers producing the coverage plots knew which of the 4 arrays had fired on each shot.

All gun mask errors were logged but were not, in fact, real errors. The data was transmitted between vessels as a block of 36 bytes but only the first 8 contained the gun mask information. If all 36 bytes were not received then an error was detected but the gun mask data was usually good.

The gun dimensions were checked visually from the heli-deck on a regular basis and gun/streamer offset tests were carried out whenever streamer sections were changed.

Depth transducers on gun arrays would be a useful addition to the QC environment as would a method of measuring the sub-array separ-

ation as, on more than one occasion, the sub-arrays were noticed to be too close together, but the only check available was a visual one. In such instances the relevant shotpoints were discarded.

3.2 Streamer

Generally the streamers were reliable. There was an occasional problem, mostly due to the ingress of sea water.

There were dead traces on both vessels but never enough to affect the data. The birds operated well with no problems, despite some inclement weather.

On the Geco Sigma starboard trace 18 developed leakage towards the end of the survey but was acceptable in character apart from picking up the Navtech acoustics trigger pulse at 5.46 seconds into the record. This cross-feeding was caused by the leakage but it was accepted as it was well past the target area on the records. On 4th September the amplitude of this pulse was reduced and the problem disappeared.

At the start of the survey it was known that a low water speed would be used and so special attention was to be given to cable balance both then and during the survey itself. However, once lines were shot into the current this became less critical. Even so cable depth wandered at times, mostly during periods of inclement weather. Several portions of lines were edited out and subsequently re-shot due to the streamer depth being considerably out of specification.

Streamer balance was adjusted by MOB boat on several occasions whilst in production.

Ambient noise levels were low (less than 5 microbars) with only rare bursts of low level ship noise.

Both vessels had high/low frequency, front end streamer noise on occasion, especially on the port streamers. The level was up to

approximately 20 microbars. The exact cause of this was never really isolated but involved the wide tow arrangement.

Sea noise was a problem after the swell had built up to about 2 m. This happened quite frequently and marginal lines were either rejected or MicroMAXed for assessment. The light areas of the cables were the first to be affected but the bursts were never prolonged in any area on data that was accepted.

It must be said here that some lines with heavy swell noise were accepted after MicroMAX processing, although they would have been rejected according to traditional QC criteria.

Compass performance was good, if noisy in poor conditions.

It was felt that streamer recovery prior to the crew change was carried out too fast as problems occurred upon re-deployment which could have been caused by excessive tension on the streamers. This is a matter for Geco to rectify.

Both vessels had problems with their lead-ins and stretch sections due to the ingress of sea water and these were changed on occasion. One stretch section on the Geco Sigma almost snapped when all the stress members broke and only the skin was left to tow from.

3.3 Instruments

Daily and monthly DFS and DSS tests were conducted and no major problems appeared. A summary of the Geco Sigma's monthly tests can be seen in the Appendices, Section 9.1. Daily and monthly tests were sometimes processed by MicroMAX on the Geco Rho.

The Observer's Log was common to both vessels and was not liked by either crew. Individual logs would be much easier to produce and read but the common log is required and useful in many ways. Development on this is required to come up with a clear document that is easy to read and produce, but versatile enough to be tailored to NAM's requirements. Quite frequently it was necessary to wait

one whole line for the log from the line before due to problems with its production. The Observers on the Geco Sigma did not seem to understand the term "daily" instrument tests.

Due to fluctuations in ground speed it was common to have several NDRs on each line. Generally these were accompanied by the loss of gun sequence and also, on occasion, by missing or not updated external header data. This latter problem was caused by there being insufficient time to transfer blocks of data between the navigation and recording computers before the acquisition of seismic data started.

The problems with inter-vessel communications also resulted in corruption of the inter-vessel timing QC package when Pulse-clock errors were generated which corrupted end of line statistics for link and field timebreak delays.

The Pulse-clock program on the Geco Sigma failed several times towards the end of the survey. However, this should not affect data quality, but only the timing QC package.

3.4 Navigation

The navigation chains were poor with problems of instability with Hyperfix and long range drop-out on Syledis. Both chains suffered from reduced angles of cut, depending on which stations were available at any given time.

The Hyperfix caused problems at dawn and dusk and whenever the weather was particularly poor and frequently the primary fix was a cocktail of Hyperfix and Syledis ranges.

Hyperfix stations H7 and K7 continually gave larger residuals than were acceptable, the reason apparently being activity on each platform. Towards the end of the survey it was possible to log K8 Hyperfix but this could not be used in any fix until it was calibrated on 2nd September.

Generally lines which exceeded the navigation specifications for standard deviation etc. were accepted on the basis that there would be no real guarantee of any improvement if the line was re-shot.

A complete failure of the Hyperfix receiver on 28th August on the Geco Sigma resulted in the mobilisation of the spare which needed to be calibrated. However, the original receiver was fixed soon afterwards and the crisis was averted. At this point it was necessary to criticise the NESA engineer on the Geco Sigma who was not conversant with his equipment and caused several periods of unnecessary delay, both in this instance and on numerous other occasions. Eventually he was replaced on 2nd September.

A detailed account of the navigation procedures can be found in the Geodetic Report for this area.

3.4.1 Pre- and Post-Survey Calibration

Upon mobilisation in Den Helder and once the new navigation equipment had been installed, it was necessary to carry out a comprehensive series of equipment calibrations before production could start.

The primary navigation system was to be Hyperfix and this was to be calibrated against Syledis. Unfortunately good Syledis coverage was not available in the prospect area and the calibration had to take place north of the prospect in an area of good Syledis coverage.

First of all the integrity of the Syledis itself had to be checked by means of baseline crossings. Baselines were crossed but the results were poor and, eventually, it was revealed by Dan Surveys that the antennae coverage was such that poor results would be obtained and also that interference could be expected from a platform which was newly arrived in that area. If this had been known about prior to the start of the verification then considerable time would have been saved.

Next the vessels had to sail up and down on line headings and compute Hyperfix corrections by direct fix comparison with Syledis. At the time only 3 Hyperfix ranges could be received on the Geco Sigma due to the inability of the engineer to modify the receiver to receive 4 ranges.

Part of the way through the calibration procedure Borkum went off the air and could not be calibrated, although the calibration for the others was completed. Following a NAM directive Geco Sigma went to check Syledis by means of transit fixing the Glomar Baltic Platform. The results were considered to be acceptable. Next the Hyperfix calibration was resumed as Borkum was back on the air. However, Syledis Station B11/2 went down, leaving only 2 good Syledis stations. Calibration continued using this arrangement but was not really up to the standard expected and so, eventually, it was abandoned. The vessels were informed that, as it was a weekend, the Syledis station could not be investigated for several days and that it would be pointless to continue. With this in mind the calibration was adjudged as being as complete as possible under the circumstances and preparations were made to start production.

As soon as B11/2 was back on the air the vessels resumed the calibration procedure, this time using all 4 Hyperfix ranges at once and all 3 good Syledis ranges.

In addition calibration runs were carried out with the vessels in close proximity as per their positions when in production. It was discovered that if there was any disturbance of Hyperfix in these circumstances then it was too small to detect.

These calibration runs produced correction figures for the Hyperfix very close to the original ones. As a result all lines shot to date were considered acceptable.

It can be seen that the calibration of the navigation system took rather a long time due to breakdowns in communications and to beacon failures.

Interspersed with all this activity was the fact that the Racal/NESA personnel could not get their tailbuoy equipment working correctly nor could they produce a set of calibration figures as was supposed to be the case. In the event the calibration figures were produced by Geco and the onboard Geodetic Navigation QC representatives.

The authors feel that the whole organisation of the mobilisation/ calibration was extremely poor with the result that considerable time was lost. However, it is also felt that a little extra time in port in order to check all systems thoroughly would have been useful as it was felt that the vessels left port without adequate testing.

Fuller details can be found in the Daily Diaries, Section 8, as well as in the Geodetic Navigation Report for this prospect.

Unfortunately, due to an oversight, only 1 Hyperfix receiver on each vessel was calibrated at the start of the survey and this caused problems later on when it became apparent that the quality of fixes on Geco Sigma was worse than on Geco Rho. It would have been extremely useful to have had a calibrated spare to hand against which to check the original receiver.

The post-survey calibration was done on 2nd September, during a period of bad weather, in an effort to improve the quality of the fixes on the Geco Sigma before the survey finished. It had become apparent that all was not right as far as the Geco Sigma was concerned.

Basic calibration runs were completed for both receivers on both vessels and thereafter the spare receiver was used on the Geco Sigma with appropriate corrections for each range. Subsequently, the quality of the navigation improved. Why the original receiver should, apparently, degrade during the job was never explained satisfactorily, nor was a reason given as to why the spare, which proved to be the better of the two, had not been used from the outset.

The Hyperfix ATU on the Geco Rho broke down on 3rd September due to being blasted accidentally by the ship's radio. An infill line was rejected because of this as the signals were very poor and it was thought that the antenna in this instance had been the cable from the ATU to the instrument room rather than the actual antenna itself. The ATU was repaired quickly and re-calibration was not necessary. After this the spare calibrated receiver on the Geco Rho was used to complete the prospect.

When survey production was completed finally both vessels carried out Syledis baseline crossings of the Danish Syledis chain.

3.5 Active Tailbuoys

Each tailbuoy was equipped with a transceiver unit which relayed raw Pulse 8 data to receivers on the vessel. Considerable hardware problems were experienced with this set-up, mostly due to failures on the tailbuoys themselves. At times only 2 out of 4 tailbuoys were working and it was possible for the onboard units to lock onto the wrong tailbuoys. It seemed that if a tailbuoy failed the onboard receiver tuned to the nearest alternative. This seemed to indicate that there was not enough discrimination on the receivers or that the transmitting frequencies were too close together. Considerable Contractor downtime was accrued both before and during the survey while these problems were sorted out, either by pulling in the cables or, weather permitting, by using the chase boats and MOB boats to effect repairs. It must be pointed out that this system was largely new and better qualified operators should have been supplied.

Given the inherent inaccuracies in the performance of Pulse 8 it took several lines before a way of solving the acoustic network solution on the streamer tails was worked out whereby the tailbuoys, which apparently were "drifting" in position from shot to shot could be incorporated successully. This had not been necessary on the previous prospect which used Syledis on the tailbuoys and hence enabled a much tighter solution.

The Geodetic Report contains more detailed information on the tailbuoy performance.

3.6 Acoustics

The acoustic networks were remarkably reliable with only the occasional breakdown of individual acoustic elements. They did, however, require careful setting up and maintenance in order to maintain a tight network. The navigators on board learnt quickly and were able to get the best out of the system.

It should be pointed out that the hardware could be improved and that the networks should, perhaps, be re-arranged to make certain hardware elements less critical to the performance such that the failures of these elements would not constitute a major breakdown of the acoustic networks. A discrepancy in source-receiver offsets on the Geco Rho came to light well into the survey, although dating back to the start of the prospect. The error was 3-5 m and a more rigorous approach by relevant personnel is needed in order to ensure that nominal offsets agree with those calculated by the acoustic networks and by gun offset shots.

The Geodetic Report contains more detailed information on acoustic performance.

3.7 Omniseis and 3D

Few problems were encountered with the 3D system. Data between the vessels was lost occasionally, especially at the start of the survey, due to comms. problems brought about, partly, by excessive ground speed caused by navigation signal instability. This confused the coverage plots.

When the loss of data was significant floppy disks were transferred between vessels by MOB boat.

It seemed that the data link problems were worse on Geco Rho and larger gaps in the coverage, visible on the plots, were more apparent.

This was caused by a higher error in transmission, presumably due to hardware problems on the communication link. The exact cause was never discovered. This problem will have to be rectified next year, possibly by the use of better radios or modems and/or siting the antennae in a more advantageous position.

A lack of computer power slowed down re-processing but both vessels managed to keep up well, considering the speed of production.

Due to the navigational instability it became apparent, whilst watching lines being shot, that the coverage plots produced in such circumstances were not necessarily correct due to errors in vessel positions at shot fire times, despite heavy pattern filtering. There was no method available on board to test this theory and coverage for all lines had to be accepted as correct.

On 28th August it was discovered on the Geco Sigma that all coverage plots had been produced using the incorrect compass corrections for the Geco Rho streamers but only in the 090° line direction. A comparison with the plot produced on the Geco Rho revealed small differences which could, in fact, be explained by the fact that different people had produced each plot. In order to test this 2 lines where the discrepancy were greatest were re-processed and the results were identical to the original plot on the Geco Sigma. This went some way to proving that producing the CDP plot with the incorrect compass corrections had only a very small effect, if any.

At the end of the survey the Geco Rho managed to miss completely the required coverage on 2 of their allocated infill lines due to steering down the wrong CDP lines. The Geco Sigma had to re-shoot these portions as by the time most of this came to light the Geco Rho was on the way to carry out basline crossings. These errors by the Geco Rho extended the survey as far as the Geco Sigma was concerned, but did not add to NAM's costs.

Sequence 41 was shot as infill by the Geco Rho without consultation as to whether this was necessary. The coverage was held until

later when it was decided to "trade" this line for 3 very small Contractor re-shoots. Thus NAM gained some "free" infill.

The Appendices, Section 9.5, contain full details of the infill and re-shoots carried out on the prospect area.

3.8 MicroMAX

Reports on the previous blocks have outlined the advantages of having this equipment on board. On this block it was useful for evaluating swell noise.

Suggested disavantages of this system are as follows:

First of all the data output depends on the expertise of the operator and the software. It is not the sort of equipment that can be handled by a junior observer between tape changes, which apparently happens on some vessels. The personnel on this job were excellent.

Secondly, the assessment of the final section depends on the individual. Most onboard representatives are not trained geophysicists or interpreters and their criteria may be different to those held by the person in charge of the project. When swell noise is involved there is little problem but more complex interference, such as seismic, ship or piling noise, should be assessed with caution.

Thirdly, the MicroMAX cannot replace the contract. If the streamer is not at the correct depth, but the MicroMAX section shows that the data is quiet, then the line is still not acceptable. The authors can foresee problems in the future when Contractors will want to shoot lines when they are a long way out of specification and it will be difficult to establish from the MicroMAX whether the data quality is sufficiently good.

The authors think that, for future surveys, it is vital that a link and software be available to enable the master vessel to send MicroMAX data to Head Office for immediate evaluation.

Also a short briefing should be given before each prospect to inform concerned parties about basic details of the prospect (target depth, expected structures, velocities etc.).

3.9 Communications

At the start of this block all the inter-vessel links were operational. All the instrument room voice links worked well.

There was only one inter-vessel Stentofon channel for this and previous blocks. It worked well on this occasion but, nevertheless, a second channel and more spare parts should be insisted upon for future work.

The communications rooms on both boats should have Stentofon units. The Geco Sigma already has one installed. There were times when a voice link could have saved time and effort when transmitting and receiving data files between the vessels.

The inter-vessel data link failed completely during line FO106 on 1st September. Despite this each vessel was able to record its own data and the transfer of data floppy disks between vessels enabled full CDP coverage to be computed. During the period of failure the steering of both vessels was good, as was confirmed by good group 1 coverage on the CDP plots. The inter-vessel timing was being controlled via a completely separate blast modem and was considered to be satisfactory. To check this, data tapes were MicroMAXed on Geco Rho. The failure was fixed simply by switching everything off and on.

3.10 Crew Changes

A crew change took place on 23rd August by boat off Ameland. This necessitated the recovery of all equipment by both vessels.

The crew change had been planned out beforehand so that the key personnel would get several hours in which to hand over to their opposite numbers. In the event all of the plans went astray and

less than 1 hour was used for the actual hand-over. Considering the complexity of the operation this cannot in any respect be considered an adequate amount of time in which to impart information. Indeed the oncoming MicroMAX operator got no hand-over at all as he had been allocated the second trip out of port.

NAM personnel who attended could make only very limited use of the time available and to a large extent wasted their time in attending.

After the crew change it took in excess of 3 days for the Geco Sigma to get back into production mode, so not only was the crew change not a good one but it also cost a lot of time.

Prior to the crew change all systems had been functioning well and production was reaching 4 lines per day. It is a considerable waste to have to pull in all the equipment to change crews on a specific day when, with a little flexibility as regards crew change days and bearing in mind weather conditions, it could all be done by boat or helicopter on prospect with minimal loss of time or production.

3.11 Personnel

3.11.1 Geco Rho

Both crews were hard workers; both crews had excellent Party Chiefs and both the gun crews were outstanding. Unfortunately the navigation/seismic crew that left the vessel on 23rd August could not match their successors. There were several errors of concentration and it is felt that they lacked experience in certain areas. However, this was their first season with this type of survey and the situation will, no doubt, improve with practice.

3.11.2 Geco Sigma

Both crews were competent and well informed but, in general, there was a lack of drive. It would be nice to see senior personnel

really getting hold of the job in order to set an example to their more junior colleagues. Sometimes it was felt that personnel were working at half pace.

Communication with the Observers was good but they persistently left misfiring guns switched on when they should have been turned off. This point had been brought up before and was relatively simple to put into practice but it seemed that there was a mental block about it.

The gun chief was spotted in the instrument room but very little effort was made to tune the Litton to minimise timing drifts on individual guns.

The senior navigators were very good and could be relied upon to produce accurate coverage plots and generally to hold the team together.

All the ship's crew were good. The bridge crews on both vessels were worthy of note for their ability in maintaining position and arriving at the start of line on time. Indeed with a free run in to line without any other considerations the error in SOL time was several minutes at most.

On numerous occasions, due to unstable navigation signals and unpredictable tides, it was extremely difficult to steer the vessels accurately down the line and the crew must be complemented for their efforts in the face of difficulty.

3.12 Safety

3.12.1 Geco Rho

Geco have a comprehensive safety policy and regular drills and safety meetings took place. The Captains should be congratulated on their attitude and the organisation of the meetings and drills. Minutes of every meeting and criticism of drills were displayed in the mess.

The crews adopted a sensible attitude towards safety most of the time but there was the occasional lapse (e.g. no hard hat on the back-deck area, no safety line while leaning over the side etc.). Once these things had been pointed out no further prompting was required.

Fire drills were realistic, involving the actual use of the equipment to fight imaginary fires in various areas of the vessel. All the fire fighting equipment appeared well cared for and worked well.

The MOB boat was used regularly with different qualified drivers and because of this the launch and recovery were smooth and safe.

3.12.2 Geco Sigma

Most of the safety regulations were observed. The only Geco/NAM safety rule not followed, usually by one person, was that of wearing proper clothes on the back-deck. This individual wore tracksuits, trainers and a shirt and he would also stand close to the stern of the vessel in this attire. When questioned about this his attitude was very negative. There can be no recourse to Geco or NAM in the event of an accident in these circumstances.

Three fire/boat drills/safety meetings were held during this period but were conducted in Norwegian for the benefit of the majority of the crew. It was left to an English speaking crew member to update QC personnel as to the general points which had arisen.

It was noticed that the clothing and footwear worn by many crew members who attended such drills was below the standard expected: in this the personnel on board were generally very slack. The NESA engineer came aboard without any safety footwear.

Some of the gun crew that came on board on 23rd August did not seem to value themselves very highly. They were seen on the back-deck and repairing gun strings, while wearing clogs and they did not seem to like wearing life-jackets. This is not a general observation but specific cases were noticed. If they have been warned then

it is their own responsibility but it would be good to be able to apply some extra pressure. The point should be made at next year's mobilisation meetings that the survey can be stopped because of bad personal safety.

The authors feel that the standards of such drills and meetings was much better on the Geco Rho than on Geco Sigma.

Use of the MOB boat was well organised and safe.

3.12.3 Safety Meeting Minutes, Geco Rho

Please see the attached.

M/V GECO RHO
AT SEA
13AUGUST 1989

MINUTES OF THE SAFETY MEETING HELD IN THE MESSROOM AT 1230 hrs.

1. 6 pcs day/night signal flares have been put in the MOB Boat for emergency use.
2. The new survival suits have still not been received on board. Till then the old ones are to be used for MOB Boat operations.
3. A small quantity of oil has been leaking from one of the two drums on the port side cable store. To be rectified. Action: Gun Chief.
4. All personnel will be required to take the cholera/Yellow fever vaccination prior the vessels departure for African waters.

.....

M .V. GECO RHO

-FIRE DRILL 3rd SEPT. 1989

1. Fire alarm is sounded at 1230 hrs.
2. Fire located in the laundry .
3. No.1. squad dons fire suit and enters through Fore-deck accomodation entrance.
4. No.2 squad dons fire suit and with fire hose ready to attack from shelter deck.
5. No.1 squad attacks fire .
6. No.2 squad asked to check adjacent cabins for 2 persons reported missing by bridge.
7. Missing persons rescued reported by squad 2.
8. Med. squad to standby with stretcher to receive any injured persons.
9. no.1 squad reports fire is brought under control.

.....

GECO GEOPHYSICAL COMPANY OF NORWAY A·S

At sea the 6th of September 1989.

MINUTES OF THE SAFETY MEETING HELD IN THE MESSROOM AT 1230 HRS.

CAPTAIN GAVE INFORMATION REGARDING THE FOLLOWING ITEMS:

1. Cause of oil spillage from drums in cable store has been removed.

2. Access to the hydrant port side cable store was blocked by a stanchion. This has now been removed.

3. Four new survival suits of Helly Hansen type were received on board, and are now in use.

4. Safety video. The party chief informed that the office has promised to send a video on board.

5. Hoses outside instrument room, which have been used for cleaning/ gas freeing of number 3 tank, will be removed this afternoon. The work is now completed.

6. Two Grafite Fire Extinguisher for fighting lithium fires have been ordered, as lithium batteries are used in the birds. One to be located outside the lithium battery store, and the other one in the cable shack.

MATTERS RAISED.

1. Mob-boat VHF radio is not working properly. Captain informed that a service has been arranged with Radio Holland upon arrival Den Helder.

2. Client stressed the importance of using harnesses while working close to the stern, or down the slips.

GENERAL.

Captain commented to the crew that the job for NAM to date has been accident free. He thanked the entire crew for maintaining a safe attitude throughout the contract. Captain also stressed the importance of keeping the same high standard of safety in the future.

The client was invited to make comments. He said that in general he was very satisfied with the safety on board, and NAM were highly pleased that the survey was conducted without any accidents.

.....

A.V. Bakke

MASTER

M/V "GECO RHO"

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SECTION 4: OPERATIONAL CONSIDERATIONS

4. OPERATIONAL CONSIDERATIONS

4.1 Tides

The biggest single operational factor to be taken into account on this survey was the effect of tides. A considerable amount of infill was generated by shooting sequences 1-28 using a following current even though the feathering itself was never very large. The shooting plan had been devised originally by NAM but proved to be unreliable, mostly due to mismatch of feathering on adjacent lines despite starting all lines at the same time relative to high water. After these sequences the shooting plan was revised after consultation with NAM so that all lines were shot into the prevailing current. This gave a considerable improvement in feather matching, feathering, cable shape, cable depth control, acoustic network geometry and control over the steering of the vessel. With a following current the water speed was necessarily low (sometimes as low as 3.3 knots) in order to keep the ground speed less than 4.6 knots, so that 18.75 m shots could be used. At this water speed the currents had a marked effect on the hydro-dynamics of the survey in as much as the equipment was not being towed at sufficient speed to allow it to remain unaffected by the fluctuations in current which were encountered and, consequently, feathering and cable shape etc. were subject to change line by line. The water speed of approximately 5 knots used on the second half of the survey immediately improved the situation considerably without compromising the shotpoint interval. The only infill chargeable to NAM for the latter lines was due to a mismatch in feathering between adjacent lines, which were not according to the 2 different shooting plans and to the following category:

4.2 Navigation Instability

Some near trace coverage was missed due to navigational instability, either due to the vessels having poor information by which to steer, or having good steering but presumably incorrectly computed CDP coverage due to the unstable signals. These factors led to gaps in the near trace coverage on the edges of the 12 line swaths which

required infill to one extent or the other. It is very difficult to say whether the bridge crew can be faulted for some of the apparent steering errors as with the kind of navigation quality available and the complexities of shooting with 2 vessels, there is always the opportunity for fluctuations in the relative vessel positions and their combined positions relative to the line.

One infill line was charged to Geco as a lot of near trace coverage was missed on the first prime attempt. At the time the feathering was small and generally conditions were good. It was judged that the vessels should have been able to get back on line quicker even if they were having problems steering.

Two more attempts were re-shot and charged to Geco as the Geco Rho missed the required coverage first time around. The Appendices, Section 9.5, have all the relevant details.

4.3 Vessel Speed

The ideal ground speed for the survey was 4.5-4.6 knots but this was difficult to achieve at first due to the following currents mentioned earlier. Later on the ground speed was no problem and all lines were completed with plenty of time remaining to reach the next one.

4.4 Weather

The weather was variable but little time was lost during the survey.

4.5 Debris and Pollution

There was little problem with debris as the survey area was so far from the shore. Occasional checks were made on the tailbuoys to see that the generating systems had not become fouled.

SECTION 5: VESSEL

5. VESSEL

5.1 Main Particulars, Geco Sigma

Name	: Geco Sigma.
Vessel Type	: Seismic Research.
Call Signals	: JXYU.
Flag	: Norwegian.
Port of Registry	: Alusund.
Owner	: K/S A/S Geco Sigma.
Length Overall	: 60 m.
Beam	: 11 m.
Draught to Loadline	: 6.30 m.
Gross Tonnage	: 1245 tons.
Net Tonnage	: 402 tons.
Classification	: Det Norske Veritas +1A1, EO, ICE 1B.
Cruising Speed	: 14 knots.
Cruising Range	: 40 days.
Accommodation	: 50 beds.
Hospital	: 3 beds.
Helicopter Deck	: Approved for winch operations from a helicopter with a maximum rotor width of 15 m.
Panama Certificate	: Tonnage Certificate.
Suez Certificate	: Suez Tonnage Certificate.
Others	: USGG Oil Pollution Certificate (US Coast Guard regulations for merchant ships of foreign flags travelling in US waters).

5.2 Main Particulars, Geco Rho

Name	: Geco Rho.
Vessel Type	: Seismic Research.
Call Letters	: 3EGY5.
Flag	: Panama.
Owner	: Seismic 11 A/S.
Length	: 86.81 m.

Beam	: 14.22 m.
Draught to Loadline	: 6.0 m.
Gross Tonnage	: 2393.40 tons.
Net Tonnage	: 1032.39 tons.
Classification	: Germanscher Lloyd.
Cruising Speed	: 13.5 knots.
Cruising Range	: 60 days.
Seismic Crew	: 12-14.
Accommodation	: 40 berths.
Hospital	: 2 berths.
Helicopter Deck	: Diameter 20.3 m for sizes up to Bell 212. Also passes for helicopter use by Shell.
Panama Certificate	: Yes.
Suez Certificate	: Yes.
Others	: Bell 212 or equipment classification.

SECTION 6: EQUIPMENT

6. EQUIPMENT

6.1 Recording Instruments

The recording equipment consisted of:

2 x DFS V, 120 channels each.
2 x EPCs, one for each streamer.
1 Kalamos.
1 Fathometer.
1 Fathometer slave from the bridge.
1 Expanded header.
1 Digicourse streamer controller.
1 Digicourse compass controller.
1 Nord 100.
1 Graphic monitor.
1 x BUCO demux system.
1 x Nord.
1 PC for inter-vessel timing check.

6.2 Energy

The energy source consisted of:

4 sub-arrays of 6 airgun elements each.
1 LRS 100 gun controller.
1 CRT.
1 'Scope for checking transducer signatures.
1 Digital air pressure read-out with audible warning.

6.3 Streamer

2 x HSSQ streamers, 3200 metres each.
13 Digicourse bird/compass units on each streamer.

6.4 Navigation

The navigation equipment consisted of:

1 Syledis mobile.
1 Syledis mobile (spare).
1 Hyperfix recevier.
1 Hyperfix receiver (spare).
3 Pulse 8 receivers.
1 Pulse 8 receiver (spare)
1 MX 1107RS satellite receiver.
1 Anschutz gyro, recording room.
1 Anschutz gyro repeater from the bridge.
1 Simrad fathometer digitiser.
1 Sonar doppler (MX 610D).
1 HP console (2626A).
2 HP mag. tape decks (7970E).
1 Rubidium Frequency Standard.
1 Omniseis 3D system.
2 Navtech systems (one for each streamer).

For further details please see the Geodetic Report.

SECTION 7: STATISTICS

7.1 Time and Production Analyses

7.1.1 Geco Sigma

MISFIRE STATISTICS

GECO SIGMA

From 09/08/89 To 08/09/89

Number of lines / line segments acquired 78
Total chargeable Kilometers acquired 1684.144

Total number of Misfires	657	Percentage of total SPs.	0.73
Total number of NDRs.	159	Percentage of total SPs.	0.18
Total number of parity errors	0	Percentage of total SPs.	0.00
Total number of shots	89821	Percentage bad shots	0.91

Worst case lines

Misfires
Line F0418-S Misfires 44 NDRs. 0 Parity errors 0

Parity Errors
Line Misfires 0 NDRs. 0 Parity errors 0

No Data Records
Line F0286-S Misfires 21 NDRs. 18 Parity errors 0

From	To	Act	Cau	Chg	Comment	HH:MM
09/08/89						
00:00	06:00	18	26	O	Travel to port between blocks	06:00
06:00	08:30	19	14	C	Waiting for Racal engineers.	02:30
08:30	24:00	19	26	S	Setting up radio nav for F03	15:30

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 09/08/89

Code		HH:MM	Percent
P18	Travel T/F Port	06:00	25.00
P19	In Port	18:00	75.00

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	06:00	25.00
STANDBY	15:30	64.58
CONTRACTOR	02:30	10.42
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

09/08/89
No production Accumulated total to date 0.000

10/08/89

No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 10/08/89

Code		HH:MM	Percent
P14	Radio Nav. Fail	01:10	2.43
P16	Nav Calibration	03:41	7.67
P18	Travel T/F Port	19:54	41.46
P19	In Port	23:15	48.44

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	23:20	48.61
STANDBY	18:00	37.50
CONTRACTOR	06:40	13.89
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	48:00	
TOTAL Kms	0.000	

DAILY TIME LOG — GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
10/08/89						
00:00	02:30	19	26	S	Setting up radio nav for F03	02:30
02:30	05:15	19	19	C	Waiting for Geco personnel	02:45
05:15	15:45	18	26	O	Travel to Syledis cal area	10:30
15:45	16:55	14	14	C	Wait for Rho. Xfer Racal man.	01:10
16:55	20:19	18	26	O	Travel to Syledis cal area	03:24
20:19	23:45	16	16	O	Syledis baseline crossings.	03:26
23:45	24:00	16	14	C	Poor results. Stby for info.	00:15

From 10/08/89 To 10/08/89

Code		HH:MM	Percent
P14	Radio Nav. Fail	01:10	4.86
P16	Nav Calibration	03:41	15.35
P18	Travel T/F Port	13:54	57.92
P19	In Port	05:15	21.88

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	17:20	72.22
STANDBY	02:30	10.42
CONTRACTOR	04:10	17.36
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 10/08/89

Code		HH:MM	Percent
P14	Radio Nav. Fail	01:10	2.43
P16	Nav Calibration	03:41	7.67
P18	Travel T/F Port	19:54	41.46
P19	In Port	23:15	48.44

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	23:20	48.61
STANDBY	18:00	37.50
CONTRACTOR	06:40	13.89
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	48:00	
TOTAL Kms	0.000	

DAILY TIME LOG

GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
11/08/89						
00:00	07:20	16	14	C	Poor results. Wait for info.	07:20
07:20	09:30	17	16	O	Transit to Hyperfix cal area	02:10
09:30	13:55	16	14	C	Modifying equipment,setting up	04:25
13:55	18:00	16	16	O	Hyperfix calibration.	04:05
18:00	24:00	16	14	C	Stby, poor signals.	06:00

PRODUCTION/DOWNTIME BY ACTIVITY

From 11/08/89 To 11/08/89

Code		HH:MM	Percent
P16	Nav Calibration	21:50	90.97
P17	Travel Time	02:10	9.03

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	06:15	26.04
STANDBY	00:00	0.00
CONTRACTOR	17:45	73.96
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

11/08/89

No production

Accumulated total to date 0.000

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 11/08/89

Code		HH:MM	Percent
P14	Radio Nav. Fail	01:10	1.62
P16	Nav Calibration	25:31	35.44
P17	Travel Time	02:10	3.01
P18	Travel T/F Port	19:54	27.64
P19	In Port	23:15	32.29

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	29:35	41.09
STANDBY	18:00	25.00
CONTRACTOR	24:25	33.91
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	72:00	
TOTAL Kms	0.000	

DAILY TIME LOG

GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
12/08/89						
00:00	01:00	16	14	C	Standby. Poor Syledis signals	01:00
01:00	12:20	16	16	O	Transit fix and Hyperfix cal.	11:20
12:20	14:35	16	14	C	Standby for info on B11/2	02:15
14:35	21:20	16	14	C	Repair of Pulse-8 tailbuoys.	06:45
21:20	24:00	20	26	O	Deploying streamers.	02:40

PRODUCTION/DOWNTIME BY ACTIVITY

From 12/08/89 To 12/08/89

Code		HH:MM	Percent
P16	Nav Calibration	21:20	88.89
P20	Deploy /Recover	02:40	11.11

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	14:00	58.33
STANDBY	00:00	0.00
CONTRACTOR	10:00	41.67
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 12/08/89

Code		HH:MM	Percent
P14	Radio Nav. Fail	01:10	1.22
P16	Nav Calibration	46:51	48.80
P17	Travel Time	02:10	2.26
P18	Travel T/F Port	19:54	20.73
P19	In Port	23:15	24.22
P20	Deploy /Recover	02:40	2.78

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	43:35	45.40
STANDBY	18:00	18.75
CONTRACTOR	34:25	35.85
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	96:00	
TOTAL Kms	0.000	

12/08/89
No production

Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 13/08/89 To 13/08/89

Code		HH:MM	Percent
P02	Line Change	00:33	2.29
P14	Radio Nav. Fail	03:23	14.10
P20	Deploy /Recover	13:53	57.85
P25	Extended L/C	06:11	25.76

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	13:53	57.85
STANDBY	03:56	16.39
CONTRACTOR	06:11	25.76
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
13/08/89						
00:00	13:53	20	26	O	Deploying streamers and guns.	13:53
13:53	20:04	25	20	C	Vessels not ready at proj. SOL	06:11
20:04	23:27	14	07	S	Data bad.Poor Hyperfix signals	03:23
23:27	24:00	02	14	S	L-C after bad Hyperfix data.	00:33

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 13/08/89

Code		HH:MM	Percent
P02	Line Change	00:33	0.46
P14	Radio Nav. Fail	04:33	3.79
P16	Nav Calibration	46:51	39.04
P17	Travel Time	02:10	1.81
P18	Travel T/F Port	19:54	16.58
P19	In Port	23:15	19.38
P20	Deploy /Recover	16:33	13.79
P25	Extended L/C	06:11	5.15

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	57:28	47.89
STANDBY	21:56	18.28
CONTRACTOR	40:36	33.83
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	120:00	
TOTAL Kms	0.000	

13/08/89
No production

Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 14/08/89 To 14/08/89

Code		HH:MM	Percent
P01	Recording Time	09:53	41.18
P02	Line Change	07:27	31.04
P14	Radio Nav. Fail	03:18	13.75
P25	Extended L/C	03:22	14.03

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	09:53	41.18
OPERATIONAL TIME	04:00	16.67
STANDBY	10:07	42.15
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	83.550	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
14/08/89						
00:00	01:27	02	14	S	L/C after bad Hyperfix data	01:27
01:27	02:16	25	08	S	Wait for tides	00:49
02:16	05:34	14	07	S	Line 0574 NTBP Nav signals	03:18
05:34	07:34	02	14	S	Line change after bad line	02:00
07:34	08:35	25	08	S	Wait for tides.	01:01
08:35	12:00	01	01	P	Line F0250-S	03:25
12:00	14:00	02	02	O	Normal line change	02:00
14:00	14:46	25	08	S	Standby for tide slot.	00:46
14:46	18:08	01	01	P	Line F0562-S	03:22
18:08	20:08	02	02	O	Allocated 2hr line change time	02:00
20:08	20:54	25	08	S	Extended to wait for tide.	00:46
20:54	24:00	01	01	P	Line F0238-S	03:06

14/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0250-S	270					Complete
0252/449		0	0	0	0.000	
0251/450		0	0	0	0.000	
0250/451		100	1630	1531	28.706	
0249/452		0	0	0	0.000	
0248/453		0	0	0	0.000	
0247/454		0	0	0	0.000	
0246/455		0	0	0	0.000	
0245/456		0	0	0	0.000	
F0562-S	90					Complete
0568/133		0	0	0	0.000	
0567/134		0	0	0	0.000	
0566/135		0	0	0	0.000	
0565/136		0	0	0	0.000	
0564/137		0	0	0	0.000	
0563/138		0	0	0	0.000	
0562/139		100	1630	1531	28.706	
0561/140		0	0	0	0.000	
F0238-S	270					Complete
0240/461		0	0	0	0.000	
0239/462		0	0	0	0.000	
0238/463		100	1493	1394	26.138	
0237/464		0	0	0	0.000	
0236/465		0	0	0	0.000	
0235/466		0	0	0	0.000	
0234/467		0	0	0	0.000	
0233/468		0	0	0	0.000	
Total kms for day:		83.550	Accumulated total to date			83.550

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 14/08/89

Code		HH:MM	Percent
P01	Recording Time	09:53	6.86
P02	Line Change	08:00	5.56
P14	Radio Nav. Fail	07:51	5.45
P16	Nav Calibration	46:51	32.53
P17	Travel Time	02:10	1.50
P18	Travel T/F Port	19:54	13.82
P19	In Port	23:15	16.15
P20	Deploy /Recover	16:33	11.49
P25	Extended L/C	09:33	6.63

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	09:53	6.86
OPERATIONAL TIME	61:28	42.69
STANDBY	32:03	22.26
CONTRACTOR	40:36	28.19
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	144:00	
TOTAL Kms	83.550	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
15/08/89						
00:00	00:18	01	01	P	Line F0238-S	00:18
00:18	02:18	02	02	O	Allocated 2hr line change time	02:00
02:18	03:04	25	08	S	Time to next projected SOL.	00:46
03:04	05:40	17	16	C	Transit to nav cal area.	02:36
05:40	08:10	16	16	O	Hyperfix/Syledis calibration.	02:30
08:10	14:50	20	07	S	Recover Pt cable. 8-9 forecast	06:40
14:50	20:30	16	16	O	2-Boat proximity checks.	05:40
20:30	24:00	20	07	S	Deploy port streamer.	03:30

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 15/08/89 To 15/08/89

Code		HH:MM	Percent
P01	Recording Time	00:18	1.25
P02	Line Change	02:00	8.33
P16	Nav Calibration	08:10	34.03
P17	Travel Time	02:36	10.83
P20	Deploy /Recover	10:10	42.36
P25	Extended L/C	00:46	3.19

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:18	1.25
OPERATIONAL TIME	10:10	42.36
STANDBY	10:56	45.56
CONTRACTOR	02:36	10.83
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	2.569	

15/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0238-S	270					Complete
0240/461		0	0	0	0.000	
0239/462		0	0	0	0.000	
0238/463		1494	1630	137	2.569	
0237/464		0	0	0	0.000	
0236/465		0	0	0	0.000	
0235/466		0	0	0	0.000	
0234/467		0	0	0	0.000	
0233/468		0	0	0	0.000	
Total kms for day:			2.569	Accumulated total to date		2.569

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 15/08/89

Code		HH:MM	Percent
P01	Recording Time	10:11	6.06
P02	Line Change	10:00	5.95
P14	Radio Nav. Fail	07:51	4.67
P16	Nav Calibration	55:01	32.75
P17	Travel Time	04:46	2.84
P18	Travel T/F Port	19:54	11.85
P19	In Port	23:15	13.84
P20	Deploy /Recover	26:43	15.90
P25	Extended L/C	10:19	6.14

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	10:11	6.06
OPERATIONAL TIME	71:38	42.64
STANDBY	42:59	25.59
CONTRACTOR	43:12	25.71
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	168:00	
TOTAL Kms	86.119	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
16/08/89						
00:00	04:16	20	07	S	Re-deploying equipment.	04:16
04:16	07:38	01	01	P	Line F0574-S	03:22
07:38	09:38	02	02	O	Allocated 2hr line change time	02:00
09:38	10:01	25	08	S	Extended to wait for tides.	00:23
10:01	13:19	01	01	P	Line F0262-S	03:18
13:19	15:19	02	02	O	Allocated 2hr line change time	02:00
15:19	16:18	25	08	S	Extended to wait for tides.	00:59
16:18	19:36	01	01	P	Line F0550-S	03:18
19:36	21:36	02	02	O	Allocated 2hr line change time	02:00
21:36	22:27	25	08	S	Extended to wait for tides.	00:51
22:27	24:00	01	01	P	Line F0226-S	01:33

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 16/08/89 To 16/08/89

Code		HH:MM	Percent
P01	Recording Time	11:31	47.99
P02	Line Change	06:00	25.00
P20	Deploy /Recover	04:16	17.78
P25	Extended L/C	02:13	9.24

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	11:31	47.99
OPERATIONAL TIME	06:00	25.00
STANDBY	06:29	27.01
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	99.450	

16/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0574-S	90					Complete
0580/121		0	0	0	0.000	
0579/122		0	0	0	0.000	
0578/123		0	0	0	0.000	
0577/124		0	0	0	0.000	
0576/125		0	0	0	0.000	
0575/126		0	0	0	0.000	
0574/127		100	1630	1531	28.706	
0573/128		0	0	0	0.000	
F0262-S	270					Complete
0264/437		0	0	0	0.000	
0263/438		0	0	0	0.000	
0262/439		100	1630	1531	28.706	
0261/440		0	0	0	0.000	
0260/441		0	0	0	0.000	
0259/442		0	0	0	0.000	
0258/443		0	0	0	0.000	
0257/444		0	0	0	0.000	
F0550-S	90					Complete
0556/145		0	0	0	0.000	
0555/146		0	0	0	0.000	
0554/147		0	0	0	0.000	
0553/148		0	0	0	0.000	
0552/149		0	0	0	0.000	
0551/150		0	0	0	0.000	
0550/151		100	1630	1531	28.706	
0549/152		0	0	0	0.000	
F0226-S	270					Complete
0228/473		0	0	0	0.000	
0227/474		0	0	0	0.000	
0226/475		100	810	711	13.331	
0225/476		0	0	0	0.000	
0224/477		0	0	0	0.000	
0223/478		0	0	0	0.000	
0222/479		0	0	0	0.000	
0221/480		0	0	0	0.000	

Total kms for day: 99.450 Accumulated total to date 99.450

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 16/08/89

Code		HH:MM	Percent
P01	Recording Time	21:42	11.30
P02	Line Change	16:00	8.33
P14	Radio Nav. Fail	07:51	4.09
P16	Nav Calibration	55:01	28.65
P17	Travel Time	04:46	2.48
P18	Travel T/F Port	19:54	10.36
P19	In Port	23:15	12.11
P20	Deploy /Recover	30:59	16.14
P25	Extended L/C	12:32	6.53

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	21:42	11.30
OPERATIONAL TIME	77:38	40.43
STANDBY	49:28	25.76
CONTRACTOR	43:12	22.50
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	192:00	
TOTAL Kms	185.569	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
17/08/89						
00:00	01:49	01	01	P	Line F0226-S	01:49
01:49	03:49	02	02	O	Normal line change.	02:00
03:49	04:31	25	08	S	Wait for tides	00:42
04:31	07:50	01	01	P	Line F0586-S	03:19
07:50	09:50	02	02	O	Normal line change.	02:00
09:50	10:44	25	08	S	Extended to wait for tides.	00:54
10:44	14:11	01	01	P	Line F0274-S	03:27
14:11	16:11	02	02	O	Allocated 2hr line change time	02:00
16:11	16:58	25	08	S	Time to next projected SOL.	00:47
16:58	24:00	20	14	C	Repair P-8 antenna, stbd cable	07:02

PRODUCTION/DOWNTIME BY ACTIVITY

From 17/08/89 To 17/08/89

Code		HH:MM	Percent
P01	Recording Time	08:35	35.76
P02	Line Change	06:00	25.00
P20	Deploy /Recover	07:02	29.31
P25	Extended L/C	02:23	9.93

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	08:35	35.76
OPERATIONAL TIME	06:00	25.00
STANDBY	02:23	9.93
CONTRACTOR	07:02	29.31
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	72.787	

17/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0226-S	270					Complete
0228/473		0	0	0	0.000	
0227/474		0	0	0	0.000	
0226/475		811	1630	820	15.375	
0225/476		0	0	0	0.000	
0224/477		0	0	0	0.000	
0223/478		0	0	0	0.000	
0222/479		0	0	0	0.000	
0221/480		0	0	0	0.000	
F0586-S	90					Complete
0591/110		0	0	0	0.000	
0590/111		0	0	0	0.000	
0589/112		0	0	0	0.000	
0588/113		0	0	0	0.000	
0587/114		0	0	0	0.000	
0586/115		100	1630	1531	28.706	
0585/116		0	0	0	0.000	
0585/116		0	0	0	0.000	
F0274-S	270					Complete
0276/425		0	0	0	0.000	
0275/426		0	0	0	0.000	
0274/427		100	1630	1531	28.706	
0273/428		0	0	0	0.000	
0272/429		0	0	0	0.000	
0271/430		0	0	0	0.000	
0270/431		0	0	0	0.000	
0269/432		0	0	0	0.000	

Total kms for day: 72.787 Accumulated total to date 72.787

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 17/08/89

Code		HH:MM	Percent
P01	Recording Time	30:17	14.02
P02	Line Change	22:00	10.19
P14	Radio Nav. Fail	07:51	3.63
P16	Nav Calibration	55:01	25.47
P17	Travel Time	04:46	2.21
P18	Travel T/F Port	19:54	9.21
P19	In Port	23:15	10.76
P20	Deploy /Recover	38:01	17.60
P25	Extended L/C	14:55	6.91

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	30:17	14.02
OPERATIONAL TIME	83:38	38.72
STANDBY	51:51	24.00
CONTRACTOR	50:14	23.26
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	216:00	
TOTAL Kms	258.356	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
18/08/89						
00:00	05:13	20	14	C	Repair P-8 antenna, Stbd cable	05:13
05:13	06:05	25	13	C	Rho unable to shoot,cable lkge	00:52
06:05	06:12	01	10	C	Line F0574*S1	00:07
06:12	06:28	02	02	C	Line Change after Reshoot.	00:16
06:28	06:41	01	08	O	Line F0574*S2	00:13
06:41	07:07	02	02	O	L-C after chargeable reshoot	00:26
07:07	07:27	01	15	C	Line F0574*S3	00:20
07:27	11:26	02	02	C	L-C after non-chargble reshoot	03:59
11:26	24:00	07	09	S	Standby for weather.	12:34

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 18/08/89 To 18/08/89

Code		HH:MM	Percent
P01	Recording Time	00:40	2.78
P02	Line Change	04:41	19.51
P07	Weather Standby	12:34	52.36
P20	Deploy /Recover	05:13	21.74
P25	Extended L/C	00:52	3.61

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	00:39	2.71
STANDBY	12:34	52.36
CONTRACTOR	10:47	44.93
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

18/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0574*S1	90					Cntr Downtime
0574/129		0	0	0	0.000	
/130		0	0	0	0.000	
/131		0	0	0	0.000	
/132		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0574*S2	90					Non Cntr Downtime
0574/133		0	0	0	0.000	
/134		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0574*S3	90					Cntr Downtime
0574/137		0	0	0	0.000	
/138		0	0	0	0.000	
/139		0	0	0	0.000	
/140		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	

18/08/89
No production

Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 18/08/89

Code		HH:MM	Percent
P01	Recording Time	30:57	12.90
P02	Line Change	26:41	11.12
P07	Weather Standby	12:34	5.24
P14	Radio Nav. Fail	07:51	3.27
P16	Nav Calibration	55:01	22.92
P17	Travel Time	04:46	1.99
P18	Travel T/F Port	19:54	8.29
P19	In Port	23:15	9.69
P20	Deploy /Recover	43:14	18.01
P25	Extended L/C	15:47	6.58

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	30:17	12.62
OPERATIONAL TIME	84:17	35.12
STANDBY	64:25	26.84
CONTRACTOR	61:01	25.42
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	240:00	
TOTAL Kms	258.356	

DAILY TIME LOG

GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
19/08/89						
00:00	00:52	07	09	S	Standby for weather.	00:52
00:52	03:12	01	01	P	Line F0214-S	02:20
03:12	05:12	02	02	O	Normal line change	02:00
05:12	05:58	25	08	S	Wait for tides	00:46
05:58	09:15	01	01	P	Line F0598-S	03:17
09:15	11:15	02	02	O	Allocated 2hr line change time	02:00
11:15	12:10	25	08	S	Extended to wait for tides.	00:55
12:10	15:33	01	01	P	Line F0286-S	03:23
15:33	17:33	02	02	O	Allocated 2hr line change time	02:00
17:33	18:20	25	08	S	Extended to wait for tides.	00:47
18:20	21:40	01	01	P	Line F0538-S	03:20
21:40	23:40	02	02	O	Allocated 2hr line change time	02:00
23:40	24:00	25	08	S	Extended to wait for tides.	00:20

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 19/08/89 To 19/08/89

Code		HH:MM	Percent
P01	Recording Time	12:20	51.39
P02	Line Change	08:00	33.33
P07	Weather Standby	00:52	3.61
P25	Extended L/C	02:48	11.67

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	12:20	51.39
OPERATIONAL TIME	08:00	33.33
STANDBY	03:40	15.28
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	106.313	

19/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0214-S	270					Incomplete
216/485		0	0	0	0.000	
215/486		0	0	0	0.000	
214/487		554	1630	1077	20.194	
213/488		0	0	0	0.000	
212/489		0	0	0	0.000	
211/490		0	0	0	0.000	
210/491		0	0	0	0.000	
209/492		0	0	0	0.000	
F0598-S	90					Complete
0604/097		0	0	0	0.000	
0603/098		0	0	0	0.000	
0602/099		0	0	0	0.000	
0601/100		0	0	0	0.000	
0600/101		0	0	0	0.000	
0599/102		0	0	0	0.000	
0598/103		100	1630	1531	28.706	
0597/104		0	0	0	0.000	
F0286-S	270					Complete
0288/413		0	0	0	0.000	
0287/414		0	0	0	0.000	
0286/415		100	1630	1531	28.706	
0285/416		0	0	0	0.000	
0284/417		0	0	0	0.000	
0283/418		0	0	0	0.000	
0282/419		0	0	0	0.000	
0281/420		0	0	0	0.000	
F0538-S	90					Complete
0544/157		0	0	0	0.000	
0543/158		0	0	0	0.000	
0542/159		0	0	0	0.000	
0541/160		0	0	0	0.000	
0540/161		0	0	0	0.000	
0539/162		0	0	0	0.000	
0538/163		100	1630	1531	28.706	
0537/164		0	0	0	0.000	

Total kms for day: 106.313 Accumulated total to date 106.313

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 19/08/89

Code		HH:MM	Percent
P01	Recording Time	43:17	16.40
P02	Line Change	34:41	13.14
P07	Weather Standby	13:26	5.09
P14	Radio Nav. Fail	07:51	2.97
P16	Nav Calibration	55:01	20.84
P17	Travel Time	04:46	1.81
P18	Travel T/F Port	19:54	7.54
P19	In Port	23:15	8.81
P20	Deploy /Recover	43:14	16.38
P25	Extended L/C	18:35	7.04

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	42:37	16.14
OPERATIONAL TIME	92:17	34.96
STANDBY	68:05	25.79
CONTRACTOR	61:01	23.11
DISPUTED	00:00	0.00
	00:00	0.00

TOTAL Time	264:00
TOTAL Kms	364.669

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
20/08/89						
00:00	00:33	25	08	S	Extended to wait for tides.	00:33
00:33	04:02	01	01	P	Line F0202-S	03:29
04:02	06:02	02	02	O	Allocated 2hr line change time	02:00
06:02	06:41	25	08	S	Extended to wait for tides.	00:39
06:41	09:58	01	01	P	Line F0610-S	03:17
09:58	11:58	02	02	O	Allocated 2hr line change time	02:00
11:58	12:55	25	08	S	Extended to wait for tide.	00:57
12:55	16:14	01	01	P	Line F0298-S	03:19
16:14	18:14	02	02	O	Allocated 2hr line change time	02:00
18:14	19:04	25	08	S	Extended to wait for tide.	00:50
19:04	22:23	01	01	P	Line F0526-S	03:19
22:23	24:00	02	02	O	Allocated 2hr line change time	01:37

PRODUCTION LOG GECO SIGMA

20/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0202-S	270					Complete
0204/497		0	0	0	0.000	
0203/498		0	0	0	0.000	
0202/499		100	1630	1531	28.706	
0201/500		0	0	0	0.000	
0200/501		0	0	0	0.000	
0199/502		0	0	0	0.000	
0198/503		0	0	0	0.000	
0197/504		0	0	0	0.000	
F0610-S	90					Complete
0616/085		0	0	0	0.000	
0615/086		0	0	0	0.000	
0614/087		0	0	0	0.000	
0613/088		0	0	0	0.000	
0612/089		0	0	0	0.000	
0611/090		0	0	0	0.000	
0610/091		100	1630	1531	28.706	
0609/092		0	0	0	0.000	
F0298-S	270					Complete
0300/401		0	0	0	0.000	
0299/402		0	0	0	0.000	
0298/403		100	1630	1531	28.706	
0297/404		0	0	0	0.000	
0296/405		0	0	0	0.000	
0295/406		0	0	0	0.000	
0294/407		0	0	0	0.000	
0293/408		0	0	0	0.000	
F0526-S	90					Complete
0532/169		0	0	0	0.000	
0531/170		0	0	0	0.000	
0530/171		0	0	0	0.000	
0529/172		0	0	0	0.000	
0528/173		0	0	0	0.000	
0527/174		0	0	0	0.000	
0526/175		100	1630	1531	28.706	
0525/176		0	0	0	0.000	
Total kms for day:		114.825		Accumulated total to date		114.825

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 20/08/89 To 20/08/89

Code		HH:MM	Percent
P01	Recording Time	13:24	55.83
P02	Line Change	07:37	31.74
P25	Extended L/C	02:59	12.43

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	13:24	55.83
OPERATIONAL TIME	07:37	31.74
STANDBY	02:59	12.43
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	114.825	

GECO SIGMA

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 20/08/89

Code		HH:MM	Percent
P01	Recording Time	56:41	19.68
P02	Line Change	42:18	14.69
P07	Weather Standby	13:26	4.66
P14	Radio Nav. Fail	07:51	2.73
P16	Nav Calibration	55:01	19.10
P17	Travel Time	04:46	1.66
P18	Travel T/F Port	19:54	6.91
P19	In Port	23:15	8.07
P20	Deploy /Recover	43:14	15.01
P25	Extended L/C	21:34	7.49

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	56:01	19.45
OPERATIONAL TIME	99:54	34.69
STANDBY	71:04	24.68
CONTRACTOR	61:01	21.19
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	288:00	
TOTAL Kms	479.494	

DAILY TIME LOG — GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
21/08/89						
00:00	00:23	02	02	O	Allocated 2hr line change time	00:23
00:23	01:19	25	08	S	Extended to wait for tide.	00:56
01:19	04:43	01	01	P	Line F0190-S	03:24
04:43	06:43	02	02	O	Allocated 2hr line change time	02:00
06:43	07:30	25	08	S	Extended to wait for tide.	00:47
07:30	10:46	01	01	P	Line F0622-S	03:16
10:46	12:46	02	02	O	Allocated 2hr line change time	02:00
12:46	13:41	25	08	S	Extended to wait for tide.	00:55
13:41	17:04	01	01	P	Line F0310-S	03:23
17:04	19:04	02	02	O	Allocated 2hr line change time	02:00
19:04	19:50	25	08	S	Extended to wait for tide.	00:46
19:50	23:08	01	01	P	Line F0514-S	03:18
23:08	24:00	02	02	O	Allocated 2hr line change time	00:52

21/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0190-S	270					Complete
0192/509		0	0	0	0.000	
0191/510		0	0	0	0.000	
0190/511		100	1630	1531	28.706	
0189/512		0	0	0	0.000	
0188/513		0	0	0	0.000	
0187/514		0	0	0	0.000	
0186/515		0	0	0	0.000	
0185/516		0	0	0	0.000	
F0622-S	90					Complete
0628/073		0	0	0	0.000	
0627/074		0	0	0	0.000	
0626/075		0	0	0	0.000	
0625/076		0	0	0	0.000	
0624/077		0	0	0	0.000	
0623/078		0	0	0	0.000	
0622/079		100	1630	1531	28.706	
0621/080		0	0	0	0.000	
F0310-S	270					Complete
0312/389		0	0	0	0.000	
0311/390		0	0	0	0.000	
0310/391		100	1630	1531	28.706	
0309/392		0	0	0	0.000	
0308/393		0	0	0	0.000	
0307/394		0	0	0	0.000	
0306/395		0	0	0	0.000	
0305/396		0	0	0	0.000	
F0514-S	90					Complete
0520/181		0	0	0	0.000	
0519/182		0	0	0	0.000	
0518/183		0	0	0	0.000	
0517/184		0	0	0	0.000	
0516/185		0	0	0	0.000	
0515/186		0	0	0	0.000	
0514/187		100	1630	1531	28.706	
0513/188		0	0	0	0.000	

Total kms for day: 114.825 Accumulated total to date 114.825

BY ACTIVITY

From 21/08/89 To 21/08/89

Code		HH:MM	Percent
P01	Recording Time	13:21	55.63
P02	Line Change	07:15	30.21
P25	Extended L/C	03:24	14.17

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	13:21	55.63
OPERATIONAL TIME	07:15	30.21
STANDBY	03:24	14.17
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	114.825	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 21/08/89

Code		HH:MM	Percent
P01	Recording Time	70:02	22.45
P02	Line Change	49:33	15.88
P07	Weather Standby	13:26	4.31
P14	Radio Nav. Fail	07:51	2.52
P16	Nav Calibration	55:01	17.63
P17	Travel Time	04:46	1.53
P18	Travel T/F Port	19:54	6.38
P19	In Port	23:15	7.45
P20	Deploy /Recover	43:14	13.86
P25	Extended L/C	24:58	8.00

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	69:22	22.23
OPERATIONAL TIME	107:09	34.34
STANDBY	74:28	23.87
CONTRACTOR	61:01	19.56
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	312:00	
TOTAL Kms	594.319	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
22/08/89						
00:00	01:08	02	02	O	Allocated 2hr line change time	01:08
01:08	02:08	25	08	S	Extended to wait for tide.	01:00
02:08	05:29	01	01	P	Line F0178-S	03:21
05:29	07:29	02	02	O	Allocated 2hr line change time	02:00
07:29	08:19	25	08	S	Wait for tide slot.	00:50
08:19	11:40	01	01	P	Line F0634-S	03:21
11:40	13:40	02	02	O	Allocated 2 Hour line change	02:00
13:40	14:29	25	08	S	Extended to wait for tide.	00:49
14:29	17:51	01	01	P	Line F0322-S	03:22
17:51	19:51	02	02	O	Allocated 2hr line change time	02:00
19:51	20:38	25	08	S	Extended to wait for tide.	00:47
20:38	24:00	20	27	C	Crew Change.	03:22

22/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0178-S	270					Incomplete
0180/521		0	0	0	0.000	
0179/522		0	0	0	0.000	
0178/523		100	1630	1531	28.706	
0177/524		0	0	0	0.000	
0176/525		0	0	0	0.000	
0175/526		0	0	0	0.000	
0174/527		0	0	0	0.000	
0173/528		0	0	0	0.000	
F0634-S	90					Complete
0639/62		0	0	0	0.000	
0638/63		0	0	0	0.000	
0637/64		0	0	0	0.000	
0636/65		0	0	0	0.000	
0635/66		0	0	0	0.000	
0634/67		100	1630	1531	28.706	
0633/68		0	0	0	0.000	
0633/68		0	0	0	0.000	
F0322-S	270					Complete
0324/377		0	0	0	0.000	
0323/378		0	0	0	0.000	
0322/379		100	1630	1531	28.706	
0321/380		0	0	0	0.000	
0320/381		0	0	0	0.000	
0319/382		0	0	0	0.000	
0318/383		0	0	0	0.000	
0317/384		0	0	0	0.000	

Total kms for day: 86.119 Accumulated total to date 86.119

PRODUCTION/DOWNTIME
BY ACTIVITY

BECO SIGMA

From 22/08/89 To 22/08/89

Code		HH:MM	Percent
P01	Recording Time	10:04	41.94
P02	Line Change	07:08	29.72
P20	Deploy /Recover	03:22	14.03
P25	Extended L/C	03:26	14.31

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	10:04	41.94
OPERATIONAL TIME	07:08	29.72
STANDBY	03:26	14.31
CONTRACTOR	03:22	14.03
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	86.119	

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 22/08/89

Code		HH:MM	Percent
P01	Recording Time	80:06	23.84
P02	Line Change	56:41	16.87
P07	Weather Standby	13:26	4.00
P14	Radio Nav. Fail	07:51	2.34
P16	Nav Calibration	55:01	16.37
P17	Travel Time	04:46	1.42
P18	Travel T/F Port	19:54	5.92
P19	In Port	23:15	6.92
P20	Deploy /Recover	46:36	13.87
P25	Extended L/C	28:24	8.45

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	79:26	23.64
OPERATIONAL TIME	114:17	34.01
STANDBY	77:54	23.18
CONTRACTOR	64:23	19.16
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	336:00	
TOTAL Kms	680.437	

DAILY TIME LOG

GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
23/08/89						
00:00	17:00	17	27	C	Transit and crew change.	17:00
17:00	24:00	20	27	C	Re-deploying equipment.	07:00

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 23/08/89 To 23/08/89

Code		HH:MM	Percent
P17	Travel Time	17:00	70.83
P20	Deploy /Recover	07:00	29.17

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	00:00	0.00
STANDBY	00:00	0.00
CONTRACTOR	24:00	100.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

23/08/89
No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 23/08/89

Code		HH:MM	Percent
P01	Recording Time	80:06	22.25
P02	Line Change	56:41	15.75
P07	Weather Standby	13:26	3.73
P14	Radio Nav. Fail	07:51	2.18
P16	Nav Calibration	55:01	15.28
P17	Travel Time	21:46	6.05
P18	Travel T/F Port	19:54	5.53
P19	In Port	23:15	6.46
P20	Deploy /Recover	53:36	14.89
P25	Extended L/C	28:24	7.89

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	79:26	22.06
OPERATIONAL TIME	114:17	31.75
STANDBY	77:54	21.64
CONTRACTOR	88:23	24.55
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	360:00	
TOTAL Kms	680.437	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
24/08/89						
00:00	03:00	20	27	C	Nominal time, cable deployment	03:00
03:00	05:00	20	27	C	Nominal time, gun deployment	02:00
05:00	08:00	20	13	C	Nominal time, rewiring lead-in	03:00
08:00	23:00	14	14	C	Nominal, P-8 tailbuoy failure	15:00
23:00	24:00	07	07	S	Weather standby. W 6 Sea 2-4m	01:00

PRODUCTION/DOWNTIME BY ACTIVITY

From 24/08/89 To 24/08/89

Code		HH:MM	Percent
P07	Weather Standby	01:00	4.17
P14	Radio Nav. Fail	15:00	62.50
P20	Deploy /Recover	08:00	33.33

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	00:00	0.00
STANDBY	01:00	4.17
CONTRACTOR	23:00	95.83
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

PRODUCTION LOG GECO SIGMA

24/08/89

No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 24/08/89

Code		HH:MM	Percent
P01	Recording Time	79:26	21.03
P02	Line Change	52:00	13.76
P07	Weather Standby	14:26	3.82
P14	Radio Nav. Fail	22:51	6.05
P16	Nav Calibration	55:01	14.56
P17	Travel Time	21:46	5.76
P18	Travel T/F Port	19:54	5.27
P19	In Port	23:15	6.15
P20	Deploy /Recover	61:36	16.31
P25	Extended L/C	27:32	7.29

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	79:26	21.03
OPERATIONAL TIME	113:38	30.08
STANDBY	78:54	20.88
CONTRACTOR	105:49	28.01
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	377:47	
TOTAL Kms	680.437	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
25/08/89						
00:00	05:04	07	07	S	Standby for weather.	05:04
05:04	24:00	20	13	C	Cable work and deployment.	18:56

From 25/08/89 To 25/08/89

Code		HH:MM	Percent
P07	Weather Standby	05:04	21.11
P20	Deploy /Recover	18:56	78.89

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	00:00	0.00
STANDBY	05:04	21.11
CONTRACTOR	18:56	78.89
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

PRODUCTION LOG GECO SIGMA

25/08/89
No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 25/08/89

Code		HH:MM	Percent
P01	Recording Time	80:06	19.63
P02	Line Change	56:41	13.89
P07	Weather Standby	19:30	4.78
P14	Radio Nav. Fail	22:51	5.60
P16	Nav Calibration	55:01	13.48
P17	Travel Time	21:46	5.33
P18	Travel T/F Port	19:54	4.88
P19	In Port	23:15	5.70
P20	Deploy /Recover	80:32	19.74
P25	Extended L/C	28:24	6.96

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	79:26	19.47
OPERATIONAL TIME	114:17	28.01
STANDBY	83:58	20.58
CONTRACTOR	130:19	31.94
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	408:00	
TOTAL Kms	680.437	

DAILY TIME LOG — GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
26/08/89						
00:00	03:31	01	01	P	Line F0334-S	03:31
03:31	05:31	02	02	O	Allocated 2hr line change time	02:00
05:31	06:32	25	08	S	Extended to wait for tide.	01:01
06:32	09:57	01	01	P	Line F0502-S	03:25
09:57	11:57	02	02	O	Allocated 2hr line change time	02:00
11:57	13:07	25	08	S	Extended to wait for tides.	01:10
13:07	16:42	01	01	P	Line F0166-S	03:35
16:42	18:42	02	02	O	Allocated 2hr line change time	02:00
18:42	19:11	25	08	S	Extended L-C to wait for tide	00:29
19:11	22:42	01	01	P	Line F0646-S	03:31
22:42	24:00	02	02	O	Allocated 2hr line change time	01:18

BY ACTIVITY

From 26/08/89 To 26/08/89

Code		HH:MM	Percent
P01	Recording Time	14:02	58.47
P02	Line Change	07:18	30.42
P25	Extended L/C	02:40	11.11

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	14:02	58.47
OPERATIONAL TIME	07:18	30.42
STANDBY	02:40	11.11
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	114.825	

26/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0334-S	270					Complete
0336/365		0	0	0	0.000	
0335/366		0	0	0	0.000	
0334/367		100	1630	1531	28.706	
0333/368		0	0	0	0.000	
0332/369		0	0	0	0.000	
0331/370		0	0	0	0.000	
0330/371		0	0	0	0.000	
0329/372		0	0	0	0.000	
F0502-S	90					Complete
0508/193		0	0	0	0.000	
0507/194		0	0	0	0.000	
0506/195		0	0	0	0.000	
0505/196		0	0	0	0.000	
0504/197		0	0	0	0.000	
0503/198		0	0	0	0.000	
0502/199		100	1630	1531	28.706	
0501/200		0	0	0	0.000	
F0166-S	270					Complete
0168/533		0	0	0	0.000	
0167/534		0	0	0	0.000	
0166/535		100	1630	1531	28.706	
0165/536		0	0	0	0.000	
0164/537		0	0	0	0.000	
0163/538		0	0	0	0.000	
0162/539		0	0	0	0.000	
0161/540		0	0	0	0.000	
F0646-S	90					Complete
0652/049		0	0	0	0.000	
0651/050		0	0	0	0.000	
0650/051		0	0	0	0.000	
0649/052		0	0	0	0.000	
0648/053		0	0	0	0.000	
0647/054		0	0	0	0.000	
0646/055		100	1630	1531	28.706	
0645/056		0	0	0	0.000	

Total kms for day: 114.825 Accumulated total to date 114.825

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 26/08/89

Code		HH:MM	Percent
P01	Recording Time	94:08	21.79
P02	Line Change	63:59	14.81
P07	Weather Standby	19:30	4.51
P14	Radio Nav. Fail	22:51	5.29
P16	Nav Calibration	55:01	12.74
P17	Travel Time	21:46	5.04
P18	Travel T/F Port	19:54	4.61
P19	In Port	23:15	5.38
P20	Deploy /Recover	80:32	18.64
P25	Extended L/C	31:04	7.19

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	93:28	21.64
OPERATIONAL TIME	121:35	28.14
STANDBY	86:38	20.05
CONTRACTOR	130:19	30.17
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	432:00	
TOTAL Kms	795.262	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
27/08/89						
00:00	00:42	02	02	O	Allocated 2hr line change time	00:42
00:42	01:16	25	08	S	Extended L-C to wait for tide	00:34
01:16	04:51	01	01	P	Line F0346-S	03:35
04:51	06:51	02	02	O	Allocated 2hr line change time	02:00
06:51	07:46	25	08	S	Extended L-C to wait for tide	00:55
07:46	11:15	01	01	P	Line F0490-S	03:29
11:15	13:15	02	02	O	Allocated 2hr line change time	02:00
13:15	14:14	25	08	S	Extended L-C to wait for tide	00:59
14:14	17:42	01	01	P	Line F0154-S	03:28
17:42	19:42	02	02	O	Allocated 2hr line change time	02:00
19:42	20:18	25	08	S	Extended L-C to next tide slot	00:36
20:18	24:00	07	09	S	Weather standby. North 7-8	03:42

27/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0346-S	270					Complete
0348/353		0	0	0	0.000	
0347/354		0	0	0	0.000	
0346/355		100	1630	1531	28.706	
0345/356		0	0	0	0.000	
0344/357		0	0	0	0.000	
0343/358		0	0	0	0.000	
0342/359		0	0	0	0.000	
0341/360		0	0	0	0.000	
F0490-S	90					Complete
0496/205		0	0	0	0.000	
0495/206		0	0	0	0.000	
0494/207		0	0	0	0.000	
0493/208		0	0	0	0.000	
0492/209		0	0	0	0.000	
0491/210		0	0	0	0.000	
0490/211		100	1630	1531	28.706	
0489/212		0	0	0	0.000	
F0154-S	270					Complete
0156/545		0	0	0	0.000	
0155/546		0	0	0	0.000	
0154/547		100	1630	1531	28.706	
0153/548		0	0	0	0.000	
0152/549		0	0	0	0.000	
0151/550		0	0	0	0.000	
0150/551		0	0	0	0.000	
0149/552		0	0	0	0.000	
Total kms for day:			86.119	Accumulated total to date		86.119

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 27/08/89 To 27/08/89

Code		HH:MM	Percent
P01	Recording Time	10:32	43.89
P02	Line Change	06:42	27.92
P07	Weather Standby	03:42	15.42
P25	Extended L/C	03:04	12.78

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	10:32	43.89
OPERATIONAL TIME	06:42	27.92
STANDBY	06:46	28.19
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	86.119	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 27/08/89

Code		HH:MM	Percent
P01	Recording Time	104:40	22.95
P02	Line Change	70:41	15.50
P07	Weather Standby	23:12	5.09
P14	Radio Nav. Fail	22:51	5.01
P16	Nav Calibration	55:01	12.07
P17	Travel Time	21:46	4.77
P18	Travel T/F Port	19:54	4.36
P19	In Port	23:15	5.10
P20	Deploy /Recover	80:32	17.66
P25	Extended L/C	34:08	7.49

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	104:00	22.81
OPERATIONAL TIME	128:17	28.13
STANDBY	93:24	20.48
CONTRACTOR	130:19	28.58
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	456:00	
TOTAL Kms	881.381	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
28/08/89						
00:00	08:42	07	09	S	Cables on surface, swell noise	08:42
08:42	12:19	01	01	P	Line F0478-S	03:37
12:19	14:19	02	02	O	Allocated 2hr line change time	02:00
14:19	15:02	25	08	S	Extended L-C to wait for tide	00:43
15:02	21:07	07	09	S	Swell.Unable to control cables	06:05
21:07	24:00	01	01	P	Line F0658-S	02:53

28/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0478-S	90					Complete
0484/217		0	0	0	0.000	
0483/218		0	0	0	0.000	
0482/219		0	0	0	0.000	
0481/220		0	0	0	0.000	
0480/221		0	0	0	0.000	
0479/222		0	0	0	0.000	
0478/223		100	1630	1531	28.706	
0477/224		0	0	0	0.000	
F0658-S	90					Complete
0664/037		0	0	0	0.000	
0663/038		0	0	0	0.000	
0662/039		0	0	0	0.000	
0661/040		0	0	0	0.000	
0660/041		0	0	0	0.000	
0659/042		0	0	0	0.000	
0658/043		100	1330	1231	23.081	
0657/044		0	0	0	0.000	

Total kms for day: 51.788 Accumulated total to date 51.788

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 28/08/89 To 28/08/89

Code		HH:MM	Percent
P01	Recording Time	06:30	27.08
P02	Line Change	02:00	8.33
P07	Weather Standby	14:47	61.60
P25	Extended L/C	00:43	2.99

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	06:30	27.08
OPERATIONAL TIME	02:00	8.33
STANDBY	15:30	64.58
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	51.788	

BY ACTIVITY

From 09/08/89 To 28/08/89

Code		HH:MM	Percent
P01	Recording Time	111:10	23.16
P02	Line Change	72:41	15.14
P07	Weather Standby	37:59	7.91
P14	Radio Nav. Fail	22:51	4.76
P16	Nav Calibration	55:01	11.46
P17	Travel Time	21:46	4.53
P18	Travel T/F Port	19:54	4.15
P19	In Port	23:15	4.84
P20	Deploy /Recover	80:32	16.78
P25	Extended L/C	34:51	7.26

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	110:30	23.02
OPERATIONAL TIME	130:17	27.14
STANDBY	108:54	22.69
CONTRACTOR	130:19	27.15
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	480:00	
TOTAL Kms	933.169	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
29/08/89						
00:00	00:43	01	01	P	Line F0658-S	00:43
00:43	02:43	02	02	O	Allocated 2hr line change time	02:00
02:43	03:09	25	08	S	Time to projected SOL time.	00:26
03:09	15:42	15	15	C	Hyperfix receiver failure.	12:33
15:42	19:17	01	01	P	Line F0142-S	03:35
19:17	21:17	02	02	O	Allocated 2hr line change time	02:00
21:17	21:48	25	08	S	Extended L-C to wait for tide	00:31
21:48	24:00	01	01	P	Line F0670-S	02:12

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 29/08/89 To 29/08/89

Code		HH:MM	Percent
P01	Recording Time	06:30	27.08
P02	Line Change	04:00	16.67
P15	Nav.Equip. Fail	12:33	52.29
P25	Extended L/C	00:57	3.96

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	06:30	27.08
OPERATIONAL TIME	04:00	16.67
STANDBY	00:57	3.96
CONTRACTOR	12:33	52.29
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	51.675	

29/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0658-S	90					Complete
0664/037		0	0	0	0.000	
0663/038		0	0	0	0.000	
0662/039		0	0	0	0.000	
0661/040		0	0	0	0.000	
0660/041		0	0	0	0.000	
0659/042		0	0	0	0.000	
0658/043		1331	1630	300	5.625	
0657/044		0	0	0	0.000	
F0142-S	270					Complete
0144/557		0	0	0	0.000	
0143/558		0	0	0	0.000	
0142/559		100	1630	1531	28.706	
0141/560		0	0	0	0.000	
0140/561		0	0	0	0.000	
0139/562		0	0	0	0.000	
0138/563		0	0	0	0.000	
0137/564		0	0	0	0.000	
F0670-S	90					Complete
0676/025		0	0	0	0.000	
0675/026		0	0	0	0.000	
0674/027		0	0	0	0.000	
0673/028		0	0	0	0.000	
0672/029		0	0	0	0.000	
0671/030		0	0	0	0.000	
0670/031		100	1024	925	17.344	
0669/032		0	0	0	0.000	

Total kms for day: 51.675 Accumulated total to date 51.675

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 29/08/89

Code		HH:MM	Percent
P01	Recording Time	117:40	23.35
P02	Line Change	76:41	15.21
P07	Weather Standby	37:59	7.54
P14	Radio Nav. Fail	22:51	4.53
P15	Nav.Equip. Fail	12:33	2.49
P16	Nav Calibration	55:01	10.92
P17	Travel Time	21:46	4.32
P18	Travel T/F Port	19:54	3.95
P19	In Port	23:15	4.61
P20	Deploy /Recover	80:32	15.98
P25	Extended L/C	35:48	7.10

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	117:00	23.21
OPERATIONAL TIME	134:17	26.64
STANDBY	109:51	21.80
CONTRACTOR	142:52	28.35
DISPUTED	00:00	0.00
	00:00	0.00

TOTAL Time	504:00
TOTAL Kms	984.844

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
30/08/89						
00:00	01:29	01	01	P	Line F0670-S	01:29
01:29	03:29	02	02	O	Allocated 2hr line change time	02:00
03:29	03:53	25	08	S	Extended L-C to wait for tide.	00:24
03:53	07:29	01	01	P	Line F0358-S	03:36
07:29	09:29	02	02	O	Allocated 2hr line change time	02:00
09:29	10:06	25	08	S	Extended L-C to wait for tide	00:37
10:06	13:44	01	01	P	Line F0466-S	03:38
13:44	15:44	02	02	O	Allocated 2hr line change time	02:00
15:44	16:21	25	08	S	Extended L-C to wait for tide.	00:37
16:21	19:56	01	01	P	Line F0130-S	03:35
19:56	21:56	02	02	O	Allocated 2hr line change time	02:00
21:56	22:31	25	08	S	Extended L-C to wait for tide	00:35
22:31	24:00	01	01	P	Line F0682-S	01:29

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 30/08/89 To 30/08/89

Code		HH:MM	Percent
P01	Recording Time	13:47	57.43
P02	Line Change	08:00	33.33
P25	Extended L/C	02:13	9.24

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	13:47	57.43
OPERATIONAL TIME	08:00	33.33
STANDBY	02:13	9.24
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	109.106	

30/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0670-S	90					Complete
0676/025		0	0	0	0.000	
0675/026		0	0	0	0.000	
0674/027		0	0	0	0.000	
0673/028		0	0	0	0.000	
0672/029		0	0	0	0.000	
0671/030		0	0	0	0.000	
0670/031		1025	1630	606	11.363	
0669/032		0	0	0	0.000	
F0358-S	270					Complete
0360/341		0	0	0	0.000	
0359/342		0	0	0	0.000	
0358/343		100	1630	1531	28.706	
0357/344		0	0	0	0.000	
0356/345		0	0	0	0.000	
0355/346		0	0	0	0.000	
0354/347		0	0	0	0.000	
0353/348		0	0	0	0.000	
F0466-S	90					Complete
0472/229		0	0	0	0.000	
0471/230		0	0	0	0.000	
0470/231		0	0	0	0.000	
0469/232		0	0	0	0.000	
0468/233		0	0	0	0.000	
0467/234		0	0	0	0.000	
0466/235		100	1630	1531	28.706	
0465/236		0	0	0	0.000	
F0130-S	270					Complete
0132/569		0	0	0	0.000	
0131/570		0	0	0	0.000	
0130/571		100	1630	1531	28.706	
0129/572		0	0	0	0.000	
0128/573		0	0	0	0.000	
0127/574		0	0	0	0.000	
0126/575		0	0	0	0.000	
0125/576		0	0	0	0.000	
F0682-S	90					Complete
0688/013		0	0	0	0.000	
0687/014		0	0	0	0.000	
0606/015		0	0	0	0.000	
0685/016		0	0	0	0.000	
0684/017		0	0	0	0.000	
0683/018		0	0	0	0.000	
0682/019		100	719	620	11.625	
0681/020		0	0	0	0.000	

Total kms for day: 109.106 Accumulated total to date 109.106

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 30/08/89

Code		HH:MM	Percent
P01	Recording Time	131:27	24.90
P02	Line Change	84:41	16.04
P07	Weather Standby	37:59	7.19
P14	Radio Nav. Fail	22:51	4.33
P15	Nav.Equip. Fail	12:33	2.38
P16	Nav Calibration	55:01	10.42
P17	Travel Time	21:46	4.12
P18	Travel T/F Port	19:54	3.77
P19	In Port	23:15	4.40
P20	Deploy /Recover	80:32	15.25
P25	Extended L/C	38:01	7.20

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	130:47	24.77
OPERATIONAL TIME	142:17	26.95
STANDBY	112:04	21.22
CONTRACTOR	142:52	27.06
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	528:00	
TOTAL Kms	1093.950	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
31/08/89						
00:00	02:10	01	01	P	Line F0682-S	02:10
02:10	04:10	02	02	O	Allocated 2hr line change time	02:00
04:10	04:38	25	08	S	Extended L-C to wait for tide	00:28
04:38	08:17	01	01	P	Line F0370-S	03:39
08:17	10:17	02	02	O	Allocated 2hr line change time	02:00
10:17	10:49	25	08	S	Extended L-C to wait for tide	00:32
10:49	14:28	01	01	P	Line F0454-S	03:39
14:28	16:28	02	02	O	Allocated 2hr line change time	02:00
16:28	17:00	25	08	S	Extended L-C to wait for tide	00:32
17:00	20:38	01	01	P	Line F0118-S	03:38
20:38	22:38	02	02	O	Allocated 2hr line change time	02:00
22:38	23:11	25	08	S	Extended L-C to wait for tide	00:33
23:11	24:00	01	01	P	Line F0694-S	00:49

31/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0682-S	90					Complete
0688/013		0	0	0	0.000	
0687/014		0	0	0	0.000	
0686/015		0	0	0	0.000	
0685/016		0	0	0	0.000	
0684/017		0	0	0	0.000	
0683/018		0	0	0	0.000	
0682/019		720	1630	911	17.081	
0681/020		0	0	0	0.000	
F0370-S	270					Complete
0372/329		0	0	0	0.000	
0371/330		0	0	0	0.000	
0370/331		100	1630	1531	28.706	
0369/332		0	0	0	0.000	
0368/333		0	0	0	0.000	
0367/334		0	0	0	0.000	
0366/335		0	0	0	0.000	
0365/336		0	0	0	0.000	
F0454-S	90					Complete
0460/241		0	0	0	0.000	
0459/242		0	0	0	0.000	
0458/243		0	0	0	0.000	
0457/244		0	0	0	0.000	
0456/245		0	0	0	0.000	
0455/246		0	0	0	0.000	
0454/247		100	1630	1531	28.706	
0453/248		0	0	0	0.000	
F0118-S	270					Complete
0120/581		0	0	0	0.000	
0119/582		0	0	0	0.000	
0118/583		100	1630	1531	28.706	
0117/584		0	0	0	0.000	
0116/585		0	0	0	0.000	
0115/586		0	0	0	0.000	
0114/587		0	0	0	0.000	
0113/588		0	0	0	0.000	
F0694-S	90					Complete
0700/001		0	0	0	0.000	
0699/002		0	0	0	0.000	
0698/003		0	0	0	0.000	
0697/004		0	0	0	0.000	
0696/005		0	0	0	0.000	
0695/006		0	0	0	0.000	
0694/007		100	437	338	6.337	
0693/008		0	0	0	0.000	

Total kms for day: 109.538 Accumulated total to date 109.538

PRODUCTION/DOWNTIME BY ACTIVITY

From 31/08/89 To 31/08/89

Code		HH:MM	Percent
P01	Recording Time	13:55	57.99
P02	Line Change	08:00	33.33
P25	Extended L/C	02:05	8.68

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	13:55	57.99
OPERATIONAL TIME	08:00	33.33
STANDBY	02:05	8.68
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	109.538	

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 31/08/89

Code		HH:MM	Percent
P01	Recording Time	145:22	26.33
P02	Line Change	92:41	16.79
P07	Weather Standby	37:59	6.88
P14	Radio Nav. Fail	22:51	4.14
P15	Nav.Equip. Fail	12:33	2.27
P16	Nav Calibration	55:01	9.97
P17	Travel Time	21:46	3.94
P18	Travel T/F Port	19:54	3.61
P19	In Port	23:15	4.21
P20	Deploy /Recover	80:32	14.59
P25	Extended L/C	40:06	7.26

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	144:42	26.21
OPERATIONAL TIME	150:17	27.23
STANDBY	114:09	20.68
CONTRACTOR	142:52	25.88
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	552:00	
TOTAL Kms	1203.487	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
01/09/89						
00:00	02:52	01	01	P	Line F0694-S	02:52
02:52	04:52	02	02	O	Allocated 2hr line change time	02:00
04:52	05:21	25	08	S	Extended L-C to wait for tide	00:29
05:21	09:00	01	01	P	Line F0382-S	03:39
09:00	11:00	02	02	O	Allocated 2hr line change time	02:00
11:00	11:31	25	08	S	Extended L-C to wait for tide	00:31
11:31	15:11	01	01	P	Line F0442-S	03:40
15:11	17:11	02	02	O	Allocated 2hr line change time	02:00
17:11	17:43	25	08	S	Extended L-C to wait for tide	00:32
17:43	21:26	01	01	P	Line F0106-S	03:43
21:26	23:26	02	02	O	Allocated 2hr line change time	02:00
23:26	24:00	25	08	S	Extended L-C to wait for tide	00:34

01/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0694-S	90					Complete
0700/001		0	0	0	0.000	
0699/002		0	0	0	0.000	
0698/003		0	0	0	0.000	
0697/004		0	0	0	0.000	
0696/005		0	0	0	0.000	
0695/006		0	0	0	0.000	
0694/007		438	1630	1193	22.369	
0693/008		0	0	0	0.000	
F0382-S	270					Complete
0384/317		0	0	0	0.000	
0383/318		0	0	0	0.000	
0382/319		100	1630	1531	28.706	
0381/320		0	0	0	0.000	
0380/321		0	0	0	0.000	
0379/322		0	0	0	0.000	
0378/323		0	0	0	0.000	
0377/324		0	0	0	0.000	
F0442-S	90					Complete
0448/253		0	0	0	0.000	
0447/254		0	0	0	0.000	
0446/255		0	0	0	0.000	
0445/256		0	0	0	0.000	
0444/257		0	0	0	0.000	
0443/258		0	0	0	0.000	
0442/259		100	1630	1531	28.706	
0441/260		0	0	0	0.000	
F0106-S	270					Complete
0108/593		0	0	0	0.000	
0107/594		0	0	0	0.000	
0106/595		100	1630	1531	28.706	
0105/596		0	0	0	0.000	
0104/597		0	0	0	0.000	
0103/598		0	0	0	0.000	
0102/599		0	0	0	0.000	
0101/600		0	0	0	0.000	

Total kms for day: 108.488 Accumulated total to date 108.488

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 01/09/89 To 01/09/89

Code		HH:MM	Percent
P01	Recording Time	13:54	57.92
P02	Line Change	08:00	33.33
P25	Extended L/C	02:06	8.75

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	13:54	57.92
OPERATIONAL TIME	08:00	33.33
STANDBY	02:06	8.75
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	108.488	

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 01/09/89

Code		HH:MM	Percent
P01	Recording Time	159:16	27.65
P02	Line Change	100:41	17.48
P07	Weather Standby	37:59	6.59
P14	Radio Nav. Fail	22:51	3.97
P15	Nav.Equip. Fail	12:33	2.18
P16	Nav Calibration	55:01	9.55
P17	Travel Time	21:46	3.78
P18	Travel T/F Port	19:54	3.45
P19	In Port	23:15	4.04
P20	Deploy /Recover	80:32	13.98
P25	Extended L/C	42:12	7.33

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	158:36	27.53
OPERATIONAL TIME	158:17	27.48
STANDBY	116:15	20.18
CONTRACTOR	142:52	24.80
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	576:00	
TOTAL Kms	1311.975	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
02/09/89						
00:00	00:01	25	08	S	Extended L-C to wait for tide	00:01
00:01	02:51	07	09	S	Weather stby. Cables unstable	02:50
02:51	03:36	01	15	C	Line F0658*S	00:45
03:36	06:06	02	15	C	L-C after non-chgble reshoot	02:30
06:06	12:16	07	09	S	Weather stby.Travel to nav cal	06:10
12:16	24:00	16	26	O	Post calibration time.	11:44

02/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0658*S	90					Cntr Downtime
0664/037		0	0	0	0.000	
0663/038		0	0	0	0.000	
0662/039		0	0	0	0.000	
0661/040		0	0	0	0.000	
0660/041		0	0	0	0.000	
0659/042		0	0	0	0.000	
0658/043		0	0	0	0.000	
0657/044		0	0	0	0.000	

02/09/89

No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 02/09/89 To 02/09/89

Code		HH:MM	Percent
P01	Recording Time	00:45	3.13
P02	Line Change	02:30	10.42
P07	Weather Standby	09:00	37.50
P16	Nav Calibration	11:44	48.89
P25	Extended L/C	00:01	0.07

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	11:44	48.89
STANDBY	09:01	37.57
CONTRACTOR	03:15	13.54
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 02/09/89

Code		HH:MM	Percent
P01	Recording Time	160:01	26.67
P02	Line Change	103:11	17.20
P07	Weather Standby	46:59	7.83
P14	Radio Nav. Fail	22:51	3.81
P15	Nav.Equip. Fail	12:33	2.09
P16	Nav Calibration	66:45	11.13
P17	Travel Time	21:46	3.63
P18	Travel T/F Port	19:54	3.32
P19	In Port	23:15	3.88
P20	Deploy /Recover	80:32	13.42
P25	Extended L/C	42:13	7.04

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	158:36	26.43
OPERATIONAL TIME	170:01	28.34
STANDBY	125:16	20.88
CONTRACTOR	146:07	24.35
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	600:00	
TOTAL Kms	1311.975	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
03/09/89						
00:00	01:30	16	26	O	Post calibration time.	01:30
01:30	03:26	01	30	O	Line F0586/S	01:56
03:26	05:26	02	02	O	Allocated 2hr line change time	02:00
05:26	06:50	25	08	S	Extended L-C to wait for tide.	01:24
06:50	12:59	07	09	S	Stdby for weather. Swell noise	06:09
12:59	14:45	25	13	C	Leakage,Rho lead-in.Missed SOL	01:46
14:45	16:30	01	30	O	Line F0526/S	01:45
16:30	18:12	02	02	O	Normal operational line change	01:42
18:12	21:54	01	30	O	Line F0226/S	03:42
21:54	23:54	02	02	O	Allocated 2hr line change time	02:00
23:54	24:00	25	08	S	Extended L-C to wait for tide	00:06

03/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0586/S	90					Fill-in
0586/106		500	1300	801	15.019	
/107		0	0	0	0.000	
/108		0	0	0	0.000	
/109		0	0	0	0.000	
/110		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0526/S	90					Fill-in
0526/178		887	1630	744	13.950	
/179		0	0	0	0.000	
/180		0	0	0	0.000	
/181		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0226/S	270					Fill-in
0226/465		100	1630	1531	28.706	
/466		0	0	0	0.000	
/467		0	0	0	0.000	
/468		0	0	0	0.000	
/469		0	0	0	0.000	
/470		0	0	0	0.000	
/471		0	0	0	0.000	
		0	0	0	0.000	

Total kms for day: 57.675 Accumulated total to date 57.675

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 03/09/89 To 03/09/89

Code		HH:MM	Percent
P01	Recording Time	07:23	30.76
P02	Line Change	05:42	23.75
P07	Weather Standby	06:09	25.63
P16	Nav Calibration	01:30	6.25
P25	Extended L/C	03:16	13.61

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	14:35	60.76
STANDBY	07:39	31.88
CONTRACTOR	01:46	7.36
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	57.675	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 03/09/89

Code		HH:MM	Percent
P01	Recording Time	167:24	26.83
P02	Line Change	108:53	17.45
P07	Weather Standby	53:08	8.51
P14	Radio Nav. Fail	22:51	3.66
P15	Nav.Equip. Fail	12:33	2.01
P16	Nav Calibration	68:15	10.94
P17	Travel Time	21:46	3.49
P18	Travel T/F Port	19:54	3.19
P19	In Port	23:15	3.73
P20	Deploy /Recover	80:32	12.91
P25	Extended L/C	45:29	7.29

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	158:36	25.42
OPERATIONAL TIME	184:36	29.58
STANDBY	132:55	21.30
CONTRACTOR	147:53	23.70
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	624:00	
TOTAL Kms	1369.650	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
04/09/89						
00:00	01:20	25	08	S	Extended L-C to wait for tide	01:20
01:20	04:58	01	01	P	Line F0430-S	03:38
04:58	06:58	02	02	O	Allocated 2hr line change time	02:00
06:58	07:32	25	08	S	Extended L-C to wait for tide	00:34
07:32	11:05	01	01	P	Line F0394-S	03:33
11:05	13:05	02	02	O	Allocated 2hr line change time	02:00
13:05	13:42	25	08	S	Extended L-C to wait for tide	00:37
13:42	17:18	01	01	P	Line F0418-S	03:36
17:18	19:18	02	02	O	Allocated 2hr line change time	02:00
19:18	19:41	25	08	S	Extended L-C to wait for tide	00:23
19:41	20:47	01	01	P	Line F0214-S1	01:06
20:47	22:36	02	09	S	L-C after chargeable reshoot	01:49
22:36	23:19	01	14	S	Line F0178*S	00:43
23:19	24:00	02	14	S	L-C after chargeable reshoot	00:41

04/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0430-S	90					Complete
0436/265		0	0	0	0.000	
0435/266		0	0	0	0.000	
0434/267		0	0	0	0.000	
0433/268		0	0	0	0.000	
0432/269		0	0	0	0.000	
0431/270		0	0	0	0.000	
0430/271		100	1630	1531	28.706	
0429/272		0	0	0	0.000	
F0394-S	270					Complete
0396/305		0	0	0	0.000	
0395/306		0	0	0	0.000	
0394/307		10100	11630	1531	28.706	
0393/308		0	0	0	0.000	
0392/309		0	0	0	0.000	
0391/310		0	0	0	0.000	
0390/311		0	0	0	0.000	
0389/312		0	0	0	0.000	
F0418-S	90					Complete
0424/277		0	0	0	0.000	
0423/278		0	0	0	0.000	
0422/279		0	0	0	0.000	
0421/280		0	0	0	0.000	
0420/281		0	0	0	0.000	
0419/282		0	0	0	0.000	
0418/283		100	1630	1531	28.706	
0417/284		0	0	0	0.000	
F0214-S1	270					Complete
0216/485		0	0	0	0.000	
0215/486		0	0	0	0.000	
0214/487		10100	10553	454	8.512	
0213/488		0	0	0	0.000	
0212/489		0	0	0	0.000	
0211/490		0	0	0	0.000	
0210/491		0	0	0	0.000	
0209/492		0	0	0	0.000	
F0178*S	270					Reshoot
0180/521		0	0	0	0.000	
0179/522		0	0	0	0.000	
0178/523		0	0	0	0.000	
0177/524		0	0	0	0.000	
0176/525		0	0	0	0.000	
0175/526		0	0	0	0.000	
0174/527		0	0	0	0.000	
0173/528		0	0	0	0.000	
Total kms for day:			94.631	Accumulated total to date		94.631

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 04/09/89 To 04/09/89

Code		HH:MM	Percent
P01	Recording Time	12:36	52.50
P02	Line Change	08:30	35.42
P25	Extended L/C	02:54	12.08

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	11:53	49.51
OPERATIONAL TIME	06:00	25.00
STANDBY	06:07	25.49
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	94.631	

GECO SIGMA

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 04/09/89

Code		HH:MM	Percent
P01	Recording Time	180:00	27.78
P02	Line Change	117:23	18.11
P07	Weather Standby	53:08	8.20
P14	Radio Nav. Fail	22:51	3.53
P15	Nav.Equip. Fail	12:33	1.94
P16	Nav Calibration	68:15	10.53
P17	Travel Time	21:46	3.36
P18	Travel T/F Port	19:54	3.07
P19	In Port	23:15	3.59
P20	Deploy /Recover	80:32	12.43
P25	Extended L/C	48:23	7.47

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	170:29	26.31
OPERATIONAL TIME	190:36	29.41
STANDBY	139:02	21.46
CONTRACTOR	147:53	22.82
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	648:00	
TOTAL Kms	1464.281	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
05/09/89						
00:00	01:55	02	14	S	L-C after chargeable reshoot	01:55
01:55	05:34	01	30	O	Line F0466/S	03:39
05:34	07:34	02	30	O	Allocated 2hr line change time	02:00
07:34	08:06	25	30	S	Extended L-C to next line.	00:32
08:06	08:53	01	12	C	Line F0322*S	00:47
08:53	11:38	01	30	O	Line F0322/S	02:45
11:38	13:38	02	30	O	Allocated 2hr line change time	02:00
13:38	15:33	25	30	S	Extended L-C to next infill.	01:55
15:33	16:39	01	30	O	Line F0490/S	01:06
16:39	16:48	01	12	C	Line F0490*S	00:09
16:48	17:42	01	30	O	Line F0490/S1	00:54
17:42	19:42	02	30	O	Allocated 2hr line change time	02:00
19:42	20:09	25	30	S	Extended L-C to reshoot line	00:27
20:09	21:22	01	12	C	Line F0358*S	01:13
21:22	22:31	01	30	O	Line F0358/S	01:09
22:31	24:00	02	30	O	Allocated 2hr line change time	01:29

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 05/09/89 To 05/09/89

Code		HH:MM	Percent
P01	Recording Time	11:42	48.75
P02	Line Change	09:24	39.17
P25	Extended L/C	02:54	12.08

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	17:02	70.97
STANDBY	04:49	20.07
CONTRACTOR	02:09	8.96
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	75.488	

05/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0466/S	90					Fill-in
0466/237		10100	11630	1531	28.706	
/238		0	0	0	0.000	
/239		0	0	0	0.000	
/240		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0322*S	270					Reshoot
0322/382		0	0	0	0.000	
/383		0	0	0	0.000	
/384		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0322/S	270					Fill-in
0322/383		10433	11630	1198	22.463	
/384		0	0	0	0.000	
/385		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0490/S	90					Fill-in
0490/204		10700	11171	472	8.850	
/205		0	0	0	0.000	
/206		0	0	0	0.000	
/207		0	0	0	0.000	
/208		0	0	0	0.000	
/209		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0490*S	90					Reshoot
0496/205		0	0	0	0.000	
0495/206		0	0	0	0.000	
0494/207		0	0	0	0.000	
0493/208		0	0	0	0.000	
0492/209		0	0	0	0.000	
0491/210		0	0	0	0.000	
0490/211		0	0	0	0.000	
0489/212		0	0	0	0.000	
F0490/S1	90					Fill-in
0490/204		11240	11630	391	7.331	
/205		0	0	0	0.000	
/206		0	0	0	0.000	
/207		0	0	0	0.000	
/208		0	0	0	0.000	
/209		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0358*S	270					Reshoot
0360/341		0	0	0	0.000	
0359/342		0	0	0	0.000	

0358/343	0	0	0	0.000
0357/344	0	0	0	0.000
0356/345	0	0	0	0.000
0355/346	0	0	0	0.000
0354/347	0	0	0	0.000
0353/348	0	0	0	0.000

05/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0358/S	270					Fill-in
0358/346		10571	11004	434	8.137	
/347		0	0	0	0.000	
/348		0	0	0	0.000	
/349		0	0	0	0.000	
/350		0	0	0	0.000	
/351		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	

Total kms for day: 75.488 Accumulated total to date 75.488

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 05/09/89

Code		HH:MM	Percent
P01	Recording Time	191:42	28.53
P02	Line Change	126:47	18.87
P07	Weather Standby	53:08	7.91
P14	Radio Nav. Fail	22:51	3.40
P15	Nav.Equip. Fail	12:33	1.87
P16	Nav Calibration	68:15	10.16
P17	Travel Time	21:46	3.24
P18	Travel T/F Port	19:54	2.96
P19	In Port	23:15	3.46
P20	Deploy /Recover	80:32	11.98
P25	Extended L/C	51:17	7.63

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	170:29	25.37
OPERATIONAL TIME	207:38	30.90
STANDBY	143:51	21.41
CONTRACTOR	150:02	22.33
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	672:00	
TOTAL Kms	1539.769	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
06/09/89						
00:00	00:31	02	30	O	Allocated 2hr line change time	00:31
00:31	02:21	25	30	S	Extended L-C to wait for tide	01:50
02:21	06:04	01	01	P	Line F0406-S	03:43
06:04	08:04	02	02	O	Allocated 2hr line change time	02:00
08:04	08:27	25	08	S	Extended L-C to wait for tide.	00:23
08:27	09:41	01	30	O	Line F0262/S	01:14
09:41	09:53	01	14	S	Line F0262*S	00:12
09:53	12:17	02	14	S	L-C after chargeable reshoot	02:24
12:17	15:27	01	30	O	Line F0646/S	03:10
15:27	17:27	02	30	O	Allocated 2hr line change time	02:00
17:27	17:43	25	30	S	Extended L-C to next infill.	00:16
17:43	21:23	01	30	O	Line F0106/S	03:40
21:23	23:23	02	30	O	Allocated 2hr line change time	02:00
23:23	24:00	25	30	S	Extended L-C.	00:37

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 06/09/89 To 06/09/89

Code		HH:MM	Percent
P01	Recording Time	11:59	49.93
P02	Line Change	08:55	37.15
P25	Extended L/C	03:06	12.92

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	03:43	15.49
OPERATIONAL TIME	14:35	60.76
STANDBY	05:42	23.75
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	92.662	

06/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0406-S	90					Complete
0412/289		0	0	0	0.000	
0411/290		0	0	0	0.000	
0410/291		0	0	0	0.000	
0409/292		0	0	0	0.000	
0408/293		0	0	0	0.000	
0407/294		0	0	0	0.000	
0406/295		100	1630	1531	28.706	
0405/296		0	0	0	0.000	
F0262/S	270					Fill-in
0262/442		10800	11318	519	9.731	
/443		0	0	0	0.000	
/444		0	0	0	0.000	
/445		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0262*S	270					Reshoot
0264/437		0	0	0	0.000	
0263/438		0	0	0	0.000	
0262/439		0	0	0	0.000	
0261/440		0	0	0	0.000	
0260/441		0	0	0	0.000	
0259/442		0	0	0	0.000	
0258/443		0	0	0	0.000	
0257/444		0	0	0	0.000	
F0646/S	90					Fill-in
0646/058		10270	11630	1361	25.519	
/059		0	0	0	0.000	
/060		0	0	0	0.000	
/061		0	0	0	0.000	
/062		0	0	0	0.000	
/063		0	0	0	0.000	
/064		0	0	0	0.000	
		0	0	0	0.000	
F0106/S	270					Fill-in
0106/586		10100	11630	1531	28.706	
/587		0	0	0	0.000	
/588		0	0	0	0.000	
/589		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	

Total kms for day: 92.662 Accumulated total to date 92.662

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 06/09/89

Code		HH:MM	Percent
P01	Recording Time	203:41	29.26
P02	Line Change	135:42	19.50
P07	Weather Standby	53:08	7.63
P14	Radio Nav. Fail	22:51	3.28
P15	Nav.Equip. Fail	12:33	1.80
P16	Nav Calibration	68:15	9.81
P17	Travel Time	21:46	3.13
P18	Travel T/F Port	19:54	2.86
P19	In Port	23:15	3.34
P20	Deploy /Recover	80:32	11.57
P25	Extended L/C	54:23	7.81

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	174:12	25.03
OPERATIONAL TIME	222:13	31.93
STANDBY	149:33	21.49
CONTRACTOR	150:02	21.56
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	696:00	
TOTAL Kms	1632.431	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 07/09/89 To 07/09/89

Code		HH:MM	Percent
P01	Recording Time	09:23	39.10
P02	Line Change	09:53	41.18
P20	Deploy /Recover	01:30	6.25
P25	Extended L/C	02:33	10.63
P27	Contractor Req.	00:41	2.85

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	13:03	54.38
STANDBY	02:42	11.25
CONTRACTOR	08:15	34.38
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	51.713	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
07/09/89						
00:00	01:14	25	30	S	Extended L-C to next infill.	01:14
01:14	03:22	01	30	O	Line F0190/S	02:08
03:22	05:22	02	30	O	Allocated 2hr line change time	02:00
05:22	06:01	25	30	S	Extended L-C to next infill.	00:39
06:01	06:47	01	30	C	Line F0274/S	00:46
06:47	08:15	02	30	C	L-C after nonchargeable Infill	01:28
08:15	11:39	01	30	O	Line F0418/S	03:24
11:39	13:39	02	30	O	Allocated 2hr line change time	02:00
13:39	13:47	25	30	S	Extended L-C to next infill.	00:08
13:47	14:33	01	30	O	Line F0382/S	00:46
14:33	15:48	02	30	O	Estimated 1.25 hr line change	01:15
15:48	16:20	25	12	C	Extended L-C to repair guns.	00:32
16:20	17:27	01	12	C	Line F0394*S	01:07
17:27	19:08	02	12	C	L-C to non-chargeable infill	01:41
19:08	19:37	01	30	C	Line F0574/S	00:29
19:37	21:06	02	30	C	L-C after nonchargeable infill	01:29
21:06	21:49	01	30	C	Line F0586/S1	00:43
21:49	22:30	27	30	S	Waiting for last coverage plot	00:41
22:30	24:00	20	20	O	Recovering equipment.	01:30

07/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0190/S	270					Fill-in
0190/505		737	1630	894	16.763	
/506		0	0	0	0.000	
/507		0	0	0	0.000	
/508		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0274/S	270					Fill-in
0274/431		0	0	0	0.000	
/432		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0418/S	90					Fill-in
0418/286		100	1630	1531	28.706	
/287		0	0	0	0.000	
/288		0	0	0	0.000	
/289		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0382/S	270					Fill-in
0382/313		0	0	0	0.000	
/314		0	0	0	0.000	
/315		100	432	333	6.244	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0394*S	270					Reshoot
0392/309		0	0	0	0.000	
0391/310		0	0	0	0.000	
0390/311		0	0	0	0.000	
0389/312		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0574/S	90					Fill-in
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0586/S1	90					Cntr Downtime
0586/120		0	0	0	0.000	
		0	0	0	0.000	

0	0	0	0.000
0	0	0	0.000
0	0	0	0.000
0	0	0	0.000
0	0	0	0.000
0	0	0	0.000

Total kms for day: 51.713 Accumulated total to date 51.713

PRODUCTION/DOWNTIME BY ACTIVITY

From 09/08/89 To 07/09/89

Code		HH:MM	Percent
P01	Recording Time	213:04	29.59
P02	Line Change	145:35	20.22
P07	Weather Standby	53:08	7.38
P14	Radio Nav. Fail	22:51	3.17
P15	Nav.Equip. Fail	12:33	1.74
P16	Nav Calibration	68:15	9.48
P17	Travel Time	21:46	3.02
P18	Travel T/F Port	19:54	2.76
P19	In Port	23:15	3.23
P20	Deploy /Recover	82:02	11.39
P25	Extended L/C	56:56	7.91
P27	Contractor Req.	00:41	0.09

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	174:12	24.19
OPERATIONAL TIME	235:16	32.68
STANDBY	152:15	21.15
CONTRACTOR	158:17	21.98
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	720:00	
TOTAL Kms	1684.144	

DAILY TIME LOG GECO SIGMA

From	To	Act	Cau	Chg	Comment	HH:MM
08/09/89						
00:00	03:35	20	20	0	Recovering equipment.	03:35
03:35	05:20	17	16	0	Travel,to Syledis baselines.	01:45
05:20	07:35	16	16	0	Syledis baseline crossings.	02:15
07:35	08:45	26	22	0	Bar check.	01:10
08:45	22:00	26	18	0	Steam to Den Helder.	13:15

PRODUCTION/DOWNTIME BY ACTIVITY

From 08/09/89 To 08/09/89

Code		HH:MM	Percent
P16	Nav Calibration	02:15	10.23
P17	Travel Time	01:45	7.95
P20	Deploy /Recover	03:35	16.29
P26	Client Request	14:25	65.53

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	22:00	100.00
STANDBY	00:00	0.00
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	22:00	
TOTAL Kms	0.000	

08/09/89
No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 08/09/89

Code		HH:MM	Percent
P01	Recording Time	213:04	28.72
P02	Line Change	145:35	19.62
P07	Weather Standby	53:08	7.16
P14	Radio Nav. Fail	22:51	3.08
P15	Nav.Equip. Fail	12:33	1.69
P16	Nav Calibration	70:30	9.50
P17	Travel Time	23:31	3.17
P18	Travel T/F Port	19:54	2.68
P19	In Port	23:15	3.13
P20	Deploy /Recover	85:37	11.54
P25	Extended L/C	56:56	7.67
P26	Client Request	14:25	1.94
P27	Contractor Req.	00:41	0.09

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	174:12	23.48
OPERATIONAL TIME	257:16	34.67
STANDBY	152:15	20.52
CONTRACTOR	158:17	21.33
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	742:00	
TOTAL Kms	1684.144	

7.1.2 Geco Rho

MISFIRE STATISTICS

GECO RHO

From 09/08/89 To 08/09/89

Number of lines / line segments acquired	73		
Total chargeable Kilometers acquired	~~1616.869~~ 1645.575		
Total number of Misfires	173	Percentage of total SPs.	0.20
Total number of NDRs.	235	Percentage of total SPs.	0.27
Total number of parity errors	0	Percentage of total SPs.	0.00
Total number of shots	86233	Percentage bad shots	0.47

Worst case lines

Misfires

Line F0226-R	Misfires	12	NDRs.	7	Parity errors	0

Parity Errors

Line	Misfires	0	NDRs.	0	Parity errors	0

No Data Records

Line F0574-R	Misfires	8	NDRs.	49	Parity errors	0

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
09/08/89						
00:00	05:35	18	26	O	Travel to Den Helder.	05:35
05:35	08:30	19	15	C	Den Helder - wait on Racal.	02:55
08:30	24:00	21	26	S	Den Helder - Reconfigure Nav.	15:30

09/08/89

No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 09/08/89

Code		HH:MM	Percent
P18	Travel T/F Port	05:35	23.26
P19	In Port	02:55	12.15
P21	Reconfigure	15:30	64.58

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	05:35	23.26
STANDBY	15:30	64.58
CONTRACTOR	02:55	12.15
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
10/08/89						
00:00	02:30	21	26	S	Den Helder - Reconfigure Nav.	02:30
02:30	06:38	21	15	C	Den Helder - Reconfigure Nav.	04:08
06:38	20:00	18	26	O	Travel to Syledis Cal Area.	13:22
20:00	24:00	16	16	O	Syledis Baseline Crossings.	04:00

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 10/08/89 To 10/08/89

Code		HH:MM	Percent
P16	Nav. Calibration	04:00	16.67
P18	Travel T/F Port	13:22	55.69
P21	Reconfigure	06:38	27.64

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	17:22	72.36
STANDBY	02:30	10.42
CONTRACTOR	04:08	17.22
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

10/08/89
No production

Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 10/08/89

Code		HH:MM	Percent
P16	Nav Calibration	04:00	8.33
P18	Travel T/F Port	18:57	39.48
P19	In Port	02:55	6.08
P21	Reconfigure	22:08	46.11

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	22:57	47.81
STANDBY	18:00	37.50
CONTRACTOR	07:03	14.69
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	48:00	
TOTAL Kms	0.000	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
11/08/89						
00:00	02:45	16	16	O	Syledis Baseline Crossings.	02:45
02:45	04:40	16	14	C	Poor results. Stdby for info.	01:55
04:40	07:20	20	26	O	Deploy streamers/Reballast.	02:40
07:20	09:30	17	16	O	Transit to Hyperfix Cal Area.	02:10
09:30	14:18	16	14	C	Modifying equipment,setting up	04:48
14:18	15:40	16	16	O	Hyperfix Calibration.	01:22
15:40	20:39	20	26	O	Deploy Streamers/Reballast.	04:59
20:39	24:00	16	14	C	Standby. Poor signals(d/time).	03:21

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 11/08/89 To 11/08/89

Code		HH:MM	Percent
P16	Nav. Calibration	14:11	59.10
P17	Travel Time	02:10	9.03
P20	Deploy / Recover	07:39	31.88

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	13:56	58.06
STANDBY	00:00	0.00
CONTRACTOR	10:04	41.94
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

11/08/89

No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 11/08/89

Code		HH:MM	Percent
P16	Nav Calibration	18:11	25.25
P17	Travel Time	02:10	3.01
P18	Travel T/F Port	18:57	26.32
P19	In Port	02:55	4.05
P20	Deploy /Recover	07:39	10.63
P21	Reconfigure	22:08	30.74

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	36:53	51.23
STANDBY	18:00	25.00
CONTRACTOR	17:07	23.77
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	72:00	
TOTAL Kms	0.000	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
12/08/89						
00:00	06:00	16	14	C	Standby. Poor signals(d/time).	06:00
06:00	10:04	16	16	O	Hyperfix Calibration Runs.	04:04
10:04	21:32	20	13	C	Deploy Streamer/Reballast.	11:28
21:32	24:00	20	26	O	Deploy Streamer/Reballast.	02:28

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 12/08/89 To 12/08/89

Code		HH:MM	Percent
P16	Nav. Calibration	10:04	41.94
P20	Deploy / Recover	13:56	58.06

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	06:32	27.22
STANDBY	00:00	0.00
CONTRACTOR	17:28	72.78
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

12/08/89

No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 12/08/89

Code		HH:MM	Percent
P16	Nav Calibration	28:15	29.43
P17	Travel Time	02:10	2.26
P18	Travel T/F Port	18:57	19.74
P19	In Port	02:55	3.04
P20	Deploy /Recover	21:35	22.48
P21	Reconfigure	22:08	23.06

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	43:25	45.23
STANDBY	18:00	18.75
CONTRACTOR	34:35	36.02
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	96:00	
TOTAL Kms	0.000	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
13/08/89						
00:00	13:53	20	26	O	Deploy Streamers/Guns.	13:53
13:53	20:04	25	20	C	Vessels not ready at proj. SOL	06:11
20:04	23:27	14	07	S	Data bad.Poor Hyperfix signals	03:23
23:27	24:00	02	14	S	Line Change.	00:33

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 13/08/89 To 13/08/89

Code		HH:MM	Percent
P02	Line Change	00:33	2.29
P14	Radio Nav. Fail	03:23	14.10
P20	Deploy / Recover	13:53	57.85
P25	Extended L/C	06:11	25.76

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	13:53	57.85
STANDBY	03:56	16.39
CONTRACTOR	06:11	25.76
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

PRODUCTION LOG GECO RHO

13/08/89

No production Accumulated total to date 0.000

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PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 13/08/89

Code		HH:MM	Percent
P02	Line Change	00:33	0.46
P14	Radio Nav. Fail	03:23	2.82
P16	Nav Calibration	28:15	23.54
P17	Travel Time	02:10	1.81
P18	Travel T/F Port	18:57	15.79
P19	In Port	02:55	2.43
P20	Deploy /Recover	35:28	29.56
P21	Reconfigure	22:08	18.44
P25	Extended L/C	06:11	5.15

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	57:18	47.75
STANDBY	21:56	18.28
CONTRACTOR	40:46	33.97
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	120:00	
TOTAL Kms	0.000	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
14/08/89						
00:00	02:16	02	14	S	Line Change.	02:16
02:16	05:34	14	07	S	Data Bad.Poor Hyperfix Signals	03:18
05:34	08:35	02	14	S	Line Change.	03:01
08:35	12:00	01	01	P	Line F0250-R	03:25
12:00	14:00	02	02	O	Allocated 2hr Line Change Time	02:00
14:00	14:46	25	08	S	Waiting on Tide.	00:46
14:46	18:08	01	01	P	Line F0562-R	03:22
18:08	20:08	02	02	O	Allocated 2hr Line Change Time	02:00
20:08	20:54	25	08	S	Waiting on Tide.	00:46
20:54	24:00	01	01	P	Line F0238-R	03:06

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 14/08/89 To 14/08/89

Code		HH:MM	Percent
P01	Recording Time	09:53	41.18
P02	Line Change	09:17	38.68
P14	Radio Nav. Fail	03:18	13.75
P25	Extended L/C	01:32	6.39

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	09:53	41.18
OPERATIONAL TIME	04:00	16.67
STANDBY	10:07	42.15
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	83.550	

14/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0250-R	270					Complete
0256/445		0	0	0	0.000	
0255/446		0	0	0	0.000	
0254/447		0	0	0	0.000	
0253/448		0	0	0	0.000	
0252/449		0	0	0	0.000	
0251/450		0	0	0	0.000	
0250/451		100	1630	1531	28.706	
0249/452		0	0	0	0.000	
F0562-R	90					Complete
0564/137		0	0	0	0.000	
0563/138		0	0	0	0.000	
0562/139		100	1630	1531	28.706	
0561/140		0	0	0	0.000	
0560/141		0	0	0	0.000	
0559/142		0	0	0	0.000	
0558/143		0	0	0	0.000	
0557/144		0	0	0	0.000	
F0238-R	270					Complete
0244/457		0	0	0	0.000	
0243/458		0	0	0	0.000	
0242/459		0	0	0	0.000	
0241/460		0	0	0	0.000	
0240/461		0	0	0	0.000	
0239/462		0	0	0	0.000	
0238/463		100	1493	1394	26.138	
0237/464		0	0	0	0.000	
Total kms for day:			83.550	Accumulated total to date		83.550

PRODUCTION/DOWNTIME BY ACTIVITY

GECO RHO

From 09/08/89 To 14/08/89

Code		HH:MM	Percent
P01	Recording Time	09:53	6.86
P02	Line Change	09:50	6.83
P14	Radio Nav. Fail	06:41	4.64
P16	Nav Calibration	28:15	19.62
P17	Travel Time	02:10	1.50
P18	Travel T/F Port	18:57	13.16
P19	In Port	02:55	2.03
P20	Deploy /Recover	35:28	24.63
P21	Reconfigure	22:08	15.37
P25	Extended L/C	07:43	5.36

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	09:53	6.86
OPERATIONAL TIME	61:18	42.57
STANDBY	32:03	22.26
CONTRACTOR	40:46	28.31
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	144:00	
TOTAL Kms	83.550	

DAILY TIME LOG — GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
15/08/89						
00:00	00:18	01	01	P	Line F0238-R	00:18
00:18	02:18	02	02	O	Allocated 2hr Line Change Time	02:00
02:18	03:04	25	08	S	Waiting on Tide.	00:46
03:04	05:40	17	16	C	Transit to Hyperfix Cal Area.	02:36
05:40	08:10	16	16	O	Hyperfix Calibration.	02:30
08:10	14:50	20	07	S	Recover cable/Weather stby.	06:40
14:50	20:30	16	16	O	Hyperfix 2 bt Proximity Checks	05:40
20:30	24:00	20	07	S	Deploy streamer/Weather stby.	03:30

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 15/08/89 To 15/08/89

Code		HH:MM	Percent
P01	Recording Time	00:18	1.25
P02	Line Change	02:00	8.33
P16	Nav Calibration	08:10	34.03
P17	Travel Time	02:36	10.83
P20	Deploy /Recover	10:10	42.36
P25	Extended L/C	00:46	3.19

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:18	1.25
OPERATIONAL TIME	10:10	42.36
STANDBY	10:56	45.56
CONTRACTOR	02:36	10.83
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	2.569	

15/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0238-R	270					Complete
0244/457		0	0	0	0.000	
0243/458		0	0	0	0.000	
0242/459		0	0	0	0.000	
0241/460		0	0	0	0.000	
0240/461		0	0	0	0.000	
0239/462		0	0	0	0.000	
0238/463		1494	1630	137	2.569	
0237/464		0	0	0	0.000	

Total kms for day: 2.569 Accumulated total to date 2.569

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 15/08/89

Code		HH:MM	Percent
P01	Recording Time	10:11	6.06
P02	Line Change	11:50	7.04
P14	Radio Nav. Fail	06:41	3.98
P16	Nav Calibration	36:25	21.68
P17	Travel Time	04:46	2.84
P18	Travel T/F Port	18:57	11.28
P19	In Port	02:55	1.74
P20	Deploy /Recover	45:38	27.16
P21	Reconfigure	22:08	13.17
P25	Extended L/C	08:29	5.05

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	10:11	6.06
OPERATIONAL TIME	71:28	42.54
STANDBY	42:59	25.59
CONTRACTOR	43:22	25.81
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	168:00	
TOTAL Kms	86.119	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 16/08/89 To 16/08/89

Code		HH:MM	Percent
P01	Recording Time	11:31	47.99
P02	Line Change	06:00	25.00
P20	Deploy /Recover	04:16	17.78
P25	Extended L/C	02:13	9.24

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	11:31	47.99
OPERATIONAL TIME	06:00	25.00
STANDBY	06:29	27.01
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	99.450	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
16/08/89						
00:00	04:16	20	07	S	Deploy streamer/Weather stby.	04:16
04:16	07:38	01	01	P	Line F0574-R	03:22
07:38	09:38	02	02	O	Allocated 2hr Line Change Time	02:00
09:38	10:01	25	08	S	Waiting on Tide.	00:23
10:01	13:19	01	01	P	Line F0262-R	03:18
13:19	15:19	02	02	O	Allocated 2hr Line Change Time	02:00
15:19	16:18	25	08	S	Waiting on Tide.	00:59
16:18	19:36	01	01	P	Line F0550-R	03:18
19:36	21:36	02	02	O	Allocated 2hr Line Change Time	02:00
21:36	22:27	25	08	S	Waiting on Tide.	00:51
22:27	24:00	01	01	P	Line F0226-R	01:33

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 16/08/89

Code		HH:MM	Percent
P01	Recording Time	21:42	11.30
P02	Line Change	17:50	9.29
P14	Radio Nav. Fail	06:41	3.48
P16	Nav Calibration	36:25	18.97
P17	Travel Time	04:46	2.48
P18	Travel T/F Port	18:57	9.87
P19	In Port	02:55	1.52
P20	Deploy /Recover	49:54	25.99
P21	Reconfigure	22:08	11.53
P25	Extended L/C	10:42	5.57

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	21:42	11.30
OPERATIONAL TIME	77:28	40.35
STANDBY	49:28	25.76
CONTRACTOR	43:22	22.59
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	192:00	
TOTAL Kms	185.569	

PRODUCTION LOG GECO RHO

16/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0574-R	90					Complete
0576/125		0	0	0	0.000	
0575/126		0	0	0	0.000	
0574/127		100	1630	1531	28.706	
0573/128		0	0	0	0.000	
0572/129		0	0	0	0.000	
0571/130		0	0	0	0.000	
0570/131		0	0	0	0.000	
0569/132		0	0	0	0.000	
F0262-R	270					Complete
0268/433		0	0	0	0.000	
0267/434		0	0	0	0.000	
0266/435		0	0	0	0.000	
0265/436		0	0	0	0.000	
0264/437		0	0	0	0.000	
0263/438		0	0	0	0.000	
0262/439		100	1630	1531	28.706	
0261/440		0	0	0	0.000	
F0550-R	90					Complete
0552/149		0	0	0	0.000	
0551/150		0	0	0	0.000	
0550/151		100	1630	1531	28.706	
0549/152		0	0	0	0.000	
0548/153		0	0	0	0.000	
0547/154		0	0	0	0.000	
0546/155		0	0	0	0.000	
0545/156		0	0	0	0.000	
F0226-R	270					Complete
0232/469		0	0	0	0.000	
0231/470		0	0	0	0.000	
0230/471		0	0	0	0.000	
0229/472		0	0	0	0.000	
0228/473		0	0	0	0.000	
0227/474		0	0	0	0.000	
0226/475		100	810	711	13.331	
0225/476		0	0	0	0.000	

Total kms for day: 99.450 Accumulated total to date 99.450

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
17/08/89						
00:00	01:49	01	01	P	Line F0226-R	01:49
01:49	03:49	02	02	O	Allocated 2hr Line Change Time	02:00
03:49	04:31	25	08	S	Waiting on Tide.	00:42
04:31	07:50	01	01	P	Line F0586-R	03:19
07:50	09:50	02	02	O	Allocated 2hr Line Change Time	02:00
09:50	10:44	25	08	S	Waiting on Tide.	00:54
10:44	14:11	01	01	P	Line F0274-R	03:27
14:11	16:11	02	02	O	Allocated 2hr Line Change Time	02:00
16:11	16:58	25	08	S	Waiting on Tide.	00:47
16:58	24:00	20	24	C	Streamer Cable Work (F4H1).	07:02

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 17/08/89 To 17/08/89

Code		HH:MM	Percent
P01	Recording Time	08:35	35.76
P02	Line Change	06:00	25.00
P20	Deploy /Recover	07:02	29.31
P25	Extended L/C	02:23	9.93

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	08:35	35.76
OPERATIONAL TIME	06:00	25.00
STANDBY	02:23	9.93
CONTRACTOR	07:02	29.31
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	72.787	

17/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0226-R	270					Complete
0232/469		0	0	0	0.000	
0231/470		0	0	0	0.000	
0230/471		0	0	0	0.000	
0229/472		0	0	0	0.000	
0228/473		0	0	0	0.000	
0227/474		0	0	0	0.000	
0226/475		811	1630	820	15.375	
0225/476		0	0	0	0.000	
F0586-R	90					Complete
0588/113		0	0	0	0.000	
0587/114		0	0	0	0.000	
0586/115		100	1630	1531	28.706	
0585/116		0	0	0	0.000	
0584/117		0	0	0	0.000	
0583/118		0	0	0	0.000	
0582/119		0	0	0	0.000	
0581/120		0	0	0	0.000	
F0274-R	270					Complete
0280/421		0	0	0	0.000	
0279/422		0	0	0	0.000	
0278/423		0	0	0	0.000	
0277/424		0	0	0	0.000	
0276/425		0	0	0	0.000	
0275/426		0	0	0	0.000	
0274/427		100	1630	1531	28.706	
0273/428		0	0	0	0.000	

Total kms for day: 72.787 Accumulated total to date 72.787

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 17/08/89

Code		HH:MM	Percent
P01	Recording Time	30:17	14.02
P02	Line Change	23:50	11.03
P14	Radio Nav. Fail	06:41	3.09
P16	Nav Calibration	36:25	16.86
P17	Travel Time	04:46	2.21
P18	Travel T/F Port	18:57	8.77
P19	In Port	02:55	1.35
P20	Deploy /Recover	56:56	26.36
P21	Reconfigure	22:08	10.25
P25	Extended L/C	13:05	6.06

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	30:17	14.02
OPERATIONAL TIME	83:28	38.64
STANDBY	51:51	24.00
CONTRACTOR	50:24	23.33
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	216:00	
TOTAL Kms	258.356	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
18/08/89						
00:00	11:26	20	24	C	Streamer Cable Work (F4H1).	11:26
11:26	24:00	07	07	S	Weather Standby.	12:34

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 18/08/89 To 18/08/89

Code		HH:MM	Percent
P07	Weather Standby	12:34	52.36
P20	Deploy /Recover	11:26	47.64

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	00:00	0.00
STANDBY	12:34	52.36
CONTRACTOR	11:26	47.64
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

PRODUCTION LOG GECO RHO

19/08/89
No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 18/08/89

Code		HH:MM	Percent
P01	Recording Time	30:17	12.62
P02	Line Change	23:50	9.93
P07	Weather Standby	12:34	5.24
P14	Radio Nav. Fail	06:41	2.78
P16	Nav Calibration	36:25	15.17
P17	Travel Time	04:46	1.99
P18	Travel T/F Port	18:57	7.90
P19	In Port	02:55	1.22
P20	Deploy /Recover	68:22	28.49
P21	Reconfigure	22:08	9.22
P25	Extended L/C	13:05	5.45

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	30:17	12.62
OPERATIONAL TIME	83:28	34.78
STANDBY	64:25	26.84
CONTRACTOR	61:50	25.76
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	240:00	
TOTAL Kms	258.356	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
19/08/89						
00:00	00:52	07	07	S	Weather Standby.	00:52
00:52	03:12	01	01	P	Line F0214-R	02:20
03:12	05:12	02	02	O	Allocated 2hr Line Change Time	02:00
05:12	05:58	25	08	S	Waiting on Tide.	00:46
05:58	09:15	01	01	P	Line F0598-R	03:17
09:15	11:15	02	02	O	Allocated 2hr Line Change Time	02:00
11:15	12:10	25	08	S	Waiting on Tide.	00:55
12:10	15:33	01	01	P	Line F0286-R	03:23
15:33	17:33	02	02	O	Allocated 2hr Line Change Time	02:00
17:33	18:20	25	08	S	Waiting on Tide.	00:47
18:20	21:40	01	01	P	Line F0538-R	03:20
21:40	23:40	02	02	O	Allocated 2hr Line Change Time	02:00
23:40	24:00	25	08	S	Waiting on Tide.	00:20

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 19/08/89 To 19/08/89

Code		HH:MM	Percent
P01	Recording Time	12:20	51.39
P02	Line Change	08:00	33.33
P07	Weather Standby	00:52	3.61
P25	Extended L/C	02:48	11.67

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	12:20	51.39
OPERATIONAL TIME	08:00	33.33
STANDBY	03:40	15.28
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	106.313	

19/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0214-R	270					Incomplete
0220/481		0	0	0	0.000	
0219/482		0	0	0	0.000	
0218/483		0	0	0	0.000	
0217/484		0	0	0	0.000	
0216/485		0	0	0	0.000	
0215/486		0	0	0	0.000	
0214/487		554	1630	1077	20.194	
0213/488		0	0	0	0.000	
F0598-R	90					Complete
0600/101		0	0	0	0.000	
0599/102		0	0	0	0.000	
0598/103		100	1630	1531	28.706	
0597/104		0	0	0	0.000	
0596/105		0	0	0	0.000	
0595/106		0	0	0	0.000	
0594/107		0	0	0	0.000	
0593/108		0	0	0	0.000	
F0286-R	270					Complete
0292/409		0	0	0	0.000	
0291/410		0	0	0	0.000	
0290/411		0	0	0	0.000	
0289/412		0	0	0	0.000	
0288/413		0	0	0	0.000	
0287/414		0	0	0	0.000	
0286/415		100	1630	1531	28.706	
0285/416		0	0	0	0.000	
F0538-R	90					Complete
0540/161		0	0	0	0.000	
0539/162		0	0	0	0.000	
0538/163		100	1630	1531	28.706	
0537/164		0	0	0	0.000	
0536/165		0	0	0	0.000	
0535/166		0	0	0	0.000	
0534/167		0	0	0	0.000	
0533/168		0	0	0	0.000	

Total kms for day: 106.313 Accumulated total to date 106.313

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 19/08/89

Code		HH:MM	Percent
P01	Recording Time	42:37	16.14
P02	Line Change	31:50	12.06
P07	Weather Standby	13:26	5.09
P14	Radio Nav. Fail	06:41	2.53
P16	Nav Calibration	36:25	13.79
P17	Travel Time	04:46	1.81
P18	Travel T/F Port	18:57	7.18
P19	In Port	02:55	1.10
P20	Deploy /Recover	68:22	25.90
P21	Reconfigure	22:08	8.38
P25	Extended L/C	15:53	6.02

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	42:37	16.14
OPERATIONAL TIME	91:28	34.65
STANDBY	68:05	25.79
CONTRACTOR	61:50	23.42
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	264:00	
TOTAL Kms	364.669	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
20/08/89						
00:00	00:33	25	08	S	Waiting on Tide.	00:33
00:33	04:02	01	01	P	Line F0202-R	03:29
04:02	06:02	02	02	O	Allocated 2hr Line Change Time	02:00
06:02	06:41	25	08	S	Waiting on Tide.	00:39
06:41	09:58	01	01	P	Line F0610-R	03:17
09:58	11:58	02	02	O	Allocated 2hr Line Change Time	02:00
11:58	12:55	25	08	S	Waiting on Tide.	00:57
12:55	16:14	01	01	P	Line F0298-R	03:19
16:14	18:14	02	02	O	Allocated 2hr Line Change Time	02:00
18:14	19:04	25	08	S	Waiting on Tide.	00:50
19:04	22:23	01	01	P	Line F0526-R	03:19
22:23	24:00	02	02	O	Allocated 2hr Line Change Time	01:37

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 20/08/89 To 20/08/89

Code		HH:MM	Percent
P01	Recording Time	13:24	55.83
P02	Line Change	07:37	31.74
P25	Extended L/C	02:59	12.43

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	13:24	55.83
OPERATIONAL TIME	07:37	31.74
STANDBY	02:59	12.43
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	114.825	

20/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0202-R	270					Complete
0208/493		0	0	0	0.000	
0207/494		0	0	0	0.000	
0206/495		0	0	0	0.000	
0205/496		0	0	0	0.000	
0204/497		0	0	0	0.000	
0203/498		0	0	0	0.000	
0202/499		100	1630	1531	28.706	
0201/500		0	0	0	0.000	
F0610-R	90					Complete
0612/89		0	0	0	0.000	
0611/90		0	0	0	0.000	
0610/91		100	1630	1531	28.706	
0609/92		0	0	0	0.000	
0608/93		0	0	0	0.000	
0607/94		0	0	0	0.000	
0606/95		0	0	0	0.000	
0605/96		0	0	0	0.000	
F0298-R	270					Complete
0304/397		0	0	0	0.000	
0303/398		0	0	0	0.000	
0302/399		0	0	0	0.000	
0301/400		0	0	0	0.000	
0300/401		0	0	0	0.000	
0299/402		0	0	0	0.000	
0298/403		100	1630	1531	28.706	
0297/404		0	0	0	0.000	
F0526-R	90					Complete
0528/173		0	0	0	0.000	
0527/174		0	0	0	0.000	
0526/175		100	1630	1531	28.706	
0525/176		0	0	0	0.000	
0524/177		0	0	0	0.000	
0523/178		0	0	0	0.000	
0522/179		0	0	0	0.000	
0521/180		0	0	0	0.000	

Total kms for day: 114.825 Accumulated total to date 114.825

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 20/08/89

Code		HH:MM	Percent
P01	Recording Time	56:01	19.45
P02	Line Change	39:27	13.70
P07	Weather Standby	13:26	4.66
P14	Radio Nav. Fail	06:41	2.32
P16	Nav Calibration	36:25	12.64
P17	Travel Time	04:46	1.66
P18	Travel T/F Port	18:57	6.58
P19	In Port	02:55	1.01
P20	Deploy /Recover	68:22	23.74
P21	Reconfigure	22:08	7.69
P25	Extended L/C	18:52	6.55

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	56:01	19.45
OPERATIONAL TIME	99:05	34.40
STANDBY	71:04	24.68
CONTRACTOR	61:50	21.47
DISPUTED	00:00	0.00
	00:00	0.00

TOTAL Time	288:00
TOTAL Kms	479.494

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
21/08/89						
00:00	00:23	02	02	O	Allocated 2hr Line Change Time	00:23
00:23	01:19	25	08	S	Waiting on Tide.	00:56
01:19	04:43	01	01	P	Line F0190-R	03:24
04:43	06:43	02	02	O	Allocated 2hr Line Change Time	02:00
06:43	07:30	25	08	S	Waiting on Tide.	00:47
07:30	10:46	01	01	P	Line F0622-R	03:16
10:46	12:46	02	02	O	Allocated 2hr Line Change Time	02:00
12:46	13:41	25	08	S	Waiting on Tide.	00:55
13:41	17:04	01	01	P	Line F0310-R	03:23
17:04	19:04	02	02	O	Allocated 2hr Line Change Time	02:00
19:04	19:50	25	08	S	Waiting on Tide.	00:46
19:50	23:08	01	01	P	Line F0514-R	03:18
23:08	24:00	02	02	O	Allocated 2hr Line Change Time	00:52

PRODUCTION/DOWNTIME BY ACTIVITY

GECO RHO

From 21/08/89 To 21/08/89

Code		HH:MM	Percent
P01	Recording Time	13:21	55.63
P02	Line Change	07:15	30.21
P25	Extended L/C	03:24	14.17

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	13:21	55.63
OPERATIONAL TIME	07:15	30.21
STANDBY	03:24	14.17
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	114.825	

21/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0190-R	270					Complete
0196/505		0	0	0	0.000	
0195/506		0	0	0	0.000	
0194/507		0	0	0	0.000	
0193/508		0	0	0	0.000	
0192/509		0	0	0	0.000	
0191/510		0	0	0	0.000	
0190/511		100	1630	1531	28.706	
0189/512		0	0	0	0.000	
F0622-R	90					Complete
0624/77		0	0	0	0.000	
0623/78		0	0	0	0.000	
0622/79		100	1630	1531	28.706	
0621/80		0	0	0	0.000	
0620/81		0	0	0	0.000	
0619/82		0	0	0	0.000	
0618/83		0	0	0	0.000	
0617/84		0	0	0	0.000	
F0310-R	270					Complete
0316/385		0	0	0	0.000	
0315/386		0	0	0	0.000	
0314/387		0	0	0	0.000	
0313/388		0	0	0	0.000	
0312/389		0	0	0	0.000	
0311/390		0	0	0	0.000	
0310/391		100	1630	1531	28.706	
0309/392		0	0	0	0.000	
F0514-R	90					Complete
0516/185		0	0	0	0.000	
0515/185		0	0	0	0.000	
0514/187		100	1630	1531	28.706	
0513/188		0	0	0	0.000	
0512/189		0	0	0	0.000	
0511/190		0	0	0	0.000	
0510/191		0	0	0	0.000	
0509/192		0	0	0	0.000	

Total kms for day: 114.825 Accumulated total to date 114.825

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 21/08/89

Code		HH:MM	Percent
P01	Recording Time	69:22	22.23
P02	Line Change	46:42	14.97
P07	Weather Standby	13:26	4.31
P14	Radio Nav. Fail	06:41	2.14
P16	Nav Calibration	36:25	11.67
P17	Travel Time	04:46	1.53
P18	Travel T/F Port	18:57	6.07
P19	In Port	02:55	0.93
P20	Deploy /Recover	68:22	21.91
P21	Reconfigure	22:08	7.09
P25	Extended L/C	22:16	7.14

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	69:22	22.23
OPERATIONAL TIME	106:20	34.08
STANDBY	74:28	23.87
CONTRACTOR	61:50	19.82
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	312:00	
TOTAL Kms	594.319	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
22/08/89						
00:00	01:08	02	02	O	Allocated 2hr Line Change Time	01:08
01:08	02:08	25	08	S	Waiting on Tide.	01:00
02:08	05:29	01	01	P	Line F0178-R	03:21
05:29	07:29	02	02	O	Allocated 2hr Line Change Time	02:00
07:29	08:19	25	08	S	Waiting on Tide.	00:50
08:19	11:40	01	01	P	Line F0634-R	03:21
11:40	13:40	02	02	O	Allocated 2hr Line Change Time	02:00
13:40	14:29	25	08	S	Waiting on Tide.	00:49
14:29	17:51	01	01	P	Line F0322-R	03:22
17:51	19:51	02	02	O	Allocated 2hr Line Change Time	02:00
19:51	20:16	25	08	S	Waiting on Tide.	00:25
20:16	20:46	01	15	C	Line F0562*R	00:30
20:46	24:00	20	27	C	Recover Trailing Equipment.	03:14

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 22/08/89 To 22/08/89

Code		HH:MM	Percent
P01	Recording Time	10:34	44.03
P02	Line Change	07:08	29.72
P20	Deploy /Recover	03:14	13.47
P25	Extended L/C	03:04	12.78

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	10:04	41.94
OPERATIONAL TIME	07:08	29.72
STANDBY	03:04	12.78
CONTRACTOR	03:44	15.56
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	86.119	

22/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0178-R	270					Complete
0184/517		0	0	0	0.000	
0183/518		0	0	0	0.000	
0182/519		0	0	0	0.000	
0181/520		0	0	0	0.000	
0180/521		0	0	0	0.000	
0179/522		0	0	0	0.000	
0178/523		100	1630	1531	28.706	
0177/524		0	0	0	0.000	
F0634-R	90					Complete
0636/65		0	0	0	0.000	
0635/66		0	0	0	0.000	
0634/67		100	1630	1531	28.706	
0633/68		0	0	0	0.000	
0632/69		0	0	0	0.000	
0631/70		0	0	0	0.000	
0630/71		0	0	0	0.000	
0629/72		0	0	0	0.000	
F0322-R	270					Complete
0328/373		0	0	0	0.000	
0327/374		0	0	0	0.000	
0326/375		0	0	0	0.000	
0325/376		0	0	0	0.000	
0324/377		0	0	0	0.000	
0323/378		0	0	0	0.000	
0322/379		100	1630	1531	28.706	
0321/380		0	0	0	0.000	
F0562*R	90					Reshoot
0562/135		0	0	0	0.000	
/136		0	0	0	0.000	
/137		0	0	0	0.000	
/138		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	

Total kms for day: 86.119 Accumulated total to date 86.119

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 22/08/89

Code		HH:MM	Percent
P01	Recording Time	79:56	23.79
P02	Line Change	53:50	16.02
P07	Weather Standby	13:26	4.00
P14	Radio Nav. Fail	06:41	1.99
P16	Nav Calibration	36:25	10.84
P17	Travel Time	04:46	1.42
P18	Travel T/F Port	18:57	5.64
P19	In Port	02:55	0.87
P20	Deploy /Recover	71:36	21.31
P21	Reconfigure	22:08	6.59
P25	Extended L/C	25:20	7.54

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	79:26	23.64
OPERATIONAL TIME	113:28	33.77
STANDBY	77:32	23.08
CONTRACTOR	65:34	19.51
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	336:00	
TOTAL Kms	680.437	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
23/08/89						
00:00	01:00	20	27	C	Recover Trailing Equipment.	01:00
01:00	08:00	18	27	C	Travel to Crewchange.	07:00
08:00	15:30	19	27	C	Crewchange offshore Lauwerzoog	07:30
15:30	18:50	18	27	C	Travel back to Prospect.	03:20
18:50	23:40	20	27	C	Deploy Trailing Equipment.	04:50
23:40	24:00	07	07	S	Weather Standby.	00:20

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 23/08/89 To 23/08/89

Code		HH:MM	Percent
P07	Weather Standby	00:20	1.39
P18	Travel T/F Port	10:20	43.06
P19	In Port	07:30	31.25
P20	Deploy /Recover	05:50	24.31

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	00:00	0.00
STANDBY	00:20	1.39
CONTRACTOR	23:40	98.61
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

PRODUCTION LOG GECO RHO

23/08/89
No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 23/08/89

Code		HH:MM	Percent
P01	Recording Time	79:56	22.20
P02	Line Change	53:50	14.95
P07	Weather Standby	13:46	3.82
P14	Radio Nav. Fail	06:41	1.86
P16	Nav Calibration	36:25	10.12
P17	Travel Time	04:46	1.32
P18	Travel T/F Port	29:17	8.13
P19	In Port	10:25	2.89
P20	Deploy /Recover	77:26	21.51
P21	Reconfigure	22:08	6.15
P25	Extended L/C	25:20	7.04

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	79:26	22.06
OPERATIONAL TIME	113:28	31.52
STANDBY	77:52	21.63
CONTRACTOR	89:14	24.79
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	360:00	
TOTAL Kms	680.437	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
24/08/89						
00:00	23:04	07	07	S	Weather Standby.	23:04
23:04	24:00	20	27	C	Nominal Deployment Downtime.	00:56

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 24/08/89 To 24/08/89

Code		HH:MM	Percent
P07	Weather Standby	23:04	96.11
P20	Deploy /Recover	00:56	3.89

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	00:00	0.00
STANDBY	23:04	96.11
CONTRACTOR	00:56	3.89
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

24/08/89

No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 24/08/89

Code		HH:MM	Percent
P01	Recording Time	79:56	20.82
P02	Line Change	53:50	14.02
P07	Weather Standby	36:50	9.59
P14	Radio Nav. Fail	06:41	1.74
P16	Nav Calibration	36:25	9.48
P17	Travel Time	04:46	1.24
P18	Travel T/F Port	29:17	7.63
P19	In Port	10:25	2.71
P20	Deploy /Recover	78:22	20.41
P21	Reconfigure	22:08	5.76
P25	Extended L/C	25:20	6.60

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	79:26	20.69
OPERATIONAL TIME	113:28	29.55
STANDBY	100:56	26.28
CONTRACTOR	90:10	23.48
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	384:00	
TOTAL Kms	680.437	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
25/08/89						
00:00	05:04	20	27	C	Nominal Deployment Downtime.	05:04
05:04	06:40	02	30	O	Run Down Infill Line.	01:36
06:40	08:42	01	30	O	Line F0562/R	02:02
08:42	10:42	02	02	O	Allocated 2hr Line Change Time	02:00
10:42	11:33	25	08	S	Waiting on Tide.	00:51
11:33	12:10	01	12	C	Line F0202*R	00:37
12:10	14:57	01	30	O	Line F0202/R	02:47
14:57	16:57	02	02	O	Allocated 2hr Line Change Time	02:00
16:57	17:46	25	08	S	Waiting on Tide.	00:49
17:46	21:14	01	30	O	Line F0634/R	03:28
21:14	23:14	02	02	O	Allocated 2hr Line Change Time	02:00
23:14	24:00	25	08	S	Waiting on Tide.	00:46

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 25/08/89 To 25/08/89

Code		HH:MM	Percent
P01	Recording Time	08:54	37.08
P02	Line Change	07:36	31.67
P20	Deploy /Recover	05:04	21.11
P25	Extended L/C	02:26	10.14

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	15:53	66.18
STANDBY	02:26	10.14
CONTRACTOR	05:41	23.68
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	68.681	

25/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0562/R	90					Fill-in
0562/141		593	1490	898	16.838	
/142		0	0	0	0.000	
/143		0	0	0	0.000	
/144		0	0	0	0.000	
/145		0	0	0	0.000	
/146		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0202*R	270					Reshoot
0202/493		0	0	0	0.000	
/494		0	0	0	0.000	
/495		0	0	0	0.000	
/496		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0202/R	270					Fill-in
0202/493		377	1630	1254	23.513	
/494		0	0	0	0.000	
/495		0	0	0	0.000	
/496		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0634/R	90					Fill-in
0634/72		120	1630	1511	28.331	
/73		0	0	0	0.000	
/74		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	

Total kms for day: 68.681 Accumulated total to date 68.681

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 25/08/89

Code		HH:MM	Percent
P01	Recording Time	88:50	21.77
P02	Line Change	61:26	15.06
P07	Weather Standby	36:50	9.03
P14	Radio Nav. Fail	06:41	1.64
P16	Nav Calibration	36:25	8.93
P17	Travel Time	04:46	1.17
P18	Travel T/F Port	29:17	7.18
P19	In Port	10:25	2.55
P20	Deploy /Recover	83:26	20.45
P21	Reconfigure	22:08	5.42
P25	Extended L/C	27:46	6.81

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	79:26	19.47
OPERATIONAL TIME	129:21	31.70
STANDBY	103:22	25.33
CONTRACTOR	95:51	23.49
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	408:00	
TOTAL Kms	749.119	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
26/08/89						
00:00	03:31	01	01	P	Line F0334-R	03:31
03:31	05:31	02	02	O	Allocated 2hr Line Change Time	02:00
05:31	06:32	25	08	S	Waiting on Tide.	01:01
06:32	09:57	01	01	P	Line F0502-R	03:25
09:57	11:57	02	02	O	Allocated 2hr Line Change Time	02:00
11:57	13:07	25	08	S	Waiting on Tide.	01:10
13:07	16:42	01	01	P	Line F0166-R	03:35
16:42	18:42	02	02	O	Allocated 2hr Line Change Time	02:00
18:42	19:11	25	08	S	Waiting on Tide.	00:29
19:11	22:42	01	01	P	Line F0646-R	03:31
22:42	24:00	02	02	O	Allocated 2hr Line Change Time	01:18

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 26/08/89 To 26/08/89

Code		HH:MM	Percent
P01	Recording Time	14:02	58.47
P02	Line Change	07:18	30.42
P25	Extended L/C	02:40	11.11

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	14:02	58.47
OPERATIONAL TIME	07:18	30.42
STANDBY	02:40	11.11
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	114.825	

26/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0334-R	270					Complete
0340/361		0	0	0	0.000	
0339/362		0	0	0	0.000	
0338/363		0	0	0	0.000	
0337/364		0	0	0	0.000	
0336/365		0	0	0	0.000	
0335/366		0	0	0	0.000	
0334/367		100	1630	1531	28.706	
0333/368		0	0	0	0.000	
F0502-R	90					Complete
0504/197		0	0	0	0.000	
0503/198		0	0	0	0.000	
0502/199		100	1630	1531	28.706	
0501/200		0	0	0	0.000	
0500/201		0	0	0	0.000	
0499/202		0	0	0	0.000	
0498/203		0	0	0	0.000	
0497/204		0	0	0	0.000	
F0166-R	270					Complete
0172/529		0	0	0	0.000	
0171/530		0	0	0	0.000	
0170/531		0	0	0	0.000	
0169/532		0	0	0	0.000	
0168/533		0	0	0	0.000	
0167/534		0	0	0	0.000	
0166/535		100	1630	1531	28.706	
0165/536		0	0	0	0.000	
F0646-R	90					Complete
0648/53		0	0	0	0.000	
0647/54		0	0	0	0.000	
0646/55		100	1630	1531	28.706	
0645/56		0	0	0	0.000	
0644/57		0	0	0	0.000	
0643/58		0	0	0	0.000	
0642/59		0	0	0	0.000	
0641/60		0	0	0	0.000	

Total kms for day: 114.825 Accumulated total to date 114.825

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 26/08/89

Code		HH:MM	Percent
P01	Recording Time	102:52	23.81
P02	Line Change	68:44	15.91
P07	Weather Standby	36:50	8.53
P14	Radio Nav. Fail	06:41	1.55
P16	Nav Calibration	36:25	8.43
P17	Travel Time	04:46	1.10
P18	Travel T/F Port	29:17	6.78
P19	In Port	10:25	2.41
P20	Deploy /Recover	83:26	19.31
P21	Reconfigure	22:08	5.12
P25	Extended L/C	30:26	7.04

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	93:28	21.64
OPERATIONAL TIME	136:39	31.63
STANDBY	106:02	24.54
CONTRACTOR	95:51	22.19
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	432:00	
TOTAL Kms	863.944	

DAILY TIME LOG — GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
27/08/89						
00:00	00:42	02	02	O	Allocated 2hr Line Change Time	00:42
00:42	01:16	25	08	S	Waiting on Tide.	00:34
01:16	04:51	01	01	P	Line F0346-R	03:35
04:51	06:51	02	02	O	Allocated 2hr Line Change Time	02:00
06:51	07:46	25	08	S	Waiting on Tide.	00:55
07:46	11:15	01	01	P	Line F0490-R	03:29
11:15	13:15	02	02	O	Allocated 2hr Line Change Time	02:00
13:15	14:14	25	08	S	Waiting on Tide.	00:59
14:14	17:42	01	01	P	Line F0154-R	03:28
17:42	19:42	02	02	O	Allocated 2hr Line Change Time	02:00
19:42	20:18	25	08	S	Waiting on Tide.	00:36
20:18	24:00	07	07	S	Weather Standby.	03:42

27/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0346-R	270					Complete
0348/353		0	0	0	0.000	
0347/354		0	0	0	0.000	
0346/355		100	1630	1531	28.706	
0345/356		0	0	0	0.000	
0344/357		0	0	0	0.000	
0343/358		0	0	0	0.000	
0342/359		0	0	0	0.000	
0341/360		0	0	0	0.000	
F0490-R	90					Complete
0492/209		0	0	0	0.000	
0491/210		0	0	0	0.000	
0490/211		100	1630	1531	28.706	
0489/212		0	0	0	0.000	
0488/213		0	0	0	0.000	
0487/214		0	0	0	0.000	
0486/215		0	0	0	0.000	
0485/216		0	0	0	0.000	
F0154-R	270					Complete
0156/545		0	0	0	0.000	
0155/546		0	0	0	0.000	
0154/547		100	1630	1531	28.706	
0153/548		0	0	0	0.000	
0152/549		0	0	0	0.000	
0151/550		0	0	0	0.000	
0150/551		0	0	0	0.000	
0149/552		0	0	0	0.000	
Total kms for day:		86.119	Accumulated total to date			86.119

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 27/08/89 To 27/08/89

Code		HH:MM	Percent
P01	Recording Time	10:32	43.89
P02	Line Change	06:42	27.92
P07	Weather Standby	03:42	15.42
P25	Extended L/C	03:04	12.78

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	10:32	43.89
OPERATIONAL TIME	06:42	27.92
STANDBY	06:46	28.19
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	86.119	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 27/08/89

Code		HH:MM	Percent
P01	Recording Time	113:24	24.87
P02	Line Change	75:26	16.54
P07	Weather Standby	40:32	8.89
P14	Radio Nav. Fail	06:41	1.47
P16	Nav Calibration	36:25	7.99
P17	Travel Time	04:46	1.05
P18	Travel T/F Port	29:17	6.42
P19	In Port	10:25	2.28
P20	Deploy /Recover	83:26	18.30
P21	Reconfigure	22:08	4.85
P25	Extended L/C	33:30	7.35

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	104:00	22.81
OPERATIONAL TIME	143:21	31.44
STANDBY	112:48	24.74
CONTRACTOR	95:51	21.02
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	456:00	
TOTAL Kms	950.062	

DAILY TIME LOG — GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
28/08/89						
00:00	08:42	07	07	S	Weather Standby.	08:42
08:42	12:19	01	01	P	Line F0478-R	03:37
12:19	14:19	02	02	O	Allocated 2hr Line Change Time	02:00
14:19	15:02	25	08	S	Waiting on Tide.	00:43
15:02	21:07	07	07	S	Weather Standby.	06:05
21:07	24:00	01	01	P	Line F0658-R	02:53

28/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0478-R	90					Complete
0480/221		0	0	0	0.000	
0479/222		0	0	0	0.000	
0478/223		100	1630	1531	28.706	
0477/224		0	0	0	0.000	
0476/225		0	0	0	0.000	
0475/226		0	0	0	0.000	
0474/227		0	0	0	0.000	
0473/228		0	0	0	0.000	
F0658-R	90					Complete
0660/41		0	0	0	0.000	
0659/42		0	0	0	0.000	
0658/43		100	1330	1231	23.081	
0657/44		0	0	0	0.000	
0656/45		0	0	0	0.000	
0655/46		0	0	0	0.000	
0654/47		0	0	0	0.000	
0653/48		0	0	0	0.000	

Total kms for day: 51.788 Accumulated total to date 51.788

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 28/08/89 To 28/08/89

Code		HH:MM	Percent
P01	Recording Time	06:30	27.08
P02	Line Change	02:00	8.33
P07	Weather Standby	14:47	61.60
P25	Extended L/C	00:43	2.99

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	06:30	27.08
OPERATIONAL TIME	02:00	8.33
STANDBY	15:30	64.58
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	51.788	

PRODUCTION/DOWNTIME BY ACTIVITY

GECO RHO

From 09/08/89 To 28/08/89

Code		HH:MM	Percent
P01	Recording Time	119:54	24.98
P02	Line Change	77:26	16.13
P07	Weather Standby	55:19	11.52
P14	Radio Nav. Fail	06:41	1.39
P16	Nav Calibration	36:25	7.59
P17	Travel Time	04:46	0.99
P18	Travel T/F Port	29:17	6.10
P19	In Port	10:25	2.17
P20	Deploy /Recover	83:26	17.38
P21	Reconfigure	22:08	4.61
P25	Extended L/C	34:13	7.13

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	110:30	23.02
OPERATIONAL TIME	145:21	30.28
STANDBY	128:18	26.73
CONTRACTOR	95:51	19.97
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	480:00	
TOTAL Kms	1001.850	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
29/08/89						
00:00	00:43	01	01	P	Line F0658-R	00:43
00:43	02:43	02	02	O	Allocated 2hr Line Change Time	02:00
02:43	03:09	25	08	S	Waiting on Tide.	00:26
03:09	06:04	20	13	C	Repair Streamer Cable.	02:55
06:04	07:32	01	30	C	Line F0346/R	01:28
07:32	09:20	20	13	C	Repair Streamer Cable.	01:48
09:20	11:14	01	30	O	Line F0514/R	01:54
11:14	13:14	02	02	O	Allocated 2hr Line Change Time	02:00
13:14	15:42	25	08	S	Waiting on Tide.	02:28
15:42	19:17	01	01	P	Line F0142-R	03:35
19:17	21:17	02	02	O	Allocated 2hr Line Change Time	02:00
21:17	21:48	25	08	S	Waiting on Tide.	00:31
21:48	24:00	01	01	P	Line F0670-R	02:12

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 29/08/89 To 29/08/89

Code		HH:MM	Percent
P01	Recording Time	09:52	41.11
P02	Line Change	06:00	25.00
P20	Deploy /Recover	04:43	19.65
P25	Extended L/C	03:25	14.24

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	06:30	27.08
OPERATIONAL TIME	07:54	32.92
STANDBY	03:25	14.24
CONTRACTOR	06:11	25.76
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	66.938	

29/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0658-R	90					Complete
0660/41		0	0	0	0.000	
0659/42		0	0	0	0.000	
0658/43		1331	1630	300	5.625	
0657/44		0	0	0	0.000	
0656/45		0	0	0	0.000	
0655/46		0	0	0	0.000	
0654/47		0	0	0	0.000	
0653/48		0	0	0	0.000	
F0346/R	270					Fill-in
0346/349		0	0	0	0.000	
/350		0	0	0	0.000	
/351		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0514/R	90					Fill-in
0514/189		100	913	814	15.263	
/190		0	0	0	0.000	
/191		0	0	0	0.000	
/192		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0142-R	270					Complete
0148/553		0	0	0	0.000	
0147/554		0	0	0	0.000	
0146/555		0	0	0	0.000	
0145/556		0	0	0	0.000	
0144/557		0	0	0	0.000	
0143/558		0	0	0	0.000	
0142/559		100	1630	1531	28.706	
0141/560		0	0	0	0.000	
F0670-R	90					Complete
0672/29		0	0	0	0.000	
0671/30		0	0	0	0.000	
0670/31		100	1024	925	17.344	
0669/32		0	0	0	0.000	
0668/33		0	0	0	0.000	
0667/34		0	0	0	0.000	
0666/35		0	0	0	0.000	
0665/36		0	0	0	0.000	

Total kms for day: 66.938 Accumulated total to date 66.938

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 29/08/89

Code		HH:MM	Percent
P01	Recording Time	129:46	25.75
P02	Line Change	83:26	16.55
P07	Weather Standby	55:19	10.98
P14	Radio Nav. Fail	06:41	1.33
P16	Nav Calibration	36:25	7.23
P17	Travel Time	04:46	0.95
P18	Travel T/F Port	29:17	5.81
P19	In Port	10:25	2.07
P20	Deploy /Recover	88:09	17.49
P21	Reconfigure	22:08	4.39
P25	Extended L/C	37:38	7.47

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	117:00	23.21
OPERATIONAL TIME	153:15	30.41
STANDBY	131:43	26.13
CONTRACTOR	102:02	20.24
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	504:00	
TOTAL Kms	1068.787	

DAILY TIME LOG — GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
30/08/89						
00:00	01:29	01	01	P	Line F0670-R	01:29
01:29	03:29	02	02	O	Allocated 2hr Line Change Time	02:00
03:29	03:53	25	08	S	Waiting on Tide.	00:24
03:53	07:29	01	01	P	Line F0358-R	03:36
07:29	09:29	02	02	O	Allocated 2hr Line Change Time	02:00
09:29	10:06	25	08	S	Waiting on Tide.	00:37
10:06	13:44	01	01	P	Line F0466-R	03:38
13:44	15:44	02	02	O	Allocated 2hr Line Change Time	02:00
15:44	16:21	25	08	S	Waiting on Tide.	00:37
16:21	19:56	01	01	P	Line F0130-R	03:35
19:56	21:56	02	02	O	Allocated 2hr Line Change Time	02:00
21:56	22:31	25	08	S	Waiting on Tide.	00:35
22:31	24:00	01	01	P	Line F0682-R	01:29

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 30/08/89 To 30/08/89

Code		HH:MM	Percent
P01	Recording Time	13:47	57.43
P02	Line Change	08:00	33.33
P25	Extended L/C	02:13	9.24

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	13:47	57.43
OPERATIONAL TIME	08:00	33.33
STANDBY	02:13	9.24
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	109.106	

PRODUCTION LOG GECO RHO

30/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0670-R	90					Complete
0672/29		0	0	0	0.000	
0671/30		0	0	0	0.000	
0670/31		1025	1630	606	11.363	
0669/32		0	0	0	0.000	
0668/33		0	0	0	0.000	
0667/34		0	0	0	0.000	
0666/35		0	0	0	0.000	
0665/36		0	0	0	0.000	
F0358-R	270					Complete
0364/337		0	0	0	0.000	
0363/338		0	0	0	0.000	
0362/339		0	0	0	0.000	
0361/340		0	0	0	0.000	
0360/341		0	0	0	0.000	
0359/342		0	0	0	0.000	
0358/343		100	1630	1531	28.706	
0357/344		0	0	0	0.000	
F0466-R	90					Complete
0468/233		0	0	0	0.000	
0467/234		0	0	0	0.000	
0466/235		100	1630	1531	28.706	
0465/236		0	0	0	0.000	
0464/237		0	0	0	0.000	
0463/238		0	0	0	0.000	
0462/239		0	0	0	0.000	
0461/240		0	0	0	0.000	
F0130-R	270					Complete
0136/565		0	0	0	0.000	
0135/566		0	0	0	0.000	
0134/567		0	0	0	0.000	
0133/568		0	0	0	0.000	
0132/569		0	0	0	0.000	
0131/570		0	0	0	0.000	
0130/571		100	1630	1531	28.706	
0129/572		0	0	0	0.000	
F0682-R	90					Complete
0684/17		0	0	0	0.000	
0683/18		0	0	0	0.000	
0682/19		100	719	620	11.625	
0681/20		0	0	0	0.000	
0680/21		0	0	0	0.000	
0679/22		0	0	0	0.000	
0678/23		0	0	0	0.000	
0677/24		0	0	0	0.000	

Total kms for day: 109.106 Accumulated total to date 109.106

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 30/08/89

Code		HH:MM	Percent
P01	Recording Time	143:33	27.19
P02	Line Change	91:26	17.32
P07	Weather Standby	55:19	10.48
P14	Radio Nav. Fail	06:41	1.27
P16	Nav Calibration	36:25	6.90
P17	Travel Time	04:46	0.90
P18	Travel T/F Port	29:17	5.55
P19	In Port	10:25	1.97
P20	Deploy /Recover	88:09	16.70
P21	Reconfigure	22:08	4.19
P25	Extended L/C	39:51	7.55

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	130:47	24.77
OPERATIONAL TIME	161:15	30.54
STANDBY	133:56	25.37
CONTRACTOR	102:02	19.32
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	528:00	
TOTAL Kms	1177.894	

DAILY TIME LOG — GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
31/08/89						
00:00	02:10	01	01	P	Line F0682-R	02:10
02:10	04:10	02	02	O	Allocated 2hr Line Change Time	02:00
04:10	04:38	25	08	S	Waiting on Tide.	00:28
04:38	08:17	01	01	P	Line F0370-R	03:39
08:17	10:17	02	02	O	Allocated 2hr Line Change Time	02:00
10:17	10:49	25	08	S	Waiting on Tide.	00:32
10:49	14:28	01	01	P	Line F0454-R	03:39
14:28	16:28	02	02	O	Allocated 2hr Line Change Time	02:00
16:28	17:00	25	08	S	Waiting on Tide.	00:32
17:00	20:38	01	01	P	Line F0118-R	03:38
20:38	22:38	02	02	O	Allocated 2hr Line Change Time	02:00
22:38	23:11	25	08	S	Waiting on Tide.	00:33
23:11	24:00	01	01	P	Line F0694-R	00:49

PRODUCTION LOG GECO RHO

31/08/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0682-R	90					Complete
0684/17		0	0	0	0.000	
0683/18		0	0	0	0.000	
0682/19		720	1630	911	17.081	
0681/20		0	0	0	0.000	
0680/21		0	0	0	0.000	
0679/22		0	0	0	0.000	
0678/23		0	0	0	0.000	
0677/24		0	0	0	0.000	
F0370-R	270					Complete
0376/325		0	0	0	0.000	
0375/326		0	0	0	0.000	
0374/327		0	0	0	0.000	
0373/328		0	0	0	0.000	
0372/329		0	0	0	0.000	
0371/330		0	0	0	0.000	
0370/331		100	1630	1531	28.706	
0369/332		0	0	0	0.000	
F0454-R	90					Complete
0456/245		0	0	0	0.000	
0455/246		0	0	0	0.000	
0454/247		100	1630	1531	28.706	
0453/248		0	0	0	0.000	
0452/249		0	0	0	0.000	
0451/250		0	0	0	0.000	
0450/251		0	0	0	0.000	
0449/252		0	0	0	0.000	
F0118-R	270					Complete
0124/577		0	0	0	0.000	
0123/578		0	0	0	0.000	
0122/579		0	0	0	0.000	
0121/580		0	0	0	0.000	
0120/581		0	0	0	0.000	
0119/582		0	0	0	0.000	
0118/583		100	1630	1531	28.706	
0117/584		0	0	0	0.000	
F0694-R	90					Complete
0696/5		0	0	0	0.000	
0695/6		0	0	0	0.000	
0694/7		100	437	338	6.337	
0693/8		0	0	0	0.000	
0692/9		0	0	0	0.000	
0691/10		0	0	0	0.000	
0690/11		0	0	0	0.000	
0689/12		0	0	0	0.000	

Total kms for day: 109.538 Accumulated total to date 109.538

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 31/08/89 To 31/08/89

Code		HH:MM	Percent
P01	Recording Time	13:55	57.99
P02	Line Change	08:00	33.33
P25	Extended L/C	02:05	8.68

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	13:55	57.99
OPERATIONAL TIME	08:00	33.33
STANDBY	02:05	8.68
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	109.538	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 31/08/89

Code		HH:MM	Percent
P01	Recording Time	157:28	28.53
P02	Line Change	99:26	18.01
P07	Weather Standby	55:19	10.02
P14	Radio Nav. Fail	06:41	1.21
P16	Nav Calibration	36:25	6.60
P17	Travel Time	04:46	0.86
P18	Travel T/F Port	29:17	5.30
P19	In Port	10:25	1.89
P20	Deploy /Recover	88:09	15.97
P21	Reconfigure	22:08	4.01
P25	Extended L/C	41:56	7.60

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	144:42	26.21
OPERATIONAL TIME	169:15	30.66
STANDBY	136:01	24.64
CONTRACTOR	102:02	18.48
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	552:00	
TOTAL Kms	1287.431	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
01/09/89						
00:00	02:52	01	01	P	Line F0694-R	02:52
02:52	04:52	02	02	O	Allocated 2hr Line Change Time	02:00
04:52	05:21	25	08	S	Waiting on Tide.	00:29
05:21	09:00	01	01	P	Line F0382-R	03:39
09:00	11:00	02	02	O	Allocated 2hr Line Change Time	02:00
11:00	11:31	25	08	S	Waiting on Tide.	00:31
11:31	15:11	01	01	P	Line F0442-R	03:40
15:11	17:11	02	02	O	Allocated 2hr Line Change Time	02:00
17:11	17:43	25	08	S	Waiting on Tide.	00:32
17:43	21:26	01	01	P	Line F0106-R	03:43
21:26	23:26	02	02	O	Allocated 2hr Line Change Time	02:00
23:26	24:00	25	08	S	Waiting on Tide.	00:34

01/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0694-R	90					Complete
0696/5		0	0	0	0.000	
0695/6		0	0	0	0.000	
0694/7		438	1630	1193	22.369	
0693/8		0	0	0	0.000	
0692/9		0	0	0	0.000	
0691/10		0	0	0	0.000	
0690/11		0	0	0	0.000	
0689/12		0	0	0	0.000	
F0382-R	270					Complete
0388/313		0	0	0	0.000	
0387/314		0	0	0	0.000	
0386/315		0	0	0	0.000	
0385/316		0	0	0	0.000	
0384/317		0	0	0	0.000	
0383/318		0	0	0	0.000	
0382/319		100	1630	1531	28.706	
0381/320		0	0	0	0.000	
F0442-R	90					Complete
0444/257		0	0	0	0.000	
0443/258		0	0	0	0.000	
0442/259		100	1630	1531	28.706	
0441/260		0	0	0	0.000	
0440/261		0	0	0	0.000	
0439/262		0	0	0	0.000	
0438/263		0	0	0	0.000	
0437/264		0	0	0	0.000	
F0106-R	270					Complete
0112/589		0	0	0	0.000	
0111/590		0	0	0	0.000	
0110/591		0	0	0	0.000	
0109/592		0	0	0	0.000	
0108/593		0	0	0	0.000	
0107/594		0	0	0	0.000	
0106/595		100	1630	1531	28.706	
0105/596		0	0	0	0.000	
Total kms for day:		108.488		Accumulated total to date		108.488

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 01/09/89 To 01/09/89

Code		HH:MM	Percent
P01	Recording Time	13:54	57.92
P02	Line Change	08:00	33.33
P25	Extended L/C	02:06	8.75

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	13:54	57.92
OPERATIONAL TIME	08:00	33.33
STANDBY	02:06	8.75
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	108.488	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 01/09/89

Code		HH:MM	Percent
P01	Recording Time	171:22	29.75
P02	Line Change	107:26	18.65
P07	Weather Standby	55:19	9.60
P14	Radio Nav. Fail	06:41	1.16
P16	Nav Calibration	36:25	6.32
P17	Travel Time	04:46	0.83
P18	Travel T/F Port	29:17	5.08
P19	In Port	10:25	1.81
P20	Deploy /Recover	88:09	15.30
P21	Reconfigure	22:08	3.84
P25	Extended L/C	44:02	7.64

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	158:36	27.53
OPERATIONAL TIME	177:15	30.77
STANDBY	138:07	23.98
CONTRACTOR	102:02	17.71
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	576:00	
TOTAL Kms	1395.919	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
02/09/89						
00:00	00:01	25	08	S	Waiting on Tide.	00:01
00:01	01:46	01	30	O	Line F0670/R	01:45
01:46	02:51	02	02	O	Operational Line Change.	01:05
02:51	03:36	01	15	C	Line F0658*R	00:45
03:36	06:06	02	15	C	Line Change.	02:30
06:06	12:16	07	07	S	Weather Standby.	06:10
12:16	24:00	16	26	O	Hyperfix Post-Calibration.	11:44

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 02/09/89 To 02/09/89

Code		HH:MM	Percent
P01	Recording Time	02:30	10.42
P02	Line Change	03:35	14.93
P07	Weather Standby	06:10	25.69
P16	Nav Calibration	11:44	48.89
P25	Extended L/C	00:01	0.07

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	14:34	60.69
STANDBY	06:11	25.76
CONTRACTOR	03:15	13.54
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	14.025	

02/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0670/R	90					Fill-in
0670/34		100	847	748	14.025	
/35		0	0	0	0.000	
/36		0	0	0	0.000	
/37		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0658*R	90					Reshoot
0660/41		0	0	0	0.000	
0659/42		0	0	0	0.000	
0658/43		0	0	0	0.000	
0657/44		0	0	0	0.000	
0656/45		0	0	0	0.000	
0655/46		0	0	0	0.000	
0654/47		0	0	0	0.000	
0653/48		0	0	0	0.000	

Total kms for day: 14.025 Accumulated total to date 14.025

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 02/09/89

Code		HH:MM	Percent
P01	Recording Time	173:52	28.98
P02	Line Change	111:01	18.50
P07	Weather Standby	61:29	10.25
P14	Radio Nav. Fail	06:41	1.11
P16	Nav Calibration	48:09	8.03
P17	Travel Time	04:46	0.79
P18	Travel T/F Port	29:17	4.88
P19	In Port	10:25	1.74
P20	Deploy /Recover	88:09	14.69
P21	Reconfigure	22:08	3.69
P25	Extended L/C	44:03	7.34

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	158:36	26.43
OPERATIONAL TIME	191:49	31.97
STANDBY	144:18	24.05
CONTRACTOR	105:17	17.55
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	600:00	
TOTAL Kms	1409.944	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
03/09/89						
00:00	00:58	16	26	O	Hyperfix Post-calibration.	00:58
00:58	06:50	15	15	C	Hyperfix Failure.	05:52
06:50	12:59	07	07	S	Weather Standby.	06:09
12:59	24:00	20	13	C	Repair Port Streamer Cable.	11:01

PRODUCTION LOG GECO RHO

03/09/89
No production Accumulated total to date 0.000

GECO RHO

PRODUCTION/DOWNTIME BY ACTIVITY

From 03/09/89 To 03/09/89

Code		HH:MM	Percent
P07	Weather Standby	06:09	25.63
P15	Nav.Equip. Fail	05:52	24.44
P16	Nav Calibration	00:58	4.03
P20	Deploy /Recover	11:01	45.90

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	00:58	4.03
STANDBY	06:09	25.63
CONTRACTOR	16:53	70.35
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 03/09/89

Code		HH:MM	Percent
P01	Recording Time	173:52	27.86
P02	Line Change	111:01	17.79
P07	Weather Standby	67:38	10.84
P14	Radio Nav. Fail	06:41	1.07
P15	Nav.Equip. Fail	05:52	0.94
P16	Nav Calibration	49:07	7.87
P17	Travel Time	04:46	0.76
P18	Travel T/F Port	29:17	4.69
P19	In Port	10:25	1.67
P20	Deploy /Recover	99:10	15.89
P21	Reconfigure	22:08	3.55
P25	Extended L/C	44:03	7.06

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	158:36	25.42
OPERATIONAL TIME	192:47	30.89
STANDBY	150:27	24.11
CONTRACTOR	122:10	19.58
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	624:00	
TOTAL Kms	1409.944	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
04/09/89						
00:00	01:20	20	13	C	Repair Port Streamer Cable.	01:20
01:20	04:58	01	01	P	Line F0430-R	03:38
04:58	06:58	02	02	O	Allocated 2hr Line Change Time	02:00
06:58	07:32	25	08	S	Waiting on Tide.	00:34
07:32	11:05	01	01	P	Line F0394-R	03:33
11:05	13:05	02	02	O	Allocated 2hr Line Change Time	02:00
13:05	13:42	25	08	S	Waiting on Tide.	00:37
13:42	17:18	01	01	P	Line F0418-R	03:36
17:18	19:18	02	02	O	Allocated 2hr Line Change Time	02:00
19:18	19:41	25	08	S	Waiting on Tide.	00:23
19:41	20:47	01	01	P	Line F0214-R1	01:06
20:47	22:36	02	09	S	Run Down Line.	01:49
22:36	23:19	01	14	S	Line F0178*R	00:43
23:19	24:00	02	02	S	Line Change.	00:41

PRODUCTION LOG GECO RHO

04/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0430-R	90					Complete
0432/269		0	0	0	0.000	
0431/270		0	0	0	0.000	
0430/271		100	1630	1531	28.706	
0429/272		0	0	0	0.000	
0428/273		0	0	0	0.000	
0427/274		0	0	0	0.000	
0426/275		0	0	0	0.000	
0425/276		0	0	0	0.000	
F0394-R	270					Complete
0400/301		0	0	0	0.000	
0399/302		0	0	0	0.000	
0398/303		0	0	0	0.000	
0397/304		0	0	0	0.000	
0396/305		0	0	0	0.000	
0395/306		0	0	0	0.000	
0394/307		10100	11630	1531	28.706	
0393/308		0	0	0	0.000	
F0418-R	90					Complete
0420/281		0	0	0	0.000	
0419/282		0	0	0	0.000	
0418/283		100	1630	1531	28.706	
0417/284		0	0	0	0.000	
0416/285		0	0	0	0.000	
0415/286		0	0	0	0.000	
0414/287		0	0	0	0.000	
0413/288		0	0	0	0.000	
F0214-R1	270					Complete
0220/481		0	0	0	0.000	
0219/482		0	0	0	0.000	
0218/483		0	0	0	0.000	
0217/484		0	0	0	0.000	
0216/485		0	0	0	0.000	
0215/486		0	0	0	0.000	
0214/487		10100	10553	454	8.512	
0213/488		0	0	0	0.000	
F0178*R	270					Reshoot
0184/517		0	0	0	0.000	
0183/518		0	0	0	0.000	
0182/519		0	0	0	0.000	
0181/520		0	0	0	0.000	
0180/521		0	0	0	0.000	
0179/522		0	0	0	0.000	
0178/523		0	0	0	0.000	
0177/524		0	0	0	0.000	
Total kms for day:			94.631	Accumulated total to date		94.631

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 04/09/89 To 04/09/89

Code		HH:MM	Percent
P01	Recording Time	12:36	52.50
P02	Line Change	08:30	35.42
P20	Deploy /Recover	01:20	5.56
P25	Extended L/C	01:34	6.53

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	11:53	49.51
OPERATIONAL TIME	06:00	25.00
STANDBY	04:47	19.93
CONTRACTOR	01:20	5.56
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	94.631	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 04/09/89

Code		HH:MM	Percent
P01	Recording Time	186:28	28.78
P02	Line Change	119:31	18.44
P07	Weather Standby	67:38	10.44
P14	Radio Nav. Fail	06:41	1.03
P15	Nav.Equip. Fail	05:52	0.91
P16	Nav Calibration	49:07	7.58
P17	Travel Time	04:46	0.74
P18	Travel T/F Port	29:17	4.52
P19	In Port	10:25	1.61
P20	Deploy /Recover	100:30	15.51
P21	Reconfigure	22:08	3.42
P25	Extended L/C	45:37	7.04

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	170:29	26.31
OPERATIONAL TIME	198:47	30.68
STANDBY	155:14	23.96
CONTRACTOR	123:30	19.06
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	648:00	
TOTAL Kms	1504.575	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
05/09/89						
00:00	01:55	02	02	S	Line Change.	01:55
01:55	03:50	01	15	C	Line F0442/R	01:55
03:50	04:22	02	15	C	Run Down Line.	00:32
04:22	05:34	01	12	C	Line F0442*R	01:12
05:34	08:06	02	12	C	Line Change.	02:32
08:06	11:22	01	30	O	Line F0322/R	03:16
11:22	11:38	01	13	C	Line F0322*R	00:16
11:38	15:33	02	13	C	Line Change.	03:55
15:33	16:40	01	30	O	Line F0490/R	01:07
16:40	16:48	01	12	C	Line F0490*R	00:08
16:48	17:42	01	30	O	Line F0490/R1	00:54
17:42	19:42	02	02	O	Allocated 2hr Line Change Time	02:00
19:42	20:09	25	08	S	Waiting on Tide.	00:27
20:09	24:00	01	30	O	Line F0370/R	03:51

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 05/09/89 To 05/09/89

Code		HH:MM	Percent
P01	Recording Time	12:39	52.71
P02	Line Change	10:54	45.42
P25	Extended L/C	00:27	1.88

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	11:08	46.39
STANDBY	02:22	9.86
CONTRACTOR	10:30	43.75
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	70.294	

05/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0442/R	90					Fill-in
0442/264		0	0	0	0.000	
/265		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0442*R	90					Reshoot
0442/254		0	0	0	0.000	
/255		0	0	0	0.000	
/256		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0322/R	270					Fill-in
0322/372		10100	11499	1400	26.250	
/373		0	0	0	0.000	
/374		0	0	0	0.000	
/375		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0322*R	270					Reshoot
0322/372		0	0	0	0.000	
/373		0	0	0	0.000	
/374		0	0	0	0.000	
/375		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0490/R	90					Fill-in
0490/213		10700	11181	482	9.038	
/214		0	0	0	0.000	
/215		0	0	0	0.000	
/216		0	0	0	0.000	
/217		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0490*R	90					Reshoot
0490/213		0	0	0	0.000	
/214		0	0	0	0.000	
/215		0	0	0	0.000	
/216		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0490/R1	90					Fill-in
0490/213		11240	11630	391	7.331	
/214		0	0	0	0.000	

/215		0	0	0	0.000	
/216		0	0	0	0.000	
/217		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	

05/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0370/R	270					Fill-in
0370/324		10100	11575	1476	27.675	
/325		0	0	0	0.000	
/326		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	

Total kms for day: 70.294 Accumulated total to date 70.294

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 05/09/89

Code		HH:MM	Percent
P01	Recording Time	199:07	29.63
P02	Line Change	130:25	19.41
P07	Weather Standby	67:38	10.06
P14	Radio Nav. Fail	06:41	0.99
P15	Nav.Equip. Fail	05:52	0.87
P16	Nav Calibration	49:07	7.31
P17	Travel Time	04:46	0.71
P18	Travel T/F Port	29:17	4.36
P19	In Port	10:25	1.55
P20	Deploy /Recover	100:30	14.96
P21	Reconfigure	22:08	3.29
P25	Extended L/C	46:04	6.86

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	170:29	25.37
OPERATIONAL TIME	209:55	31.24
STANDBY	157:36	23.45
CONTRACTOR	134:00	19.94
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	672:00	
TOTAL Kms	1574.869	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
06/09/89						
00:00	00:06	01	30	O	Line F0370/R	00:06
00:06	02:06	02	02	O	Allocated 2hr Line Change Time	02:00
02:06	02:21	25	08	S	Waiting on Tide.	00:15
02:21	06:04	01	01	P	Line F0406-R	03:43
06:04	08:04	02	02	O	Allocated 2hr Line Change Time	02:00
08:04	08:27	25	08	S	Waiting on Tide.	00:23
08:27	09:41	01	30	O	Line F0262/R	01:14
09:41	09:53	01	14	S	Line F0262*R	00:12
09:53	10:26	02	02	O	Reject line - missed coverage.	00:33
10:26	12:17	02	02	O	Normal Line Change.	01:51
12:17	15:27	01	30	O	Line F0586/R	03:10
15:27	17:27	02	02	O	Allocated 2hr Line Change Time	02:00
17:27	17:43	25	08	S	Waiting on Tide.	00:16
17:43	18:25	01	30	O	Line F0154/R	00:42
18:25	19:38	02	02	O	Run Down Line.	01:13
19:38	20:16	01	13	C	Line F0154*R	00:38
20:16	21:23	02	13	C	Run Down Line.	01:07
21:23	22:52	02	26	S	Wait on Coverage Results.	01:29
22:52	24:00	20	20	O	Recover All Trailing Eqpt.	01:08

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 06/09/89 To 06/09/89

Code		HH:MM	Percent
P01	Recording Time	09:45	40.63
P02	Line Change	12:13	50.90
P20	Deploy /Recover	01:08	4.72
P25	Extended L/C	00:54	3.75

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	03:43	15.49
OPERATIONAL TIME	15:57	66.46
STANDBY	02:35	10.76
CONTRACTOR	01:45	7.29
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	70.706	

06/09/89

Line	Dir	FCSP	LCSP	Total SP	Kms	Status
F0370/R	270					Fill-in
0370/324		11576	11630	55	1.031	
/325		0	0	0	0.000	
/326		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0406-R	90					Complete
0408/293		0	0	0	0.000	
0407/294		0	0	0	0.000	
0406/295		100	1630	1531	28.706	
0405/296		0	0	0	0.000	
0404/297		0	0	0	0.000	
0403/298		0	0	0	0.000	
0402/299		0	0	0	0.000	
0401/300		0	0	0	0.000	
F0262/R	270					Fill-in
0262/428		10800	11318	519	9.731	
/429		0	0	0	0.000	
/430		0	0	0	0.000	
/431		0	0	0	0.000	
/432		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0262*R	270					Reshoot
0268/433		0	0	0	0.000	
0267/434		0	0	0	0.000	
0266/435		0	0	0	0.000	
0265/436		0	0	0	0.000	
0264/437		0	0	0	0.000	
0263/438		0	0	0	0.000	
0262/439		0	0	0	0.000	
0261/440		0	0	0	0.000	
F0586/R	90					Fill-in
0586/116		10270	11630	1361	25.519	
/117		0	0	0	0.000	
/118		0	0	0	0.000	
/119		0	0	0	0.000	
/120		0	0	0	0.000	
/121		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0154/R	270					Fill-in
0154/552		10100	10404	305	5.719	
/553		0	0	0	0.000	
/554		0	0	0	0.000	
/555		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
		0	0	0	0.000	
F0154*R	270					Reshoot
0154/549		0	0	0	0.000	
/550		0	0	0	0.000	

0	0	0	0.000
0	0	0	0.000
0	0	0	0.000
0	0	0	0.000
0	0	0	0.000
0	0	0	0.000

Total kms for day: 70.706 Accumulated total to date 70.706

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 06/09/89

Code		HH:MM	Percent
P01	Recording Time	208:52	30.01
P02	Line Change	142:38	20.49
P07	Weather Standby	67:38	9.72
P14	Radio Nav. Fail	06:41	0.96
P15	Nav.Equip. Fail	05:52	0.84
P16	Nav Calibration	49:07	7.06
P17	Travel Time	04:46	0.68
P18	Travel T/F Port	29:17	4.21
P19	In Port	10:25	1.50
P20	Deploy /Recover	101:38	14.60
P21	Reconfigure	22:08	3.18
P25	Extended L/C	46:58	6.75

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	174:12	25.03
OPERATIONAL TIME	225:52	32.45
STANDBY	160:11	23.01
CONTRACTOR	135:45	19.50
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	696:00	
TOTAL Kms	1645.575	

DAILY TIME LOG GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
07/09/89						
00:00	04:52	20	20	0	Recover Trailing Equipment.	04:52
04:52	08:40	20	27	C	Geco Cable Work.	03:48
08:40	10:25	17	16	0	Travel to Syledis Calibration.	01:45
10:25	11:40	16	26	0	Syledis Baseline Crossings.	01:15
11:40	11:55	16	26	0	Fathometer Bar Check.	00:15
11:55	13:34	16	26	0	Syledis Baseline Crossings.	01:39
13:34	24:00	18	26	0	Travel to Den Helder.	10:26

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 07/09/89 To 07/09/89

Code		HH:MM	Percent
P16	Nav Calibration	03:09	13.13
P17	Travel Time	01:45	7.29
P18	Travel T/F Port	10:26	43.47
P20	Deploy /Recover	08:40	36.11

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	20:12	84.17
STANDBY	00:00	0.00
CONTRACTOR	03:48	15.83
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	24:00	
TOTAL Kms	0.000	

PRODUCTION LOG GECO RHO

07/09/89
No production Accumulated total to date 0.000

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PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 07/09/89

Code		HH:MM	Percent
P01	Recording Time	208:52	29.01
P02	Line Change	142:38	19.81
P07	Weather Standby	67:38	9.39
P14	Radio Nav. Fail	06:41	0.93
P15	Nav.Equip. Fail	05:52	0.81
P16	Nav Calibration	52:16	7.26
P17	Travel Time	06:31	0.91
P18	Travel T/F Port	39:43	5.52
P19	In Port	10:25	1.45
P20	Deploy /Recover	110:18	15.32
P21	Reconfigure	22:08	3.07
P25	Extended L/C	46:58	6.52

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	174:12	24.19
OPERATIONAL TIME	246:04	34.18
STANDBY	160:11	22.25
CONTRACTOR	139:33	19.38
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	720:00	
TOTAL Kms	1645.575	

DAILY TIME LOG

GECO RHO

From	To	Act	Cau	Chg	Comment	HH:MM
08/09/89						
00:00	04:45	18	26	0	Travel to Den Helder.	04:45

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 08/09/89 To 08/09/89

Code		HH:MM	Percent
P18	Travel T/F Port	04:45	100.00

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	04:45	100.00
STANDBY	00:00	0.00
CONTRACTOR	00:00	0.00
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	04:45	
TOTAL Kms	0.000	

08/09/89

No production Accumulated total to date 0.000

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 08/09/89

Code		HH:MM	Percent
P01	Recording Time	208:52	28.82
P02	Line Change	142:38	19.68
P07	Weather Standby	67:38	9.33
P14	Radio Nav. Fail	06:41	0.92
P15	Nav.Equip. Fail	05:52	0.81
P16	Nav Calibration	52:16	7.21
P17	Travel Time	06:31	0.90
P18	Travel T/F Port	44:28	6.14
P19	In Port	10:25	1.44
P20	Deploy /Recover	110:18	15.22
P21	Reconfigure	22:08	3.05
P25	Extended L/C	46:58	6.48

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	174:12	24.04
OPERATIONAL TIME	250:49	34.61
STANDBY	160:11	22.10
CONTRACTOR	139:33	19.25
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	724:45	
TOTAL Kms	1645.575	

7.2 Production Analysis in Line Order

7.2.1 Geco Sigma

Line	Date	Dir	FCSP	LCSP	Kms	Status
F0106-S	01/09/89	270				Complete
0108/593			0	0	0.000	
0107/594			0	0	0.000	
0106/595			100	1630	28.706	
0105/596			0	0	0.000	
0104/597			0	0	0.000	
0103/598			0	0	0.000	
0102/599			0	0	0.000	
0101/600			0	0	0.000	
F0106/S	06/09/89	270				Fill-in
0106/586			10100	11630	28.706	
/587			0	0	0.000	
/588			0	0	0.000	
/589			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0118-S	31/08/89	270				Complete
0120/581			0	0	0.000	
0119/582			0	0	0.000	
0118/583			100	1630	28.706	
0117/584			0	0	0.000	
0116/585			0	0	0.000	
0115/586			0	0	0.000	
0114/587			0	0	0.000	
0113/588			0	0	0.000	
F0130-S	30/08/89	270				Complete
0132/569			0	0	0.000	
0131/570			0	0	0.000	
0130/571			100	1630	28.706	
0129/572			0	0	0.000	
0128/573			0	0	0.000	
0127/574			0	0	0.000	
0126/575			0	0	0.000	
0125/576			0	0	0.000	
F0142-S	29/08/89	270				Complete
0144/557			0	0	0.000	
0143/558			0	0	0.000	
0142/559			100	1630	28.706	
0141/560			0	0	0.000	
0140/561			0	0	0.000	
0139/562			0	0	0.000	
0138/563			0	0	0.000	
0137/564			0	0	0.000	
F0154-S	27/08/89	270				Complete
0156/545			0	0	0.000	
0155/546			0	0	0.000	
0154/547			100	1630	28.706	
0153/548			0	0	0.000	
0152/549			0	0	0.000	
0151/550			0	0	0.000	
0150/551			0	0	0.000	
0149/552			0	0	0.000	
F0166-S	26/08/89	270				Complete
0168/533			0	0	0.000	
0167/534			0	0	0.000	
0166/535			100	1630	28.706	
0165/536			0	0	0.000	
0164/537			0	0	0.000	
0163/538			0	0	0.000	
0162/539			0	0	0.000	

Line	Date	Dir	FCSP	LCSP	Kms	Status
0161/540			0	0	0.000	
F0178*S	04/09/89	270				Reshoot
0180/521			0	0	0.000	
0179/522			0	0	0.000	
0178/523			0	0	0.000	
0177/524			0	0	0.000	
0176/525			0	0	0.000	
0175/526			0	0	0.000	
0174/527			0	0	0.000	
0173/528			0	0	0.000	
F0178-S	22/08/89	270				Incomplete
0180/521			0	0	0.000	
0179/522			0	0	0.000	
0178/523			100	1630	28.706	
0177/524			0	0	0.000	
0176/525			0	0	0.000	
0175/526			0	0	0.000	
0174/527			0	0	0.000	
0173/528			0	0	0.000	
F0190-S	21/08/89	270				Complete
0192/509			0	0	0.000	
0191/510			0	0	0.000	
0190/511			100	1630	28.706	
0189/512			0	0	0.000	
0188/513			0	0	0.000	
0187/514			0	0	0.000	
0186/515			0	0	0.000	
0185/516			0	0	0.000	
F0190/S	07/09/89	270				Fill-in
0190/505			737	1630	16.763	
/506			0	0	0.000	
/507			0	0	0.000	
/508			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0202-S	20/08/89	270				Complete
0204/497			0	0	0.000	
0203/498			0	0	0.000	
0202/499			100	1630	28.706	
0201/500			0	0	0.000	
0200/501			0	0	0.000	
0199/502			0	0	0.000	
0198/503			0	0	0.000	
0197/504			0	0	0.000	
F0214-S	19/08/89	270				Incomplete
216/485			0	0	0.000	
215/486			0	0	0.000	
214/487			554	1630	20.194	
213/488			0	0	0.000	
212/489			0	0	0.000	
211/490			0	0	0.000	
210/491			0	0	0.000	
209/492			0	0	0.000	
F0214-S1	04/09/89	270				Complete
0216/485			0	0	0.000	
0215/486			0	0	0.000	
0214/487			10100	10553	8.512	
0213/488			0	0	0.000	
0212/489			0	0	0.000	

PRODUCTION ANALYSIS BY LINE

GECO SIGMA

Line	Date	Dir	FCSP	LCSP	Kms	Status
0211/490			0	0	0.000	
0210/491			0	0	0.000	
0209/492			0	0	0.000	
F0226-S	16/08/89	270				Complete
0228/473			0	0	0.000	
0227/474			0	0	0.000	
0226/475			100	1630	28.706	
0225/476			0	0	0.000	
0224/477			0	0	0.000	
0223/478			0	0	0.000	
0222/479			0	0	0.000	
0221/480			0	0	0.000	
F0226/S	03/09/89	270				Fill-in
0226/465			100	1630	28.706	
/466			0	0	0.000	
/467			0	0	0.000	
/468			0	0	0.000	
/469			0	0	0.000	
/470			0	0	0.000	
/471			0	0	0.000	
			0	0	0.000	
F0238-S	14/08/89	270				Complete
0240/461			0	0	0.000	
0239/462			0	0	0.000	
0238/463			100	1630	28.706	
0237/464			0	0	0.000	
0236/465			0	0	0.000	
0235/466			0	0	0.000	
0234/467			0	0	0.000	
0233/468			0	0	0.000	
F0250-S	14/08/89	270				Complete
0252/449			0	0	0.000	
0251/450			0	0	0.000	
0250/451			100	1630	28.706	
0249/452			0	0	0.000	
0248/453			0	0	0.000	
0247/454			0	0	0.000	
0246/455			0	0	0.000	
0245/456			0	0	0.000	
F0262*S	06/09/89	270				Reshoot
0264/437			0	0	0.000	
0263/438			0	0	0.000	
0262/439			0	0	0.000	
0261/440			0	0	0.000	
0260/441			0	0	0.000	
0259/442			0	0	0.000	
0258/443			0	0	0.000	
0257/444			0	0	0.000	
F0262-S	16/08/89	270				Complete
0264/437			0	0	0.000	
0263/438			0	0	0.000	
0262/439			100	1630	28.706	
0261/440			0	0	0.000	
0260/441			0	0	0.000	
0259/442			0	0	0.000	
0258/443			0	0	0.000	
0257/444			0	0	0.000	
F0262/S	06/09/89	270				Fill-in
0262/442			10800	11318	9.731	
/443			0	0	0.000	
/444			0	0	0.000	

Line	Date	Dir	FCSP	LCSP	Kms	Status
/445			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0274-S	17/08/89	270				Complete
0276/425			0	0	0.000	
0275/426			0	0	0.000	
0274/427			100	1630	28.706	
0273/428			0	0	0.000	
0272/429			0	0	0.000	
0271/430			0	0	0.000	
0270/431			0	0	0.000	
0269/432			0	0	0.000	
F0274/S	07/09/89	270				Fill-in
0274/431			0	0	0.000	
/432			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0286-S	19/08/89	270				Complete
0288/413			0	0	0.000	
0287/414			0	0	0.000	
0286/415			100	1630	28.706	
0285/416			0	0	0.000	
0284/417			0	0	0.000	
0283/418			0	0	0.000	
0282/419			0	0	0.000	
0281/420			0	0	0.000	
F0298-S	20/08/89	270				Complete
0300/401			0	0	0.000	
0299/402			0	0	0.000	
0298/403			100	1630	28.706	
0297/404			0	0	0.000	
0296/405			0	0	0.000	
0295/406			0	0	0.000	
0294/407			0	0	0.000	
0293/408			0	0	0.000	
F0310-S	21/08/89	270				Complete
0312/389			0	0	0.000	
0311/390			0	0	0.000	
0310/391			100	1630	28.706	
0309/392			0	0	0.000	
0308/393			0	0	0.000	
0307/394			0	0	0.000	
0306/395			0	0	0.000	
0305/396			0	0	0.000	
F0322*S	05/09/89	270				Reshoot
0322/382			0	0	0.000	
/383			0	0	0.000	
/384			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0322-S	22/08/89	270				Complete
0324/377			0	0	0.000	

Line	Date	Dir	FCSP	LCSP	Kms	Status
0323/378			0	0	0.000	
0322/379			100	1630	28.706	
0321/380			0	0	0.000	
0320/381			0	0	0.000	
0319/382			0	0	0.000	
0318/383			0	0	0.000	
0317/384			0	0	0.000	
F0322/S	05/09/89	270				Fill-in
0322/383			10433	11630	22.463	
/384			0	0	0.000	
/385			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0334-S	26/08/89	270				Complete
0336/365			0	0	0.000	
0335/366			0	0	0.000	
0334/367			100	1630	28.706	
0333/368			0	0	0.000	
0332/369			0	0	0.000	
0331/370			0	0	0.000	
0330/371			0	0	0.000	
0329/372			0	0	0.000	
F0346-S	27/08/89	270				Complete
0348/353			0	0	0.000	
0347/354			0	0	0.000	
0346/355			100	1630	28.706	
0345/356			0	0	0.000	
0344/357			0	0	0.000	
0343/358			0	0	0.000	
0342/359			0	0	0.000	
0341/360			0	0	0.000	
F0358*S	05/09/89	270				Reshoot
0360/341			0	0	0.000	
0359/342			0	0	0.000	
0358/343			0	0	0.000	
0357/344			0	0	0.000	
0356/345			0	0	0.000	
0355/346			0	0	0.000	
0354/347			0	0	0.000	
0353/348			0	0	0.000	
F0358-S	30/08/89	270				Complete
0360/341			0	0	0.000	
0359/342			0	0	0.000	
0358/343			100	1630	28.706	
0357/344			0	0	0.000	
0356/345			0	0	0.000	
0355/346			0	0	0.000	
0354/347			0	0	0.000	
0353/348			0	0	0.000	
F0358/S	05/09/89	270				Fill-in
0358/346			10571	11004	8.137	
/347			0	0	0.000	
/348			0	0	0.000	
/349			0	0	0.000	
/350			0	0	0.000	
/351			0	0	0.000	
			0	0	0.000	
			0	0	0.000	

Line	Date	Dir	FCSP	LCSP	Kms	Status
F0370-S	31/08/89	270				Complete
0372/329			0	0	0.000	
0371/330			0	0	0.000	
0370/331			100	1630	28.706	
0369/332			0	0	0.000	
0368/333			0	0	0.000	
0367/334			0	0	0.000	
0366/335			0	0	0.000	
0365/336			0	0	0.000	
F0382-S	01/09/89	270				Complete
0384/317			0	0	0.000	
0383/318			0	0	0.000	
0382/319			100	1630	28.706	
0381/320			0	0	0.000	
0380/321			0	0	0.000	
0379/322			0	0	0.000	
0378/323			0	0	0.000	
0377/324			0	0	0.000	
F0382/S	07/09/89	270				Fill-in
0382/313			0	0	0.000	
/314			0	0	0.000	
/315			100	432	6.244	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0394*S	07/09/89	270				Reshoot
0392/309			0	0	0.000	
0391/310			0	0	0.000	
0390/311			0	0	0.000	
0389/312			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0394-S	04/09/89	270				Complete
0396/305			0	0	0.000	
0395/306			0	0	0.000	
0394/307			10100	11630	28.706	
0393/308			0	0	0.000	
0392/309			0	0	0.000	
0391/310			0	0	0.000	
0390/311			0	0	0.000	
0389/312			0	0	0.000	
F0406-S	06/09/89	90				Complete
0412/289			0	0	0.000	
0411/290			0	0	0.000	
0410/291			0	0	0.000	
0409/292			0	0	0.000	
0408/293			0	0	0.000	
0407/294			0	0	0.000	
0406/295			100	1630	28.706	
0405/296			0	0	0.000	
F0418-S	04/09/89	90				Complete
0424/277			0	0	0.000	
0423/278			0	0	0.000	
0422/279			0	0	0.000	
0421/280			0	0	0.000	
0420/281			0	0	0.000	
0419/282			0	0	0.000	
0418/283			100	1630	28.706	

Line	Date	Dir	FCSP	LCSP	Kms	Status
0417/284			0	0	0.000	
F0418/S	07/09/89	90				Fill-in
0418/286			100	1630	28.706	
/287			0	0	0.000	
/288			0	0	0.000	
/289			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0430-S	04/09/89	90				Complete
0436/265			0	0	0.000	
0435/266			0	0	0.000	
0434/267			0	0	0.000	
0433/268			0	0	0.000	
0432/269			0	0	0.000	
0431/270			0	0	0.000	
0430/271			100	1630	28.706	
0429/272			0	0	0.000	
F0442-S	01/09/89	90				Complete
0448/253			0	0	0.000	
0447/254			0	0	0.000	
0446/255			0	0	0.000	
0445/256			0	0	0.000	
0444/257			0	0	0.000	
0443/258			0	0	0.000	
0442/259			100	1630	28.706	
0441/260			0	0	0.000	
F0454-S	31/08/89	90				Complete
0460/241			0	0	0.000	
0459/242			0	0	0.000	
0458/243			0	0	0.000	
0457/244			0	0	0.000	
0456/245			0	0	0.000	
0455/246			0	0	0.000	
0454/247			100	1630	28.706	
0453/248			0	0	0.000	
F0466-S	30/08/89	90				Complete
0472/229			0	0	0.000	
0471/230			0	0	0.000	
0470/231			0	0	0.000	
0469/232			0	0	0.000	
0468/233			0	0	0.000	
0467/234			0	0	0.000	
0466/235			100	1630	28.706	
0465/236			0	0	0.000	
F0466/S	05/09/89	90				Fill-in
0466/237			10100	11630	28.706	
/238			0	0	0.000	
/239			0	0	0.000	
/240			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0478-S	28/08/89	90				Complete
0484/217			0	0	0.000	
0483/218			0	0	0.000	
0482/219			0	0	0.000	
0481/220			0	0	0.000	
0480/221			0	0	0.000	

PRODUCTION ANALYSIS BY LINE GECO SIGMA

Line	Date	Dir	FCSP	LCSP	Kms	Status
0479/222			0	0	0.000	
0478/223			100	1630	28.706	
0477/224			0	0	0.000	
F0490*S	05/09/89	90				Reshoot
0496/205			0	0	0.000	
0495/206			0	0	0.000	
0494/207			0	0	0.000	
0493/208			0	0	0.000	
0492/209			0	0	0.000	
0491/210			0	0	0.000	
0490/211			0	0	0.000	
0489/212			0	0	0.000	
F0490-S	27/08/89	90				Complete
0496/205			0	0	0.000	
0495/206			0	0	0.000	
0494/207			0	0	0.000	
0493/208			0	0	0.000	
0492/209			0	0	0.000	
0491/210			0	0	0.000	
0490/211			100	1630	28.706	
0489/212			0	0	0.000	
F0490/S	05/09/89	90				Fill-in
0490/204			10700	11171	8.850	
/205			0	0	0.000	
/206			0	0	0.000	
/207			0	0	0.000	
/208			0	0	0.000	
/209			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0490/S1	05/09/89	90				Fill-in
0490/204			11240	11630	7.331	
/205			0	0	0.000	
/206			0	0	0.000	
/207			0	0	0.000	
/208			0	0	0.000	
/209			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0502-S	26/08/89	90				Complete
0508/193			0	0	0.000	
0507/194			0	0	0.000	
0506/195			0	0	0.000	
0505/196			0	0	0.000	
0504/197			0	0	0.000	
0503/198			0	0	0.000	
0502/199			100	1630	28.706	
0501/200			0	0	0.000	
F0514-S	21/08/89	90				Complete
0520/181			0	0	0.000	
0519/182			0	0	0.000	
0518/183			0	0	0.000	
0517/184			0	0	0.000	
0516/185			0	0	0.000	
0515/186			0	0	0.000	
0514/187			100	1630	28.706	
0513/188			0	0	0.000	
F0526-S	20/08/89	90				Complete
0532/169			0	0	0.000	
0531/170			0	0	0.000	
0530/171			0	0	0.000	

PRODUCTION ANALYSIS BY LINE

GECO SIGMA

Line	Date	Dir	FCSP	LCSP	Kms	Status
0529/172			0	0	0.000	
0528/173			0	0	0.000	
0527/174			0	0	0.000	
0526/175			100	1630	28.706	
0525/176			0	0	0.000	
F0526/S	03/09/89	90				Fill-in
0526/178			887	1630	13.950	
/179			0	0	0.000	
/180			0	0	0.000	
/181			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0538-S	19/08/89	90				Complete
0544/157			0	0	0.000	
0543/158			0	0	0.000	
0542/159			0	0	0.000	
0541/160			0	0	0.000	
0540/161			0	0	0.000	
0539/162			0	0	0.000	
0538/163			100	1630	28.706	
0537/164			0	0	0.000	
F0550-S	16/08/89	90				Complete
0556/145			0	0	0.000	
0555/146			0	0	0.000	
0554/147			0	0	0.000	
0553/148			0	0	0.000	
0552/149			0	0	0.000	
0551/150			0	0	0.000	
0550/151			100	1630	28.706	
0549/152			0	0	0.000	
F0562-S	14/08/89	90				Complete
0568/133			0	0	0.000	
0567/134			0	0	0.000	
0566/135			0	0	0.000	
0565/136			0	0	0.000	
0564/137			0	0	0.000	
0563/138			0	0	0.000	
0562/139			100	1630	28.706	
0561/140			0	0	0.000	
F0574*S1	18/08/89	90				Cntr Downtime
0574/129			0	0	0.000	
/130			0	0	0.000	
/131			0	0	0.000	
/132			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0574*S2	18/08/89	90				Non Cntr Downtime
0574/133			0	0	0.000	
/134			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0574*S3	18/08/89	90				Cntr Downtime
0574/137			0	0	0.000	

Line	Date	Dir	FCSP	LCSP	Kms	Status
/138			0	0	0.000	
/139			0	0	0.000	
/140			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0574-S	16/08/89	90				Complete
0580/121			0	0	0.000	
0579/122			0	0	0.000	
0578/123			0	0	0.000	
0577/124			0	0	0.000	
0576/125			0	0	0.000	
0575/126			0	0	0.000	
0574/127			100	1630	28.706	
0573/128			0	0	0.000	
F0574/S	07/09/89	90				Fill-in
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0586-S	17/08/89	90				Complete
0591/110			0	0	0.000	
0590/111			0	0	0.000	
0589/112			0	0	0.000	
0588/113			0	0	0.000	
0587/114			0	0	0.000	
0586/115			100	1630	28.706	
0585/116			0	0	0.000	
0585/116			0	0	0.000	
F0586/S	03/09/89	90				Fill-in
0586/106			500	1300	15.019	
/107			0	0	0.000	
/108			0	0	0.000	
/109			0	0	0.000	
/110			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0586/S1	07/09/89	90				Cntr Downtime
0586/120			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0598-S	19/08/89	90				Complete
0604/097			0	0	0.000	
0603/098			0	0	0.000	
0602/099			0	0	0.000	
0601/100			0	0	0.000	
0600/101			0	0	0.000	
0599/102			0	0	0.000	
0598/103			100	1630	28.706	
0597/104			0	0	0.000	

Line	Date	Dir	FCSP	LCSP	Kms	Status
F0610-S	20/08/89	90				Complete
0616/085			0	0	0.000	
0615/086			0	0	0.000	
0614/087			0	0	0.000	
0613/088			0	0	0.000	
0612/089			0	0	0.000	
0611/090			0	0	0.000	
0610/091			100	1630	28.706	
0609/092			0	0	0.000	
F0622-S	21/08/89	90				Complete
0628/073			0	0	0.000	
0627/074			0	0	0.000	
0626/075			0	0	0.000	
0625/076			0	0	0.000	
0624/077			0	0	0.000	
0623/078			0	0	0.000	
0622/079			100	1630	28.706	
0621/080			0	0	0.000	
F0634-S	22/08/89	90				Complete
0639/62			0	0	0.000	
0638/63			0	0	0.000	
0637/64			0	0	0.000	
0636/65			0	0	0.000	
0635/66			0	0	0.000	
0634/67			100	1630	28.706	
0633/68			0	0	0.000	
0633/68			0	0	0.000	
F0646-S	26/08/89	90				Complete
0652/049			0	0	0.000	
0651/050			0	0	0.000	
0650/051			0	0	0.000	
0649/052			0	0	0.000	
0648/053			0	0	0.000	
0647/054			0	0	0.000	
0646/055			100	1630	28.706	
0645/056			0	0	0.000	
F0646/S	06/09/89	90				Fill-in
0646/058			10270	11630	25.519	
/059			0	0	0.000	
/060			0	0	0.000	
/061			0	0	0.000	
/062			0	0	0.000	
/063			0	0	0.000	
/064			0	0	0.000	
			0	0	0.000	
F0658*S	02/09/89	90				Cntr Downtime
0664/037			0	0	0.000	
0663/038			0	0	0.000	
0662/039			0	0	0.000	
0661/040			0	0	0.000	
0660/041			0	0	0.000	
0659/042			0	0	0.000	
0658/043			0	0	0.000	
0657/044			0	0	0.000	
F0658-S	28/08/89	90				Complete
0664/037			0	0	0.000	
0663/038			0	0	0.000	
0662/039			0	0	0.000	
0661/040			0	0	0.000	
0660/041			0	0	0.000	
0659/042			0	0	0.000	
0658/043			100	1630	28.706	

PRODUCTION ANALYSIS BY LINE GECO SIGMA

Line	Date	Dir	FCSP	LCSP	Kms	Status
0657/044			0	0	0.000	
F0670-S	29/08/89	90				Complete
0676/025			0	0	0.000	
0675/026			0	0	0.000	
0674/027			0	0	0.000	
0673/028			0	0	0.000	
0672/029			0	0	0.000	
0671/030			0	0	0.000	
0670/031			100	1630	28.706	
0669/032			0	0	0.000	
F0682-S	30/08/89	90				Complete
0688/013			0	0	0.000	
0687/014			0	0	0.000	
0686/015			0	0	0.000	
0685/016			0	0	0.000	
0684/017			0	0	0.000	
0683/018			0	0	0.000	
0682/019			100	1630	28.706	
0681/020			0	0	0.000	
F0694-S	31/08/89	90				Complete
0700/001			0	0	0.000	
0699/002			0	0	0.000	
0698/003			0	0	0.000	
0697/004			0	0	0.000	
0696/005			0	0	0.000	
0695/006			0	0	0.000	
0694/007			100	1630	28.706	
0693/008			0	0	0.000	

Total Chargeable Production = 1684.144 Kms

7.2.2 Geco Rho

PRODUCTION ANALYSIS BY LINE

GECO RHO

Line	Date	Dir	FCSP	LCSP	Kms	Status
F0106-R	01/09/89	270				Complete
0112/589			0	0	0.000	
0111/590			0	0	0.000	
0110/591			0	0	0.000	
0109/592			0	0	0.000	
0108/593			0	0	0.000	
0107/594			0	0	0.000	
0106/595			100	1630	28.706	
0105/596			0	0	0.000	
F0118-R	31/08/89	270				Complete
0124/577			0	0	0.000	
0123/578			0	0	0.000	
0122/579			0	0	0.000	
0121/580			0	0	0.000	
0120/581			0	0	0.000	
0119/582			0	0	0.000	
0118/583			100	1630	28.706	
0117/584			0	0	0.000	
F0130-R	30/08/89	270				Complete
0136/565			0	0	0.000	
0135/566			0	0	0.000	
0134/567			0	0	0.000	
0133/568			0	0	0.000	
0132/569			0	0	0.000	
0131/570			0	0	0.000	
0130/571			100	1630	28.706	
0129/572			0	0	0.000	
F0142-R	29/08/89	270				Complete
0148/553			0	0	0.000	
0147/554			0	0	0.000	
0146/555			0	0	0.000	
0145/556			0	0	0.000	
0144/557			0	0	0.000	
0143/558			0	0	0.000	
0142/559			100	1630	28.706	
0141/560			0	0	0.000	
F0154*R	06/09/89	270				Reshoot
0154/549			0	0	0.000	
/550			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0154-R	27/08/89	270				Complete
0156/545			0	0	0.000	
0155/546			0	0	0.000	
0154/547			100	1630	28.706	
0153/548			0	0	0.000	
0152/549			0	0	0.000	
0151/550			0	0	0.000	
0150/551			0	0	0.000	
0149/552			0	0	0.000	
F0154/R	06/09/89	270				Fill-in
0154/552			10100	10404	5.719	
/553			0	0	0.000	
/554			0	0	0.000	
/555			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	

Line	Date	Dir	FCSP	LCSP	Kms	Status
			0	0	0.000	
F0166-R	26/08/89	270				Complete
0172/529			0	0	0.000	
0171/530			0	0	0.000	
0170/531			0	0	0.000	
0169/532			0	0	0.000	
0168/533			0	0	0.000	
0167/534			0	0	0.000	
0166/535			100	1630	28.706	
0165/536			0	0	0.000	
F0178*R	04/09/89	270				Reshoot
0184/517			0	0	0.000	
0183/518			0	0	0.000	
0182/519			0	0	0.000	
0181/520			0	0	0.000	
0180/521			0	0	0.000	
0179/522			0	0	0.000	
0178/523			0	0	0.000	
0177/524			0	0	0.000	
F0178-R	22/08/89	270				Complete
0184/517			0	0	0.000	
0183/518			0	0	0.000	
0182/519			0	0	0.000	
0181/520			0	0	0.000	
0180/521			0	0	0.000	
0179/522			0	0	0.000	
0178/523			100	1630	28.706	
0177/524			0	0	0.000	
F0190-R	21/08/89	270				Complete
0196/505			0	0	0.000	
0195/506			0	0	0.000	
0194/507			0	0	0.000	
0193/508			0	0	0.000	
0192/509			0	0	0.000	
0191/510			0	0	0.000	
0190/511			100	1630	28.706	
0189/512			0	0	0.000	
F0202*R	25/08/89	270				Reshoot
0202/493			0	0	0.000	
/494			0	0	0.000	
/495			0	0	0.000	
/496			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0202-R	20/08/89	270				Complete
0208/493			0	0	0.000	
0207/494			0	0	0.000	
0206/495			0	0	0.000	
0205/496			0	0	0.000	
0204/497			0	0	0.000	
0203/498			0	0	0.000	
0202/499			100	1630	28.706	
0201/500			0	0	0.000	
F0202/R	25/08/89	270				Fill-in
0202/493			377	1630	23.513	
/494			0	0	0.000	
/495			0	0	0.000	
/496			0	0	0.000	
			0	0	0.000	

Line	Date	Dir	FCSP	LCSP	Kms	Status
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0214-R	19/08/89	270				Incomplete
0220/481			0	0	0.000	
0219/482			0	0	0.000	
0218/483			0	0	0.000	
0217/484			0	0	0.000	
0216/485			0	0	0.000	
0215/486			0	0	0.000	
0214/487			554	1630	20.194	
0213/488			0	0	0.000	
F0214-R1	04/09/89	270				Complete
0220/481			0	0	0.000	
0219/482			0	0	0.000	
0218/483			0	0	0.000	
0217/484			0	0	0.000	
0216/485			0	0	0.000	
0215/486			0	0	0.000	
0214/487			10100	10553	8.512	
0213/488			0	0	0.000	
F0226-R	16/08/89	270				Complete
0232/469			0	0	0.000	
0231/470			0	0	0.000	
0230/471			0	0	0.000	
0229/472			0	0	0.000	
0228/473			0	0	0.000	
0227/474			0	0	0.000	
0226/475			100	1630	28.706	
0225/476			0	0	0.000	
F0238-R	14/08/89	270				Complete
0244/457			0	0	0.000	
0243/458			0	0	0.000	
0242/459			0	0	0.000	
0241/460			0	0	0.000	
0240/461			0	0	0.000	
0239/462			0	0	0.000	
0238/463			100	1630	28.706	
0237/464			0	0	0.000	
F0250-R	14/08/89	270				Complete
0256/445			0	0	0.000	
0255/446			0	0	0.000	
0254/447			0	0	0.000	
0253/448			0	0	0.000	
0252/449			0	0	0.000	
0251/450			0	0	0.000	
0250/451			100	1630	28.706	
0249/452			0	0	0.000	
F0262*R	06/09/89	270				Reshoot
0268/433			0	0	0.000	
0267/434			0	0	0.000	
0266/435			0	0	0.000	
0265/436			0	0	0.000	
0264/437			0	0	0.000	
0263/438			0	0	0.000	
0262/439			0	0	0.000	
0261/440			0	0	0.000	
F0262-R	16/08/89	270				Complete
0268/433			0	0	0.000	
0267/434			0	0	0.000	
0266/435			0	0	0.000	

Line	Date	Dir	FCSP	LCSP	Kms	Status
0265/436			0	0	0.000	
0264/437			0	0	0.000	
0263/438			0	0	0.000	
0262/439			100	1630	28.706	
0261/440			0	0	0.000	
F0262/R	06/09/89	270				Fill-in
0262/428			10800	11318	9.731	
/429			0	0	0.000	
/430			0	0	0.000	
/431			0	0	0.000	
/432			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0274-R	17/08/89	270				Complete
0280/421			0	0	0.000	
0279/422			0	0	0.000	
0278/423			0	0	0.000	
0277/424			0	0	0.000	
0276/425			0	0	0.000	
0275/426			0	0	0.000	
0274/427			100	1630	28.706	
0273/428			0	0	0.000	
F0286-R	19/08/89	270				Complete
0292/409			0	0	0.000	
0291/410			0	0	0.000	
0290/411			0	0	0.000	
0289/412			0	0	0.000	
0288/413			0	0	0.000	
0287/414			0	0	0.000	
0286/415			100	1630	28.706	
0285/416			0	0	0.000	
F0298-R	20/08/89	270				Complete
0304/397			0	0	0.000	
0303/398			0	0	0.000	
0302/399			0	0	0.000	
0301/400			0	0	0.000	
0300/401			0	0	0.000	
0299/402			0	0	0.000	
0298/403			100	1630	28.706	
0297/404			0	0	0.000	
F0310-R	21/08/89	270				Complete
0316/385			0	0	0.000	
0315/386			0	0	0.000	
0314/387			0	0	0.000	
0313/388			0	0	0.000	
0312/389			0	0	0.000	
0311/390			0	0	0.000	
0310/391			100	1630	28.706	
0309/392			0	0	0.000	
F0322*R	05/09/89	270				Reshoot
0322/372			0	0	0.000	
/373			0	0	0.000	
/374			0	0	0.000	
/375			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0322-R	22/08/89	270				Complete
0328/373			0	0	0.000	

Line	Date	Dir	FCSP	LCSP	Kms	Status
0327/374			0	0	0.000	
0326/375			0	0	0.000	
0325/376			0	0	0.000	
0324/377			0	0	0.000	
0323/378			0	0	0.000	
0322/379			100	1630	28.706	
0321/380			0	0	0.000	
F0322/R	05/09/89	270				Fill-in
0322/372			10100	11499	26.250	
/373			0	0	0.000	
/374			0	0	0.000	
/375			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0334-R	26/08/89	270				Complete
0340/361			0	0	0.000	
0339/362			0	0	0.000	
0338/363			0	0	0.000	
0337/364			0	0	0.000	
0336/365			0	0	0.000	
0335/366			0	0	0.000	
0334/367			100	1630	28.706	
0333/368			0	0	0.000	
F0346-R	27/08/89	270				Complete
0348/353			0	0	0.000	
0347/354			0	0	0.000	
0346/355			100	1630	28.706	
0345/356			0	0	0.000	
0344/357			0	0	0.000	
0343/358			0	0	0.000	
0342/359			0	0	0.000	
0341/360			0	0	0.000	
F0346/R	29/08/89	270				Fill-in
0346/349			0	0	0.000	
/350			0	0	0.000	
/351			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0358-R	30/08/89	270				Complete
0364/337			0	0	0.000	
0363/338			0	0	0.000	
0362/339			0	0	0.000	
0361/340			0	0	0.000	
0360/341			0	0	0.000	
0359/342			0	0	0.000	
0358/343			100	1630	28.706	
0357/344			0	0	0.000	
F0370-R	31/08/89	270				Complete
0376/325			0	0	0.000	
0375/326			0	0	0.000	
0374/327			0	0	0.000	
0373/328			0	0	0.000	
0372/329			0	0	0.000	
0371/330			0	0	0.000	
0370/331			100	1630	28.706	
0369/332			0	0	0.000	

PRODUCTION ANALYSIS BY LINE GECO RHO

Line	Date	Dir	FCSP	LCSP	Kms	Status
F0370/R	05/09/89	270				Fill-in
0370/324			10100	11630	28.706	
/325			0	0	0.000	
/326			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0382-R	01/09/89	270				Complete
0388/313			0	0	0.000	
0387/314			0	0	0.000	
0386/315			0	0	0.000	
0385/316			0	0	0.000	
0384/317			0	0	0.000	
0383/318			0	0	0.000	
0382/319			100	1630	28.706	
0381/320			0	0	0.000	
F0394-R	04/09/89	270				Complete
0400/301			0	0	0.000	
0399/302			0	0	0.000	
0398/303			0	0	0.000	
0397/304			0	0	0.000	
0396/305			0	0	0.000	
0395/306			0	0	0.000	
0394/307			10100	11630	28.706	
0393/308			0	0	0.000	
F0406-R	06/09/89	90				Complete
0408/293			0	0	0.000	
0407/294			0	0	0.000	
0406/295			100	1630	28.706	
0405/296			0	0	0.000	
0404/297			0	0	0.000	
0403/298			0	0	0.000	
0402/299			0	0	0.000	
0401/300			0	0	0.000	
F0418-R	04/09/89	90				Complete
0420/281			0	0	0.000	
0419/282			0	0	0.000	
0418/283			100	1630	28.706	
0417/284			0	0	0.000	
0416/285			0	0	0.000	
0415/286			0	0	0.000	
0414/287			0	0	0.000	
0413/288			0	0	0.000	
F0430-R	04/09/89	90				Complete
0432/269			0	0	0.000	
0431/270			0	0	0.000	
0430/271			100	1630	28.706	
0429/272			0	0	0.000	
0428/273			0	0	0.000	
0427/274			0	0	0.000	
0426/275			0	0	0.000	
0425/276			0	0	0.000	
F0442*R	05/09/89	90				Reshoot
0442/254			0	0	0.000	
/255			0	0	0.000	
/256			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	

PRODUCTION ANALYSIS BY LINE

GECO RHO

Line	Date	Dir	FCSP	LCSP	Kms	Status
			0	0	0.000	
F0442-R	01/09/89	90				Complete
0444/257			0	0	0.000	
0443/258			0	0	0.000	
0442/259			100	1630	28.706	
0441/260			0	0	0.000	
0440/261			0	0	0.000	
0439/262			0	0	0.000	
0438/263			0	0	0.000	
0437/264			0	0	0.000	
F0442/R	05/09/89	90				Fill-in
0442/264			0	0	0.000	
/265			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0454-R	31/08/89	90				Complete
0456/245			0	0	0.000	
0455/246			0	0	0.000	
0454/247			100	1630	28.706	
0453/248			0	0	0.000	
0452/249			0	0	0.000	
0451/250			0	0	0.000	
0450/251			0	0	0.000	
0449/252			0	0	0.000	
F0466-R	30/08/89	90				Complete
0468/233			0	0	0.000	
0467/234			0	0	0.000	
0466/235			100	1630	28.706	
0465/236			0	0	0.000	
0464/237			0	0	0.000	
0463/238			0	0	0.000	
0462/239			0	0	0.000	
0461/240			0	0	0.000	
F0478-R	28/08/89	90				Complete
0480/221			0	0	0.000	
0479/222			0	0	0.000	
0478/223			100	1630	28.706	
0477/224			0	0	0.000	
0476/225			0	0	0.000	
0475/226			0	0	0.000	
0474/227			0	0	0.000	
0473/228			0	0	0.000	
F0490*R	05/09/89	90				Reshoot
0490/213			0	0	0.000	
/214			0	0	0.000	
/215			0	0	0.000	
/216			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0490-R	27/08/89	90				Complete
0492/209			0	0	0.000	
0491/210			0	0	0.000	
0490/211			100	1630	28.706	
0489/212			0	0	0.000	
0488/213			0	0	0.000	

Line	Date	Dir	FCSP	LCSP	Kms	Status
0487/214			0	0	0.000	
0486/215			0	0	0.000	
0485/216			0	0	0.000	
F0490/R	05/09/89	90				Fill-in
0490/213			10700	11181	9.038	
/214			0	0	0.000	
/215			0	0	0.000	
/216			0	0	0.000	
/217			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0490/R1	05/09/89	90				Fill-in
0490/213			11240	11630	7.331	
/214			0	0	0.000	
/215			0	0	0.000	
/216			0	0	0.000	
/217			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0502-R	26/08/89	90				Complete
0504/197			0	0	0.000	
0503/198			0	0	0.000	
0502/199			100	1630	28.706	
0501/200			0	0	0.000	
0500/201			0	0	0.000	
0499/202			0	0	0.000	
0498/203			0	0	0.000	
0497/204			0	0	0.000	
F0514-R	21/08/89	90				Complete
0516/185			0	0	0.000	
0515/185			0	0	0.000	
0514/187			100	1630	28.706	
0513/188			0	0	0.000	
0512/189			0	0	0.000	
0511/190			0	0	0.000	
0510/191			0	0	0.000	
0509/192			0	0	0.000	
F0514/R	29/08/89	90				Fill-in
0514/189			100	913	15.263	
/190			0	0	0.000	
/191			0	0	0.000	
/192			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0526-R	20/08/89	90				Complete
0528/173			0	0	0.000	
0527/174			0	0	0.000	
0526/175			100	1630	28.706	
0525/176			0	0	0.000	
0524/177			0	0	0.000	
0523/178			0	0	0.000	
0522/179			0	0	0.000	
0521/180			0	0	0.000	
F0538-R	19/08/89	90				Complete
0540/161			0	0	0.000	
0539/162			0	0	0.000	
0538/163			100	1630	28.706	

PRODUCTION ANALYSIS BY LINE

GECO RHO

Line	Date	Dir	FCSP	LCSP	Kms	Status
0537/164			0	0	0.000	
0536/165			0	0	0.000	
0535/166			0	0	0.000	
0534/167			0	0	0.000	
0533/168			0	0	0.000	
F0550-R	16/08/89	90				Complete
0552/149			0	0	0.000	
0551/150			0	0	0.000	
0550/151			100	1630	28.706	
0549/152			0	0	0.000	
0548/153			0	0	0.000	
0547/154			0	0	0.000	
0546/155			0	0	0.000	
0545/156			0	0	0.000	
F0562*R	22/08/89	90				Reshoot
0562/135			0	0	0.000	
/136			0	0	0.000	
/137			0	0	0.000	
/138			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0562-R	14/08/89	90				Complete
0564/137			0	0	0.000	
0563/138			0	0	0.000	
0562/139			100	1630	28.706	
0561/140			0	0	0.000	
0560/141			0	0	0.000	
0559/142			0	0	0.000	
0558/143			0	0	0.000	
0557/144			0	0	0.000	
F0562/R	25/08/89	90				Fill-in
0562/141			593	1490	16.838	
/142			0	0	0.000	
/143			0	0	0.000	
/144			0	0	0.000	
/145			0	0	0.000	
/146			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0574-R	16/08/89	90				Complete
0576/125			0	0	0.000	
0575/126			0	0	0.000	
0574/127			100	1630	28.706	
0573/128			0	0	0.000	
0572/129			0	0	0.000	
0571/130			0	0	0.000	
0570/131			0	0	0.000	
0569/132			0	0	0.000	
F0586-R	17/08/89	90				Complete
0588/113			0	0	0.000	
0587/114			0	0	0.000	
0586/115			100	1630	28.706	
0585/116			0	0	0.000	
0584/117			0	0	0.000	
0583/118			0	0	0.000	
0582/119			0	0	0.000	
0581/120			0	0	0.000	
F0586/R	06/09/89	90				Fill-in
0586/116			10270	11630	25.519	

Line	Date	Dir	FCSP	LCSP	Kms	Status
/117			0	0	0.000	
/118			0	0	0.000	
/119			0	0	0.000	
/120			0	0	0.000	
/121			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0598-R	19/08/89	90				Complete
0600/101			0	0	0.000	
0599/102			0	0	0.000	
0598/103			100	1630	28.706	
0597/104			0	0	0.000	
0596/105			0	0	0.000	
0595/106			0	0	0.000	
0594/107			0	0	0.000	
0593/108			0	0	0.000	
F0610-R	20/08/89	90				Complete
0612/89			0	0	0.000	
0611/90			0	0	0.000	
0610/91			100	1630	28.706	
0609/92			0	0	0.000	
0608/93			0	0	0.000	
0607/94			0	0	0.000	
0606/95			0	0	0.000	
0605/96			0	0	0.000	
F0622-R	21/08/89	90				Complete
0624/77			0	0	0.000	
0623/78			0	0	0.000	
0622/79			100	1630	28.706	
0621/80			0	0	0.000	
0620/81			0	0	0.000	
0619/82			0	0	0.000	
0618/83			0	0	0.000	
0617/84			0	0	0.000	
F0634-R	22/08/89	90				Complete
0636/65			0	0	0.000	
0635/66			0	0	0.000	
0634/67			100	1630	28.706	
0633/68			0	0	0.000	
0632/69			0	0	0.000	
0631/70			0	0	0.000	
0630/71			0	0	0.000	
0629/72			0	0	0.000	
F0634/R	25/08/89	90				Fill-in
0634/72			120	1630	28.331	
/73			0	0	0.000	
/74			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0646-R	26/08/89	90				Complete
0648/53			0	0	0.000	
0647/54			0	0	0.000	
0646/55			100	1630	28.706	
0645/56			0	0	0.000	
0644/57			0	0	0.000	
0643/58			0	0	0.000	
0642/59			0	0	0.000	
0641/60			0	0	0.000	

PRODUCTION ANALYSIS BY LINE GECO RHO

Line	Date	Dir	FCSP	LCSP	Kms	Status
F0658*R	02/09/89	90				Reshoot
0660/41			0	0	0.000	
0659/42			0	0	0.000	
0658/43			0	0	0.000	
0657/44			0	0	0.000	
0656/45			0	0	0.000	
0655/46			0	0	0.000	
0654/47			0	0	0.000	
0653/48			0	0	0.000	
F0658-R	28/08/89	90				Complete
0660/41			0	0	0.000	
0659/42			0	0	0.000	
0658/43			100	1630	28.706	
0657/44			0	0	0.000	
0656/45			0	0	0.000	
0655/46			0	0	0.000	
0654/47			0	0	0.000	
0653/48			0	0	0.000	
F0670/R	02/09/89	90				Fill-in
0670/34			100	847	14.025	
/35			0	0	0.000	
/36			0	0	0.000	
/37			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
			0	0	0.000	
F0682-R	30/08/89	90				Complete
0684/17			0	0	0.000	
0683/18			0	0	0.000	
0682/19			100	1630	28.706	
0681/20			0	0	0.000	
0680/21			0	0	0.000	
0679/22			0	0	0.000	
0678/23			0	0	0.000	
0677/24			0	0	0.000	
F0694-R	31/08/89	90				Complete
0696/5			0	0	0.000	
0695/6			0	0	0.000	
0694/7			100	1630	28.706	
0693/8			0	0	0.000	
0692/9			0	0	0.000	
0691/10			0	0	0.000	
0690/11			0	0	0.000	
0689/12			0	0	0.000	

Total Chargeable Production = 1616.869 Kms

29.706

1645.575

Line F0670-R is missing from the above list.

7.3 Line Analysis Logs

7.3.1 Geco Sigma

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0694-S Heading 90 deg.
Line Status Complete
Date started 31/08/89 Start Time 23:11 End Time 02:52
First File 100 First Reel 37479 Last File 1630 Last Reel 37493

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0700/001	100	0	0	1630	0	0.000Kms
0699/002	100	0	0	1630	0	0.000Kms
0698/003	100	0	0	1630	0	0.000Kms
0697/004	100	0	0	1630	0	0.000Kms
0696/005	100	0	0	1630	0	0.000Kms
0695/006	100	0	0	1630	0	0.000Kms
0694/007	100	100	1630	1630	1531	28.706Kms
0693/008	100	0	0	1630	0	0.000Kms

---=== WEATHER ===---

Wind dir. NW force 4 Sea state 3 Swell dir. NW Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 37.2m. Eol. 36.3m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 24

---=== DUAL STREAMER ===---

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 8.4 m.
Feather Sol. 0.7 S Eol. 1.9 S Max. 2.7 S

Accoustic Transponders:	1.10 SDFRONT	1.70 SDTAIL	0.23 STBDROT	0.33 PORTROT	104.00 TAILSEP
Compass :	102.00 AVSEPFR	107.00 AVSEPMID	99.00 AVSEPTL	0.00 DSTDS13	1.00 DSTDP13
Tailbuoy :	8.16 MEANSDST	6.50 MEANSDPT	1.00 SD>25m S	0.00 SD>25m S	112.00 STB SEP

Dead Grp: 98 weak...18 and 31 left in but spiked on Navtech
pulse at 5.4secs...47 out at sp 1356 spiking
Noise: No significant levels

Note Control and stability good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1946
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note PORT 2/4 OFF at SOL (3037 cu.in) 21 GM2B errors
Drifting caused 22 misfires on P2/1 2MF on Stbd 3/3

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6087344. Sol. Easting 474075.
Eol. Northing 6087343. Eol. Easting 502751.
Note Cocktail used incl Tersch F2. K7 out of fixes. K8 logged
Midnight sp 437
Message SEQ 52 2-Boat Prime FTB=593.6 LINK=1.3
NO EDITS 125 cu.in gun off at SOL Proj SOL=2311 SOL=2311

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0682-S Heading 90 deg.
Line Status Complete
Date started 30/08/89 Start Time 22:31 End Time 02:10
First File 100 First Reel 37419 Last File 1629 Last Reel 37433

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0688/013	100	0	0	1630	0	0.000Kms
0687/014	100	0	0	1630	0	0.000Kms
0686/015	100	0	0	1630	0	0.000Kms
0685/016	100	0	0	1630	0	0.000Kms
0684/017	100	0	0	1630	0	0.000Kms
0683/018	100	0	0	1630	0	0.000Kms
0682/019	100	100	1630	1630	1531	28.706Kms
0681/020	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. S force 4 Sea state 3 Swell dir. S Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.7m. Eol. 36.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 1 Misfires 4

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 4.8 m. Max. 8.4 m.
Feather Sol. 1.2 P Eol. 2.1 S Max. 2.2 P

Accoustic Transponders:	1.00 SDFRONT	2.20 SDTAIL	0.37 STBDROT	0.42 PORTROT	115.00 TAILSEP
Compass :	101.00 AVSEPFR	106.00 AVSEPMID	105.00 AVSEPTL	1.20 DSTDS13	1.40 DSTDP13
Tailbuoy :	8.30 MEANSDST	6.49 MEANSDPT	1.00 SD>25m S	0.00 SD>25m S	120.00 STB SEP

Dead Grp: Group 18 left in but spiking at 5.4 secs (Navtech pulse)
Noise: Front end of port cable relatively noisy 10-15 uB

Note Stbd depth 7 shallow, mainly 5.7-6m but poor for sps 815-865 (5-5.6m) and sps 1542-EOL (4.8-5.6m). Other depths ok.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1946
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 4 MF on S3/3 and P3/3 8 GM2B errors
No seq errors.

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6087026. Sol. Easting 474075.
Eol. Northing 6087042. Eol. Easting 502751.
Note Cocktail used.K7 out of fixes. Signals quiet. Pulse-8 out sp 600-615..... Midnight sp 719.....NDR 123.....Ext Hdr corrupt 109 110 122
Message SEQ 48 2-Boat Prime FTB/LINK=N/A Proj SOL=2229
NO EDITS Nav quiet.

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0670-S Heading 90 deg.
Line Status Complete
Date started 29/08/89 Start Time 21:48 End Time 01:29
First File 100 First Reel 37361 Last File 1626 Last Reel 37374

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0676/025	100	0	0	1630	0	0.000Kms
0675/026	100	0	0	1630	0	0.000Kms
0674/027	100	0	0	1630	0	0.000Kms
0673/028	100	0	0	1630	0	0.000Kms
0672/029	100	0	0	1630	0	0.000Kms
0671/030	100	0	0	1630	0	0.000Kms
0670/031	100	100	1630	1630	1531	28.706Kms
0669/032	100	0	0	1630	0	0.000Kms

---==== WEATHER ====----

Wind dir. SSW force 3 Sea state 3 Swell dir. SW Height 1 m

--=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 37.3m. Eol. 36.5m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 4 Misfires 5

----==== DUAL STREAMER ====----

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 7.8 m.
Feather Sol. 0.3 P Eol. 0.2 P Max. 2.4 S

Accoustic Transponders:	1.20 SDFRONT	2.00 SDTAIL	0.25 STBDROT	0.38 PORTROT	109.00 TAILSEP
Compass	:	102.00 AVSEPFR	107.00 AVSEPMID	102.00 AVSEPTL	1.20 DSTDS13	1.40 DSTDP13
Tailbuoy	:	10.10 MEANSDST	6.60 MEANSDPT	5.00 SD>25m S	0.00 SD>25m S	115.00 STB SEP

Dead Grp: Group 98 weak Group 18 left in but spiking at 5.4 secs (Navtech pulse)
Noise: Front end of port streamer relatively noisy 10-15 uB
Note Cable control and stability good

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1942
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 5 MF (S3/3 and P2/1)
GUN SEQ ERRORS:681 682 1582 1583 1603 1604

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6086729. Sol. Easting 474075.
Eol. Northing 6086723. Eol. Easting 502751.
Note Cocktail used.H7 out of all fixes. K7 noisy.
Ext.Hdr data occasionally corrupt(18 sp affected)....NDR 697 1228 1274 1308
Message SEQ 44 2-Boat Prime EDIT: gun seq errors
FTB/LINK N/A. clock errors. Proj SOL=2147

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0658-S Heading 90 deg.
Line Status Complete
Date started 28/08/89 Start Time 21:07 End Time 00:43
First File 100 First Reel 37332 Last File 1630 Last Reel 37345

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0664/037	100	0	0	1630	0	0.000Kms
0663/038	100	0	0	1630	0	0.000Kms
0662/039	100	0	0	1630	0	0.000Kms
0661/040	100	0	0	1630	0	0.000Kms
0660/041	100	0	0	1630	0	0.000Kms
0659/042	100	0	0	1630	0	0.000Kms
0658/043	100	100	1630	1630	1531	28.706Kms
0657/044	100	0	0	1630	0	0.000Kms

-------- WEATHER --------

Wind dir. N force 4 Sea state 5 Swell dir. N Height 3 m

------- RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 37.9m. Eol. 37.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 2 Misfires 20

---------- DUAL STREAMER ----------

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 8.0 m.
Feather Sol. 0.8 S Eol. . Max. .

Accoustic Transponders:	4.20	SDFRONT	.	SDTAIL	0.70	STBDROT	0.19	PORTROT	107.00 TAILSEP
Compass :	99.00	AVSEPFR	105.00	AVSEPMID	102.00	AVSEPTL	1.40	DSTDS13	1.70 DSTDP13
Tailbuoy :	6.62	MEANSDST	6.65	MEANSDPT	0.00	SD>25m S	0.00	SD>25m S	115.00 STB SEP

Dead Grp: Group 47 dead. Groups 18,118,119,148,218 left in but spiking at 5.4 secs (Navtech pulse)
Noise: Random swell bursts, 60-80 uB

Note Heavy sea, cable control good up to LGSP 1320

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1900
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 20 MF on S3/3 P3/4 P2/3 P2/1 Port 3/4 off at sp 1215 to leave 3037 cu.in GUN SEQ ERRORS:1174-1184 12 GM20 errors

------ NAVIGATION ------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6086442. Sol. Easting 474075.
Eol. Northing 6086428. Eol. Easting 502752.
Note Cocktail used K7 out of all fixes. K7 out sp 885-957
HYPERFIX RECEIVER FAILED LGSP 1320 NDRs 174 1178 No Ext Hdr 1174
Message SEQ 40 2-Boat Prime LGSP 1320 Nav receiver failure
(reshoot 1321-1630).....EDIT:Gun Seq 1174-1184....FTB/LINK=N/A...P/SOL=2186

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0658*S Heading 90 deg.
Line Status Cntr Downtime
Date started 02/09/89 Start Time 02:51 End Time 03:36
First File 1312 First Reel 37546 Last File 1630 Last Reel 37549

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0664/037	11312	0	0	11630	0	0.000Kms
0663/038	11312	0	0	11630	0	0.000Kms
0662/039	11312	0	0	11630	0	0.000Kms
0661/040	11312	0	0	11630	0	0.000Kms
0660/041	11312	0	0	11630	0	0.000Kms
0659/042	11312	0	0	11630	0	0.000Kms
0658/043	11312	0	0	11630	0	0.000Kms
0657/044	11312	0	0	11630	0	0.000Kms

-------- WEATHER ========

Wind dir. NW force 5 Sea state 4 Swell dir. NW Height 2 m

------ RECORDING ------

Magnetometer N Gravity N
Water depth Sol. 36.4m. Eol. 35.2m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 4

---------- DUAL STREAMER ----------

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 5.4 m. Max. 8.7 m.
Feather Sol. 1.6 S Eol. 2.3 S Max. 2.4 S

Accoustic Transponders:	0.00 SDFRONT	0.90 SDTAIL	0.20 STBDROT	0.21 PORTROT	100.00 TAILSEP
Compass :	102.00 AVSEPFR	. AVSEPMID	112.00 AVSEPTL	1.30 DSTDS13	1.70 DSTDP13
Tailbuoy :	6.16 MEANSDST	6.11 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	117.00 STB SEP

Dead Grp: 18 left in but spiked on Navtech pulse at 5.4 secs
98 weak
Noise: Swell noise to 80 uB. Random but prolonged in places.
Note Cable depths not perfect but excursions were short lived.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1947
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note PORT 2/6 OFF at SOL (3100 cu.in) 4 MF on S3/2 S3/3
4 GM28 errors No gun seq errors

------ NAVIGATION ------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6086444. Sol. Easting 496791.
Eol. Northing 6086455. Eol. Easting 502750.
Note Cocktail used inc Tersch F2. K7 out of fixes.

Message SEQ 57 2-Boat Reshoot of seq 40 sp 1321-1630 Nav Receiver failed on Sigma Cable depths marginal PORT ARRAY 3100 cu.in from SOL

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0646-S Heading 90 deg.
Line Status Complete
Date started 26/08/89 Start Time 19:11 End Time 22:42
First File 100 First Reel 37257 Last File 1627 Last Reel 37272

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0652/049	100	0	0	1630	0	0.000Kms
0651/050	100	0	0	1630	0	0.000Kms
0650/051	100	0	0	1630	0	0.000Kms
0649/052	100	0	0	1630	0	0.000Kms
0648/053	100	0	0	1630	0	0.000Kms
0647/054	100	0	0	1630	0	0.000Kms
0646/055	100	100	1630	1630	1531	28.706Kms
0645/056	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. NNW force 2 Sea state 2 Swell dir. NNW Height 1 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 37.9m. Eol. 36.2m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 3 Misfires 9

----==== DUAL STREAMER ====----

2x12@x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 8.1 m.
Feather Sol. 0.0 Eol. 0.9 S Max. 3.7 P

Accoustic Transponders:	1.10 SDFRONT	1.00 SDTAIL	0.26 STBDROT	0.27 PORTROT	104.00 TAILSEP
Compass :	102.00 AVSEPFR	105.00 AVSEPMID	98.00 AVSEPTL	2.00 DSTDS13	0.90 DSTDP13
Tailbuoy :	6.62 MEANSDST	6.63 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	100.00 STB SEP

Dead Grp: Groups 18 and 47 dead , leakage spikes.

Noise: Front of port streamer relatively noisy 12-16 uB

Note Control and stability ok.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1945
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 6 consecutive MF on S2/5 gun sp 100-120 (SOL and small gun so accepted as ok.) 3 other MF S1/3 20 GM20 errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary DAN-C,B11/2,

Sol. Northing 6086123. Sol. Easting 474075.
Eol. Northing 6086138. Eol. Easting 502751.
Note H7 out of all fixes. Cocktail used and stn changes on line
NDR sp 182 erratic numbering sp 181-191....NDR 724,729....No Ext Hdr sp 189
Message SEQ 35 2-Boat Prime Erratic sp numbers sp 181-191
Tape No. 37259 dummy, no data.....6 MF at SOL,out of spec.....Proj SOL=1912

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0646/S Heading 90 deg.
Line Status Fill-in
Date started 06/09/89 Start Time 12:17 End Time 15:27
First File 270 First Reel 37701 Last File 1630 Last Reel 37713

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0646/058	10270	10270	11630	11630	1361	25.519Kms
/059	10270	0	0	11630	0	0.000Kms
/060	10270	0	0	11630	0	0.000Kms
/061	10270	0	0	11630	0	0.000Kms
/062	10270	0	0	11630	0	0.000Kms
/063	10270	0	0	11630	0	0.000Kms
/064	10270	0	0	11630	0	0.000Kms
	0	0	0	0	0	0.000Kms

======== WEATHER ========

Wind dir. W force 4 Sea state 3 Swell dir. W Height 2 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.6m. Eol. 36.6m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 1 Misfires 25

========== DUAL STREAMER ==========

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 4.5 m. Max. 8.4 m.
Feather Sol. 2.0 S Eol. 3.8 S Max. 4.2 S

Accoustic Transponders:	1.30 SDFRONT	0.00 SDTAIL	. STBDROT	. PORTROT	. TAILSEP
Compass :	102.00 AVSEPFR	103.00 AVSEPMID	96.00 AVSEPTL	1.00 DSTDS13	1.20 DSTDP13
Tailbuoy :	7.09 MEANSDST	4.53 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	109.00 STB SEP

Dead Grp: 47 dead

Noise: Isolated swell noise up to 30 uB

Note Middle of port cable light (4.5 - 5.7m) for most of line.
Also deep (8.4m) occasionally. Depths bad (5.1 - 8.1m) sps 10703-10721

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1944
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note GUN SEQ ERROR: 10548,10549 22 Misfires on P3/2
3 Misfires on S3/4 17 Gm2B errors.

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6085912. Sol. Easting 477261.
Eol. Northing 6085934. Eol. Easting 502751.
Note Cocktail used. Ext hdr data lost or corrupt sp 10511 10546
NDR: 10794 5 Pulse clock errors.
Message SEQ 73 2-Boat Infill Sigma columns 58-64
FTB=N/A Link=1.3 Port cable depths marginal but accepted.

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0634-S Heading 90 deg.
Line Status Complete
Date started 22/08/89 Start Time 08:19 End Time 11:40
First File 100 First Reel 37184 Last File 1630 Last Reel 37197

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0639/62	100	0	0	1630	0	0.000Kms
0638/63	100	0	0	1630	0	0.000Kms
0637/64	100	0	0	1630	0	0.000Kms
0636/65	100	0	0	1630	0	0.000Kms
0635/66	100	0	0	1630	0	0.000Kms
0634/67	100	100	1630	1630	1531	28.706Kms
0633/68	100	0	0	1630	0	0.000Kms
0633/68	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. V force 3 Sea state 3 Swell dir. S Height 05 m

------ RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 36.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 2 Misfires 9

---------- DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.4 m. Max. 8.4 m.
Feather Sol. 1.2 S Eol. 0.9 P Max. 4.3 S

Accoustic Transponders:	1.20 SDFRONT	1.60 SDTAIL	0.20 STBDROT	0.26 PORTROT	114.00 TAILSEP
Compass :	104.00 AVSEPFR	110.00 AVSEPMID	100.00 AVSEPTL	0.90 DSTDS13	1.00 DSTDP13
Tailbuoy :	5.91 MEANSDST	5.32 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	125.40 STB SEP

Dead Grp: S 98 weak.

Noise: 3 uB ambient.10 ubars fronts.
Slight SHN at SOL.
Note Stability and control affected by slow waterspeed(3.5 knots)
Extreme tail of Port streamer slightly deep.

------ ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1949
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF P1/5 sp 122 690 834 886 898 894.S1/4 972.P3/3 1182 1202
SP 897 P1/5 off 3072 array.NDR 907 1477.16 GM28 errors.5 Pulseclock errors

------ NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,

Sol. Northing 6085849.3 Sol. Easting 474074.2
Eol. Northing 6085827.0 Eol. Easting 502750.8
Note Cocktail 6 stns used,inc F2 Terschelling in Secondary.
OK.
Message SEQ 26 2-Boat Prime Good Line.

FTB N/A LINK 1.3 Proj SOL=0819

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0622-S Heading 90 deg.
Line Status Complete
Date started 21/08/89 Start Time 07:30 End Time 10:46
First File 100 First Reel 37125 Last File 1630 Last Reel 37139

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0628/073	100	0	0	1630	0	0.000Kms
0627/074	100	0	0	1630	0	0.000Kms
0626/075	100	0	0	1630	0	0.000Kms
0625/076	100	0	0	1630	0	0.000Kms
0624/077	100	0	0	1630	0	0.000Kms
0623/078	100	0	0	1630	0	0.000Kms
0622/079	100	100	1630	1630	1531	28.706Kms
0621/080	100	0	0	1630	0	0.000Kms

-------- WEATHER --------

Wind dir. W force 3 Sea state 3 Swell dir. W Height 1 m

------ RECORDING ------

Magnetometer N Gravity N
Water depth Sol. 37.8m. Eol. 36.4m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 0 Misfires 5

---------- DUAL STREAMER ----------

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 7.8 m.
Feather Sol. 4.9 S Eol. 0.0 0 Max. 5.0 S

Accoustic Transponders:	0.00 SDFRONT	2.00 SDTAIL	0.19 STBDROT	0.19 PORTROT	110.90 TAILSEP
Compass :	103.30 AVSEPFR	107.40 AVSEPMID	105.20 AVSEPTL	0.90 DSTDS13	1.10 DSTDP13
Tailbuoy :	6.06 MEANSDST	4.83 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	125.30 STB SEP

Dead Grp: Group 98 dead

Noise: Front ends relatively noisy 8-12 uB

Note Stability and control good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1948
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note Gun Seq Error: 1552-1555 MF: S2/4 1553 1554 1556 1560
S3/2 105 19 GM2B errors.

------ NAVIGATION ------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6085553. Sol. Easting 474075.
Eol. Northing 6085516. Eol. Easting 502751.
Note Hyperfix quiet. Pulse clock errors: 127 128 1546-1557

Message SEQ 22 2-Boat Prime Nav Good EDIT: Gun sequence errors
High number of pulse clock errors FTB and LINK N/A Projected SOL=0731

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0610-S Heading 90 deg.
Line Status Complete
Date started 20/08/89 Start Time 06:41 End Time 09:58
First File 100 First Reel 37065 Last File 1621 Last Reel 37078

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0616/085	100	0	0	1630	0	0.000Kms
0615/086	100	0	0	1630	0	0.000Kms
0614/087	100	0	0	1630	0	0.000Kms
0613/088	100	0	0	1630	0	0.000Kms
0612/089	100	0	0	1630	0	0.000Kms
0611/090	100	0	0	1630	0	0.000Kms
0610/091	100	100	1630	1630	1531	28.706Kms
0609/092	100	0	0	1630	0	0.000Kms

-------- WEATHER --------

Wind dir. S force Sea state 3 Swell dir. SW Height 1 m

------ RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 40.3m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 9 Misfires 1

---------- DUAL STREAMER ---------

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 9.0 m.
Feather Sol. 1.8 S Eol. 2.9 P Max. 4.3 P

Accoustic Transponders:	1.20 SDFRONT	1.90 SDTAIL	0.22 STBDROT	0.23 PORTROT	107.00 TAILSEP
Compass :	102.00 AVSEPFR	105.00 AVSEPMID	101.00 AVSEPTL	. DSTDS13	. DSTDP13
Tailbuoy :	6.62 MEANSDST	5.63 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	121.00 STB SEP

Dead Grp: Group 98 dead

Noise: Front ends relatively noisy 10-12 uB

Note Stability and control good. Port tail end slightly deep
sps 1590-EOL

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1940
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note GUN SEQ ERRORS: 692 693 934-942 945-947 952-953 1187 1188
1199-1202 16 GM28 errors.

------ NAVIGATION ------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6085245. Sol. Easting 474075.
Eol. Northing 6085226. Eol. Easting 502751.
Note Hyperfix noisy , changed to cocktail sp 188. Various station changes during line. Erratic sp nos. and NDRs sp 670-687 933-954 1384-1397
Message SEQ 18 2-Boat Prime Nav erratic sp 670-1397 bad sp interval
EDIT: gun seq as gun comment. Projected SOL=0642 FTB/Link N/A

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0598-S Heading 90 deg.
Line Status Complete
Date started 19/08/89 Start Time 05:58 End Time 09:15
First File 100 First Reel 37009 Last File 1627 Last Reel 37022

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0604/097	100	0	0	1630	0	0.000Kms
0603/098	100	0	0	1630	0	0.000Kms
0602/099	100	0	0	1630	0	0.000Kms
0601/100	100	0	0	1630	0	0.000Kms
0600/101	100	0	0	1630	0	0.000Kms
0599/102	100	0	0	1630	0	0.000Kms
0598/103	100	100	1630	1630	1531	28.706Kms
0597/104	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. S force 4 Sea state 4 Swell dir. S Height 2 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 35.3m. Eol. 36.3m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 2 Misfires 12

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 8.4 m.
Feather Sol. 0.3 S Eol. 3.8 P Max. 4.0 P

Accoustic Transponders:	0.00 SDFRONT	1.00 SDTAIL	0.40 STBDROT	0.32 PORTROT	186.70 TAILSEP	
Compass :	101.60 AVSEPFR	109.00 AVSEPMID	104.60 AVSEPTL	1.10 DSTDS13	1.10 DSTDP13	
Tailbuoy :	6.30 MEANSDST	5.13 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	120.40 STB SEP	

Dead Grp: Group 98 dead.

Noise: Isolated swell bursts. Short lived, low lwvwl.
Front ends relatively noisy 10-12 uB
Note Stability and control good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1944
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 12 MF mainly on P2/6 gun. GUN SEQ ERRORS: 152-157
14 GM2B errors.

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,B11/2,

Sol. Northing 6084928. Sol. Easting 474075.
Eol. Northing 6084891. Eol. Easting 502751.
Note Hyperfix K7 out, Hyp/Syl cocktail used. Noisy Nav signals caused sp numbering errors: sp no. 373 recorded twice sp 374 NDR...587 NDR
Message SEQ 14 2-Boat Prime EDIT: gun seq errors 152-157
Noisy nav caused sp no. jumps around sp 373

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0586-S Heading 90 deg.
Line Status Complete
Date started 17/08/89 Start Time 04:31 End Time 07:50
First File 100 First Reel 36962 Last File 1630 Last Reel 36976

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0591/110	100	0	0	1630	0	0.000Kms
0590/111	100	0	0	1630	0	0.000Kms
0589/112	100	0	0	1630	0	0.000Kms
0588/113	100	0	0	1630	0	0.000Kms
0587/114	100	0	0	1630	0	0.000Kms
0586/115	100	100	1630	1630	1531	28.706Kms
0585/116	100	0	0	1630	0	0.000Kms
0585/116	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. E force 3 Sea state 3 Swell dir. E Height 05 m

======== RECORDING ========

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 36.0m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 0 Misfires 18

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.1 m. Max. 8.1 m.
Feather Sol.01.4 S Eol. 05.7 P Max. 05.7 P

Accoustic Transponders:	1.60 SDFRONT	1.90 SDTAIL	0.40 STBDROT	0.30 PORTROT	106.00 TAILSEP
Compass :	102.00 AVSEPFR	103.00 AVSEPMID	94.00 AVSEPTL	0.00 DSTDS13	1.00 DSTDP13
Tailbuoy :	5.10 MEANSDST	6.91 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	. STB SEP

Dead Grp: None

Noise: Front ends noisy 10-12 uB

Note Stability and control good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1947
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF 855 859 867 883 887.GM2B 250 296 693 761 885 892 [illegible] 973
1065 1164 1425 1551 1615.GUNSEQ errors 1130-1132 inc.

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6084631.3 Sol. Easting 474074.9
Eol. Northing 6084617.1 Eol. Easting 502751.1
Note Nav stable.High ground speed due following current.

Message SEQ 10 Boat Prime. No major edits.
FTB and LINK N/A. Proj SOL=0431

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0586/S Heading 90 deg.
Line Status Fill-in
Date started 03/09/89 Start Time 01:30 End Time 03:26
First File 500 First Reel 37550 Last File 1300 Last Reel 37557

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0586/106	500	500	1300	1300	801	15.019Kms
/107	500	0	0	1300	0	0.000Kms
/108	500	0	0	1300	0	0.000Kms
/109	500	0	0	1300	0	0.000Kms
/110	500	0	0	1300	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ========

Wind dir. NW force 5 Sea state 4 Swell dir. NW Height 3 m

---==== RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 36.1m. Eol. 35.8m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 20

----==== DUAL STREAMER ====----

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 4.9 m. Max. 8.7 m.
Feather Sol. 1.8 S Eol. 1.7 S Max. 3.3 S

Accoustic Transponders:	2.50 SDFRONT	1.30 SDTAIL	1.27 STBDROT	1.25 PORTROT	105.00 TAILSEP
Compass :	100.00 AVSEPFR	101.00 AVSEPMID	101.00 AVSEPTL	1.40 DSTDS13	1.80 DSTDP13
Tailbuoy :	7.26 MEANSDST	6.39 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	. STB SEP

Dead Grp: 18 left in but spiked on Navtech pulse at 5.4 secs
98 weak
Noise: Swell noise heavy at times,up to 120 dB on 30-40
per cent of the cables.
Note Cable depths not perfect but excursions were short lived.
Unstable in heavy seas. Compasses very noisy.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1944
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX
ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note STBD 1/3 out from SOL (2967 cu.in) 20 MF mainly on S3/3
SEQ ERROR:1146-1155..Seq changed sp 1194 No pulse clk at SOL,GM20 errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6084718. Sol. Easting 481572.
Eol. Northing 6084682. Eol. Easting 496566.
Note Cocktail used inc Tersch F2 and K8 F1. K7 out
No pulse clock sp 500-669
Message SEQ 59 1-Boat INFILL Sigma columns 106-110
EDIT: Gun Seq Errors 1146-1155 Stbd array 2967 cu.in

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0586/S1 Heading 90 deg.
Line Status Cntr Downtime
Date started 07/09/89 Start Time 21:06 End Time 21:49
First File 1230 First Reel 37768 Last File 1540 Last Reel 37770

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0586/120	11230	0	0	11540	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

-------- WEATHER --------

Wind dir. SE force 2 Sea state 2 Swell dir. Height 0 m

------ RECORDING ------

Magnetometer N Gravity N
Water depth Sol. 36.5m. Eol. 36.8m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---------- DUAL STREAMER ----------

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.0 m. Max. 7.8 m.
Feather Sol. . Eol. 0.2 S Max. 2.8 S

Accoustic Transponders:	1.20 SDFRONT	2.40 SDTAIL	0.56 STBDROT	0.53 PORTROT	. TAILSEP	
Compass :	102.00 AVSEPFR	111.00 AVSEPMID	111.00 AVSEPTL	0.90 DSTDS13	1.00 DSTDP13	
Tailbuoy :	10.68 MEANSDST	7.15 MEANSDPT	6.00 SD>25m S	1.00 SD>25m S	116.00 STB SEP	

Dead Grp: 47 dead

Noise: Front end of port cable relatively noisy 10-16 uB

Note Depth and stability ok.

--- ENERGY SOURCE ---

Source type AIRGUN
Source Volume : 3162 Pressure: 1959
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB-ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note 0 Misfire

--- NAVIGATION ---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6084418. Sol. Easting 495254.
Eol. Northing 6084375. Eol. Easting 501064.
Note Cocktail used. Tailbuoy P-8 noisy
No external header data sp 11414, old data 11415
Message SEQ 81 1-Boat INFILL in column 120 Charged to contractor.
NO EDITS

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0574-S Heading 90 deg.
Line Status Complete
Date started 16/08/89 Start Time 04:16 End Time 07:38
First File 100 First Reel 36904 Last File 1630 Last Reel 36917

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0580/121	100	0	0	1630	0	0.000Kms
0579/122	100	0	0	1630	0	0.000Kms
0578/123	100	0	0	1630	0	0.000Kms
0577/124	100	0	0	1630	0	0.000Kms
0576/125	100	0	0	1630	0	0.000Kms
0575/126	100	0	0	1630	0	0.000Kms
0574/127	100	100	1630	1630	1531	28.706Kms
0573/128	100	0	0	1630	0	0.000Kms

---==== WEATHER ========

Wind dir. S force 4 Sea state 4 Swell dir. S Height 2 m

---====== RECORDING ======---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 36.9m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 2 Misfires 7

-----===== DUAL STREAMER ==========

2x12@x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.4 m. Max. 8.4 m.
Feather Sol. 2.4 S Eol. 4.0 P Max. 4.2 P

Accoustic Transponders:	1.20 SDFRONT	8.40 SDTAIL	0.77 STBDROT	0.15 PORTROT	112.30 TAILSEP
Compass :	100.90 AVSEPFR	104.10 AVSEPMID	101.70 AVSEPTL	1.00 DSTDS13	1.10 DSTDP13
Tailbuoy :	10.60 MEANSDST	11.25 MEANSDPT	6.00 SD>25m S	5.00 SD>25m S	115.10 STB SEP

Dead Grp: Group No. 98

Noise: Swell bursts 30-35 uB , random and short lived.
Front ends noisy 10-15 uB at EOL
Note Stbd cable shallow (5.4-5.7m) sp 1054-1123. Acceptable.
Tail current caused instability in depths and steering.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1948
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF S1/6 sps 618 646 714 786 802 842 846 switched out at sp 852 new vol 3100 cu ins. 14 GM20 errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6084344.0 Sol. Easting 474075.0
Eol. Northing 6084302.0 Eol. Easting 502751.0
Note NDRs sps 549,995 (GDR fault).....Steering difficult due to currents..... Pulse-8 on Stbd tailbuoy out sp 100-136
Message SEQ 6 2 Boat Prime line. Good line no edits.
FTB=593.6 Link=1.3 Proj SOL=0347 Actual SOL=0416 (late due to Rho cable)

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0574*S3 Heading 90 deg.
Line Status Cntr Downtime / RESHOOT
Date started 18/08/89 Start Time 07:07 End Time 07:27
First File 970 First Reel 36995 Last File 1130 Last Reel 36996

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0574/137	10970	0	0	11130	0	0.000Kms
/138	10970	0	0	11130	0	0.000Kms
/139	10970	0	0	11130	0	0.000Kms
/140	10970	0	0	11130	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

-------- WEATHER ========

Wind dir. SW force 4 Sea state 4 Swell dir. SW Height 2 m

------ RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 36.3m. Eol. 36.0m. Ave Speed 4.9 Kts.
Parity Errors 0 No Data Record 0 Misfires 1

---------- DUAL STREAMER ==========

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.1 m. Max. 7.9 m.
Feather Sol. 1.5 S Eol. 4.0 S Max. .

Accoustic Transponders:	0.30 SDFRONT	2.00 SDTAIL	0.23 STBDROT	0.22 PORTROT	100.60 TAILSEP
Compass :	101.00 AVSEPFR	102.50 AVSEPMID	96.00 AVSEPTL	1.50 DSTDS13	1.60 DSTDP13
Tailbuoy :	6.61 MEANSDST	5.03 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	112.30 STB SEP

Dead Grp: Group 98 dead.

Noise: Swell bursts, heavy at times, 60-80 uB. Worse on
Stbd streamer around birds near groups 70 and 100
Note Stability and control good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1962
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note Misfire on S2/1 gun at sp 11024

------ NAVIGATION ------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6083948. Sol. Easting 490381.
Eol. Northing 6083939. Eol. Easting 493380.
Note Hyperfix stable.
RESHOOT IN COLS 141-144 STILL TO BE RESHOT.
Message SEQ 12 1-Boat Reshoot of Seq 4 cols 137-140 (Missed on first line 562, Rho navigator finger trouble) Cols 141-144 still to be reshot

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0574*S2 Heading 90 deg.
Line Status Non Cntr Downtime /RESHOOT
Date started 18/08/89 Start Time 06:28 End Time 06:41
First File 670 First Reel 36992 Last File 770 Last Reel 36993

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0574/133	10670	0	0	10770	0	0.000Kms
/134	10670	0	0	10770	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ====---

Wind dir. SW force 4 Sea state 4 Swell dir. SW Height 2 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 37.1m. Eol. 36.9m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---==== DUAL STREAMER ====---

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.1 m. Max. 7.9 m.
Feather Sol. 4.6 P Eol. 3.0 P Max. .

Accoustic Transponders:	0.30 SDFRONT	2.80 SDTAIL	0.23 STBDROT	0.22 PORTROT	100.60 TAILSEP
Compass :	101.00 AVSEPFR	102.50 AVSEPMID	96.00 AVSEPTL	1.50 DSTDS13	1.60 DSTDP13
Tailbuoy :	6.61 MEANSDST	5.03 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	112.30 STB SEP

Dead Grp: Group 98 dead.

Noise: Swell bursts, heavy at times, 60-80 uB. Worse on Stbd streamer around birds near groups 70 and 100
Note Stability and control good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1962
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note All guns good.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6084012. Sol. Easting 484758.
Eol. Northing 6083983. Eol. Easting 486633.
Note Hyperfix stable.

Message SEQ 12 1-Boat Reshoot of Seq 4 cols 133-134 (Bad on first line 562 because of currents.Low speed caused Sigma cable instability)

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0574*S1 Heading 90 deg.
Line Status Cntr Downtime/RESHOOT
Date started 18/08/89 Start Time 06:05 End Time 06:12
First File 490 First Reel 36991 Last File 550 Last Reel 36991

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0574/129	10470	0	0	10550	0	0.000Kms
/130	10490	0	0	10550	0	0.000Kms
/131	10490	0	0	10550	0	0.000Kms
/132	10490	0	0	10550	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---------- WEATHER ---------

Wind dir. SW force 4 Sea state 4 Swell dir. SW Height 2 m

---------- RECORDING ---------

Magnetometer N Gravity N
Water depth Sol. 37.7m. Eol. 37.9m. Ave Speed 5.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 1

---------- DUAL STREAMER ---------

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.1 m. Max. 7.9 m.
Feather Sol. 1.5 P Eol. . Max. .

Accoustic Transponders:	0.30 SDFRONT	2.80 SDTAIL	0.23 STBDROT	0.22 PORTROT	100.60 TAILSEP
Compass :	101.00 AVSEPFR	102.50 AVSEPMID	96.00 AVSEPTL	1.50 DSTDS13	1.60 DSTDP13
Tailbuoy :	6.61 MEANSDST	5.03 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	112.30 STB SEP

Dead Grp: Group 98 dead.

Noise: Swell bursts, heavy at times, 60-80 uB. Worse on Stbd streamer around birds near groups 70 and 100
Note Stability and control good.

---------- ENERGY SOURCE ---------

Source type AIRGUN
Source Volume : 3162 Pressure: 1962
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note Misfire on S2/1 sp 10510

---------- NAVIGATION ---------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6084107. Sol. Easting 481385.
Eol. Northing 6084105. Eol. Easting 482509.
Note Hyperfix stable.

Message SEQ 12 1-Boat Reshoot of Seq 6 cols 129-132 (missed on original line 574 because of Rho GDR failure)

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0574/S Heading 90 deg.
Line Status Fill-in
Date started 07/09/89 Start Time 19:08 End Time 19:37
First File 310 First Reel 37765 Last File 520 Last Reel 37767

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

======== WEATHER ========

Wind dir. SE force 2 Sea state 2 Swell dir. Height 0 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.8m. Eol. 37.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 1

========== DUAL STREAMER ==========

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.1 m. Max. 8.1 m.
Feather Sol. 1.4 S Eol. 2.0 P Max. 2.0 P

Accoustic Transponders:	0.50 SDFRONT	0.00 SDTAIL	0.51 STBDROT	0.05 PORTROT	. TAILSEP	
Compass :	102.00 AVSEPFR	103.00 AVSEPMID	104.00 AVSEPTL	0.00 DSTDS13	0.00 DSTDP13	
Tailbuoy :	5.56 MEANSDST	5.40 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	120.00 STB SEP	

Dead Grp: 47 dead

Noise: Front end of port cable relatively noisy 6-14 uB

Note Depth and stability ok.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1959
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note 1 Misfire

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6084340. Sol. Easting 478012.
Eol. Northing 6084303. Eol. Easting 481947.
Note Cocktail used. K8 noisy and taken out of fix at sp 330

Message SEQ 80 1-Boat INFILL in column 121 Charged to contractor.
NO EDITS

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0562-S Heading 90 deg.
Line Status Complete
Date started 14/08/89 Start Time 14:46 End Time 18:08
First File 100 First Reel 36875 Last File 1628 Last Reel 36889

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0568/133	100	0	0	1630	0	0.000Kms
0567/134	100	0	0	1630	0	0.000Kms
0566/135	100	0	0	1630	0	0.000Kms
0565/136	100	0	0	1630	0	0.000Kms
0564/137	100	0	0	1630	0	0.000Kms
0563/138	100	0	0	1630	0	0.000Kms
0562/139	100	100	1630	1630	1531	28.706Kms
0561/140	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. SSW force 4 Sea state 4 Swell dir. SSW Height 2 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.8m. Eol. 37.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 0 Misfires 13

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 4.5 m. Max. 9.0 m.
Feather Sol. 2.6 P Eol. 2.5 P Max. 3.9 P

Accoustic Transponders:	1.10 SDFRONT	. SDTAIL	1.02 STBDROT	0.25 PORTROT	120.70 TAILSEP
Compass :	101.60 AVSEPFR	112.40 AVSEPMID	101.70 AVSEPTL	1.10 DSTDS13	1.20 DSTDP13
Tailbuoy :	18.65 MEANSDST	17.49 MEANSDPT	14.00 SD>25m S	15.00 SD>25m S	120.50 STB SEP

Dead Grp: None

Noise: Swell bursts to 45 uB decreasing along line.
Random and short lived.
Note PORT CABLE OUT OF SPEC, 4.5 - 9.0 m sp 670-770 EDIT OUT
STBD CABLE: slightly shallow 5.2 - 5.7m sps 700-735 acceptable.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1946
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF S3/2 sp 1536 1548 1552 1556 1560 1572 1576 1580 switched out sp 1582 new vol 2872 cu in. 5 other MF 12 GM20 errors

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,
Secondary DAN-C,GORM-B,

Sol. Northing 6084006.0 Sol. Easting 474075.0
Eol. Northing 6084009.0 Eol. Easting 502751.0
Note SP Nos 389,637 recorded twice.SP Nos 310 311 638 639 not recorded,Nav jumped No Data Lost. K7 noisy Syledis/Hyperfix used 630-670
Message SEQ 4 2 Boat Prime line. EDIT: Sigma port cable sp 670-770
Pulse clock errors so FTB and Link Delay N/A Proj SOL 1446 GMT

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0550-S Heading 90 deg.
Line Status Complete
Date started 16/08/89 Start Time 16:18 End Time 19:36
First File 100 First Reel 36933 Last File 1625 Last Reel 36946

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0556/145	100	0	0	1630	0	0.000Kms
0555/146	100	0	0	1630	0	0.000Kms
0554/147	100	0	0	1630	0	0.000Kms
0553/148	100	0	0	1630	0	0.000Kms
0552/149	100	0	0	1630	0	0.000Kms
0551/150	100	0	0	1630	0	0.000Kms
0550/151	100	100	1630	1630	1531	28.706Kms
0549/152	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. Var force 3 Sea state 3 Swell dir. S Height 2 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.7m. Eol. 36.3m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 4 Misfires 16

========== DUAL STREAMER ==========

2x12@x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 7.8 m.
Feather Sol. 2.2 S Eol. 5.5 P Max. 5.6 P

Accoustic Transponders:	1.70 SDFRONT	1.50 SDTAIL	0.21 STBDROT	0.22 PORTROT	109.10 TAILSEP	
Compass :	102.50 AVSEPFR	106.00 AVSEPMID	98.50 AVSEPTL	0.90 DSTDS13	1.00 DSTDP13	
Tailbuoy :	5.92 MEANSDST	7.21 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	114.00 STB SEP	

Dead Grp: None

Noise: Sporadic swell bursts < 20 uB

Note Stability and control good.

======= ENERGY SOURCE =======

Source type AIRGUN
Source Volume : 3162 Pressure: 1911
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note EDIT low pressure port array sp 1461-1478 ... P1/6 disabled at sp 1145 new vol 3188 cu in...P1/3 disabled at sp 1449 new vol 2913 cu in

======= NAVIGATION =======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6083725.0 Sol. Easting 474075.0
Eol. Northing 6083714.0 Eol. Easting 502752.0

Note Bad sp interval and numbering sps 594-1596 and 1609-1616.
From sp 1611 (recorded as 1609) sp number is 2 ahead of actual sp.
Message SEQ 8 2 Boat Prime. EDITS:Port array 1461-1478, and gun seq errors sps 1614-1619.. Bad nav 1594-1616..FTB and LINK N/A..Proj SOL=1614

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0538-S Heading 90 deg.
Line Status Complete
Date started 19/08/89 Start Time 18:20 End Time 21:40
First File 100 First Reel 37037 Last File 1619 Last Reel 37050

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0544/157	100	0	0	1630	0	0.000Kms
0543/158	100	0	0	1630	0	0.000Kms
0542/159	100	0	0	1630	0	0.000Kms
0541/160	100	0	0	1630	0	0.000Kms
0540/161	100	0	0	1630	0	0.000Kms
0539/162	100	0	0	1630	0	0.000Kms
0538/163	100	100	1630	1630	1531	28.706Kms
0537/164	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. SSE force 4 Sea state 3 Swell dir. SSE Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 36.3m. Eol. 36.1m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 11 Misfires 6

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 8.4 m.
Feather Sol. 0.3 S Eol. 2.9 P Max. 6.1 P

Accoustic Transponders:	0.00 SDFRONT	2.40 SDTAIL	0.05 STBDROT	0.05 PORTROT	111.10 TAILSEP	
Compass :	101.70 AVSEPFR	107.30 AVSEPMID	103.50 AVSEPTL	1.00 DSTDS13	1.00 DSTDP13	
Tailbuoy :	7.99 MEANSDST	6.93 MEANSDPT	2.00 SD>25m S	0.00 SD>25m S	126.20 STB SEP	

Dead Grp: Group 98 dead.

Noise: Front ends relatively noisy 10-12 uB

Note Stability and control good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1937
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 5 MF on P2/6, switched off at sp 256 leaving 3100 cu.in
GUN SEQ:1100-1190 1234-1237 1257 1258 1265-1267 1291-1296....10 GM20 errors

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6083422. Sol. Easting 474075.
Eol. Northing 6083432. Eol. Easting 502751.
Note Nav noisy,Hyp/Syl cocktail used.Stns changed during line.
Duplicate sp Nos. and NDRs sps 444-1277. 60 pulse clock errors sp 392-1455
Message SEQ 16 2-Boat Prime Untidy line. Noisy nav=erratic sps
EDIT: NDR sps 444 466 782 1178 1185 1188 1201 1222 1273 1275 1291

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0526-S Heading 90 deg.
Line Status Complete
Date started 20/08/89 Start Time 19:04 End Time 22:23
First File 100 First Reel 37096 Last File 1630 Last Reel 37110

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0532/169	100	0	0	1630	0	0.000Kms
0531/170	100	0	0	1630	0	0.000Kms
0530/171	100	0	0	1630	0	0.000Kms
0529/172	100	0	0	1630	0	0.000Kms
0528/173	100	0	0	1630	0	0.000Kms
0527/174	100	0	0	1630	0	0.000Kms
0526/175	100	100	1630	1630	1531	28.706Kms
0525/176	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. S force 3 Sea state 3 Swell dir. S Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.7m. Eol. 36.3m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 1 Misfires 1

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.5 m. Max. 8.1 m.
Feather Sol. 1.1 P Eol. 2.4 P Max. 5.0 P

Accoustic Transponders:	1.50 SDFRONT	2.40 SDTAIL	0.01 STBDROT	0.04 PORTROT	116.90 TAILSEP	
Compass :	102.80 AVSEPFR	110.70 AVSEPMID	107.90 AVSEPTL	0.90 DSTDS13	1.00 DSTDP13	
Tailbuoy :	9.49 MEANSDST	7.61 MEANSDPT	3.00 SD>25m S	0.00 SD>25m S	130.60 STB SEP	

Dead Grp: Group 98 dead

Noise: Front ends relatively noisy 8-12 uB

Note Stability and control good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1939
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note Gun Seq error: 221-223 745-748 1433-1439 1500-1504 1591-1598
23 GM20 errors. MF P3/2 sp 1446

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,

Sol. Northing 6083107. Sol. Easting 474075.
Eol. Northing 6083100. Eol. Easting 502751.
Note Hyperfix noisy,used cocktail. Various station changes during line...NDR 617...41 pulse clock errors...Happisburgh out of P-B sp 690-720
Message SEQ 20 2-Boat Prime High number of pulse clock and GM20 errors. Projected SOL=1905 FTB and Link Delay N/A NO EDITS

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0526/S Heading 90 deg.
Line Status Fill-in
Date started 03/09/89 Start Time 14:45 End Time 16:30
First File 887 First Reel 37558 Last File 1630 Last Reel 37564

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0526/178	887	887	1630	1630	744	13.950Kms
/179	887	0	0	1630	0	0.000Kms
/180	887	0	0	1630	0	0.000Kms
/181	887	0	0	1630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---=== WEATHER ===---

Wind dir. NW force 5 Sea state 4 Swell dir. NW Height 2 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.2m. Eol. 36.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 1 Misfires 13

---=== DUAL STREAMER ===---

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 5.3 m. Max. 8.1 m.
Feather Sol. 0.5 S Eol. 0.7 P Max. 2.5 P

Accoustic Transponders:	1.5@ SDFRONT	1.1@ SDTAIL	0.2@ STBDROT	0.1@ PORTROT	106.0@ TAILSEP
Compass :	100.0@ AVSEPFR	102.0@ AVSEPMID	101.0@ AVSEPTL	1.5@ DSTDS13	1.2@ DSTDP13
Tailbuoy :	4.86 MEANSDST	4.71 MEANSDPT	0.0@ SD>25m S	0.0@ SD>25m S	114.0@ STB SEP

Dead Grp: 18 left in but spiked on Navtech pulse at 5.4 secs
47 dead from SOL
Noise: Occasional random swell bursts up to 80 uB.

Note Stbd depth 7 = 5.3 - 5.7 m for sps 1222-1239. Otherwise ok.
Port depth 16 = 5.4 - 5.7 m for sps 1306-1318 otherwise ok.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1944
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB-ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note STBD 3/3 off at sp 897 leaving 2967 cu.ins on stbd array.
13 MF mainly on S3/3 and S2/5

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6082909. Sol. Easting 488826.
Eol. Northing 6082874. Eol. Easting 502751.
Note Cocktail used inc Tersch F2 and K8 F1. K7 out
Lost Syledis lock sp 1195-1417 NDR 1226
Message SEQ 60 1-Boat INFILL Sigma columns 178-181
NO EDITS

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0514-S Heading 90 deg.
Line Status Complete
Date started 21/08/89 Start Time 19:50 End Time 23:08
First File 100 First Reel 37155 Last File 1628 Last Reel 37169

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0520/181	100	0	0	1630	0	0.000Kms
0519/182	100	0	0	1630	0	0.000Kms
0518/183	100	0	0	1630	0	0.000Kms
0517/184	100	0	0	1630	0	0.000Kms
0516/185	100	0	0	1630	0	0.000Kms
0515/186	100	0	0	1630	0	0.000Kms
0514/187	100	100	1630	1630	1531	28.706Kms
0513/188	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. W force 3 Sea state 3 Swell dir. SW Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 36.5m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 2 Misfires 1

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 8.0 m.
Feather Sol. 0.1 P Eol. 2.0 P Max. 5.3 P

Accoustic Transponders:	2.10 SDFRONT	3.50 SDTAIL	0.22 STBDROT	0.19 PORTROT	109.40 TAILSEP	
Compass :	102.70 AVSEPFR	105.10 AVSEPMID	100.00 AVSEPTL	1.00 DSTDS13	0.90 DSTDP13	
Tailbuoy :	8.18 MEANSDST	7.51 MEANSDPT	2.00 SD>25m S	0.00 SD>25m S	117.40 STB SEP	

Dead Grp: Group 90 dead

Noise: Random swell bursts at SOL decreased towards EOL,
worse on tail ends. Swell spikes to 45 uB at SOL
Note Stability and control good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1945
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements
each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF on P1/5 sp 517 GUN SEQ ERRORS: 533-536
21 GM2B errors.

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6082829. Sol. Easting 474075.
Eol. Northing 6082822. Eol. Easting 502751.
Note Cocktail of Hyperfix Tersch f1,H7 f1,Borkum f1 and Tersch f2
for sp100-414 then Hyperfx primary. Syledis noisy 21 pulse clock errors
Message SEQ 24 2-Boat Prime Nav Stable-poor geometry occasionally
NDR sp 294,1625 FTB @ LINK N/A Proj SOL=1950 EDIT:533-536 gun seq

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0502-S Heading 90 deg.
Line Status Complete
Date started 26/08/89 Start Time 06:32 End Time 09:57
First File 100 First Reel 37228 Last File 1630 Last Reel 37241

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0508/193	100	0	0	1630	0	0.000Kms
0507/194	100	0	0	1630	0	0.000Kms
0506/195	100	0	0	1630	0	0.000Kms
0505/196	100	0	0	1630	0	0.000Kms
0504/197	100	0	0	1630	0	0.000Kms
0503/198	100	0	0	1630	0	0.000Kms
0502/199	100	100	1630	1630	1531	28.706Kms
0501/200	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. NW force 2 Sea state 2 Swell dir. W Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.7m. Eol. 35.9m. Ave Speed 4.5 Kts.
Parity Errors 0 No Data Record 2 Misfires 10

========== DUAL STREAMER ==========

2x12@x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 8.4 m.
Feather Sol. 0.9 P Eol. 1.0 P Max. 4.4 P

Accoustic Transponders:	2.20	SDFRONT	0.00	SDTAIL	0.26	STBDROT	0.30	PORTROT	98.00 TAILSEP
Compass :	101.00	AVSEPFR	101.00	AVSEPMID	92.00	AVSEPTL	1.90	DSTDS13	0.90 DSTDP13
Tailbuoy :	.	MEANSDST	4.80	MEANSDPT	.	SD>25m S	0.00	SD>25m S	. STB SEP

Dead Grp: Group 47 switched out because of spiking.

Noise: Front ends relatively noisy 6-10 UB

Note Control and stability ok.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1946
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements
each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 10 MF mainly gun S1/3 GUN SEQ ERRORS: 774-776
GM20 errors: 113 182 392 558 1065 1140 1277 1285 1325 1389 1442 1545

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,811/2,

Sol. Northing 6082528. Sol. Easting 474075.
Eol. Northing 6082527. Eol. Easting 502751.
Note H7 out of all Hyperfix fixes. Cocktail used sp 777-EOL
No P-8 data from stbd tailbuoy....NDR 774 776...Pulse clock errors 750-752
Message SEQ 33 2-Boat Prime EDIT: Gun Seq 774-776
FTB=N/A Link Delay= 1.3 Proj SOL= 0630 Actual =0632

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0490-S Heading 90 deg.
Line Status Complete
Date started 27/08/89 Start Time 07:46 End Time 11:15
First File 100 First Reel 37288 Last File 1630 Last Reel 37302

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0496/205	100	0	0	1630	0	0.000Kms
0495/206	100	0	0	1630	0	0.000Kms
0494/207	100	0	0	1630	0	0.000Kms
0493/208	100	0	0	1630	0	0.000Kms
0492/209	100	0	0	1630	0	0.000Kms
0491/210	100	0	0	1630	0	0.000Kms
0490/211	100	100	1630	1630	1531	28.706Kms
0489/212	100	0	0	1630	0	0.000Kms

-------==== WEATHER ====-----

Wind dir. ENE force 3 Sea state 4 Swell dir. NW Height 1 m

---====== RECORDING ======---

Magnetometer N Gravity N
Water depth Sol. 38.6m. Eol. 36.7m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 5 Misfires 15

----------==== DUAL STREAMER ====---------

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.6 m. Max. 8.1 m.
Feather Sol. 0.2 P Eol. 0.6 S Max. 2.8 P

Accoustic Transponders:	1.30 SDFRONT	1.40 SDTAIL	0.25 STBDROT	0.31 PORTROT	106.00 TAILSEP
Compass :	100.00 AVSEPFR	103.00 AVSEPMID	99.00 AVSEPTL	1.30 DSTDS13	1.30 DSTDP13
Tailbuoy :	4.68 MEANSDST	4.82 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	112.00 STB SEP

Dead Grp: Group 47 dead. Group 18 left in
but spiking at 5.5 secs (Navtech pulse)
Noise: Front of port streamer relatively noisy 8-16 uB

Note Control and stability good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1968
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note EDIT:sp 1181-1239 Both stbd arrays - Firing together
15 MF on S1/3 - disabled at sp 1369 leaving 2967 cu.in 12 GM28 errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6082215. Sol. Easting 474075.
Eol. Northing 6082235. Eol. Easting 502751.
Note H7 out of all fixes. NDR 112 , 1444-1447

Message SEQ 37 2-Boat Prime EDIT: Both stbd arrays sp 1181-1239
(2-boat reshoot) NDRs 1444-1447 FTB=593.1 Link=1.2 Proj SOL=8746

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0490/S Heading 90 deg.
Line Status Fill-in
Date started 05/09/89 Start Time 15:33 End Time 16:39
First File 700 First Reel 37662 Last File 1171 Last Reel 37666

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0490/204	10700	10700	11171	11171	472	8.850Kms
/205	10700	0	0	11171	0	0.000Kms
/206	10700	0	0	11171	0	0.000Kms
/207	10700	0	0	11171	0	0.000Kms
/208	10700	0	0	11171	0	0.000Kms
/209	10700	0	0	11171	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---=== WEATHER ===---

Wind dir. W force 2 Sea state 2 Swell dir. Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 37.1m. Eol. 36.5m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 1

---=== DUAL STREAMER ===---

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.5 m. Max. 7.9 m.
Feather Sol. 1.9 P Eol. 0.3 S Max. .

Accoustic Transponders:	1.10 SDFRONT	0.00 SDTAIL	0.00 STBDROT	0.77 PORTROT	. TAILSEP	
Compass :	102.00 AVSEPFR	103.00 AVSEPMID	99.00 AVSEPTL	0.50 DSTDS13	0.60 DSTDP13	
Tailbuoy :	5.76 MEANSDST	4.72 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	120.00 STB SEP	

Dead Grp: 98 weak

Noise: Front end of port cable noisy 10-15 uB

Note Control and stability good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1948
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note MF on S3/4 at sp 11028 5 GM2B errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6082237. Sol. Easting 485321.
Eol. Northing 6082240. Eol. Easting 494148.
Note Cocktail used.

Message SEQ 69 2-Boat Infill Sigma columns 204-209 NO EDITS
FTB=593.6 Link=1.3

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0490/S1 Heading 90 deg.
Line Status Fill-in
Date started 05/09/89 Start Time 16:48 End Time 17:42
First File 1240 First Reel 37667 Last File 1630 Last Reel 37670

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0490/204	11240	11240	11630	11630	391	7.331Kms
/205	11240	0	0	11630	0	0.000Kms
/206	11240	0	0	11630	0	0.000Kms
/207	11240	0	0	11630	0	0.000Kms
/208	11240	0	0	11630	0	0.000Kms
/209	11240	0	0	11630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

======== WEATHER ========

Wind dir. W force 2 Sea state 2 Swell dir. Height 1 m

======== RECORDING ========

Magnetometer N Gravity N
Water depth Sol. 36.2m. Eol. 36.4m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

========== DUAL STREAMER ==========

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.5 m. Max. 7.9 m.
Feather Sol. . Eol. 0.1 S Max. 3.0 P

Accoustic Transponders:	1.10 SDFRONT	0.00 SDTAIL	0.00 STBDROT	0.77 PORTROT	. TAILSEP	
Compass :	102.00 AVSEPFR	103.00 AVSEPMID	99.00 AVSEPTL	0.50 DSTDS13	0.60 DSTDP13	
Tailbuoy :	5.76 MEANSDST	4.72 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	120.00 STB SEP	

Dead Grp: 98 weak
47 dead
Noise: Front end of port cable noisy 10-15 uB

Note Control and stability good.

======= ENERGY SOURCE =======

Source type AIRGUN
Source Volume : 3162 Pressure: 1948
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note 3 GM2B errors

======= NAVIGATION =======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6082215. Sol. Easting 495441.
Eol. Northing 6082272. Eol. Easting 502752.
Note Cocktail used.

Message SEQ 69 2-Boat Infill Sigma columns 204-209 NO EDITS
FTB=593.6 Link=1.3

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0490*S Heading 90 deg.
Line Status Reshoot
Date started 05/09/89 Start Time 16:39 End Time 16:48
First File 1172 First Reel 37666 Last File 1239 Last Reel 37667

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0496/205	11172	0	0	11239	0	0.000Kms
0495/206	11172	0	0	11239	0	0.000Kms
0494/207	11172	0	0	11239	0	0.000Kms
0493/208	11172	0	0	11239	0	0.000Kms
0492/209	11172	0	0	11239	0	0.000Kms
0491/210	11172	0	0	11239	0	0.000Kms
0490/211	11172	0	0	11239	0	0.000Kms
0489/212	11172	0	0	11239	0	0.000Kms

======== WEATHER ========

Wind dir. W force 2 Sea state 2 Swell dir. Height 1 m

======== RECORDING ========

Magnetometer N Gravity N
Water depth Sol. 36.5m. Eol. 36.2m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

========== DUAL STREAMER ==========

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.5 m. Max. 7.9 m.
Feather Sol. 0.3 S Eol. . Max. .

Accoustic Transponders:	1.10 SDFRONT	0.00 SDTAIL	0.00 STBDROT	0.77 PORTROT	.	TAILSEP
Compass :	102.00 AVSEPFR	103.00 AVSEPMID	99.00 AVSEPTL	0.50 DSTDS13	0.60 DSTDP13	
Tailbuoy :	5.76 MEANSDST	4.72 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	120.00 STB SEP	

Dead Grp: 98 weak
47 spiked from sp 11192 , switched out.
Noise: Front end of port cable noisy 10-15 uB

Note Control and stability good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1948
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note 1 GM2B error

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6082240. Sol. Easting 494167.
Eol. Northing 6082215. Eol. Easting 495423.
Note Cocktail used.

Message SE0 69 2-Boat Reshoot of seq 37 sps 1181-1239 rejected due to gun failure on seq 37. FTB=593.6 Link=1.3

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0478-S Heading 90 deg.
Line Status Complete
Date started 28/08/89 Start Time 08:42 End Time 12:19
First File 100 First Reel 37317 Last File 1630 Last Reel 37331

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0484/217	100	0	0	1630	0	0.000Kms
0483/218	100	0	0	1630	0	0.000Kms
0482/219	100	0	0	1630	0	0.000Kms
0481/220	100	0	0	1630	0	0.000Kms
0480/221	100	0	0	1630	0	0.000Kms
0479/222	100	0	0	1630	0	0.000Kms
0478/223	100	100	1630	1630	1531	28.706Kms
0477/224	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. N force 6 Sea state 6 Swell dir. N Height 3 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 35.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 1 Misfires 9

---==== DUAL STREAMER ====---

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 3.4 m. Max. 8.6 m.
Feather Sol. 1.5 P Eol. 1.0 S Max. 1.9 P

Accoustic Transponders:	1.40 SDFRONT	0.90 SDTAIL	0.13 STBDROT	0.27 PORTROT	99.10 TAILSEP
Compass :	100.00 AVSEPFR	101.00 AVSEPMID	95.00 AVSEPTL	1.90 DSTDS13	2.20 DSTDP13
Tailbuoy :	5.97 MEANSDST	6.10 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	. STB SEP

Dead Grp: Group 47 dead. Group 10 left in but spiking at 5.5 secs (Navtech pulse)
Noise: Very heavy swell bursts. Almost continuous in some areas. Bursts up to 60 uB. Marginal.
Note Heavy sea , Stbd streamer shallow round bird 10 for short time at sps 309 and 1010 Marginal but all microMAXed ok on Rho

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1948
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 9 MF on various guns. Misfires on S1/3 - Sensor error,ok on scope. No Gun Seq errors. 106 GM20 errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary DAN-C,B11/2,

Sol. Northing 6081923. Sol. Easting 474475.
Eol. Northing 6081938. Eol. Easting 502751.
Note Pulse clock not switched on until sp 111.
Cocktail of stns used including Tersch F2 NDR sp 1217
Message SEQ 39 2-Boat Prime Marginal data but MicrMAXED ok.
Compasses out of spec. FTB and LINK N/A Proj SOL=0842

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0466-S Heading 90 deg.
Line Status Complete
Date started 30/08/89 Start Time 10:06 End Time 13:44
First File 100 First Reel 37389 Last File 1623 Last Reel 37403

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0472/229	100	0	0	1630	0	0.000Kms
0471/230	100	0	0	1630	0	0.000Kms
0470/231	100	0	0	1630	0	0.000Kms
0469/232	100	0	0	1630	0	0.000Kms
0468/233	100	0	0	1630	0	0.000Kms
0467/234	100	0	0	1630	0	0.000Kms
0466/235	100	100	1630	1630	1531	28.706Kms
0465/236	100	0	0	1630	0	0.000Kms

WEATHER

Wind dir. S force 2 Sea state 2 Swell dir. S Height 1 m

RECORDING

Magnetometer N Gravity N
Water depth Sol. 38.3m. Eol. 36.2m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 9 Misfires 4

DUAL STREAMER

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.5 m. Max. 7.8 m.
Feather Sol. 0.2 S Eol. 0.9 P Max. 3.1 P

Accoustic Transponders:	1.20 SDFRONT	1.10 SDTAIL	0.23 STBDROT	0.38 PORTROT	112.00 TAILSEP
Compass :	102.00 AVSEPFR	104.00 AVSEPMID	100.00 AVSEPTL	0.00 DSTDS13	0.90 DSTDP13
Tailbuoy :	8.40 MEANSDST	4.75 MEANSDPT	3.00 SD>25m S	0.00 SD>25m S	. STB SEP

Dead Grp: Group 98 weak Group 18 left in but spiking at 5.4 secs (Navtech pulse)
Noise: Front end of port cable relatively noisy 12-20 uB

Note Cable control and stability good

ENERGY SOURCE

Source type AIRGUN
Source Volume : 3162 Pressure: 1945
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 3 MF on P2/3 1 MF on P2/1 13 GN2B errors

NAVIGATION

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F2,
Secondary DAN-C,GORN-B,B11/2,

Sol. Northing 6081631. Sol. Easting 474075.
Eol. Northing 6081629. Eol. Easting 502751.
Note Cocktail used.H7 and K7 out of fixes, noisy and very bad
sp 690-717//Ext.Hdr data corrupt occasionally//NDR 590 700 708-712 714 716
Message SEQ 46 2-Boat Prime FTB=N/A LINK=1.3 Proj SOL=1007
EDIT:GDR 478-498 , NDRs ..... Poor nav, very noisy sp 690-717

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0466/S Heading 90 deg.
Line Status Fill-in
Date started 05/09/89 Start Time 01:55 End Time 05:34
First File 100 First Reel 37632 Last File 1630 Last Reel 37646

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0466/237	10100	10100	11630	11630	1531	28.706Kms
/238	10100	0	0	11630	0	0.000Kms
/239	10100	0	0	11630	0	0.000Kms
/240	10100	0	0	11630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

WEATHER

Wind dir. W force 2 Sea state 2 Swell dir. Height 1 m

RECORDING

Magnetometer N Gravity N
Water depth Sol. 38.1m. Eol. 36.5m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 1 Misfires 9

DUAL STREAMER

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.5 m. Max. 7.6 m.
Feather Sol. 1.8 S Eol. 0.5 S Max. 3.1 S

Accoustic Transponders:	0.90 SDFRONT	0.00 SDTAIL	2.29 STBDROT	. PORTROT	. TAILSEP
Compass :	102.00 AVSEPFR	104.00 AVSEPMID	99.00 AVSEPTL	0.60 DSTDS13	0.70 DSTDP13
Tailbuoy :	7.57 MEANSDST	5.73 MEANSDPT	1.00 SD>25m S	0.00 SD>25m S	112.00 STB SEP

Dead Grp: 56 weak. 47 spiked and was switched out sp 10772

Noise: Front of port cable relatively noisy 10-20 uB

Note Control and stability good.

ENERGY SOURCE

Source type AIRGUN
Source Volume : 3162 Pressure: 1942
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note STBD 2/3 out sp 10474 leaving 2967 cu.ins
9 MF on S2/3 , P2/5 , S3/4 12 GM28 errors.

NAVIGATION

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,BORN-B,B11/2,

Sol. Northing 6081433. Sol. Easting 474075.
Eol. Northing 6081437. Eol. Easting 502751.
Note Cocktail used. Station K8 noisy.
NDR sp 10736
Message SEQ 67, 2-Boat INFILL Sigma columns 237-240 NO EDITS
FTB= 593.6 Link Delay=1.3

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0454-S Heading 90 deg.
Line Status Complete
Date started 31/08/89 Start Time 10:49 End Time 14:28
First File 100 First Reel 37449 Last File 1627 Last Reel 37463

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0460/241	100	0	0	1630	0	0.000Kms
0459/242	100	0	0	1630	0	0.000Kms
0458/243	100	0	0	1630	0	0.000Kms
0457/244	100	0	0	1630	0	0.000Kms
0456/245	100	0	0	1630	0	0.000Kms
0455/246	100	0	0	1630	0	0.000Kms
0454/247	100	100	1630	1630	1531	28.706Kms
0453/248	100	0	0	1630	0	0.000Kms

---==== WEATHER ========

Wind dir. NW force 4 Sea state 3 Swell dir. NW Height 1 m

---===== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 39.0m. Eol. 36.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 3 Misfires 6

----======= DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.1 m. Max. 7.6 m.
Feather Sol. 1.9 P Eol. 1.0 P Max. 2.3 S

Accoustic Transponders:	1.20 SDFRONT	0.60 SDTAIL	0.16 STBDROT	0.27 PORTROT	111.00 TAILSEP
Compass :	102.00 AVSEPFR	105.00 AVSEPMID	103.00 AVSEPTL	1.10 DSTDS13	1.40 DSTDP13
Tailbuoy :	6.50 MEANSDST	5.33 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	111.00 STB SEP

Dead Grp: Group 47 dead from SOL. Group 98 weak
Grp 18 in but spiking on Navtech pulse at 5.4secs
Noise: Occasional random swell bursts. No significant
levels of noise.
Note Control and stability good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1942
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements
each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 6 MF on guns P2/3 P3/4 and P2/1 14 GM28 errors
No gun seq errors.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,B11/2,

Sol. Northing 6081321. Sol. Easting 474075.
Eol. Northing 6081325. Eol. Easting 502751.
Note Cocktail used incl Tersch F2. K7 out of fixes. Various
station changes on line. Old or lost Ext Hdr data sps 205 206 1468 1471
Message SEQ 50 2-Boat Prime FTB/LINK=N/A (clock errors)
NO EDITS Ext Header data corrupt occasionally Proj SOL=1049

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0442-S Heading 90 deg.
Line Status Complete
Date started 01/09/89 Start Time 11:31 End Time 15:11
First File 100 First Reel 37509 Last File 1628 Last Reel 37523

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0448/253	100	0	0	1630	0	0.000Kms
0447/254	100	0	0	1630	0	0.000Kms
0446/255	100	0	0	1630	0	0.000Kms
0445/256	100	0	0	1630	0	0.000Kms
0444/257	100	0	0	1630	0	0.000Kms
0443/258	100	0	0	1630	0	0.000Kms
0442/259	100	100	1630	1630	1531	28.706Kms
0441/260	100	0	0	1630	0	0.000Kms

---==== WEATHER ========

Wind dir. NW force 3 Sea state 3 Swell dir. NW Height 1 m

---==== RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 38.6m. Eol. 36.6m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 2 Misfires 5

----==== DUAL STREAMER =========

2x12@x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 8.1 m.
Feather Sol. 1.5 P Eol. 1.2 S Max. 2.2 S

Accoustic Transponders:	1.40 SDFRONT	1.70 SDTAIL	0.21 STBDROT	0.34 PORTROT	107.00 TAILSEP
Compass :	103.00 AVSEPFR	106.00 AVSEPMID	100.00 AVSEPTL	1.00 DSTDS13	1.30 DSTDP13
Tailbuoy :	6.80 MEANSDST	5.60 MEANSDPT	1.00 SD>25m S	0.00 SD>25m S	116.00 STB SEP

Dead Grp: 18 left in but spiked on Navtech pulse at 5.4 secs

Noise: No significant levels
Ship noise 10-15 uB at EOL
Note Control and stability good.

---=== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1924
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note PORT 2/4 OFF at SOL (3037 cu.in) 16 GM2B errors
STBD SOURCE DISABLED: sp 1123-EOL Low pressure (1750) sp 1114-1123

---=== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6081030. Sol. Easting 474069.
Eol. Northing 6081034. Eol. Easting 502751.
Note Cocktail used inc Tersch F2. K7 out of fixes. Stn changes on line. Hdr data corrupt: 494 495 520 521 667 668. NDR 492 522
Message SEQ 54 2-Boat Prime EDIT: STBD SOURCE 1123-EOL
FTB=593.6 LINK=1.3 PORT ARRAY minus 125 ci from SOL Proj SOL=1132

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0430-S Heading 90 deg.
Line Status Complete
Date started 04/09/89 Start Time 01:20 End Time 04:58
First File 100 First Reel 37579 Last File 1630 Last Reel 37593

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0436/265	100	0	0	1630	0	0.000Kms
0435/266	100	0	0	1630	0	0.000Kms
0434/267	100	0	0	1630	0	0.000Kms
0433/268	100	0	0	1630	0	0.000Kms
0432/269	100	0	0	1630	0	0.000Kms
0431/270	100	0	0	1630	0	0.000Kms
0430/271	100	100	1630	1630	1531	28.706Kms
0429/272	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. NW force 4 Sea state 3 Swell dir. NW Height 1 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 38.9m. Eol. 36.7m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 7

----==== DUAL STREAMER ====----

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 8.1 m.
Feather Sol. 1.3 S Eol. 0.5 S Max. 2.4 S

Accoustic Transponders:	1.60 SDFRONT	1.00 SDTAIL	0.35 STBDROT	0.24 PORTROT	101.00 TAILSEP	
Compass :	101.00 AVSEPFR	104.00 AVSEPMID	99.00 AVSEPTL	0.90 DSTDS13	1.00 DSTDP13	
Tailbuoy :	6.30 MEANSDST	5.67 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	111.00 STB SEP	

Dead Grp: None

Noise: Front end of port cable relatively noisy 10-12 uB

Note Control and stability good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1946
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 7 MF on S2/3 , P2/1 and P3/2
No pulse clock from sps 286-372 caused GM2B errors.Also 7 other GM2B errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6080738. Sol. Easting 474075.
Eol. Northing 6080736. Eol. Easting 502751.
Note Cocktail used.
Pulse clock off from sp 286 - sp 372
Message SEQ 62 2-Boat PRIME NO EDITS

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0418-S Heading 90 deg.
Line Status Complete
Date started 04/09/89 Start Time 13:42 End Time 17:18
First File 100 First Reel 37609 Last File 1630 Last Reel 37623

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0424/277	100	0	0	1630	0	0.000Kms
0423/278	100	0	0	1630	0	0.000Kms
0422/279	100	0	0	1630	0	0.000Kms
0421/280	100	0	0	1630	0	0.000Kms
0420/281	100	0	0	1630	0	0.000Kms
0419/282	100	0	0	1630	0	0.000Kms
0418/283	100	100	1630	1630	1531	28.706Kms
0417/284	100	0	0	1630	0	0.000Kms

------==== WEATHER ====-----

Wind dir. VAR force 1 Sea state 1 Swell dir. Height 0 m

-------=== RECORDING ===-------

Magnetometer N Gravity N
Water depth Sol. 38.7m. Eol. 36.5m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 44

----------==== DUAL STREAMER ====---------

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.4 m. Max. 7.1 m.
Feather Sol. 0.3 S Eol. 1.4 P Max. 1.9 P

Accoustic Transponders:	1.30 SDFRONT	1.40 SDTAIL	0.22 STBDROT	0.19 PORTROT	. TAILSEP	
Compass :	102.00 AVSEPFR	103.00 AVSEPMID	100.00 AVSEPTL	0.50 DSTDS13	0.60 DSTDP13	
Tailbuoy :	5.26 MEANSDST	5.05 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	110.00 STB SEP	

Dead Grp: None

Noise: Front 1/4 of port cable relatively noisy 10-12 uB

Note Control and stability good.

------=== ENERGY SOURCE ===------

Source type AIRGUN
Source Volume : 3162 Pressure: 1942
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 44 MF on S2/3,P2/1 S2/3(195) out sp 522. P2/1 (400) out at sp 1164. Spare gun P3/1 (500) enabled sp 1488 100 cu ins too much.

------=== NAVIGATION ===------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6080422. Sol. Easting 474075.
Eol. Northing 6080426. Eol. Easting 502751.

Note Cocktail used. Station changes on line.
10 GM2B errors. Gun Seq Error: sp 1513

Message SEQ 64, 2-Boat PRIME, NO EDITS, Guns theoretically out of spec but accepted.(8 consecutive MF on P3/1) FTB=593.6 Link=1.3,P.SOL=1337

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0418/S Heading 90 deg.
Line Status Fill-in
Date started 07/09/89 Start Time 08:15 End Time 11:39
First File 100 First Reel 37741 Last File 1627 Last Reel 37755

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0418/286	100	100	1630	1630	1531	28.706Kms
/287	100	0	0	1630	0	0.000Kms
/288	100	0	0	1630	0	0.000Kms
/289	100	0	0	1630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

-------- WEATHER ========

Wind dir. VAR force 2 Sea state 2 Swell dir. Height 0 m

------ RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 39.1m. Eol. 37.1m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 3 Misfires 26

---------- DUAL STREAMER ---------

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.1 m. Max. 8.3 m.
Feather Sol. 0.9 S Eol. 1.0 S Max. 4.5 S

Accoustic Transponders:	0.90 SDFRONT	0.70 SDTAIL	0.50 STBDROT	0.54 PORTROT	. TAILSEP
Compass :	102.00 AVSEPFR	105.00 AVSEPMID	106.00 AVSEPTL	0.00 DSTDS13	1.00 DSTDP13
Tailbuoy :	5.64 MEANSDST	4.99 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	110.00 STB SEP

Dead Grp: 47 dead

Noise: Front end of port cable relatively noisy 8-16 uB

Note Depth and stability ok. Port slightly deep occasionally

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1956
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note NO GUNS 207,208. AUTOFIRE 334 P1/1 off at 328 spare 500
not used till sp 348 and then MF 348-356. S3/4 off sp 1054 (3037 cu in)

------ NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6080202. Sol. Easting 474075.
Eol. Northing 6080179. Eol. Easting 502751.
Note Cocktail used. Stations changed in fix during line.
NDRs 194 200 765 Ext Header data lost or corrupt sps 224,225
Message SEQ 77 INFILL 1-Boat Flip-Flop COLUMNS 286-289 NO EDITS
Guns marginally out of spec (500 cu in down) sp 328-356 but accepted.

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0406-S Heading 90 deg.
Line Status Complete
Date started 06/09/89 Start Time 02:21 End Time 06:04
First File 100 First Reel 37680 Last File 1630 Last Reel 37694

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0412/289	100	0	0	1630	0	0.000Kms
0411/290	100	0	0	1630	0	0.000Kms
0410/291	100	0	0	1630	0	0.000Kms
0409/292	100	0	0	1630	0	0.000Kms
0408/293	100	0	0	1630	0	0.000Kms
0407/294	100	0	0	1630	0	0.000Kms
0406/295	100	100	1630	1630	1531	28.706Kms
0405/296	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. W force 5 Sea state 3 Swell dir. W Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 39.0m. Eol. 36.7m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.5 m. Max. 7.6 m.
Feather Sol. 1.9 S Eol. 0.2 S Max. 3.5 S

Accoustic Transponders:	1.00 SDFRONT	1.40 SDTAIL	0.43 STBDROT	0.41 PORTROT	. TAILSEP
Compass :	102.00 AVSEPFR	102.00 AVSEPMID	91.00 AVSEPTL	1.20 DSTDS13	1.00 DSTDP13
Tailbuoy :	7.24 MEANSDST	6.37 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	100.00 STB SEP

Dead Grp: 98 weak. 47 spiking and switched out at sp 1375
148 and 218 spiking from sp 1553-EOL
Noise: Front end of port cable noisy 8-15 uB

Note Control and stability very good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1942
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires or sequence errors. 5 GM2B errors

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6080139. Sol. Easting 474075.
Eol. Northing 6080142. Eol. Easting 502751.
Note Station changes made in fix during line.

Message SEQ 71 2-Boat Prime NO EDITS Excellent Line
FTB=593.7 Link=1.3 Projected SOL=0221

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0394-S Heading 270 deg.
Line Status Complete
Date started 04/09/89 Start Time 07:32 End Time 11:05
First File 100 First Reel 37594 Last File 1630 Last Reel 37608

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0396/305	10100	0	0	11630	0	0.000Kms
0395/306	10100	0	0	11630	0	0.000Kms
0394/307	10100	10100	11630	11630	1531	28.706Kms
0393/308	10100	0	0	11630	0	0.000Kms
0392/309	10100	0	0	11630	0	0.000Kms
0391/310	10100	0	0	11630	0	0.000Kms
0390/311	10100	0	0	11630	0	0.000Kms
0389/312	10100	0	0	11630	0	0.000Kms

---=== WEATHER ===---

Wind dir. NW force 2 Sea state 3 Swell dir. NW Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.7m. Eol. 40.5m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 11

---=== DUAL STREAMER ===---

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 4.4 m. Max. 8.4 m.
Feather Sol. 0.3 P Eol. 0.5 P Max. 2.7 S

Accoustic Transponders:	0.90 SDFRONT	2.00 SDTAIL	0.19 STBDROT	0.06 PORTROT	. TAILSEP	
Compass :	102.00 AVSEPFR	107.00 AVSEPMID	100.00 AVSEPTL	0.70 DSTDS13	0.90 DSTDP13	
Tailbuoy :	6.22 MEANSDST	5.17 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	102.00 STB SEP	

Dead Grp: None

Noise: Front 1/4 of port cable relatively noisy 10-20 uB

Note Stbd depth 7 at 4.4 - 5.8 m sp 10881-10962 & 11550-11559

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1924
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 11 MF mainly P2/1 S3/4 off at sp 10352 (3037 cu.ins)
S2/3 and S3/3 off at sp 11148 (2647 cu ins) EDIT: STBD ARRAY sp 11148-EOL

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,

Sol. Northing 6079614. Sol. Easting 501000.
Eol. Northing 6079629. Eol. Easting 472324.
Note Cocktail used, including Tersch F2. No Syledis.
13 GM2B errors.
Message SEQ 63 2-Boat PRIME EDIT: STBD ARRAY sps 11148-EOL
(3 guns out and > 425 cu in out) FTB=593.7 Link=1.2 Proj SOL=0732

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0394*S Heading 270 deg.
Line Status Reshoot
Date started 07/09/89 Start Time 16:20 End Time 17:27
First File 1148 First Reel 37760 Last File 1630 Last Reel 37764

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0392/309	21148	0	0	21630	0	0.000Kms
0391/310	21148	0	0	21630	0	0.000Kms
0390/311	21148	0	0	21630	0	0.000Kms
0389/312	21148	0	0	21630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

WEATHER

Wind dir. SE force 2 Sea state 2 Swell dir. Height 0 m

RECORDING

Magnetometer N Gravity N
Water depth Sol. 37.5m. Eol. 39.6m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 1 Misfires 4

DUAL STREAMER

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.3 m. Max. 8.1 m.
Feather Sol. 2.1 S Eol. 2.6 S Max. 2.7 S

Accoustic Transponders:	1.30 SDFRONT	2.30 SDTAIL	0.10 STBDROT	0.07 PORTROT	. TAILSEP
Compass :	101.00 AVSEPFR	109.00 AVSEPMID	115.00 AVSEPTL	0.50 DSTDS13	0.60 DSTDP13
Tailbuoy :	5.56 MEANSDST	4.66 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	113.00 STB SEP

Dead Grp: 47 dead

Noise: Front end of port cable relatively noisy 10-20 uB

Note Depth and stability ok.

ENERGY SOURCE

Source type AIRGUN
Source Volume : 3162 Pressure: 1955
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note 4 MF

NAVIGATION

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6079613. Sol. Easting 481358.
Eol. Northing 6079618. Eol. Easting 472324.
Note Cocktail used. NDR: sp 21580
No external header data sp 21581
Message SEQ 79 1-Boat reshoot of seq 63 sp 11148-EOL that were rejected on seq 63 because of Stbd gun array. NO EDITS

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0382-S Heading 270 deg.
Line Status Complete
Date started 01/09/89 Start Time 05:21 End Time 09:00
First File 100 First Reel 37494 Last File 1630 Last Reel 37508

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0384/317	100	0	0	1630	0	0.000Kms
0383/318	100	0	0	1630	0	0.000Kms
0382/319	100	100	1630	1630	1531	28.706Kms
0381/320	100	0	0	1630	0	0.000Kms
0380/321	100	0	0	1630	0	0.000Kms
0379/322	100	0	0	1630	0	0.000Kms
0378/323	100	0	0	1630	0	0.000Kms
0377/324	100	0	0	1630	0	0.000Kms

-------- WEATHER --------

Wind dir. NW force 4 Sea state 3 Swell dir. NW Height 1 m

------- RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 36.9m. Eol. 40.2m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 1 Misfires 0

---------- DUAL STREAMER ----------

2x12@x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 7.8 m.
Feather Sol. 1.4 S Eol. 0.6 P Max. 2.2 S

Accoustic Transponders:	1.40 SDFRONT	1.80 SDTAIL	0.06 STBDROT	0.03 PORTROT	109.00 TAILSEP
Compass :	102.00 AVSEPFR	109.00 AVSEPMID	104.00 AVSEPTL	1.20 DSTDS13	1.50 DSTDP13
Tailbuoy :	7.10 MEANSDST	5.32 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	104.00 STB SEP

Dead Grp: 18 left in but spiked on Navtech pulse at 5.4 secs
31 spiking occasionally.... 47 spiked, out sp 1139
Noise: No significant levels

Note Control and stability good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1946
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note PORT 2/4 OFF at SOL (3037 cu.in) 10 GM20 errors

------ NAVIGATION ------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary

Sol. Northing 6079341. Sol. Easting 501000.
Eol. Northing 6079314. Eol. Easting 472324.
Note Hyperfix primary. K7 out of fixes. NDR: 1257
Nav computer unable to use cocktail.
Message SEQ 53 2-Boat Prime FTB=593.6 LINK=1.3
NO EDITS 125 cu.in gun off at SOL Proj SOL=0521 SOL=0521

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0382/S Heading 270 deg.
Line Status Fill-in
Date started 07/09/89 Start Time 13:47 End Time 14:33
First File 100 First Reel 37756 Last File 432 Last Reel 37759

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0382/313	100	0	0	432	0	0.000Kms
/314	100	0	0	432	0	0.000Kms
/315	100	100	432	432	333	6.244Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

======== WEATHER ========

Wind dir. VAR force 2 Sea state 2 Swell dir. Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 36.3m. Eol. 37.5m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 3

========== DUAL STREAMER ==========

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.5 m. Max. 7.8 m.
Feather Sol. 0.4 P Eol. 0.0 Max. 1.2 P

Accoustic Transponders:	0.00 SDFRONT	2.10 SDTAIL	0.13 STBDROT	0.25 PORTROT	. TAILSEP
Compass :	101.00 AVSEPFR	110.00 AVSEPMID	110.00 AVSEPTL	0.70 DSTDS13	0.00 DSTDP13
Tailbuoy :	5.70 MEANSDST	4.86 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	100.00 STB SEP

Dead Grp: 47 dead

Noise: Front ends of cables relatively noisy 8-16 uB

Note Depth and stability ok.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1963
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note P3/1 used instead of P1/1 3 MF on P3/3 sps 218 320 378

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6079558. Sol. Easting 501000.
Eol. Northing 6079556. Eol. Easting 494777.
Note Cocktail used.

Message SEQ 78 INFILL 1-Boat Flip-Flop COLUMNS 313-315 NO EDITS

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0370-S Heading 270 deg.
Line Status Complete
Date started 31/08/89 Start Time 04:38 End Time 08:17
First File 100 First Reel 37434 Last File 1630 Last Reel 37448

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0372/329	100	0	0	1630	0	0.000Kms
0371/330	100	0	0	1630	0	0.000Kms
0370/331	100	100	1630	1630	1531	28.706Kms
0369/332	100	0	0	1630	0	0.000Kms
0368/333	100	0	0	1630	0	0.000Kms
0367/334	100	0	0	1630	0	0.000Kms
0366/335	100	0	0	1630	0	0.000Kms
0365/336	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. WNW force 4 Sea state 3 Swell dir. W Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 37.2m. Eol. 40.4m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---==== DUAL STREAMER ====---

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 8.4 m.
Feather Sol. 1.1 S Eol. 0.1 S Max. 4.3 S

Accoustic Transponders:	1.30 SDFRONT	1.70 SDTAIL	0.02 STBDROT	0.06 PORTROT	105.00 TAILSEP
Compass :	101.00 AVSEPFR	109.00 AVSEPMID	101.00 AVSEPTL	1.40 DSTDS13	1.70 DSTDP13
Tailbuoy :	6.65 MEANSDST	5.35 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	101.00 STB SEP

Dead Grp: Group 47 started spiking sp 700, taken out sp 816
Grp 18 in but spiking on Navtech pulse at 5.4secs
Noise: Front ends relatively noisy 10-12 uB

Note Control and stability good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1944
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires or sequence errors. 13 GM2B errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6079042. Sol. Easting 501000.
Eol. Northing 6079033. Eol. Easting 472324.
Note Cocktail used incl Tersch F2. K7 out of fixes. Signals quiet
Norstar F1 SD was 8.9 with 12 per cent out of spec. 1 pulse clock error
Message SEQ 49 2-Boat Prime FTB/LINK=N/A Proj SOL=0437
NO EDITS Nav quiet but high SD from Norstar.

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0358-S Heading 270 deg.
Line Status Complete
Date started 30/08/89 Start Time 03:53 End Time 07:29
First File 100 First Reel 37375 Last File 1625 Last Reel 37388

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0360/341	100	0	0	1630	0	0.000Kms
0359/342	100	0	0	1630	0	0.000Kms
0358/343	100	100	1630	1630	1531	28.706Kms
0357/344	100	0	0	1630	0	0.000Kms
0356/345	100	0	0	1630	0	0.000Kms
0355/346	100	0	0	1630	0	0.000Kms
0354/347	100	0	0	1630	0	0.000Kms
0353/348	100	0	0	1630	0	0.000Kms

----==== WEATHER ========

Wind dir. SSW force 3 Sea state 3 Swell dir. SW Height 1 m

------=== RECORDING ======---

Magnetometer N Gravity N
Water depth Sol. 36.6m. Eol. 40.2m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 5 Misfires 4

----------==== DUAL STREAMER ====------

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.5 m. Max. 7.9 m.
Feather Sol. 1.4 S Eol. 0.4 S Max. 4.4 S

Accoustic Transponders:	1.30 SDFRONT	0.70 SDTAIL	0.02 STBDROT	0.09 PORTROT	107.00 TAILSEP
Compass :	102.00 AVSEPFR	109.00 AVSEPMID	103.00 AVSEPTL	1.00 DSTDS13	1.20 DSTDP13
Tailbuoy :	09.57 MEANSDST	4.63 MEANSDPT	4.00 SD>25m S	0.00 SD>25m S	101.00 STB SEP

Dead Grp: Group 98 weak Group 18 left in but spiking at 5.4 secs (Navtech pulse)
Noise: Front end of port cable relatively noisy 10-12 uB

Note Cable control and stability good

------=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1929
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note PORT ARRAY GEOMETRY WRONG Edit:sp 100-570.....4 Misfires
GUN SEQ ERRORS: 621-623 684 17 GM2B

------=== NAVIGATION ======---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6078704. Sol. Easting 501000.
Eol. Northing 6078723. Eol. Easting 472324.
Note Cocktail used.H7 out of fixes. Nav noisy, various stns used,very bad sp 620-706... Ext.Hdr data corrupted occasionally sps 620-706
Message SEQ 45 2-Boat Prime FTB/LINK=N/A Proj SOL=0354
EDIT: Port array sp 100-570 + gun seq errors.....NDR 198 244 627 630 705

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0358/S Heading 270 deg.
Line Status Fill-in
Date started 05/09/89 Start Time 21:22 End Time 22:31
First File 568 First Reel 37675 Last File 1001 Last Reel 37679

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0358/346	10571	10571	11004	11004	434	8.137Kms
/347	10571	0	0	11004	0	0.000Kms
/348	10571	0	0	11004	0	0.000Kms
/349	10571	0	0	11004	0	0.000Kms
/350	10571	0	0	11004	0	0.000Kms
/351	10571	0	0	11004	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

======== WEATHER ========

Wind dir. W force 4 Sea state 2 Swell dir. Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.6m. Eol. 38.2m. Ave Speed 3.8 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

========== DUAL STREAMER ==========

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.8 m. Max. 7.4 m.
Feather Sol. . Eol. . Max. .

Accoustic Transponders:	0.00	SDFRONT	. SDTAIL	. STBDROT	. PORTROT	. TAILSEP
Compass :	101.00	AVSEPFR	107.00	AVSEPMID	102.00	AVSEPTL	1.40	DSTDS13	1.60	DSTDP13
Tailbuoy :	9.00	MEANSDST	7.97	MEANSDPT	2.00	SD>25m S	1.00	SD>25m S	102.00	STB SEP

Dead Grp: 98 weak

Noise: Front end of port cable noisy 10-15 uB

Note Control and stability good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1970
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note 7 GM2B errors

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6078707. Sol. Easting 492191.
Eol. Northing 6078645. Eol. Easting 484057.
Note UNSTABLE- OUT OF SPEC Cocktail used.
Stations in fix changed on line. 6 GDR/pulse clock errors.
Message SEQ 70 2-Boat Infill Sigma columns 346-351 NO EDITS
Nav out of spec FTB=593.6 Link=1.2

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0358*S Heading 270 deg.
Line Status Reshoot
Date started 05/09/89 Start Time 20:09 End Time 21:22
First File 100 First Reel 37671 Last File 567 Last Reel 37675

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0360/341	10100	0	0	10570	0	0.000Kms
0359/342	10100	0	0	10570	0	0.000Kms
0358/343	10100	0	0	10570	0	0.000Kms
0357/344	10100	0	0	10570	0	0.000Kms
0356/345	10100	0	0	10570	0	0.000Kms
0355/346	10100	0	0	10570	0	0.000Kms
0354/347	10100	0	0	10570	0	0.000Kms
0353/348	10100	0	0	10570	0	0.000Kms

---------- WEATHER ---------

Wind dir. W force 4 Sea state 2 Swell dir. Height 1 m

---------- RECORDING ---------

Magnetometer N Gravity N
Water depth Sol. 36.7m. Eol. 37.6m. Ave Speed 3.9 Kts.
Parity Errors 0 No Data Record 3 Misfires 0

---------- DUAL STREAMER ----------

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.8 m. Max. 7.4 m.
Feather Sol. 2.1 S Eol. . Max. .

Accoustic Transponders:	0.00 SDFRONT	. SDTAIL	. STBDROT	. PORTROT	. TAILSEP	
Compass :	101.00 AVSEPFR	107.00 AVSEPMID	102.00 AVSEPTL	1.40 DSTDS13	1.60 DSTDP13	
Tailbuoy :	9.00 MEANSDST	7.97 MEANSDPT	2.00 SD>25m S	1.00 SD>25m S	102.00 STB SEP	

Dead Grp: 98 weak

Noise: Front end of port cable noisy 10-15 uB

Note Control and stability good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1970
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note GUN SEQ Errors: 10261-10263 , 10314 9 GM2B errors

------ NAVIGATION ------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6078686. Sol. Easting 501000.
Eol. Northing 6078707. Eol. Easting 492191.
Note UNSTABLE- OUT OF SPEC Cocktail used. Stn changed on line
8 Norstar/pulse clock errors. Ext Hdr lost or corrupt on 11 records
Message SEQ 70 2-Boat Reshoot of seq 45 sp 100-570 rejected due to
guns on seq 45/NO EDITS/NDR:10208,10300,10308/Nav Poor/FTB=593.6 Link=1.3

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0346-S Heading 270 deg.
Line Status Complete
Date started 27/08/89 Start Time 01:16 End Time 04:51
First File 100 First Reel 37273 Last File 1630 Last Reel 37287

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0348/353	100	0	0	1630	0	0.000Kms
0347/354	100	0	0	1630	0	0.000Kms
0346/355	100	100	1630	1630	1531	28.706Kms
0345/356	100	0	0	1630	0	0.000Kms
0344/357	100	0	0	1630	0	0.000Kms
0343/358	100	0	0	1630	0	0.000Kms
0342/359	100	0	0	1630	0	0.000Kms
0341/360	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. ENE force 4 Sea state 3 Swell dir. NE Height 1 m

------ RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 36.6m. Eol. 40.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 1 Misfires 5

---------- DUAL STREAMER ==========

2x12@x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 7.8 m.
Feather Sol. 0.2 P Eol. 0.3 P Max. 2.8 S

Accoustic Transponders:	1.40 SDFRONT	1.80 SDTAIL	0.15 STBDROT	0.13 PORTROT	104.00 TAILSEP
Compass :	102.00 AVSEPFR	105.00 AVSEPMID	99.00 AVSEPTL	1.90 DSTDS13	0.90 DSTDP13
Tailbuoy :	6.16 MEANSDST	6.07 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	95.00 STB SEP

Dead Grp: Group 47 dead. Group 18 left in
but spiking at 5.5 secs (Navtech pulse)
Noise: Front of port streamer relatively noisy 10-16 uB

Note Control and stability good.

------ ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1942
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF S1/3 552 652 940 1432 1600..... GUN SEQ Errors 543-547
Stbd 2/3 out from SOL giving 2967 cu.in on stbd array. 19 GM2B errors

------ NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary DAN-C,B11/2,

Sol. Northing 6078430. Sol. Easting 501000.
Eol. Northing 6078432. Eol. Easting 472324.
Note Cocktail used with station changes on line.
10 pulse clock errors....No ext header data on 16 records..... NDR 1131
Message SEQ 36 2-Boat Prime EDIT: GUN SEQ 543-547
NDR 1131 FTB=594.8 Link=1.3 Proj SOL=0117 Actual=0116

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0334-S Heading 270 deg.
Line Status Complete
Date started 26/08/89 Start Time 00:00 End Time 03:31
First File 100 First Reel 37213 Last File 1630 Last Reel 37227

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0336/365	100	0	0	1630	0	0.000Kms
0335/366	100	0	0	1630	0	0.000Kms
0334/367	100	100	1630	1630	1531	28.706Kms
0333/368	100	0	0	1630	0	0.000Kms
0332/369	100	0	0	1630	0	0.000Kms
0331/370	100	0	0	1630	0	0.000Kms
0330/371	100	0	0	1630	0	0.000Kms
0329/372	100	0	0	1630	0	0.000Kms

-------- WEATHER --------

Wind dir. NW force 3 Sea state 2 Swell dir. W Height 1 m

------ RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 36.3m. Eol. 40.1m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 2 Misfires 12

---------- DUAL STREAMER ----------

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 4.5 m. Max. 8.2 m.
Feather Sol. 4.1 P Eol. 0.3 P Max. 4.1 P

Accoustic Transponders:	1.20 SDFRONT	1.00 SDTAIL	0.02 STBDROT	0.16 PORTROT	116.00 TAILSEP
Compass :	101.00 AVSEPFR	104.00 AVSEPMID	104.00 AVSEPTL	2.40 DSTDS13	1.30 DSTDP13
Tailbuoy :	. MEANSDST	6.31 MEANSDPT	. SD>25m S	0.00 SD>25m S	. STB SEP

Dead Grp: All groups good.

Noise: Isolated swell bursts (40 uB

Note Stbd 7 depth unstable.Shallow (4.5 - 5.0 m) sps 256-458 and
1178-1585....No compass data sps 1431-1437....Compasses noisy occasionally

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1948
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 12 MF mainly guns S1/3 and S3/3
GM2B errors: 272 335 361 472 484 588 983 916 1028 1116 1143 1209 1241 1343

------ NAVIGATION ------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6078146. Sol. Easting 501000.
Eol. Northing 6078144. Eol. Easting 472324.
Note H7 out of all Hyperfix fixes. No compass data sp 1431-1437
No P-8 data from stbd tailbuoy. NDR 491,492
Message SEQ 32 2-Boat Prime NO EDITS
FTB=593.6 Link Delay= 1.3 Proj SOL= 2354 Actual =0000

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0322-S Heading 270 deg.
Line Status Complete
Date started 22/08/89 Start Time 14:29 End Time 17:51
First File 100 First Reel 37198 Last File 1629 Last Reel 37212

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0324/377	100	0	0	1630	0	0.000Kms
0323/378	100	0	0	1630	0	0.000Kms
0322/379	100	100	1630	1630	1531	28.706Kms
0321/380	100	0	0	1630	0	0.000Kms
0320/381	100	0	0	1630	0	0.000Kms
0319/382	100	0	0	1630	0	0.000Kms
0318/383	100	0	0	1630	0	0.000Kms
0317/384	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. W force 5 Sea state 4 Swell dir. W Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 40.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 1 Misfires 3

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 8.1 m.
Feather Sol. 1.7 S Eol. 1.1 P Max. 4.1 P

Accoustic Transponders:	1.50 SDFRONT	1.00 SDTAIL	0.03 STBDROT	0.03 PORTROT	110.00 TAILSEP
Compass :	102.00 AVSEPFR	109.00 AVSEPMID	104.00 AVSEPTL	1.00 DSTDS13	1.90 DSTDP13
Tailbuoy :	5.79 MEANSDST	5.40 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	109.00 STB SEP

Dead Grp: Group 98 dead.

Noise: Occasional swell noise at EOL. 30 uB on tail of starboard streamer.
Note Compasses noisy. Control and stability ok.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1949
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note SOL S3/6 off (3100 cu.in) sp 432 P1/5 off (3072 cu.in)
EDIT:ALL data SOL-130,P array 131-432 NF,autofire+Gun Seq 1000,09 1043-1047

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,B11/2,

Sol. Northing 6077821. Sol. Easting 501000.
Eol. Northing 6077837. Eol. Easting 472324.
Note Cocktail 6 stns used,inc Tersch F2. Stn changes on line.
14 GM28 errors. Pulse clock errors. NDR sp 1045
Message SEQ 27 2-Boat Prime EDIT: SOL-130 all data (autofires 2Boat resht),131-432 port array (1bt resht) + Gun Seq Err Proj SOL=1429

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0322/S Heading 270 deg.
Line Status Fill-in
Date started 05/09/89 Start Time 08:53 End Time 11:38
First File 433 First Reel 37650 Last File 1630 Last Reel 37661

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0322/383	10433	10433	11630	11630	1198	22.463Kms
/384	10433	0	0	11630	0	0.000Kms
/385	10433	0	0	11630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ====----

Wind dir. W force 2 Sea state 2 Swell dir. Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 37.4m. Eol. 40.7m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 2

---=== DUAL STREAMER ===---

12@x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.3 m. Max. 7.6 m.
Feather Sol. . Eol. 0.2 S Max. 2.8 P

Accoustic Transponders:	0.60 SDFRONT	2.50 SDTAIL	1.00 STBDROT	1.00 PORTROT	. TAILSEP	
Compass :	101.00 AVSEPFR	100.00 AVSEPMID	105.00 AVSEPTL	1.00 DSTDS13	1.20 DSTDP13	
Tailbuoy :	7.35 MEANSDST	6.57 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	104.00 STB SEP	

Dead Grp: 47 killed sp 10758.
148 and 210 spiked from sp 11300- EOL
Noise: Front end of port cable noisy 10-15 uB

Note Control and stability good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1943
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note S2/3 not firing sp 10465 10497 10513 10517 10529 10537 10553 10557 10561 10569, disabled sp 10573. Autofire 10530 MF S2/3 10469

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6077723. Sol. Easting 494760.
Eol. Northing 6077748. Eol. Easting 472324.
Note Cocktail used. 6 GM2B errors

Message SEQ 68 @-Boat Infill Sigma columns 383-385 NO EDITS
FTB=593.6 Link=1.3 Stbd array 2967 cu ins from sp 10573-EOL

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0322*S Heading 270 deg.
Line Status Reshoot
Date started 05/09/89 Start Time 08:06 End Time 08:53
First File 100 First Reel 37647 Last File 432 Last Reel 37650

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0322/382	10100	0	0	10432	0	0.000Kms
/383	10100	0	0	10432	0	0.000Kms
/384	10100	0	0	10432	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ====---

Wind dir. W force 2 Sea state 2 Swell dir. Height 1 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 37.2m. Eol. 37.4m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 1 Misfires 1

---==== DUAL STREAMER ====---

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.3 m. Max. 7.6 m.
Feather Sol. 0.1 S Eol. . Max. .

Accoustic Transponders:	0.60 SDFRONT	2.50 SDTAIL	1.00 STBDROT	1.00 PORTROT	. TAILSEP	
Compass :	101.00 AVSEPFR	100.00 AVSEPMID	105.00 AVSEPTL	1.00 DSTDS13	1.20 DSTDP13	
Tailbuoy :	7.35 MEANSDST	6.57 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	104.00 STB SEP	

Dead Grp: None

Noise: Ship noise up to 15 uB sp 10100-10320
Front end of port cable noisy 10-15 uB
Note Control and stability good.

---==== ENERGY SOURCE ====---

Source type AIRGUN
Source Volume : 3162 Pressure: 1943
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note MF on port 3/2 sp 10423 3 GM20 errors

---==== NAVIGATION ====---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6077812. Sol. Easting 501000.
Eol. Northing 6077723. Eol. Easting 494780.
Note Cocktail used.

Message SEQ 68 Reshoot of seq 27. sp 100-130 1-boat, sp 131-432 2-boat, both rejected on seq 27 because of Sigma guns. FTB=593.6 Link=1.3

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0310-S Heading 270 deg.
Line Status Complete
Date started 21/08/89 Start Time 13:41 End Time 17:04
First File 100 First Reel 37140 Last File 1630 Last Reel 37154

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0312/389	100	0	0	1630	0	0.000Kms
0311/390	100	0	0	1630	0	0.000Kms
0310/391	100	100	1630	1630	1531	28.706Kms
0309/392	100	0	0	1630	0	0.000Kms
0308/393	100	0	0	1630	0	0.000Kms
0307/394	100	0	0	1630	0	0.000Kms
0306/395	100	0	0	1630	0	0.000Kms
0305/396	100	0	0	1630	0	0.000Kms

---==== WEATHER ====----

Wind dir. W force 4 Sea state 3 Swell dir. W Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.4m. Eol. 40.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---=== DUAL STREAMER ===---

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.5 m. Max. 8.4 m.
Feather Sol. 1.9 S Eol. 0.3 P Max. 4.4 S

Accoustic Transponders:	0.70	SDFRONT	.	SDTAIL	.	STBDROT	0.83	PORTROT	115.40 TAILSEP
Compass :	101.20	AVSEPFR	110.70	AVSEPMID	100.20	AVSEPTL	2.00	DSTDS13	2.20 DSTDP13
Tailbuoy :	6.53	MEANSDST	5.34	MEANSDPT	1.00	SD>25m S	0.00	SD>25m S	105.60 STB SEP

Dead Grp: Group 98 dead

Noise: Random swell bursts 60-100 uB.
Isolated swell spikes to 450 uB peak.
Note Stbd 10 depth slightly unstable sp 1053-1068 (5.5m).
Port 23 depth slightly deep sp 1443-1556 (8.4m)

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1948
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note All guns good. No misfires. No sequence errors.
19 GM2B errors.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary

Sol. Northing 6077508. Sol. Easting 501000.
Eol. Northing 6077518. Eol. Easting 472324.
Note Cocktail of Hyperfix tersch f1,H7 f1,Borkum f1 and Tersch f2
Syledis noisy. Nav weak due to poor angles of cut. Clock error sp 1319
Message SEQ 23 2-Boat Prime. Nav stable but with very poor geometry
NO EDITS Pulse clock error FTB and LINK N/A Projected SOL=1341

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0298-S Heading 270 deg.
Line Status Complete
Date started 20/08/89 Start Time 12:55 End Time 16:14
First File 100 First Reel 3/081 Last File 1630 Last Reel 37095

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0300/401	100	0	0	1630	0	0.000Kms
0299/402	100	0	0	1630	0	0.000Kms
0298/403	100	100	1630	1630	1531	28.706Kms
0297/404	100	0	0	1630	0	0.000Kms
0296/405	100	0	0	1630	0	0.000Kms
0295/406	100	0	0	1630	0	0.000Kms
0294/407	100	0	0	1630	0	0.000Kms
0293/408	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. S force 3 Sea state 3 Swell dir. SW Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 44.3m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 0 Misfires 1

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.5 m. Max. 7.6 m.
Feather Sol. 0.5 S Eol. 2.8 S Max. 4.2 S

Accoustic Transponders:	0.00 SDFRONT	1.00 SDTAIL	0.00 STBDROT	0.15 PORTROT	114.00 TAILSEP
Compass :	101.00 AVSEPFR	106.00 AVSEPMID	106.00 AVSEPTL	0.70 DSTDS13	0.70 DSTDP13
Tailbuoy :	8.79 MEANSDST	7.73 MEANSDPT	2.00 SD>25m S	2.00 SD>25m S	104.30 STB SEP

Dead Grp: Group 98 dead

Noise: Front ends relatively noisy 10-12 uB

Note Stability and control good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1947
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note Guns and sequence good. 1 MF sp 1332
7 GM2B errors.

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6077217. Sol. Easting 501000.
Eol. Northing 6077195. Eol. Easting 472324.
Note Hyperfix noisy,K7 out, used cocktail. Various station changes during line.
Message SEQ 19 2-Boat Prime Nav noisy. NO EDITS
Projected SOL=1254 FTB=593.6 Link Delay=1.3

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0286-S Heading 270 deg.
Line Status Complete
Date started 19/08/89 Start Time 12:10 End Time 15:33
First File 100 First Reel 37023 Last File 1613 Last Reel 37036

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0288/413	100	0	0	1630	0	0.000Kms
0287/414	100	0	0	1630	0	0.000Kms
0286/415	100	100	1630	1630	1531	28.706Kms
0285/416	100	0	0	1630	0	0.000Kms
0284/417	100	0	0	1630	0	0.000Kms
0283/418	100	0	0	1630	0	0.000Kms
0282/419	100	0	0	1630	0	0.000Kms
0281/420	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. S force 3 Sea state 3 Swell dir. S Height 1 m

------- RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 18 Misfires 21

---------- DUAL STREAMER ---------

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 8.0 m.
Feather Sol. 2.4 S Eol. 1.7 S Max. 5.0 S

Accoustic Transponders:	0.00 SDFRONT	0.70 SDTAIL	0.12 STBDROT	0.18 PORTROT	117.00 TAILSEP	
Compass :	101.00 AVSEPFR	110.00 AVSEPMID	112.00 AVSEPTL	1.00 DSTDS13	1.10 DSTDP13	
Tailbuoy :	7.04 MEANSDST	6.07 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	111.00 STB SEP	

Dead Grp: Group 98 dead.

Noise: Front ends relatively noisy 8-10 uB

Note Stability and control good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1938
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 21 MF mainly P2/6 27 GM2B errors.
GUN SEQ ERRORS: 703-709,713-720,760-762,771-775

------ NAVIGATION ------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary GORM-B,B11/2,

Sol. Northing 6076810. Sol. Easting 501000.
Eol. Northing 6076913. Eol. Easting 472324.
Note Hypfx K7 out,Hyp/Syl cocktail used. Borkum out sp 760-870
Noisy nav: speed variations caused NDRs and repeated sp numbers.sp703-863
Message SEQ 15 2-Boat Prime EDIT: gun seq errors as gun comment
Noisy nav:Erratic sp numbering Marginal, scrappy line.(Nav,NDR,MF,GM2B)

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0274-S Heading 270 deg.
Line Status Complete
Date started 17/08/89 Start Time 10:44 End Time 14:11
First File 100 First Reel 36977 Last File 1630 Last Reel 36990

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0276/425	100	0	0	1630	0	0.000Kms
0275/426	100	0	0	1630	0	0.000Kms
0274/427	100	100	1630	1630	1531	28.706Kms
0273/428	100	0	0	1630	0	0.000Kms
0272/429	100	0	0	1630	0	0.000Kms
0271/430	100	0	0	1630	0	0.000Kms
0270/431	100	0	0	1630	0	0.000Kms
0269/432	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. WSW force 5 Sea state 4 Swell dir. WSW Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 36.3m. Eol. 40.4m. Ave Speed 4.5 Kts.
Parity Errors 0 No Data Record 1 Misfires 2

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. . m. Max. . m.
Feather Sol. 1.7 S Eol. 1.3 S Max. 4.8 S

Accoustic Transponders:	1.30 SDFRONT	.	SDTAIL	0.14 STBDROT	0.63 PORTROT	104.90 TAILSEP
Compass	:	100.60 AVSEPFR	105.80 AVSEPMID	97.30 AVSEPTL	1.40 DSTDS13	2.00 DSTDP13
Tailbuoy	:	. MEANSDST	. MEANSDPT	. SD>25m S	. SD>25m S	. STB SEP

Dead Grp: None

Noise: Front ends noisy 10-12 uB

Note Stability and control good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure:
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF on P2/6 sps 129,353 GM2B 156 166 388 No extended header stats at EOL GUN SEQ ERRORS: sps 1572-1588 (Sigma sp nos.)

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6076618. Sol. Easting 501000.
Eol. Northing 6076618. Eol. Easting 472324.
Note Hyperfix stable. Stbd tailbuoy dead from SOL,broken mast. P-8 bad on vessel and port tailbuoy. NDR 946
Message SEQ 11 2Boat Prime. Tail end positioning bad. No ext header stats at EOL Proj SOL=1044

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0274/S Heading 270 deg.
Line Status Fill-in
Date started 07/09/89 Start Time 06:01 End Time 06:47
First File 1300 First Reel 37737 Last File 1630 Last Reel 37740

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0274/431	1300	0	0	1630	0	0.000Kms
/432	1300	0	0	1630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

======== WEATHER ========

Wind dir. force 0 Sea state 1 Swell dir. Height 0 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 39.3m. Eol. 40.4m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 18

========== DUAL STREAMER ==========

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 5.4 m. Max. 8.1 m.
Feather Sol. 4.6 S Eol. 0.3 S Max. .

Accoustic Transponders:	0.50 SDFRONT	0.00 SDTAIL	0.38 STBDROT	. PORTROT	. TAILSEP	
Compass :	101.00 AVSEPFR	108.00 AVSEPMID	116.00 AVSEPTL	0.00 DSTDS13	0.90 DSTDP13	
Tailbuoy :	6.26 MEANSDST	5.30 MEANSDPT	1.00 SD>25m S	0.00 SD>25m S	105.00 STB SEP	

Dead Grp: 47 dead

Noise: Front end of port cable relatively noisy 10-15 uB

Note Port depths unstable 5.4-8.1 m for most of the line. Stbd ok
Turn in cables at SOL distorted feather angle.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1964
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note 14 MF (timing error 2-3 ms) on S1/3. Switched off at sp 1506
leaving 2967 cu ins. 4 MF on S1/3

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,

Sol. Northing 6076504. Sol. Easting 478509.
Eol. Northing 6076606. Eol. Easting 472324.
Note Cocktail used.

Message SEQ 76 INFILL 1-Boat Flip-Flop COLUMNS 431-432
Contractor cost. NO EDITS

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0262-S Heading 270 deg.
Line Status Complete
Date started 16/08/89 Start Time 10:01 End Time 13:19
First File 100 First Reel 36918 Last File 1627 Last Reel 36932

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0264/437	100	0	0	1630	0	0.000Kms
0263/438	100	0	0	1630	0	0.000Kms
0262/439	100	100	1630	1630	1531	28.706Kms
0261/440	100	0	0	1630	0	0.000Kms
0260/441	100	0	0	1630	0	0.000Kms
0259/442	100	0	0	1630	0	0.000Kms
0258/443	100	0	0	1630	0	0.000Kms
0257/444	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. Var force 3 Sea state 3 Swell dir. S Height 2 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 40.0m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 8 Misfires 22

========== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 8.1 m.
Feather Sol. 1.2 S Eol. 0.2 P Max. 5.2 S

Accoustic Transponders:	1.90	SDFRONT	.	SDTAIL	.	STBDROT	.	PORTROT	110.00 TAILSEP
Compass :	101.00	AVSEPFR	109.00	AVSEPMID	107.00	AVSEPTL	1.20	DSTDS13	1.60 DSTDP13
Tailbuoy :	6.40	MEANSDST	7.50	MEANSDPT	0.00	SD>25m S	0.00	SD>25m S	. STB SEP

Dead Grp: Group No. 98

Noise: Swell bursts 30-35 uB , random and short lived.

Note Stability and control good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1926
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note EDIT Gun Seq Error: 1329-1333 1348-1351 1362-1371 1374-1377
EDIT Port Array sp 1045-1064 (airleak) sp 1065 P1/3 off giving 2967 cu in

====== NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary GORM-B,B11/2,

Sol. Northing 6076313.0 Sol. Easting 501000.0
Eol. Northing 6076331.0 Eol. Easting 472328.0
Note NDRs sp 611 1326-1329 1351 1354 1374 Borkum out sp 1352-1370 cocktail of stns used.... 3x sp no. 1325 recorded.
Message SEQ 7 2 Boat Prime. EDITS:as gun comment. reshoot 1319-1387 (2-Boat) 1045-1064 (1-Boat) FTB and LIINK N/A Proj SOL=1001

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0262/S Heading 270 deg.
Line Status Fill-in
Date started 06/09/89 Start Time 08:27 End Time 09:41
First File 800 First Reel 37695 Last File 1318 Last Reel 37699

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0262/442	10800	10800	11318	11318	519	9.731Kms
/443	10800	0	0	11318	0	0.000Kms
/444	10800	0	0	11318	0	0.000Kms
/445	10800	0	0	11318	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ========

Wind dir. W force 4 Sea state 3 Swell dir. W Height 1 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 38.1m. Eol. 40.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 3 Misfires 0

----==== DUAL STREAMER ====----

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.0 m. Max. 8.0 m.
Feather Sol. 0.8 P Eol. 1.9 S Max. 3.5 S

Accoustic Transponders:	0.90 SDFRONT	2.10 SDTAIL	0.24 STBDROT	. PORTROT	. TAILSEP	
Compass :	101.00 AVSEPFR	106.00 AVSEPMID	102.00 AVSEPTL	1.50 DSTDS13	1.70 DSTDP13	
Tailbuoy :	5.50 MEANSDST	4.82 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	98.00 STB SEP	

Dead Grp: 47 spiked and was switched out at sp 10911

Noise: Front end of port cable noisy 10-20 uB

Note Control and stability good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1946
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note No misfires or sequence errors. 2 GM20 errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6076323. Sol. Easting 487880.
Eol. Northing 6076310. Eol. Easting 478100.
Note Station changes made in fix during line.
2 GDR errors. 3x NDR: 10931-10933
Message SEQ 72 2-Boat Infill Sigma columns 442-445 NO EDITS
FTB=593.5 Link=1.3

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0262*S Heading 270 deg.
Line Status Reshoot
Date started 06/09/89 Start Time 09:41 End Time 09:53
First File 1319 First Reel 37699 Last File 1397 Last Reel 37700

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0264/437	11319	0	0	11397	0	0.000Kms
0263/438	11319	0	0	11397	0	0.000Kms
0262/439	11319	0	0	11397	0	0.000Kms
0261/440	11319	0	0	11397	0	0.000Kms
0260/441	11319	0	0	11397	0	0.000Kms
0259/442	11319	0	0	11397	0	0.000Kms
0258/443	11319	0	0	11397	0	0.000Kms
0257/444	11319	0	0	11397	0	0.000Kms

---==== WEATHER ========

Wind dir. W force 4 Sea state 3 Swell dir. W Height 1 m

------- RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 40.0m. Eol. 40.0m. Ave Speed 4.0 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

----------==== DUAL STREAMER ==========

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.0 m. Max. 8.0 m.
Feather Sol. 1.9 S Eol. 0.5 S Max. 1.9 S

Accoustic Transponders:	0.90 SDFRONT	2.10 SDTAIL	0.24 STBDROT	. PORTROT	. TAILSEP	
Compass :	101.00 AVSEPFR	106.00 AVSEPMID	102.00 AVSEPTL	1.50 DSTDS13	1.70 DSTDP13	
Tailbuoy :	5.50 MEANSDST	4.82 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	90.00 STB SEP	

Dead Grp: 47 dead

Noise: Front end of port cable noisy 10-20 uB

Note Control and stability good.

---=== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1946
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note No misfires, sequence errors or GM20 errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6076310. Sol. Easting 478082.
Eol. Northing 6076333. Eol. Easting 476689.
Note Cocktail used.

Message SEQ 72 2-Boat Reshoot of sp 1319-1387 on seq 07, rejected on seq 7 because of gun seq errors. FTB=593.5 Link=1.3

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0250-S Heading 270 deg.
Line Status Complete
Date started 14/08/89 Start Time 08:35 End Time 12:00
First File 100 First Reel 36861 Last File 1630 Last Reel 36874

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0252/449	100	0	0	1630	0	0.000Kms
0251/450	100	0	0	1630	0	0.000Kms
0250/451	100	100	1630	1630	1531	28.706Kms
0249/452	100	0	0	1630	0	0.000Kms
0248/453	100	0	0	1630	0	0.000Kms
0247/454	100	0	0	1630	0	0.000Kms
0246/455	100	0	0	1630	0	0.000Kms
0245/456	100	0	0	1630	0	0.000Kms

-------- WEATHER ========----

Wind dir. SW force 5 Sea state 5 Swell dir. SSW Height 2 m

---====== RECORDING =======---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 39.6m. Ave Speed 4.5 Kts.
Parity Errors 0 No Data Record 1 Misfires 21

---------- DUAL STREAMER ==========----

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.6 m. Max. 8.4 m.
Feather Sol.01.7 P Eol. 01.9 S Max. 04.0 S

Accoustic Transponders:	3.00	SDFRONT	4.00	SDTAIL	1.59	STBDROT	0.43	PORTROT	110.00 TAILSEP
Compass :	101.00	AVSEPFR	107.00	AVSEPMID	101.00	AVSEPTL	1.70	DSTDS13	2.10 DSTDP13
Tailbuoy :	.	MEANSDST	.	MEANSDPT	.	SD>5M S	.	SD>5M P	. TB SEP

Dead Grp: None

Noise: Substantial swell noise to approx 150 ubars in random bursts on several traces at once,improving
Note Acoustics OK.Compasses noisy.Balance OK but slightly affected by seastate and straying marginally beyond spec on occasion.

------==== ENERGY SOURCE ====------

Source type AIRGUN
Source Volume : 3162 Pressure: 1949
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF 101 113 743 821 1097 1477.GM2B 218 294 449 491 538 733 835 879 976 984 1052 1088 1411 1445 1556.NDR 1160

------==== NAVIGATION ====------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,
Secondary

Sol. Northing 6076127.0 Sol. Easting 501000.0
Eol. Northing 6076012.6 Eol. Easting 472323.9
Note Nav Stable

Message SEQ 3 2 Boat Prime line. FTB 593.7 Link Dly 1.3
Proj SOL 0831 GMT

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0238-S Heading 270 deg.
Line Status Complete
Date started 14/08/89 Start Time 20:54 End Time 00:18
First File 100 First Reel 36890 Last File 1625 Last Reel 36903

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0240/461	100	0	0	1630	0	0.000Kms
0239/462	100	0	0	1630	0	0.000Kms
0238/463	100	100	1630	1630	1531	28.706Kms
0237/464	100	0	0	1630	0	0.000Kms
0236/465	100	0	0	1630	0	0.000Kms
0235/466	100	0	0	1630	0	0.000Kms
0234/467	100	0	0	1630	0	0.000Kms
0233/468	100	0	0	1630	0	0.000Kms

-------==== WEATHER ========-----

Wind dir. S force 5 Sea state 4 Swell dir. S Height 2 m

-------==== RECORDING =======---

Magnetometer N Gravity N
Water depth Sol. 37.1m. Eol. 39.9m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 4 Misfires 22

----------==== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.1 m. Max. 7.8 m.
Feather Sol. 1.9 S Eol. 4.3 S Max. 6.0 S

Accoustic Transponders:	6.7@ SDFRONT	12.1@ SDTAIL	@.74 STBDROT	@.7@ PORTROT	114.5@ TAILSEP
Compass :	101.2@ AVSEPFR	100.1@ AVSEPMID	105.8@ AVSEPTL	1.2@ DSTDS13	1.7@ DSTDP13
Tailbuoy :	19.9@ MEANSDST	18.1@ MEANSDPT	25.8@ SD>25m S	21.@@ SD>25m S	114.8@ STB SEP

Dead Grp: Group No. 98

Noise: Swell bursts to 35 uB , random and short lived.
Ship noise sp 1000-1200 40 ub max abeam.
Note Stability and control good. Compass noise ok.

---=== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1848
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF P1/3 sp 880 884 888 switched out at sp 890, new vol 2967
Gun Seq error: sp 1024-1026,1230-1235 24 GM28 errors 19 other MF

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,

Sol. Northing 6075703.0 Sol. Easting 501000.0
Eol. Northing 6075704.0 Eol. Easting 472324.0
Note Noisy sp 970-1100,1485-EOL.\NDR sp 1301.\Poor nav:bad sp nos from sp1556-1566 one no. recorded twice and 3sp NDR. 31 pulse clock errors
Message SEQ 5 2 Boat Prime line. EDIT: Gun Seq Errors. NDRs
Pulse clock errors so FTB and Link Delay N/A Proj SOL 2855 GMT

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0226-S Heading 270 deg.
Line Status Complete
Date started 16/08/89 Start Time 22:27 End Time 01:49
First File 100 First Reel 36947 Last File 1630 Last Reel 36961

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0228/473	100	0	0	1630	0	0.000Kms
0227/474	100	0	0	1630	0	0.000Kms
0226/475	100	100	1630	1630	1531	28.706Kms
0225/476	100	0	0	1630	0	0.000Kms
0224/477	100	0	0	1630	0	0.000Kms
0223/478	100	0	0	1630	0	0.000Kms
0222/479	100	0	0	1630	0	0.000Kms
0221/480	100	0	0	1630	0	0.000Kms

---=== WEATHER ===---

Wind dir. Var force 3 Sea state 3 Swell dir. S Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.7m. Eol. 40.4m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 1 Misfires 34

---=== DUAL STREAMER ===---

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.4 m. Max. 8.1 m.
Feather Sol. 0.5 P Eol. 0.8 P Max. 3.2 S

Accoustic Transponders:	1.30	SDFRONT	2.00	SDTAIL	0.06	STBDROT	0.13	PORTROT	114.30 TAILSEP
Compass :	101.30	AVSEPFR	107.90	AVSEPMID	106.20	AVSEPTL	1.00	DSTDS13	1.30 DSTDP13
Tailbuoy :	7.34	MEANSDST	9.66	MEANSDPT	0.00	SD>25m S	2.00	SD>25m S	114.70 STB SEP

Dead Grp: None

Noise: Front ends noisy 10-12 uB

Note Stability and control good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1925
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note S1/6 off SOL-sp 807...P1/3 off at sp 836...Seq error 148-153
Airleak P1 array sp832.MFs P array sp836-864 small timing errors,small guns

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6075425.0 Sol. Easting 500981.0
Eol. Northing 6075421.0 Eol. Easting 472324.0
Note NDR: sp 579

Message SEQ 9 2 Boat Prime. NO EDITS Guns Untidy 34 misfires and 2967 cu ins at EOL FTB and LINK N/A. Proj SOL=2223

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0226/S Heading 270 deg.
Line Status Fill-in
Date started 03/09/89 Start Time 18:12 End Time 21:54
First File 100 First Reel 37565 Last File 1625 Last Reel 37578

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0226/465	100	100	1630	1630	1531	28.706Kms
/466	100	0	0	1630	0	0.000Kms
/467	100	0	0	1630	0	0.000Kms
/468	100	0	0	1630	0	0.000Kms
/469	100	0	0	1630	0	0.000Kms
/470	100	0	0	1630	0	0.000Kms
/471	100	0	0	1630	0	0.000Kms
	0	0	0	0	0	0.000Kms

---=== WEATHER ===---

Wind dir. W force 4 Sea state 4 Swell dir. NW Height 2 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 37.4m. Eol. 40.5m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 5 Misfires 20

---=== DUAL STREAMER ===---

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 5.8 m. Max. 8.6 m.
Feather Sol. 1.1 P Eol. 0.5 S Max. 3.6 S

Accoustic Transponders:	1.25 SDFRONT	3.20 SDTAIL	0.02 STBDROT	0.21 PORTROT	111.00 TAILSEP
Compass :	100.00 AVSEPFR	103.00 AVSEPMID	104.00 AVSEPTL	1.30 DSTDS13	1.40 DSTDP13
Tailbuoy :	5.98 MEANSDST	5.41 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	104.00 STB SEP

Dead Grp: 18 left in but spiked on Navtech pulse at 5.4 secs
47 dead from sp 818
Noise: Occasional random swell bursts. Low level pick-up on stbd cable from partially leaky Navtech phone.
Note STARBOARD STREAMER DEPTHS OUT OF SPEC SP 100-262

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1957
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note 20 MF mainly S3/2 and P3/3

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6075699. Sol. Easting 501000.
Eol. Northing 6075666. Eol. Easting 472324.
Note Cocktail used. Stn changes on line. Noisy signals caused corrupt header data on 15 sps and 5 NDRs 130 1009 1073 1108 1440
Message SEQ 61 1-Boat INFILL Columns 465-471
EDIT: STBD STREAMER SPS 100-262 Low level pick up from Navtech

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0214-S Heading 270 deg.
Line Status Incomplete
Date started 19/08/89 Start Time 00:52 End Time 03:12
First File 100 First Reel 36997 Last File 1630 Last Reel 37008

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
216/485	100	0	0	1630	0	0.000Kms
215/486	100	0	0	1630	0	0.000Kms
214/487	100	554	1630	1630	1077	20.194Kms
213/488	100	0	0	1630	0	0.000Kms
212/489	100	0	0	1630	0	0.000Kms
211/490	100	0	0	1630	0	0.000Kms
210/491	100	0	0	1630	0	0.000Kms
209/492	100	0	0	1630	0	0.000Kms

----==== WEATHER ====----

Wind dir. WSW force 4 Sea state 4 Swell dir. WSW Height 2 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 37.8m. Eol. 40.1m. Ave Speed 6.6 Kts.
Parity Errors 0 No Data Record 0 Misfires 21

----==== DUAL STREAMER ====----

2x12@x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 4.9 m. Max. 9.0 m.
Feather Sol.02.8 S Eol. 00.8 P Max. 03.5 P

Accoustic Transponders:	1.00 SDFRONT	3.40 SDTAIL	0.73 STBDROT	0.74 PORTROT	107.00 TAILSEP
Compass :	100.30 AVSEPFR	105.40 AVSEPMID	100.30 AVSEPTL	1.60 DSTDS13	1.70 DSTDP13
Tailbuoy :	8.50 MEANSDST	6.96 MEANSDPT	2.00 SD>25m S	0.00 SD>25m S	103.20 STB SEP

Dead Grp: Group 98 dead for whole line.

Noise: Front ends relatively noisy 8-12 uB
Substantial swell noise at SOL.reducing quickly.
Note Stability and control affected by seastate at SOL,but affected SPs are edited.

---==== ENERGY SOURCE ====---

Source type AIRGUN
Source Volume : 3162 Pressure: 1948
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF 725 729 733 737 S2 array.15MF P2/6.1 MF P3/3 1 MF S1/4

---==== NAVIGATION ====---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6075126. Sol. Easting 496127.
Eol. Northing 6075127. Eol. Easting 472324.
Note Hyperfix OK.

Message SEQ 13 2-boat Prime Nav good.
FTB:NA Linnk:NA Projected SOL=2349.FGSP 554 at 0852GMT due to swell noise

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0214-S1 Heading 270 deg.
Line Status Complete
Date started 04/09/89 Start Time 19:41 End Time 20:47
First File 100 First Reel 37624 Last File 626 Last Reel 37628

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0216/485	10100	0	0	10626	0	0.000Kms
0215/486	10100	0	0	10626	0	0.000Kms
0214/487	10100	10100	10553	10626	454	8.512Kms
0213/488	10100	0	0	10626	0	0.000Kms
0212/489	10100	0	0	10626	0	0.000Kms
0211/490	10100	0	0	10626	0	0.000Kms
0210/491	10100	0	0	10626	0	0.000Kms
0209/492	10100	0	0	10626	0	0.000Kms

---==== WEATHER ====---

Wind dir. SW force 1 Sea state 1 Swell dir. Height 0 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 37.4m. Eol. 37.9m. Ave Speed 4.9 Kts.
Parity Errors 0 No Data Record 0 Misfires 3

---==== DUAL STREAMER ====---

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.5 m. Max. 7.8 m.
Feather Sol. 2.0 S Eol. 0.2 P Max. 4.0 S

Accoustic Transponders:	0.00 SDFRONT	1.40 SDTAIL	0.02 STBDROT	0.17 PORTROT	. TAILSEP	
Compass :	102.00 AVSEPFR	106.00 AVSEPMID	105.00 AVSEPTL	0.60 DSTDS13	0.70 DSTDP13	
Tailbuoy :	8.51 MEANSDST	7.30 MEANSDPT	2.00 SD>25m S	0.00 SD>25m S	109.00 STB SEP	

Dead Grp: None

Noise: Front of port cable relatively noisy 10-12 uB

Note Control and stability good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1944
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 2 MF on S3/3 and 1 MF on P2/5 6 GM20 errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6075109. Sol. Easting 501000.
Eol. Northing 6075130. Eol. Easting 491141.
Note Cocktail used. Stations changed on line. Old Ext Header data for sp 10476 DFS tape reel nos recorded as 375** not 376**
Message SEQ 65, 2-Boat PRIME, NO EDITS, Completion of seq 13 sp 100-553 not accepted for swell noise. sp 553-626 overlap. FTB=593.6Link=1.3

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0202-S Heading 270 deg.
Line Status Complete
Date started 20/08/89 Start Time 00:33 End Time 04:02
First File 100 First Reel 37051 Last File 1630 Last Reel 37064

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0204/497	100	0	0	1630	0	0.000Kms
0203/498	100	0	0	1630	0	0.000Kms
0202/499	100	100	1630	1630	1531	28.706Kms
0201/500	100	0	0	1630	0	0.000Kms
0200/501	100	0	0	1630	0	0.000Kms
0199/502	100	0	0	1630	0	0.000Kms
0198/503	100	0	0	1630	0	0.000Kms
0197/504	100	0	0	1630	0	0.000Kms

---=== WEATHER ===---

Wind dir. SSE force 3 Sea state 3 Swell dir. SSE Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.6m. Eol. 40.1m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 4 Misfires 3

---=== DUAL STREAMER ===---

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 8.4 m.
Feather Sol. 0.1 P Eol. 1.5 P Max. 4.6 P

Accoustic Transponders:	1.70 SDFRONT	3.40 SDTAIL	0.14 STBDROT	0.20 PORTROT	100.40 TAILSEP
Compass :	101.20 AVSEPFR	106.30 AVSEPMID	105.10 AVSEPTL	0.70 DSTDS13	0.80 DSTDP13
Tailbuoy :	7.73 MEANSDST	6.92 MEANSDPT	2.00 SD>25m S	0.00 SD>25m S	103.90 STB SEP

Dead Grp: Group 90 dead for whole line.
Groups 60,100,101 dead for sp 100-149
Noise: Front ends relatively noisy 8-12 uB

Note Stability and control good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1947
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF on Port array sp 944 MF P2/2 sp 1128 P1/1 sp 1276
GM2B errors: 107 378 448 491 1003 1356 1566

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6074762. Sol. Easting 501000.
Eol. Northing 6074830. Eol. Easting 472324.
Note Hyperfix stable. NDRs 682 683 684 1539
Slightly off line (60m) at SOL because of Rho streaming guns
Message SEQ 17 2-Boat Prime Nav Good. EDIT: NDR 682,683,684,1539
FTB:593.7 Link:1.3 Projected SOL= 0032 60m off line at SOL

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0190-S Heading 270 deg.
Line Status Complete
Date started 21/08/89 Start Time 01:19 End Time 04:43
First File 109 First Reel 37111 Last File 1628 Last Reel 37124

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0192/509	100	0	0	1630	0	0.000Kms
0191/510	100	0	0	1630	0	0.000Kms
0190/511	100	100	1630	1630	1531	28.706Kms
0189/512	100	0	0	1630	0	0.000Kms
0188/513	100	0	0	1630	0	0.000Kms
0187/514	100	0	0	1630	0	0.000Kms
0186/515	100	0	0	1630	0	0.000Kms
0185/516	100	0	0	1630	0	0.000Kms

---==== WEATHER ========

Wind dir. SW force 4 Sea state 3 Swell dir. SW Height 1 m

---==== RECORDING ======---

Magnetometer N Gravity N
Water depth Sol. 36.9m. Eol. 40.2m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 11 Misfires 2

-----===== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 7.8 m.
Feather Sol. 1.6 S Eol. 3.2 P Max. 5.1 P

Accoustic Transponders:	3.40 SDFRONT	6.50 SDTAIL	0.07 STBDROT	0.01 PORTROT	112.10 TAILSEP
Compass :	102.60 AVSEPFR	110.60 AVSEPMID	100.50 AVSEPTL	1.20 DSTDS13	1.30 DSTDP13
Tailbuoy :	11.40 MEANSDST	10.70 MEANSDPT	14.00 SD>25m S	14.00 SD>25m S	115.20 STB SEP

Dead Grp: Group 98 dead

Noise: Front ends relatively noisy 8-12 uB

Note Stability and control good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1944
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note Gun Seq Error: 1573-1579 MF: P2/2 1064 P3/2 1249
15 GM20 errors.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6074507. Sol. Easting 501000.
Eol. Northing 6074549. Eol. Easting 472324.
Note Hyperfix noisy,used cocktail. Various stn changes on line.
NDRs sp 100-109,1178 sp no.1177 recorded twice.....20 pulse clock errors
Message SEQ 21 2-Boat Prime EDIT: NDR 100-109,1178 + gun seq err
High number of pulse clock errors FTB and LINK N/A Projected SOL=0118

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0190/S Heading 270 deg.
Line Status Fill-in
Date started 07/09/89 Start Time 01:14 End Time 03:22
First File 737 First Reel 37728 Last File 1629 Last Reel 37736

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0190/505	737	737	1630	1630	894	16.763Kms
/506	737	0	0	1630	0	0.000Kms
/507	737	0	0	1630	0	0.000Kms
/508	737	0	0	1630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---=== WEATHER ===---

Wind dir. W force 3 Sea state 3 Swell dir. W Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 38.4m. Eol. 41.1m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 2 Misfires 30

---=== DUAL STREAMER ===---

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 5.7 m. Max. 8.4 m.
Feather Sol. 0.4 S Eol. 1.0 S Max. 2.6 P

Accoustic Transponders:	0.40 SDFRONT	. SDTAIL	0.09 STBDROT	0.07 PORTROT	. TAILSEP	
Compass :	101.00 AVSEPFR	106.00 AVSEPMID	105.00 AVSEPTL	0.90 DSTDS13	1.00 DSTDP13	
Tailbuoy :	0.81 MEANSDST	7.62 MEANSDPT	3.00 SD>25m S	0.00 SD>25m S	106.00 STB SEP	

Dead Grp: 47 dead

Noise: Front end of port cable relatively noisy 10-15 uB

Note Stability and control good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1942
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note 30 MF mainly on S3/4 S3/3 S1/3.
S1/3 off at sp 1348 leaving 2967 cu ins.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,

Sol. Northing 6074773. Sol. Easting 489061.
Eol. Northing 6074752. Eol. Easting 472324.
Note Cocktail used. Noisy Hyperfix signals. Out of spec for sp 1300-1400. Lost or corrupt Ext Hdr data on 12 records NDR:780,1206
Message SEQ 75 INFILL 1-Boat Flip-Flop Columns 505-508
NO EDITS Norstar checksum errors.

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0178-S Heading 270 deg.
Line Status Incomplete
Date started 22/08/89 Start Time 02:08 End Time 05:29
First File 100 First Reel 37170 Last File 1623 Last Reel 37183

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0180/521	100	0	0	1630	0	0.000Kms
0179/522	100	0	0	1630	0	0.000Kms
0178/523	100	100	1630	1630	1531	28.706Kms
0177/524	100	0	0	1630	0	0.000Kms
0176/525	100	0	0	1630	0	0.000Kms
0175/526	100	0	0	1630	0	0.000Kms
0174/527	100	0	0	1630	0	0.000Kms
0173/528	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. SW force 3 Sea state 3 Swell dir. S Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.7m. Eol. 40.2m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 4 Misfires 9

----==== DUAL STREAMER ====----

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 7.7 m.
Feather Sol. 2.4 S Eol. 0.9 P Max. 3.8 S

Accoustic Transponders:	2.30 SDFRONT	3.90 SDTAIL	0.03 STBDROT	0.04 PORTROT	115.00 TAILSEP
Compass :	102.00 AVSEPFR	109.00 AVSEPMID	108.40 AVSEPTL	1.30 DSTDS13	1.20 DSTDP13
Tailbuoy :	7.50 MEANSDST	7.22 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	116.10 STB SEP

Dead Grp: Groups 56 and 98 dead.

Noise: 6-8 uB ambient.

Note Stability and control good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1944
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note MF on S1/6 sp 118 126 146 154 S3/6 342 890 1010 S1/4 686 S1/3 930 27 GM2B errors.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6074212. Sol. Easting 501000.
Eol. Northing 6074232. Eol. Easting 472324.
Note Cocktail 8 stations used.Noisy Nav SP 1500-1520.LGSP 1500 due Nav signals.NDRs 1269 1503 1513 1516
Message SEQ 25 2-Boat Prime.Nav erratic SP 1500-1520.LGSP 1500 due Nav signals. FTB/LINK N/A Proj SOL 0205

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0178*S Heading 270 deg.
Line Status Reshoot
Date started 04/09/89 Start Time 22:36 End Time 23:19
First File 1330 First Reel 37629 Last File 1630 Last Reel 37631

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0180/521	11330	0	0	11630	0	0.000Kms
0179/522	11330	0	0	11630	0	0.000Kms
0178/523	11330	0	0	11630	0	0.000Kms
0177/524	11330	0	0	11630	0	0.000Kms
0176/525	11330	0	0	11630	0	0.000Kms
0175/526	11330	0	0	11630	0	0.000Kms
0174/527	11330	0	0	11630	0	0.000Kms
0173/528	11330	0	0	11630	0	0.000Kms

---==== WEATHER ====----

Wind dir. W force 2 Sea state 2 Swell dir. Height 0 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 40.0m. Eol. 41.4m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

----==== DUAL STREAMER ====----

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 6.5 m. Max. 7.5 m.
Feather Sol. 0.6 P Eol. 0.8 P Max. 1.9 P

Accoustic Transponders:	1.40 SDFRONT	2.10 SDTAIL	0.10 STBDROT	0.09 PORTROT	. TAILSEP	
Compass :	101.00 AVSEPFR	106.00 AVSEPMID	104.00 AVSEPTL	0.60 DSTDS13	0.70 DSTDP13	
Tailbuoy :	9.99 MEANSDST	7.90 MEANSDPT	4.00 SD>25m S	0.00 SD>25m S	103.00 STB SEP	

Dead Grp: None

Noise: Front of port cable relatively noisy 10-12 uB

Note Control and stability good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1945
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note 1 GM2B error sp 11451

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6074225. Sol. Easting 477947.
Eol. Northing 6074234. Eol. Easting 472323.
Note Cocktail used. Stations changed on line.

Message SEQ 66, 2-Boat RESHOOT of sp 1500-1630 on seq 25, rejected due to bad nav signals. Line now Complete FTB= 593.6 Link Delay=1.2

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0166-S Heading 270 deg.
Line Status Complete
Date started 26/08/89 Start Time 13:07 End Time 16:42
First File 100 First Reel 37242 Last File 1629 Last Reel 37256

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0168/533	100	0	0	1630	0	0.000Kms
0167/534	100	0	0	1630	0	0.000Kms
0166/535	100	100	1630	1630	1531	28.706Kms
0165/536	100	0	0	1630	0	0.000Kms
0164/537	100	0	0	1630	0	0.000Kms
0163/538	100	0	0	1630	0	0.000Kms
0162/539	100	0	0	1630	0	0.000Kms
0161/540	100	0	0	1630	0	0.000Kms

----==== WEATHER ========

Wind dir. NW force 2 Sea state 3 Swell dir. W Height 1 m

------ RECORDING ======

Magnetometer N Gravity N
Water depth Sol. 36.7m. Eol. 40.8m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 2 Misfires 1

-----===== DUAL STREAMER =========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.1 m. Max. 7.9 m.
Feather Sol. 1.2 P Eol. 1.5 P Max. 2.3 S

Accoustic Transponders:	1.30 SDFRONT	4.20 SDTAIL	0.21 STBDROT	0.18 PORTROT	115.00 TAILSEP
Compass :	102.00 AVSEPFR	104.00 AVSEPMID	107.00 AVSEPTL	1.00 DSTDS13	0.00 DSTDP13
Tailbuoy :	4.94 MEANSDST	4.96 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	. STB SEP

Dead Grp: Group 31 out from SOL.
Group 47 switched out at sp 1316 , spiking
Noise: Front of port streamer relatively noisy 15-20 uB

Note Control and stability ok.
Starboard tailbuoy not in use until sp 445.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1948
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note Gun Seq wrong sps 100-153 , data good but wrong sequence.
GUN SEQ ERRORS: 1413-1415 1 MF sp 222 16 GM28 errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary

Sol. Northing 6073920. Sol. Easting 501000.
Eol. Northing 6073935. Eol. Easting 472324.
Note H7 out of all Hyperfix fixes. Stbd tailbuoy not in use until sp 445.....NDR 1411,1412 erratic sp interval... Clock error sp 1410
Message SEQ 34 2-Boat Prime EDIT: Gun Seq 1413-1415
FTB=N/A Link Delay= N/A Proj SOL= 1306 Actual =1307

Exploration Consultants Limited
NAM block F03

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0154-S Heading 270 deg.
Line Status Complete
Date started 27/08/89 Start Time 14:14 End Time 17:42
First File 100 First Reel 37303 Last File 1630 Last Reel 37316

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0156/545	100	0	0	1630	0	0.000Kms
0155/546	100	0	0	1630	0	0.000Kms
0154/547	100	100	1630	1630	1531	28.706Kms
0153/548	100	0	0	1630	0	0.000Kms
0152/549	100	0	0	1630	0	0.000Kms
0151/550	100	0	0	1630	0	0.000Kms
0150/551	100	0	0	1630	0	0.000Kms
0149/552	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. N force 6 Sea state 6 Swell dir. N Height 2 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 40.0m. Ave Speed 4.5 Kts.
Parity Errors 0 No Data Record 4 Misfires 9

---==== DUAL STREAMER ====---

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 0.0 m. Max.14.2 m.
Feather Sol. 0.2 P Eol. 1.5 P Max. 2.6 S

Accoustic Transponders:	1.7m SDFRONT	1.4m SDTAIL	0.0? STBDROT	0.0? PORTROT	104.0m TAILSEP
Compass :	101.0m AVSEPFR	105.0m AVSEPMID	98.0m AVSEPTL	1.6m DSTDS13	1.6m DSTDP13
Tailbuoy :	4.5m MEANSDST	4.6m MEANSDPT	0.0m SD>25m S	0.0m SD>25m S	95.3m STB SEP

Dead Grp: Group 47 dead. Group 98 weak. Group 18 left in but spiking at 5.5 secs (Navtech pulse)
Noise: Swell noise increasing towards EOL. Random bursts up to 60 uB.
Note Stbd streamer shallow (0 m) and then over-compensated to 14 m at sp 930-1165.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1942
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 9 MF on S1/3 P2/3 S2/3 S1/3 off at sp 155 (2967 cu.in)
GUN SEQ ERRORS: 607-610 654-660 18 GM20 errors

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6073628. Sol. Easting 501000.
Eol. Northing 6073630. Eol. Easting 472324.
Note Nav signals noisy probably due to poor weather. Cocktail of all stns used.Stn changes on line. NDRs 304 521 607 1200
Message SEQ 38 2-Boat Prime EDIT: STBD streamer 930-1165 and GUN SEQ 607-610 654-660 FTB and LINK N/A Proj SOL=1414

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0142-S Heading 270 deg.
Line Status Complete
Date started 29/08/89 Start Time 15:42 End Time 19:17
First File 100 First Reel 37346 Last File 1628 Last Reel 37360

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0144/557	100	0	0	1630	0	0.000Kms
0143/558	100	0	0	1630	0	0.000Kms
0142/559	100	100	1630	1630	1531	28.706Kms
0141/560	100	0	0	1630	0	0.000Kms
0140/561	100	0	0	1630	0	0.000Kms
0139/562	100	0	0	1630	0	0.000Kms
0138/563	100	0	0	1630	0	0.000Kms
0137/564	100	0	0	1630	0	0.000Kms

---==== WEATHER ========

Wind dir. SW force 3 Sea state 3 Swell dir. SW Height 1 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 40.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 2 Misfires 3

----==== DUAL STREAMER ====----

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 8.1 m.
Feather Sol. 3.2 S Eol. 0.3 P Max. 3.8 S

Accoustic Transponders:	1.40 SDFRONT	1.00 SDTAIL	0.00 STBDROT	0.00 PORTROT	112.00 TAILSEP
Compass :	101.00 AVSEPFR	106.00 AVSEPMID	104.00 AVSEPTL	1.20 DSTDS13	1.50 DSTDP13
Tailbuoy :	7.26 MEANSDST	4.47 MEANSDPT	1.00 SD>25m S	0.00 SD>25m S	110.00 STB SEP

Dead Grp: Group 98 weak Group 18 left in but spiking at 5.4 secs (Navtech pulse)
Noise: Low levels

Note Cable control and stability good

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1943
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 3 MF (S3/3 and P2/1) 11 GM20 errors
GUN SEQ ERRORS:1399-1404

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary DAN-C,

Sol. Northing 6073295. Sol. Easting 501000.
Eol. Northing 6073321. Eol. Easting 472324.
Note Cocktail used.H7 out of all fixes. NDR sps 1399,1535
Ext.Hdr data corrupted sp 1418 1429 1524 1525 1527 1528 1534
Message SEQ 43 2-Boat Prime EDIT: gun seq 1399-1404 P/SOL=1540
Depth read=2x actual depth sps 100-1287....FTB/LINK N/A...Ext Hdr data poor

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0130-S Heading 270 deg.
Line Status Complete
Date started 30/08/89 Start Time 16:21 End Time 19:56
First File 100 First Reel 37404 Last File 1630 Last Reel 37418

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0132/569	100	0	0	1630	0	0.000Kms
0131/570	100	0	0	1630	0	0.000Kms
0130/571	100	100	1630	1630	1531	28.706Kms
0129/572	100	0	0	1630	0	0.000Kms
0128/573	100	0	0	1630	0	0.000Kms
0127/574	100	0	0	1630	0	0.000Kms
0126/575	100	0	0	1630	0	0.000Kms
0125/576	100	0	0	1630	0	0.000Kms

-------==== WEATHER ====-----

Wind dir. S force 3 Sea state 2 Swell dir. S Height 1 m

---===== RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.3m. Eol. 41.5m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 3

----------==== DUAL STREAMER ==========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.4 m. Max. 7.8 m.
Feather Sol. 1.9 S Eol. 0.4 S Max. 3.5 S

Accoustic Transponders:	1.50 SDFRONT	0.90 SDTAIL	0.14 STBDROT	0.06 PORTROT	114.00 TAILSEP
Compass :	102.00 AVSEPFR	110.00 AVSEPMID	109.00 AVSEPTL	0.90 DSTDS13	1.20 DSTDP13
Tailbuoy :	6.33 MEANSDST	5.13 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	109.00 STB SEP

Dead Grp: Group 10 left in but spiking at 5.4 secs (Navtech pulse)
Noise: Front end of port cable relatively noisy 10-15 uB

Note Cable control and stability good

------==== ENERGY SOURCE ====---

Source type AIRGUN
Source Volume : 3162 Pressure: 1944
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 3 MF on S3/3 and P2/1 13 BM2B errors
Gun seq Error: 1529

---===== NAVIGATION ======---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,B11/2,

Sol. Northing 6073005. Sol. Easting 501000.
Eol. Northing 6073016. Eol. Easting 472324.
Note Cocktail used.K7 out of fixes. Signals quiet. NOR* STATS FOR F1 SHOW ONLY 80 SHOTS IN SPEC. Mean SD 8.1.... Ext Hdr corrupt 1527 1529
Message SEQ 47 2-Boat Prime FTB/LINK=N/A Proj SOL=1620
NO EDITS NAV OUT OF SPEC ON NORSTAR Geodetic stats ok.

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0118-S Heading 270 deg.
Line Status Complete
Date started 31/08/89 Start Time 17:00 End Time 20:38
First File 100 First Reel 37464 Last File 1627 Last Reel 37478

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0120/581	100	0	0	1630	0	0.000Kms
0119/582	100	0	0	1630	0	0.000Kms
0118/583	100	100	1630	1630	1531	28.706Kms
0117/584	100	0	0	1630	0	0.000Kms
0116/585	100	0	0	1630	0	0.000Kms
0115/586	100	0	0	1630	0	0.000Kms
0114/587	100	0	0	1630	0	0.000Kms
0113/588	100	0	0	1630	0	0.000Kms

---==== WEATHER ====----

Wind dir. NW force 4 Sea state 3 Swell dir. NW Height 1 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 37.6m. Eol. 41.2m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 3 Misfires 4

----==== DUAL STREAMER ====----

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.4 m. Max. 7.9 m.
Feather Sol. 0.8 S Eol. 1.5 S Max. 2.9 S

Accoustic Transponders:	1.00 SDFRONT	0.70 SDTAIL	0.12 STBDROT	0.06 PORTROT	109.00 TAILSEP
Compass	:	102.00 AVSEPFR	110.00 AVSEPMID	105.00 AVSEPTL	1.50 DSTDS13	1.00 DSTDP13
Tailbuoy	:	6.90 MEANSDST	5.50 MEANSDPT	0.00 SD>25m S	0.00 SD>25m S	101.00 STB SEP

Dead Grp: Group 98 weak Groups 18 and 47 were left in
but were spiking on Navtech pulse at 5.4secs
Noise: Occasional random swell bursts. No significant
levels of noise.
Note Starboard depth 10 shallow (5.4 - 5.7 m) sp 518-531
Overall control and stability good.

------==== ENERGY SOURCE ====---

Source type AIRGUN
Source Volume : 3162 Pressure: 1941
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements
each.Centre lateral separation 50m.Total output 45.7 bar metres

Note 4 MF on guns P2/3 and S3/3 14 GM20 errors
GUN SEQ ERRORS: 649-655 , 873-878. Seq changed sp 714

---==== NAVIGATION ====---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,

Sol. Northing 6072710. Sol. Easting 501000.
Eol. Northing 6072709. Eol. Easting 472324.
Note Cocktail used incl Tersch F2. K7 out of fixes. K8 logged
Stn changes on line.//Old or lost Ext Hdr data on 22 sps// NDR 844 874 1536
Message SEQ 51 2-Boat Prime FTB/LINK=N/A (8 clock errors)
EDIT: Gun Seq Errors.... Header data corrupt occasionally.... Proj SOL=1701

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FA- F0106-S Heading 270 deg.
Line Status Complete
Date started 01/09/89 Start Time 17:43 End Time 21:26
First File 100 First Reel 37524 Last File 1630 Last Reel 37538

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0108/593	100	0	0	1630	0	0.000Kms
0107/594	100	0	0	1630	0	0.000Kms
0106/595	100	100	1630	1630	1531	28.706Kms
0105/596	100	0	0	1630	0	0.000Kms
0104/597	100	0	0	1630	0	0.000Kms
0103/598	100	0	0	1630	0	0.000Kms
0102/599	100	0	0	1630	0	0.000Kms
0101/600	100	0	0	1630	0	0.000Kms

---==== WEATHER ========

Wind dir. W force 5 Sea state 3 Swell dir. NW Height 1 m

---=== RECORDING ======

Magnetometer N Gravity N
Water depth Sol. 37.8m. Eol. 42.3m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 11

----==== DUAL STREAMER ========

2x120x25m grp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 3.7 m. Max. 8.1 m.
Feather Sol. 0.0 P Eol. 0.3 P Max. .

Accoustic Transponders:	1.00 SDFRONT	1.60 SDTAIL	0.30 STBDROT	0.19 PORTROT	107.00 TAILSEP
Compass :	100.00 AVSEPFR	106.00 AVSEPMID	101.00 AVSEPTL	2.10 DSTDS13	2.20 DSTDP13
Tailbuoy :	7.40 MEANSDST	6.30 MEANSDPT	1.00 SD>25m S	0.00 SD>25m S	101.00 STB SEP

Dead Grp: 16 left in but spiked on Navtech pulse at 5.4 secs

Noise: Swell noise to 120 uB , Increased from SOL

Note Tail of stbd cable shallow 4.3 - 5.7 m SOL-sp1069 Tail of
Tail of port cable shallow:sp 987 - 1267, 3.7-5.6m for sp 1534-EOL

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1942
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note PORT 2/6 OFF at SOL (3100 cu.in) 11 MF mainly S3/3
LINKS FAILED , no GM2B 1253-1582 GUN SEQ ERROR: 1383-1387

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,
Secondary DAN-C,GORM-B,B11/2,

Sol. Northing 6072441. Sol. Easting 501000.
Eol. Northing 6072439. Eol. Easting 472324 .
Note Cocktail used inc Tersch F2. K7 out of fixes. Stn changes on line. All links failed: sp 1250-1611, NO Omniseis, GM2B or Steering
Message SEQ 55 2-Boat Prime NO EDITS FTB=N/A LINK=1.3
Cable depths marginal. PORT ARRAY 3100 cu.ins from SOL Proj SOL=1742

SURVEY LINE ANALYSIS

GECO SIGMA
Line name 89FF- F0106/S Heading 270 deg.
Line Status Fill-in
Date started 06/09/89 Start Time 17:43 End Time 21:23
First File 100 First Reel 37714 Last File 1630 Last Reel 37727

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0106/586	10100	10100	11630	11630	1531	28.706Kms
/587	10100	0	0	11630	0	0.000Kms
/588	10100	0	0	11630	0	0.000Kms
/589	10100	0	0	11630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

----==== WEATHER ========

Wind dir. W force 4 Sea state 4 Swell dir. W Height 1 m

-------== RECORDING ======---

Magnetometer N Gravity N
Water depth Sol. 37.4m. Eol. 42.1m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

-----===== DUAL STREAMER ==========

120x25 GRP TRANSFORMERLESS/100m LATERAL SEPARATION SENSITIVITY 20V/B
Cable depth Min. 5.7 m. Max. 8.4 m.
Feather Sol. 0.6 P Eol. 1.8 S Max. .

Accoustic Transponders:	1.30 SDFRONT .	SDTAIL .	STBDROT .	PORTROT .	TAILSEP
Compass :	101.00 AVSEPFR	106.00 AVSEPMID	100.00 AVSEPTL	1.30 DSTDS13	1.40 DSTDP13
Tailbuoy :	7.12 MEANSDST	6.79 MEANSDPT	1.00 SD>25m S	0.00 SD>25m S	98.00 STB SEP

Dead Grp: 47 dead

Noise: Isolated swell noise. Ship noise at SOL < 20 uB
Turning noise on streamers sp 10644
Note Port cable unstable 5.7 - 8.4 m for most of line.

------=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1944
DUAL 3162 CU.IN AIRGUN ARRAYS EACH COMPRISING THREE SUB=ARRAYS OF SIX ELEMENTS. EACH CENTRE LATERAL SEPARATION OF 50 M. TOTAL OUTPUT 45.7 B

Note SEQ REVERSED sp 11120 GM2B and Pulse clock not working
sp 11180-11193 29 Gm2B errors.

------=== NAVIGATION ======---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K8 F1,
Secondary Terschelling F2,DAN-C,B11/2,

Sol. Northing 6072709. Sol. Easting 501000.
Eol. Northing 6072647. Eol. Easting 472324.
Note Cocktail used...19 pulse clock errors... 13 NDRs 10363-10375
when BUCO/DFS failed..... Stations changed in fix during line
Message SEQ 74 2-Boat Infill Sigma columns 586-589
FTB=N/A Link=N/A EDIT: NDRs sp 10363-10375

SURVEY LINE ANALYSIS continued

Recording filters lo: 3.5(18) Hi: 180.0(72) Hz. (db/oct)	Cable depth 7.0 metre Limit +/- 1.0
Record length : 6 Sec. Sample rate : 2.00 ms.	Source depth : 6:: 6:: 6: 6 metre
Cable Centre Source / Centre Near Trace : 118.20/25.00S metre	Spheroid INTERNATIONAL
Offset Prime Antenna / Centre Source : 164.10/25.00S metre	Delta X,Y,Z 83.0/ 110.0/ 113.5
Shot point interval 0018.7500 metre Group length 25.00 metre	Coverage 12000 %

7.3.2 Geco Rho

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0694-R Heading 90 deg.
Line Status Complete
Date started 31/08/89 Start Time 23:11 End Time 02:52
First File 100 First Reel 11915 Last File 1630 Last Reel 11928

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0696/5	100	0	0	1630	0	0.000Kms
0695/6	100	0	0	1630	0	0.000Kms
0694/7	100	100	1630	1630	1531	28.706Kms
0693/8	100	0	0	1630	0	0.000Kms
0692/9	100	0	0	1630	0	0.000Kms
0691/10	100	0	0	1630	0	0.000Kms
0690/11	100	0	0	1630	0	0.000Kms
0689/12	100	0	0	1630	0	0.000Kms

-------==== WEATHER ====------

Wind dir. NW force 3 Sea state 3 Swell dir. WNW Height 1 m

-------==== RECORDING ====------

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 37.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

----------==== DUAL STREAMER ====----------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 8.3 m.
Feather Sol. 2.2 S Eol. 2.0 S Max. 2.5 S

Accoustic Transponders:	1.0	SIGO/FR	2.1	SIGO/TL	0.0	STBD/ROT	0.1	PORT/ROT	102.0	TAIL/SEP
Compass :	100.0	AVSEP/FR	104.0	AVSEP/MD	112.0	AVSEP/TL	0.7	DSTD/S13	0.9	DSTD/P13
Tailbuoy :	17.3	MEANSD/S	11.4	MEANSD/P	24.0	SD>5M/S	9.0	SD>5M/P	110.0	TB SEP

Dead Grp: Trace 589 o/c - killed.

Noise: Low ambient noise on line.

Note Stability OK. Compasses good.

------==== ENERGY SOURCE ====------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires none.
GM28 Errors: 29 - poor telemetry again.

------==== NAVIGATION ====------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6087144.0 Sol. Easting 474111.0
Eol. Northing 6087139.0 Eol. Easting 502779.0
Note Vsl SD 3.2m OK. Port TB nav OK. Stbd TB nav very poor with high SDs.
Message SEQ 52. 2 BT PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0682-R Heading 90 deg.
Line Status Complete
Date started 30/08/89 Start Time 22:31 End Time 02:10
First File 100 First Reel 11856 Last File 1629 Last Reel 11869

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0684/17	100	0	0	1630	0	0.000Kms
0683/18	100	0	0	1630	0	0.000Kms
0682/19	100	100	1630	1630	1531	28.706Kms
0681/20	100	0	0	1630	0	0.000Kms
0680/21	100	0	0	1630	0	0.000Kms
0679/22	100	0	0	1630	0	0.000Kms
0678/23	100	0	0	1630	0	0.000Kms
0677/24	100	0	0	1630	0	0.000Kms

---==== WEATHER ========

Wind dir. S force 4 Sea state 3 Swell dir. S Height 1 m

---==== RECORDING ======

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 35.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 1 Misfires 0

----==== DUAL STREAMER ========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.8 m. Max. 8.2 m.
Feather Sol. 0.2 S Eol. 2.0 S Max. 2.3 P

Accoustic Transponders:	0.8	SIG0/FR	2.1	SIG0/TL	0.1	STB0/R0T	0.2	PORT/R0T	107.0	TAIL/SEP
Compass :	100.0	AVSEP/FR	103.0	AVSEP/MD	113.0	AVSEP/TL	1.0	DSTD/S13	1.4	DSTD/P13
Tailbuoy :	18.2	MEANSD/S	14.3	MEANSD/P	25.0	SD>5M/S	15.0	SD>5M/P	110.0	TB SEP

Dead Grp: Trace 589 o/c - killed all line.

Noise: Low ambient noise all line.

Note Stability OK. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires none.
GM2B Errors: 22.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6086822.0 Sol. Easting 474099.0
Eol. Northing 6086844.0 Eol. Easting 502768.0
Note Vsl SD 2.8m OK. TB nav marginal/unstable. Lost 1 shot.

Message SEQ 48. 2 BT PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0670-R Heading 90 deg.
Line Status Complete
Date started 29/08/89 Start Time 21:48 End Time 01:29
First File 100 First Reel 11798 Last File 1619 Last Reel 11812

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0672/29	100	0	0	1630	0	0.000Kms
0671/30	100	0	0	1630	0	0.000Kms
0670/31	100	100	1630	1630	1531	28.706Kms
0669/32	100	0	0	1630	0	0.000Kms
0668/33	100	0	0	1630	0	0.000Kms
0667/34	100	0	0	1630	0	0.000Kms
0666/35	100	0	0	1630	0	0.000Kms
0665/36	100	0	0	1630	0	0.000Kms

-------- WEATHER --------

Wind dir. SSW force 3 Sea state 3 Swell dir. SW Height 1 m

------- RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 35.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 7

---------- DUAL STREAMER ----------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 28V/b
Cable depth Min. 6.1 m. Max. 8.4 m.
Feather Sol. 0.5 P Eol. 1.8 S Max. 2.4 S

Accoustic Transponders:	1.2	SIG0/FR	2.9	SIG0/TL	0.1	STBD/ROT	0.2	PORT/ROT	106.0	TAIL/SEP
Compass :	100.0	AVSEP/FR	103.0	AVSEP/MD	111.0	AVSEP/TL	0.9	DSTD/S13	1.3	DSTD/P13
Tailbuoy :	15.1	MEANSD/S	13.1	MEANSD/P	16.0	SD>5M/S	12.0	SD>5M/P	100.0	TB SEP

Dead Grp: Trace S89 o/c - killed all line.

Noise: Low ambient noise all line.

Note Stability OK. Compasses good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP 117 539 625 657 1177 1205 1325.
GM2B Errors: 38.

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6086522.0 Sol. Easting 474106.0
Eol. Northing 6086525.0 Eol. Easting 502771.0
Note Vsl SD 3.2m OK. TB nav unstable with high SDs.

Message SEQ 44. 2 BT PRIME. Complete. EDIT GUN SEQ SP681-682(S) &
1582-1583(S) & 1603-1604(S).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0670/R Heading 90 deg.
Line Status Fill-in
Date started 02/09/89 Start Time 00:01 End Time 01:46
First File 100 First Reel 11973 Last File 846 Last Reel 11979

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0670/34	100	100	847	847	748	14.025Kms
/35	100	0	0	847	0	0.000Kms
/36	100	0	0	847	0	0.000Kms
/37	100	0	0	847	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

-------- WEATHER --------

Wind dir. NW force 4 Sea state 4 Swell dir. WNW Height 2 m

------- RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 35.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---------- DUAL STREAMER ----------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 2.6 m. Max. 8.6 m.
Feather Sol. 2.8 S Eol. 3.2 S Max. 4.0 S

Accoustic Transponders:	.	SIG0/FR	.	SIG0/TL	0.0	STBD/ROT	0.2	PORT/ROT	102.0	TAIL/SEP	
Compass	:	99.0	AVSEP/FR	105.0	AVSEP/MD	116.0	AVSEP/TL	1.2	DSTD/S13	1.5	DSTD/P13
Tailbuoy	:	20.0	MEANSD/S	12.0	MEANSD/P	28.0	SD>5M/S	10.0	SD>5M/P	109.0	TB SEP

Dead Grp: Trace 589 d/c - killed all line.

Noise: Considerable but acceptable swell burstout on line with levels c. 10/240 30uB & 4/240 50uB (2s anal).
Note Poor stability. Port cable OK(min 5.2m). EDIT STBD CABLE SHALLOW SPs 523-608 (min 2.3m). Compasses noisy in swell.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note No Misfires. GM2B LINK FAILED SPs 100 - 107 at same time as 3D link.

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,

Sol. Northing . Sol. Easting .
Eol. Northing 6086506.0 Eol. Easting 488099.0
Note Vsl SD 3.3m OK. Stbd TB Pulse8 noisy/high SDs. Acoustics OK. OMNISEIS LINK FAILURE SPs 100-172. Steering/Coverage to be evaluated.
Message SEQ 56. 2 BT SPLIT INFILL. EDIT RHO STBD STR SP 523 - 608. EDIT SP100-117 NDR. 3D LINK FAIL SP100-173. Coverage Rho Cols: 34-37.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0658-R Heading 90 deg.
Line Status Complete
Date started 28/08/89 Start Time 21:07 End Time 00:43
First File 100 First Reel 11754 Last File 1622 Last Reel 11768

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0660/41	100	0	0	1630	0	0.000Kms
0659/42	100	0	0	1630	0	0.000Kms
0658/43	100	100	1630	1630	1531	28.706Kms
0657/44	100	0	0	1630	0	0.000Kms
0656/45	100	0	0	1630	0	0.000Kms
0655/46	100	0	0	1630	0	0.000Kms
0654/47	100	0	0	1630	0	0.000Kms
0653/48	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. N force 4 Sea state 4 Swell dir. NNE Height 2 m

---===== RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 35.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 3 Misfires 0

---------- DUAL STREAMER =========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 8.3 m.
Feather Sol. 0.0 P Eol. 0.0 S Max. 1.5 S

Accoustic Transponders:		.	SIG0/FR	.	SIG0/TL	.	STBD/ROT	.	PORT/ROT	104.0	TAIL/SEP
Compass	:	99.0	AVSEP/FR	104.0	AVSEP/MD	112.0	AVSEP/TL	1.1	DSTD/S13	1.7	DSTD/P13
Tailbuoy	:	14.0	MEANSD/S	.	MEANSD/P	15.0	SD>5M/S	.	SD>5M/P	.	TB SEP

Dead Grp: Trace 589 o/c - killed all line.

Noise: Some swell bursts all line. Towing noise on Rho front port cab at 20/30uB 4/10Hz accepted.
Note Stability OK. Compasses noisy in swell.

---=== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires. GM2B Errors: 34 - usual level.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6086241.0 Sol. Easting 474063.0
Eol. Northing 6086227.0 Eol. Easting 502753.0
Note Vsl SD 3.0m OK. Port TB dead. Sigma lost all Hyperfix at SP1330 and drifted offline. No AC stats. SP spacing degraded. Rho nav OK.
Message SEQ 40. 2 BT PRIME. Complete. ED GUN SQ 1174-1185 1435-1440 & 1591-1600. EDIT ALL SIGMA GUNS/DATA SPs 1331-1630 D/T NO NAV ON SIGMA.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0658*R Heading 90 deg.
Line Status Reshoot
Date started 02/09/89 Start Time 02:51 End Time 03:36
First File 1312 First Reel 11980 Last File 1630 Last Reel 11983

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0660/41	11312	0	0	11630	0	0.000Kms
0659/42	11312	0	0	11630	0	0.000Kms
0658/43	11312	0	0	11630	0	0.000Kms
0657/44	11312	0	0	11630	0	0.000Kms
0656/45	11312	0	0	11630	0	0.000Kms
0655/46	11312	0	0	11630	0	0.000Kms
0654/47	11312	0	0	11630	0	0.000Kms
0653/48	11312	0	0	11630	0	0.000Kms

---==== WEATHER ========

Wind dir. NW force 4 Sea state 4 Swell dir. WNW Height 2 m

---=== RECORDING ======

Magnetometer N Gravity N
Water depth Sol. 35.0m. Eol. 35.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

----==== DUAL STREAMER =========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.4 m. Max. 9.1 m.
Feather Sol. 1.6 S Eol. 2.0 S Max. 2.1 S

Accoustic Transponders:		0.9	SIG0/FR	1.1	SIG0/TL	0.1	STBD/ROT	0.3	PORT/ROT	106.0	TAIL/SEP
Compass	:	99.0	AVSEP/FR	105.0	AVSEP/MD	110.0	AVSEP/TL	1.1	DSTD/S13	1.4	DSTD/P13
Tailbuoy	:	13.0	MEANSD/S	12.0	MEANSD/P	17.0	SD>5M/S	11.0	SD>5M/P	107.0	TB SEP

Dead Grp: Trace 589 o/c - killed all line.

Noise: Considerable but acceptable swell burstout on line
with levels c. 10/240 30uB & 4/240 50uB (2s anal).
Note Cable stability adequate.
Compasses noisy in swell.

---=== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.ni.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral seoaration 50m.Total output 45.7 bar metres

Note No Misfires.
GM28 Errors: 5.

---=== NAVIGATION ======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,

Sol. Northing 6086244.0 Sol. Easting 496810.0
Eol. Northing 6086252.0 Eol. Easting 502785.0
Note Vsl SD 4.6m OK. TB Pulse8 marginal as uausal. Acoustics OK.

Message SEQ 57. 2 BT RESHOOT. Complete. No Rho edits.
(Reshoot for seq 40 Sigma nav crash).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0646-R Heading 90 deg.
Line Status Complete
Date started 26/08/89 Start Time 19:11 End Time 22:42
First File 100 First Reel 11682 Last File 1622 Last Reel 11696

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0648/53	100	0	0	1630	0	0.000Kms
0647/54	100	0	0	1630	0	0.000Kms
0646/55	100	100	1630	1630	1531	28.706Kms
0645/56	100	0	0	1630	0	0.000Kms
0644/57	100	0	0	1630	0	0.000Kms
0643/58	100	0	0	1630	0	0.000Kms
0642/59	100	0	0	1630	0	0.000Kms
0641/60	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. NNW force 2 Sea state 2 Swell dir. NNW Height 0 m

---==== RECORDING ======

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 36.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 5 Misfires 0

----------==== DUAL STREAMER ==========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.8 m. Max. 8.1 m.
Feather Sol. 0.6 S Eol. 1.0 S Max. 4.0 P

Accoustic Transponders:		1.0	SIG0/FR	1.3	SIG0/TL	0.1	STBD/ROT	.	PORT/ROT	104.0	TAIL/SEP
Compass	:	99.0	AVSEP/FR	100.0	AVSEP/MD	100.0	AVSEP/TL	0.6	DSTD/S13	0.9	DSTD/P13
Tailbuoy	:	12.0	MEANSD/S	.	MEANSD/P	13.0	SD>5M/S	.	SD>5M/P	.	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.

Note Stability good. Compasses good/quiet.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires.
GM2B transmission errors: 31 - still very poor.

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6085929.0 Sol. Easting 474117.0
Eol. Northing 6085942. Eol. Easting 502776.0
Note Vsl SD 170m OK. Port TB dead. Acoustics OK.

Message SEQ 35. 2 BT PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0634-R Heading 90 deg.
Line Status Complete
Date started 22/08/89 Start Time 08:19 End Time 11:40
First File 100 First Reel 11573 Last File 1627 Last Reel 11586

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0636/65	100	0	0	1630	0	0.000Kms
0635/66	100	0	0	1630	0	0.000Kms
0634/67	100	100	1630	1630	1531	28.706Kms
0633/68	100	0	0	1630	0	0.000Kms
0632/69	100	0	0	1630	0	0.000Kms
0631/70	100	0	0	1630	0	0.000Kms
0630/71	100	0	0	1630	0	0.000Kms
0629/72	100	0	0	1630	0	0.000Kms

---=== WEATHER ===---

Wind dir. VAR force 3 Sea state 3 Swell dir. W Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 36.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 3 Misfires 1

---=== DUAL STREAMER ===---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 8.6 m.
Feather Sol. 3.0 S Eol. 1.0 P Max. 4.5 S

Accoustic Transponders:		0.4	SIG0/FR	0.7	SIG0/TL	0.0	STBD/ROT	0.2	PORT/ROT	111.0	TAIL/SEP
Compass	:	101.0	AVSEP/FR	105.0	AVSEP/MD	114.0	AVSEP/TL	0.0	DSTD/S13	0.9	DSTD/P13
Tailbuoy	:	5.5	MEANSD/S	10.9	MEANSD/P	1.0	SD>5M/S	6.0	SD>5M/P	110.0	TB SEP

Dead Grp: Trace S60 spiking - killed all line.

Noise: Very occasional slight swell breakout on line.

Note Stability good. Compass/birds good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfire SP 1323 only.
GM2B Errors: 26.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6085649.0 Sol. Easting 474063.0
Eol. Northing 6085622.0 Eol. Easting 502770.0
Note Vsl SD 2.2m OK. TB nav OK. Acoustics OK.

Message SEQ 26. PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0634/R Heading 90 deg.
Line Status Fill-in
Date started 25/08/89 Start Time 17:46 End Time 21:14
First File 120 First Reel 11626 Last File 1614 Last Reel 11639

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0634/72	120	120	1630	1630	1511	28.331Kms
/73	120	0	0	1630	0	0.000Kms
/74	120	0	0	1630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ========

Wind dir. NNW force 4 Sea state 4 Swell dir. NNW Height 2 m

---==== RECORDING ======---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 35.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 21 Misfires 5

----==== DUAL STREAMER ========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 8.2 m.
Feather Sol. 1.0 S Eol. 0.0 P Max. 6.1 P

Accoustic Transponders:	1.8	SIGO/FR	.	SIGO/TL	0.0	STBD/ROT	.	PORT/ROT	104.0	TAIL/SEP	
Compass :	99.0	AVSEP/FR	105.0	AVSEP/MD	112.0	AVSEP/TL	0.9	DSTD/S13	1.3	DSTD/P13	
Tailbuoy :	4.1	MEANSD/S	.	MEANSD/P	0.0	SD>5M/S	.	SD>5M/P	.	TB SEP	

Dead Grp: Trace S28 killed all line - open circuit.

Noise: Some swell breakout on line circa 8 of 240 traces
at 10 to 30uB RMS (2 second analysis).
Note Stability good. Compasses OK though noisy in swell.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements
each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note Misfires SPs 152 154 166 188 all gun P1/4 disabled SP 190.
Also misfire SP854 gun P2/5.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6085743.0 Sol. Easting 474462.0
Eol. Northing 6085531.0 Eol. Easting 507770.0
Note Vsl SD 3.3m OK. Port TB dead. Missed 21 SPs d/t nav (dusk).
3D crash on run-in resulted in wrong coverage first part of line.
Message SEQ 31. 1 BT 40F INFILL. Complete. No Edits. Port TB dead.
Cols: 72-74. 3D CRASH ON RUN IN. MISSING COVERAGE REQD. ON GECO A/C.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0622-R Heading 90 deg.
Line Status Complete
Date started 21/08/89 Start Time 07:30 End Time 10:46
First File 100 First Reel 11517 Last File 1626 Last Reel 11530

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0624/77	100	0	0	1630	0	0.000Kms
0623/78	100	0	0	1630	0	0.000Kms
0622/79	100	100	1630	1630	1531	28.706Kms
0621/80	100	0	0	1630	0	0.000Kms
0620/81	100	0	0	1630	0	0.000Kms
0619/82	100	0	0	1630	0	0.000Kms
0618/83	100	0	0	1630	0	0.000Kms
0617/84	100	0	0	1630	0	0.000Kms

---==== WEATHER ========

Wind dir. W force 4 Sea state 3 Swell dir. SW Height 1 m

------- RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 36.0m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 4 Misfires 0

----------- DUAL STREAMER ----------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 8.4 m.
Feather Sol. 6.0 S Eol. 2.0 S Max. 6.1 S

Accoustic Transponders:	0.0	SIG0/FR	1.1	SIG0/TL	0.1	STBD/ROT	0.3	PORT/ROT	100.0	TAIL/SEP
Compass :	100.0	AVSEP/FR	99.0	AVSEP/MD	104.0	AVSEP/TL	0.9	DSTD/S13	1.0	DSTD/P13
Tailbuoy :	5.5	MEANSD/S	10.0	MEANSD/P	1.0	SD>5M/S	5.0	SD>5M/P	97.0	TB SEP

Dead Grp: Trace S60 spiking - killed all line.

Noise: Low ambient noise all line.

Note Stability good. Compass/birds quiet/good.

---=== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No Rho misfires. EDIT GUN SEQ ERRS SP 1552-1555(S).
GM2B Errors: 29.

---=== NAVIGATION ======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,K7 F2,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6085343.0 Sol. Easting 474400.0
Eol. Northing 6085315.0 Eol. Easting 502755.0
Note VSL SD 2.8m OK. TB nav OK. Acoustics OK. Lost shots d/t
speed too high plus some Hyperfix instability - Rho 4 shots not recorded.
Message SEQ 22. PRIME. Complete. EDIT GUN SEQ ERRS SP1552-1555.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0610-R Heading 90 deg.
Line Status Complete
Date started 20/08/89 Start Time 06:41 End Time 09:58
First File 100 First Reel 11460 Last File 1614 Last Reel 11473

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0612/89	100	0	0	1630	0	0.000Kms
0611/90	100	0	0	1630	0	0.000Kms
0610/91	100	100	1630	1630	1531	28.706Kms
0609/92	100	0	0	1630	0	0.000Kms
0608/93	100	0	0	1630	0	0.000Kms
0607/94	100	0	0	1630	0	0.000Kms
0606/95	100	0	0	1630	0	0.000Kms
0605/96	100	0	0	1630	0	0.000Kms

---==== WEATHER ========

Wind dir. S force 3 Sea state 3 Swell dir. SW Height 1 m

------- RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 36.0m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 1 Misfires 10

----------==== DUAL STREAMER =========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.8 m. Max. 8.7 m.
Feather Sol. 2.0 S Eol. 2.0 S Max. 5.1 P

Accoustic Transponders:	0.7	SIG0/FR	2.4	SIGO/TL	0.3	STBD/ROT	0.2	PORT/ROT	102.0	TAIL/SEP
Compass :	100.0	AVSEP/FR	100.0	AVSEP/MD	105.0	AVSEP/TL	0.5	DSTD/S13	0.6	DSTD/P13
Tailbuoy :	5.3	MEANSD/S	15.7	MEANSD/P	0.0	SD>5M/S	13.0	SD>5M/P	104.2	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.

Note Stability good. Compass/birds quiet/good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires 10. EDIT GUN SEQ ERRS SPs 692-693(S) 934-942(R)
945-947(S) 952-953(S) 1187(R) 1199-1202(S). GM20 Errors: 10.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,K7 F2,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6085041.0 Sol. Easting 474083.0
Eol. Northing 6085020.0 Eol. Easting 502768.0
Note VSL SD 1.6m OK. TB nav adequate. Acoustics OK.
HYPFX/SYLEDIS cocktail SP225-EOL(F1 instabilities). RHO 15 SP behind at EOL
Message SEQ 10. PRIME. Complete. EDIT GUN SEQ ERRS SPs 692-693
934-942 945-947 952-953 1187 1199-1202. Rho 15 SP behind Sigma at EOL(nav).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0598-R Heading 90 deg.
Line Status Complete
Date started 19/08/89 Start Time 05:58 End Time 09:15
First File 100 First Reel 11403 Last File 1625 Last Reel 11416

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0600/101	100	0	0	1630	0	0.000Kms
0599/102	100	0	0	1630	0	0.000Kms
0598/103	100	100	1630	1630	1531	28.706Kms
0597/104	100	0	0	1630	0	0.000Kms
0596/105	100	0	0	1630	0	0.000Kms
0595/106	100	0	0	1630	0	0.000Kms
0594/107	100	0	0	1630	0	0.000Kms
0593/108	100	0	0	1630	0	0.000Kms

---==== WEATHER ========

Wind dir. S force 4 Sea state 3 Swell dir. SW Height 2 m

---==== RECORDING ======---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 36.0m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 1 Misfires 7

----===== DUAL STREAMER ====-----

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 8.5 m.
Feather Sol. 0.0 S Eol. 2.0 P Max. 4.8 P

Accoustic Transponders:		1.7	SIG0/FR	2.5	SIG0/TL	0.0	STBD/ROT	0.1	PORT/ROT	104.0	TAIL/SEP
Compass	:	100.0	AVSEP/FR	105.0	AVSEP/MD	110.0	AVSEP/TL	0.9	DSTD/S13	1.0	DSTD/P13
Tailbuoy	:	5.1	MEANSD/S	10.5	MEANSD/P	1.0	SD>5M/S	6.0	SD>5M/P	105.0	TB SEP

Dead Grp: Trace S60 spiking - killed all line.
Trace P63 low amplitude.
Noise: Some swell noise all line.

Note Stability good. Compass/birds quiet/good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfire/drifts SPs 145 177 209 317 357 369 489.
EDIT GUN SEQ ERR SP 152-157 (Sigma nos). GM20 Errors: 20.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6084718.0 Sol. Easting 474067.0
Eol. Northing 6084692.0 Eol. Easting 502773.3
Note VSL SD 3.2m good. TB nav OK.

Message SEQ 14. PRIME. Complete. EDIT GUN SEQ ERR SP 152-157.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0586-R Heading 90 deg.
Line Status Complete
Date started 17/08/89 Start Time 04:31 End Time 07:50
First File 100 First Reel 11361 Last File 1630 Last Reel 11374

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0588/113	100	0	0	1630	0	0.000Kms
0587/114	100	0	0	1630	0	0.000Kms
0586/115	100	100	1630	1630	1531	28.706Kms
0585/116	100	0	0	1630	0	0.000Kms
0584/117	100	0	0	1630	0	0.000Kms
0583/118	100	0	0	1630	0	0.000Kms
0582/119	100	0	0	1630	0	0.000Kms
0581/120	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. E force 3 Sea state 3 Swell dir. SE Height 2 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.3m. Eol. 36.3m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 0 Misfires 1

========== DUAL STREAMER ==========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 8.1 m.
Feather Sol. 2.0 S Eol. 0.0 S Max. 4.4 S

Accoustic Transponders:	1.3	SIG0/FR	5.1	SIG0/TL	0.1	STBD/ROT	0.3	PORT/ROT	101.8	TAIL/SEP
Compass :	104.0	AVSEP/FR	105.0	AVSEP/MD	111.0	AVSEP/TL	0.0	DSTD/S13	0.0	DSTD/P13
Tailbuoy :	6.1	MEANSD/S	9.3	MEANSD/P	0.0	SD>5M/S	4.0	SD>5M/P	100.0	TB SEP

Dead Grp: None.

Noise: Some swell noise all line.

Note Stability good. Compasses good except C28(P8) bad/taken out.

======= ENERGY SOURCE =======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfire SP 1605. EDIT GUN SEQ ERR SP1130-1132.
GM2B Errors: 28.

======= NAVIGATION =======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6084435.0 Sol. Easting 474111.0
Eol. Northing 6084400.0 Eol. Easting 502774.0
Note VSL SD 1.6m good. TBs OK. F4H1 dead all line.

Message SEQ 18. PRIME. Complete. EDIT GUN SEQ BAD SP 1130-1132(Sigma SP nos).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0586/R Heading 90 deg.
Line Status Fill-in
Date started 06/09/89 Start Time 12:17 End Time 15:27
First File 270 First Reel 12121 Last File 1628 Last Reel 12133

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0586/116	10270	10270	11630	11630	1361	25.519Kms
/117	10270	0	0	11630	0	0.000Kms
/118	10270	0	0	11630	0	0.000Kms
/119	10270	0	0	11630	0	0.000Kms
/120	10270	0	0	11630	0	0.000Kms
/121	10270	0	0	11630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

-------==== WEATHER ====-----

Wind dir. W force 4 Sea state 3 Swell dir. W Height 1 m

-------=== RECORDING ===-------

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 40.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 2 Misfires 1

----------===== DUAL STREAMER =========

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 8.5 m.
Feather Sol. 2.4 S Eol. 0.4 S Max. 3.5 S

Accoustic Transponders:	4.6	SIG@/FR	1.@	SIGO/TL	@.@	STBD/ROT	@.3	PORT/ROT	89.@	TAIL/SEP
Compass :	99.@	AVSEP/FR	105.@	AVSEP/MD	112.@	AVSEP/TL	@.@	DSTD/S13	1.2	DSTD/P13
Tailbuoy :	10.1	MEANSD/S	9.@	MEANSD/P	5.@	SD>5M/S	1.@	SD>5M/P	95.@	TB SEP

Dead Grp: Trace S89 spiking - killed all line.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20u@.
Note Cable stability good. Compasses good except S13 7 rejected readings and P27 12 rejected readings.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note Misfire SP 10852 only.
GM28 Errors 34 - poor telemetry as usual.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6084422.0 Sol. Easting 477331.0
Eol. Northing . Eol. Easting .
Note Vsl SD 2.6m OK. TB nav OK. Acoustics OK.
Acoustic stats corrupted d/t wide separation split synchronised shooting.
Message SEQ 73. 1 BT 28 FOLD INFILL. Complete. EDIT GUNSEQ ERRORS
SPs 10548-10549. Coverage required cols: 116-121 various offset groups.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0574-R Heading 90 deg.

Line Status Complete
Date started 16/08/89 Start Time 04:16 End Time 07:38
First File 100 First Reel 11304 Last File 1630 Last Reel 11317

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0576/125	100	0	0	1630	0	0.000Kms
0575/126	100	0	0	1630	0	0.000Kms
0574/127	100	100	1630	1630	1531	28.706Kms
0573/128	100	0	0	1630	0	0.000Kms
0572/129	100	0	0	1630	0	0.000Kms
0571/130	100	0	0	1630	0	0.000Kms
0570/131	100	0	0	1630	0	0.000Kms
0569/132	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. S force 4 Sea state 4 Swell dir. S Height 2 m

---==== RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.3m. Eol. 35.3m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 49 Misfires 8

---------- DUAL STREAMER ---------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.6 m. Max. 8.4 m.
Feather Sol. 2.0 S Eol. 2.0 P Max. 3.8 P

Accoustic Transponders:		1.5	SIG0/FR	9.6	SIG0/TL	0.0	STBD/ROT	0.3	PORT/ROT	100.0	TAIL/SEP
Compass	:	105.1	AVSEP/FR	107.8	AVSEP/MD	114.1	AVSEP/TL	0.9	DSTD/S13	1.1	DSTD/P13
Tailbuoy	:	11.3	MEANSD/S	7.0	MEANSD/P	0.0	SD>5M/S	6.0	SD>5M/P	104.3	TB SEP

Dead Grp: None.

Noise: Some swell noise all line.

Note Stability adequate. Compasses OK except C28(P8) bad and disabled all line.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP331 375 559 675 767 783 791 819 1331 - total 9.
GM28 Errors: 29. Gun S3/5 drifting - disabled SP 791 - EOL.

------ NAVIGATION ======

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6084146.0 Sol. Easting 474079.0
Eol. Northing 6084096.0 Eol. Easting 502787.0
Note VSL & TB2 nav OK. TB1 poor. F4H1 dead all line.
Strong following current caused wide and variable cable separation at tail.
Message SEQ 06. PRIME. Complete. EDIT RHO NO DATA RECORDED (GDRhang)
SPs 500-548 (shooting OK).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0562-R Heading 90 deg.
Line Status Complete
Date started 14/08/89 Start Time 14:46 End Time 18:08
First File 100 First Reel 11275 Last File 1619 Last Reel 11288

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0564/137	100	0	0	1630	0	0.000Kms
0563/138	100	0	0	1630	0	0.000Kms
0562/139	100	100	1630	1630	1531	28.706Kms
0561/140	100	0	0	1630	0	0.000Kms
0560/141	100	0	0	1630	0	0.000Kms
0559/142	100	0	0	1630	0	0.000Kms
0558/143	100	0	0	1630	0	0.000Kms
0557/144	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. SSW force 4 Sea state 4 Swell dir. SSW Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 36.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---==== DUAL STREAMER ====---

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 4.8 m. Max. 8.4 m.
Feather Sol. 2.0 P Eol. 3.0 P Max. 4.6 P

Accoustic Transponders:	1.7	SIG0/FR	12.1	SIG0/TL	0.1	STBD/ROT	0.3	PORT/ROT	.	TAIL/SEP
Compass :	186.5	AVSEP/FR	187.8	AVSEP/MD	189.0	AVSEP/TL	0.9	DSTD/S13	1.1	DSTD/P13
Tailbuoy :	7.1	MEANSD/S	10.1	MEANSD/P	1.0	SD>5M/S	2.0	SD>5M/P	100.0	TB SEP

Dead Grp: Trace P73 dead all line.

Noise: Occasional swell noise all line.

Note Stability adequate. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires. EDIT GUN SEQ WRONG SPs295-302 (Rho SP numbers).
GM20 Errors: TOTAL 30 shots - too many.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,K7 F2,DAN-C,
Secondary

Sol. Northing 6083806.0 Sol. Easting 474211.0
Eol. Northing 6083807.0 Eol. Easting 502789.0
Note EDIT VSL NAV LOST (Hyperfix corrupt) SPs 973 - 1119.
Stbd TB no Pulse8 SPs166-176. Navtech F4H1 & S4H4 dead all line.
Message SEQ 04. PRIME. Complete. EDIT RHO NAV BAD SPs 973 - 1119.
EDIT GUN SEQ WRONG SPs 295-302. Rho 6 SP behind Sigma at SOL - 9 at EOL.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0562*R Heading 90 deg.
Line Status Reshoot
Date started 22/08/89 Start Time 20:16 End Time 20:46
First File 940 First Reel 11602 Last File 1148 Last Reel 11603

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0562/135	10940	0	0	11150	0	0.000Kms
/136	10940	0	0	11150	0	0.000Kms
/137	10940	0	0	11150	0	0.000Kms
/138	10940	0	0	11150	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

-------==== WEATHER ========---

Wind dir. NW force 3 Sea state 3 Swell dir. W Height 2 m

-------=== RECORDING =======---

Magnetometer N Gravity N
Water depth Sol. 35.0m. Eol. 36.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 1 Misfires 0

----------===== DUAL STREAMER ==========-----

2x120x25agrp transforaerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.1 m. Max. 7.8 m.
Feather Sol. 0.3 S Eol. 2.6 S Max. 2.6 S

Accoustic Transponders:	1.5	SIG0/FR	0.1	SIGO/TL	0.3	STBD/ROT	0.4	PORT/ROT	100.0	TAIL/SEP
Compass :	100.0	AVSEP/FR	99.0	AVSEP/MD	109.0	AVSEP/TL	1.3	DSTD/S13	1.5	DSTD/P13
Tailbuoy :	8.9	MEANSD/S	10.9	MEANSD/P	2.0	SD>5M/S	3.0	SD>5M/P	100.0	TB SEP

Dead Grp: None.

Noise: Some swell breakout on line.

Note Stability good. Compasses OK.

------=== ENERGY SOURCE ======---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.ni.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral seoaration 50m.Total output 45.7 bar metres

Note No misfires.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,K7 F2,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6083946.0 Sol. Easting 489819.0
Eol. Northing 6084021.0 Eol. Easting 493756.0
Note Vsl SD 2.5m OK. TB nav OK. Acoustics OK.

Message SEQ 28. SINGLE BOAT RESHOOT. Complete. Reshoot of Seq 4 (14/8) for Rho nav fail. Coverage cols: 135-139 groups 2/3/4 - good.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0562/R Heading 90 deg.
Line Status Fill-in
Date started 25/08/89 Start Time 06:40 End Time 08:42
First File 593 First Reel 11603 Last File 1490 Last Reel 11611

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0562/141	593	593	1490	1490	898	16.838Kms
/142	593	0	0	1490	0	0.000Kms
/143	593	0	0	1490	0	0.000Kms
/144	593	0	0	1490	0	0.000Kms
/145	593	0	0	1490	0	0.000Kms
/146	593	0	0	1490	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ====---

Wind dir. NW force 3 Sea state 3 Swell dir. NW Height 2 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 36.0m. Ave Speed 4.5 Kts.
Parity Errors 0 No Data Record 0 Misfires 8

---===== DUAL STREAMER ====---

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.8 m. Max. 7.9 m.
Feather Sol. 0.0 S Eol. 0.3 P Max. 1.8 S

Accoustic Transponders:	1.1	SIG@/FR	.	SIG0/TL	0.0	STBD/ROT	.	PORT/ROT	106.0	TAIL/SEP	
Compass :	101.0	AVSEP/FR	106.0	AVSEP/MD	117.0	AVSEP/TL	1.1	DSTD/S13	1.4	DSTD/P13	
Tailbuoy :	9.5	MEANSD/S	.	MEANSD/P	6.0	SD>5M/S	.	SD>5M/P	.	TB SEP	

Dead Grp: Trace S28 killed all line - open circuit.

Noise: Some swell breakout on line circa 8 of 240 traces
at 30 to 60uB RMS (2 second analysis).
Note Stability good. Compasses OK though noisy in swell.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements
each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note Misfires SPs 699 767 771 925 976 1006 1107 1185.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6083793.0 Sol. Easting 483296.0
Eol. Northing 6083834.0 Eol. Easting 500127.0
Note Vsl SD 1.8m OK. Stbd TB OK. Port TB Pulse8 dead.
Front acoustics adequate and tail acoustics poor (still tuning in).
Message SEQ 29. SINGLE BOAT 40 FOLD INFILL. Complete. No Edits.
Coverage cols: 141-146 various groups. Port TB Pulse8 dead.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0550-R Heading 90 deg.
Line Status Complete
Date started 16/08/89 Start Time 16:18 End Time 19:36
First File 100 First Reel 11333 Last File 1623 Last Reel 11346

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0552/149	100	0	0	1630	0	0.000Kms
0551/150	100	0	0	1630	0	0.000Kms
0550/151	100	100	1630	1630	1531	28.706Kms
0549/152	100	0	0	1630	0	0.000Kms
0548/153	100	0	0	1630	0	0.000Kms
0547/154	100	0	0	1630	0	0.000Kms
0546/155	100	0	0	1630	0	0.000Kms
0545/156	100	0	0	1630	0	0.000Kms

----==== WEATHER ========

Wind dir. VAR force 3 Sea state 3 Swell dir. SSW Height 1 m

---===== RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 36.0m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 1 Misfires 9

----======= DUAL STREAMER =========

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.1 m. Max. 8.1 m.
Feather Sol. 3.0 S Eol. 4.0 P Max. 6.4 P

Accoustic Transponders:	1.5	SIG0/FR	1.8	SIGO/TL	.	STBD/ROT	.	PORT/ROT	107.4	TAIL/SEP
Compass :	105.4	AVSEP/FR	105.0	AVSEP/MD	107.7	AVSEP/TL	0.0	DSTD/S13	0.9	DSTD/P13
Tailbuoy :	7.6	MEANSD/S	11.2	MEANSD/P	1.0	SD>5M/S	0.0	SD>5M/P	103.0	TB SEP

Dead Grp: Traces P15 & P17 kicking from SP 1350 - EOL.
Occasional random spikes on port cable SP1300-EOL.
Noise: Slight swell noise all line.

Note Stability good. Compasses OK except C20 (port 8) reading 90 degrees high all line and disabled all line.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP 206 276 488 760 846 990 1010 1060 1116 (drifts).
EDIT GUN SEQ BAD SP 1614-1619 (Sigma nos). GM20 Errors: 30.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6083532.0 Sol. Easting 474100.0
Eol. Northing 6083501.0 Eol. Easting 502673.0
Note VSL SD 2.3m good. TBs adequate. F4H1 dead all line.
Acoustic tailnet weak. Rho 7 SPs behind Sigma at EOL.
Message SEQ 08. PRIME. Complete. EDIT GUN SEQ BAD SP 1614-1619(Sigma SP nos).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0538-R Heading 90 deg.
Line Status Complete
Date started 19/08/89 Start Time 18:20 End Time 21:40
First File 100 First Reel 11432 Last File 1592 Last Reel 11445

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0540/161	100	0	0	1630	0	0.000Kms
0539/162	100	0	0	1630	0	0.000Kms
0538/163	100	100	1630	1630	1531	28.706Kms
0537/164	100	0	0	1630	0	0.000Kms
0536/165	100	0	0	1630	0	0.000Kms
0535/166	100	0	0	1630	0	0.000Kms
0534/167	100	0	0	1630	0	0.000Kms
0533/168	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. SSE force 4 Sea state 3 Swell dir. S Height 1 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 35.0m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 18 Misfires 0

----==== DUAL STREAMER ====----

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.5 m. Max. 8.3 m.
Feather Sol. 2.0 S Eol. 2.0 P Max. 6.5 P

Accoustic Transponders:	1.3	SIG0/FR	3.4	SIG0/TL	0.1	STBD/ROT	0.3	PORT/ROT	106.0	TAIL/SEP
Compass :	103.0	AVSEP/FR	101.0	AVSEP/MD	103.0	AVSEP/TL	0.6	DSTD/S13	0.9	DSTD/P13
Tailbuoy :	6.6	MEANSD/S	13.9	MEANSD/P	1.0	SD>5M/S	11.0	SD>5M/P	104.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.

Note Stability good. Compass/birds quiet/good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires.HYPFIX prop caused EDIT GUN SEQ ERRORS SP 1188-1190 1265-1267 1234 1237 1257-1258 1265-1267 1291-1296 GM2B errors:7

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6083222.0 Sol. Easting 474080.0
Eol. Northing 6083222.0 Eol. Easting 502771.0
Note VSL SD 2.4m OK but poor HYPF prop (esp laneslips K7 F1/F2) led to lost SPs & gun seq errs c. SPs 750-1300. TB nav OK. Acoustics OK.
Message SEQ 16 PRIME.Complete.EDIT GUN SEQ ERRS(all Sigma nos) 1188-1190 1234-1237 1257-1258 1265-1267 1291-1296(poor nav).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0526-R Heading 90 deg.
Line Status Complete
Date started 20/08/89 Start Time 19:04 End Time 22:23
First File 100 First Reel 11488 Last File 1608 Last Reel 11501

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0528/173	100	0	0	1630	0	0.000Kms
0527/174	100	0	0	1630	0	0.000Kms
0526/175	100	100	1630	1630	1531	28.706Kms
0525/176	100	0	0	1630	0	0.000Kms
0524/177	100	0	0	1630	0	0.000Kms
0523/178	100	0	0	1630	0	0.000Kms
0522/179	100	0	0	1630	0	0.000Kms
0521/180	100	0	0	1630	0	0.000Kms

-------- WEATHER ========----

Wind dir. S force 3 Sea state 3 Swell dir. SSW Height 1 m

------- RECORDING =======---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 36.0m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 15 Misfires 0

---------- DUAL STREAMER ==========

2x120x25agrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 8.6 m.
Feather Sol. 0.0 S Eol. 2.0 P Max. 5.9 P

Accoustic Transponders:	.	SIG0/FR	.	SIGO/TL	0.2	STBD/ROT	0.4	PORT/ROT	.	TAIL/SEP	
Compass	: 101.0	AVSEP/FR	.	AVSEP/MD	117.0	AVSEP/TL	0.6	DSTD/S13	0.0	DSTD/P13	
Tailbuoy	: 10.4	MEANSD/S	21.0	MEANSD/P	2.0	SD>5M/S	21.0	SD>5M/P	111.0	TB SEP	

Dead Grp: Trace S60 spiking - killed all line.

Noise: Low ambient noise all line.

Note Stability good. Compass/birds quiet/good.

------ ENERGY SOURCE ======---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No Misfires. EDIT GUN SEQ ERRS SP 221-223(S) 745-748(S)
1433-1439(S) 1500-1504(S) & 1591-1598(S). GM20 Errors: 33.

------ NAVIGATION ======---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,K7 F2,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6082903.0 Sol. Easting 474073.0
Eol. Northing 6082907.0 Eol. Easting 502721.0
Note VSL SD 2.5m OK. TB1 OK. TB2(port) unstable. Acoustics OK.
Rho 7 SP behind Sigma at EOL caused by usual HYPFX instabilities/laneslips.
Message SEQ 20. PRIME. Complete. EDIT GUN SEQ ERRS SP 221-223(S)
745-748(S) 1433-1439(S) 1500-1504(S) 1591-1598(S) caused bu unstable nav.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0514-R Heading 90 deg.
Line Status Complete
Date started 21/08/89 Start Time 19:50 End Time 23:08
First File 100 First Reel 11545 Last File 1619 Last Reel 11558

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0516/185	100	0	0	1630	0	0.000Kms
0515/185	100	0	0	1630	0	0.000Kms
0514/187	100	100	1630	1630	1531	28.706Kms
0513/188	100	0	0	1630	0	0.000Kms
0512/189	100	0	0	1630	0	0.000Kms
0511/190	100	0	0	1630	0	0.000Kms
0510/191	100	0	0	1630	0	0.000Kms
0509/192	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. W force 3 Sea state 3 Swell dir. SSW Height 1 m

------- RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 36.0m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 7 Misfires 2

---------- DUAL STREAMER ---------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 8.1 m.
Feather Sol. 0.0 S Eol. 2.0 P Max. 5.8 P

Accoustic Transponders:		0.6	SIG0/FR	0.8	SIGO/TL	0.0	STBD/ROT	0.2	PORT/ROT	101.0	TAIL/SEP
Compass	:	100.0	AVSEP/FR	101.0	AVSEP/MD	109.0	AVSEP/TL	0.7	DSTD/S13	0.9	DSTD/P13
Tailbuoy	:	7.9	MEANSD/S	13.8	MEANSD/P	1.0	SD>5M/S	16.0	SD>5M/P	99.0	TB SEP

Dead Grp: Trace S60 spiking - killed all line.

Noise: Occasional swell breakout on line.

Note Stability good. Compass/birds good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP 359 783. EDIT GUN SEQ ERRS SP 476-483(R) &
533-536(S). GM20 Errors: 32.

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6082619.0 Sol. Easting 474184.0
Eol. Northing 6082621.0 Eol. Easting 502776.0
Note VSL SD 3.5m OK. TB nav OK. Acoustics OK.
Cocktail in prime fit SOL-SP445.
Message SEQ 24. PRIME. Complete. EDIT GUN SEQ ERRS SP 476-483(R) &
533-536(S).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0514/R Heading 90 deg.
Line Status Fill-in
Date started 29/08/89 Start Time 09:20 End Time 11:14
First File 100 First Reel 11775 Last File 913 Last Reel 11782

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0514/189	100	100	913	913	814	15.263Kms
/190	100	0	0	913	0	0.000Kms
/191	100	0	0	913	0	0.000Kms
/192	100	0	0	913	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ====---

Wind dir. NW force 2 Sea state 3 Swell dir. NW Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 36.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 1

---==== DUAL STREAMER ====---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 8.2 m.
Feather Sol. 2.0 P Eol. 2.0 P Max. 3.8 P

Accoustic Transponders:		8.8	SIG0/FR	.	SIG0/TL	0.1	STBD/ROT	.	PORT/ROT	104.0	TAIL/SEP
Compass	:	100.0	AVSEP/FR	102.0	AVSEP/MD	111.0	AVSEP/TL	0.7	DSTD/S13	1.0	DSTD/P13
Tailbuoy	:	9.8	MEANSD/S	.	MEANSD/P	6.0	SD>5M/S	.	SD>5M/P	.	TB SEP

Dead Grp: Trace 589 o/c - killed all line.

Noise: Low ambient noise all line.

Note Stability good. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note Misfires SPs 178 & 339.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6082591.0 Sol. Easting 474075.0
Eol. Northing . Eol. Easting .
Note Vsl SD 3.5m OK. Port TB dead. Acoustics OK.
No Pulse8 stbd TB SPs 560-819 d/t RACAL computer crash.
Message SEQ 42. 1 BT 40F INFILL. Complete. No edits.
Coverage cols: 189-192 various groups.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0502-R Heading 90 deg.
Line Status Complete
Date started 26/08/89 Start Time 06:32 End Time 09:57
First File 100 First Reel 11654 Last File 1627 Last Reel 11667

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0504/197	100	0	0	1630	0	0.000Kms
0503/198	100	0	0	1630	0	0.000Kms
0502/199	100	100	1630	1630	1531	28.706Kms
0501/200	100	0	0	1630	0	0.000Kms
0500/201	100	0	0	1630	0	0.000Kms
0499/202	100	0	0	1630	0	0.000Kms
0498/203	100	0	0	1630	0	0.000Kms
0497/204	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. N force 2 Sea state 2 Swell dir. NW Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 35.0m. Ave Speed 4.5 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---==== DUAL STREAMER ====---

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 8.1 m.
Feather Sol. 0.6 P Eol. 1.6 P Max. 4.2 P

Accoustic Transponders:	1.0	SIG0/FR	1.0	SIGO/TL	0.0	STBD/ROT	.	PORT/ROT	101.0	TAIL/SEP	
Compass :	99.0	AVSEP/FR	101.0	AVSEP/MD	107.0	AVSEP/TL	0.7	DSTD/S13	1.0	DSTD/P13	
Tailbuoy :	8.9	MEANSD/S	.	MEANSD/P	5.0	SD>5M/S	.	SD>5M/P	.	TB SEP	

Dead Grp: None.

Noise: Low ambient noise all line.

Note Stability good. Compasses good/quiet.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires.
GM2B transmission errors: 32 - still very poor.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6082015.0 Sol. Easting 474120.0
Eol. Northing . Eol. Easting .
Note Vsl SD 4.0m OK. Port TB dead. Acoustics OK.
Cocktail solution in vsl fit from SP 882 d/t Hyperfix instability.
Message SEQ 33. 2 BT PRIME. Complete. EDIT GUN SEQ ERR SP774-776.
Port TB dead.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0490-R Heading 90 deg.
Line Status Complete
Date started 27/08/89 Start Time 07:46 End Time 11:15
First File 100 First Reel 11711 Last File 1630 Last Reel 11724

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0492/209	100	0	0	1630	0	0.000Kms
0491/210	100	0	0	1630	0	0.000Kms
0490/211	100	100	1630	1630	1531	28.706Kms
0489/212	100	0	0	1630	0	0.000Kms
0488/213	100	0	0	1630	0	0.000Kms
0487/214	100	0	0	1630	0	0.000Kms
0486/215	100	0	0	1630	0	0.000Kms
0485/216	100	0	0	1630	0	0.000Kms

---=== WEATHER ===---

Wind dir. ENE force 3 Sea state 4 Swell dir. NW Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 35.0m. Eol. 35.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---=== DUAL STREAMER ===---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 8.3 m.
Feather Sol. 0.0 S Eol. 0.0 S Max. 3.2 P

Accoustic Transponders:	1.1	SIG0/FR	2.7	SIGO/TL	0.1	STBD/ROT	.	PORT/ROT	112.0	TAIL/SEP	
Compass :	99.0	AVSEP/FR	103.0	AVSEP/MD	112.0	AVSEP/TL	0.9	DSTD/S13	1.5	DSTD/P13	
Tailbuoy :	11.1	MEANSD/S	.	MEANSD/P	0.0	SD>5M/S	.	SD>5M/P	.	TB SEP	

Dead Grp: None.

Noise: Low ambient noise all line.

Note Stability good. Compasses good/quiet.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires. GM20 Errors: 29.
EDIT BOTH BOATS STARBOARD GUNS (OVERSHOOTING) SPs 1181 - 1139.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6082013.0 Sol. Easting 474099.0
Eol. Northing 6082037. Eol. Easting 502763.0
Note Vsl SD 3.1m OK. Port TB dead. Acoustics OK.

Message SEQ 37. 2 BT PRIME. Complete. GUN SEQ PROBLEM LED TO EDIT
BOTH BOATS STARBOARD SOURCE SPs 1181 - 1239.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0490/R Heading 90 deg.
Line Status Fill-in
Date started 05/09/89 Start Time 15:33 End Time 16:40
First File 700 First Reel 12075 Last File 1181 Last Reel 12079

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0490/213	10700	10700	11181	11181	482	9.038Kms
/214	10700	0	0	11181	0	0.000Kms
/215	10700	0	0	11181	0	0.000Kms
/216	10700	0	0	11181	0	0.000Kms
/217	10700	0	0	11181	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

======== WEATHER ========

Wind dir. W force 2 Sea state 2 Swell dir. NIL Height 0 m

======== RECORDING ========

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 38.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 1 Misfires 1

========== DUAL STREAMER ==========

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 8.1 m.
Feather Sol. 2.5 P Eol. 1.1 P Max. 2.5 P

Accoustic Transponders:	1.1	SIG0/FR	1.4	SIG0/TL	0.0	STBD/ROT	0.2	PORT/ROT	103.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	102.0	AVSEP/MD	113.0	AVSEP/TL	0.6	DSTD/S13	0.6	DSTD/P13
Tailbuoy :	10.3	MEANSD/S	9.5	MEANSD/P	7.0	SD>5M/S	3.0	SD>5M/P	106.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note No misfires.
GM2B Errors 12.

====== NAVIGATION ======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6081786.0 Sol. Easting 485362.0
Eol. Northing . Eol. Easting .
Note Vsl SD 2.7m OK. TB nav adequate/marginal.
Acoustics not active in 3D d/t wide separation split synchronised shooting.
Message SEQ 69. 1 BT 20 FOLD INFILL. Complete. No edits.
Coverage cols: 213 - 217 various offset groups.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0490/R1 Heading 90 deg.
Line Status Fill-in
Date started 05/09/89 Start Time 16:48 End Time 17:42
First File 1240 First Reel 12080 Last File 1630 Last Reel 12083

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0490/213	11240	11240	11630	11630	391	7.331Kms
/214	11240	0	0	11630	0	0.000Kms
/215	11240	0	0	11630	0	0.000Kms
/216	11240	0	0	11630	0	0.000Kms
/217	11240	0	0	11630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

-------- WEATHER ========

Wind dir. W force 2 Sea state 2 Swell dir. NIL Height 0 m

---==== RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 36.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---------- DUAL STREAMER =========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 8.1 m.
Feather Sol. 1.3 P Eol. 1.2 S Max. 1.3 P

Accoustic Transponders:		1.1	SIG0/FR	1.4	SIGO/TL	0.0	STBD/ROT	0.2	PORT/ROT	103.0	TAIL/SEP
Compass	:	99.0	AVSEP/FR	102.0	AVSEP/MD	113.0	AVSEP/TL	0.6	DSTD/S13	0.6	DSTD/P13
Tailbuoy	:	10.3	MEANSD/S	9.5	MEANSD/P	7.0	SD>5M/S	3.0	SD>5M/P	106.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note No misfires.
GM2B Errors 10.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing . Sol. Easting .
Eol. Northing 6081946.0 Eol. Easting 602776.0
Note Vsl SD 2.7m OK. TB nav adequate/marginal.
Acoustics not active in 3D d/t wide separation split synchronised shooting.
Message SEQ 69. 1 BT 2B FOLD INFILL. Complete. No edits.
Coverage required cols: 213 - 217 various groups.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0490*R Heading 90 deg.
Line Status Reshoot
Date started 05/09/89 Start Time 16:40 End Time 16:48
First File 1182 First Reel 12079 Last File 1239 Last Reel 12080

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0490/213	11182	0	0	11239	0	0.000Kms
/214	11182	0	0	11239	0	0.000Kms
/215	11182	0	0	11239	0	0.000Kms
/216	11182	0	0	11239	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

======== WEATHER ========

Wind dir. W force 2 Sea state 2 Swell dir. NIL Height 0 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 38.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

========== DUAL STREAMER ==========

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 8.1 m.
Feather Sol. 1.1 P Eol. 1.3 P Max. 1.3 P

Accoustic Transponders:	1.1	SIG0/FR	1.4	SIGO/TL	0.0	STBD/ROT	0.2	PORT/ROT	103.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	102.0	AVSEP/MD	113.0	AVSEP/TL	0.6	DSTD/S13	0.6	DSTD/P13
Tailbuoy :	10.3	MEANSD/S	9.5	MEANSD/P	7.0	SD>5M/S	3.0	SD>5M/P	106.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

======= ENERGY SOURCE =======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.ni.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral seoaration 50m.Total output 45.7 bar metres

Note No misfires.
GM2B Errors 5.

======= NAVIGATION =======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,K7 F1,BORKUM F1,DAN-C,GORN-B,B11/2,
Secondary ,,,,,,,

Sol. Northing . Sol. Easting .
Eol. Northing . Eol. Easting .
Note Vsl SD 2.7m OK. TB nav adequate/marginal.
Acoustics not active in 3D d/t wide separation split synchronised shooting.
Message SEQ 69. 1 BT 20 FOLD RESHOOT. Complete. No edits.
Reshoot for seq 37 (27/08/89) gun sequence errors. Coverage cols: 213-216.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0478-R Heading 90 deg.
Line Status Complete
Date started 28/08/89 Start Time 08:42 End Time 12:19
First File 100 First Reel 11740 Last File 1630 Last Reel 11753

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0480/221	100	0	0	1630	0	0.000Kms
0479/222	100	0	0	1630	0	0.000Kms
0478/223	100	100	1630	1630	1531	28.706Kms
0477/224	100	0	0	1630	0	0.000Kms
0476/225	100	0	0	1630	0	0.000Kms
0475/226	100	0	0	1630	0	0.000Kms
0474/227	100	0	0	1630	0	0.000Kms
0473/228	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. NE force 6 Sea state 6 Swell dir. NE Height 3 m

======== RECORDING ========

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 35.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

========== DUAL STREAMER ==========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 4.0 m. Max. 8.5 m.
Feather Sol. 0.0 P Eol. 1.0 S Max. 1.4 S

Accoustic Transponders:	1.1	SIG0/FR	1.5	SIG0/TL	0.1	STBD/ROT	.	PORT/ROT	104.0	TAIL/SEP	
Compass :	105.0	AVSEP/FR	104.0	AVSEP/MD	99.0	AVSEP/TL	1.5	DSTD/S13	2.0	DSTD/P13	
Tailbuoy :	9.7	MEANSD/S	.	MEANSD/P	10.0	SD>5M/S	.	SD>5M/P	.	TB SEP	

Dead Grp: Trace S89 o/c - killed all line.

Noise: Considerable swell noise all line with 24 tr 30uB
& 6 tr 50uB peak 80/100uB (2s analysis). Pr uMAX.
Note Stability marginal but never more than 1 bird shallow.
Compasses very noisy in side sea swell.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires. GM20 Errors: 207 - major telemetry problem.

====== NAVIGATION ======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6081724.0 Sol. Easting 474115.0
Eol. Northing 6081749.0 Eol. Easting 502764.0
Note Vsl SD 2.6m OK. Port TB dead. Acoustics OK.
Cocktail in prime fit d/t Hyperfix instability. No lost shots.
Message SEQ 39. 2 BT PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0466-R Heading 90 deg.
Line Status Complete
Date started 30/08/89 Start Time 10:06 End Time 13:44
First File 100 First Reel 11827 Last File 1621 Last Reel 11840

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0468/233	100	0	0	1630	0	0.000Kms
0467/234	100	0	0	1630	0	0.000Kms
0466/235	100	100	1630	1630	1531	28.706Kms
0465/236	100	0	0	1630	0	0.000Kms
0464/237	100	0	0	1630	0	0.000Kms
0463/238	100	0	0	1630	0	0.000Kms
0462/239	100	0	0	1630	0	0.000Kms
0461/240	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. S force 2 Sea state 2 Swell dir. S Height 0 m

---==== RECORDING ======---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 35.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 7 Misfires 3

---------- DUAL STREAMER ----------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 8.0 m.
Feather Sol. 1.8 P Eol. 0.6 P Max. 2.2 P

Accoustic Transponders:		1.0	SIG0/FR	1.2	SIGO/TL	0.2	STBD/ROT	0.3	PORT/ROT	105.0	TAIL/SEP
Compass	:	100.0	AVSEP/FR	100.0	AVSEP/MD	109.0	AVSEP/TL	0.6	DSTD/S13	0.9	DSTD/P13
Tailbuoy	:	7.6	MEANSD/S	9.2	MEANSD/P	0.0	SD>5M/S	3.0	SD>5M/P	106.0	TB SEP

Dead Grp: Trace 589 o/c - killed all line.

Noise: Low ambient noise all line.

Note Stability OK. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP 379 531 671.
GM2B Errors: 28.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,R11/2,
Secondary ,,,,,,,

Sol. Northing 6081428.0 Sol. Easting 474087.0
Eol. Northing 6081422.0 Eol. Easting 492452.0

Note Vsl SD 3.8m OK. Good TB performance.
Several lost SPs on line d/t nav. Rho 7 SPs behind Sigma at EOL.
Message SEQ 46. 2 BT PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0454-R Heading 90 deg.
Line Status Complete
Date started 31/08/89 Start Time 10:49 End Time 14:28
First File 100 First Reel 11886 Last File 1627 Last Reel 11900

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0456/245	100	0	0	1630	0	0.000Kms
0455/246	100	0	0	1630	0	0.000Kms
0454/247	100	100	1630	1630	1531	28.706Kms
0453/248	100	0	0	1630	0	0.000Kms
0452/249	100	0	0	1630	0	0.000Kms
0451/250	100	0	0	1630	0	0.000Kms
0450/251	100	0	0	1630	0	0.000Kms
0449/252	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. NW force 4 Sea state 3 Swell dir. WNW Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 35.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

========== DUAL STREAMER ==========

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 7.8 m.
Feather Sol. 0.2 S Eol. 0.5 P Max. 2.3 P

Accoustic Transponders:	1.0	SIG0/FR	1.0	SIG0/TL	.	STBD/ROT	.	PORT/ROT	109.0	TAIL/SEP	
Compass :	99.0	AVSEP/FR	103.0	AVSEP/MD	116.0	AVSEP/TL	1.0	DSTD/S13	1.2	DSTD/P13	
Tailbuoy :	.	MEANSD/S	.	MEANSD/P	.	SD>5M/S	.	SD>5M/P	.	TB SEP	

Dead Grp: Trace S89 o/c - killed.

Noise: Low ambient noise all line.

Note Stability OK. Compasses good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires none.
GM20 Errors: 31.

====== NAVIGATION ======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6081114.0 Sol. Easting 474075.0
Eol. Northing 6081122.0 Eol. Easting 502772.0
Note Vsl SD 3.7m OK. Both OmniSeis & GRiD stats corrupted.

Message SEQ 50. 2 BT PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0442-R Heading 90 deg.
Line Status Complete
Date started 01/09/89 Start Time 11:31 End Time 15:11
First File 100 First Reel 11943 Last File 1626 Last Reel 11957

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0444/257	100	0	0	1630	0	0.000Kms
0443/258	100	0	0	1630	0	0.000Kms
0442/259	100	100	1630	1630	1531	28.706Kms
0441/260	100	0	0	1630	0	0.000Kms
0440/261	100	0	0	1630	0	0.000Kms
0439/262	100	0	0	1630	0	0.000Kms
0438/263	100	0	0	1630	0	0.000Kms
0437/264	100	0	0	1630	0	0.000Kms

---=== WEATHER ===---

Wind dir. NW force 3 Sea state 2 Swell dir. WNW Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 35.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 3

---=== DUAL STREAMER ===---

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 8.5 m.
Feather Sol. 1.2 S Eol. 0.1 S Max. 2.4 S

Accoustic Transponders:	1.2	SIGO/FR	1.5	SIGO/TL	0.2	STBD/ROT	0.3	PORT/ROT	106.0	TAIL/SEP
Compass :	100.0	AVSEP/FR	104.0	AVSEP/MD	113.0	AVSEP/TL	0.9	DSTD/S13	1.1	DSTD/P13
Tailbuoy :	11.5	MEANSD/S	11.2	MEANSD/P	0.0	SD>5M/S	5.0	SD>5M/P	110.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise on line.

Note Stability OK. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP 1150 1586 & 1600.
GM20 Errors: 32 - poor telemetry again.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,

Sol. Northing 6080830.0 Sol. Easting 474105.0
Eol. Northing 6080830.0 Eol. Easting 502781.0
Note Vsl SD 3.2m OK. No Pulse8 lock SP142-160. Acoustics OK.

Message SEQ 54. 2 BT PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0442/R Heading 90 deg.
Line Status Fill-in
Date started 05/09/89 Start Time 01:55 End Time 03:50
First File 1100 First Reel 12046 Last File 1900 Last Reel 12053

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0442/264	10100	0	0	10900	0	0.000Kms
/265	10100	0	0	10900	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

======== WEATHER ========

Wind dir. W force 2 Sea state 2 Swell dir. NIL Height 0 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 37.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 6

========== DUAL STREAMER ==========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 8.1 m.
Feather Sol. 1.3 S Eol. 0.3 S Max. 2.3 S

Accoustic Transponders:	0.0	SIG0/FR	1.1	SIG0/TL	0.0	STBD/ROT	0.2	PORT/ROT	97.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	100.0	AVSEP/MD	106.0	AVSEP/TL	0.7	DSTD/S13	0.7	DSTD/P13
Tailbuoy :	14.0	MEANSD/S	11.0	MEANSD/P	14.0	SD>5M/S	10.0	SD>5M/P	100.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note Misfires SPs 10109 10379 10383 10387 10391 10445.
Gun S1/3 drifting - disabled SP 10395-EOL. GM20 Errors 9 - poor telemetry.

====== NAVIGATION ======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6080605.0 Sol. Easting 473948.0
Eol. Northing 6081022.2 Eol. Easting 502775.0
Note Vsl SD 1.4m OK. TB nav poor. Acoustics OK.
Acoustics not active in 3D d/t wide separation split synchronised shooting.
Message SEQ 67. 1 BT 20 FOLD INFILL. Complete. No edit. (GECO A/C).
Cols: 264-265. FILE NOS. 1000 HIGH D/T OPERATOR ERROR.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0442*R Heading 90 deg.
Line Status Reshoot
Date started 05/09/89 Start Time 04:22 End Time 05:34
First File 2114 First Reel 12055 Last File 2630 Last Reel 12060

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0442/254	11114	0	0	11630	0	0.000Kms
/255	11114	0	0	11630	0	0.000Kms
/256	11114	0	0	11630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ====----

Wind dir. W force 2 Sea state 2 Swell dir. NIL Height 0 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 36.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 4

----==== DUAL STREAMER ====----

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.3 m. Max. 8.1 m.
Feather Sol. 0.3 S Eol. 0.3 S Max. 2.3 S

Accoustic Transponders:	0.0	SIG0/FR	1.1	SIG0/TL	0.0	STBD/ROT	0.2	PORT/ROT	97.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	100.0	AVSEP/MD	106.0	AVSEP/TL	0.7	DSTD/S13	0.7	DSTD/P13
Tailbuoy :	14.0	MEANSD/S	11.8	MEANSD/P	14.0	SD>5M/S	10.0	SD>5M/P	100.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.ni.arrays each comprising 3 sub arrays of 6 elements
each.Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SPs 11233 11280 11585.
GM20 Errors 11 - poor telemetry.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,811/2,
Secondary ,,,,,,,

Sol. Northing 6080605.0 Sol. Easting 473948.0
Eol. Northing 6081022.2 Eol. Easting 502775.0
Note Vsl SD 1.4m OK. TB nav poor. Np Pulse8 SOL - SP11360.
Acoustics not active in 3D d/t wide separation split synchronised shooting.
Message SEQ 67. 1 BT 20 FOLD RESHOOT. Complete. No edits.
Reshoot for Sigma stbd guns seq 54. FILE NOS. 1000 HIGH (OPERATOR ERROR).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0430-R Heading 90 deg.
Line Status Complete
Date started 04/09/89 Start Time 01:20 End Time 04:58
First File 100 First Reel 11993 Last File 1630 Last Reel 12007

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0432/269	100	0	0	1630	0	0.000Kms
0431/270	100	0	0	1630	0	0.000Kms
0430/271	100	100	1630	1630	1531	28.706Kms
0429/272	100	0	0	1630	0	0.000Kms
0428/273	100	0	0	1630	0	0.000Kms
0427/274	100	0	0	1630	0	0.000Kms
0426/275	100	0	0	1630	0	0.000Kms
0425/276	100	0	0	1630	0	0.000Kms

-------==== WEATHER ========

Wind dir. NW force 4 Sea state 3 Swell dir. NW Height 1 m

-------=== RECORDING ======---

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 36.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 6

----------===== DUAL STREAMER ====------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 8.1 m.
Feather Sol. 1.7 S Eol. 0.4 S Max. 2.1 S

Accoustic Transponders:	1.2	SIG0/FR	.	SIGO/TL	0.1	STBD/ROT	0.1	PORT/ROT	.	TAIL/SEP	
Compass :	99.0	AVSEP/FR	105.0	AVSEP/MD	112.0	AVSEP/TL	0.7	DSTD/S13	0.9	DSTD/P13	
Tailbuoy :	13.6	MEANSD/S	11.2	MEANSD/P	15.0	SD>5M/S	10.0	SD>5M/P	104.0	TB SEP	

Dead Grp: Trace S89 o/c - killed all line.

Noise: Low ambient noise all line.

Note Cable stability good. Compasses good.

------=== ENERGY SOURCE ======---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SPs 329 463 627 639 651.
Multiplexer problem on Sigma led to no GM28 telemetry SPs 286-371.

------=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,GORM-B,B11/2,
Secondary ,,,,,,

Sol. Northing 6080538.0 Sol. Easting 474105.0
Eol. Northing 6080536.0 Eol. Easting 502743.0

Note Vsl SD 4.8m OK. TB Pulse8 poor. T1 ac. bad - no S3R4.
3D link fail SP 284-378 (check coverage).

Message SEQ 62. 2 BT PRIME. Complete. No Rho edits.
Check coverage for 3D link failure SPs 284-378.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0418-R Heading 90 deg.
Line Status Complete
Date started 04/09/89 Start Time 13:42 End Time 17:18
First File 100 First Reel 12023 Last File 1630 Last Reel 12037

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0420/281	100	0	0	1630	0	0.000Kms
0419/282	100	0	0	1630	0	0.000Kms
0418/283	100	100	1630	1630	1531	28.706Kms
0417/284	100	0	0	1630	0	0.000Kms
0416/285	100	0	0	1630	0	0.000Kms
0415/286	100	0	0	1630	0	0.000Kms
0414/287	100	0	0	1630	0	0.000Kms
0413/288	100	0	0	1630	0	0.000Kms

---=== WEATHER ===---

Wind dir. VAR force 1 Sea state 2 Swell dir. NIL Height 0 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 39.0m. Eol. 36.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 5

---=== DUAL STREAMER ===---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 8.3 m.
Feather Sol. 1.0 S Eol. 1.7 P Max. 2.1 P

Accoustic Transponders:	1.5	SIG0/FR	0.9	SIG0/TL	0.2	STBD/ROT	0.4	PORT/ROT	104.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	102.0	AVSEP/MD	112.0	AVSEP/TL	0.4	DSTD/S13	0.6	DSTD/P13
Tailbuoy :	10.3	MEANSD/S	10.0	MEANSD/P	7.0	SD>5M/S	3.0	SD>5M/P	140.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.

Note Cable stability good. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires 5 - SPs 873 1499 1503 1507 1511. S1/3 off SP1515.
EDIT GUNSEQ ERR SP 1513. GM2B Errors 36 - poor telemetry.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6080222.0 Sol. Easting 474092.0
Eol. Northing 6080216.0 Eol. Easting 502765.0
Note Vsl SD 2.3m OK. TB nav adequate. Acoustics OK.

Message SEQ 64. 2 BT PRIME. Complete. EDIT GUNSEQ ERR SP 1513(S).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0406-R Heading 90 deg.
Line Status Complete
Date started 06/09/89 Start Time 02:21 End Time 06:04
First File 100 First Reel 12098 Last File 1630 Last Reel 12112

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0408/293	100	0	0	1630	0	0.000Kms
0407/294	100	0	0	1630	0	0.000Kms
0406/295	100	100	1630	1630	1531	28.706Kms
0405/296	100	0	0	1630	0	0.000Kms
0404/297	100	0	0	1630	0	0.000Kms
0403/298	100	0	0	1630	0	0.000Kms
0402/299	100	0	0	1630	0	0.000Kms
0401/300	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. W force 5 Sea state 3 Swell dir. W Height 1 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 39.0m. Eol. 37.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 2

========== DUAL STREAMER ==========

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.1 m. Max. 8.2 m.
Feather Sol. 0.3 S Eol. 1.7 S Max. 2.9 S

Accoustic Transponders:		0.0	SIG0/FR	1.0	SIG0/TL	0.1	STBD/ROT	0.2	PORT/ROT	88.0	TAIL/SEP
Compass	:	99.0	AVSEP/FR	100.0	AVSEP/MD	103.0	AVSEP/TL	1.0	DSTD/S13	1.3	DSTD/P13
Tailbuoy	:	15.0	MEANSD/S	11.0	MEANSD/P	15.0	SD>5M/S	0.0	SD>5M/P	92.0	TB SEP

Dead Grp: Trace S98 weak all line.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good except S13 6 rejected readings and P27 18 rejected readings.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SPs 899 & 903.
GM2B Errors 38.

====== NAVIGATION ======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6079948.0 Sol. Easting 474100.0
Eol. Northing 6079933.0 Eol. Easting 502768.0
Note Vsl SD 3.0m OK. TB nav OK. Acoustics OK.

Message SEQ 71. 2 BT PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0394-R Heading 270 deg.
Line Status Complete
Date started 04/09/89 Start Time 07:32 End Time 11:05
First File 100 First Reel 12008 Last File 1630 Last Reel 12022

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0400/301	10100	0	0	11630	0	0.000Kms
0399/302	10100	0	0	11630	0	0.000Kms
0398/303	10100	0	0	11630	0	0.000Kms
0397/304	10100	0	0	11630	0	0.000Kms
0396/305	10100	0	0	11630	0	0.000Kms
0395/306	10100	0	0	11630	0	0.000Kms
0394/307	10100	10100	11630	11630	1531	28.706Kms
0393/308	10100	0	0	11630	0	0.000Kms

---==== WEATHER ====---

Wind dir. NW force 2 Sea state 2 Swell dir. NW Height 0 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 7

----==== DUAL STREAMER ====----

2x12000x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 8.1 m.
Feather Sol. 1.2 P Eol. 0.3 P Max. 2.3 S

Accoustic Transponders:	0.7	SIG0/FR	1.7	SIGO/TL	0.1	STBD/ROT	0.1	PORT/ROT	.	TAIL/SEP
Compass :	99.0	AVSEP/FR	97.0	AVSEP/MD	103.0	AVSEP/TL	0.7	DSTD/S13	0.0	DSTD/P13
Tailbuoy :	9.7	MEANSD/S	11.2	MEANSD/P	3.0	SD>5M/S	0.0	SD>5M/P	94.5	TB SEP

Dead Grp: Trace S89 o/c - killed all line.

Noise: Low ambient noise all line.

Note Cable stability good. Compasses good.
Rho port streamer front end LF towing noise to 20uB (6-8Hz).

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note GUN P3/2(290) off all line. GUN P3/5(90) off SP10133-EOL.
Port volume 2782 just in spec. GM20 Errors: 38 - poor telemetry.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,

Sol. Northing 6079831.0 Sol. Easting 500971.0
Eol. Northing . Eol. Easting .
Note Vsl SD 2.4m OK. TB Pulse8 OK.
Tailnet acoustics bad with S3R4 dead.
Message SEQ 63. 2 BT PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0382-R Heading 270 deg.
Line Status Complete
Date started 01/09/89 Start Time 05:21 End Time 09:00
First File 100 First Reel 11929 Last File 1629 Last Reel 11942

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0388/313	100	0	0	1630	0	0.000Kms
0387/314	100	0	0	1630	0	0.000Kms
0386/315	100	0	0	1630	0	0.000Kms
0385/316	100	0	0	1630	0	0.000Kms
0384/317	100	0	0	1630	0	0.000Kms
0383/318	100	0	0	1630	0	0.000Kms
0382/319	100	100	1630	1630	1531	28.706Kms
0381/320	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. NW force 3 Sea state 3 Swell dir. WNW Height 1 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 8

----==== DUAL STREAMER ====----

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.8 m. Max. 8.2 m.
Feather Sol. 1.4 S Eol. 0.9 S Max. 2.1 S

Accoustic Transponders:	1.1	SIGO/FR	1.3	SIGO/TL	0.1	STBD/ROT	0.1	PORT/ROT	102.0	TAIL/SEP	
Compass :	99.0	AVSEP/FR	98.0	AVSEP/MD	103.0	AVSEP/TL	0.9	DSTD/S13	1.3	DSTD/P13	
Tailbuoy :	10.7	MEANSD/S	9.9	MEANSD/P	8.0	SD>5M/S	5.0	SD>5M/P	96.0	TB SEP	

Dead Grp: Trace 589 o/c - killed.

Noise: Low ambient noise on line.

Note Stability OK. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP 113 473 709 749 869 885 all gun S2/5 which was disabled SP 889-EOL. GM28 Errors: 29 - poor telemetry again.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6078535.0 Sol. Easting 500965.0
Eol. Northing 6079506.0 Eol. Easting 472305.0
Note Vsl SD 235.2m OK. TB nav adequate. Acoustics OK.

Message SEQ 53. 2 BT PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0370-R Heading 270 deg.
Line Status Complete
Date started 31/08/89 Start Time 04:38 End Time 08:17
First File 100 First Reel 11871 Last File 1630 Last Reel 11885

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0376/325	100	0	0	1630	0	0.000Kms
0375/326	100	0	0	1630	0	0.000Kms
0374/327	100	0	0	1630	0	0.000Kms
0373/328	100	0	0	1630	0	0.000Kms
0372/329	100	0	0	1630	0	0.000Kms
0371/330	100	0	0	1630	0	0.000Kms
0370/331	100	100	1630	1630	1531	28.706Kms
0369/332	100	0	0	1630	0	0.000Kms

-------- WEATHER --------

Wind dir. S force 4 Sea state 3 Swell dir. S Height 1 m

------- RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---------- DUAL STREAMER ----------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.8 m. Max. 8.1 m.
Feather Sol. 2.2 S Eol. 0.0 S Max. 3.8 P

Accoustic Transponders:	1.2	SIG0/FR	2.2	SIG0/TL	0.1	STBD/ROT	0.1	PORT/ROT	103.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	100.0	AVSEP/MD	104.0	AVSEP/TL	1.0	DSTD/S13	1.6	DSTD/P13
Tailbuoy :	10.3	MEANSD/S	9.9	MEANSD/P	6.0	SD>5M/S	5.0	SD>5M/P	96.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.

Note Stability OK. Compasses good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires none.
GM20 Errors: 28.

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6079239.0 Sol. Easting 500979.0
Eol. Northing 6079230.0 Eol. Easting 472315.0
Note Vsl SD 2.0m OK. TB nav OK. Acoustics OK.

Message SEQ 49. 2 BT PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0370/R Heading 270 deg.
Line Status Fill-in
Date started 05/09/89 Start Time 20:09 End Time 00:06
First File 100 First Reel 12084 Last File 1616 Last Reel 12097

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0370/324	10100	10100	11630	11630	1531	28.706Kms
/325	10100	0	0	11630	0	0.000Kms
/326	10100	0	0	11630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

WEATHER

Wind dir. W force 3 Sea state 2 Swell dir. NIL Height 0 m

RECORDING

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 3.9 Kts.
Parity Errors 0 No Data Record 8 Misfires 5

DUAL STREAMER

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.8 m. Max. 8.3 m.
Feather Sol. 1.4 P Eol. 1.2 P Max. 3.5 S

Accoustic Transponders:	1.1	SIG0/FR	1.4	SIGO/TL	.	STBD/ROT	.	PORT/ROT	100.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	103.0	AVSEP/MD	106.0	AVSEP/TL	1.0	DSTD/S13	1.5	DSTD/P13
Tailbuoy :	21.0	MEANSD/S	14.3	MEANSD/P	30.0	SD>5M/S	15.0	SD>5M/P	96.0	TB SEP

Dead Grp: Traces S89 & S109 killed all line.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

ENERGY SOURCE

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note Misf. SP 10275 10279 10291 10351 10359. S1/5 out 10362-EOL.
GM20 Errors 34. EDIT GUNSEQ ERRS SPs 10261-10263 & 10314.

NAVIGATION

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6079255.0 Sol. Easting 500964.0
Eol. Northing 6079304.0 Eol. Easting 472302.0
Note Vsl SD 2.5m OK. TB nav very poor. Tailnet F3R1 intermittent
Ac. off in 3D d/t wide sep. split synch. shooting. Lost SPs d/t Sigma nav.
Message SEQ 70. 1 BT 20 FOLD INFILL. Complete. EDIT GUNSEQ ERRS SPs 10261-10263 & 10314. Coverage required cols: 324 - 326 various groups.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0358-R Heading 270 deg.
Line Status Complete
Date started 30/08/89 Start Time 03:53 End Time 07:29
First File 100 First Reel 11813 Last File 1619 Last Reel 11826

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0364/337	100	0	0	1630	0	0.000Kms
0363/338	100	0	0	1630	0	0.000Kms
0362/339	100	0	0	1630	0	0.000Kms
0361/340	100	0	0	1630	0	0.000Kms
0360/341	100	0	0	1630	0	0.000Kms
0359/342	100	0	0	1630	0	0.000Kms
0358/343	100	100	1630	1630	1531	28.706Kms
0357/344	100	0	0	1630	0	0.000Kms

-------==== WEATHER ========----

Wind dir. SSW force 3 Sea state 3 Swell dir. SW Height 1 m

-------=== RECORDING =======---

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 7 Misfires 3

----------==== DUAL STREAMER ==========

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 7.9 m.
Feather Sol. 1.0 S Eol. 0.3 S Max. 4.2 P

Accoustic Transponders:	0.9	SIG0/FR	2.0	SIGO/TL	0.1	STBD/ROT	0.1	PORT/ROT	107.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	98.0	AVSEP/MD	104.0	AVSEP/TL	0.0	DSTD/S13	1.1	DSTD/P13
Tailbuoy :	15.2	MEANSD/S	10.0	MEANSD/P	20.0	SD>5M/S	7.0	SD>5M/P	102.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.

Note Stability OK. Compasses good.

---=== ENERGY SOURCE ======---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP 567 603 631. EDIT GUNSEQ SP621-623 & 684.
GM2B Errors: 26.

---=== NAVIGATION ======---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6078900.0 Sol. Easting 500975.0
Eol. Northing 6078932.0 Eol. Easting 472300.0
Note Vsl SD 3.6m OK. Stbd TB poor/noisy.
Several lost SPs on line d/t nav.
Message SEQ 45. 2 BT PRIME. Complete. EDIT GUN SEQ SP621-623(S) &
684.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0346-R Heading 270 deg.
Line Status Complete
Date started 27/08/89 Start Time 01:16 End Time 04:51
First File 100 First Reel 11697 Last File 1623 Last Reel 11710

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0348/353	100	0	0	1630	0	0.000Kms
0347/354	100	0	0	1630	0	0.000Kms
0346/355	100	100	1630	1630	1531	28.706Kms
0345/356	100	0	0	1630	0	0.000Kms
0344/357	100	0	0	1630	0	0.000Kms
0343/358	100	0	0	1630	0	0.000Kms
0342/359	100	0	0	1630	0	0.000Kms
0341/360	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. ENE force 4 Sea state 3 Swell dir. NNW Height 1 m

------- RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 6 Misfires 0

---------- DUAL STREAMER ----------

2x12ex25agrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.1 m. Max. 7.9 m.
Feather Sol. 0.3 P Eol. 0.4 P Max. 2.4 P

Accoustic Transponders:	1.2	SIG0/FR	3.1	SIGO/TL	0.1	STBD/ROT	.	PORT/ROT	103.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	98.0	AVSEP/MD	102.0	AVSEP/TL	0.0	DSTD/S13	0.0	DSTD/P13
Tailbuoy :	15.6	MEANSD/S	.	MEANSD/P	17.0	SD>5M/S	.	SD>5M/P	.	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.

Note Stability good. Compasses good/quiet.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires. GN20 Errors: 35 - very poor telemetry again.
EDIT GUN SEQ ERRS SPs 543 - 547(S).

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6078635.0 Sol. Easting 500946.0
Eol. Northing 6078631.0 Eol. Easting 472298.0

Note Vsl SD 6.4m OK. Port TB dead. Acoustics OK.
Cocktail in prime fit d/t Hyperfix instability.
Message SEQ 36. 2 BT PRIME. Complete. EDIT GUN SEQ ERR SP 543-547.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0346/R Heading 270 deg.
Line Status Fill-in
Date started 29/08/89 Start Time 06:04 End Time 07:32
First File 1029 First Reel 11769 Last File 1622 Last Reel 11774

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0346/349	1029	0	0	1630	0	0.000Kms
/350	1029	0	0	1630	0	0.000Kms
/351	1029	0	0	1630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---=== WEATHER ===---

Wind dir. NW force 4 Sea state 3 Swell dir. NW Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 39.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 6 Misfires 6

---=== DUAL STREAMER ===---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 8.1 m.
Feather Sol. 1.5 S Eol. 2.0 S Max. 2.3 S

Accoustic Transponders:		0.0	SIGO/FR	1.0	SIGO/TL	0.3	STBD/ROT	.	PORT/ROT	.	TAIL/SEP
Compass	:	100.0	AVSEP/FR	90.0	AVSEP/MD	105.0	AVSEP/TL	0.9	DSTD/S13	1.3	DSTD/P13
Tailbuoy	:	7.3	MEANSD/S	.	MEANSD/P	2.0	SD>5M/S	.	SD>5M/P	.	TB SEP

Dead Grp: Trace S89 o/c - killed all line.

Noise: Low ambient noise all line.

Note Cable stability good. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note Misfires 6 - SPs 1195 1199 1201 1243 1249 1253.
EDIT NO PORT GUNS FIRING SPs 1046 - 1086.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6078620.0 Sol. Easting 483270.0
Eol. Northing 6078625.0 Eol. Easting 472324.0
Note Vsl SD 1.0m OK. Port TB Pulse8 dead.
EDIT NO NAV RUNNING SPs 1029 - 1045.
Message SEQ 41. 1 BT INFILL. Complete. EDIT ALL NAV SP 1029-1045.
EDIT NO PORT GUNS FIRING SPs 1029-1086. Port TB dead.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0334-R Heading 270 deg.
Line Status Complete
Date started 26/08/89 Start Time 00:00 End Time 03:31
First File 100 First Reel 11640 Last File 1628 Last Reel 11653

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0340/361	100	0	0	1630	0	0.000Kms
0339/362	100	0	0	1630	0	0.000Kms
0338/363	100	0	0	1630	0	0.000Kms
0337/364	100	0	0	1630	0	0.000Kms
0336/365	100	0	0	1630	0	0.000Kms
0335/366	100	0	0	1630	0	0.000Kms
0334/367	100	100	1630	1630	1531	28.706Kms
0333/368	100	0	0	1630	0	0.000Kms

---==== WEATHER ========

Wind dir. NW force 3 Sea state 2 Swell dir. NW Height 1 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 35.0m. Eol. 39.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

----==== DUAL STREAMER ====----

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 7.9 m.
Feather Sol. 1.0 P Eol. 0.0 P Max. 3.2 P

Accoustic Transponders:		1.0	SIG0/FR	1.3	SIG0/TL	0.0	STBD/ROT	.	PORT/ROT	107.0	TAIL/SEP
Compass	:	99.0	AVSEP/FR	102.0	AVSEP/MD	108.0	AVSEP/TL	1.0	DSTD/S13	1.3	DSTD/P13
Tailbuoy	:	13.8	MEANSD/S	.	MEANSD/P	15.0	SD>5M/S	.	SD>5M/P	.	TB SEP

Dead Grp: Trace 571 killed all line - open circuit.

Noise: Occasional low level breakout on line.

Note Stability good. Compasses good/quiet.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires.
GM20 transmission errors: 31 - still very poor.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6078352.0 Sol. Easting 500963.0
Eol. Northing 6078350.0 Eol. Easting 472311.0
Note Vsl SD 2.1m OK. Port TB dead. Acoustics OK.

Message SEQ 32. 2 BT PRIME. Complete. No Rho Edits.
Port TB dead.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0322-R Heading 270 deg.
Line Status Complete
Date started 22/08/89 Start Time 14:29 End Time 17:51
First File 100 First Reel 11587 Last File 1621 Last Reel 11600

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0328/373	100	0	0	1630	0	0.000Kms
0327/374	100	0	0	1630	0	0.000Kms
0326/375	100	0	0	1630	0	0.000Kms
0325/376	100	0	0	1630	0	0.000Kms
0324/377	100	0	0	1630	0	0.000Kms
0323/378	100	0	0	1630	0	0.000Kms
0322/379	100	100	1630	1630	1531	28.706Kms
0321/380	100	0	0	1630	0	0.000Kms

---=== WEATHER ===---

Wind dir. W force 5 Sea state 4 Swell dir. W Height 2 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 6 Misfires 9

---=== DUAL STREAMER ===---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 1.7 m. Max. 8.1 m.
Feather Sol. 2.0 S Eol. 1.0 P Max. 3.5 S

Accoustic Transponders:	0.5	SIG0/FR	0.0	SIGO/TL	0.2	STBD/ROT	0.3	PORT/ROT	104.0	TAIL/SEP
Compass :	101.0	AVSEP/FR	98.0	AVSEP/MD	106.0	AVSEP/TL	1.1	DSTD/S13	1.4	DSTD/P13
Tailbuoy :	6.5	MEANSD/S	12.3	MEANSD/P	3.0	SD>5M/S	11.0	SD>5M/P	100.0	TB SEP

Dead Grp: Trace S60 spiking - killed all line.
Trace P17 occasionally noisy.
Noise: Some swell breakout on line.

Note Port cable depthkeeping OK. EDIT RHO STBD CABLE SHALLOW SPs 1500-1590. Compasses OK.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Rho misfires 9. EDIT ALL FOR GUNS (Sigma autofires & Rho misfires SPs 100-130. GM20 Errors: 31.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6078022.0 Sol. Easting 500956.0
Eol. Northing 6078041.0 Eol. Easting 472417.0
Note Vsl SD 3.3m OK. TB nav OK. Acoustics OK.

Message SEQ 27. PRIME. Complete. EDIT ALL (GUNS) SPs 100-130.
EDIT RHO STBD CABLE (SHALLOW) SPs 1500-1590. EDIT GUN SEQ ERR 1043-1047.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0322/R Heading 270 deg.
Line Status Fill-in
Date started 05/09/89 Start Time 08:06 End Time 11:22
First File 100 First Reel 12061 Last File 1499 Last Reel 12073

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0322/372	10100	10100	11499	11499	1400	26.250Kms
/373	10100	0	0	11499	0	0.000Kms
/374	10100	0	0	11499	0	0.000Kms
/375	10100	0	0	11499	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

======== WEATHER ========

Wind dir. W force 2 Sea state 2 Swell dir. NIL Height 0 m

======= RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 40.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 6

========== DUAL STREAMER ==========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 8.9 m.
Feather Sol. 0.5 P Eol. 2.8 S Max. 2.8 S

Accoustic Transponders:	13.0	SIG0/FR	.	SIG0/TL	0.0	STBD/ROT	0.2	PORT/ROT	98.0	TAIL/SEP	
Compass :	99.0	AVSEP/FR	99.0	AVSEP/MD	103.0	AVSEP/TL	0.0	DSTD/S13	1.2	DSTD/P13	
Tailbuoy :	14.1	MEANSD/S	21.0	MEANSD/P	0.0	SD>5M/S	0.0	SD>5M/P	93.0	TB SEP	

Dead Grp: None.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

===== ENERGY SOURCE =====

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note Misfires SPs 10103 10537 10541 10545 10561 10781 10833.
AUTOFIRE SP 10529 EDIT. Gun S1/3 off SP10565-EOL. GM20 Errors 11.

======= NAVIGATION =======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6078008.0 Sol. Easting 500956.0
Eol. Northing . Eol. Easting .
Note Vsl SD 2.7m OK. TB nav poor. No Pulse8 SP10314-10536.
Acoustics not active in 3D d/t wide separation split synchronised shooting.
Message SEQ 68. 1 BT 20 FOLD INFILL. Complete.
EDIT AUTOFIRE SP10529. Coverage cols: 372-375.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0322*R Heading 270 deg.
Line Status Reshoot
Date started 05/09/89 Start Time 11:22 End Time 11:38
First File 1500 First Reel 12073 Last File 1630 Last Reel 12074

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0322/372	11500	0	0	11630	0	0.000Kms
/373	11500	0	0	11630	0	0.000Kms
/374	11500	0	0	11630	0	0.000Kms
/375	11500	0	0	11630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

-------- WEATHER ========

Wind dir. W force 2 Sea state 2 Swell dir. NIL Height 0 m

------ RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 40.0m. Eol. 41.0m. Ave Speed 5.0 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---------- DUAL STREAMER ---------

2x12@x25agrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 8.1 m.
Feather Sol. 2.8 S Eol. 1.7 P Max. 3.2 S

Accoustic Transponders:	13.0	SIG0/FR	.	SIGO/TL	0.0	STBD/ROT	0.2	PORT/ROT	98.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	99.0	AVSEP/MD	103.0	AVSEP/TL	0.0	DSTD/S13	1.2	DSTD/P13
Tailbuoy :	14.1	MEANSD/S	21.0	MEANSD/P	0.0	SD>5M/S	0.0	SD>5M/P	93.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

------ ENERGY SOURCE ---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.ni.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires.

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing . Sol. Easting .
Eol. Northing . Eol. Easting .

Note Vsl SD 2.7m OK. TB nav poor.
Acoustics not active in 3D d/t wide separation split synchronised shooting.
Message SEQ 68. 1 BT 20 FOLD RESHOOT. Complete. No edits.
Reshoot for Rho stbd cable seq 27 (22/08/89). Coverage cols: 372-375.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0310-R Heading 270 deg.
Line Status Complete
Date started 21/08/89 Start Time 13:41 End Time 17:04
First File 100 First Reel 11531 Last File 1628 Last Reel 11544

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0316/385	100	0	0	1630	0	0.000Kms
0315/386	100	0	0	1630	0	0.000Kms
0314/387	100	0	0	1630	0	0.000Kms
0313/388	100	0	0	1630	0	0.000Kms
0312/389	100	0	0	1630	0	0.000Kms
0311/390	100	0	0	1630	0	0.000Kms
0310/391	100	100	1630	1630	1531	28.706Kms
0309/392	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. W force 4 Sea state 3 Swell dir. W Height 1 m

------- RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 2 Misfires 0

---------- DUAL STREAMER =========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.4 m. Max. 8.4 m.
Feather Sol. 2.0 S Eol. 0.0 S Max. 3.6 S

Accoustic Transponders:		0.7	SIG0/FR	0.9	SIG0/TL	0.3	STBD/ROT	0.4	PORT/ROT	100.0	TAIL/SEP
Compass	:	101.0	AVSEP/FR	103.0	AVSEP/MD	109.0	AVSEP/TL	1.4	DSTD/S13	1.5	DSTD/P13
Tailbuoy	:	6.0	MEANSD/S	12.3	MEANSD/P	1.0	SD>5M/S	10.0	SD>5M/P	102.0	TB SEP

Dead Grp: Trace 560 spiking - killed all line.

Noise: Low ambient noise all line.

Note Stability good. Compass/birds quiet/good.

------ ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No Rho misfires. EDIT GUN SEQ ERRS SP 672(S) only.
GM2B Errors: 31.

------ NAVIGATION ======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,K7 F2,DAN-C,
Secondary ,,,,,,,

Sol. Northing 6077708.0 Sol. Easting 500979.0
Eol. Northing 6077718.0 Eol. Easting 472303.0
Note VSL SD 3.9m OK. TB nav OK. Acoustics OK.

Message SEQ 23. PRIME. Complete. EDIT GUN SEQ ERRS SP 672(S) only.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0298-R Heading 270 deg.
Line Status Complete
Date started 20/08/89 Start Time 12:55 End Time 16:14
First File 100 First Reel 11474 Last File 1630 Last Reel 11487

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0304/397	100	0	0	1630	0	0.000Kms
0303/398	100	0	0	1630	0	0.000Kms
0302/399	100	0	0	1630	0	0.000Kms
0301/400	100	0	0	1630	0	0.000Kms
0300/401	100	0	0	1630	0	0.000Kms
0299/402	100	0	0	1630	0	0.000Kms
0298/403	100	100	1630	1630	1531	28.706Kms
0297/404	100	0	0	1630	0	0.000Kms

======== WEATHER ========

Wind dir. S force 3 Sea state 3 Swell dir. SW Height 1 m

======== RECORDING ========

Magnetometer N Gravity N
Water depth Sol. 35.0m. Eol. 39.0m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 0 Misfires 3

========== DUAL STREAMER ==========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.1 m. Max. 8.3 m.
Feather Sol. 2.0 S Eol. 2.0 S Max. 5.1 P

Accoustic Transponders:	1.1	SIGO/FR	5.4	SIGO/TL	0.3	STBD/ROT	0.3	PORT/ROT	105.0	TAIL/SEP
Compass :	100.0	AVSEP/FR	95.0	AVSEP/MD	101.0	AVSEP/TL	0.5	DSTD/S13	0.6	DSTD/P13
Tailbuoy :	7.13	MEANSD/S	10.37	MEANSD/P	3.0	SD>5M/S	5.0	SD>5M/P	105.0	TB SEP

Dead Grp: Trace S60 spiking - killed all line.

Noise: Low ambient noise all line.

Note Stability good. Compass/birds quiet/good.

====== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SPs 289 293 &1609.
GM28 Errors: 10.

====== NAVIGATION ======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,K7 F2,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6077415.0 Sol. Easting 500993.0
Eol. Northing 6077403.0 Eol. Easting 472275.0
Note VSL SD 1.8m good. TB nav OK. Acoustics OK.

Message SEQ 19. PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0286-R Heading 270 deg.
Line Status Complete
Date started 19/08/89 Start Time 12:10 End Time 15:33
First File 100 First Reel 11418 Last File 1594 Last Reel 11430

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0292/409	100	0	0	1630	0	0.000Kms
0291/410	100	0	0	1630	0	0.000Kms
0290/411	100	0	0	1630	0	0.000Kms
0289/412	100	0	0	1630	0	0.000Kms
0288/413	100	0	0	1630	0	0.000Kms
0287/414	100	0	0	1630	0	0.000Kms
0286/415	100	100	1630	1630	1531	28.706Kms
0285/416	100	0	0	1630	0	0.000Kms

-------==== WEATHER ====-----

Wind dir. S force 3 Sea state 3 Swell dir. W Height 1 m

-------=== RECORDING ===-----

Magnetometer N Gravity N
Water depth Sol. 35.0m. Eol. 39.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 5 Misfires 0

----------==== DUAL STREAMER ====---------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.2 m. Max. 8.1 m.
Feather Sol. 2.0 S Eol. 2.0 S Max. 5.1 S

Accoustic Transponders:	1.3	SIG0/FR	2.6	SIGO/TL	0.3	STBD/ROT	0.3	PORT/ROT	110.0	TAIL/SEP
Compass :	101.0	AVSEP/FR	103.0	AVSEP/MD	110.0	AVSEP/TL	0.7	DSTD/S13	0.9	DSTD/P13
Tailbuoy :	7.3	MEANSD/S	10.6	MEANSD/P	1.0	SD>5M/S	5.0	SD>5M/P	100.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.

Note Stability good. Compass/birds quiet/good.

------=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires. Poor Hyperfix propagation caused several EDIT
GUN SEQ ERRS SP 703-709(S) 713-720(S) 760-762(S) 771-775(S) GM28 Errors: 9.

------=== NAVIGATION ===------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6077106.0 Sol. Easting 500946.0
Eol. Northing 6077110.0 Eol. Easting 472305.0
Note VSL SD 1.9m OK but poor Hyperfix propagation led to 24 lost
shots and gun seq errs esp. around SPs 700-870. TB nav OK. Acoustics OK.
Message SEQ 15. PRIME. Complete. EDIT GUN SEQ ERRS SP 703-709(S) &
713-720(S) & 760-762(S) & 771-775(S). Poor Hyperfix propagation.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0274-R Heading 270 deg.
Line Status Complete
Date started 17/08/89 Start Time 10:44 End Time 14:11
First File 100 First Reel 11375 Last File 1628 Last Reel 11388

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0280/421	100	0	0	1630	0	0.000Kms
0279/422	100	0	0	1630	0	0.000Kms
0278/423	100	0	0	1630	0	0.000Kms
0277/424	100	0	0	1630	0	0.000Kms
0276/425	100	0	0	1630	0	0.000Kms
0275/426	100	0	0	1630	0	0.000Kms
0274/427	100	100	1630	1630	1531	28.706Kms
0273/428	100	0	0	1630	0	0.000Kms

-------==== WEATHER ========-----

Wind dir. WSW force 5 Sea state 4 Swell dir. WSW Height 2 m

-------=== RECORDING ======---

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 4.5 Kts.
Parity Errors 0 No Data Record 1 Misfires 0

----------==== DUAL STREAMER =========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 2.7 m. Max. 8.4 m.
Feather Sol. 2.0 S Eol. 0.0 S Max. 4.8 S

Accoustic Transponders:	2.0	SIG0/FR	.	SIG0/TL	0.3	STBD/ROT	0.2	PORT/ROT	103.4	TAIL/SEP	
Compass :	101.8	AVSEP/FR	104.0	AVSEP/MD	99.0	AVSEP/TL	1.3	DSTD/S13	1.7	DSTD/P13	
Tailbuoy :	14.1	MEANSD/S	9.9	MEANSD/P	5.0	SD>5M/S	4.0	SD>5M/P	104.0	TB SEP	

Dead Grp: Trace P01 noisy all line c. 25uB.

Noise: Some swell noise all line.

Note Stability poor. Birds S10(occ S11) shallow SPs 1333-1465 to c. 3.5m. This portion of line being examined with MicroMAX processing.

------=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No Rho misfires. EDIT GUN SEQ ERR SP1571-1576 (Rho SP nos).
GM20 Errors: 26.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6076826.0 Sol. Easting 500984.0
Eol. Northing 6076822.0 Eol. Easting 472490.0

Note VSL SD 2.6m good. TBs OK except SOL-SP230 lost lock.
F4H1 dead. Acoustic tailnet v. poor (Sigma TBs not working/also F1H1).
Message SEQ 11. PRIME. Complete. EDIT GUN SEQ BAD SP 1571-1576(Rho SP nos). Evaluating Rho stbd cable (shallow) with MicroMAX processing.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0262-R Heading 270 deg.
Line Status Complete
Date started 16/08/89 Start Time 10:01 End Time 13:19
First File 100 First Reel 11318 Last File 1619 Last Reel 11331

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0268/433	100	0	0	1630	0	0.000Kms
0267/434	100	0	0	1630	0	0.000Kms
0266/435	100	0	0	1630	0	0.000Kms
0265/436	100	0	0	1630	0	0.000Kms
0264/437	100	0	0	1630	0	0.000Kms
0263/438	100	0	0	1630	0	0.000Kms
0262/439	100	100	1630	1630	1531	28.706Kms
0261/440	100	0	0	1630	0	0.000Kms

-------- WEATHER --------

Wind dir. VAR force 3 Sea state 3 Swell dir. SSW Height 1 m

------- RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 6 Misfires 0

---------- DUAL STREAMER ----------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 9.0 m.
Feather Sol. 2.0 S Eol. 0.0 P Max. 5.1 S

Accoustic Transponders:	.	SIG0/FR	.	SIGO/TL	0.3	STBD/ROT	0.2	PORT/ROT	106.7	TAIL/SEP
Compass	:	100.7	AVSEP/FR	109.2	AVSEP/MD	111.4	AVSEP/TL	1.0	DSTD/S13	1.4	DSTD/P13
Tailbuoy	:	29.0	MEANSD/S	12.7	MEANSD/P	19.0	SD>5M/S	10.0	SD>5M/P	.	TB SEP

Dead Grp: None.

Noise: Some swell noise all line.

Note Stability adequate. Compasses OK.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires. Series of gun seq errors caused by nav laneslip
led to EDIT ALL SPs 1329-1377 (both boats). GM20 Errors: 30.

------ NAVIGATION ------

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6076514.0 Sol. Easting 500991.0
Eol. Northing 6076533.0 Eol. Easting 472293.0

Note VSL & TB2 nav OK. TB1 very poor. F4H1 dead SOL-SP550.
TB positioning marginal - wait on NAM evaluation before processing.

Message SEQ 07. PRIME. Complete. EDIT GUN SEQ BAD SP 1329 - 1377.
(reshoot 1319-1387 NAM a/c). TB positioning marginal - await NAM decision.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0262/R Heading 270 deg.
Line Status Fill-in
Date started 06/09/89 Start Time 08:27 End Time 09:41
First File 800 First Reel 12113 Last File 1318 Last Reel 12117

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0262/428	10800	10800	11318	11318	519	9.731Kms
/429	10800	0	0	11318	0	0.000Kms
/430	10800	0	0	11318	0	0.000Kms
/431	10800	0	0	11318	0	0.000Kms
/432	10800	0	0	11318	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ====----

Wind dir. W force 4 Sea state 3 Swell dir. W Height 1 m

--==== RECORDING ====--

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 39.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 1 Misfires 0

----==== DUAL STREAMER ====----

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 8.3 m.
Feather Sol. 1.0 P Eol. 1.8 S Max. 4.4 S

Accoustic Transponders:	1.0	SIG0/FR	1.0	SIG0/TL	0.1	STBD/ROT	0.1	PORT/ROT	92.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	100.0	AVSEP/MD	104.0	AVSEP/TL	1.0	DSTD/S13	1.5	DSTD/P13
Tailbuoy :	10.0	MEANSD/S	10.3	MEANSD/P	5.0	SD>5M/S	5.0	SD>5M/P	95.0	TB SEP

Dead Grp: Trace 589 spiking - killed all line.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good except S13 1 rejected reading and P27 15 rejected readings.

------ ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note No misfires.
GM2B Errors 7.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6076649.0 Sol. Easting 487889.0
Eol. Northing . Eol. Easting .
Note Vsl SD 2.7m OK. TB nav OK. Acoustics OK.
Acoustic stats not valid d/t wide separation split synchronised shooting.
Message SEQ 72. 1 BT 2B FOLD INFILL. Complete. No edits.
Coverage required cols: 428 - 432 various offset groups.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0262*R Heading 270 deg.
Line Status Reshoot
Date started 06/09/89 Start Time 09:41 End Time 09:53
First File 1319 First Reel 12117 Last File 1397 Last Reel 12118

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0268/433	11319	0	0	11397	0	0.000Kms
0267/434	11319	0	0	11397	0	0.000Kms
0266/435	11319	0	0	11397	0	0.000Kms
0265/436	11319	0	0	11397	0	0.000Kms
0264/437	11319	0	0	11397	0	0.000Kms
0263/438	11319	0	0	11397	0	0.000Kms
0262/439	11319	0	0	11397	0	0.000Kms
0261/440	11319	0	0	11397	0	0.000Kms

-------- WEATHER --------

Wind dir. W force 4 Sea state 3 Swell dir. W Height 1 m

------- RECORDING -------

Magnetometer N Gravity N
Water depth Sol. 39.0m. Eol. 39.0m. Ave Speed 4.0 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---------- DUAL STREAMER ----------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 8.3 m.
Feather Sol. 1.8 S Eol. 0.3 S Max. 1.8 S

Accoustic Transponders:	1.0	SIG0/FR	1.0	SIGO/TL	0.1	STBD/ROT	0.1	PORT/ROT	92.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	100.0	AVSEP/MD	104.0	AVSEP/TL	1.0	DSTD/S13	1.5	DSTD/P13
Tailbuoy :	10.0	MEANSD/S	10.3	MEANSD/P	5.0	SD>5M/S	5.0	SD>5M/P	95.0	TB SEP

Dead Grp: Trace 589 spiking - killed all line.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20u8.

Note Cable stability good. Compasses good except S13 1 rejected reading and P27 15 rejected readings.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.ni.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral seoaration 50m.Total output 45.7 bar metres

Note No misfires.
GM2B Errors 3.

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing . Sol. Easting .
Eol. Northing . Eol. Easting .
Note Vsl SD 2.7m OK. TB nav OK. Acoustics OK.

Message SEQ 72. 2 BT RESHOOT. Complete. No Rho edits.
Reshoot for seq: 7 (16/08/89) gun sequence errors caused by nav (NAM A/C).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0250-R Heading 270 deg.
Line Status Complete
Date started 14/08/89 Start Time 08:35 End Time 12:00
First File 100 First Reel 11261 Last File 1629 Last Reel 11274

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0256/445	100	0	0	1630	0	0.000Kms
0255/446	100	0	0	1630	0	0.000Kms
0254/447	100	0	0	1630	0	0.000Kms
0253/448	100	0	0	1630	0	0.000Kms
0252/449	100	0	0	1630	0	0.000Kms
0251/450	100	0	0	1630	0	0.000Kms
0250/451	100	100	1630	1630	1531	28.706Kms
0249/452	100	0	0	1630	0	0.000Kms

----==== WEATHER ====----

Wind dir. SW force 5 Sea state 4 Swell dir. SW Height 2 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 35.0m. Eol. 39.0m. Ave Speed 4.5 Kts.
Parity Errors 0 No Data Record 0 Misfires 1

----------==== DUAL STREAMER ====----------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.3 m. Max. 8.3 m.
Feather Sol. 2.0 P Eol. 0.0 S Max. 4.0 P

Accoustic Transponders:	1.6	SIG0/FR	1.0	SIG0/TL	0.1	STBD/ROT	0.2	PORT/ROT	102.8	TAIL/SEP
Compass :	100.3	AVSEP/FR	103.2	AVSEP/MD	103.1	AVSEP/TL	1.4	DSTD/S13	1.9	DSTD/P13
Tailbuoy :	6.9	MEANSD/S	15.2	MEANSD/P	0.0	SD>5M/S	15.0	SD>5M/P	104.0	TB SEP

Dead Grp: Trace P73 dead all line.

Noise: Swell noise all line - processing with uMAX.
SHN SPs 100-400 max 18uB from abeam.
Note Stability adequate. Front compasses both streamers noisy d/t heave (swell from ahead).

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfire SP 903 only.
GM2B Errors: TOTAL 36 shots - too many.

---=== NAVIGATION ===---

Prime : SYLEDIS Secondary : SYLEDIS
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,
Secondary

Sol. Northing 6076253.0 Sol. Easting 501010.0
Eol. Northing 6076203.0 Eol. Easting 472316.0
Note VSL nav OK - mix HYP/SYL prime. K7 in/out VSL solution/gate.
Port TB OK. Stbd TB Pulse8 unstable/high SDs. Acoustics OK.
Message SE0 03. PRIME. Complete. No Rho edits.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0238-R Heading 270 deg.
Line Status Complete
Date started 14/08/89 Start Time 20:54 End Time 00:18
First File 100 First Reel 11289 Last File 1615 Last Reel 11302

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0244/457	100	0	0	1630	0	0.000Kms
0243/458	100	0	0	1630	0	0.000Kms
0242/459	100	0	0	1630	0	0.000Kms
0241/460	100	0	0	1630	0	0.000Kms
0240/461	100	0	0	1630	0	0.000Kms
0239/462	100	0	0	1630	0	0.000Kms
0238/463	100	100	1630	1630	1531	28.706Kms
0237/464	100	0	0	1630	0	0.000Kms

-------==== WEATHER ========

Wind dir. S force 5 Sea state 4 Swell dir. SW Height 2 m

-------==== RECORDING ======---

Magnetometer N Gravity N
Water depth Sol. 36.3m. Eol. 39.4m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 8 Misfires 2

----------==== DUAL STREAMER ==========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.5 m. Max. 8.4 m.
Feather Sol. 3.0 S Eol. 1.0 S Max. 6.0 S

Accoustic Transponders:	1.9	SIG0/FR	3.9	SIG0/TL	0.2	STBD/ROT	0.1	PORT/ROT	.	TAIL/SEP
Compass :	100.7	AVSEP/FR	102.4	AVSEP/MD	106.5	AVSEP/TL	1.0	DSTD/S13	1.4	DSTD/P13
Tailbuoy :	18.0	MEANSD/S	14.6	MEANSD/P	17.0	SD>5M/S	13.0	SD>5M/P	119.0	TB SEP

Dead Grp: Trace P73 dead all line.

Noise: Occasional swell noise all line.
SHN SPs 930 - 1150 max 33uB from abeam.
Note Stability adequate. Compasses OK though port front still a little noisy d/t swell heave.

-------==== ENERGY SOURCE ======---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP1371 1579. EDIT GUN SEQ SP 1024-1026 & 1230-1235.
GM2B Errors: TOTAL 36 shots - too many.

-------==== NAVIGATION ======---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,K7 F2,DAN-C,GORM-B,B11/2,
Secondary

Sol. Northing 6075913.0 Sol. Easting 500963.0
Eol. Northing 6075894.0 Eol. Easting 472332.0
Note VSL nav adequate. Both TBs high SDs - Pulse8 unstable.
Navtech F4H1 & S4H4 dead all line. Rho 8 SPs behind Sigma at EOL.
Message SEQ 05. PRIME. Complete. EDIT GUN SEQ BAD SPs 1024-1026 &
ALSO BAD SPs 1230-1235. Rho 8 SP behind Sigma at EOL.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0226-R Heading 270 deg.
Line Status Complete
Date started 16/08/89 Start Time 22:27 End Time 01:49
First File 100 First Reel 11347 Last File 1623 Last Reel 11360

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0232/469	100	0	0	1630	0	0.000Kms
0231/470	100	0	0	1630	0	0.000Kms
0230/471	100	0	0	1630	0	0.000Kms
0229/472	100	0	0	1630	0	0.000Kms
0228/473	100	0	0	1630	0	0.000Kms
0227/474	100	0	0	1630	0	0.000Kms
0226/475	100	100	1630	1630	1531	28.706Kms
0225/476	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. VAR force 3 Sea state 3 Swell dir. SSW Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.4m. Eol. 40.4m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 7 Misfires 12

---==== DUAL STREAMER ====---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 8.1 m.
Feather Sol. 0.0 S Eol. 1.0 S Max. 4.7 S

Accoustic Transponders:	.	SIG0/FR	.	SIG0/TL	0.3	STBD/ROT	0.2	PORT/ROT	.	TAIL/SEP	
Compass :	183.4	AVSEP/FR	186.7	AVSEP/MD	188.8	AVSEP/TL	0.8	DSTD/S13	1.1	DSTD/P13	
Tailbuoy :	10.0	MEANSD/S	13.3	MEANSD/P	4.0	SD>5M/S	14.0	SD>5M/P	188.4	TB SEP	

Dead Grp: None.

Noise: Occasional swell noise all line.

Note Stability good. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP 356 898 918 922 926 930 1424 1504 1532 1536 1612 & 1616. EDIT GUN SEQ BAD SP 148-153 (Sigma nos). GM2B Errors: 28.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary : HYPERFIX
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6075638.0 Sol. Easting 500963.0
Eol. Northing 6075626.0 Eol. Easting 472310.0
Note VSL SD 3.8m good. TB1 OK. TB2 marginal. F4H1 dead all line. Acoustic tailnet weak. Rho 6 SPs behind Sigma at EOL.
Message SEQ 89. PRIME. Complete. EDIT GUN SEQ BAD SP 148 - 153(Sigma SP nos).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0214-R Heading 270 deg.
Line Status Incomplete
Date started 19/08/89 Start Time 00:52 End Time 03:12
First File 554 First Reel 11392 Last File 1630 Last Reel 11402

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0220/481	554	0	0	1630	0	0.000Kms
0219/482	554	0	0	1630	0	0.000Kms
0218/483	554	0	0	1630	0	0.000Kms
0217/484	554	0	0	1630	0	0.000Kms
0216/485	554	0	0	1630	0	0.000Kms
0215/486	554	0	0	1630	0	0.000Kms
0214/487	554	554	1630	1630	1077	20.194Kms
0213/488	554	0	0	1630	0	0.000Kms

---==== WEATHER ====----

Wind dir. WSW force 5 Sea state 4 Swell dir. W Height 2 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 37.3m. Eol. 39.4m. Ave Speed 4.7 Kts.
Parity Errors 0 No Data Record 0 Misfires 4

---=== DUAL STREAMER ===---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.4 m. Max. 8.1 m.
Feather Sol. 2.0 P Eol. 0.0 P Max. 4.5 P

Accoustic Transponders:	2.3	SIG0/FR	2.5	SIG0/TL	.	STBD/ROT	.	PORT/ROT	102.0	TAIL/SEP
Compass :	102.0	AVSEP/FR	101.0	AVSEP/MD	105.0	AVSEP/TL	1.5	DSTD/S13	1.6	DSTD/P13
Tailbuoy :	12.2	MEANSD/S	15.1	MEANSD/P	10.0	SD>5M/S	10.0	SD>5M/P	92.0	TB SEP

Dead Grp: Trace S60 spiking - killed all line.

Noise: Swell noise all line reducing along line and accepted after uMAX processing.
Note Stability adequate. Compass/birds adequate in swell.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SPs 558 562 1150.
GM20 Errors: 35.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6075323.0 Sol. Easting 496117.0
Eol. Northing 6075333.0 Eol. Easting 472276.0
Note VSL SD 2.4m OK. TB nav adequate.

Message SEQ 13. PRIME. Incomplete. No Rho Edits.
Line accepted from SP554 only d/t swell breakout.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0214-R1 Heading 270 deg.
Line Status Complete
Date started 04/09/89 Start Time 19:41 End Time 20:47
First File 100 First Reel 12038 Last File 553 Last Reel 12042

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0220/481	10100	0	0	10553	0	0.000Kms
0219/482	10100	0	0	10553	0	0.000Kms
0218/483	10100	0	0	10553	0	0.000Kms
0217/484	10100	0	0	10553	0	0.000Kms
0216/485	10100	0	0	10553	0	0.000Kms
0215/486	10100	0	0	10553	0	0.000Kms
0214/487	10100	10100	10553	10553	454	8.512Kms
0213/488	10100	0	0	10553	0	0.000Kms

-------- WEATHER --------

Wind dir. VAR force 1 Sea state 2 Swell dir. NIL Height 0 m

------ RECORDING ------

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 37.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 2

---------- DUAL STREAMER ----------

2x12@x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 8.2 m.
Feather Sol. 0.7 S Eol. 0.0 P Max. 3.8 S

Accoustic Transponders:	1.0	SIG0/FR	1.6	SIG0/TL	0.0	STBD/ROT	0.3	PORT/ROT	103.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	100.0	AVSEP/MD	106.0	AVSEP/TL	0.5	DSTD/S13	0.6	DSTD/P13
Tailbuoy :	16.8	MEANSD/S	12.8	MEANSD/P	22.0	SD>5M/S	11.0	SD>5M/P	94.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires 2 - SPs 10103 & 10259.
6M2B Errors 11 - poor telemetry.

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6075305.0 Sol. Easting 500973.0
Eol. Northing 6075322.0 Eol. Easting 491123.0
Note Vsl SD 2.7m OK. TB nav poor. Acoustics OK.

Message SEQ 65. 2 BT PRIME. Complete. No Rho edits.
Completion of SEQ 13 (19/08/89) (swell noise before SP 554).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0202-R Heading 270 deg.
Line Status Complete
Date started 20/08/89 Start Time 00:33 End Time 04:02
First File 100 First Reel 11446 Last File 1630 Last Reel 11459

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0208/493	100	0	0	1630	0	0.000Kms
0207/494	100	0	0	1630	0	0.000Kms
0206/495	100	0	0	1630	0	0.000Kms
0205/496	100	0	0	1630	0	0.000Kms
0204/497	100	0	0	1630	0	0.000Kms
0203/498	100	0	0	1630	0	0.000Kms
0202/499	100	100	1630	1630	1531	28.706Kms
0201/500	100	0	0	1630	0	0.000Kms

---==== WEATHER ====----

Wind dir. SSE force 3 Sea state 3 Swell dir. SW Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.3m. Eol. 39.3m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 1 Misfires 11

---=== DUAL STREAMER ===---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.4 m. Max. 8.1 m.
Feather Sol. 2.0 P Eol. 2.0 P Max. 5.1 P

Accoustic Transponders:	1.2	SIG0/FR	0.7	SIGO/TL	0.2	STBD/ROT	0.2	PORT/ROT	104.0	TAIL/SEP
Compass :	100.0	AVSEP/FR	97.0	AVSEP/MD	101.0	AVSEP/TL	0.5	DSTD/S13	0.7	DSTD/P13
Tailbuoy :	10.1	MEANSD/S	16.6	MEANSD/P	6.0	SD>5M/S	20.0	SD>5M/P	103.0	TB SEP

Dead Grp: Trace S60 spiking - killed all line.

Noise: Low ambient noise all line.

Note Stability good. Compass/birds quiet/good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP 425 783 1199 1231 1260 1296 1344 1352 1376 more.
EDIT RHO NO PORT GUNS (AIR LEAK) SPs 100 - 376. GM2B Errors: 6.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,K7 F2,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6074987.0 Sol. Easting 500986.0
Eol. Northing 6075033.0 Eol. Easting 472306.0
Note VSL SD 3.3m OK. TB1 nav OK. TB2 (port) nav poor - unstable.
Acoustics OK. HYPFX/SYLEDIS cocktail in prime vsl fit SOL-SP120.
Message SEQ 17. PRIME. Complete. EDIT RHO NO PORT GUNS (AIR LEAK)
SPs 100-376 (Single boat reshoot required on GECO A/C).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0202*R Heading 270 deg.
Line Status Reshoot
Date started 25/08/89 Start Time 11:33 End Time 12:10
First File 100 First Reel 11612 Last File 376 Last Reel 11614

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0202/493	100	0	0	376	0	0.000Kms
/494	100	0	0	376	0	0.000Kms
/495	100	0	0	376	0	0.000Kms
/496	100	0	0	376	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ====---

Wind dir. N force 5 Sea state 4 Swell dir. N Height 2 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 36.0m. Ave Speed 4.5 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---==== DUAL STREAMER ====---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.5 m. Max. 8.0 m.
Feather Sol. 1.0 P Eol. 1.8 P Max. 2.8 P

Accoustic Transponders:	2.4	SIG0/FR	.	SIG0/TL	0.1	STBD/ROT	.	PORT/ROT	97.0	TAIL/SEP	
Compass :	99.0	AVSEP/FR	101.0	AVSEP/MD	100.0	AVSEP/TL	1.6	DSTD/S13	1.9	DSTD/P13	
Tailbuoy :	8.8	MEANSD/S	.	MEANSD/P	2.0	SD>5M/S	.	SD>5M/P	.	TB SEP	

Dead Grp: Trace S28 killed all line - open circuit.

Noise: Some swell breakout on line circa 8 of 240 traces
at 30 to 60uB RMS (2 second analysis).
Note Stability good. Compasses OK though noisy in swell.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.ni.arrays each comprising 3 sub arrays of 6 elements
each.Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires - occasional intermittent sensor line on gun
P1/4 showed erroneous misfires but gun was stable.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6075030.0 Sol. Easting 501000.0
Eol. Northing . Eol. Easting .
Note Vsl SD 2.7m OK. Stbd TB OK. Port TB Pulse8 dead.
Front acoustics OK. Tail acoustics poor (problem tuning in).
Message SEQ 30. SINGLE BOAT 40 FOLD RESHOOT. Complete. No Edits.
Reshoot for seq 17 (20/8) (Rho guns) cols: 493-496. Port TB Pulse8 dead.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0202/R Heading 270 deg.
Line Status Fill-in
Date started 25/08/89 Start Time 12:10 End Time 14:57
First File 377 First Reel 11614 Last File 1628 Last Reel 11625

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0202/493	377	377	1630	1630	1254	23.513Kms
/494	377	0	0	1630	0	0.000Kms
/495	377	0	0	1630	0	0.000Kms
/496	377	0	0	1630	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

---==== WEATHER ====---

Wind dir. N force 5 Sea state 4 Swell dir. N Height 2 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 39.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

-----==== DUAL STREAMER ====----

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.5 m. Max. 8.0 m.
Feather Sol. 1.0 P Eol. 1.8 P Max. 2.8 P

Accoustic Transponders:	2.4	SIG0/FR	.	SIG0/TL	0.1	STBD/ROT	.	PORT/ROT	97.0	TAIL/SEP	
Compass :	99.0	AVSEP/FR	101.0	AVSEP/MD	100.0	AVSEP/TL	1.6	DSTD/S13	1.9	DSTD/P13	
Tailbuoy :	0.0	MEANSD/S	.	MEANSD/P	2.0	SD>5M/S	.	SD>5M/P	.	TB SEP	

Dead Grp: Trace S28 killed all line - open circuit.

Noise: Some swell breakout on line circa 8 of 240 traces
at 30 to 60uB RMS (2 second analysis).
Note Stability good. Compasses OK though noisy in swell.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements
each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note No misfires - occasional intermittent sensor line on gun
P1/4 showed erroneous misfires but gun was stable.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing . Sol. Easting .
Eol. Northing 6074990.0 Eol. Easting 472310.0
Note Vsl SD 2.7m OK. Stbd TB OK. Port TB Pulse8 dead.
Front acoustics OK. Tail acoustics poor (problem tuning in).
Message SEQ 30. SINGLE BOAT 4@ FOLD INFILL. Complete. No Edits.
Coverage required cols: 493-496. Port TB Pulse8 dead.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0190-R Heading 270 deg.
Line Status Complete
Date started 21/08/89 Start Time 01:19 End Time 04:43
First File 100 First Reel 11503 Last File 1622 Last Reel 11516

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0196/505	100	0	0	1630	0	0.000Kms
0195/506	100	0	0	1630	0	0.000Kms
0194/507	100	0	0	1630	0	0.000Kms
0193/508	100	0	0	1630	0	0.000Kms
0192/509	100	0	0	1630	0	0.000Kms
0191/510	100	0	0	1630	0	0.000Kms
0190/511	100	100	1630	1630	1531	28.706Kms
0189/512	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. SW force 4 Sea state 3 Swell dir. SW Height 1 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 36.3m. Eol. 39.3m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 7 Misfires 1

----==== DUAL STREAMER ====----

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.8 m. Max. 8.0 m.
Feather Sol. 2.0 S Eol. 3.0 P Max. 5.1 P

Accoustic Transponders:		1.0	SIG0/FR	0.9	SIG0/TL	0.2	STBD/ROT	0.1	PORT/ROT	101.0	TAIL/SEP
Compass	:	100.0	AVSEP/FR	97.0	AVSEP/MD	98.0	AVSEP/TL	0.8	DSTD/S13	1.1	DSTD/P13
Tailbuoy	:	6.8	MEANSD/S	8.5	MEANSD/P	0.0	SD>5M/S	5.0	SD>5M/P	98.0	TB SEP

Dead Grp: Trace S60 spiking - killed all line.

Noise: Low ambient noise all line.

Note Stability good. Compass/birds quiet/good.

---=== ENERGY SOURCE ====---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfire SP 552 only. EDIT GUN SEQ ERRS SP 1573-1579(SR).
GM20 Errors: 32.

---=== NAVIGATION ====---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,K7 F2,DAN-C,GORM-B,
Secondary ,,,,,,,

Sol. Northing 6074010.0 Sol. Easting 500971.0
Eol. Northing 6074745.0 Eol. Easting 472318.0
Note VSL SD 3.0m OK. TB nav OK. Acoustics OK. Lost shots d/t
speed too high plus some Hyperfix instability - Rho 8 shots no recorded.
Message SEQ 21. PRIME. Complete. EDIT GUN SEQ ERRS SP1573-1579.
EDIT SP 100-109 D/T SIGMA GDR & GUN SEQ ERRS.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0178-R Heading 270 deg.
Line Status Complete
Date started 22/08/89 Start Time 02:08 End Time 05:29
First File 100 First Reel 11559 Last File 1619 Last Reel 11572

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0184/517	100	0	0	1630	0	0.000Kms
0183/518	100	0	0	1630	0	0.000Kms
0182/519	100	0	0	1630	0	0.000Kms
0181/520	100	0	0	1630	0	0.000Kms
0180/521	100	0	0	1630	0	0.000Kms
0179/522	100	0	0	1630	0	0.000Kms
0178/523	100	100	1630	1630	1531	28.706Kms
0177/524	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. SW force 3 Sea state 3 Swell dir. W Height 1 m

---==== RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 39.0m. Ave Speed 4.6 Kts.
Parity Errors 0 No Data Record 2 Misfires 3

----------==== DUAL STREAMER ==========

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 8.2 m.
Feather Sol. 2.0 S Eol. 1.0 P Max. 3.5 S

Accoustic Transponders:	0.6	SIG0/FR	0.8	SIG0/TL	0.2	STBD/ROT	0.2	PORT/ROT	107.0	TAIL/SEP
Compass :	100.0	AVSEP/FR	99.0	AVSEP/MD	106.0	AVSEP/TL	0.9	DSTD/S13	1.1	DSTD/P13
Tailbuoy :	8.5	MEANSD/S	11.6	MEANSD/P	4.0	SD>5M/S	9.0	SD>5M/P	103.0	TB SEP

Dead Grp: Trace S60 spiking - killed all line.

Noise: Occasional swell breakout on line.

Note Stability good. Compass/birds good.

---=== ENERGY SOURCE ======

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SPs 201 249 253.
GM20 Errors: 29.

---=== NAVIGATION ======

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6074413.0 Sol. Easting 500980.0
Eol. Northing 6074438.0 Eol. Easting 472300.0

Note Vessel nav OK to SP 1500 but after that K7 laneslips and v.
noisy unusable Syledis led to EDIT ALL SPs 1501-1630 D/T POOR NAV (NAM A/C)
Message SEQ 25. PRIME. Complete. Poor nav towards EOL led to
EDIT ALL SPs 1501-1630 D/T NAV PROPAGATION (2 boat reshoot on NAM a/c).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0178*R Heading 270 deg.
Line Status Reshoot
Date started 04/09/89 Start Time 22:36 End Time 23:19
First File 1330 First Reel 12043 Last File 1630 Last Reel 12045

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0184/517	11330	0	0	11630	0	0.000Kms
0183/518	11330	0	0	11630	0	0.000Kms
0182/519	11330	0	0	11630	0	0.000Kms
0181/520	11330	0	0	11630	0	0.000Kms
0180/521	11330	0	0	11630	0	0.000Kms
0179/522	11330	0	0	11630	0	0.000Kms
0178/523	11330	0	0	11630	0	0.000Kms
0177/524	11330	0	0	11630	0	0.000Kms

-------- WEATHER --------

Wind dir. W force 2 Sea state 2 Swell dir. NIL Height 0 m

------ RECORDING ------

Magnetometer N Gravity N
Water depth Sol. 40.0m. Eol. 40.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---------- DUAL STREAMER ----------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.0 m. Max. 7.6 m.
Feather Sol. 0.3 S Eol. 0.9 P Max. 0.9 P

Accoustic Transponders:	.	SIG0/FR	.	SIGO/TL	.	STBD/ROT	.	PORT/ROT	.	TAIL/SEP
Compass	:	.	AVSEP/FR	.	AVSEP/MD	.	AVSEP/TL	0.6	DSTD/S13	0.7	DSTD/P13
Tailbuoy	:	17.9	MEANSD/S	12.0	MEANSD/P	28.0	SD>5M/S	12.0	SD>5M/P	107.0	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note No misfires.
GM20 Errors 9 - poor telemetry.

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6074430.0 Sol. Easting 477911.0
Eol. Northing 6074444.2 Eol. Easting 472308.0
Note Vsl SD 2.8m OK. TB nav poor. Acoustics OK.

Message SEQ 66. 2 BT RESHOOT. Complete. No Rho edits.
Reshoot of Seq 25 (22/08/89) for bad Hyperfix signals (NAM A/C).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0166-R Heading 270 deg.
Line Status Complete
Date started 26/08/89 Start Time 13:07 End Time 16:42
First File 100 First Reel 11668 Last File 1618 Last Reel 11681

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0172/529	100	0	0	1630	0	0.000Kms
0171/530	100	0	0	1630	0	0.000Kms
0170/531	100	0	0	1630	0	0.000Kms
0169/532	100	0	0	1630	0	0.000Kms
0168/533	100	0	0	1630	0	0.000Kms
0167/534	100	0	0	1630	0	0.000Kms
0166/535	100	100	1630	1630	1531	28.706Kms
0165/536	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. NW force 2 Sea state 3 Swell dir. NW Height 1 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 41.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 12 Misfires 0

----==== DUAL STREAMER ====---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.9 m. Max. 8.1 m.
Feather Sol. 0.3 S Eol. 1.3 P Max. 1.8 S

Accoustic Transponders:	1.8	SIG0/FR	5.0	SIG0/TL	0.1	STBD/ROT	.	PORT/ROT	113.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	99.0	AVSEP/MD	109.0	AVSEP/TL	0.6	DSTD/S13	0.8	DSTD/P13
Tailbuoy :	8.5	MEANSD/S	.	MEANSD/P	2.0	SD>5M/S	.	SD>5M/P	.	TB SEP

Dead Grp: None.

Noise: Low ambient noise all line.

Note Stability good. Compasses good/quiet.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires.
GM2B transmission errors: 31 - still very poor.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing . Sol. Easting .
Eol. Northing 6074142. Eol. Easting 472304.
Note Vsl SD 4.0m OK. Port TB dead. Rho 10SP behind Sigma at SOL &
12 behind at EOL. First 10 SPs(Sigma) Rho guns OK but no data recorded.
Message SEQ 34. 2 BT PRIME. Complete. EDIT GUN SEQ ERR SP1413-1415.
EDIT SPs100-109(Sigma SPs - Rho 10 behind) RHO NDR (ALL sources firing OK).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0154-R Heading 270 deg.
Line Status Complete
Date started 27/08/89 Start Time 14:14 End Time 17:42
First File 100 First Reel 11725 Last File 1626 Last Reel 11739

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0156/545	100	0	0	1630	0	0.000Kms
0155/546	100	0	0	1630	0	0.000Kms
0154/547	100	100	1630	1630	1531	28.706Kms
0153/548	100	0	0	1630	0	0.000Kms
0152/549	100	0	0	1630	0	0.000Kms
0151/550	100	0	0	1630	0	0.000Kms
0150/551	100	0	0	1630	0	0.000Kms
0149/552	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. N force 5 Sea state 4 Swell dir. NNW Height 2 m

---==== RECORDING ====---

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 40.0m. Ave Speed 4.5 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

----==== DUAL STREAMER ====----

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 28V/b
Cable depth Min. 5.3 m. Max. 8.5 m.
Feather Sol. 1.7 P Eol. 0.0 S Max. 2.2 P

Accoustic Transponders:	1.41	SIG0/FR	4.17	SIG0/TL	0.1	STBD/ROT	.	PORT/ROT	101.0	TAIL/SEP	
Compass :	100.0	AVSEP/FR	100.0	AVSEP/MD	102.0	AVSEP/TL	1.3	DSTD/S13	1.6	DSTD/P13	
Tailbuoy :	7.9	MEANSD/S	.	MEANSD/P	2.0	SD>5M/S	.	SD>5M/P	.	TB SEP	

Dead Grp: Trace S89 open circuit - killed all line.

Noise: Swell noise increasing down line to a maximum at EOL of 8 traces of 240 at 30/50uB (2s analysis).
Note Stability adequate. Compasses noisy as usual in swell conditions.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No misfires. GM20 Errors: 36.
EDIT GUN SEQ ERRS SPs 607-610(S) & 654-660(S).

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6073831.0 Sol. Easting 500976.0
Eol. Northing 6073842. Eol. Easting 472300.0
Note Vsl SD 4.3m OK. Port TB dead. Acoustics OK. Usual dusk nav instability. Cocktail in prime fit. Rho 7 SPs behind Sigma at EOL.
Message SEQ 38. 2 BT PRIME. Complete.
EDIT GUN SEQ ERR SPs 607-610 & 654-660.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FF- F0154/R Heading 270 deg.
Line Status Fill-in
Date started 06/09/89 Start Time 17:43 End Time 18:25
First File 100 First Reel 12134 Last File 404 Last Reel 12136

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0154/552	10100	10100	10404	10404	305	5.719Kms
/553	10100	0	0	10404	0	0.000Kms
/554	10100	0	0	10404	0	0.000Kms
/555	10100	0	0	10404	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

-------- WEATHER --------

Wind dir. W force 4 Sea state 4 Swell dir. W Height 1 m

------ RECORDING ------

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 37.0m. Ave Speed 4.4 Kts.
Parity Errors 0 No Data Record 1 Misfires 0

---------- DUAL STREAMER ----------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 8.5 m.
Feather Sol. 2.5 S Eol. 0.0 S Max. 2.5 S

Accoustic Transponders:	.	SIG0/FR	.	SIG0/TL	0.1	STBD/ROT	0.2	PORT/ROT	.	TAIL/SEP	
Compass	: 99.0	AVSEP/FR	99.0	AVSEP/MD	104.0	AVSEP/TL	0.9	DSTD/S13	1.3	DSTD/P13	
Tailbuoy	: 14.5	MEANSD/S	12.4	MEANSD/P	14.0	SD>5M/S	11.0	SD>5M/P	87.0	TB SEP	

Dead Grp: Trace S89 spiking - killed all line.
Trace S109 spiking - killed SP 10120-EOL.
Noise: Some swell noise. Shipnoise less than 20uB.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral separation 50m.Total output 45.7 bar metres.

Note No misfires.
GM28 Errors 8.

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing 6073543.0 Sol. Easting 500939.0
Eol. Northing . Eol. Easting .
Note Vsl SD 2.5m OK. TB nav poor. Acoustics adequate.
Acoustic stats corrupted d/t wide separation split synchronised shooting.
Message SEQ 74. 1 BT 20 FOLD INFILL. Complete. No edits.
Coverage required cols: 552-555.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0154*R Heading 270 deg.
Line Status Reshoot
Date started 06/09/89 Start Time 19:38 End Time 20:16
First File 921 First Reel 12137 Last File 1174 Last Reel 12139

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0154/549	10921	0	0	11174	0	0.000Kms
/550	10921	0	0	11174	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms
	0	0	0	0	0	0.000Kms

WEATHER

Wind dir. W force 4 Sea state 4 Swell dir. W Height 1 m

RECORDING

Magnetometer N Gravity N
Water depth Sol. 38.0m. Eol. 38.0m. Ave Speed 4.1 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

DUAL STREAMER

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.1 m. Max. 8.4 m.
Feather Sol. 2.0 P Eol. 2.5 P Max. 2.5 P

Accoustic Transponders:	.	SIG0/FR	.	SIGO/TL	0.1	STBD/ROT	0.2	PORT/ROT	.	TAIL/SEP	
Compass	:	99.0	AVSEP/FR	99.0	AVSEP/MD	104.0	AVSEP/TL	0.9	DSTD/S13	1.3	DSTD/P13
Tailbuoy	:	14.5	MEANSD/S	12.4	MEANSD/P	14.0	SD>5M/S	11.0	SD>5M/P	87.0	TB SEP

Dead Grp: Trace S89 spiking - killed all line.
Trace S109 spiking - killed all line.
Noise: Some swell noise.
LF front end towing noise port cable 15/20uB.
Note Cable stability good. Compasses good.

ENERGY SOURCE

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.ni.arrays each comprising 3 sub arrays of 6 elements each.Centre lateral seoaration 50m.Total output 45.7 bar metres

Note No misfires.
GM20 Errors 6.

NAVIGATION

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,
Secondary ,,,,,,,

Sol. Northing . Sol. Easting .
Eol. Northing 6073629.0 Eol. Easting 480860.0
Note Vsl SD 2.5m OK. TB nav poor. Acoustics adequate.
Acoustic stats corrupted d/t wide separation split synchronised shooting.
Message SEQ 74. 1 BT 20 FOLD RESHOOT. Complete. No edits.
Reshoot for seq: 38 (27/08/89) Sigma stbd cable shallow. Cols: 549-550.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0142-R Heading 270 deg.
Line Status Complete
Date started 29/08/89 Start Time 15:42 End Time 19:17
First File 100 First Reel 11783 Last File 1625 Last Reel 11797

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0148/553	100	0	0	1630	0	0.000Kms
0147/554	100	0	0	1630	0	0.000Kms
0146/555	100	0	0	1630	0	0.000Kms
0145/556	100	0	0	1630	0	0.000Kms
0144/557	100	0	0	1630	0	0.000Kms
0143/558	100	0	0	1630	0	0.000Kms
0142/559	100	100	1630	1630	1531	28.706Kms
0141/560	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. SW force 3 Sea state 3 Swell dir. SW Height 1 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 41.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 0 Misfires 2

----==== DUAL STREAMER ====----

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.6 m. Max. 8.5 m.
Feather Sol. 4.0 S Eol. 0.0 P Max. 4.0 S

Accoustic Transponders:	1.1	SIG0/FR	5.0	SIG0/TL	.	STBD/ROT	.	PORT/ROT	109.0	TAIL/SEP	
Compass :	99.0	AVSEP/FR	100.0	AVSEP/MD	107.0	AVSEP/TL	0.9	DSTD/S13	1.4	DSTD/P13	
Tailbuoy :	12.0	MEANSD/S	5.9	MEANSD/P	12.0	SD>5M/S	1.0	SD>5M/P	.	TB SEP	

Dead Grp: Trace S89 o/c - killed all line.

Noise: Low ambient noise all line.

Note Stability OK. Compasses good.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SPs 106 & 150.
GM20 Errors: 38.

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,K7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6073498.0 Sol. Easting 500977.0
Eol. Northing 6073528.0 Eol. Easting 472291.0
Note Vsl SD 2.2m OK. TB nav OK. Acoustics OK.

Message SEQ 43. 2 BT PRIME. Complete. EDIT GUN SEQ SP1399-1404(S).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0130-R Heading 270 deg.
Line Status Complete
Date started 30/08/89 Start Time 16:21 End Time 19:56
First File 100 First Reel 11841 Last File 1628 Last Reel 11855

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0136/565	100	0	0	1630	0	0.000Kms
0135/566	100	0	0	1630	0	0.000Kms
0134/567	100	0	0	1630	0	0.000Kms
0133/568	100	0	0	1630	0	0.000Kms
0132/569	100	0	0	1630	0	0.000Kms
0131/570	100	0	0	1630	0	0.000Kms
0130/571	100	100	1630	1630	1531	28.706Kms
0129/572	100	0	0	1630	0	0.000Kms

-------- WEATHER ========

Wind dir. S force 3 Sea state 2 Swell dir. S Height 0 m

------ RECORDING =======

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 40.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 2 Misfires 5

---------- DUAL STREAMER ---------

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.7 m. Max. 7.9 m.
Feather Sol. 0.2 P Eol. 2.0 S Max. 2.7 S

Accoustic Transponders:	1.2	SIG0/FR	1.1	SIG0/TL	0.0	STBD/ROT	0.0	PORT/ROT	111.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	100.0	AVSEP/MD	109.0	AVSEP/TL	0.7	DSTD/S13	1.1	DSTD/P13
Tailbuoy :	10.6	MEANSD/S	10.6	MEANSD/P	6.0	SD>5M/S	5.0	SD>5M/P	105.0	TB SEP

Dead Grp: Trace S89 o/c - killed all line.

Noise: Low ambient noise all line.

Note Stability OK. Compasses good.

------ ENERGY SOURCE ------

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires SP 607 679 683 723 all P1/4 disabled SP726-EOL.
Also misfire SP1409 S3/6. GM28 Errors: 32. GUNSEQ ERR SP 1529.

------ NAVIGATION ------

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6073204.0 Sol. Easting 500979.0
Eol. Northing 6073206.0 Eol. Easting 472303.0
Note Vsl SD 3.0m OK. TB nav OK. Acoustics OK. Lost 2 shots.

Message SEQ 47. 2 BT PRIME. Complete. EDIT GUNSEQ ERR SP 1529.

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0118-R Heading 270 deg.
Line Status Complete
Date started 31/08/89 Start Time 17:00 End Time 20:38
First File 100 First Reel 11901 Last File 1618 Last Reel 11914

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0124/577	100	0	0	1630	0	0.000Kms
0123/578	100	0	0	1630	0	0.000Kms
0122/579	100	0	0	1630	0	0.000Kms
0121/580	100	0	0	1630	0	0.000Kms
0120/581	100	0	0	1630	0	0.000Kms
0119/582	100	0	0	1630	0	0.000Kms
0118/583	100	100	1630	1630	1531	28.706Kms
0117/584	100	0	0	1630	0	0.000Kms

WEATHER

Wind dir. NW force 3 Sea state 3 Swell dir. WNW Height 1 m

RECORDING

Magnetometer N Gravity N
Water depth Sol. 37.0m. Eol. 40.0m. Ave Speed 4.3 Kts.
Parity Errors 0 No Data Record 7 Misfires 0

DUAL STREAMER

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 6.1 m. Max. 8.3 m.
Feather Sol. 1.2 S Eol. 2.5 P Max. 2.8 P

Accoustic Transponders:	1.3	SIG0/FR	2.7	SIGO/TL	0.0	STBD/ROT	0.1	PORT/ROT	106.0	TAIL/SEP
Compass :	100.0	AVSEP/FR	101.0	AVSEP/MD	107.0	AVSEP/TL	1.0	DSTD/S13	1.4	DSTD/P13
Tailbuoy :	10.7	MEANSD/S	10.7	MEANSD/P	5.0	SD>5M/S	4.0	SD>5M/P	98.0	TB SEP

Dead Grp: Trace 589 o/c - killed.

Noise: Occasional swell noise on line.

Note Stability OK. Compasses good.

ENERGY SOURCE

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note Misfires none.
GM2B Errors: 41 - poor telemetry again.

NAVIGATION

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,,

Sol. Northing 6072722.0 Sol. Easting 500849.0
Eol. Northing 6072907.0 Eol. Easting 472300.0
Note Vsl SD 2.8m OK. TB nav adequate. Acoustics OK.
Lost 7 SPs d/t unstable prime navigation.
Message SEQ 51. 2 BT PRIME. Complete. EDIT GUNSEQ ERR SP649-655(S).
& SP873-878(S).

SURVEY LINE ANALYSIS

GECO RHO
Line name 89FA- F0106-R Heading 270 deg.
Line Status Complete
Date started 01/09/89 Start Time 17:43 End Time 21:26
First File 100 First Reel 11958 Last File 1630 Last Reel 11972

Sub-S-Line Name	F.S.P.	F.C.S.P.	L.C.S.P.	L.S.P.	Shot Points	Coverage
0112/589	100	0	0	1630	0	0.000Kms
0111/590	100	0	0	1630	0	0.000Kms
0110/591	100	0	0	1630	0	0.000Kms
0109/592	100	0	0	1630	0	0.000Kms
0108/593	100	0	0	1630	0	0.000Kms
0107/594	100	0	0	1630	0	0.000Kms
0106/595	100	100	1630	1630	1531	28.706Kms
0105/596	100	0	0	1630	0	0.000Kms

---==== WEATHER ====---

Wind dir. NW force 5 Sea state 4 Swell dir. WNW Height 2 m

---=== RECORDING ===---

Magnetometer N Gravity N
Water depth Sol. 36.0m. Eol. 41.0m. Ave Speed 4.2 Kts.
Parity Errors 0 No Data Record 0 Misfires 0

---=== DUAL STREAMER ===---

2x120x25mgrp transformerless/100m lateral separation.Sensitivity 20V/b
Cable depth Min. 5.8 m. Max. 8.4 m.
Feather Sol. 0.6 S Eol. 0.2 S Max. 2.0 P

Accoustic Transponders:	1.0	SIG0/FR	1.2	SIG0/TL	0.1	STBD/ROT	0.1	PORT/ROT	96.0	TAIL/SEP
Compass :	99.0	AVSEP/FR	99.0	AVSEP/MD	102.0	AVSEP/TL	1.5	DSTD/S13	1.9	DSTD/P13
Tailbuoy :	15.1	MEANSD/S	11.5	MEANSD/P	17.0	SD>5M/S	7.0	SD>5M/P	92.0	TB SEP

Dead Grp: None.

Noise: Quiet at SOL with increasing swell noise on line.
Noise at EOL 8/240 30uB & 2/240 50uB - acceptable.
Note Stability OK. Compasses good though noisy in swell.

---=== ENERGY SOURCE ===---

Source type AIRGUN
Source Volume : 3162 Pressure: 1950
Dual 3162 cu.in.arrays each comprising 3 sub arrays of 6 elements each.
Centre lateral separation 50m.Total output 45.7 bar metres

Note No Misfires. GM2B LINK FAILED SPs 1253 - 1582 at same time
as 3D link (Sigma multiplexer failure).

---=== NAVIGATION ===---

Prime : HYPERFIX Secondary :
Primary TERSCHELLING F1,H7 F1,BORKUM F1,DAN-C,GORM-B,B11/2,
Secondary ,,,,,,

Sol. Northing 6072639.0 Sol. Easting 500986.0
Eol. Northing 6072655.0 Eol. Easting 472321.0
Note Vsl SD 2.8m OK. Stbd TB Pulse8 noisy/high SDs. Acoustics OK.
OMNISEIS LINK FAILURE SPs 1250-1611. Steering/Coverage to be evaluated.
Message SEQ 55. 2 BT PRIME. Complete. No Rho edits. 3D LINK FAILURE
SP1250-1611. EVALUATE STEERING/COVERAGE. GM2B LINK FAIL SP1253-1582.

SURVEY LINE ANALYSIS continued

Recording filters lo: 3.5(18) Hi: 180.0(72) Hz. (db/oct)	Cable depth 7 . metre Limit +/- 1.
Record length : 6 Sec. Sample rate : 2. ms.	Source depth 6: 6: 6: 6 metre
Cable Centre Source / Centre Near Trace : 118.00/25.00S metre	Spheroid INTERNATIONAL
Offset Prime Antenna / Centre Source : 183.7 /25.003 metre	Delta X,Y,Z 83.0/ 110.0/ 113.5
Shot point interval 0018.7500 metre Group length 25. metre	Coverage 12000 %

7.4 Survey Summary

09/08/89 to 08/09/89

	ACCUMULATED TOTALS	1684.144 Kms
PRIME TIME	174:12	
OPERATIONAL TIME	257:16	
STANDBY	152:15	
CONTRACTOR	158:17	
DISPUTED	00:00	
	00:00	

PRODUCTION/DOWNTIME
BY CAUSE

GECO SIGMA

From 09/08/89 To 08/09/89

Code		HH:MM	Percent
P01	Recording Time	174:12	23.48
P02	Line Change	110:23	14.88
P07	Weather Standby	27:11	3.66
P08	Currents	40:10	5.41
P09	Swell	48:53	6.59
P10	Instrument Fail	00:07	0.02
P12	Source Fail	05:29	0.74
P13	Streamer Fail	24:34	3.31
P14	Radio Nav. Fail	68:50	9.28
P15	Nav.Equip. Fail	16:08	2.17
P16	Nav Calibration	35:47	4.82
P18	Travel T/F Port	13:15	1.79
P19	In Port	02:45	0.37
P20	Deploy /Recover	11:16	1.52
P22	Equipment tests	01:10	0.16
P26	Client Request	67:41	9.12
P27	Contractor Req.	32:22	4.36
P30	Infill	61:47	8.33

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	174:12	23.48
OPERATIONAL TIME	257:16	34.67
STANDBY	152:15	20.52
CONTRACTOR	158:17	21.33
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	742:00	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 08/09/89

Code		HH:MM	Percent
P01	Recording Time	213:04	28.72
P02	Line Change	145:35	19.62
P07	Weather Standby	53:08	7.16
P14	Radio Nav. Fail	22:51	3.08
P15	Nav.Equip. Fail	12:33	1.69
P16	Nav Calibration	70:30	9.50
P17	Travel Time	23:31	3.17
P18	Travel T/F Port	19:54	2.68
P19	In Port	23:15	3.13
P20	Deploy /Recover	85:37	11.54
P25	Extended L/C	56:56	7.67
P26	Client Request	14:25	1.94
P27	Contractor Req.	00:41	0.09

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	174:12	23.48
OPERATIONAL TIME	257:16	34.67
STANDBY	152:15	20.52
CONTRACTOR	158:17	21.33
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	742:00	
TOTAL Kms	1684.144	

09/08/89 to 08/09/89

	ACCUMULATED TOTALS	1645.575 Kms
PRIME TIME	174:12	
OPERATIONAL TIME	250:49	
STANDBY	160:11	
CONTRACTOR	139:33	
DISPUTED	00:00	
	00:00	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO RHO

From 09/08/89 To 08/09/89

Code		HH:MM	Percent
P01	Recording Time	208:52	28.82
P02	Line Change	142:38	19.68
P07	Weather Standby	67:38	9.33
P14	Radio Nav. Fail	06:41	0.92
P15	Nav.Equip. Fail	05:52	0.81
P16	Nav Calibration	52:16	7.21
P17	Travel Time	06:31	0.90
P18	Travel T/F Port	44:28	6.14
P19	In Port	10:25	1.44
P20	Deploy /Recover	110:18	15.22
P21	Reconfigure	22:08	3.05
P25	Extended L/C	46:58	6.48

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	174:12	24.04
OPERATIONAL TIME	250:49	34.61
STANDBY	160:11	22.10
CONTRACTOR	139:33	19.25
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	724:45	
TOTAL Kms	1645.575	

PRODUCTION/DOWNTIME
BY CAUSE

GECO RHO

From 09/08/89 To 08/09/89

Code		HH:MM	Percent
P01	Recording Time	174:12	24.04
P02	Line Change	121:18	16.74
P07	Weather Standby	88:45	12.25
P08	Currents	40:47	5.63
P09	Swell	01:49	0.25
P12	Source Fail	04:29	0.62
P13	Streamer Fail	34:28	4.76
P14	Radio Nav. Fail	22:49	3.15
P15	Nav.Equip. Fail	19:07	2.64
P16	Nav Calibration	26:52	3.71
P20	Deploy /Recover	12:11	1.68
P24	Acoustic. :	18:28	2.55
P26	Client Request	93:28	12.90
P27	Contractor Req.	36:42	5.06
P30	Infill	29:20	4.05

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	174:12	24.04
OPERATIONAL TIME	250:49	34.61
STANDBY	160:11	22.10
CONTRACTOR	139:33	19.25
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	724:45	

PRODUCTION/DOWNTIME
BY ACTIVITY

GECO SIGMA

From 09/08/89 To 10/08/89

Code		HH:MM	Percent
P14	Radio Nav. Fail	01:10	2.43
P16	Nav Calibration	03:41	7.67
P18	Travel T/F Port	19:54	41.46
P19	In Port	23:15	48.44

PRODUCTION/DOWNTIME SUMMARY

PRIME TIME	00:00	0.00
OPERATIONAL TIME	23:20	48.61
STANDBY	18:00	37.50
CONTRACTOR	06:40	13.89
DISPUTED	00:00	0.00
	00:00	0.00
TOTAL Time	48:00	
TOTAL Kms	0.000	

SECTION 8: DAILY DIARIES

8. DAILY DIARIES

8.1 Geco Sigma

9th August 1989

0000 En-route to Den Helder to mobilise for F3 Block.
Operational time for a NAM-requested port call.

0600 Tied up in Den Helder.
As there was no sign of the Racal engineers who were to install the new navigation equipment the vessel would be on contractor downtime until they arrived.

0830 The Racal engineers arrived. Standby time started.

2400 Installation of Hyperfix and Pulse 8 continued.

10th August 1989

0230 Navigation installation completed on Geco Sigma.
Not all personnel were on board (NAM personnel were there) so departure was delayed while they were found. On Contractor time.

0515 En-route from Den Helder. Start of operational travel time.
It was necessary to steam north of the prospect area to reach the Syledis baselines which formed the basis of the navigation calibrations.

1500 Unable to transfer data from the Pulse 8 computer to Norstar and the Racal man was not able to re-configure the Hyperfix to range-range mode.

1545 The vessel stopped and turned to the opposite direction to allow Geco Rho to catch up to transfer the Racal engineer to Geco Sigma.

1645 MOB boat away to Geco Rho to collect the Racal engineer.

1655 Racal engineer and MOB boat on board.

1903 MOB boat away to Geco Rho to take the Racal engineer back.

1916 MOB boat back on board.

2019 B11/2 to Dan-C baseline crossing started.

2114 Dan-C to Gorm-B baseline crossing started (027°).

2140 Dan-C to Gorm-B baseline crossing started (202°).

2230 B11/2 to Dan-C baseline crossing started.

2300 Another B11/2-Dan-C baseline was tried with co-orinates from B11 but the result was still bad.

2345 Bll/2-Dan-C baseline re-shot but with poor results again.

2400 Investigating the bad results from Bll/2.

11th August 1989

0000 Awaiting results of Geco Rho's extended baseline Bll/2-Gorm B. The results were very poor because of the bad coverage area for Bll/2 antenna.

0200 Norstar was still not getting Pulse 8.

0340 Crossing Dan-C-Bll/2 baseline.
The results from Bll/2 were not good.

0400 The Intersite man called his office to check on Bll/2 details.

0545 Crossed Bll/2-Gorm B baseline. The result was poor due to the vessel being outside the beam of Bll/2's antenna.

0720 Informed by Intersite that a platform in the area had interfered with all baselines except Rolf-Gorm B. No other details were forthcoming. The baseline crossings were abandoned and the vessel headed for the Hyperfix calibration area closer to the FO3 prospect.
Summary of results:

Gorm B-Dan-C	:	good but noisy.
Bll/2-Dan-C	:	10 m too short.
Bll/2-Gorm B extension	:	good.

Informed by Intersite that the other chain users reported the chain to be good.
The time taken to cross the baselines would have been much less had the crew known yesterday about the possible interference as time would not have been wasted trying to repeat baselines in order to get better results. Lack of information from Intersite was to blame for this.
The chain details document supplied by Dan Surveys contained conflicting details of the coverage angle available from the Bll/2 beacon.
Pulse 8 was still not getting to the Norstar. The Racal engineer continued to investigate but did not seem to be very successful.

0730 Heading for the Syledis/Hyperfix calibration area.

0800 Racal had problems reading Syledis and setting up and getting the Pulse 8 signals to Norstar.

0930 In the vicinity of the calibration area but Racal were not ready to start.

The Syledis had only 2 outputs and 3 were needed. Therefore, it was necessary to make up a cable splitter to distribute the Syledis signals to the NESA, Geodetic and Norstar systems.

Pulse 8 was going to Norstar.

1030 Heading back to the calibration point and setting up (mainly Racal).

1130 Splitter constructed and all systems were receiving Syledis signals.

The Racal engineer set up the computer with calibration details.

Geodetic had to construct a splitter to enable them to receive Pulse 8.

Pulses due to Hyperfix were noticed on the DSS V noise tests. These were fairly low amplitude and would be monitored before the survey started to see whether there was any improvement when the equipment was streamed.

Geco Sigma and Geco Rho stayed close together and in the vicinity of the optimum calibration point approximately midway between the prospect and the Syledis stations.

1355 Commenced Hyperfix calibration run-1. Weather conditions were poor; SW 5-7. NESA equipment was not on line.

1530 Commenced run-2.

1800 Unable to run the calibration on F2 because Borkum station was unstable. The engineer contacted the shore engineer. NESA equipment was not on line.

2130 Waiting for the results of Geco Rho's calibration using NESA equipment only. The shore engineer reported that there were no problems with Borkum station when it was monitored from Den Helder.

2211 The shore monitor confirmed that Borkum was off the air. An engineer was sent to investigate.

2400 Hyperfix was unstable. Waiting for Geco Rho to come alongside for a proximity check to test for interference.

12th August 1989

0100 The proximity check was not possible because of poor signals.

Heading to a platform for a Syledis transit check.

0400 At the Glomar Baltic Platform.

Norstar was configured for the transit fix. Waiting for daylight.

Borkum was still off the air.

0522 Started rig transit, fix 1.

0633 Finished rig transit, fix 2.
The results were evaluated and looked good.

0845 Heading for the calibration area to meet up with Geco Rho for 2-boat proximity checks. Borkum was still off the air.

1000 Borkum back on the air.

1022 Started calibration of Borkum.

1030 Boat drill followed by a safety meeting.

1107 Norstar stopped and calibration data was lost. Geodetic data was good.

1134 Finished calibration run.

1220 Syledis Station B11/2 went dead.

1320 B11/2 could not be fixed until Monday afternoon according to the Intersite engineer.
It was decided to stream the cables and try calibration runs using a 2-way Syledis fix only as there was now no alternative.

1435 Start of Borkum calibration using 2 Syledis stations.

1440 Port tailbuoy deployed.

1515 No signals were received from the port tailbuoy.

1520 Port tailbuoy back on board.

1540 End of calibration run.

1650 Start of second calibration run for Borkum.

1700 Port tailbuoy launched.

1813 Finished calibration run.

1830 Port tailbuoy recovered again as it was still not working.

1900 The Racal engineer was transferred from Geco Rho by MOB boat.

1915 A problem with the port tailbuoy antenna coupler was fixed.

2000 Pulse 8 was finally received to Norstar (finger trouble).

2120 Started to deploy the port streamer.

2350 Port streamer out and towed wide.

2400 Deploying the streamers and adjusting balance.

13th August 1989

0000 Deploying the streamers.

0130 Started deploying the starboard tailbuoy.

0615 55 km north-west of prospect and still heading 347°.
The vessel was a long way from the nearest line but it was necessary to stay on one heading while deploying the second streamer to prevent the cables from crossing.

0637 Both streamers fully deployed. The vessel turned towards the prospect area.

0700 Started to launch the guns. The next tide slot was at 13:53 hours GMT for section 3 (W-E) line.

0740 Streamer balance had not been checked at the projected shooting speed.

0800 All guns deployed.

0920 Cable balance checked at shooting speed and considered to be good enough to start. The port cable was slightly heavy at 3.5 knots' shooting speed and the ballast would be trimmed using the MOB boat at the first available opportunity.

1353 Unable to get to the start of line on time. Next slot at 2005 hours GMT. Contractor time started.
The Party Chief proposed shooting a dummy line in order to check out all the systems.

1400 Offset checks were good.

2004 SOL 89FA-0238, Seq. 001.
The Norstar blast command re-set was set to zero causing errors in gun timing QC. Hyperfix signals were very bad due to atmospherics. Data was not to be processed.

2327 EOL 89FA-0238.

2400 On line change. On standby time because the previous line was scrapped.
Weather: sea 2-3 m; wind S'ly 15-20 knots.

14th August 1989

0000 Line change. On standby time.

0127 Line change extended while waiting for tides.

0216 SOL 89FA-0574-S, hdg. 090°.

0534 EOL 89FA-0574-S.
Line scratched. Navigation instability caused numerous missed SPs and gun sequence errors on both vessels. Approximately 30% would have to be shot again in 2-boat mode. Also, considering that the Geco Rho had problems with cable depth, it was decided that a complete re-shoot would be in order to acquire good data rather than run the risk of accepting bad data on this pass. This line was shot at dawn with heavy rain; the worst possible conditions.
Line change.

0734 Line change extended while waiting for tides.

0835 SOL 89FA-0250-S, hdg. 270°.

1200 EOL 89FA-0250-S. A good line.

1400 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby.

1446 SOL 89FA-FO562-S.

1808 EOL 89FA-FO562-S.

2008 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

2054 SOL 89FA-FO238-S.

2400 LSP of the day 1493, line 89FA-FO238-S.

15th August 1989

0018 EOL 89FA-FO238-S.
Heading north to re-calibrate Hyperfix.

0218 End of allocated 2 hour line change time. The remainder of the time until the next projected SOL time would be charged as standby time.

0304 Next projected SOL time. The remainder of the time until the start of the Hyperfix calibration would be charged as Contractor time.

0540 Start of Hyperfix calibration of Borkum using 3-way Syledis fix. Operational time.

0810 End of calibration runs for Borkum.
Weather forecast: SW-S force 8. It was decided in the light of the worsening conditions to pull in the port streamer and to stand by for weather.

0900 Started to retrieve the port cable.

1000 Weather: wind SSW 25-35 knots; sea 3-4 m.

1235 Port streamer on board. Heading north for a two-vessel proximity check.

1450 Start of two-boat check. Operational time.

2030 Proximity checks abandoned because of noisy Hyperfix signals. End of operational time.

2130 Started streaming the port cable. The latest forecast was for SW 5-6, decreasing 4-5, sea state 2-4 m.

2400 Deploying the port streamer.

16th August 1989

0000 Deploying the port streamer.
Weather: SSW 20-25 knots; sea 2-3 m.

0347 Projected SOL time. Geco Rho was delayed because of cable work. Any infill resulting would be to Geco's account.

0416 SOL 89FA-FO574-S.

0738 EOL 89FA-FO574-S.

0928 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1001 SOL 89FA-FO262-S.

1319 EOL 89FA-FO262-S.

1519 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1618 SOL 89FA-FO550-S.

1936 EOL 89FA-FO550-S.

2136 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

2227 SOL 89FA-FO226-S.

2400 LSP of the day 810, line 89FA-FO226-S.
Weather: sea 1 m; wind variable force 3.

17th August 1989

0000 FSP of the day 811, line 89FA-FO226-S.

0149 EOL 89FA-FO226-S.

0349 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby.

0431 SOL 89FA-FO586-S.

0750 EOL 89FA-FO586-S.

0950 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.
During the line change the chase boat crew noticed that the Pulse 8 antenna had snapped on the starboard tailbuoy which was dead.
the sea state was increasing; WSW 5, swell 1-2 m.

1044 SOL 89FA-FO274-S.

1411 EOL 89FA-FO274-S.
Started to recover the starboard streamer to repair the Pulse 8 antenna.

1515 Guns on deck.

1611 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby.

1658 Next projected SOL time but Geco Sigma was not ready because of Pulse 8 failure. The remaining time from now until the next actual SOL would be Contractor downtime.

1800 Starboard tailbuoy on deck.

1915 Started to re-deploy the starboard streamer.

2115 Streamer out and towed wide. The vessels were not able to reach the next projected SOL time (23:06 hours).

2400 Both streamers in the water. Guns on deck.

18th August 1989

0000 Heading to next SOL.

0513 Next projected SOL time. Geco Rho was still chasing streamer leakage so Geco Sigma went to complete one-boat re-shoots.

0605 SOL 89FA-FO574*S1. Re-shoot of Sequence 6 (Geco Rho instrument failure).

0612 EOL 89FA-FO574*S1.

0628 SOL 89FA-FO574*S2. Re-shoot of line 562, Sequence 4, which was poor on the original line because a following current caused low water speed and Geco Sigma's cable came shallow. This line time was chargeable.

0641 EOL 89FA-FO574*S2.
The line change was chargeable as it followed a chargeable re-shoot.

0707 SOL 89FA-FO574*S3. Half re-shoot of line 562 in columns 137-140 that were missed originally because of navigator error on the Geco Rho. Columns 141-144 still had to be re-shot.

0727 EOL 89FA-FO574*S3.

1126 Next projected SOL time. Swell noise was very bad and consistent. On weather standby.

1738 Next projected SOL time. The vessels were on line heading but streamer noise was still excessive.

2349 Next projected SOL. Swell noise persisted, especially on the starboard streamer groups 70-120. Data was considered to be unacceptable on Geco Sigma and the line was not started. The Party Chief on Geco Rho decided that he would like to acquire the data and MicroMAX it.

This was good thinking but it came too late to start the line on time.

2400 Weather standby time.

19th August 1989

0027 SOL 89FA-FO214-S.

0052 FGSP 0554 after the data had been processed.

0312 EOL 89FA-FO214-S.

0512 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

0558 SOL 89FA-FO598-S.

0915 EOL 89FA-FO598-S.

1115 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1210 SOL 89FA-FO286-S.

1533 EOL 89FA-FO286-S.

1733 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1820 SOL 89FA-FO538-S.

1830 MOB boat away to Marie Louise.

1845 MOB boat back on board.

2140 EOL 89FA-FO0538-S.

2340 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

2400 Line change extended waiting for the tides.

20th August 1989

0033 SOL 89FA-FO202-S.

0402 EOL 89FA-FO202-S.

0602 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

0641 SOL 89FA-FO610-S.

0958 EOL 89FA-FO610-S.

1145 Fire drill. A fire was simulated in the engine room.
"Normal methods were unable to control the blaze. The lifeboat was launched, injured people removed and the Halon system activated."
The exercise was well organised and was followed by a crew meeting to analyse and criticise the drill.

1158 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1255 SOL 89FA-FO298-S.

1614 EOL 89FA-FO298-S.

1814 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1904 SOL 89FA-FO526-S.

2223 EOL 89FA-FO526-S.

2400 On a normal line change.

Weather: wind southerly 3; sea 1 m.

21st August 1989

0023 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

0119 SOL 89FA-FO190-S.

0443 EOL 89FA-FO190-S.

0643 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

0730 SOL 89FA-FO622-S.

1046 EOL 89FA-FO622-S.

1246 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1341 SOL 89FA-FO310-S.

1704 EOL 89FA-FO310-S.

1904 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1950 SOL 89FA-FO514-S.

2308 EOL 89FA-FO514-S.

2400 On normal line change.

22nd August 1989

0108 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

0208 SOL 89FA-FO178-S.

0529 EOL 89FA-FO178-S.

0729 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

0819 SOL 89FA-FO634-S.

1140 EOL 89FA-FO634-S.

1340 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1429 SOL 89FA-FO322-S.

1751 EOL 89FA-FO322-S.

1800 Recovering the equipment for a crew change.

1855 All guns on board. Recovering the streamers.

1951 End of allocated 2 hour line change time. The remainder of the time until the next projected SOL time would be charged as standby time.

2038 Next projected SOL time. Start of Contractor downtime.

2155 Both streamers on board.
Heading to Ameland for a crew change.

2400 In transit to Ameland for a crew change.

23rd August 1989

0610 Alongside the 'C' buoy. Standing by for the crew vessel Deneb.

0849 Deneb alongside. Crew and stores were transferred.

0950 Crew change completed. The vessel set course back to prospect.

1700 Port tailbuoy deployed and tied off.

1730 Starboard tailbuoy deployed and the offsets checked.

1930 A call was received from NAM informing the vessels of a change in shooting sequence. Instead of shooting with a following current they were to use the same tide slots and the same line directions but shoot into the current in an effort to improve the feather matching and reduce the effect on the shot sequencing caused by bad navigational signals.

2230 Pulse 8 dropped out on the starboard tailbuoy.

2400 Investigating the Pulse 8 problems.

24th August 1989

0000 Investigating the Pulse 8 problems.

0327 Starboard tailbuoy on deck for fault-finding.

0605 Starboard tailbuoy working again after changing hardware on the float.
Started to re-deploy the starboard streamer.

0650 The Pulse 8 problem returned so the crew stopped streaming and

attempted to re-tune the system because the vessel's starboard receiver was picking up the port tailbuoy.

1030 Tailbuoy now working again. Continued deploying the starboard streamer.

Weather: wind W 5; swell 1-2 m.

It appeared that the radio link between the tailbuoys and the vessel was not sufficiently frequency-selective and it was possible for the onboard receivers to lock onto the wrong tailbuoy transmitters. Presumably this was because the bandwidths of the vessel receivers overlapped and/or the 4 relevant frequencies were too close together. Once locked onto a frequency the only way to unlock each receiver was to switch each transmitter off which meant retrieving the streamers as there was no remote link to the tailbuoys.

1500 Leakage on the starboard cable was traced to the lead-in and wires had to be bypassed.

1914 Continued to deploy the starboard streamer. Weather conditions were poor with W 6 wind and 2-3 m swell.

Deployment of the streamer was considerably slower because of these conditions.

The time charged since 17:00 hours on 23rd August was as follows:

Nominal streaming of starboard cable	5 hours including measurements.
Nominal streaming of port cable	5 hours including measurements.
Nominal streaming of guns	2 hours.
Approximate delay due to Pulse 8	15 hours.
Approximate time to re-wire lead-in	3 hours.
TOTAL	30 hours.

This gave Contractor time up to 23:00 hours on 24th August and then weather standby time until the next SOL.

2300 End of Contractor time. Start of weather standby time.

2400 Work continued on bypassing the leaky wires in the lead-in.

The starboard streamer was very nearly lost. All the stress members had snapped in the waterbreak section and the streamer was being towed on the skin.

Weather: wind W 6; sea 2-4 m.

25th August 1989

0030 The Pulse 8 receiver was changed but still no signals were being received from the starboard tailbuoy.

0400 Stretch and waterbreak sections changed.

0504 Next projected SOL time. The weather had decreased to NW 4 with a 2 m swell. Production could not start because Geco Sigma was not ready although the conditions were suitable. Start of Contractor downtime.

0600 The spare tailbuoy tracker was set up on the heli-deck and the starboard receiver locked-on which confirmed that the tailbuoy was dead. The Geodetic representative decided to accept one tailbuoy per vessel for a short time but they were to be repaired as soon as possible.

0645 Starboard streamer out and towed wide.

0700 Started deploying the port streamer.

1400 Trace 132 had leakage. To try to catch the next tide slot it was decided to start with 1 bad trace. The fault was in the slip ring box and this would be re-wired during a line change.

1420 The Observers noticed a broken stress member in a stretch section which had to be changed.

1600 The other stretch section was badly holed and also had to be changed. This meant that the next tide slot at 17:43 hours was missed.

1830 Port cable out on wide. Some traces were pulsing and there was one dead in the instrument room.

2354 No dead traces and swell noise was acceptable.

2400 In production. The starboard cable was slightly unstable.
Offset and polarity checks were not completed. No starboard tailbuoy.

26th August 1989

0000 SOL 89FA-FO334-S.
At the start of this line streamer feathering was still affected by the turn on to line and coverage could be affected.
Any infill would be at Geco's expense.

0331 EOL 89FA-FO334-S. Data was much improved by shooting against the current.

0531 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

Offset and polarity shots were completed.

0632 SOL 89FA-FO502-S.

0957 EOL 89FA-FO502-S.

Both MOB boats left to repair tailbuoys.

1154 MOB boat back on board. The NESA engineer remained on Frans Naerebout to repair the tailbuoy.

1300 MOB boat back out.

1307 SOL 89FA-FO166-S.

1354 Starboard tailbuoy back in use. The engineers were still working on the Geco Rho tailbuoy and the MOB boat remained at sea.

1638 MOB boat back on board.

1642 EOL 89FA-FO166-S.

The water speed log did not always appear to be working correctly. It very often seemed to read approximately 4.3 knots when shooting into the current and making 4.5 knots over the ground.

1842 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1911 SOL 89FA-FO646-S.

2242 EOL 89FA-FO646-S.

2400 On normal line change.

27th August 1989

0042 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

0116 SOL 89FA-FO346-S.

0451 EOL 89FA-FO346-S.

0651 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby.

0746 SOL 89FA-FO490-S.

1115 EOL 89FA-FO490-S.

1130 Since the revised shooting plan came into action data quality was much better but group 1 coverage was still missing on occasions, indicating slack steering by both vessels. This should not have happened and all parties were reminded of the necessity of keeping a tight grip on the steering performance. The relevant infill, if necessary, would be charged to Geco for any such instances since the new shooting plan was adopted. However, it should always be remembered

that poor navigation signals could have an adverse effect on steering through no fault of Geco.

1315 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1414 SOL 89FA-FO154-S.

1742 EOL 89FA-FO154-S.

1942 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

2018 Next projected SOL time. Swell noise was excessive and the line was aborted on the run-in. On weather standby.

2400 Standing by for weather.

28th August 1989

0245 The run-in to line 358 was aborted due to a complete lack of streamer control on both vessels.

0400 Waiting for an improvement in the weather; wind N 6-8; swell 2-3 m. No real improvement was forecast.

0842 SOL 89FA-FO478-S.

1219 EOL 89FA-FO478-S. This line was subject to swell noise and fluctuations in streamer depths and, initially, was considered to be marginal but later it was processed successfully by MicroMAX.

1419 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

1458 The run-in to line 0142 was aborted due to excessive swell noise and loss of cable control.

1502 Next projected SOL time.

2105 SOL 89FA-FO658-S.

2358 The Hyperfix receiver lost lock on all stations.

2400 Line 89FA-FO658-S scratched from SP 1320. The full prime line and line change were charged for and the re-shoot would be charged as Geco downtime.

29th August 1989

0043 EOL 89FA-FO658-S.

0100 Hyperfix receiver changed.

0200 The NESA engineer was trying to set up the receiver.

0243 End of allocated 2 hour line change time. The remainder of the time until the next SOL time would be charged as standby time.

0309 Next projected SOL time. Hyperfix was not operational and so Contractor downtime started.

0355 Hyperfix back in use. Waiting for the Racal engineer from Geco Rho before going to re-calibrate the Hyperfix.

0400 Started to recover the guns.

0455 Guns on board.

0510 Started to recover the starboard cable to look for leakage.

0635 Racal engineer from Geco Rho on board.

0700 The original Hyperfix receiver was back in use. The fault was corruption in the phase-lock loop firmware. Nothing was replaced but the system had to be cleared.

0750 MOB boat out to add weight to the starboard cable and remove debris from the tailbuoy.

0838 MOB boat back on board.

0925 Next tide slot. Still on Contractor time.

0930 Call from Geco Sigma to Geco Orpington to request an investigation in to the deteriorating performance of Hyperfix beacons H7 and K7. Apparently Orpington were going to contact Racal with a view to getting something done but it still remained unclear what course of action was to be taken.

1025 Starboard cable out in wide tow. Leakage had been found in the waterbreak section but no spare was available, so the cable was redeployed. A spare was available on Geco Rho and was to be collected at the next opportunity. During all the time available before the next SOL none of the faults which should have been fixed, streamer leakage, repair of acoustic hydrophone S2H2 on the port streamer, were actually fixed.

1050 Guns deployed. The vessels were unable to make any line in the time available so Contractor time continued.

1542 SOL 89FA-FO142-S.

1917 EOL 89FA-FO142-S.

2117 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

2148 SOL 89FA-FO670-S.

2400 LSP of the day 1024, line 89FA-FO670-S.

30th August 1989

0129 EOL 89FA-FO670-S.

0329 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

0353 SOL 89FA-FO358-S.

0729 EOL 89FA-FO358-S.

0929 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

1006 SOL 89FA-FO466-S.

1105 MOB boat away to Geco Rho to collect a waterbreak section.

1120 MOB boat back on board.

1344 EOL 89FA-FO466-S. Poor navigation.

1544 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

1621 SOL 89FA-FO130-S.

1956 EOL 89FA-FO130-S. This was a good seismic line but the Norstar stats for Hyperfix F1 showed that only 80 shots were in specification.

2156 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

2231 SOL 89FA-FO682-S.

2400 LSP of the day 719, line 89FA-FO628-S.

31st August 1989

0210 EOL 89FA-FO682-S.

0410 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

0438 SOL 89FA-FO370-S.

0735 MOB boat away to Geco Rho to collect the Racal engineer.
The boat had to run alongside Geco Rho for too long because the engineer was not ready for the transfer.

0823 MOB boat back on board.

0817 EOL 89FA-FO370-S.

1017 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

1049 SOL 89FA-FO454-S.

1428 EOL 89FA-FO454-S.

1530 MOB boat away to Geco Rho to transfer the Racal man.

1540 MOB boat back on board.

1628 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

1700 SOL 89FA-FO118-S.

2038 EOL 89FA-FO118-S.

2238 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

2311 SOL 89FA-FO694-S.

2400 LSP of the day 437, line 89FA-FO694-S.

1st September 1989

0252 EOL 89FA-FO694-S.

0452 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

0521 SOL 89FA-FO382-S.

0900 EOL 89FA-FO382-S.

1100 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

1131 SOL 89FA-FO442-S.

1511 EOL 89FA-FO442-S.

1711 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

1743 SOL 89FA-FO106-S.

2126 EOL 89FA-FO106-S.

2326 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

2400 On extended line change.

2nd September 1989

0001 Start of infill line in columns 25-27. Streamer stability was very poor with the cables on or close to the surface. The data was scratched.

0146 End of scratched line. Geco Rho was able to collect acceptable data but their cables were also unstable.

There was a 2-3 m swell and for this reason the time on Geco Sigma

for this line and the following line change were logged as weather standby.

0251 SOL 89FA-FO658*S. Re-shoot of Seq. 40.
There was heavy swell noise but the streamer depths stayed within specification.

0336 EOL 89FA-FO658*S.
The line change from this time to the next projected SOL time would be charged as Contractor downtime because it followed a non-chargeable re-shoot.

0525 MOB boat away to the crew boat Stormvogel to collect the Racal engineer and then to Geco Rho to collect floppies.
The sea was about 2 m but there were no problems.

0544 MOB boat back on board.

0600 Attempt made to shoot Seq. 58 but cable stability was bad and the line was abandoned. Weather standby was logged to the next projected SOL time.

0606 Next projected SOL time.
During this period of weather standby it was decided to re-calibrate the Hyperfix to try to improve the fix quality on Geco Sigma. New C-O values were to be obtained using both receivers. K8 was to be calibrated so that it could be used in the fix and K7 had to be re-calibrated because changes had been made on this station. It was agreed that this operation would be acceptable as the end of job post-calibration and it was logged as operational time from the next projected SOL time.

0645 Heading north to reach the calibration area.

0900 Syledis lost sync.

0924 Syledis now good.

1137 Start of the first run, heading west.

1216 Next projected SOL time. Start of operational time.

1250 End of the first run.

1320 Start of the second run, heading east.

1433 End of the second run.

1650 Start of the first run using the spare receiver, heading east.

1741 End of the first run.

1808 Start of the second run, heading west.

1858 Calibration completed.

1928 The decision was made to use the spare Hyperfix receiver and associated C-O values. Heading south to the prospect.

2400 On line heading. The sea was 2-3 m.

3rd September 1989

0130 SOL 89FF-FO586/S. 1-boat infill in columns 106-110.

0326 EOL 89FF-FO586/S.

0526 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

0650 Next projected SOL time but the swell noise and cable control were too bad for production. On weather standby.

1259 Next projected SOL time. The sea state was much better but Geco Rho was unable to shoot because of leakage in the lead-in. Geco Sigma was, therefore, on Contractor downtime until the next SOL.

1445 SOL 89FF-FO526/S. 1-boat infill in columns 178-181.

1630 EOL 89FF-FO526/S.
Line change on operational time.

1812 SOL 89FF-FO226/S. 1-boat infill in columns 465-471.

2154 EOL 89FF-FO226/S.
A partially grounded Navtech hydrophone caused pick-up on the cable. It was removed from the patch panel and shorted out completely. The Navtech trigger pulse was reduced to prevent interference.

2354 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

2400 Line change extended to the next prime line.

4th September 1989

0120 SOL 89FA-FO430-S. Prime line.

0458 EOL 89FA-FO430-S.

0658 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

0732 SOL 89FA-FO394-S.

1105 EOL 89FA-FO394-S.

1142 MOB boat away to add lead around starboard depth 7.

1233 MOB boat back on board.

1305 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

1342 SOL 89FA-FO418-S.

1718 EOL 89FA-FO418-S.

1918 End of allocated 2 hour line change. The remainder of the time until thue next SOL would be charged as standby time.

1941 SOL 89FA-FO214-S1. This was the completion of Seq. 13, SPs 100-553 rejected because of swell noise.

2047 EOL 89FA-FO214-S1. The original time was not charged as prime. This line was prime time followed by standby time until the next SOL time.

2236 SOL 89FA-FO178*S. Re-shoot of Seq. 25, SPs 1500-1630 rejected because of bad navigation signals.

2319 EOL 89FA-FO178*S. This line and the following line change were charged as standby.

2400 On a line change following a chargeable re-shoot.

5th September 1989

0155 SOL 89FF-FO466/S, infill in columns 237-240.

0534 EOL 89FF-FO466/S.

0734 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

0806 SOL 89FA-FO322*S. Re-shoot of Seq. 27. SPs 100-130 were a 2-boat re-shoot and SPs 131-432 a 1-boat re-shoot because of Geco Sigma gun failures on the original line.

0853 EOL 89FA-FO322*S, LSP 10432.
SOL 89FF-FO322/S, infill in columns 383-385, FSP 10433.

1138 EOL 89FF-FO322/S.

1338 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

1533 SOL 89FF-FO490/S, infill in columns 204-209.

1639 EOL 89FF-FO490/S, LSP 11171.
SOL 89FA-FO490*S, FSP 11172. Re-shoot of Seq. 37, SPs 1181-1239 because of gun failures on the original line.

1648 EOL 89FA-FO490*S, LSP 11239.
SOL 89FF-FO490/S1, infill in columns 204-209, LSP 11240.

1742 EOL 89FF-FO490/S1, LSP 11630.

1942 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

2009 SOL 89FA-FO358*S. Re-shoot of Seq. 45, SPs 100-570 because of gun failure on the original line.

2122 EOL 89FA-FO358*S, LSP 10570.
SOL 89FF-FO358/S, infill in columns 346-351, FSP 10571.

2231 EOL 89FF-FO358/S, LSP 11004.

2400 On allocated 2 hour line change.

6th September 1989

0031 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

0221 SOL 89FA-0406-S.

0604 EOL 89FA-0406-S.

0804 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

0827 SOL 89FF-0262/S, infill in columns 442-445.

0941 EOL 89FF-0262/S, LSP 11318.
SOL 89FA-0262*S, FSP 11319. Re-shoot of Seq. 7, SPs 1319-1387 rejected on the original line because of gun sequence errors caused by poor navigation signals. This was a chargeable re-shoot.

0953 EOL 89FA-0262*S.
The one line change from here to the next SOL would be charged as standby time as it followed a chargeable re-shoot.

1217 SOL 89FF-FO646/S, infill in columns 58-64.

1527 EOL 89FF-FO646/S.

1727 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

1743 SOL 89FF-FO106/S, infill in columns 586-589.

2123 EOL 89FF-FO106/S.

2323 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

2400 Extended line change.

7th September 1989

As CDP coverage was thought to be completed the Geco Rho was released from production in order to carry out Contractor streamer work and also to carry out Syledis baseline crossings.
The remaining lines (all single-boat) were to be done by Geco Sigma.

0114 SOL 89FF-FO190/S, single-boat infill.

0322 EOL 89FF-FO190/S.

0522 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

0601 SOL 89FF-FO274/S. Single-boat infill, columns 431-432, at Contractor cost because Geco Rho missed the columns last time.

0647 EOL 89FF-FO274/S.
The line change from here to the next SOL would be charged as Contractor time because it followed a non-chargeable re-shoot.

0815 SOL 89FF-FO274/S. Single-boat infill in columns 286-289.

1139 EOL 89FF-FO274/S.

1300 It came to light that, during Seq. 73, the Geco Rho missed the near group infill on CDP lines 121 and 122. Groups 2, 3 and 4 were full. This was now the biggest hole remaining in the coverage and it would have to be re-shot at Contractor expense. It remained a mystery how, when shooting 4 CDP lines, that the Geco Rho could completely miss the required infill in group 1. The delay in preparation of the coverage was due to a comms. breakdown on line when the Geco Rho data did not get to the Geco Sigma during production. The data was sent over later and it was believed to be complete at the time, but proved otherwise.

1339 End of allocated 2 hour line change. The remainder of the time until the next SOL would be charged as standby time.

1347 SOL 89FF-FO382/S, single-boat infill in columns 313-315.

1433 EOL 89FF-FO382/S.

1548 Estimated SOL time but the line change was extended to finish repairing the starboard array. Start of Contractor time.

1620 SOL 89FA-FO394*S. Single-boat re-shoot of SPs 11148-EOL on Seq. 63 rejected on the original line because the starboard gun array failed.

1727 EOL 89FA-FO394*S. The line change from here to the next infill would be charged as Contractor downtime.

1908 SOL 89FF-FO574/S, single-boat infill in column 121.

1937 EOL 89FF-FO574/S. This was non-chargeable infill and the line change from here to the next SOL would be charged as Contractor time.

2106 SOL 89FF-FO586/S1, single-boat infill in column 120.

2149 EOL 89FF-FO586/S1. This was non-chargeable infill. Standby time would be charged while the final coverage plot was prepared.

2205 Started to recover the guns.

2230 Coverage plot completed. All infill was complete.

Operational time would be charged from now until the vessel arrived in Den Helder.

2345 Guns on board.

2355 Started to recover the wide tows and streamers.

2400 Recovering the equipment.

8th September 1989

0311 Both streamers recovered.

0335 Both tailbuoys on deck. The vessel headed north to re-cross the Syledis baselines. Operational time.

0520 Commenced baseline crossings.

0745 Baseline crossings completed. Commenced bar check.

0845 Bar check completed. Heading south to Den Helder. Operational time continued.

2200 Nominal end of contract time. Berthed in Den Helder.

8.2 Geco Rho

9th August 1989

0000 En-route to Den Helder for NAM-requested port call to rig navigation etc. for F-03 blocks.

0525 Alongside Den Helder Pier 35.

0535 Gangway down. There was no sign of Racal, although all other companies, including Intersite, Geodetic, Radio Holland etc. were present.

0830 Racal arrived with equipment.

2400 Alongside Den Helder rigging Hyperfix etc.

10th August 1989

0000 Alongside Den Helder rigging Hyperfix etc.

0230 The 18 hours allocated operational time for rig-up at the dock now expired. Continued rigging at dockside on Contractor downtime.

0638 En-route from Den Helder to the prospect area. Now on operational time for travel to the prospect. Continued setting up navigation and tailbuoys etc.

2000 Commenced first baseline crossing. Still on operational time but now starting the navigation calibration period.

2345 Baseline crossings continued.

11th August 1989

0000 Baseline crossings continued.

0245 Last baseline crossing (B11/2-Gorm B extension) completed. Evaluating the problem results.

0345 Chase boat sent off to the centre of the prospect area to obtain a TS dip to aid in cable re-ballasting.

0440 Started deploying the starboard tailbuoy to check it and take physical measurements of the tailbuoy rope etc.

0700 TS dip results: 1509.26 m/s. Continued deploying the starboard streamer.

0900 Receiving Syledis and Hyperfix satisfactorily.

1000 Starboard tailbuoy Pulse 8 transferring through satisfactorily.

1045 F2 Hyperfix satisfactorily received through to Norstar.

1100 Racal Syledis not coming through. Norstar Syledis was good.

1135 Racal Syledis was good.

1150 Racal Syledis not coming through.

1230 Starboard streamer fully deployed. Checking balance/wing angles for re-ballasting.

1418 Start of trial C-O calibration run (270°) with GRID and Norstar good but Racal not able to run their program.

1454 First trial calibration run completed. Start of second trial calibration run (090°) still without Racal.

1540 Second trial calibration run completed.

Note: work continued on the ballasting of the starboard streamer throughout except when making turns for the calibration runs.

Continued streamer ballasting.

2039 Start of third calibration run (270°) with Racal GNS running. Syledis was very poor/noisy and Hyperfix had skywave problems (dusk).

2200 Started turning to get alongside Geco Sigma to test Hyperfix with the vessels at shooting separation (200 m).

2214 Borkum Hyperfix failed. A technician went to investigate.

2334 Start of 2-boat Hyperfix test line at 200 m separation with Geco Sigma on the starboard side.

2400 The test line continued but Hyperfix was very unstable.

12th August 1989

0000 The test line continued but Hyperfix was very unstable.

0050 Hyperfix test line with Geco Sigma completed. Hyperfix was too unstable for any conclusive results.

0115 Turning to head west to stay in the vicinity of the nominated calibration line. Streamer work continued.

0325 Hyperfix K7 (F2) was still experiencing lane slippage.

0525 Lane slip again.

0600 Commenced Hyperfix calibration run (090°) with Racal GNS and GRID monitoring (unable at present to run all three systems simultaneously. GRID was on-line all the time, leaving only the choice of either Racal or Norstar. There seemed to be a problem which was being investigated with data format output from the Intersite CDUs).

0648 Same calibration run - Racal changed to Borkum.

0800 End of calibration run. Turning for the 270° calibration run.

0834 Commenced Hyperfix calibration run (270°) with Racal GNS and GRID monitoring. Borkum was in at this time.

0910 Portion of calibration with Borkum completed. Terschelling was put in.

1004 Calibration run completed. Streamer work continued throughout this period when turns etc. permitted.

1100 Measured the front stretch sections on the starboard cable and installed Navtech sensors etc.

1300 Starboard cable fully deployed in dilt. It was probably a bit heavy at the front but otherwise was looking good.

1300 Syledis B11/2 off the air. This put the dampeners on any further calibration runs until it was repaired. The navigation QC and navigators were analysing the calibration data to see whether the Hyperfix C-Os could be accepted. Pulse 8 data was being evaluated.

1315 Port tailbuoy deployed.

1405 Port tailbuoy rope etc. measured. Continued deploying port streamer.

2055 Geco Sigma's MOB boat picked up Racal's engineer, Jeff Smith, to take him over to assist his colleague on Geco Sigma in setting up the Racal systems.

2200 Measuring the port front stretches and installing Navtech sensors etc.

2400 Working on the port streamer. This was the one with spiking and low frequency front end noise.

13th August 1989

0000 Streamer adjustments continued.

0200 Port cable going out in wide.

0240 Both streamers out in dilt. Heading for the prospect area while observing balance/wing angles.

0330 Started retrieving the starboard streamer as the front end was heavy.

0800 Both cables out in dilt. Started deploying the guns.

1353 Missed tidal slot on FO406 because Geco Sigma was not in position.

2004 SOL but Hyperfix signals were too poor to use.

2327 EOL. All data scratched.

2400 Line change to the next tidal slot on standby.

14th August 1989

0000 Line change to the next tidal slot on standby.

0216 SOL 89FA-FO574-R, Seq. 2. Two-boat prime.

0534 EOL 89FA-FO574-R. All data scratched due to poor Hyperfix signals (night conditions). Large variations to bottom speed caused by Hyperfix instability resulted in lost shotpoints, degraded SP spacing and made cable balance difficult. Heavy showers contributed significantly to the poor Hyperfix performance in addition to the night sky-wave problem. Line change on standby.

0835 SOL 89FA-FO250-R, Seq. 3. Two-boat prime.

1200 EOL 89FA-FO250-R, complete. No Geco Rho edits. Starboard tailbuoy Pulse 8 unstable with high standard deviations. Swell noise was present throughout the line. This should not be a problem but the line would be processed with MicroMAX anyway.

1446 SOL 89FA-FO562-R, Seq. 4. Two-boat prime.

1808 EOL 89FA-FO562-R, complete. Edit Geco Rho SPs 973-1119 due to poor navigation (Hyperfix outputs corrupted). Edit SPs 295-302 as the gun sequence was wrong. Geco Rho was 6 SPs behind Geco Sigma at SOL and 9 SPs behind at EOL. Geco Rho's Navtech hydrophones F4H1 and S4H4 were dead throughout the line. No Pulse 8 on the starboard tailbuoy from SPs 166-176.

2054 SOL 89FA-FO238-R, Seq. 5. Two-boat prime.

2400 LSP of the day 1493, line 89FA-FO238-R.

15th August 1989

0000 In production on line 89FA-FO238-R.

0018 EOL 89FA-FO238-R, complete. Edit SPs 1024-1026 and 1230-1235 due to poor gun sequence. Geco Rho was 8 SPs behind Geco Sigma at EOL. Pulse 8 was unstable with high standard deviations on both tailbuoys. Have experimented on last line change using the best combinations of receivers/UHF links and this was about the best possible. Occasional swell noise was seen during the line with ship noise from SPs 930-1150; maximum 33 microbars from abeam. Acoustics F4H1 and S3H4 were dead. After EOL the problem was found to be a relay problem in the Kalamos M6 cable fault locator which was fixed.

0030 Turning north for 2-boat Hyperfix calibration runs/checks.

Started retrieving the guns.

0150 All guns on board.

0218 Allocated 2 hour operational line change time expired.

0700 Start of calibration check run.

0725 Calibration run completed. Turning to head into the weather to recover the port streamer as wind/swell were increasing rapidly and force 6/8 was imminent.

1055 Port cable and tailbuoy on board. The centre compartment had water inside. The regulator was changed out and the batteries etc. checked.

1245 Geco Sigma and Geco Rho both had one cable on board and were heading north for 2-boat calibration runs.

1502 Start of 2-boat calibration runs.

2015 End of calibration runs/checks. No problems were observed. Both vessels headed for the prospect area.

2105 Port tailbuoy deployed. The UHF link, Pulse 8 and Navtech hydrophone were all checked and found good.

2300 Changing out section 25 as trace P73 had been dead since start-up.

2400 Continued working on/deploying the port streamer.

16th August 1989

0000 Continued working on/deploying the port streamer.

0416 SOL 89FA-FO574-R, Seq. 6. Two-boat prime.

0738 EOL 89FA-FO574-R, complete. Edit Geco Rho SPs 500-548 as no data recorded (GDR hang-up). To be re-shot at Geco's expense. Port tailbuoy hydrophone F4H1 was dead. A strong following current caused variable tail cable separations over much of the line.

1001 SOL 89FA-FO262-R, Seq. 7. Two-boat prime.

1319 EOL 89FA-FO262-R, complete. Edit SPs 1329-1377 due to bad gun sequence caused by a Hyperfix lane slip on Geco Sigma. To be re-shot with 10 SPs overlap either side of SPs 1319-1387 on NAM's account (poor navigation propagation). Geco Rho's tail positioning was very marginal on this line and was being put to NAM Topo for evaluation. Geco Rho's starboard tailbuoy's Pulse 8 had very high standard deviations on 50% of line when in lock and also lost lock on SPs 380-500, 650-675, 750-840 and 850-880 (no lock meant no position generated). The port tailbuoy was much better though on edge of specification. This situation was compounded by port tailbuoy hydrophone F4H1 being

dead from SOL-SP 550. With the hydrophone down the end result was one tailbuoy's Pulse 8 good, but with the hydrophone down and other tailbuoy's Pulse 8 bad and the responder good, not a satisfactory situation. It was felt that only 2 of the 4 Pulse 8 receivers on board had full sensitivity and tuning, because swapping tailbuoy receivers changed the bad tailbuoy. The spare was just as bad. Racal needed to provide more Pulse 8 receivers as soon as possible.

1618 SOL 89FA-FO550-R, Seq. 8. Two-boat prime.

1936 EOL 89FA-FO550-R, complete. Edit SPs 1614-1619 (Geco Sigma SP numbers) due to bad gun sequence. Tailbuoy Pulse 8 adequate. F4H1 was dead. Tailnet positioning was just acceptable. Geco Rho's port trace P15 and P17 were spiking occasionally from SP 1350-EOL with very occasional random spikes across the port streamer from SP 1380-EOL (checking raw shots with MicroMAX).

2227 SOL 89FA-FO226-R, Seq. 9. Two-boat prime.

2400 LSP of the day 810, line 89FA-FO226-R.

17th August 1989

0000 FSP of the day 811, line 89FA-FO226-R.

0149 EOL 89FA-FO226-R, complete. Edit SPs 148-153 (Geco Sigma SP numbers) due to bad gun sequence. Port tailbuoy hydrophone F4H1 dead.

0431 SOL 89FA-FO586-R, Seq. 10. Two-boat prime.

0750 EOL 89FA-FO586-R, complete. Edit SPs 1130-1132 (Geco Sigma SP numbers) due to bad gun sequence. F4H1 was still dead.

0800 MOB boat away to fix F4H1.

0850 The MOB boat reported broken wiring inside the streamer ahead of the breakout point at the tail of the tail stretch. Probably a connector at the tail of the tail stretch had corroded; this had happened before. The MOB boat changed out compass/bird C28 (port 8) which had 90° wrong readings in one line direction.

0950 MOB boat back on board.

1044 SOL 89FA-FO274-R, Seq. 11. Two-boat prime.

1411 EOL 89FA-FO274-R, complete. Edit SPs 1571-1576 (Geco Rho SP numbers) due to bad gun sequence. Geco Rho's starboard cable was shallow for a portion of the line, mainly bird 10 to 3.5 m followed briefly by bird 11. This line portion (SPs 1333-1465) was being evaluated by MicroMAX for acceptance or not. Both of Geco Rho's tailbuoys were

poor (intermittent loss of lock) from SOL-SP 230 then adequate after that. Geco Sigma also had tailbuoy problems on this line (NAM evaluation), with their starboard tailbuoy mast reported broken and the port tailbuoy signals corrupted. The decision was made for both vessels to pull streamer, Geco Rho for F4H1 and Geco Sigma for the starboard Pulse 8 tailbuoy.

1500 Heading west to start bringing the port cable on board.

1730 Port cable up as far as the tailbuoy rope. Looking for F4H1 wire break.

2230 Start port cable back out. F4H1 was corroded/broken wire at tail of tail stretch section inside connector.

2400 Deploying the port cable. Leakage had been observed so this was chased while deploying.

18th August 1989

0000 Deploying the port cable while chasing leakage.

0345 Due to port streamer leakage problems, Geco Rho would not be ready for next time slot at 05:13 hours. Geco Sigma would do a single-boat re-shoot while Geco Rho continued streamer repair work.

0600 Working on the port cable. The port tailbuoy Pulse 8 was very noisy and Racal were investigating. Heading east for line slot at 11:26 hours.

0630 MOB boat deployed to Geco Sigma to collect a spare UHF tailbuoy receiver and receiving antenna.

0800 Port cable out in dilt with no leakage. Geco Rho's port tailbuoy still had problems and appeared to be locking on to Geco Sigma's starboard tailbuoy.

1120 Line 89FA-FO286-R aborted on the run-in due to swell noise over 30%/40% of the traces with several traces at 100/200 microbars (2 second analysis). On weather downtime. Troubleshooting Geco Rho's port tailbuoy Pulse 8. It now seemed that the problem might be that the tailbuoy was not transmitting.

1220 Commenced retrieving the guns to check out the port tailbuoy.

1300 Four gun strings on board. Started retrieving the port cable.

1545 Port cable and tailbuoy up. Checking the tailbuoy Pulse 8 and UHF link.

1700 Port tailbuoy ready to go out with new batteries and a new transmitter.

2145 Deploying the port streamer out in wide tow.

2245 Turning on to the run-in to line 89FA-FO214-R.

2348 Run-in aborted due to swell breakout.

2400 Running-in on line direction with vessel deviated off-line.

19th August 1989

0000 Running-in on line 89FA-FO214-R with the vessel deviated off-line. Swell noise, severe on the run-in, reduced very quickly so the Geco Rho's Party Chief decided to get back on line and start acquisition.

0003 SOL 89FA-FO214-R but the vessel was still off-line and the gun sequence was out.

0027 FGSP 360 but, due to operator error, Geco Rho's port guns were not firing.

0052 The first SP with all 4 arrays firing was SP 554. After MicroMAX processing this was accepted as the FGSP as the swell was reducing rapidly from cable noise strip time at around 23:30 hours.

0312 EOL 89FA-FO214-R, Seq. 13, incomplete. Line processed with MicroMAX for swell noise and accepted SPs 554-1630.

0558 SOL 89FA-FO598-R, Seq. 14. Two-boat prime.

0915 EOL 89FA-FO598-R, complete. A good line. Edit SPs 152-157 (Geco Sigma numbers) due to gun sequence errors. Some swell noise was present but reducing on line.

1210 SOL 89FA-FO286-R, Seq. 15. Two-boat prime.

1533 EOL 89FA-FO286-R, complete. A good line in all respects except that the propagation conditions appeared to have changed (the mobile 'phone was working for the first time on this prospect); Pulse 8 was good but Hyperfix affected adversely, leading to lane slip (especially Hyperfix K7 F1 and F2) and the use of a Hyperfix/Syledis cocktail in prime vessel solutions. The vessel mean standard deviation was good at 1.9 metres, but many lost shots, especially circa SP 700-870, caused sequence reversals. Edit SPs 703-709, 713-720, 760-762 and 771-775 (all Geco Sigma numbers) due to gun sequence errors.

1820 SOL 89FA-FO538-R, Seq. 16. Two-boat prime.

2140 EOL 89FA-FO538-R, complete. The same type of Hyperfix difficulties led to instabilities around SPs 750-1300. Edit SPs 393-407, 1188-1190, 1234-1237, 1257-1258, 1265-1267 and 1291-1296 (all Geco Sigma numbers) due to gun sequence errors.

2400 On line change.

20th August 1989

0000 On line change.

0033 SOL 89FA-FO202-R, Seq. 17. Two-boat prime.

0402 EOL 89FA-FO202-R, complete. One Geco Rho array (P2) developed an airleak on the run-in and had to be pulled in and repaired at SOL. Edit Geco Rho SPs 100-376 as no port guns were available (airleak) (single-boat re-shoot required at Geco cost). Vessel and starboard tailbuoy navigation was good. Port tailbuoy navigation was unstable as usual though locked on properly.

0641 SOL 89FA-FO610-R, Seq. 18. Two-boat prime.

0958 EOL 89FA-FO610-R, complete. Edit SPs 692-693(S), 934-942(R), 945-947(S), 952-953(S), 1187(R) and 1199-1202(S) due to gun sequence errors, all caused by vessel navigation instability, mainly on Geco Sigma. This problem appeared to be closure loss from Geco Sigma to Geco Rho, resulting in flip on Geco Sigma but not on Geco Rho and overshooting until the sequence was corrected.

1255 SOL 89FA-FO298-R, Seq. 19. Two-boat prime.

1614 EOL 89FA-FO298-R, complete. No Geco Rho edits. Hyperfix was more stable on this line for some unknown reason.

1904 SOL 89FA-FO526-R, Seq. 20. Two-boat prime.

2223 EOL 89FA-FO526-R, complete. Hyperfix instabilities returned. As a result edit SPs 221-223(S), 745-748(S), 1433-1439(S), 1500-1504(S) and 1591-1598(S) (all Geco Sigma SP numbers) due to gun sequence errors.

2400 On line change.

21st August 1989

0000 On line change.

0119 SOL 89FA-FO190-R, Seq. 21. Two-boat prime.

0443 EOL 89FA-FO190-R, complete. Edit SPs 1573-1579(S) due to gun sequence errors. Also Geco Sigma GDR and gun sequence problems led to the edit of SPs 100-109 on both vessels.

0730 SOL 89FA-FO622-R, Seq. 22. Two-boat prime.

1046 EOL 89FA-FO622-R, complete. Edit SPs 1552-1555(S) only due to gun sequence errors.

1341 SOL 89FA-FO310-R, Seq. 23. Two-boat prime.

1704 EOL 89FA-FO310-R, complete. Edit SP 672(S) only due to gun sequence errors.

1950 SOL 89FA-FO514-R, Seq. 24. Two-boat prime.

2308 EOL 89FA-FO514-R, complete. Edit SPs 476-483(R) and SPs 533-536(S) due to gun sequence errors.

2400 Line change.

22nd August 1989

0000 Line change.

0208 SOL 89FA-FO178-R, Seq. 25. Two-boat prime.

0529 EOL 89FA-FO178-R, complete. Poor navigation (K7 F1 was slipping and erratic Syledis) led to the edit of all SPs 1501-1630 (two-boat re-shoot on NAM's account).

0819 SOL 89FA-FO634-R, Seq. 26. Two-boat prime.

1140 EOL 89FA-FO634-R, complete. No Geco Rho edits.

1429 SOL 89FA-FO322-R, Seq. 27. Two-boat prime.

1751 EOL 89FA-FO322-R, complete. Geco Sigma autofires and a couple of misfires from each vessel led to the edit of all SPs 100-130 due to the guns (two-boat re-shoot on Geco's account). Geco Rho's starboard cable was caught in the swell when the speed dropped and led to the edit of SPs 1500-1590 due to Geco Rho's starboard cable being shallow (single-boat re-shoot on Geco's account). Also edit SPs 1008-1009 and 1043-1047 due to gun sequence errors. Some breakout was seen throughout the line. A scrappy line altogether (Geco Sigma had port source problems too). Geco Sigma started picking up streamers for the crew change and Geco Rho headed for a single-boat re-shoot.

1951 Allocated 2 hour operational line change period expired.

2016 SOL 89FA-FO562*R, Seq. 28. Single-boat, low feather re-shoot. Re-shoot of Seq. 4 (14th August 1989) when Geco Rho's navigation failed. Geco Sigma had already had a go at the top 4 columns. Group 1 was good but groups 2, 3 and 4 were still required on columns 135-139.

2046 EOL 89FA-FO562*S, complete. No edits. Trailing equipment picked up for the Geco crew change off Lauwerzoog.

2400 Trailing equipment retrieved.

23rd August 1989

0000 Trailing equipment retrieved.

0100 All trailing equipment on board. The vessel picked up speed to rendezvous with the vessel Deneb at 11:30 hours.

0800 At the rendezvous point off Lauwerzoog.

1530 En-route back to the prospect area after the crew change.

1850 Started deploying the starboard streamer. The weather had been picking up all afternoon.

2340 Starboard streamer out in wide tow and good. This definitely was not shooting weather with breakout present with the streamer at 15 metres depth. At 7 metres 80%/90% traces were breaking out. Continued deploying the port streamer on weather standby.

24th August 1989

0000 Preparing the port tailbuoy.

0030 Launching the port tailbuoy and measuring the tail stretch etc.

0600 Started recovering the port cable due to the forecast for force 8 winds.

0745 The port tailbuoy rope parted while hauling it up the slip.

1030 Port tailbuoy recovered on board. Fortunately the chase boat had been able to get a line on it.

1130 Started deploying the port tailbuoy.

1210 Port tailbuoy recovered as Pulse 8 was not working.

1255 Started deploying the port tailbuoy out again after the fuses had been replaced/fixed.

1525 Port cable front stretches measured.

1900 Port streamer out in wide (both now out).

1955 Turning on heading 090° to check for swell breakout; 40%/60% traces were still at up to 600 microbars. Swell height was still 3 to 4 metres.

2236 At SOL position for line 89FA-FO322*R re-shoot, but it was still far too noisy to shoot.

2300 The port cable was spiking as it had done a couple of weeks ago. Retrieving the port lead-in.

2304 Off weather standby and on to Contractor downtime.

2400 Port cable off dilt.

25th August 1989

0000 Port cable off dilt.

0100 Adaptor (1 metre special section at tail of lead-in used for re-routing the wires) removed and repaired and chains on the dilt clamp modified.

0305 Port tailbuoy Pulse 8 not working.

0330 Both cables out in dilt. No spiking on port streamer. Source deployed.

0504 Nominal slot time for infill line 0562. Now off Contractor downtime and on to operational infill time.

0640 SOL 89FF-FO562/R, Seq. 29. Single-boat, 40-fold chargeable infill line with coverage required on columns 141-146 on various groups.

0842 EOL 89FF-FO562/R, complete. No edits. Port tailbuoy dead.
The front acoustics were just adequate as they were still being tuned in on line (the only way to do it) but the tail acoustics were poor.

1133 SOL 89FA-FO202*R, Seq. 30. Single-boat, 40-fold re-shoot of Sequence 17 (Geco Rho's port guns had had an airleak and were switched off) with coverage required on columns 493-496.

1210 EOL 89FA-FO202*R, complete. No edits. Port tailbuoy dead.
The vessel carried on without stopping straight into infill line.

1210 SOL 89FF-FO202/R, Seq. 30. Single-boat, 40-fold infill line with coverage required on the same columns: 1493-496.

1457 EOL 89FF-FO202/R, complete. No edits. Port tailbuoy dead.
The front acoustics were good but the tail net still had an unresolved problem with the position displayed on 3D (it would not be used in processing).

1746 SOL 89FF-FO634/R, Seq. 31. Single-boat, 40-fold infill line with coverage required on columns 72-74, mostly groups 2/3/4.

2114 EOL 89FF-FO634/R, complete. No edits. Port tailbuoy dead.
Some swell burst-out was seen at low levels, 10/30 microbars rms.
An Omniseis crash on the run-in led to a bit of a panic at SOL and though it was up and running at SOL, in the meantime the vessel had wandered several columns to port and therefore coverage would be missing at this end of the line. The missing infill coverage on this line portion would be re-acquired at Geco's expense. Also 21 shots were lost and SP spacing was degraded due to the usual navigation instability at dusk. For some reason the very stable Syledis ranges

were not used in the prime fit, which would have improved matters. This would be corrected in future.

2400 SOL 89FA-FO334-R, Seq. 32. Two-boat prime.

26th August 1989

0000 SOL 89FA-FO334-R, Seq. 32. Two-boat prime.

0331 EOL 89FA-FO334-R, complete. No Geco Rho edits. Port tailbuoy dead. No missed SPs, with reasonable feathers/cable separations and good cable depth keeping.

0632 SOL 89FA-FO502-R, Seq. 33. Two-boat prime.

0736 MOB boat away to check the tailbuoys.

0900 MOB boat back. There were no obvious problems. A full expedition would be mounted later to get the tailbuoys to Naarebout for repair.

0957 EOL 89FA-FO502-R, complete. Edit SPs 774-776 (Geco Sigma numbers) due to gun sequence errors. Geco Rho was 2 SPs behind Geco Sigma at EOL. Hyperfix was unstable from around SP 800 and the cocktail solution was used in the prime fit until EOL. The port tailbuoy was dead. Low ambient noise was seen throughout the line. The weather had moderated but should pick up again later.

1030 MOB boat away for tailbuoy repairs.

1130 MOB boat back.

1307 SOL 89FA-FO166-R, Seq. 34. Two-boat prime.

1612 Geco Sigma tailbuoys now good. MOB boat away to work on Geco Rho's port tailbuoy on line as the weather was now quite calm.

1642 EOL 89FA-FO166-R, complete. Geco Rho was 10 SPs behind Geco Sigma from SOL and 12 SPs behind at EOL. Geco Rho was shooting but not recording for the first 10 SPs. Edit Geco Rho SPs 100-109 (Geco Sigma SP numbers) as no data was recorded. Edit SPs 1413-1415 (Geco Sigma SP numbers) due to gun sequence errors. Port tailbuoy still dead.

1716 MOB boat back. It changed the UHF link antenna cable, but Geco Rho's port tailbuoy was still bad.

1911 SOL 89FA-FO646-R, Seq. 35. Two-boat prime.

2242 EOL 89FA-FO646-R, complete. No Geco Rho edits. Port tailbuoy dead.

2400 Line change.

27th August 1989

0000 Line change.

0116 SOL 89FA-FO346-R, Seq. 36. Two-boat prime.

0451 EOL 89FA-FO346-R, complete. Edit SPs 543-547 due to gun sequence errors. Otherwise an incident-free line.

0740 MOB boat away for a last attempt at the port tailbuoy Pulse 8.

0850 MOB boat back. It had replaced the Pulse 8 antenna but still it was only a UHF carrier with no Pulse 8 modulation. The seas were too rough to open up the waterproof boxes with the tailbuoy in the water.

0746 SOL 89FA-FO490-R, Seq. 37. Two-boat prime.

1115 EOL 89FA-FO490-R, complete. An odd gun sequence split, caused by one of Geco Sigma's Litton boxes misbehaving and not noticed by Observers, led to the edit of SPs 1181-1239 due to both vessels' starboard sources (missing columns to be re-shot at Geco's expense). Geco Rho's port tailbuoy was still dead and the weather was now too rough to use the MOB boat. However, 3 out of 4 were working.

1414 SOL 89FA-FO154-R, Seq. 38. Two-boat prime.

1742 EOL 89FA-FO154-R, complete. Edit SPs 607-610 and 654-660 due to gun sequence errors. The weather increased during the line and swell breakout was present at EOL on 8 of 240 traces at 30/50 microbars rms (2 second analysis). The weather also increased on the line change.

2018 Line start aborted with swell level bursting out at 100/200 microbars rms (2 second analysis) on 40/50 traces. Weather standby.

2400 Weather standby.

28th August 1989

0000 Weather standby.

0802 SOL 89FA-FO478-R, Seq. 39. Two-boat prime.

1219 EOL 89FA-FO478-R, complete. No Geco Rho edits. Moderate to heavy swell throughout of 2.5/3.0 metres but from the NNE which gave side seas and much less noise. 24 out of 240 traces were at 30 microbars, with 10 at 50 microbars and 2/3 up to 80/100 microbars, all for fairly short periods and with low frequency content (all measurements over 2 seconds minimum). Line accepted and this was confirmed by MicroMAX processing. Cable stability was marginal and the compasses were very noisy. Coverage was being looked at to see whether the vessel

separations were maintained, but this was a very adequate line for purely processed seimsic data quality.

2107 SOL 89FA-FO658-R, Seq. 40. Two-boat prime.

2400 In production on line 89FA-FO658-R.

29th August 1989

0000 In production on line 89FA-FO658-R.

0043 EOL 89FA-FO658-R, complete. Geco Sigma lost all Hyperfix navigation and this caused SP spacing degradation on Geco Rho etc. Edit SPs 1321-1630 on both vessels. Port tailbuoy still dead. There was some swell breakout throughout the line and some towing noise at the front end of the port streamer. This would be fixed on the line change. Geco Rho headed for an infill line while Geco Sigma dealt with the Hyperfix failure.

0100 Started retrieving the guns to repair the port streamer due to front end towing noise.

0309 Nominal slot time for line 0346 infill. The vessel ran down the line on Contractor downtime while deploying the guns.

0607 SOL 89FF-FO346/R, Seq. 41. Single-boat, 40-fold infill line with coverage required on columns 349-351 in various groups.

0732 EOL 89FF-FO346/R, complete. Edit SPs 1046-1086 as the port guns were not firing (operator error). There were some SP numbering problems associated with this SOL which were being scrutinised and documented. Coverage was checked to see whether any missing coverage should be re-acquired at Geco's expense. Please note that this line was a quick decision by the chief navigator on Geco Rho and was not, in fact, planned. The data was marked "Possible Infill Only - Do Not Process". This time was all Contractor downtime and the vessel ran to the next infill line on downtime.

0920 SOL 89FF-FO514-R, Seq. 42. Single-boat, 40-fold infill line with coverage required on columns 189-192 in various groups.

1105 MOB boat away to repair the port tailbuoy.

1114 EOL 89FF-FO514-R, complete. No edits. No problems.
Geco Sigma had been able to fix their Hyperfix and would join Geco Rho in the next slot for a two-boat prime line. Meanwhile the weather had moderated enough to take the port tailbuoy in to Naarebout for repair.

1542 SOL 89FA-FO142-R, Seq. 43. Two-boat prime.

1620 MOB boat back.

1659 Port tailbuoy Pulse 8 now good and running to Norstar.

1917 EOL 89FA-FO142-R, complete. Edit SPs 1399-1404(S) due to gun sequence errors.

2148 SOL 89FA-FO670-R, Seq. 44. Two-boat prime.

2400 LSP of the day 913, line 89FA-FO670-R.

30th August 1989

0000 FSP of the day 914, line 89FA-FO670-R.

0129 EOL 89FA-FO670-R, Seq. 44, complete. Two-boat prime. Edit SPs 681-682(S), 1582-1583(S) and 1603-1604(S) due to gun sequence errors.

0353 SOL 89FA-FO358-R, Seq. 45. Two-boat prime.

0729 EOL 89FA-FO358-R, complete. Edit SPs 621-623(S) and 684 due to gun sequence errors.

1006 SOL 89FA-FO466-R, Seq. 46. Two-boat prime.

1344 EOL 89FA-FO466-R, complete. No Geco Rho edits. The Pulse 8 tailbuoys performed well on this line.

1621 SOL 89FA-FO130-R, Seq. 47. Two-boat prime.

1956 EOL 89FA-FO130-R, complete. Edit SP 1529 due to a gun sequence error.

2231 SOL 89FA-FO682-R, Seq. 48. Two-boat prime.

2400 LSP of the day 719, line 89FA-FO682-R.

31st August 1989

0000 FSP of the day 720, line 89FA-FO682-R.

0210 EOL 89FA-FO682-R, complete. No Geco Rho edits.

0438 SOL 89FA-FO370-R, Seq. 49. Two-boat prime.

0817 EOL 89FA-FO370-R, complete. No Geco Rho edits.

1049 SOL 89FA-FO454-R, Seq. 50. Two-boat prime.

1428 EOL 89FA-FO454-R, complete. No Geco Rho edits.

1700 SOL 89FA-FO118-R, Seq. 51. Two-boat prime.

2038 EOL 89FA-FO118-R, complete. Edit SPs 649-655 due to gun sequence errors.

2311 SOL 89FA-FO694-R, Seq. 52. Two-boat prime.

2400 LSP of the day 437, line 89FA-FO694-R.

1st September 1989

0000 FSP of the day 438, line 89FA-FO694-R.

0252 EOL 89FA-FO694-R, complete. No Geco Rho edits. The starboard Pulse 8 tailbuoy navigation was very poor and unstable with high standard deviations.

0521 SOL 89FA-FO382-R, Seq. 53. Two-boat prime.

0900 EOL 89FA-FO382-R, complete. No Geco Rho edits.

1131 SOL 89FA-FO442-R, Seq. 54. Two-boat prime.

1511 EOL 89FA-FO442-R, complete. No Geco Rho edits.

1743 SOL 89FA-FO106-R, Seq. 55. Two-boat prime.

2126 EOL 89FA-FO106-R, complete. No Geco Rho edits. However, the 3D link failed, as did the GM2B link (common to Geco Sigma's multiplexer) from SPs 1250-1611(3D) and SPs 1253-1582(GM2B)(Geco Rho SP numbers). This meant that no 2-boat gun mask was recorded anywhere. Provided that individual vessel Omniseis data was intact, coverage could be processed after the vessels had transferred their data to each other. During a 3D link failure the vessels were obliged to steer on a combination of Norstar distances, radar and eyeball. In the past there had been severe coverage degradation due to poor in-line/cross-line separations. Coverage would be evaluated and any infill acquired on Geco's account.

2400 Line change.

2nd September 1989

0000 Line change.

0001 SOL 89FF-FO670/R, Seq. 56. Two-boat, 20-fold, split infill line with Geco Sigma on columns 25-27 and Geco Rho on columns 34-37.

0146 EOL 89FF-FO670/R. Edit Geco Rho SPs 523-608 as Geco Rho's starboard cable was shallow and Geco Rho SPs 100-117 as no data was recorded (guns good).

Considerable swell breakout was seen on 10 out of 240 traces at 30 microbars and at 50 microbars on 4 traces. The compasses were noisy in the swell and there was an Omniseis link failure at SOL to SP 172 (the GM2B link was bad at the same time, indicating a multiplexer problem again on Geco Sigma). The vessel carried on down the line on operational line change time to a re-shoot.

0252 SOL 89FA-FO658*R, Seq. 57. Two-boat re-shoot of Seq. 40 (Geco Sigma navigation crash).

0336 EOL 89FA-FO658*R, complete. No Geco Rho edits. The swell levels were as above and Geco Rho cable stability was adequate.

0606 Line 89FA-FO394-R, prime, aborted due to swell/cable stability. On weather standby. Both vessels headed up north to re-calibrate Hyperfix.

1900 Calibrations on both Hyperfix units were completed satisfactorily. Heading back to the prospect.

2215 There was no lock on any Hyperfix stations and the Racal engineer started investigating.

2400 Heading for line 89FF-FO586-R while investigating the Hyperfix problem.

3rd September 1989

0000 Heading for line 89FF-FO586-R, Seq. 59, split infill line. Still investigating the Hyperfix problem.

0058 Attempt to start line 89FF-FO586/R without any Hyperfix and on Syledis only. The Racal engineer had mixed up the 2 transceivers and the vessel continued down the line with the RF boards from one transceiver installed in the other. This definitely was not acceptable and this sequence was totally rejected. On Contractor downtime for navigation equipment failure.

0413 End line 89FF-FO586-R. Swell noise increased rapidly during the last portion of the line and was marginally acceptable, but the navigation configuration made the line unacceptable.

0430 The Racal engineer put the original components back in their proper calibrated positions. Although the signal to noise ratio was then poor and K8 F1 was not locking, nevertheless it was considered that navigation was minimally acceptable, i.e. it would have been possible to shoot the next prime line if the swell level had not shut the vessel down. Line change continued on downtime.

0650 SOL 89FA-FO394-R, two-boat prime, aborted on the run-in as the swell levels/cable control were not acceptable. On weather standby.

0700 Spikes were noticed on the port streamer. These would be investigated.

0705 Started retrieving the guns.

0830 Started retrieving the port cable.

1200 It was decided to change out the port lead-in due to leakage. Meanwhile, the Racal engineer was investigating the reason for the low Hyperfix signal levels. It was discovered that the problem had started while a radio call was being made last night. Normally, calls were made during the day on 2 MHz at medium power levels but last night the radio operator had used 4 MHz at high power and the Hyperfix degraded around that time.

1230 A spare Hyperfix antenna turning unit (ATU) was installed at the top of the main mast and the signals became good. This unit could not be used as it required calibration, but this gave the crew a chance to attempt to troubleshoot the original ATU.

1259 On Contractor downtime for cable failure as this was slot time and the swell had come down (Geco Sigma was running down to an infill line with reasonable swell burst-out levels).

1345 Original ATU repaired and replaced. The failure was due to a burnt-out resistor. These are known to fail when external RF is applied. Monitoring Hyperfix to determine quality.

1400 Hyperfix locked on all stations, both F1 and F2, with good standard deviations which were almost exactly the same as Geco Sigma's.

1554 Port streamer deployed with the new lead-in. Running-up north to join Geco Sigma and do offset checks on the line heading. Hyperfix was good and navigation satisfactorily re-validated.

1740 Start of a 3D test line to verify the offsets and streamer separation.

1820 End of the test line. There had been no change in the previous offsets/separation.
Port offset: 111.1 m; starboard offset: 112.2 m; % cable separation: 100.9 m. All good.

1900 Rendezvous with Geco Sigma.

2400 Turning on to line 89FA-FO430-R, two-boat prime.

4th September 1989

0000 Turning on to line 89FA-FO430-R, two-boat prime.

0120 SOL 89FA-FO430-R, Seq. 62. Two-boat prime.

0458 EOL 89FA-FO430-R, complete. No Geco Rho edits. Geco Sigma's optical multiplexer failed again and resulted in the loss of the 3D link, GM2B link and Observer's link from SP 284-SP 378. Coverage was to be checked after re-processing. Geco Rho had no S3R4 throughout the line and the tail net acoustics were virtually non-existent.

0652 MOB boat away to change out the S3R4.

0732 SOL 89FA-FO394-R, Seq. 63. Two-boat prime.

0750 MOB boat back. The S3R4 was still bad as they had changed the float responder by mistake!

1050 MOB boat away to change out the correct responder this time! The Zodiac was also tested at this time.

1105 EOL 89FA-FO394-R, complete. No Geco Rho edits. The tail net acoustics were still poor with S3R4 dead. For the last two sequences, since the lead-in change, Geco Rho had increased LF towing noise at circa 18/20 microbars maximum, 6-8 Hz, on the first couple of traces only. The crew had tried adjusting the superwire etc., but it appeared that the dilt clamp would have to be modified. This would entail missing a slot, as it would take too long to do on a normal line change. After F-K filtering this noise was definitely not a problem in real terms. It was decided to continue in production while this excellent weather lasted or until a longer line change.

1155 Zodiac back on board.

1342 SOL 89FA-FO418-R, Seq. 64. Two-boat prime.

1410 MOB boat back on board.

1718 EOL 89FA-FO418-R, complete. Edit SP 1513(S) due to gun sequence errors.
Low frequency front end towing noise was seen on the port cable at 15/20 microbars, 6-8 Hz.

1941 SOL 89FA-FO214-R1, Seq. 65. Two-boat prime portion - completion of Seq. 13 (19th August) when this portion was not accepted due to swell breakout.

2047 EOL 89FA-FO214-R1, complete. No Geco Rho edits. The same front end port cable towing noise was present. Running on down the line.

2236 SOL 89FA-FO178*R, Seq. 66. Two-boat re-shoot on NAM's account for Seq. 25 (22nd August) which had bad Hyperfix signals.

2319 EOL 89FA-FO179*R, complete. No Geco Rho edits.

2400 Line change.

5th September 1989

0000 Line change.

0155 SOL 89FF-FO442/R, Seq. 67. Single-boat, 20-fold infill line (Geco Sigma was shooting synchronous single-boat line) with Geco Rho cover-

ing columns 264-265. This was on Contractor downtime as the missing coverage was from Seq. 62 which had steering problems.

0350 EOL 89FF-FO442/R, complete. No edits. Please note that the file numbers were 1000 too high due to operator error. The vessel carried on down line (Geco Sigma was still shooting) until the re-shoot portion.

0422 SOL 89FA-FO442*R, Seq. 67. Single-boat, 20-fold infill line (Geco Sigma was shooting a synchronous single-boat line) with Geco Rho re-shooting for Seq. 54 when Geco Sigma's starboard guns were bad on columns 254-256. Contractor time for Geco Rho.

0534 EOL 89FA-FO442*R, complete. No edits. Please note that the file numbers were 1000 too high due to operator error. Line change now on downtime for Geco Rho.

0806 SOL 89FF-FO322/R, Seq. 68. Single-boat, 20-fold infill line (Geco Sigma was shooting a synchronous single-boat line) with Geco Rho coverage required on columns 372-375. Operational infill time.

1122 EOL 89FF-FO322/R, complete. Edit SP 10529 only due to an autofire. Now heading straight into a re-shoot.

1122 SOL 89FA-FO322*R, Seq. 68. Single-boat, 20-fold re-shoot line (Geco Sigma was shooting a synchronous single boat line) for Seq. 27 (22nd August) when Geco Rho's starboard cable was shallow. Contractor time.

1138 EOL 89FA-FO322*R, complete. No edits. Line change continued on Contractor time.

1533 SOL 89FF-FO490/R, Seq. 69. Single-boat, 20-fold infill line (Geco Sigma was shooting a synchronous single-boat line) with Geco Rho coverage required on columns 213-217 in various offset groups. Operational infill time.

1640 EOL 89FF-FO490/R, complete. No edits. The re-shoot then started immediately.

1640 SOL 89FA-FO490*R, Seq. 69. Single-boat, 20-fold re-shoot line (Geco Sigma was shooting a synchronous single-boat line) for Seq. 37 (27th August) due to gun sequence errors. Contractor time.

1648 EOL 89FA-FO490*R, complete. No edits. Infill started immediately.

1648 SOL 89FF-FO490/R1, Seq. 69. Single-boat, 20-fold infill line (Geco Sigma was shooting a synchronous single-boat line) with Geco Rho coverage required on columns 213-217 in various offset groups. Operational infill time.

1742 EOL 89FF-FO490/R1, complete. No edits. Operational line change time.

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-232.TXT/NMM/F03
DATE: Monday 21st August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Sunday 20th August 1989 @ 24.00 GMT JD 232

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0202	270	100	1630	1531	28.70625	Complete
0610	090	100	1630	1531	28.70625	Complete
0298	270	100	1630	1531	28.70625	Complete
0526	090	100	1630	1531	28.70625	Complete

Summary

Daily Sail Line	(Sigma)	114.8250	Kms
Daily Sail Line	(Rho)	114.8250	Kms
Accumulated Sail Line		479.49375	Kms
Daily Production	(Sigma)	688.9500	Kms
Daily Production	(Rho)	688.9500	Kms
Combined Daily Production		1377.9000	Kms
Accumulative Total	(Sigma)	2876.9625	Kms
Accumulative Total	(Rho)	2876.9625	Kms
Accumulative Combined Vessel Total		5753.9250	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	06:00	02:23	07:02	00:00
18/8	00:00	00:39	12:34	10:47	00:00
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:37	02:59	00:00	00:00
TOTAL	56:01	42:26	49:08	20:25	00:00

Summary for Period Monday 14/8/89 to Sunday 20/8/89

	SIGMA	RHO
No of Prime lines	17	17
No of Infill lines	0	0
No of Reshoot lines	1 (3 parts)	0
Prime KM	479.49375	479.49375
Infill Km	0.00	0.00

3.0C STATUS

3.1 Seismic

Line 0202 was started with 4 dead traces but 3 of these were in the DFS V plugs and were "repaired" by sp 150.
Line 610 was affected by erratic navigation.(NDRs and gun seq errors)
Line 298 was good.
Line 526 was affected by poor nav.
A lot of GM2B errors have been occurring. These are not consistent and do not appear to be causing any problems.
A large number of pulse clock errors haveoccurred on most lines but they do not appearto be causing a problem either, otherthan disrupting the EOL statistics.
Monthly DFS tests have been completed and look ok. The gain accuracy has some channels out of spec but these are not consistently bad on all steps and the results are acceptable.

3.2 Daily Diary

0033	SOL 89FA-F0202-S
0402	EOL 89FA-F0202-S
0602	End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
0641	SOL 89FA-F0610-S
0958	EOL 89FA-F0610-S
1145	Fire drill. A fire was simulated in the engine room. "Normal methods were unable to control the blaze. The lifeboat was launched, injured people removed and the Halon system activated." The exercise was well organised and was followed by a crew meeting to analyse and criticise the drill.
1158	End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
1255	SOL 89FA-F0298-S
1614	EOL 89FA-F0298-S
1814	End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
1904	SOL 89FA-F0526-S
2223	EOL 89FA-F0526-S
2400	On a normal line change. Wind southerly 3, sea 1m

3.3 Status at 0400 GMT

In production on line going west. Navigation is very bad.

NAV QC REPORT GECO SIGMA SUNDAY 20TH AUGUST 1989 JDAY 232

LINE 89FA0202S DIR 270 SEQ #17

Hyperfix was stable again for this line. The four frequency #1 ranges were used as the primary fit.

The Nav point SD was not changed from the previous time the 270 deg survey def'n was loaded. It did not cause the same problems that were seen on the last line but has been reduced to 4m in any case.

Wrong speed of sound used for this line. Is should have been 1511.22m/s.

LINE 89FA0610S DIR 090 SEQ #18

Several problems with noisy Hyperfix ranges, especially K-7 and H-7. SP690-710 instability caused a speed fluctuation that caused resulted in missing 3 SPs. H-7 was then dropped from the fit. SP 940-EOL there were several changes to the primary fit exchanging K-7 with Borkum and back. If it was not for the stabilising influence of the Syledis ranges the navigation would have been unuseable.

LINE 89FA0298S DIR 270 SEQ #19

Due to bad ranges from K-7 Syledis had to be used to help balance the geometry of the primary fix. This resulted in slightly higher than normal residuals useable navigation. 21% of SDs exceeded 5m but only 1% exceeded 6m. The navigation was technically out of spec but was quite satisfactory for the major part of the line.

LINE 89FA0526S DIR 090 SEQ #20

At SP690 Happisburgh (Pulse/8 stn 5) was off the air for a few minutes causing all the tailbuoys to lose their position. Pattern 1-5 is critical to Pulse/8 geometry.

Separation by navigation (130.6m) is unreliable due to Pulse/8 problem mentioned above. Separation by compassees (117.2) and by acoustics (116.9) agree well. It is slightly higher than ideal but still inside specified limits.

ACOUSTICS: Since setting the Nav. point SD from 2m to 4m in the Omniseis, the acoustic solution has been greatly improved. There are still periods of poor LSQ values most probably due to the fluctuating Pulse/8 tailbuoy positions. There are also fewer computed solutions for the tail network streamer sensors. Nevertheless, it is now possible to run with acoustics in active mode for most of the time which was impossible before.

Regards
M.Smith / R. Knight / P.Cohen

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-231.TXT/NMM/F03
DATE: Sunday 20th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Saturday 19th August 1989 @ 24.00 GMT JD 231

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0214	270	554	1630	1077	20.19375	Incomplete
0598	090	100	1630	1531	28.70625	Complete
0286	270	100	1630	1531	28.70625	Complete
0538	090	100	1630	1531	28.70625	Complete

Summary

Daily Sail Line	(Sigma)	106.31250	Kms
Daily Sail Line	(Rho)	106.31250	Kms
Accumulated Sail Line		364.66875	Kms
Daily Production	(Sigma)	637.8750	Kms
Daily Production	(Rho)	637.8750	Kms
Combined Daily Production		1275.7500	Kms
Accumulative Total	(Sigma)	2188.0125	Kms
Accumulative Total	(Rho)	2188.0125	Kms
Accumulative Combined Vessel Total		4376.0250	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	06:00	02:23	07:02	00:00
18/8	00:00	00:39	12:34	10:47	00:00
19/8	12:20	08:00	03:40	00:00	00:00

3.QC STATUS

3.1 Seismic

All the problems with data have been caused by noisy navigation signals. The bottom speed varies which causes an erratic sp interval. This causes some shotpoint numbers to be recorded twice and others to be missed completely (NDR). Gun sequence errors are another result of poor timing.
Gun misfires on port 2/6 gun (54 cu.in) were persistent over 3 lines but it has now been cured. Gun crew are not impressive on this crew.

3.2 Daily Diary

0023 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
0119 SOL 89FA-F0190-S
0443 EOL 89FA-F0190-S
0643 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
0730 SOL 89FA-F0622-S
1046 EOL 89FA-F0622-S
1246 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
1341 SOL 89FA-F0310-S
1704 EOL 89FA-F0310-S
1904 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
1950 SOL 89FA-F0514-S
2308 EOL 89FA-F0514-S
2400 On normal line change.

3.3 Status at 0400 GMT

On line heading west.

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NAV QC REPORT SECS SIGMA MONDAY 21ST AUGUST 1989 JDAY 233

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LINE 89FA0190S DIR 270 SEQ #21

LINE 89FA0622S DIR 090 SEQ #22

Streamers moved apart to about 140m separation as the feather changed during the line. The tailbuoys were affected more than the streamers (sep by acoustics F2R1-F1H1 mean = 114.3m). The average separation for the whole line was within tolerances but there might be some very small gaps in the CDP coverage.

Tail network had 98% or more solution rates for the streamer sensor nodes. This may be due to particularly stable Pulse/8 positions experienced over this line.

LINE 89FA0310S DIR 270 SEQ #23

Syledis was too noisy to use and K-7 was reading 18m wrong and was also left out from the fix. The only reliable ranges were from Borkum, H-7 and Terschelling F1 and Terschelling F2. Unfortunately, this combination does not have the minimum required good angles of cut but was the only way to provide reasonably stable navigation. Angles of cut: H-7 and Terschelling about 50 - 60 deg; H-7 and Borkum about 20 - 25 deg.

With both frequencies from Terschelling being used, it might be argued that: instead of only two angles of cut greater than 30 deg, there were four.

First and last compasses on both streamers were noisy. However, the same level of noise (DSDs < 2.0 deg) has been found to be acceptable on previous prospects.

LINE 89FA0514S DIR 090 SEQ #24

SP 1490-1535; K-7 was suspended from fix because it was unstable.

MISCLOSURES: The tailbuoy misclosures from the Rho show slightly different trends than those from the Sigma. The observations cover a larger range and indicate the presence of a small rotational error. The largest mean offline misclosure is 13m and the magnitude of the rotational error is 0.2 degrees or less.

Regards
M.Smith / R. Knight / P.Cohen

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-234.TXT/NMM/F03
DATE: Wednesday 23rd August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Tuesday 22nd August 1989 @ 24.00 GMT JD 234

1. PRODUCTION

All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0178	270	100	1630	1531	28.70625	Complete
0634	090	100	1630	1531	28.70625	Complete
0322	270	100	1630	1531	28.70625	Complete

Summary

Daily Sail Line	(Sigma)	86.11875 Kms
Daily Sail Line	(Rho)	86.11875 Kms
Accumulated Sail Line		680.43750 Kms
Daily Production	(Sigma)	516.71250 Kms
Daily Production	(Rho)	516.71250 Kms
Combined Daily Production		1033.4250 Kms
Accumulative Total	(Sigma)	4082.6250 Kms
Accumulative Total	(Rho)	4082.6250 Kms
Accumulative Combined Vessel Total		8165.2500 Kms

Reshoot (Rho)..... / Lines

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	06:00	02:23	07:02	00:00
18/8	00:00	00:39	12:34	10:47	00:00
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:37	02:59	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:26	03:22	00:00

3.QC STATUS

3.1 Seismic

Line 0178 had bad nav signals at the EOL and will require a reshoot of sp 1500-1630. Sp interval was erratic and there were gun seq errors.
Line 0634 was shot at low water speed and there were cable control problems on both vessels.
Line 0322 was plagued by gun problems. There were autofires at the SOL and the port array was bad from SOL to 432. This line requires a 2-boat reshoot SOL-130 and two 1-boat reshoots later.

3.2 Daily Diary

0108 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
0208 SOL 89FA-F0178-S
0529 EOL 89FA-F0178 S
0729 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
0819 SOL 89FA-F0634-S
1140 EOL 89FA-F0634-S
1340 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
1429 SOL 89FA-F0322-S
1751 EOL 89FA-F0322-S
1800 Started to recover equipment for crew change.
1855 All guns on board. Started to recover streamers.
1951 End of the allocated 2hr line change time. The remainder of the time until the next projected SOL time was charged as standby.
2038 Next projected SOL time. Contractor downtime started.
2155 Both streamers on board.
Heading to Ameland for crew change
2400 In transit to Ameland for crew change.

3.3 Status at 0400 GMT

Crew change

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NAV QC REPORT GECO SIGMA TUESDAY 22ND AUGUST 1989 JDAY 234

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LINE 89FA0178S DIR 270 SEQ #25

Hyperfix initially used in primary fit. From SP 1270 Cocktail used as primary fit with Terschelling F1 & F2, H-7, K-7 and B-11/2. From SP 1500, K-7 moved out of position (due to crane on platform??). The remaining LOPs were not stable enough to provide steady navigation for the last part of the line. It is planned to reshoot the last part of the line (from SP 1500). The statistics from Gridnav are poor because both Hyperfix and cocktail were used as primary and the statistics for each fit contain data from when it was not the prime system. It can be seen from the time series plots how the Nav quality deteriorated after SP 1500.

With an unstable prime nav, the differential tailbuoy position also jumped around more tha normal causing the network to be degraded somewhat.

LINE 89FA0634S DIR 090 SEQ #26

Cocktail used as primary fit. K-7 suspended. Syledis stable again; perhaps we are on the north side of the Rho and in the north part of the prospect closer to the Syledis stations.

LINE 89FA0322S DIR 270 SEQ #27

From SOL, Cocktail was primary using all ranges except K-7 FA1. SP 650 Hyperfix noisy. SP 740-1045, H-7 suspeded from fit.
Rho's port tailbuoy sensor defined as a relaxed point.

Regards
M.Smith / R. Knight / P.Cohen

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-233.TXT/NMM/F03
DATE: Tuesday 22nd August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

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SUBJ: Progress to Monday 21st August 1989 @ 24.00 GMT JD 233

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1. PRODUCTION

All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0190	270	100	1630	1531	28.70625	Complete
0622	090	100	1630	1531	28.70625	Complete
0310	270	100	1630	1531	28.70625	Complete
514	090	100	1630	1531	28.70625	Complete

Summary

Daily Sail Line	(Sigma)	114.8250	Kms
Daily Sail Line	(Rho)	114.8250	Kms
Accumulated Sail Line		594.31875	Kms
Daily Production	(Sigma)	688.9500	Kms
Daily Production	(Rho)	688.9500	Kms
Combined Daily Production		1377.9000	Kms
Accumulative Total	(Sigma)	3565.9125	Kms
Accumulative Total	(Rho)	3565.9125	Kms
Accumulative Combined Vessel Total		7131.8250	Kms

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2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	06:00	02:23	07:02	00:00
18/8	00:00	00:39	12:34	10:47	00:00
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:37	02:59	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00

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3.QC STATUS

3.1 Seismic

High numbers of GM2B and Pulse clock errors are still occurring Nav was reasonably stable but a cocktail of stations was used on most lines. Without K7 the geometry was below spec, the worst line was 310 which was actually out of spec.
Swell noise affected line 0310. Bursts were random but there were isolated spikes of noise to 450 uB peak. Noise was also seen on line 0514 but at lower levels.

3.2 Daily Diary

0027 SOL 89FA F0214-S
0052 First good shotpoint 0554 after data was processed.
0312 EOL 89FA-F0214-S
0512 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby time.
0558 SOL 89FA-F0598-S
0915 EOL 89FA-F0598-S
1115 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby time.
1210 SOL 89FA-F0286-S
1533 EOL 89FA-F0286-S
1733 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby time.
1820 SOL 89FA-F0538-S
1830 MOB boat away to Marie Louise
1845 MOB boat back on board.
2140 EOL 89FA-0538-S
2340 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby time.
2400 On an extended line change waiting for tides.

3.3 Status at 0500 GMT

On line change after completing 0202. Nav better on line.

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NAV QC REPORT GECO SIGMA SATURDAY 19TH AUGUST 1989 JDAY 231

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LINE 89FA0214S DIR 270 SEQ #13

Compasses noisy due to swell; 5 just out of spec (DSDs >1.0 by Cabletracker). Although this line fails the contractual specifications, past lines have been worse and successfully processed by micromax and also by NAM last year.

There was a brief problem that caused the tail network solution to diverge (LSQ figures around 5). Afterwards, the ranges stabilised but thenetwork still did notconverge. A reset was required to clear the bad data and allow the net to solve. This was not done because all the stats would have been lost including those for the front net. As a result, the statistics were corrupted but were available for the whole line. Next time this situation occurs, the systemwill be reset and at least the statistics will be meaningful for the second part of the line.

The line was abortedon the run-in due toswell noise and then re-commenced but not until SP 360.

LINE 89FA0598S DIR 090 SEQ #14

K-7 was 24m away from primary fix position (probably local disturbance on platform egcrane). We have beenwarned about such a phenomenon on this station. The primary fix for this line

included Syledis ranges fromB-11/2 and Dan-C. It providedstable navigation.

The SD of the nav points was further relaxed on this line to 7m. The Rho's port tailbuoy was jumping about and with such a reduced weight, the solution converged well despite one bad tailbuoy.

LINE 89FA0286S DIR 270 SEQ #15

K-7 averaged 11m away from primary fix position (probably local disturbance on platform eg crane as per last line). The primary fix for this line also included Syledis ranges from B-11/2 and Dan-C. It provided reasonablenavigation but there were occasional fluctuations that causedspeed variations (especially SPs 750-870).

23% of SDs exceeded5m but only 4% exceeded 6m.The navigation was technically out of spec but was quite satisfactory for the major part of the line.

LINE 89FA0538S DIR 090 SEQ #16

K-7 was back in agreement with the primary fix but Hyperfix was too noisy to be used as prime andSyledis was used also. The main instability came from Borkum and K-7.

With the nav point SD set to 7m in the Omniseis, it was discovered that the weight of the Pulse/8 position had been reduced too much. When thestreamer feather suddenly changed and the tailbuoys actually moved off line, The Omniseis display showed the network inits original position andthe tailbuoys off to one side being ignored by the calculations. The nav point SD was changed to 4m and the networkjumped to its correct position at the end of the streamers.

ACOUSTICS: After seq #13 it was discovered that the Sigma had been using the wrong sound velocity since the start of this prospect. We had been using1514.18m/s and should have bee using 1509.3m/s. The correct velocity shall be used in processing.

A TS dip was also made and the new velocity is 1511.22. This value has been in use since seq #15.

Regards
M.Smith / R. Knight / P.Cohen

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-230.TXT/NMM/F03
DATE: Saturday 19th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Friday 18th August 1989 @ 24.00 GMT JD 230

1. PRODUCTION

All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0574*S1	090	10490	10550	61	0.00	Reshoot
*S2	090	10670	10770	101	0.00	Reshoot
*S3	090	10970	11130	161	0.00	Reshoot

Summary

Daily Sail Line	(Sigma)	0.0	Kms
Daily Sail Line	(Rho)	0.0	Kms
Accumulated Sail Line	.....	258.35625	Kms
Daily Production	(Sigma)	0.0	Kms
Daily Production	(Rho)	0.0	Kms
Combined Daily Production	.....	0.0	Kms
Accumulative Total	(Sigma) 1550.1375		Kms
Accumulative Total	(Rho) 1550.1375		Kms
Accumulative Combined Vessel Total.....		3100.2750	Kms

Reshoot Lines ..... 1 Line

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
12/8	00:00	14:00	00:00	10:00	00:00
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	06:00	02:23	07:02	00:00
18/8	00:00	00:39	12:34	10:47	00:00

3.0C STATUS

3.1 Seismic

Heavy swell noise on line 0574. Marginal data.
Line 0574*S was shot in 3 parts. Each part was a separate reshoot.
Swell noise was very bad later in the day and line 286 was aborted at1121 on the run-in. Weather standby was charged from the next projected SOL time,1126.
Swell noise was persistent and prolonged at the next SOL time, 2349. The stbd streamer was particularly bad. See Daily Diary for details.

3.2 Daily Diary

0000 Heading to next SOL.
0513 Next projected SOL time. Rho was still chasing streamer leakage. Sigma went to complete 1-boat reshoots.
0605 SOL 89FA-F0574*S1 Reshoot of sequence 6. Rho instrument failure.
0612 EOL 89FA-F0574*S1
0628 SOL 89FA-F0574*S2 Reshoot of line 562, sequence 4 which was poor on the original line because a following current caused low water speed and the Sigma cable came shallow. This line time was chargeable.
0641 EOL 89FA-F0574*S2
The line change was chargeable as it followed a chargeable reshoot.
0707 SOL 89FA-F0574*S3 Half reshoot of line 562 in columns 137-140 that were missed originally because of navigator error on the Rho. Columns 141-144 still to be reshot.
0727 EOL 89FA-F0574*S3
1126 Next projected SOL time. Swell noise was very bad and consistent. Weather standby.
1738 Next projected SOL time. The vessels were on line heading but the streamer noise was still excessive.
2349 Next projected SOL. Swell noise was persistent, especially on the stbd streamer groups 70-120. Data was considered to be unacceptable on Sigma and the line was not started. The party chief on Rho decided that he would like to acquire the data and MicroMAX it. This was acceptable thinking but it came too late to start the line on time.
2400 Weather standby time.

3.3 Status at 0500 GMT

Line completed. Sea state much improved.

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NAV QC REPORT GECO SIGMA FRIDAY 18TH AUGUST 1989 JDAY 230

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LINE 89FA0574S DIR 090 SEQ #12 reshoot
Hyperfix very stable and mean tailbuoy Pusle/8 SDs were 6.6m and 5.0m.
This was a singleboat line covering severalcolumns of infill and reshoot. The acoustics seemed reasonable with generally low DSDs on good levels of acceptance but AvarX and AvarY values for the tail network were still quite poor. The boat changed course three times which would not have helped the statistics.

MISCLOSURES: After examining the data for the first 12 sequences, there appears to be a definite correlation in the tailbuoy misclosures.

1) The position of the tailbuoy byextrapolation of the compass data is an average of 10m south of the Pulse/8derived position. The wind and seahave been generally from the southand southwest which may have caused the tailbuoys to stream slightly to the north of the streamer. Furthermore,the westerly lines' relative positions have a closer agreement with each other, when plotted

2) The Pusle/8 position is offset to the starboard on westerly lines and to the port on easterly lines, which implies that the misclose is not rotational in nature. In fact, the differences are remarkably well balanced suggesting a good set of magnetic corrections.

3) The along line misclosures have consistently indicated that the streamer is 5m - 12m shorter that the nominal measurements of the streamer lengths. The stretchsections and tailbuoy ropes wereall measured under tension at approx 4.8 knots at the start of the prospect but the actual shooting speed through the water has been between 3.5 and 4.0 knots.

CONCLUSION: If the compasses only are used without the tailbuoy network, for the binning of the data, the most probable maximum positional error at the tailbuoys is approximately 12m. This error would be halved atthe far trace CDP and considerably less than that for the nearertraces. It is therefore considered that the onboard coverage computations will not be significantly different if the acoustics are not used.

Note:The trends outlined above havenot been evident on the Rho.

Regards
M.Smith / R. Knight / P.Cohen

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-229.TXT/NMM/F03
DATE: Friday 18th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Thursday 17th August 1989 @ 24.00 GMT JD 229

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0226	270	811	1630	820	15.37500	Complete
0586	090	100	1630	1531	28.70625	Complete
0274	270	100	1630	1531	28.70625	Complete

Summary

Daily Sail Line (Sigma)	72.78750	Kms
Daily Sail Line (Rho)	72.78750	Kms
Accumulated Sail Line	258.35625	Kms
Daily Production (Sigma)	436.725	Kms
Daily Production (Rho)	436.725	Kms
Combined Daily Production	873.450	Kms
Accumulative Total (Sigma)	1550.1375	Kms
Accumulative Total (Rho)	1550.1375	Kms
Accumulative Combined Vessel Total	3100.2750	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
11/8	00:00	06:15	00:00	17:45	00:00
12/8	00:00	14:00	00:00	10:00	00:00
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	06:00	02:23	07:02	00:00

NB: Rho unable to transmit data to Sigma because of distance.
Figures are the same for both vessels.

3.QC STATUS

3.1 Seismic

The misfire rate is much better and the gun problems appear to have been resolved.

There was no Pulse-8 positioning to tie in the tail network on line 0274. This has been provisionally accepted subject to NAM approval.

Stbd cable was recovered to repair a broken antenna on tailbuoy

3.2 Daily Diary

0000 On line. First sp of the day 811
0149 EOL 89FA-F0226-S
0349 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby time.
0431 SOL 89FA-F0586-S
0750 EOL 89FE-F0586-S
0950 End of the allocated 2hr line change time.The remainder of the time until the next SOL time was charged as Standby time.
During the line change the chase boat crew noticed that the Pulse 8 antenna had snapped on the stbd tailbuoy. The stbd tailbouy was dead.
Sea state was increasing. WSW 5 swell 1-2m.
1044 SOL 89FA-F0274-S
1411 EOL 89FA-F0274-S
Started to recover the stbd streamer to repair the Pulse-8 antenna.
1515 Guns on deck.
1611 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby time.
1658 Next projected SOL time. Sigma was not ready because of Pulse-8 failure. The remaining time from now until the next actual SOL was contractor downtime.
1800 Stbd tailbuoy on deck.
1915 Started to re-deploy stbd streamer.
2115 Streamer out and towed wide. Vessels were not able to reach the next projected SOL time (2306).
2400 Both streamers in the water. Guns on deck.

3.3 Status at 0500 GMT

Rho is not ready for next time slot.(0513) Sigma will attempt to clear away reshoots.

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NAV QC REPORT GECO SIGMA THURSDAY 17TH AUGUST 1989 JDAY 229

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LINE 89FA0226S DIR 270 SEQ #09

Pulse/8 is as good as it is likely to be at night with nearly all SDs less than 25m.

High DSDs on tail network and only about 50% of shots had any solution on the Sigma's streamer sensors.

LINE 89FA0586S DIR 090 SEQ #10

SP 1120-1138 Stbd tailbuoy data frozen; suspected Norstar MPU problem.

The tailbuoys "navigation point SD" was relaxed in the Omniseis settings from 2 to 4. This put relatively less weight on the Pulse/8 positions and more on the acoustic ranges.

After Stbd tailbuoy problem, Omniseis could not get a good solution until the filters were reset. This also may (the manual is not clear) have cleared the statistics buffers so the EOL statistics are either corrupted or only available from SP 1180. There appeared to be an improvement in the online solution but the statistics still show noisy (maybe corrupted) data.

LINE 89FA0274S DIR 270 SEQ #11

the signals from the port tailbuoy and it appeared on the computer that both tailbuoys were in the same place.

Also, at SP 786 the vessel Pulse/8 receiver developed a fault on the serial output ports and was swapped for the inactive TB1 receiver. This worked from SP952 to SP990 then all Pulse/8 receivers were switched off until EOL.

With F4H1 and Float 1 both down and doubtful Pulse/8 data from Float 2, the tail network was understandably poor. It was not possible to evaluate the effect of the larger Nav. point STD that was entered into the Omniseis during the previous line

PULSE/8: After sequence 11, the receivers were set up as before and the Serial board was taken from the spare (not working) receiver. We now have almost no backup at all. The "spare" has faulty output circuits as well as unreliable reception. It was first changed out before shooting started because it would not lock in. More spares have been ordered for the crew change.

ACOUSTICS: Today was difficult to test the effect of reducing the relative weight of the Pulse/8 tailbuoy positions in the tail network. It seemed to improve the LSQ figures when on line but so far there has not been a meaningful EOL statistical printout to verify the theory.

HYPERFIX CALIBRATION RESULTS:

Station	090	270	mean	090	270	mean
FREQ #1	<------Gridnav------>			<-----Norstar------>		
Terschelling	-0.010	-0.045	-0.028	-0.010	-0.359	-0.030*
H-7	-0.349	-0.344	-0.347	-0.327	-0.391	-0.359*
K-7	-0.445	-0.463	-0.454	-0.430	-0.474	-0.452*
Borkum	0.138	0.131	0.135	0.156	0.118	0.137*
FREQ #2						
Terschelling	0.067	-0.031	0.018	0.069	0.032	0.050*
H-7	0.271	0.267	0.269	0.317	0.259	0.288*
K-7	0.500	0.470	0.485	0.557	0.527	0.542*
Borkum	0.207	0.180	0.194	0.226	0.189	0.208*

(*) Norstar determined means are being used on vessel.

Regards
M.Smith / R. Knight / P.Cohen

Line 0262 Gun sequence errors and ~~Sigma port array airleak will~~ require reshoots.
Line 0550 An airleak on the port array will require reshoot ~~x~~ ok.
Line 0226 An airleak on port array caused 8 consecutive misfires. These were small timing errors on smallest guns and were accepted.

3.2 Daily Diary

0000 Deploying port streamer. SSW 20-25 kts. Sea 2-3 m
0347 Projected SOL time. Rho was delayed because of cable work Any infill resulting will be Geco expense.
0416 SOL 89FA-F0574-S
0738 EOL 89FA-F0574-S
0928 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby time.
1001 SOL 89FA-F0262-S
1319 EOL 89FA-F0262-S
1519 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby time.
1618 SOL 89FA-F0550-S
1936 EOL 89FA-F0550-S
2136 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby time.
2227 SOL 89FA-F0226-S
2400 On line. Midnight sp 810. Sea 1m, Wind Var force 3

3.3 Status at 0500 GMT

On line, heading east.

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NAV QC REPORT GECO SIGMA WEDNESDAY 16TH AUGUST 1989 JDAY 228

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LINE 89FA0574S DIR 090 SEQ #06

The tail network acoustics were poor. Bad ranges were enabled and causing the solution to not converge very well. Only 7 out of 22 tail network ranges had DSDs less than 30m. The Rho has problems with F4H1 but that cannot explain the whole problem.

LINE 89FA0262S DIR 270 SEQ #07

SP 1332-1370 Hyperfix noisy; Borkum was disabled then H-7 was disabled and the coctail with B11/2 and Dan C was used as primary until Borkum was enabled again.

LINE 89FA0550S DIR 090 SEQ #08

ACOUSTICS: Tail acoustic network has been generally bad all day There have been numerous unstable ranges but the tailbuoy positions are also suspected to be aggravating the situation. We are trying to establish whether Omniseis solves the acoustic network and then fits the tailbuoy positions as well as possible, or whether the tailbuoy positions form an integral part of the network. If it is the latter, the weight of the Pusle/8 tailbuoy position may need to be reduced.

HYPERFIX: Hyperfix was stable most of the time, but there were a few bursts of instability that caused vessel computed velocity to fluctuate which in turn caused gun sequencing problems.

Regards
M.Smith / R. Knight / P.Cohen

1	0238	SIGMA RHO	Complete line scratched
2	0574	SIGMA RHO	Complete line scratched
3	0250	SIGMA RHO	No major edits
4	0562	SIGMA RHO	Port cable sp 670-770 Bad Nav sp 973-1119(8 cols bad)
5	0238	SIGMA RHO	Gun Seq 1024-1026,1230-1235
6	0574	SIGMA RHO	None sp 500-548 (GDR, not recording)
7	0262	BOTH SIGMA RHO	1329-1377 (Sigma sp numbers) due to GunSeq errors. 1045-1064 Port Guns Out 100-900 Rho tailbuoys
8.	0550	BOTH	1614-1619 Gun seq errors
9	0226	SIGMA RHO	Gun Seq 148-153 ditto
10	0586	SIGMA RHO	GunSeq SP 1130-1132 inc. ditto
11	0274	SIGMA RHO	None or all ?? (No P-8 on tailbuoys) None

Reshoots Block F3

SEQ	LINE	SP RANGE TO RESHOOT	REASON	ACTION TAKEN	CHARGE
1	238	ALL	NAVSIG	DONE SEQ 5	NAM
2	574	ALL	NAVSIG	DONE SEQ 6	NAM
4	562	670-770(1 boat)	Sigma Port Cable		NAM
		973-1119(2 boat)	Rho Nav		GECO
6	574	500-548 (1 boat)	RHO INST		GECO
7	262	100-900??(?boat)	RHO T/B		GECO
		1045-1064(1boat)	SIG PTGUNS		GECO
		1319-1387(2boat)	GUNSEQ(NAV)		NAM
11	274	All ???? (1boat)	P-8		Geco

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-228.TXT/NMM/F03
DATE: Thursday 17th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Wednesday 16th August 1989 @ 24.00 GMT JD 228

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0574	090	100	1630	1531	28.70625	Complete
0262	270	100	1630	1531	28.70625	Complete
0550	090	100	1630	1531	28.70625	Complete
0226	270	100	810	711	13.33125	To Midnight sp

Summary

Daily Sail Line (Sigma)	99.450	Kms
Daily Sail Line (Rho)	99.450	Kms
Accumulated Sail Line	185.56875	Kms
Daily Production (Sigma)	596.700	Kms
Daily Production (Rho)	596.700	Kms
Combined Daily Production	1193.400	Kms
Accumulative Total (Sigma)	1113.4125	Kms
Accumulative Total (Rho)	1113.4125	Kms
Accumulative Combined Vessel Total	2226.8250	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
10/8	00:00	17:20	02:30	04:10	00:00
11/8	00:00	06:15	00:00	17:45	00:00
12/8	00:00	14:00	00:00	10:00	00:00
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00

3.QC STATUS

3.1 Seismic

Most of the lines shot so far have needed reshoots for one reason or another. If this trend continues this block will drag on well into September. Guns have been the main problem on Sigma and hopefully these problems will be resolved quickly. So far there have been too many repetitive faults on the same array or gun.

Line 0574 The Stbd streamer was slightly shallow for sps 1054-1123. Data was acceptable.
Difficult to keep the vessel on line. Both problems were a result of a following current.

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-227.TXT/NMM/F03
DATE: Wednesday 16th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Tuesday 15th August 1989 @ 24.00 GMT JD 227

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0238	270	1494	1630	137	2.56875	Complete

Summary

Daily Sail Line (Sigma)	2.56875	Kms
Daily Sail Line (Rho)	2.56875	Kms
Accumulated Sail Line	86.11875	Kms
Daily Production (Sigma)	15.41250	Kms
Daily Production (Rho)	15.41250	Kms
Combined Daily Production	30.82500	Kms
Accumulative Total (Sigma)	516.71250	Kms
Accumulative Total (Rho)	516.71250	Kms
Accumulative Combined Vessel Total	1033.42500	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
09/8	00:00	06:00	15:30	02:30	00:00
10/8	00:00	17:20	02:30	04:10	00:00
11/8	00:00	06:15	00:00	17:45	00:00
12/8	00:00	14:00	00:00	10:00	00:00
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00

3.QC STATUS

3.1 Seismic

Completed Hyperfix calibration. Proximity checks were abandoned after the Hyperfix signals were too noisy.
The weather deteriorated during the morning and the forecast was 35 kt winds gusting to 50 kts. One cable was recovered for safety reasons. The forecast winds did not arrive but the sea was 2-4 m all day.
There was still a very large swell at 2030 (End of cal time) but the forecast was better so streamers were deployed.

3.2 Daily Diary

0018 EOL 89FA-F0238-S
Headed north to re-calibrate the Hyperfix.

0218 End of the allocated 2hr line change time. The remainder of the time until the next projected SOL time was charged as standby time.

0304 Next projected SOL time. The remainder of the time until the start of the Hyperfix calibration was charged as contractor time.

0540 Started Hyperfix calibration of Borkum using 3 way Syledis fix.Operational time.

0810 Ended calibration runs for Borkum.
Weather forecast was SW-S force 8.It was decided in the light of worsening conditions to pull in the port streamer and to standby for weather.

0900 Started to retrieve port cable.

1000 Wind SSW 25-35 kts. Sea 3-4 m.

1235 Port streamer on board. Headed north for two-vessel proximity check.

1450 Started 2-boat check. Operational time.

2030 Abandoned proximity checks because of noisy Hyperfix signals. Operational time ended.

2130 Started streaming port cable. Latest forecast was SW 5-6 decreasing 4-5 and the sea state was 2-4 m.

2400 Deploying port steamer.

3.3 Status at 0500 GMT

On line. Swell noise acceptable.

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NAV QC REPORT GECO SIGMA MONDAY 14TH AUGUST 1989 JDAY 226

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LINE 89FA0574S DIR 090 SEQ#02 Scatched

LINE 89FA0250S DIR 270 SEQ#03
Navigation was more stable on this line than seen last night. The weather was better and it was daytime also.

LINE 89FA0562S DIR 090 SEQ#04
SP 630-670 Hyperfix K-7 was unstable and slipped one lane.

LINE 89FA0238S DIR 270 SEQ#05
SP 1022-1058 Norstar lost all pulse/8 data due to Racal computer hangup.
SP 1552-1610 lost both pulse/8 and stn K-7 Hyperfix during a squall and generally signals were noisier than in the previous two sequences (probably the effect of night and rainy weather).
First and last port compasses noisy.

RADIO NAV: Hyperfix receiver has been reconfigured and now monitors 4 stations simultaneously and outputs 8 LOPs.
Syledis stn B 11/2 back on the air during the line. New delays were input and range was logged

ACOUSTICS: The navigators had difficulty tuning the acoustics in the high seas. Also, by having Pulse/8 instead of Syledis for tailbuoy tracking, the tail end network cannot be as well positioned as for previous jobs.

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NAV QC REPORT GECO SIGMA TUESDAY 15TH AUGUST 1989 JDAY 227

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Another two calibration lines were run to calibrate the ranges from Borkum. Four ranges were observed on each frequency and calibrated against a 3-way Syledis fix.

The results closely agreed the previous C-Os for Terschelling, H-7 and K-7. The largest difference was 5m on the range from K-7 (F2). That range has shown the greatest differences between Gridnav andNorstar when data taken concurrentlyis compared. The station is on a platform and is over 200Km from the calibration area so until more information is available, K-7 (F2) will be regarded as less reliable than the others and not used in the primary fit.

A two boat run was also made to check whether having the two vessels only 200m apart, had any noticeable effect on the Hyperfix ranges. Both boats started the line in the normal shooting configuration with200m separation. After 300fixes, the Sigma moved away to a distance of 400m and maintained that separation for another 500 fixes. It then moved out to a separation of 1000m in200m steps. There wasno noticeable change in the difference between Hyperfix coords and Syledis coords either at 200m separation or any of the other separations observed. Timeseries plots of deltaEastings and delta Northings were generated by gridnav. These showed that, if there was any change in coords as afunction of separation, then it was within the random noise levels of the plots and less than a couple of metres.

Regards
M.Smith / R. Knight / P.Cohen

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-226.TXT/NMM/F03
DATE: Tuesday 15th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Monday 14th August 1989 @ 24.00 GMT JD 226

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0250	270	100	1630	1531	28.70625	Complete
0562	090	100	1630	1531	28.70625	Complete
0238	270	100	1493	1394	26.13750	Complete

Summary

Daily Sail Line	(Sigma)	83.550	Kms
Daily Sail Line	(Rho)	.....83.550	Kms
Accumulated Sail Line		..... 83.550	Kms
Daily Production	(Sigma)	.....501.300	Kms
Daily Production	(Rho)	.....501.300	Kms
Combined Daily Production		.....1002.600	Kms
Accumulative Total	(Sigma)	..... 501.300	Kms
Accumulative Total	(Rho)	..... 501.300	Kms
Accumulative Combined Vessel Total		..... 1002.600	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
08/8	04:48	18:15	00:57	00:00	00:00
09/8	00:00	06:00	15:30	02:30	00:00
10/8	00:00	17:20	02:30	04:10	00:00
11/8	00:00	06:15	00:00	17:45	00:00
12/8	00:00	14:00	00:00	10:00	00:00
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00

3.QC STATUS

3.1 Seismic

Navigation signals were bad at start of the day and lines were scratched. Signals improved later and data was good. Occasional bad signals caused erratic sp interval, sp numbering and pulse clock errors.

Sigma port cable was out of spec for 100 sps on line 0562. This was caused by change in current causing vessel to turn slightly and has happened on most lines so far. There will be no problem when sea state is better.

Data was generally good. Swell noise was not a problem.

3.2 Daily Diary

0000 Line change. Standby time.
0127 Line change was extended due to waiting for tides.
0216 SOL 89FA-0574-S.HDG 090.
0534 EOL 89FA-0574-S.
Line scratched.Nav instability caused numerous missed SPs and gun sequence errors on both vessels.Approx 30 percent would have to be shot again in 2 boat mode and considering that the Rho also had problems with cable depth it was decided that a complete reshoot would be in order to acquire good data rather than run the risk of accepting bad data on this pass.
This line was shot at dawn with heavy rain; the worst conditions.
Line change
0734 Line change was extended due to waiting for tides.
0835 SOL 89 FA-0250-S.HDG 270
1200 EOL 89 FA-0250-S.Good line.
1400 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby time.
1446 SOL 89FA-F0562-S
1808 EOL 89FA-F0562-S
2008 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby time.
2054 SOL 89FA-F0238-S
2400 On line 0238. Midnight sp 1493

3.3 Status at 0400 GMT

On way north to re-calibrate Hyperfix.

==========

NAV OC REPORT GECO SIGMA THURSDAY 10TH AUGUST 1989 JDAY 222

==========

Most of the day was spent configuring the navigation computers, sorting out some interfacing problemsand cross checking entered data. By the end of the day, there was still some trouble with getting the vessel Pulse/8 into the Norstar.

Baselines were also crossed with results as follows:

Baseline	dirn	O-C Nor*	O-C Gridnav
Dan C - B 11/2	004	-10.0	-9.9
	178	-12.0	-9.9

This crossing was triedagain with the co-ordinateslisted as B11 in case there had been a mix up and the antenna had been placed

there. However, the error grew larger when the alternative co-ordinates were used.

Dan C - Gorm B	027	+ 2.0	+2.6

202 + 3.9 +4.1

These were very noisy with a large amplitude sine wave superimposed over the parabola. The reason for this is probably that we were receiving signals from just outside the main beam of the antenna on Gorm B.

The Coordinates supplied by both NeSA and Dan Surveys used a CM of 3 deg E (not 5 deg E). The Coords were converted to CM 5 and were confirmed officially by fax to the Rho.

==========

NAV QC REPORT GECO SIGMA FRIDAY 11TH AUGUST 1989 JDAY 223

==========

SYLEDIS: The reason that Dan Surveys give that we are not able to get good baseline crossingresults is that there is a rigthat has just moved into the area and is causing some interference. Also, none of the baselines, except for Rolf-A to Gorm-B, have the antennae oriented alongthe baselines and cannot be expected to give good results.

HYPERFIX: The Hyperfixcalibration was executed bysteaming along an East-Westline in the area where theSyledis geometry was good and within the beacon antenna beams. Data was collected for one hour in each direction andthe mean differences from the Syledis position and each Hyperfix range was computed.

The maximum difference seen between C-Os computed for opposite directions was 0.061 lanes (4.2m). This means that the maximum deviation fromthe mean is 2.1m. It also indicates that there is not anysignificant variation in thevessel electrical centre for the two line directions.

Another calibration run was made with both vessels in shooting position to test whetherthe proximity to another vesselaffected the C-Os of the Hyperfix. The boats started the line with 200m separation. One thirdof the way down theline the separation was increased to 400m and at two thirds of the way it was reduced again to200m. If the C-Os were affected by the proximity of the vessels, there would have been noticeable differences in the Syledis to Hyperfix Delta E and/or Delta N time series plots. Unfortuneately, the Hyperfix was very noisy duringthis test and the results were not conclusive. The exercise will need to be repeated to get meaningful data.

==========

NAV QC REPORT GECO SIGMA SATURDAY 12TH AUGUST 1989 JDAY 224

==========

SYLEDIS: A transit fix of the "Glomar Baltic" (3 legged Jackup rig) was performed. The transitswere logged by both Gridnav and Norstar and the rig centre position was computed independently by Gridtransit softwareand also graphically. Bothmethods agreed with each other withina couple of metres andthe difference from the rig centre, computed from the GPS antenna position and the supplied offsets, was 13m.

After the transit fix, and before the Sigma completed the first calibration line for calibrating Borkum, the beacon on B 11/2 stopped transmitting and we were informed that it could not be repaired until Monday 14/08.

HYPERFIX: Without B11/2 there was mediocre geometry with a two way fix to use for further calibration attempts. The second attempt at the twoboat calibration line wasalso not undertaken. There were C-O values already esatablished for Terschelling, K-7 and H-7 stations and it was decided to lay out the streamers and start the survey withthe understanding that if any Hyperfix stations dropped out, Borkum would need calibrating properly before it could be used.

Apparently, the Rho's Hyperfix has been configured to give 4 patterns on eachfrequency. The unit on theSigma can only output 3 patterns on each frequency. It shall be investigated whether or not the Signma's Hyperfix can be configured like the Rho's.

PULSE/8: The Pulse/8 appears to be reasonable. The geometry for patterns 1-3, 1-4 and 1-5 is not very good and would be much improved by substituting 1-3 for 3-5. However it does not seem to be possible to use secondary patterns in the Norstar.

The Norstar receives its Pulse/8 data from the receivers via a splitter which it shares with Racal's computer. There does not seem to be anything that the computer does for Norstar that Norstar cannot do for itself.However, if the Racal computer has a hangup, the Norstar receives no Pulse/8 data at all. So far there have been quite a few problems with Racal's system. Most seem to have been "finger trouble" and inexperience on the part of the Racal operator and will hopefully not re-occur. Nevertheless, no Pulse/8 data while shooting may cause significant problems. Geco are presently exploring their alternatives with respect to this problem.

==========

NAV QC REPORT GECO SIGMA SUNDAY 13TH AUGUST 1989 JDAY 225

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LINE 89FA0238S DIR 270 SEQ#01 Scatched

Hyperfix signals unstable. Multiple lane slips ocurred causing navigation jumps and missed SPs.The weather was poor during the line with heavy rain squalls.

OFFSETS: Asboth streamers were deployed, the tailbuoy ropes and stretch sections were remeasured. There were minor differences from the previous (1.5m max). The new values were entered into the latest survey definition. The Navtech acoustic sensor's offsets were also vreified to be unchanged.

Regards

M.Smith / R. Knight / P.Cohen

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-225.TXT/NMM/F03
DATE: Monday 14th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Sunday 13th August 1989 @ 24.00 GMT JD 225

1. PRODUCTION

NIL

Summary

Daily Sail Line	(Sigma)	00.000	Kms
Daily Sail Line	(Rho)	00.000	Kms
Accumulated Sail Line		00.000	Kms
Daily Production	(Sigma)	000.000	Kms
Daily Production	(Rho)	000.000	Kms
Combined Daily Production		000.000	Kms
Accumulative Total	(Sigma)	000.000	Kms
Accumulative Total	(Rho)	000.000	Kms
Accumulative Combined Vessel Total		000.000	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
K7,K8					
07/8	05:01	14:22	04:37	00:00	00:00
08/8	04:48	18:15	00:57	00:00	00:00
F03					
09/8	00:00	06:00	15:30	02:30	00:00
10/8	00:00	17:20	02:30	04:10	00:00
11/8	00:00	06:15	00:00	17:45	00:00
12/8	00:00	14:00	00:00	10:00	00:00
13/8	00:00	13:53	03:56	06:11	00:00
TOTAL	09:49	90:05	27:30	40:36	00:00

LINES SHOT MONDAY-SUNDAY:

14 Undershoot lines in K7,K8 Total 80.512 Kms
Zero production in F03

3.QC STATUS

3.1 Seismic

The vessels were not ready for the 1353 time slot because they were too far from the prospect area after both streamers were deployed.
At the start of line 238 the gun mask data was wrong. This was eventually traced to the blast reset in the Norstar beingset to

zero. This happened last month and the observers were told that this looked like the same problem but they did not respond. Navigation signals were very bad and the line was scratched.

3.2 Daily Diary

0000 Deploying streamers.
0130 Start deploying stbd tailbuoy.
0615 55Km north west of prospect and still heading 347.
Vessel was a long way from the nearest line. It was necessary tostay on one headingwhile deploying the second streamer to prevent the cables from crossing.
0637 Both streamers fully deployed and vessel turned towards prospect.
0700 Started to launch guns.
Next tide slot was 1353 GMT for section 3 (W-E) line.
0740 Streamer balancehad not been checkedat projected shooting speed.
0800 All guns deployed.
0920 Cable balance checked at shooting speed and considered to be good enough to start.Port cable was slightly heavy at 3.5 knots shootingspeed and the ballastwill be trimmed using the MOB boat at the first available opportunity.
1353 Unable to get to start of line on time.Nextslot 2005 GMT.
Contractor time started.
Party chief proposed to shoot a dummy line in order to check out all the systems.
1400 Offset checks all ok.
2004 SOL 89FA-0238 Seq 001.
Norstar blast command reset was setto zero causing errors in gun timing QC. Very bad Hyperfix signals due to atmospherics. Data not to be processed.
2327 EOL.
2400 On line change. Sea 2-3m Wind S'ly 15-20 kts.

3.3 Status at 0400 GMT

On line. Navigation much better. Some swell noise.

Regards
M.Smith / R. Knight / P.Cohen

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-224.TXT/NMM/F03
DATE: Sunday 13th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

==========

SUBJ: Progress to Saturday 12th August 1989 @ 24.00 GMT JD 224

==========

1. PRODUCTION

==========

NIL

Summary

Daily Sail Line	(Sigma)	00.000	Kms
Daily Sail Line	(Rho)	.....00.000	Kms
Accumulated Sail Line		..... 00.000	Kms
Daily Production	(Sigma)	.....000.000	Kms
Daily Production	(Rho)	.....000.000	Kms
Combined Daily Production		.....000.000	Kms
Accumulative Total	(Sigma)	..... 000.000	Kms
Accumulative Total	(Rho)	..... 000.000	Kms
Accumulative Combined Vessel Total.....		000.000	Kms

==========

2.TIME ANALYSIS

==========

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
06/8	01:42	12:56	04:42	04:40	00:00
07/8	05:01	14:22	04:37	00:00	00:00
08/8	04:48	18:15	00:57	00:00	00:00
09/8	00:00	06:00	15:30	02:30	00:00
10/8	00:00	17:20	02:30	04:10	00:00
11/8	00:00	06:15	00:00	17:45	00:00
12/8	00:00	14:00	00:00	10:00	00:00

==========

3.QC STATUS

==========

3.1 Seismic

Calibrating navigation and deploying streamers.
The antenna coupler did not work on the port tailbuoy and the Racal engineer was transferred from Rho. Finger trouble on the part of NeSA prevented Pulse-8 data reaching the Norstar.B11/2 is off the air until Monday morning.

3.2 Daily Diary

0100 Proximity check not possible because of poor signals.
Heading to platform for transit check of Syledis.
0400 Arrived at the Glomar Baltic platform. Configured Norstar for transit fix.Waited for daylight.
Borkum still off the air.
0522 Started Rig Transit fix 1

0633 Finished Rig Transit fix 2
Evaluated the results.
0845 Results looked OK.Headedfor calibration area to meet with Rho for 2-boat proximity checks.
Borkum still off the air.
1000 Borkum back on the air.
1022 Started calibration of Borkum.
1030 Boat Drill followed by Safety Meeting.
1107 Norstar stopped. Calibration data lost. Geodetic data ok
1134 Finished Calibration run.
1220 Syledis station B11/2 went dead.
1320 B11/2 cannot be fixed until Monday afternoon according to the Intersite engineer.
Decided to stream cables and try calibration runs using only a 2-way Syledis fix as there was now no alternative.
1435 Started calibration of Borkum using 2 Syledis stations
1440 Deployed port tailbouy.
1515 No signals received from port tailbouy.
1520 Port tailbouy back on board.
1540 Ended calibration run.
1650 Started second calibration run for Bokum.
1700 Launched port tailbouy.
1813 Finished calibration run.
1830 Recovered port tailbouy again as itwas still not working.
1900 Racal engineer was transferred from Rho by MOB boat.
1915 Problem with port tailbuoy antenna coupler was fixed.
2000 Pulse 8 finally received to Norstar.Finger trouble.
2120 Started to deploy port streamer.
2350 Port streamer out and towed wide.
2400 Deploying streamers and adjusting balance.

Regards
M.Smith / R. Knight / P.Cohen

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-223.TXT/NMM/F03
DATE: Saturday 12th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Friday 11th August 1989 @ 24.00 GMT JD 223

1. PRODUCTION

NIL

Summary

Daily Sail Line (Sigma)	00.000	Kms
Daily Sail Line (Rho)	.....00.000	Kms
Accumulated Sail Line	..... 00.000	Kms
Daily Production (Sigma)	.....000.000	Kms
Daily Production (Rho)	.....000.000	Kms
Combined Daily Production	.....000.000	Kms
Accumulative Total (Sigma)	..... 000.000	Kms
Accumulative Total (Rho)	..... 000.000	Kms
Accumulative Combined Vessel Total.....	000.000	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
05/8	00:00	13:25	07:28	03:07	00:00
06/8	01:42	12:56	04:42	04:40	00:00
07/8	05:01	14:22	04:37	00:00	00:00
08/8	04:48	18:15	00:57	00:00	00:00
09/8	00:00	06:00	15:30	02:30	00:00
10/8	00:00	17:20	02:30	04:10	00:00
11/8	00:00	06:15	00:00	17:45	00:00

3.QC STATUS

3.1 Seismic

All of the day wasspent trying to calibrate the navigation. Splitter cables had tobe manufactured on board todistribute the signals to the Norstar, Geodetic and NeSA .
Hyperfix pulses have been noted on the DSS V noise test. The level is not as bad as expected and it may be reduced when the equipment is streamed.
Tha calibration runs which have been done have not used the NeSA equipment.The operator cannot getit to work correctly.

3.2 Daily Diary

0000 Awaiting results of Rho extended baseline B11/2-Gorm B. Results were very poorbecause of the badcoverage area for B11/2 antenna.

0200 Norstar still not getting Pulse 8.
0340 Crossing Dan C-B11/2 baseline.
Results from B11/2 were not good.
0400 Intersite man called his office to check on B11/2 details.
0545 Crossed B11/2-Gorm B baseline.Result poor due to being outside the beam of B11/2 antenna.
0720 Informed by Intersite that a platform in the area interfered with all baselines except Rolf-Gorm B.
No other details were forthcoming. Abandoned baseline crossings and headed for Hyperfix calibration area closer to the F03 prospect.
Informed by Intersite that other chain users report the chain is OK.
The time taken to cross baselines would have been much less had weknown yesterday about thepossible interference as we would then not have wasted time trying to repeat baselines in order to try to get better results.
A lack of information fromIntersite is to blame for this.

The chain detailsdocument supplied by DANsurvey contained conflicting details of the coverage angle available from the B11/2 beacon.

The Pulse-8 was stillnot getting to theNorstar.The Racal engineer continued to investigate but did not seem to be very successful.
0730 Heading for Syledis/Hyperfix calibration area.
0800 Racal had problemsreading Syledis, setting up and getting the Pulse-8 signals to Norstar.
0930 Arrived in the vicinity of the calibration area but Racal were not ready to start.
The Syledis had only 2outputs and 3 were required. It was necessary tomake up a cablesplitter to distribute Syledis signals to the NESA,Geodetic and Norstar systems.
Pulse-8 was going to Norstar.
1030 Heading back to calibration point and setting up.
(Mainly Racal).
1130 Splitter constructed and allsystems were receiving Syledis signals.
Racal engineer set up the computer with calibration details.
Geodetic had to construct a splitter to enable them to receive Pulse-8.

Sigma and Rho stayed closetogether and in the vicinity of the optimum calibration point approx midway between the prospect and the Syledis stations.
1355 Commenced Hyperfix calibration run-1. Weather conditions poor. NeSA equipment not on line.
1530 Commenced run-2.
1800 Unable to run calibration onF2 because Borkum station was unstable. Engineer contacted the shore. NeSA equipment not on line.
2130 Waiting forresults of Rho calibrationusing NeSA equipment only. Shore engineer reported no problem with Borkum station when monitored from Den Helder.
2211 Shore monitor confirmed that Borkum was off the air. An engineer was sent to investigate.

2400 Hyperfix unstable. Waiting for Rho to come alongside for a proximity check to test for interference.

3.3 Status

0600 Carrying out transit fix on Glomar Baltic

Regards
M.Smith / R. Knight / P.Cohen

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-222.TXT/NMM/F03
DATE: Friday 11th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Thursday 10th August 1989 @ 24.00 GMT JD 222

1. PRODUCTION

NIL

Summary

Daily Sail Line	(Sigma)	00.000	Kms
Daily Sail Line	(Rho)	00.000	Kms
Accumulated Sail Line		00.000	Kms
Daily Production	(Sigma)	000.000	Kms
Daily Production	(Rho)	000.000	Kms
Combined Daily Production		000.000	Kms
Accumulative Total	(Sigma)	000.000	Kms
Accumulative Total	(Rho)	000.000	Kms
Accumulative Combined Vessel Total		000.000	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
04/8	00:00	10:38	02:01	11:21	00:00
05/8	00:00	13:25	07:28	03:07	00:00
06/8	01:42	12:56	04:42	04:40	00:00
07/8	05:01	14:22	04:37	00:00	00:00
08/8	04:48	18:15	00:57	00:00	00:00
09/8	00:00	06:00	15:30	02:30	00:00
10/8	00:00	17:20	02:30	04:10	00:00

3.QC STATUS

3.1 Seismic

Transit from Den Helder and baseline crossings.
Hardwareproblems were encountered withthe Hyperfix receiver and the Racal engineer had to be transferred from the Rho.

3.2 Daily Diary

0230 Navigation installation completed on Sigma.
All personnel were not on board (NAM personnel ok).
Departure was delayed while they were found.Contractor time.

0515 Departed Den Helder.Start of operational travel time.
It was necessary to steam north of the prospect area to reach the Syledis baselines which formed the basis of the navigation calibrations.

1500 Not able to transferdata from Pulse-8 computer to Norstar and the RACAL man wasnot able to reconfigure the hyperfix to range-range mode.
1545 Stopped and turned to opposite direction to allow the Rho to catch up to transfer the Racal engineer to Sigma.
1645 MOB boat away to Rho to collect Racal engineer.
1655 Racal engineer and MOB boat on board.
1903 MOB boat away to Rho to take Racal engineer back.
1916 MOB boat back on board.
2019 B11/2 to DAN-C basline crossing started.
2114 DAN-C to GORM-B baseline crossing started (027 degrees).
2140 DAN-C to GORM-B baseline crossing started (202 degrees).
2230 B11/2 to DAN-C baseline crossing started.
2300 Tried anotherB11/2 - DAN-C baselinewith co-ordinates from B11 but the result was still bad.
2345 B11/2-Dan C again.poor result again.
2400 Investigating the bad results from B11/2.

3.3 Status

0100 Still trying baselines to get better results.

==========

NAV QC REPORT GECO SIGMA THURSDAY 9TH AUGUST 1989 JDAY 222

==========

Most of the day was spent configuring the navigation computers, sorting out some interfacing problemsand cross checking entered data. By the end of the day, there was still some trouble with getting the vessel Pulse/8 into the Norstar.

Baselines were also crossed with results as follows:

Baseline	dirn	O-C Nor*	O-C Gridnav
Dan C - B 11/2	004	-10.0	-9.9
	178	-12.0	-9.9

This crossing was triedagain with the co-ordinateslisted as B11 in case there had been a mix up and the antenna had been placed there. However, the error grew larger when the alternative co-ordinates were used.

Dan C - Gorm B	027	+ 2.0	+2.6
	202	+ 3.9	+4.1

These were very noisy with a large amplitude sine wave superimposed over the parabola. The reason for this is probably that we were receiving signals from just outside the main beam of the antenna on Gorm B.

The Coordinates supplied by both NeSA and Dan Surveys used a CM of 3 deg E (not 5 deg E). The Coords were converted to CM 5 and were confirmed officially by fax to the Rho.

Regards
M.Smith / R. Knight / P.Cohen

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-221.TXT/NMM/F03
DATE: Thursday 10th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

==========

SUBJ: Progress to Wednesday 9th August 1989 @ 24.00 GMT JD 221

==========

1. PRODUCTION

==========

NIL

Summary

Daily Sail Line	(Sigma)	00.000 Kms
Daily Sail Line	(Rho)	00.000 Kms
Accumulated Sail Line		00.000 Kms
Daily Production	(Sigma)	000.000 Kms
Daily Production	(Rho)	000.000 Kms
Combined Daily Production		000.000 Kms
Accumulative Total	(Sigma)	000.000 Kms
Accumulative Total	(Rho)	000.000 Kms
Accumulative Combined Vessel Total		000.000 Kms

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2.TIME ANALYSIS

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DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
03/8	00:00	00:56	09:16	13:48	00:00
04/8	00:00	10:38	02:01	11:21	00:00
05/8	00:00	13:25	07:28	03:07	00:00
06/8	01:42	12:56	04:42	04:40	00:00
07/8	05:01	14:22	04:37	00:00	00:00
08/8	04:48	18:15	00:57	00:00	00:00
09/8	00:00	06:00	15:30	02:30	00:00

==========

3.QC STATUS

==========

3.1 Seismic

Baseline crossings for F7 completed

3.2 Daily Diary

0000 En route to Den Helder to mobilise for F3 Block.
Operational time for NAM requested port call.

0600 Tied up in Den Helder.
As there was no sign of the RACAL engineers to install the new navigation equipment the vessel was on contractor downtime until they arrived.

0830 Racal engineers arrived. Standby time started.

2400 Installation of Hyperfix and Pulse-8 continued.

3.3 Status

K7,K8 completed. Change over from K7 to F03 was at midnight 8th/9th. Times from 0000 on 9th were for F03 block.

Regards
M.Smith / R. Knight / P.Cohen

8.4.2 Geco Rho

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-251.TXT/NMM/F03
DATE : Saturday 9th September 1989
ATTN : A.BANDELL/C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ :SURVEY PROGRESS TO Friday 8th September 1989 @ 2400Z

1.PRODUCTION (F-03)

No Production . . . . . Survey Completed.

Total Prospect Prime Production 1435.312 Kms

Total Prospect Infill Production 210.263 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
02/9	00:00	14:34	06:11	03:15	00:00
03/9	00:00	00:58	06:09	16:53	00:00
04/9	11:53	06:00	04:47	01:20	00:00
05/9	00:00	11:08	02:22	10:30	00:00
06/9	03:43	15:57	02:35	01:45	00:00
07/9	00:00	20:12	00:00	03:48	00:00
08/9	00:00	04:45	00:00	00:00	00:00

ACCOUNTING COMPLETE AT 04:45 8TH SEPTEMBER 1989

DAILY DIARY

0000 Travel to Den Helder at 14 knots.
0445 Alongside Den Helder - close the NAM books for 1989!!!

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-250.TXT/NMM/F03
DATE : Friday 8th September 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ :SURVEY PROGRESS TO Thursday 7th September1989 @2400Z

1.PRODUCTION (F-03)

No Production . . . . . Survey Completed.

Total Prospect Prime Production 1435.312 Kms

Total Prospect Infill Production 210.263 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
01/9	13:54	08:00	02:06	00:00	00:00
02/9	00:00	14:34	06:11	03:15	00:00
03/9	00:00	00:58	06:09	16:53	00:00
04/9	11:53	06:00	04:47	01:20	00:00
05/9	00:00	11:08	02:22	10:30	00:00
06/9	03:43	15:57	02:35	01:45	00:00
07/9	00:00	20:12	00:00	03:48	00:00

DAILY DIARY

0000 Recover trailing equipment.
0452 Agreed time of six hours for operational trailing equipment recovery expires. Geco continue cable work (reprogramming streamers for Elf) on contractor time.
0840 All trailing equipment on board. Head for Baseline Crossings on operational time.
1025 Start Baseline crossings.
1140 Complete first baseline crossings. Commence bar check.
1155 Bar check completed - good planning here made it very quick. Recommence baseline crossings.
1334 Complete baseline crossings to satisfaction of NAV QC. Head at full speed to Den Helder.
2400 Travel to Den Helder at 14 knots.

3. QC STATUS

3.1 Streamers

On board - prospect complete.

3.2 Weather

Calm weather.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-249.TXT/NMM/F03
DATE : Thursday 7th September 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ :SURVEY PROGRESS TO Wednesday 6th September1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0370	270	11576	11630	55	1.031	Infill
0406	090	100	1630	1531	28.706	Prime
0262	270	10800	11318	519	9.731	Infill
0262	270	0	0	0	0.000	Reshoot
0586	090	10270	11630	1361	25.519	Infill
0154	270	10100	10404	305	5.719	Infill
0154	270	0	0	0	0.000	Reshoot

Total Daily Production Prime 28.706 Kms
Accumulated Prime Production 1435.313 Kms

Total Daily Production Infill 42.000 Kms
Accumulated Infill Production 210.263 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	08:00	02:06	00:00	00:00
02/9	00:00	14:34	06:11	03:15	00:00
03/9	00:00	00:58	06:09	16:53	00:00
04/9	11:53	06:00	04:47	01:20	00:00
05/9	00:00	11:08	02:22	10:30	00:00
06/9	03:43	15:57	02:35	01:45	00:00

DAILY DIARY

0000 Continue 89FF-F0370/R. FSPD 11576. Some lost SPs d/t nav on Sigma, though Rho was OK.
0006 EOL 89FF-F0370/R. Complete. EDIT GUNSEQ ERRS SPs 10261-10263 & 10314(S).
0221 SOL 89FA-F0406-R. SEQ 71. Last two boat prime line.
0604 EOL 89FA-F0406-R. Complete. No Rho edits.
0827 SOL 89FF-F0262/R. SEQ 72. Single boat 20 fold wide separation infill with Rho coverage required cols: 428-432 in various offset groups.
0941 EOL 89FF-F0262/R. Complete. No edits. Go straight into a full two boat reshoot.
0941 SOL 89 FA-F0262*R. SEQ 72. Two boat standard reshoot on NAM A/C for gun sequence errors caused by poor Hyperfix propagation conditions on seq: 7 (16/08/89).
0953 EOL 89FA-F0262*R. Complete. No Rho edits. Go straight into a Rho infill on columns 431 & 432, which, however,was

completely missed due to navigator error. This is being charged as operational infill time, but the reshoot for the missing coverage will be contractor time as per usual.

1026 End of rejected infill line. Normal operational line change to the next line.

1030 Last NAM safety meeting held.

1217 SOL 89FF-F0586/R. SEQ 73. Single boat 20 fold wide separation infill with Rho coverage required cols: 116-121 in various offset groups.

1527 EOL 89FF-F0586/R. Complete. EDIT GUNSEQ ERRORS SPs 10548-10549 ONLY.

1743 SOL 89FF-F0154/R. SEQ 74. Single boat 20 fold wide separation infill with Rho coverage required cols: 552-555 in various offset groups.

1825 EOL 89FF-F0154/R. Complete. No edits. Sigma carrying on their line. Rho on operational line change.

1938 SOL 89FA-F0154*R. SEQ 74. Single boat 20 fold reshoot (Sigma shooting synchronous split line) for sequence 38 (27/08/89) where Sigma stbd cable was shallow.

2016 EOL 89FA-F0154*R. Complete. No edits. Run down line on contractor time.

2123 Sigma completed shooting. Rho standing by at client request while coverage being evaluated.

2252 Coverage deemed sufficient. Rho released from NAM production status. Now on operational time to recover trailing equipment.

2400 Recover trailing equipment.

3. QC STATUS

3.1 Streamers

Traces S89 & S109 spiking and killed.

3.2 Weather

Good shooting weather with occasional swell bursts.

Regards,
N.Morrison
^Z

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-248.TXT/NMM/F03
DATE : Wednesday 6th September 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Tuesday 5th September 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0442	090	0	0	0	0.000	Infill
0442	090	0	0	0	0.000	Reshoot
0322	270	10100	11499	1400	26.250	Infill
0322	270	0	0	0	0.000	Reshoot
0490	090	10700	11181	482	9.038	Infill
0490	090	0	0	0	0.000	Reshoot
0490	090	11240	11630	391	7.331	Infill
0370	270	10100	11575	1476	27.675	Infill(cont.)

Total Daily Production Prime 0.000 Kms
Accumulated Prime Production 1406.607 Kms

Total Daily Production Infill 70.294 Kms
Accumulated Infill Production 168.263 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	08:00	02:06	00:00	00:00
02/9	00:00	14:34	06:11	03:15	00:00
03/9	00:00	00:58	06:09	16:53	00:00
04/9	11:53	06:00	04:47	01:20	00:00
05/9	00:00	11:08	02:22	10:30	00:00

DAILY DIARY

0000 Line change.
0155 SOL 89FF-F0442/R. SEQ 67. Single boat 20 fold infill line (Sigma shooting synchronous single boat), with Rho covering cols: 264-265. Note this is contractor downtime as missing coverage is fromseq 62 with steering problems.
0350 EOL 89FF-F0442/R. Complete. No edits. NOTE THAT FILE NUMBERS ARE 1000 TOO HIGH DUETO OPERATOR ERROR. Carry on down line (Sigma still shooting their line) until the reshoot portion.
0422 SOL 89FA-F0442*R. SEQ 67. Single boat 20 fold infill line (Sigma shooting synchronous single boat), with Rho reshooting for seq 54 (Sigma stbd guns bad) on cols: 254-256. Contractor time for Rho.

1942 Operational line change period expired. Now on standby rate.

2009 SOL 89FF-FO370/R, Seq. 70. Single-boat, 20-fold infill line (Geco Sigma was shooting a synchronous single-boat line) with Geco Rho coverage required on columns 324-326 in various offset groups. Operational infill time.

2400 LSP of the day 11575, line 89FF-FO370/R. Some SPs lost due to Geco Sigma's navigation, though Geco Rho's was good.

6th September 1989

0000 FSP of the day 11576, line 89FF-FO370/R. Some SPs were lost due to Geco Sigma's navigation, though Geco Rho's was good.

0006 EOL 89FF-FO370/R, complete. Edit SPs 10261-10263 and 10314(S) due to gun sequence errors.

0221 SOL 89FA-FO406-R, Seq. 71. Last two-boat prime line.

0604 EOL 89FA-FO406-R, complete. No Geco Rho edits.

0827 SOL 89FF-FO262/R, Seq. 72. Single-boat, 20-fold, wide separation infill with Geco Rho coverage required on columns 428-432 in various offset groups.

0941 EOL 89FF-FO262/R, complete. No edits. The vessel went straight into a full two-boat re-shoot.

0941 SOL 89FA-FO262*R, Seq. 72. Two-boat standard re-shoot on NAM's account due to gun sequence errors caused by poor Hyperfix propagation conditions on Seq. 7 (16th August).

0953 EOL 89FA-FO262*R, complete. No Geco Rho edits. The vessel went straight into a Geco Rho infill on columns 431 and 432 which, however, was missed completely due to navigator error. This was being charged as operational infill time, but the re-shoot for the missing coverage would be Contractor time as per usual.

1026 End of rejected infill line. Normal operational line change to the next line.

1030 Last NAM safety meeting held.

1217 SOL 89FF-FO586/R, Seq. 73. Single-boat, 20-fold, wide separation infill with Geco Rho coverage required on columns 116-121 in various offset groups.

1527 EOL 89FF-FO586/R, complete. Edit SPs 10548-10549 only due to gun sequence errors.

1743 SOL 89FF-FO154/R, Seq. 74. Single-boat, 20-fold, wide separation

infill with Geco Rho coverage required on columns 552-555 in various offset groups.

1825 EOL 89FF-FO154/R, complete. No edits. Geco Sigma carried on their line while Geco Rho was on operational line change.

1938 SOL 89FA-FO154*R, Seq. 74. Single-boat, 20-fold re-shoot (Geco Sigma was shooting a synchronous split line) for Seq. 38 (27th August) when Geco Sigma's starboard cable had been shallow.

2016 EOL 89FA-FO154*R, complete. No edits. Running down the line on Contractor time.

2123 Geco Sigma completed shooting. Geco Rho stood by at the Client's request while coverage was evaluated.

2252 Coverage was deemed sufficient and Geco Rho was released from NAM production status. Now on operational time while recovering the trailing equipment.

2400 Trailing equipment recovered.

7th September 1989

0000 Trailing equipment recovered.

0452 The agreed time of 6 hours for operational trailing equipment recovery expired. Geco continued cable work (re-programming the streamers for Elf) on Contractor time.

0840 All trailing equipment on board. Heading for baseline crossings on operational time.

1025 Baseline crossings commenced.

1140 First baseline crossing completed. Bar check commenced.

1155 Bar check completed. Good planning here made it very quick. Re-commenced baseline crossings.

1334 Baseline crossings completed to the satisfaction of the navigation QC. Heading at full speed to Den Helder.

2400 Heading to Den Helder at 14 knots.

8th September 1989

0000 Travel to Den Helder at 14 knots.

0445 Alongside Den Helder.

8.3 Daily Summary

Date	Comments
9th August 1989	Travel to Den Helder. Mobilising for F3 Block.
10th August 1989	Mobilising. Travel to F3. Navigation calibration.
11th August 1989	Navigation calibration.
12th August 1989	Navigation calibration. Deploy the streamers.
13th August 1989	Deploy the streamers and guns. Attempt line but bad Hyperfix.
14th August 1989	Bad Hyperfix. Production.
15th August 1989	Hyperfix calibration. Weather downtime.
16th August 1989	Production. Gun and instrument failures.
17th August 1989	Production. Cable and tailbuoy repairs.
18th August 1989	Geco Sigma re-shoot. Geco Rho cable work. Weather downtime.
19th August 1989	Weather standby. Prime production.
20th August 1989	Prime production.
21st August 1989	Prime production.
22nd August 1989	Prime production. Crew change.
23rd August 1989	Crew change. Re-deploying the equipment.
24th August 1989	Re-deploying the equipment after the crew change. Weather.
25th August 1989	Weather. Geco Sigma re-deploying the equipment. Geco Rho infill/re-shoot.
26th August 1989	Prime production.
27th August 1989	Prime production. Weather standby.
28th August 1989	Prime production. Weather standby.
29th August 1989	Prime production. Geco Sigma navigation receiver failed. Geco Rho cable work/infill.
30th August 1989	Prime production.
31st August 1989	Prime production.
1st September 1989	Prime production.
2nd September 1989	Weather. Geco Sigma re-shoot. Navigation calibration. Geco Rho infill.

Date	Comments
3rd September 1989	Navigation calibration. Weather. Geco Sigma infill. Geco Rho cable work. Navigation failure.
4th September 1989	Prime and re-shoot production.
5th September 1989	Infill and re-shoot production.
6th September 1989	Prime, infill and re-shoot production.
7th September 1989	Geco Rho baselines and travel. Geco Sigma infill and re-shoot.
8th September 1989	Geco Rho in Den Helder. Geco Sigma cutting baselines and travel.

8.4 Daily Text Files

8.4.1 Geco Sigma

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-251.TXT/NMM/F03
DATE: Saturday 9th September 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

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SUBJ:Progress to Friday 8th September 1989 @ 24.00 GMT JD251

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1. PRODUCTION

==========

NIL

Summary

Daily Sail Line (Sigma)	00.00	Kms
Daily Sail Line (Rho)	00.00	Kms
Accumulated Sail Line	1435.31240	Kms
Daily Production (Sigma)	00.00	Kms
Daily Production (Rho)	00.00	Kms
Combined Daily Production	00.00	Kms
Accumulative Total (Sigma)	8611.8750	Kms
Accumulative Total (Rho)	8611.8750	Kms
Accumulative Combined Vessel Total	17223.7500	Kms

Daily Infill (Sigma)	00.000	Kms
Daily Infill (Rho)	00.000	Kms
Combined Daily Infill	00.000	Kms
Accumulated Infill (both)	459.0940	Kms

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2.TIME ANALYSIS

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DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
02/9	00:00	11:44	09:01	03:15	00:00
03/9	00.00	14:35	07:39	01:46	00:00
04/9	11:53	06:00	06:07	00:00	00:00
05/9	00:00	17:02	04:49	02:09	00:00
06/9	03:43	14:35	05:42	00:00	00:00
07/9	00:00	13:03	02:42	08:15	00:00
08/9	00:00	22:00	00:00	00:00	00:00

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3.QC STATUS

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3.1 Seismic

Baseline results not good or conclusive.

3.2 Diary

0311 Both streamers recovered.
0335 Both tailbuoys on deck and vessel headed north to re-cross the Syledis baselines. Operational time.
0520 Commenced baseline crossings.
0745 Baseline crossings completed. Commenced bar check.
0845 Bar check complete. Headed south to Den Helder.

Operational time continued.
2200 Nominal end of contract time. Berthed in Den Helder.

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NAV QC REPORT GECO SIGMA FRIDAY 8TH SEPTEMBER 1989 JDAY 251

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03:40 Both tailbuoys onboard.
05:20 Start Baseline crossings
07:30 Complete baseline crossings.
08:45 Bar check at 55 32.5 N 04 38 E water depth 33m.
Draught computed as 4.5m using a speed of sound of 1500m/s.

		GRID		NOR*		
	HDG	C-o	SD	C-o	R1	R2
DAN C - B11/2	358	0.9	4.8	10.3	13612	24112
DAN C - B11/2	182	2.1	4.7	9.7	14017	23706
GORM B - ROLF A	009	-7.4	1.5	-5.9	8750	8948
GORM B - ROLF A	191	-7.3	1.1	-6.2	8684	9077

When 200m from the Dan C - B11/2 baseline the fix SD increased from approx 3m to 9m and then decreased back to 3m 200m after the baseline. Signals were strong and stable and this was shown in the plotted data. However the baseline data appeared to have a very long period wave superimposed and the computed parabola fitted the data very badly hence the SD of 4.8m and the large difference between Nor* and Grid values.

The Gorm B - Rolf baselines were a little noisy hence the curve fit Sds of 1.1 and 1.5.

Regards
M.Smith / R. Knight / M.Lanha

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-250.TXT/NMM/F03
DATE: Friday 8th September 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ:Progress to Thursday 7th September 1989 @ 24.00 GMT JD250

1. PRODUCTION All Lines prefixed 89FF or 89FA

Line	Hdg	FSP	LSP	SP	Kms	STATUS
F0190/S	270	737	1630	894	16.7625	INFILL
F0274/S	270	1300	1630	331	00.0000	Contractor INFILL
F0418/S	090	100	1630	1531	28.70625	INFILL
F0382/S	270	100	432	333	6.24375	INFILL
F0394*S	270	21148	21630	483	0.00000	RESHOOT
F0574/S	090	310	520	211	0.00000	Contractor INFILL
F0586/S1	090	11230	11540	311	0.00000	Contractor INFILL

Summary

Daily Sail Line (Sigma)	00.00	Kms
Daily Sail Line (Rho)	00.00	Kms
Accumulated Sail Line	1435.31240	Kms
Daily Production (Sigma)	00.00	Kms
Daily Production (Rho)	00.00	Kms
Combined Daily Production	00.00	Kms
Accumulative Total (Sigma)	8611.8750	Kms
Accumulative Total (Rho)	8611.8750	Kms
Accumulative Combined Vessel Total	17223.7500	Kms

Daily Infill (Sigma)	51.7125	Kms
Daily Infill (Rho)	00.00	Kms
Combined Daily Infill	51.7125	Kms
Accumulated Infill (both)	459.0940	Kms
NON-Chargeable Infill	3	Lines
Reshoots	1	Lines

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
01/9	13:54	08:00	02:06	00:00	00:00
02/9	00:00	11:44	09:01	03:15	00:00
03/9	00.00	14:35	07:39	01:46	00:00
04/9	11:53	06:00	06:07	00:00	00:00
05/9	00:00	17:02	04:49	02:09	00:00
06/9	03:43	14:35	05:42	00:00	00:00
07/9	00:00	13:03	02:42	08:15	00:00

3.0C STATUS

3.1 Seismic

Line 0190 was out of spec for navigation between sp 1300-1400 which caused lost header data.

Line 274 was marginal for cable stability on the port streamer but acceptable.

Line 418 was actually outside the gun spec for 29 shots because a 500 cu in gun failed and the spare was not switched in, however the data was accepted because of the double fold and the timing errors on the spare gun were not large.

The guns gave a lot of problems. There seems tobe problems with the umbilical (SWAG) cables which take a long time to repair.

3.2 Diary

0000 As CDP coverage was thought to be completed the Rho was released from production in order to carry out contractor streamer work and also to carry out Syledis baselines. The remaining lines (all single boat) were to be done by Sigma.

0114 SOL 89FF-F0190/S Single boat infill.

0322 EOL 89FF-F0190/S

0522 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.

0601 SOL 89FF-F0274/S Single boat infill at contractor cost because Rho missed the columns last time. Columns 431,432

0647 EOL 89FF-F0274/S
The line change from here to the next SOL was charged as contractor time because it followed a non-chargeable reshoot.

0815 SOL 89FF-F0274/S Single boat infill in columns 286-289.

1139 EOL 89FF-F0274/S

1300 It came to light that during SEQ 73 the Rho missed the near group infill on CDP lines 121 and 122.Groups 2,3 and 4 are full.This was now the biggest hole remaining in the coverageand would have to bereshot at Contractor expense. It remained a mystery how,whenshooting 4CDP lines,the Rho could completely miss the required infill in Group 1. The delay in preparation of the coverage was due to a comms breakdown on line when the Rho data did not get to the Sigma during production.The data was sent over later, and believed to be complete at the time,but proved otherwise.

1339 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.

1347 SOL 89FF-F0382/S Single boat infill in columns 313-315.

1433 EOL 89FF-F0382/S

1548 Estimated SOL time but the line change was extended to finish repairing the stbd array. Contractor time started.

1620 SOL 89FA-F0394*S Single boat reshoot of sp 11148-EOL on sequence 63 that were rejected on the original line because the stbd gun array failed.

1727 EOL 89FA-F0394*S The line change from here to the next infill was charged as contractor downtime.

1908 SOL 89FF-F0574/S Single boat infill in column 121.
1937 EOL 89FF-F0574/S This was non-chargeable infill and the line change from here to the next SOL was charged as contractor time.
2106 SOL 89FF-F0586/S1 Single boat infill in column 120.
2149 EOL 89FF-F0586/S1 This was nonchargeable infill.
2205 Started to recover the guns.
2230 Coverage plot completed. All infill was complete.
2345 Guns on board.
2355 Started to recover wide tows and streamers.
2400 Recovering equipment.

3.3 Status at 0500 GMT

Heading north to cross Syledis baselines.

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NAV QC REPORT GECO SIGMA THURSDAY 7TH SEPTEMBER 1989 JDAY 250

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LINE 89FF0190S DIRN 270 SEQ 75 SP 737-1630 INFILL
All Hyperfix F1s + Terschelling F2 in use at SOL. No Syledis ranges usable for the whole line as stations were at 80,85 and 72km. Even the 72km range, B11/2 was very noisy (SD up to 9m). K8 lost lock SP 1076 and 1137, from SP 1060 to EOL K8 was taken out of the fix due to instability.
Excessive filtering was in use in Nor*, rate filter set to 10 (max) and expected accurracy decreased from 7 to 10m. Although taking K8 out of the fit reduced the fluctuaqtion in the SD, drifts of up to 15m occurrred between the filtered radio nav position and the system (Kalman filter) position. These drifts occurred SP 772-780, 1302-1308, 1332-1343, 1372-1388, 1395-1401 1410-1420, 1482-1485.Large spped fluctuations up to 0.5 Knot occurred resulting in regular non recording of the header on the seismic tapes.
NAVAIGATION OUT OF SPECIFICATION sp 1300-1420. For the whole line
17% of Hyperfix SDs exceeded 5m.

LINE 89FF0274S DIRN 270 SEQ 76 SP 1300-1630 INFILL
Hyperfix very stable. Syledis ranges very unstable and not included in the fit. Omniseis statistics corrupted as were not reset prior to SOL and included a sharp deviation just prior to the SOL.

LINE 89FF0418S DIRN 090 SEQ 77 SP 100-1630 INFILL
Cocktail was used as primary. SP 240-438 F1 Terschelling suspended. Cocktail was very stable with SD varying from 1-2m except for the short period prior to Terschelling F1 being taken out of the fix. SP 287 and SP 312 Dan C and B11/2 taken out due to weak signals.

LINE 89FF0382S DIRN 270 SEQ 78 SP 100-432 INFILL
Cocktail was used as primary with Gorm suspended. Cocktail SD was very stable at 1-2m. GridNav time series plots for Hyperfix showe a slightly unstable fit which at approx SP 320 stabalised and dropped from 4-5m to around 3m, appears to have been caused by Terschelling.

The time series plot of GridNav Hyperfix Eastings - Nor* eastings displayed an unusual saw tooth characteristic in places (not found in northings differences) . The easting difference increases from 0 to 4m gradually then jumps back to 0.

LINE 89FA0394S DIRN 270 SEQ 79 SP 21139-21630 2ND RESHOOT
Cocktail fit primary with Gorm suspended. F1 Terschelling suspended in Gridnav cocktail and this resulted in the cocktail having a very stable SD compared to the 4 way Hyperfix fit. As seen previously when F1 Terschelling is suspended in the cocktail and in use in the Hyperfix F1 fit, the Hyperfix - Cocktail difference in eastings exhibits a systematic fluctuation from +3 to -3m.
G2R1 bad with only one range having more than 15% good data.

LINE 89FF0574S DIRN 090 SEQ 80 SP 310-520 INFILL
Cocktail primary fit with Terschelling F1 suspended. All Syledis stations in use due to exceptional propogation giving double the normal received signal strengths. SP 330-EOL K8 taken out of the fit due to noise. Expected accurracy increased to 10m normally set to 7m. Cocktail had 8% SDs >5m, cocktail positions agreed within 1-2 of Hyperfix F2 position with K8 suspended.
SP 488-518 no Pulse 8 data recorded on Nor* due to interface fault.

LINE 89FF0574S DIRN 090 SEQ 81 SP 11230-11540 INFILL
Cocktail in use with F1 Terschelling suspended. Very strong Syledis signals (80%), receiving Rolf A for the first time. Terschelling F1 noisy for the whole line. G1R1 pinger dead.

ACOUSTICS : Nav point weighting changed to 2m as in single boat mode. This reduced the average variance of B1R1 to 1-3m and fixed the adjusted coordinates to the Navpoint rather than the navpoint being shifted by the network solution.
Tailnet S1H4 dead for all lines shot today. On several lines F2R1-S2H4 also had very low percentages of good data resulting in very few solutions for the tailnet and corrupted solutions.

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-249.TXT/NMM/F03
DATE: Thursday 7th September 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

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SUBJ:Progress to Wednesday 6th September 1989 @ 24.00 GMT JD249

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1. PRODUCTION All Lines prefixed 89F

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Line	Hdg	FSP	LSP	SP	Kms	STATUS
A-F0406-S	090	100	1630	1531	28.70625	Complete Prime
F-F0262/S	270	10800	11318	519	9.73125	INFILL
A-F0262*S	270	11319	11397	79	0.00	RESHOOT
F-F0646/S	090	10270	11630	1361	25.51875	INFILL
F-F0106/S	270	10100	11630	1531	28.70625	INFILL

Summary

Daily Sail Line (Sigma)	28.70625	Kms
Daily Sail Line (Rho)	28.70625	Kms
Accumulated Sail Line	1435.31240	Kms
Daily Production (Sigma)	172.23750	Kms
Daily Production (Rho)	172.23750	Kms
Combined Daily Production	344.4750	Kms
Accumulative Total (Sigma)	8611.8750	Kms
Accumulative Total (Rho)	8611.8750	Kms
Accumulative Combined Vessel Total	17223.7500	Kms

Daily Infill (Sigma)	63.95625	Kms
Daily Infill (Rho)	42.000	Kms
Combined Daily Infill	105.95625	Kms
Accumulated Infill (both)	407.38150	Kms
Reshoots	2	Lines

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2.TIME ANALYSIS

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DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	08:00	02:06	00:00	00:00
02/9	00:00	11:44	09:01	03:15	00:00
03/9	00.00	14:35	07:39	01:46	00:00
04/9	11:53	06:00	06:07	00:00	00:00
05/9	00:00	17:02	04:49	02:09	00:00
06/9	03:43	14:35	05:42	00:00	00:00

==========

3.QC STATUS

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3.1 Seismic

Line 406 was the last prime line and the seismic data was excellent with no misfires and only 5 GM2B errors. There were

four bad groups.

Line 0262 was infill/reshoot and the data was also very clean with only group 47 dead.

The port cable depths were not good on line 646. The sea state increased for a short time and the middle of the streamer floated. It was 4.5 - 5.7 m for most of the line but also went deep to 8.4 m occasionally. Between sp10703 and 10721 there was a 2.5 - 3 m difference between adjacent birds. There were also 22 misfires on gun P2/3 on this line.

The port cable was also unstable during line 0106. The depths were 5.7-8.4 for most of the line. The BUCO/DFS caused 13 NDR records.

3.2 Diary

0031 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
0221 SOL 89FA-0406-S
0604 EOL 89FA-0406-S
0804 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
0827 SOL 89FF-0262/S Infill in columns 442-445
0941 EOL 89FF-0262/S Last sp 11318
SOL 89FA-0262*S First sp 11319. Reshoot of seq 7 sps 1319-1387 that were rejected on the original line because of gun sequence errors caused by poor navigation signals. This was a chargeable reshoot.
0953 EOL 89FA-0262*S
The line change from here to the next SOL was charged as standby time as it followed a chargeable reshoot.
1217 SOL 89FF-F0646/S Infill in columns 58-64
1527 EOL 89FF-F0646/S
1727 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
1743 SOL 89FF-F0106/S Infill in columns 586-589
2123 EOL 89FF-F0106/S
2323 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
2400 Extended line change.

3.3 Status at 0400 GMT

On line change after single boat infill.

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NAV QC REPORT GECO SIGMA WEDNESDAY 6TH SEPTEMBER 1989 JDAY249

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LINE 89FA0406S DIRN 090 SEQ 71 SP 100-1630 PRIME
Cocktail in use with Dan C and Gorm suspended.
SP 420-452 Dan C included in fix. SP 831 Dan C included in fix.
SP 906 K8 F1 lost lanes, noisy but Ok by SP 910.
SP 1075 K8 lost lock and not included in fix again until
SP 1313. SP 1608 lost Syledis synch until the end of line.
SP 129-145 Pulse 8 1-5 Krummhorn disturbed (1000m residual) but only on vessel receiver, two way fix compared well with Hyperfix position.
S3R2 had only one good range (S3R2-S1H1 91%), all other ranges

less than 15%.good data. S1H4 dead.

LINE 89FA0262S DIRN 270 SEQ 72 SP 10800-11630 RESHOOT/INFILL
Cocktail with all stations except Gorm B.
SP 11172-EOL Gorm B included in fix. Hyperfix unstable SDs from 1 to 6m. Terschelling F1 was removed from GridNav Hyperfix fit and resulted in the SDs being conc=sistently 1-2m. Terschelling F1 was
kept in Nor* and GridNav cocktail the difference between the fits when Terschelling F1 was removed being 2-3m in Northings.
Port and Starboard compass 13 noisy DSD 1.0 and 1.1 respectively.
Acoustic stats corrupted due to large vessel separation

LINE 89FF0646S DIRN 090 SEQ 73 SP 10270-11630 INFILL
Ccoktail primary fit with Gorm suspended. Hyperfix was very stable except for two short periods around SP 10500 when the residual for H7 increased from -.7m to -15m. The two short duration spikes suggest that a crane may have been moved past the antenna and then back again.
Acoustics passive to be processed as single boat, vessel separation 1500m.

LINE 89FA0106S DIRN 270 SEQ 74 SP 10100-11630
Cocktail in use with Gorm suspended. SP 10278 Syledis taken out of cocktail. SP 10363 Rate Filter increased to 8. SP 10517 Terschelling F1 taken out of cocktail. SP 10625 Expected accuracy increased from 7 to 9m. SP 10634 K8 F1 lost lock,
SP 10641 Terschelling F1 put back in fix.
SP 10691-10813 Terschelling F1 out of fix.
Navigation very noisy with several periods when Nor* filter position was 7-8m from rate filtered cocktail position. Particularly bad SP 10678-10690, 11500-11605. Navigation was out of spec 13% SDs >5m but worse lines have been accepted previously.
SP 10654-SP10740 lost synch Syledis.
Acoustics passive.

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-248.TXT/NMM/F03
DATE: WEDNESDAY 6th September 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Tuesday 5th September 1989 @ 24.00 GMT JD248

1. PRODUCTION All Lines prefixed 89F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
F-F0466/S	090	10100	11630	1531	28.70625	INFILL
A-F0322*S	270	10100	10432	333	00.00	RESHOOT
F-F0322/S	270	10433	11630	1198	22.46250	INFILL
F-F0490/S	090	10700	11171	472	8.850	INFILL
A-F0490*S	090	11172	11239	68	0.00	RESHOOT
F-F0490/S1	090	11240	11630	391	7.33125	INFILL
A-F0358*S	270	10100	10570	471	0.000	RESHOOT
F-F0358/S	270	10571	11004	434	8.1375	INFILL

Summary

Daily Sail Line (Sigma)	00.00	Kms
Daily Sail Line (Rho)	00.00	Kms
Accumulated Sail Line	1406.60620	Kms
Daily Production (Sigma)	00.00	Kms
Daily Production (Rho)	00.00	Kms
Combined Daily Production	00.00	Kms
Accumulative Total (Sigma)	8439.6375	Kms
Accumulative Total (Rho)	8439.6375	Kms
Accumulative Combined Vessel Total	16879.2750	Kms
Daily Infill (Sigma)	75.48750	Kms
Daily Infill (Rho)	70.29375	Kms
Accumulated Infill (both)	301.42525	Kms
2-Boat Reshoots	3	Lines

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	08:00	02:06	00:00	00:00
02/9	00:00	11:44	09:01	03:15	00:00
03/9	00.00	14:35	07:39	01:46	00:00
04/9	11:53	06:00	06:07	00:00	00:00
05/9	00:00	17:02	04:49	02:09	00:00

3.0C STATUS

3.1 Seismic

At the end of the job are 2 boat timing tests required? It has been continuously logged on Sigma and on Rho with ECL Header and it is felt that it will be unnecessary. If required Rho will have to stay in port until Sigma arrives.

At current rate of progress the 2 boat passes will be completed by Midnight GMT Wednesday,leaving 2 single boat Reshoots which the Sigma can do.Our ETA Den Helder after Syledis Baselines is 1200 Friday,with Rho arriving maybe 8 hours or more earlier.

We arenot sure why it is necessary for both vessels to do Baseline crossings.

I propose to send you an updated Infill/reshoot list together with further possible infill for your consideration.

Are we required to go to Assen next week or can we clear all details away when we are in port?

A show of appreciation for a job well done would go down well with all personnel.

Gun S2/3 was unreliable on 2 lines but the guns were generally much better.

Line 0358 (seq 70) was flagged as being out of spec on navigation. The signals were very noisy but the Geodetic stats and the Norstar stats did not agree because different stations were used at different times in the primary fix.

3.2 Diary

0155 SOL 89FF-F0466/S Infill in columns 237-240
0534 EOL 89FF-F0466/S
0734 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
0806 SOL 89FA-F0322*S Reshoot of sequence 27. Sp 100-130 were a 2-boat reshoot and sp 131-432 were a 1-boat reshoot because of Sigma gun failures on the original line.
0853 EOL 89FA-F0322*S Last sp 10432
SOL 89FF-F0322/S Infill in columns 383-385.
First sp 10433
1138 EOL 89FF-F0322/S
1338 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
1533 SOL 89FF-F0490/S Infill in columns 204-209
1639 EOL 89FF-F0490/S Last sp 11171
SOL 89FA-F0490*S First sp 11172. Reshoot of seq 37 sp 1181-1239 because of gun failures on the original line.
1648 EOL 89FA-F0490*S Last sp 11239

SOL 89FF-F0490/S1 Infill in columns 204-209
First sp 11240
1742 EOL 89FF-F0490/S1 Last sp 11630
1942 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
2009 SOL 89FA-F0358*S Reshoot of seq 45 sp 100-570 because of gun failure on original line.
2122 EOL 89FA-F0358*S Last sp 10570
SOL 89FF-F0358/S Infill in columns 346-351
First sp 10571
2231 EOL 89FF-F0358/S Last sp 11004
2400 On the allocated 2 hour line change.

3.3 Status at 0600 GMT

Last prime line completed.

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NAV QC REPORT GECO SIGMA TUESDAY 5TH SEPTEMBER 1989 JDAY 248
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LINE 89FF0466S DIRN 090 SEQ 67 SP 10100-11630 INFILL
Cocktail in use with Gorm suspended. SP 10265 K8 noisy and suspended until SP 10426. Monitoring on GridNav indicated that Terschelling F1 was unstable and should have been taken out of the fix from SP 10500 to EOL. K8 should have been used in place of Terschelling as this range was stable after the lane slip.
In Nor* Terschelling remained in the fix but expected accurracy was decreased to 10 (all other ranges 7).
Poor acoustics due to separation. Range stats give a false picture due to window being set to 20m+-20%.

LINE 89FA0322S DIRN 270 SEQ 68 SP 10100-11630 RESHOOT
Cocktail primary fit . F1 Terschelling unstable and taken out of fix SP 11240.
SP 10308-10482 Pulse 8 station Krummhorn lost lock.
GridNav showing Hyperfix 4 way fit to be stable but showing a long period oscillation from 0 to 5.5m. Terschelling F1 was taken out of the fix half way along the line and SDs then remained stable at 2 to 2.7m
---
LINE 89FA0490S DIRN 090 SEQ 69 SP 10700-11630 RESHOOT/INFILL
Cocktail primary with all stations in use except Gorm B.
Hyperfix was very stable until the EOL when Terschelling became unstable.

LINE 89FA0358S DIRN 270 SEQ 70 SP 10100-11104 RESHOOT/INFILL
Cocktail in use with K8, Gorm and Dan C suspended.
SP 10165 K8 and Dan C included in the fit due to HYperfix instability.
SP 10207 Terschelling F1, Dan C and B11/2 suspended.
SP 10545-10560 using only H7, Borkum and Terschelling F2.
SP 10560 Dan C and B11/2 included in fit.
SP 10678-SP10904 K8 included in fit.
SP 10904 K8 and B11/2 suspended.
SP 10930 B11/2 included in fit.

Navigation very unstable due to instability in Terschelling and

lane slips K8 resulting in poor shot point interval and lost SPs.
Grid cocktail with F1 Terschelling and all Syledis ranges suspended had 17% fixes SD>5m. Some of the 17% of fixes were caused by not suspendung K8 at the appropriate times. Nor* trackplot also shows noisy navigation. Navigation marginal/out of spec.

ACOUSTICS S1H4 dead for all lines shot. Acoustics poor as most lines were sailed with separation in excess of 200m. Generally all inter vessel ranges were suspended.

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-247.TXT/NMM/F03
DATE: Tuesday 5th September 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Monday 4th September 1989 @ 24.00 GMT JD247

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0430	090	100	1630	1531	28.70625	Complete
0394	270	10100	11630	1531	28.70625	Complete
0418	090	100	1630	1531	28.70625	Complete
0214-S1	270	10100	10553	454	8.51250	Complete
0178*S	270	11330	11630	301	0.00	Reshoot

Summary

Daily Sail Line (Sigma)	94.63125	Kms
Daily Sail Line (Rho)	94.63125	Kms
Accumulated Sail Line	1406.60620	Kms
Daily Production (Sigma)	567.78750	Kms
Daily Production (Rho)	567.78750	Kms
Combined Daily Production	1135.5750	Kms
Accumulative Total (Sigma)	8439.6375	Kms
Accumulative Total (Rho)	8439.6375	Kms
Accumulative Combined Vessel Total	16879.2750	Kms
Daily Infill (Sigma)	.	Kms
Daily Infill (Rho)	.	Kms
Accumulated Infill (both)	155.6440	Kms
2-Boat Reshoots	1	Line

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
29/8	06:30	04:00	00:57	12:33	00:00
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	08:00	02:06	00:00	00:00
02/9	00:00	11:44	09:01	03:15	00:00
03/9	00.00	14:35	07:39	01:46	00:00
04/9	11:53	06:00	06:07	00:00	00:00

3.QC STATUS

3.1 Seismic

Both cables started the day with no bad traces.

Line 0430 had 87 shots with no pulse clock but data was not affected. There were no gun sequence errors during that time and the QC was ok after the clock started again.

Line 0394 will need a reshoot because of guns. The stbd array was 3 guns down and > 425 cu ins down.

The MOB boat has been out to add lead around stbd 7. Hopefully the stability will now be better.

Line 0418 was badly affected by gun problems. A 195 cu ins gun was switched out on the stbd array and then a 400 cu ins gun was switched out on the port array. After the shift change the observer thought they were both on the same array and switched on the spare port 500 cu in gun. This was not necessary and gave 100 cu ins too much volume. It also misfired for 8 consecutive shots (600m). These were small timing errors (2-3 ms) and the data was accepted.

Reliability of the guns has not been good lately. the Rho are much better than the Sigma. This may be due to many factors such as a bad batch of "o"rings, poor maintenance, deteriorating umbilical cables etc. The gun crew on Sigma are not as efficient or conscientious as the crew on Rho.

Line 430 has a hole in group 1 coverage on the extreme Port outside CDP line due to bad steering on Sigma.The weather was perfect,Nav good and the hole is so long that the vessel should have managedto get back into the correct columns sooner even if it temporarily drifted offline. Offline distance went from-110m to 090m during the relevant period.This Infill will be charged to Geco .

3.2 Diary

0120 SOL 89FA-F0430-S Prime line.
0458 EOL 89FA-F0430-S
0658 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
0732 SOL 89FA-F0394-S
1105 EOL 89FA-F0394-S
1142 MOB boat away to add lead around stbd depth 7.
1233 MOB boat back on board.
1305 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
1342 SOL 89FA-F0418-S
1718 EOL 89FA-F0418-S
1918 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
1941 SOL 89FA-F0214-S1 This is the completion of sequence 13 sp 100-553 that were rejected because of swell noise.
2047 EOL 89FA-F0214-S1 The original time was not charged as prime. This line was prime time followed by standby time until the next SOL time.
2236 SOL 89FA-F0178*S Reshoot of seq 25 sp 1500-1630 that were rejected because of bad navigation signals.
2319 EOL 89FA-F0178*S This line and the following line change were charged as standby.
2400 On a line change following a chargeable reshoot.

3.3 Status at 0500 GMT

On Infill/Reshoot line heading east. Weather perfect.

NAV QC REPORT GECO SIGMA MONDAY 4TH SEPTEMBER 1989 JDAY 247

LINE 89FF0430S DIRN 090 SEQ 62 SP 100-1630 PRIME
Cocktail in use with Gorm suspended. SP 770-1080 Dan C taken out of fix due to noise. SP 563-695 and SP 1454-1465 K8 suspended due to lane slips. Other than these short periods of lane slips Hyperfix was very stable.
SP 284-379 no Omniseis data from Rho.

LINE 89FA0394S DIRN 270 SEQ 63 SP 10100-11630 PRIME
Cocktail in use but without Syledis ranges included. Hyperfix was a little unstable for the first half of the line but became very stable for the rest of the line.
Tailnet solution statistics corrupted

LINE 89FA0418S DIRN 090 SEQ 64 SP 100-1630 PRIME
Cocktail in use Gorm B suspended. SP 724 Terschelling F1 taken out of the cocktail due to to residuals of 5m. However Terschelling was kept in GridNav fit and Hyperfix was very stable.
Acoustics reset SP 1156 due to problems with tailnet.

LINE 89FA0214S DIRN 270 SEQ 65 SP 10100-10626 TWO BOAT RESHOOT
SP 10100-SP10190 cocktail in use without Syledis ranges.
SP 10190 to EOL Dan C and B11/2 included in the fix. Hyperfix very stable except for the last 100 SPs when Terschelling F1 became very noisy.

LINE 89FA0178S DIRN 270 SEQ 66 SP 11330-11630 TWO BOAT RESHOOT
Cocktail in use with F1 Terschelling and Gorm suspended for the whole line. SP 11505 Dan C suspended.
Hyperfix 4 way fix was very stable, mean SD 2.7m SD 0.7 1% SDs>5m.
GridNav primary was Hyperfix 4 way fix, Timeplot of GridNav - Nor* position showed a very systematic variation alongline from 2 to +3m. GridNav shot interval also had a very systematic and regular spike of 5m.

COMPASSES : Very quiet for all lines shot DSDs 0.2 to 0.6.

ACOUSTICS : S3R2 responder bad for all lines shot today with all ranges from this responder being disabled in the solution. Network solutions are good with variances of 11 to 28m in x and y.

Tailnet : The input line to the patch box from S1H4 was disconnected as this hydrophone was causing interference on the seismic records. Rho's S3R4 was bad for sequences 62 and 63 with almost no data for ranges from this responder, after sequence 63 the responder was replaced by Mob boat. F2R1-S2H4 is also bad with 15 to 20% solutions. Even with S3R4 replaced performance of the tailnet has been poor due to the loss of S1H4.

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-246.TXT/NMM/F03
DATE: Monday 4th September 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Sunday 3rd September 1989 @ 24.00 GMT JD246

1. PRODUCTION All Lines prefixed 89FF-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
586/S	090	500	1300	801	15.01875	Infill
526/S	090	887	1630	744	13.95000	Infill
226/S	270	100	1630	1531	28.70625	Infill

Summary

Daily Sail Line	(Sigma)	00.00	Kms
Daily Sail Line	(Rho)	00.00	Kms
Accumulated Sail Line	.....	1311.9750	Kms
Daily Production	(Sigma)	00.00	Kms
Daily Production	(Rho)	00.00	Kms
Combined Daily Production	.....	00.00	Kms
Accumulative Total	(Sigma)	7871.850	Kms
Accumulative Total	(Rho)	7871.850	Kms
Accumulative Combined Vessel Total	.....	15743.700	Kms

Daily Infill (Sigma).....	57.6750	Kms
Daily Infill (Rho)	00.00	Kms
Accumulated Infill (both).....	155.6440	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	04:00	00:57	12:33	00:00
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	08:00	02:06	00:00	00:00
02/9	00:00	11:44	09:01	03:15	00:00
03/9	00.00	14:35	07:39	01:46	00:00
TOTAL	54.36	56:19	39:31	17:34	00:00

Summary for Period Monday 28/8/89 to Sunday 03/9/89

	SIGMA	RHO
No of Prime lines	15	15
No of Infill lines	3	2
No of Reshoot lines	1	1
Prime KM	430.59375	430.59375
Infill Km	57.6750	29.2875

3.0C STATUS

3.1 Seismic

Line 0586/S was started without the pulse clock running. It was operational again by sp 669. Data was recoverable. The swell noise was heavy on this line but MicroMAX data from Rho showed it to be at an acceptable level. The compasses were out of spec.

Line 0526/S showed swell noise, again at an acceptable level.

Line 0226/S had noisy navigation that caused lost or corrupted ext header data on 15 records and 5 NDR records. There was also low level pick-up on the stbd streamer. This was traced to a partially grounded Navtech hydrophone which was removed from the patch panel and is now completely shorted to ground. The Navtech trigger pulse was reduced which cured the pick-up at 5.4 secs on group 18. This was suggested weeks ago but no action was taken until today.

All these cable problems are associated with the waterbreak section that was inserted into the stbd streamer when the original one snapped and stretched. A spare has been obtained from the Rho but it is potted at one end and the head of the first active has to be modified before we can use it.

3.2 Diary

0130 SOL 89FF-F0586/S 1-boat infill in columns 106-110
0326 EOL 89FF-F0586/S
0526 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
0650 Next projected SOL time but the swell noise and cable control were too bad for production. Weather standby.
1259 Next projected SOL time. The sea state was much better but Rho was unable to shoot because of leakage in the lead-in. Sigma was therefore on contractor downtime until the next SOL
1445 SOL 89FF-F0526/S 1-boat infill in columns 178-181
1630 EOL 89FF-F0526/S
The line change was operational time.
1812 SOL 89FF-F0226/S 1-boat infill in columns 465-471
2154 EOL 89FF-F0226/S
A partially grounded Navtech hydrophone caused pick-up on the cable. It was removed from the patch panel and shorted out completely. The Navtech trigger pulse was reduced to prevent interference.
2354 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
2400 Extended line change to next prime line.

3.3 Status at 0330 GMT

On Prime line heading east.

NAV QC REPORT GECO SIGMA SUNDAY 3RD SEPTEMBER 1989 JDAY 246

LINE 89FF0586S DIRN 090 SEQ 59 SP 500-1300 TWO BOAT INFILL
K8 station down SOL-SP 567. K8 station was turned on again remotely from the Sigma. Four way Hyperfix very stable mean SD 2.1m SD 0.8m with 0% of fixes >5mSD.

Rho navigation unacceptable using combination of two receivers but still have very weak signals.

Compasses 1 and 13 Port out of spec DSDs of 1.6 and 1.2 degrees S2H2 bad. All intervessel ranges deleted due to variations in vessel separation from 250 to 300m.

Aborted run in to line 89FA0394S due to weather. Rho to discover cause of poor Hyperfix before any more they shoot any more lines.
S2H2 hydrophone replaced.

LINE 89FF0526S DIRN 090 SEQ 60 SP 889-1630 SINGLE BOAT INFILL
Using cocktail with Gorm B suspended.
SP 1195 to SP 1417 lost synch on syledis. Hyperfix was very stable with a mean SD of 3.3m SD 0.3 0% sds>5m.
Port compass 1 out of spec DSD 1.1.
No ranges disabled but three ranges less than 50%. Acoustic solution variances corrupted but very low percentage solutions front net, 26-27%.

LINE 89FF0226S DIRN 270 SEQ 61 SP 100-1630 SINGLE BOAT INFILL
The Hyperfix was unstable due to the time of day (18:12-21:54 GMT)
with a mean SD of 3.9m 14% sds > 5m. Sp 1350 and SP 1605 K8 lost lanes. From SP 1080 Nor* Hyperfix rate filter was increased to 10 (Max value).
Syledis signals were weak and Gorm, Dan C and B11/2 were taken out of the fix at SP 213, 229, and SP 510.

Port compass 13 noisy DSD 1.0

Only 65 to 68% solutions for front net with AvarY of 42-43m.
S1H4 bad.

ACOUSTICS : Output power of Navtech reduced to 20W due to interference with the seismic recording. S1H4 hydrophone disconnected as leakage causing problems with DFS.

TS dip 1510.63 m/s.

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-245.TXT/NMM/F03
DATE: Sunday 3rd September 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Saturday 2nd September 1989 @ 24.00 GMT JD245

1. PRODUCTION

All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0658*S	090	11312	11630	319	00.000	Reshoot

Summary

Daily Sail Line (Sigma)	00.00	Kms
Daily Sail Line (Rho)	00.00	Kms
Accumulated Sail Line	1311.9750	Kms
Daily Production (Sigma)	00.00	Kms
Daily Production (Rho)	00.00	Kms
Combined Daily Production	00.00	Kms
Accumulative Total (Sigma)	7871.850	Kms
Accumulative Total (Rho)	7871.850	Kms
Accumulative Combined Vessel Total	15743.700	Kms

Daily Infill (Sigma)	0.0	
Daily Infill (Rho)	14.025	
Accumulated Infill (both)	97.969	Kms

2-Boat reshoots ..... 1 line

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	04:00	00:57	12:33	00:00
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	08:00	02:06	00:00	00:00
02/9	11:44	09:01	03:15	00:00	00:00

3.0C STATUS

3.1 Seismic

The first Infill line of the day was scratched on Sigma because of cable instability. The Rho data was marginal but acceptable. Sigma time was logged as weather standby because all 4 cables showed swell problems.

The rest of the day was spent on nav calibration.(see diary and nav report.)

3.2 Diary

0001 Start of Infill line in columns 25-27. Streamer stability was very poor with the cables on or close to the surface. The data was scratched.

0146 End of scratched line. The Rho was able to collect acceptable data but their cables were also unstable. There was a 2-3m swell and for this reason the time on Sigma for this line and the following line change were logged as weather standby.

0251 SOL 89FA-F0658*S Reshoot of sequence 40.
Therewas heavy swell noise but the streamer depths stayed within spec.

0336 EOL 89FA-F0658*S
The line change from this time to the next projected SOL time was charged as contractor downtime because it followed a non-chargeable reshoot.

0525 MOB boat away to crew boat "Stormvogel" to collect Racal engineer and then to Rho to collect floppies. Sea was about 2m but there were no problems.

0544 MOB boat back on board.

0600 Attempted to shoot sequence 58 but cable stability was bad and the line was abandoned.Weather standby was logged from the next projected SOL time.

0606 Next projected SOL time.
During this period of weather standby it was decided to re-calibrate the Hyperfix to try to improve the fix quality on Sigma. New C-O values were to be obtained using both receivers. K8 was to be calibrated so that it could be used in the fix and K7 had to be recalibrated because changes had been made on the station.
It was agreed that this operation would be acceptable as the end of job post calibration and was logged as operational time from the next projected SOL time.

0645 Headed north to reach the calibration area.

0900 Syledis lost synch.

0924 Syledis ok.

1137 Started the first run, heading west.

1216 Next projected SOL time. Operational time started.

1250 Ended the first run.

1320 Started the second run, heading east.

1433 Ended the second run.

1650 Started the first run using the spare receiver, heading east.

1741 Ended the first run.

1808 Started the second run, heading west.

1858 Calibration completed.

1928 The decision was made to use the spare Hyperfix receiver and associated C-O values. Headed south to the prospect.

2400 On line heading. The sea was 2-3m

3.3 Status at 0330 GMT

On line heading east. The swell noise is bad. 80-90 uB over 30-40 per cent of the cables.

NAV QC REPORT GECO SIGMA SATURDAY 2ND SEPTEMBER 1989 JDAY 245

LINE 89FF0670S DIRN 090 SEQ 56 SP 100-847 INFILL
No Omniseis data from Rho SOL-SP175.
Borkum F1 SOL - SP 160 very noisy resulting in 3 way Hyperfix SD fluctuating between 1 and 10m. Dan C and B11/2 stable.
From SP 160 Hyperfix stable with SD of 4.5 to 5.5m.
Acoustics not active due to varaitions in vessel separation (150-300m). At approx SP 620 SD jumped to 10m and stayed at 9 to 10m for the rest of the line, jump appeared to be caused by Borkum.
Compass 13 port out of spec DSD 1.3, compass 1 port noisy SD 1.0.

LINE 89FA0670S DIRN 090 SEQ 57 SP 11312-11630 RESHOOT
Cocktail in used with all Syledis stations active. Hyperfix was stable until the EOL when Borkum was noisy. Mean SD was 3.9m with 12% of fixes having SD>5m compared to sequence 56 where mean Sd was 6.8m with 85% SDs > 5m.
Compass 13 Port out of spec DSD 1.3 degrees, compass 1 port noisy DSD 1.0 degrees. S2H2 worse with 7 ranges having no data and two ranges only having 50% good data.
Tailnet only had 75 and 90% solutions for Sigma tailbuoys despite only having two bad ranges F2R1-S2H4 SD 9.1
DSD 72.2 28%

LINE 89FA0394S DIRN 090 SEQ 58
Line aborted SP 260 due to cables on surface and unstable navigation. Fix SDs fluctauating between 7 and 17m.

06:30 Decision made to go and calibrate both of Sigma's Hyperfix receivers so that
a). The spare receiver which has 10db less noise could be used.
b). To derive C-os for Station K8 which is essential for good geometry.

10:00 L. Zeiljmaker informed of decision to go and calibrate receivers. Suggestion made that if the results were acceptable this would suffice as the final calibration. Unable to verify Syledis due to vessels having cables deployed. Verification of Syledis to be carried out at the end of the job. Calibration lines to be 10km long.

First line sailed along original line, second line sailed DC -2000 to reduce time spent in turning so that calibration of both receivers can be completed before any problems with sky wave experienced.

11:49-12:51 First calibration line dirn 270. Receiver SN 136.
Syledis mean SD 1.7 varying from 1m to 5m with <1% SDs>5m.
Syledis was more stable for the last 4km of the line.
Hyperfix SD was characterized by a approx 1m amplitude square wave form repeated 15 times along the line. H7 was unstable for 200m 2500m along the line and again 5000m along the line.

13:25-14:34 Start of second calibration line dirn 090. Receiver SN136.

Syledis mean SD 2.5m varying from 0 to 5.5m with 5% of SDs>5m. Syledis was stable for the first 4000m but had a series of waves on the last 6000m. Square wave again seen on the Hyperfix sd but no pattern instability present.

Intended starting line further to the west this reduces the angles by two degrees but gives more stable Syledis signals. However problems getting data output from receiver SN 1441 meant that did not get any data.

16:50-17:42 Third calibration line dirn 090. Receiver SN 1441. Syledis very stable except for the last 2500m when the SD increased from 1-2m to 4.5m. Mean SD 1.66m 3% SDs>5m. Hyperfix stable, no square wave seen on the Sd or any residuals.

18:08-18:58 Fourth calibration line dirn 270. Receiver SN 1441.

All Hyperfix ranges much less stable, data from the last 3000m should not be used in the computation of the C-os. Instability is almost certainly due to skywave interference.

C-os were entered into the patterns and monitored while sailing back to the prospect for 1200 samples at 5 seconds interval in GridNav. Mean Hyperfix Sd was 2 to 3m for fixes containing F1s only, F2s, and all F1s+F2s.

RECEIVER SN 136		DIRN 270		DIRN 090		MEAN	
		GRID	NOR*	GRID	NOR*	GRID	NOR*
TERSCHELLING	F1	0.074	0.032	0.037	0.076	0.056	0.054
H7	F1	-0.380	-0.421	-0.361	-0.340	-0.371	-0.381
K8	F1	0.318	0.290	0.264	0.301	0.291	0.296
BORKUM	F1	0.240	0.202	0.246	0.275	0.243	0.239
TERSCHELLING	F2	0.174	0.154	0.159	0.216	0.167	0.185
H7	F2	0.746	0.778	0.719	0.831	0.733	0.805
K8	F2	0.275	0.278	0.256	0.323	0.266	0.301
BORKUM	F2	0.294	0.288	0.311	0.378	0.303	0.333
RECEIVER SN 1441							
TERSCHELLING	F1	0.004	-0.032	-0.009	0.031	-0.003	-0.005
H7	F1	-0.429	-0.465	-0.404	-0.379	-0.417	-0.422
K8	F1	0.310	0.284	0.267	0.305	0.289	0.295
BORKUM	F1	0.219	0.182	0.224	0.257	0.222	0.220
TERSCHELLING	F2	0.159	0.141	0.113	0.167	0.136	0.154
H7	F2	-0.347	-0.421	-0.350	-0.365	-0.349	-0.393
K8	F2	0.347	0.361	0.272	0.342	0.310	0.352
BORKUM	F2	0.282	0.278	0.263	0.327	0.273	0.303

Comparing mean Nor* values for calibration on 15/08 and 02/09.

		15/08	02/09	Diff
Terschelling	F1	-0.030	-0.005	0.02
H7	F1	-0.359	-0.422	-0.06
Borkum	F1	0.137	0.220	-0.08
Terschelling	F2	0.050	0.154	-0.10
H7	F2	0.438	-0.393	0.83

Borkum	F2	0.208	0.303	-0.10

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-244.TXT/NMM/F03
DATE: Saturday 2nd September 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Friday 1st September 1989 @ 24.00 GMT JD 244

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0694	090	438	1630	1193	22.36875	Complete
0382	270	100	1630	1531	28.70625	Complete
0442	090	100	1630	1531	28.70625	Complete
0106	270	100	1630	1531	28.70625	Complete

Summary

Daily Sail Line (Sigma)	108.4875	Kms
Daily Sail Line (Rho)	108.4875	Kms
Accumulated Sail Line	1311.9750	Kms
Daily Production (Sigma)	650.9250	Kms
Daily Production (Rho)	650.9250	Kms
Combined Daily Production	1301.8500	Kms
Accumulative Total (Sigma)	7871.850	Kms
Accumulative Total (Rho)	7871.850	Kms
Accumulative Combined Vessel Total	15743.700	Kms

Daily Infill (Sigma)	0.0	
Daily Infill (Rho)	0.0	
Accumulated Infill (both)	83.944	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	04:00	00:57	12:33	00:00
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	08:00	02:06	00:00	00:00

3.0C STATUS

3.1 Seismic

Port 2/4 gun, 125 cu.in, was open circuit in the umbilical and lines 694,382 and 442 were started with 3037 cu.inches on the port array. The faulty wires were swapped to gun 2/6 and line 106 was started with a 54 cu.in gun missing (3108 cu.ins)

During line 0442 the stbd source developed an airleak and was switched out from sp 1123-EOL.

Line 106 was shot without the 2-boat links for sp 1250-1611 but data should be recoverable. Any extra infill caused by loss of the steering link will be at Geco's expense. Streamer depths were marginal for most of the line but the swell noise was acceptable.

3.2 Diary

0252	EOL 89FA-F0694-S
0452	End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
0501	SOL 89FA-F0382-S
0900	EOL 89FA-F0382-S
1100	End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
1131	SOL 89FA-F0442-S
1511	EOL 89FA-F0442-S
1711	End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
1743	SOL 89FA-F0106-S
2126	EOL 89FA-F0106-S
2326	End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
2400	On extended line change.

3.3 Status at 0730 GMT

Weather standby. Heading north for nav. cal

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NAV QC REPORT GECO SIGMA FRIDAY 1ST SEPTEMBER 1989 JDAY 244

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LINE 89FA0382S DIRN 270 SEQ 53 SP 100-1630
Nor* software bug resulted in Syledis data not being logged from SP 120-190. Same bug meant that the cocktail fit could not be used for the whole line.
Borkum unstable residual fluctuating between 5 and 10m resulting in fix SDs of 8 to 13m.
Mean Sd Nor* F1 Hyperfix fit 11.9m with residuals of 4.4, 6.0 and -9.3 for Terschelling, H7 and Borkum.

LINE 89FA0442S DIRN 090 SEQ 54 SP 100-1630
Cocktail used as primary with Hyperfix stations H7,Borkum and all three Syledis ranges. SP 130-160 Rho and Sigma lost lock on Pulse 8 master station. From SP 525-570 H7 was suspended from the fit leaving Borkum as the only Hyperfix station in the fix. From SP 670 to EOL all Hyperfix and Syledis stations in use (K7 logged only.
Gridnav had all Hyperfix stations in the fit for the whole line and showed a period of instability in Borkum 400-500m.

LINE 89FA0106S DIRN 270 SEQ 55 SP 100-1630 INFILL
SP 1250 to 1610 two boat communications lost no Omniseis data passed between vessels. First 100 SPs SD fluctuating by 6m due to instability in Borkum. At approx SP 620 SD jumped to 10m and stayed at 9 to 10m for the rest of the line. Jump appeared to

be caused by ranges from Borkum.
Acoustics not used actively due to vessel separation varying between 150 and 300m.

HYPERFIX : 18:27 informed by NESA that antenna loading unit (ATU) and antenna changed on K7. Decision made by Geco to stop logging K8 and log K7 instead. This means that K7 and K8 will have to be post calibrated. (Sequences 51 to 54 inclusive have K8 logged). Considering the previous experience of unstable signals, regular lane slips and constant offset values this decision was puzzling to say the least.

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-243.TXT/NMM/F03
DATE: Friday 1st September 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

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SUBJ: Progress to Thursday 31st August 1989 @ 24.00 GMT JD 243

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1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0682	090	720	1630	911	17.08125	Complete
0370	270	100	1630	1531	28.70625	Complete
0454	090	100	1630	1531	28.70625	Complete
0118	270	100	1630	1531	28.70625	Complete
0694	090	100	437	338	6.33750	Midnight sp 437

Summary

Daily Sail Line (Sigma)	109.5375	Kms
Daily Sail Line (Rho)	109.5375	Kms
Accumulated Sail Line	1203.4875	Kms
Daily Production (Sigma)	657.225	Kms
Daily Production (Rho)	657.225	Kms
Combined Daily Production	1314.450	Kms
Accumulative Total (Sigma)	7220.925	Kms
Accumulative Total (Rho)	7220.925	Kms
Accumulative Combined Vessel Total	14441.850	Kms

Daily Infill (Sigma)	0.0	
Daily Infill (Rho)	0.0	
Accumulated Infill (both)	83.944	Kms

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2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
25/8	00:00	00:00	05:04	18:56	00:00
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	04:00	00:57	12:33	00:00
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00

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3.0C STATUS

3.1 Seismic

Navigation was much more stable today, probably because of better weather conditions. Mark Lanham is not happy with the quality but seismic data was very good.

The first lines of the day had no problems. Line 118 had

22 records with old or lost header data but only a few records of data were actually lost.

Gun P2/1 was drifting and caused 22 misfires on line 694. P2/4 (125 cu.in) was already switched out and so P2/1 was kept in.

The Racal engineer was taken from Rho to Sigma to check out the Hyperfix system. The MOB boat was away for 48 mins making this transfer and had to spend too long running alongside Rho because the engineer was not prepared. The operation was safe but should be done as quickly as possible and this has been discussed with the party chief.

3.2 Diary

0710 EOL 89FA-F0682-S
0410 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
0438 SOL 89FA-F0370-S
0745 MOB boat away to Rho to collect the Racal engineer. The boat had to run alongside Rho for too long because the engineer was not ready for the transfer.
0823 MOB boat back on board.
0817 EOL 89FA-F0370-S
1017 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
1049 SOL 89FA-F0454-S
1428 EOL 89FA-F0454-S
1530 MOB boat away to Rho to transfer Racal man.
1540 MOB boat back on board.
1628 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
1700 SOL 89FA-F0118-S
2038 EOL 89FA-F0118-S
2238 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
2311 SOL 89FA-F0694-S
2400 Midnight sp 437

3.3 Status at 0530 GMT

On line heading west.

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NAV QC REPORT GECO SIGMA THURSDAY 31ST AUGUST 1989 JDAY 243

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LINE 89FA0370S DIRN 270 SEQ 49 SP 100-1630
From SP 800-1200 the SD and residuals for Gridnav fit with F1 patterns Terschelling, H7, and Borkumwere logged every 10 SP on Sigma and Rho.

Rho SD 1.5 - 4.4m Terschelling -0.5 to -1.3, H7 -0.7 to -1.7
Borkum +0.5 to +3.3

Sigma SD 6.7 - 10.6m Terschelling -2.1 to -3.8, H7 -2.8 to -5.3
Borkum +4.2 to +8.1

Mean SD for F1 fit was 8.1m with only 1% offixes having SD less than 5m.

GridNav fit with Hyperfix F1 and F2 (H7 F2, K7 F1 and F2 suspended) hadSD of 4-5m. Cocktail had mean SD 3.2 with 10% SDs > 5m.

LINE 89FA0454S DIRN 090 SEQ 50 SP 100-1630
Cocktail in use. SP 1475-EOL H7 suspended from fix. Mean NOR* Hyperfix SD 6.1m. At SP 80 SD was 12.7m, SOL 11.2, SP 120 9.4m SP 140 7.2m , SP 160 6.4m, SP 180 8.0m SP 2008.7m. Between SP 230 and SP 240 SD (approx 11:09 GMT) reduced from 8-9m to 5-6m. This ocurred suddenly and can be seen as a vertical line on the time plot of SD. Residuals for Terschelling, H7 and Borkum went from
3.2, 4.3 and -6.8 to 2.0, 2.6 and -4.2 respectively.

LINE 89FA0118S DIRN 270 SEQ 51 SP 100-1630
Cocktailin use with Gorm and H7 suspended.Nor* F1 mean SD 7.5m. Additional correction for H7 not applied in Nor*.

LINE 89FA0694S DIRN 090 SEQ 52 SP 100-1630
Cocktail in use with K8 suspended as not calibrated, mean SD 3.7m.
Nor * Hyperfix F1 fix mean SD 7.0m (additional correction not applied to H7 C-o).
GridNav Hyperfix F1 fit with extra correction added to H7 had mean Sd 7.4m with only 13% of SDs less than 5m. At the start of the line GridNav fithad F1s and F2s and SDwas 4.5 to 5.5m, from SP 500 to 530 only F2s were used in the fix and the SD was 0 to 2m, from SP 530 to EOL F1s only were used in the fix and the SD increased from 6.5m to 10m at the EOL. (GridNav had additional correction added to H7 F1 and F2)

SP 188-206 no Pulse 8 data output.

Rho starboard tailbuoy set as relaxed point from SP 818 as very unstable. Sigma tailbuoys only had 77 and 74% solutions.

HYPERFIX : K7still unusable offset 35m and veryweak signal. Has been like this since 0520 on 29/8. From Seq 51 K8 was logged on Nor* and GrtidNav in place of K7.
12:15 Telecon from XTP2 . NESA has shifted phase of station H7 and an additionalvalue has to be added tothe C-0 to correct for this change. NESA personnel onboardhad received a C-0 value for H7 on 30/8 but had not been advised (or did not understand) as to why the value had been sent and how it was to be applied.

16:30 Fax received from NESAgiving additional value to be added to H7 F1 and F2 C-o. Fax suggested that a). value sholud be tested offline to check validity b). That a shift in the range had been noticed on the monitor but no explaination as to why there was a shift in the range or when it occurred.

Valuewas added to F1 and F2 H7 C-oand tried in GridNav and Nor* on both vessels. On both vessels the F1 fix SD increased by 2-

3m, however the correction improved the 27m offset in H7 F2 and the F2 fit then had an Sd of 1-2m.

On Sigma Hyperfix F1 SD, withcorrection added to H7 F1 C-o, had SDs of 6-10m increasing towards the EOL, residuals were -2.8, -5 and +7m for Terschelling, H7 and Borkum respectively.

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-242.TXT/NMM/F03
DATE: Thursday 31st August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Wednesday 30th August 1989 @ 24.00 GMT JD 242

1. PRODUCTION

All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0670	090	1025	1630	606	11.36250	Complete
0358	270	100	1630	1531	28.70625	Complete
0466	090	100	1630	1531	28.70625	Complete
0130	270	100	1630	1531	28.70625	Complete
0682	090	100	719	620	11.62500	Midnight sp 719

Summary

Daily Sail Line	(Sigma)	109.10625	Kms
Daily Sail Line	(Rho)	109.10625	Kms
Accumulated Sail Line		1093.95000	Kms
Daily Production	(Sigma)	654.63750	Kms
Daily Production	(Rho)	654.63750	Kms
Combined Daily Production		1309.27500	Kms
Accumulative Total	(Sigma)	6563.700	Kms
Accumulative Total	(Rho)	6563.700	Kms
Accumulative Combined Vessel Total		13127.400	Kms

Daily Infill (Sigma)	0.0	
Daily Infill (Rho)	0.0	
Accumulated Infill (both)	83.944	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
24/8	00:00	00:00	01:00	23:00	00:00
25/8	00:00	00:00	05:04	18:56	00:00
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	04:00	00:57	12:33	00:00
30/8	13:47	08:00	02:13	00:00	00:00

3.0C STATUS

3.1 Seismic

Line 0358 had poor navigation that was very bad between sps 620-706. The shot interval was erratic but the cross course was basically unaffected. At the SOL the port gun array

collapsed so that the outer string was next to the centre string. A reshoot will be needed from sp 100-570

Line 0466 was shot without K7 or H7 in the Hyperfix. Very poor geometry and noisy Syledis between sp 690 and 717 resulted in erratic sp interval and a bottom speed of 80 knots. 5 shots were completely missed and the numbering was confused. Positioning is probably salvageable and will not require reshooting. A reshoot will be necessary where the GDR failed.

Line 130 was a good seismic line. The nav was quiet and caused no prblems with sp interval,gun sequence etc. The EOL stats from Norstar showed that the Hyperfix F1 mean SD was 8.1 and only 80 shots were in spec. The Rho stats were ok. Mark Lanham is investigating.

Line 0682 was also a good seismic line.

The CDP plot comparison has shown that the original plot which used the incorrect compass corrections was ok.

3.2 Diary

0129 EOL 89FA-F0670-S
0329 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
0353 SOL 89FA-F0358-S
0729 EOL 89FA-F0358-S
0929 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
1006 SOL 89FA-F0466-S
1105 MOB boat away to Rho to collect waterbreak section.
1120 MOB boat back on board.
1344 EOL 89FA-F0466-S Poor navigation.
1544 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
1621 SOL 89FA-F0130-S
1956 EOL 89FA-F0130-S This was a good seismic line but the Norstar stats for Hyperfix F1 showed only 80 shots were in spec.
2156 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.
2231 SOL 89FA-F0682-S
2400 Midnight sp 719

3.3 Status at 0500 GMT

On line heading west.

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NAV QC REPORT GECO SIGMA WEDNESDAY 30TH AUGUST 1989 JDAY 242

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LINE 89FA0358S DIRN 270 SEQ 45 SP 100-1630
Cocktail in use with H7 and Gorm suspended. From SP 600 K7 noisy and shifted 35m however K7 was not taken out of the Nor* fix until SP 700. SP 600-700 Nor* was showing a position difference of 19m in Eastings compared to GridNav cocktail without H7 and K7.

Starboard tailbuoy positioning worse than port 22% SD>15m compared to 0% port tailbuoy however crossline misclosure from cabletracker (bad nav rejected)

LINE 89FA0466S DIRN 090 SEQ 46 SP 100-1630
Cocktail used as primary with H7 and K7 suspended due to consistently high residuals of -13,21,49 and -33 H7 F1,F2 and K7 F1,F2 respectively.
Gorm B was suspended from the fit SP 413,640,707,1024 due to low signal strength.
SP 707-711 position jump by Nor* due to input Of Gorm B into fit with 10km error in range.

LINE 89FA0130S DIRN 270 SEQ 47 SP 100-1630
Geco using cocktail as primary with K7 suspended. Syledis signals were weak and unstable at times. Dan C and B11/2 were included in the fix for SPs 192-365 and 1001-1570.

Based on GECO statistics the LINE is OUT OF SPECIFICATION and should be rejected:-

Nor* F1 Hyperfix fit with K7 suspended had a mean SD of 8.1m and only 80 fixes had an SD of less than 5m. Nor* cocktail had a mean SD of 5.4m .

However Grid statistics for Hyperfix F1+F2 fit with K7 F1,F2 and H7 F2 suspended had mean SD of 3.1m with 8% of fixes having SD>5m (1% SD>5m). (A Grid fix with only F1s agrees with Nor*)

Range S4R2-S3H1 should not be used in processing as mean is 20m larger than nominal and 13m larger than similar cross streamer range S4R1-S3H2.

LINE 89FA0632S DIRN 270 SEQ 48 SP 100-1630
Geco using cocktail with K7 suspended and all syledis staions in use, mean SD 3.04m. Hyperfix was very stable and only 1 SP was lost and no header errors occurred.

However while GridNav F1+F2 fit with K7 F1+F2 and H7 F2 suspended had a mean SD of 2.9m and 0% of SDs >5m the Nor* F1 Hyperfix fit had a mean of 5.0m.

SP 530 Starboard tailbuoy was changed from a relaxed point to a fixed navigation point.

HYPERFIX : At 0520 GMT range K7 developed a 35m residual and remained like this for the rest of the day. K7 platform was contacted and Sigma was informed that a construction crane was working in front of the crane and would stay in this position until Friday evening. The crane would then be out of use for 14 days. Before 0520 a four way fix had high residuals for H7 F1 and F2 10-12m and 25-27m respectively and H7 was not used in the fix.
While the Rho also has a 25-27m residual for H7 F2 some times the residual for H7 F1 is smaller and they can use it in a four way fix. From SP 1140 sequence 46 H7 was included in the fix, the residual plot shows the residual decrease by 5m several SPs before it was put into the fit.

For sequences 47 and 48 H7 was used in the fix. However this resulted in mean SDs of 8.1 and 5.0 respectively for Sigma Nor* Hyperfix fit with F1s only, indicating that H7 is still in error. (H7 F2 still had a residual of 25-27m on both vessels).

All data indicates a fault in H7 or that both vessels have the wrong C-os for this station. With only 3 stations it is difficult to positively detect which station is in error. At times Borkum has larger residuals than H7...., H7 was taken out of the fix partly dt the fact that the F2 range is also incorrect.

SEQ	Mean Residual F1				Mean Residual F2			
	Ter	H7	K7	Borkum	Ter	H7	K7	Borkum
2	-1.5	-0.2	0.3		-1.1	16.8	-5.1	
3	0.4	-0.3	-0.1		2.6	19.8	-6.0	
4	-1.9	1.3	3.0		-0.2	6.8	-1.3	
5	-0.2	0.3	0.3	-0.1	1.9	13.3	-6.6	-3.2
6	-0.7	-0.2	0.3	0.7	-1.1	8.7	-5.1	0.2
7	-0.7	-3.1	-1.1	5.8	0.4	14.5	-8.5	0.2
8	-0.8	0.5	1.2	4.6	-1.1	14.8	-4.4	0.9
9	-0.1	-1.3	-0.7	3.8	0.3	19.5	-8.4	1.1
10	-0.9	0.2	0.6	0.5	-1.2	6.9	-5.5	-0.3
11	-0.7	-3.0	-0.8	3.5	1.4	13.0	-8.3	1.1
12	-0.2	-1.1	-0.2	1.3	-2.1	4.8	4.8	-7.2

SEQ N	Mean	SD	% SD >5m	P8-HYP E	P8-HYP
2	2.8		11	24.0	-9.6
3	1.8		1	22.7	-10.2
4	2.8		0	19.3	-9.2
5	2.1		6	20.1	-9.5
6	1.0		0	7	3.6
	10		1.8	-1.8	
8	1.5		1	7.2	0.1
9	1.7		0	6.4	-0.6
10	1.0		0	5.7	-1.2
11	3.5		0	-0.1	1.1
12	1.2		0	6.2	10.2

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-241.TXT/NMM/F03
DATE: Wednesday 30th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Tuesday 29th August 1989 @ 24.00 GMT JD 241

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0658	090	1331	1630	300	5.62500	Complete
0142	270	100	1630	1531	28.70625	Complete
0670	090	100	1024	925	17.34375	Complete

Summary

Daily Sail Line	(Sigma)	51.67500	Kms
Daily Sail Line	(Rho)	51.67500	Kms
Accumulated Sail Line		984.84375	Kms
Daily Production	(Sigma)	310.0500	Kms
Daily Production	(Rho)	310.0500	Kms
Combined Daily Production		620.1000	Kms
Accumulative Total	(Sigma)	5909.0625	Kms
Accumulative Total	(Rho)	5909.0625	Kms
Accumulative Combined Vessel Total		11818.1250	Kms

Daily Infill (Sigma)	0.0	
Daily Infill (Rho)	15.2630	
Accumulated Infill (both)	83.9440	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
23/8	00:00	00:00	00:00	24:00	00:00
24/8	00:00	00:00	01:00	23:00	00:00
25/8	00:00	00:00	05:04	18:56	00:00
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	04:00	00:57	12:33	00:00

3.0C STATUS

3.1 Seismic

On occasion we still get missed shotpoints due to Nav.Instability.Sometimes they are acually missing but most times they are recorded OK.but have the last SP number recorded again.Also sometimes the GDR printout says that the external header data is missing when most times it is actually recorded OK.This is all caused by

shot closures occuring marginally faster than the minimum cycle time on occasion.Header data has been dumped to check the above.

When the Sigma was experiencing all the problems with the Hyperfix yesterday the RHO was instructed to do Infill and relevant details werepassed from myself tothe RHO personnel as regards exactly what Infill to do(i.e.what columns to shoot in what cable groups and when to shoot them).At the time Rho was doing cable work on their port streamer fixing the source of some front end noise and I was told that they would not make the next tide slot.

They fixed this quicker than expected and shot an Infillwhich was not part of the plan,without consulting me. The line that they infilled may be necessary but they were not in a position to start early enough to get all required coverage plus it was at the edge of a 12 line swathe where the adjacent line had not been shot so that full coverage details were not yet available.With this in mind this line (346/R)is on hold and forthe purposes of accounting we will pretend itwas not shot.If it is decided that infill here is needed then probably the whole thing will be done again as if the current portion is accepted and an extra piece done at a later date then 2 line changes are chargable where 1 would be chargable if it were all done again.

This all arose due to unexpectedly finishing the cable work early and so made a nonsense of the comprehensive shooting details I had passed to them for later in the day

It has been stressed again that all Infill has to be approved by me.

By all accounts Geco have started the process whereby H7 Hyperfix station will be investigated.
Apparently the crane on K7 which causes problems with the station when it moves will be stationary from Friday for 2 weeks.

The CDP coveragefrom the Rho has been obtained and is being compared with that on the Sigma to establish if any major errors exist due to the wrong compass correction being used on the Sigma for the Rho cables for line headings of 90 degrees.
First impressions are that small differences do exist but these could be due to the differences in technique used by the different personnel who reprocess the lines.To try to establish exactly what is correct certain portions of lines are being reprocessed again on the Sigma with the correct compass corrections applied to see if they come out the same as on the first attempt.

3.2 Diary

0043 EOL 89FA-F0658-S
0100 Hyperfix receiver changed.
0200 NeSA engineer was trying to set up the receiver.
0243 End of allocated 2hr line change time.The remainder of the time until the next SOL time was charged as standby.
0309 Next projected SOL time. The Hyperfix was not operational

and so contractor downtime started.

0355 Hyperfix back in use. Waiting for Racal engineer from Rho before going to re-calibrate the Hyperfix.

0400 Started to recover the guns.

0455 Guns on board.

0510 Started to recover the starboard cable to look for leakage.

0635 Racal engineer from Rho onboard.

0700 Original Hyperfix receiver back in use. The fault was corruption in the phase-lock loop firmware. Nothing was replaced but the system had to be cleared.

0750 MOB boat out to add weight to the stbd cable and remove debris from tailbuoy.

0838 MOB boat back on board.

0925 Next tide slot.Contractor time continued.

0930 Call from Sigmato Geco Orpington to request investigation of deteriorating performanceof H7 and K7Hyperfix beacons. Apparently Orpington were going to contact Racal with a view to getting something done but it still remained unclear as to what course of action was to be taken.

1025 Starboard cableout in wide.Leakage wasfound in waterbreak section but nospare was available,so cablewas redeployed. Spare was available on Rho andwas to be collected at next opportunity.During all the time available before the next SOL none of the faults requested to be fixed were fixed. (streamer leakage,repair of acoustic Hyrophone S2H2 on port streamer).

1050 Guns deployed.Unable to make any line in the time available.Contractor time continued.

1542 SOL 89FA-F0142-S

1917 EOL 89FA-F0142-S

2117 End of allocated 2hr line change.The remainder of the time until the next SOL was charged as standby time.

2148 SOL 89FA-F0670-S

2400 Midnight sp 1024

3.3 Status at 0430 GMT

On line heading west.

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-240.TXT/NMM/F03
DATE: Tuesday 29th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

==========

SUBJ: Progress to Monday 28th August 1989 @ 24.00 GMT JD 240

==========

1. PRODUCTION All Lines prefixed 89FA-F

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Line	Hdg	FSP	LSP	SP	Kms	STATUS
0478	090	100	1630	1531	28.70625	Complete
0658	090	100	1330	1231	23.08125	Midnight sp 1330 LGSP 1320

Summary

Daily Sail Line (Sigma)	51.78750	Kms
Daily Sail Line (Rho)	51.78750	Kms
Accumulated Sail Line	933.16875	Kms
Daily Production (Sigma)	310.7250	Kms
Daily Production (Rho)	310.7250	Kms
Combined Daily Production	621.4500	Kms
Accumulative Total (Sigma)	5599.0125	Kms
Accumulative Total (Rho)	5599.0125	Kms
Accumulative Combined Vessel Total	11198.0250	Kms

Daily Infill (Sigma)	0.0	
Daily Infill (Rho)	0.0	
Accumulated Infill (both)	68.68100	Kms

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2.TIME ANALYSIS

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DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
22/8	10:04	07:08	03:26	03:22	00:00
23/8	00:00	00:00	00:00	24:00	00:00
24/8	00:00	00:00	01:00	23:00	00:00
25/8	00:00	00:00	05:04	18:56	00:00
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00

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3.QC STATUS

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3.1 Seismic

It has been discovered that all the CDP coverage produced on the Sigma for this block has used the compass corrections for 270 degrees on the Rho cables in both directions instead of different corrections in each direction.It is thought that the effect of this will be minimal provided all lines have had a reasonable acoustic network which they have.At the first available opportunity the coverage plot from the Rho (which is

correct)will be obtained and compared to see if any major differences exist.

Traces 18,118,119,148 and 210 are picking up the Navtech trigger due to streamer leakage at approx 5.4 seconds on monitor records. As this is at the end of the record it is being tolerated at present but should the situation deteriorate then cable work will have to be done.

Line 0478 was affected by swell noise and cable instability but the MicroMAX passed it as good.

The Hyperfix receiver on Sigma failed during line 0658. The last good shotpoint was 1320. The line was charged as a complete prime line so the reshoot will be Geco downtime.

3.2 Diary

0745 The run in to line 358 was aborted due to complete lack of streamer control on both vessels.
0400 Waiting for an improvement in the weather. Wind N6-8.Swell 2-3m.No real improvement forecast.
0842 SOL 89FA-F0478-S
1219 EOL 89FA-F0478-S.This line was subject to swell noise and fluctuation of streamer depths and was initially considered to be marginal but was successfully processed by the Micromax.
1419 End of allocated 2hr line change time.The remainder of the time until the next SOL time was charged as standby.
1458 The run in to line 0142 was aborted due to excess swell noise and loss of cable control.
1502 Next projected SOL time.
2105 SOL 89FA-F0658-S
2358 Hyperfix receiver lost lock on all stations.
2400 Line scratched from sp 1320. Full prime line and line change were charged and the reshoot was charged as Geco downtime.

3.3 Status at 0500 GMT

Hyperfix receiver replaced. En route to calibration area.

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NAV QC REPORT GECO SIGMA MONDAY 28TH AUGUST 1989 JDAY 240

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02:24 Line 89FA0358S scratched after cables came to surface due to weather.

LINE 89FA0478S DIRN 270 SEQ 39 SP 100-1630
Geco using cocktail with H7 and Gorm suspended. However 3 way Hyperfix fit without H7 was stable throughout line with mean 2.96m and SD 0.54m. Less than 1% of fixes had SD >4m.
SP 363-SP440 Stn 1-4 P8 dropped out of all fits also on Rho.
Omniseis acoustic stats reset at SP 440.

Vessel inline separation out of spec - +50 to +66m SP 826-860.

Side seas resulted in compasses 1,8,13 stbd having DSDs 1.1 and 1.0 degrees. Port compasses much worse affected with DSDs 2.2, 1.6
1.3, 1.2, and 1.3 degrees for first 5 compasses and DSDs of 1.1 1.1,1.2 and 1.6 degrees for last 4 compasses (Grid). However SD of streamer separation from Omniseis is 6.0m indicating that the median filter effectively removed the spikes from the compasses Filter length was increased from 5 to 7 during line.

LINE 89FA0658S DIRN 090 SEQ 40 SP 100-1320
Geco using cocktail with all stations except H7 in use. Good agreement Nor* and Hyperfix (all stns except H7).
SP 883-976 K7 out of fit due to lane slip.
SP 1117 Gorm taken out of cocktail dt noise (73Km).
SP 1144 Dan C gated out of fix.
SP 1165 K7 taken out of cocktail this resulted in a 19mE and 6mN shift compared to the Hyperfix.
SP 1200 B11/2 noisy Nor* to Hyperfix (F1 and F2s) 15mE and5mN.
SP 1215 cocktail SD back to 2-3m and agrees with Hyperfix to 1-2m.
SP 1250 K7 put back in the Grid Hyperfix fit and this resulted in a 8mE and 6mN difference with the Nor* position. Therefore SP 1260 K7 back in Nor* cocktail.
SP 1320 Hyperfix diverging from syledis. SP 1330 Hyperfix position has good SD but is 300mE and 300mN of Pulse 8 and Syledis positions. LGSP 1320.

Compass 1 and 13 Port noisy DSDs 1.4 and 1.1 degrees.
Magnetic anomaly affected compasses 1-5 approx SP300 by max 7 degrees compass 1.

S2H2 bad :- S1R1-S2H2, B2R1-S2H2,S1R2-S2H2, S4R2-S2H2 disabled S1R2-S1H1 and S1R2-S4H1 also disabled.
Solution stats corrupted by large vessel separation after SP 1320.

ACOUSTICS : S2H2 still bad. Rho Port tailbuoy still dead.

Edits List Geco Sigma/Rho Block F3

SEQ	LINE		EDITS
1	0238	SIGMA RHO	Complete line scratched
2	0574	SIGMA RHO	Complete line scratched
3	0250	SIGMA RHO	No major edits
4	0562	SIGMA RHO	Port cable sp 670-770 Bad Nav sp 973-1119(8 cols bad)
5	0238	SIGMA RHO	Gun Seq 1024-1026,1230-1235

6	0574	SIGMA RHO	None sp 500-548 (GDR, not recording)
7	0262	BOTH SIGMA	1329-1377 (Sigma sp numbers) due to GunSeq errors. 1045-1064 Port Guns Out
8.	0550	BOTH	1614-1619 Gun seq errors
9	0226	SIGMA RHO	Gun Seq 148-153 ditto
10	0586	SIGMA RHO	GunSeq SP 1130-1132 inc. ditto
11	0274	SIGMA RHO	Gunseq errors SP 1572-1580 ditto
12	0574*S	SIGMA	None
13	0214	SIGMA RHO	SP 100-553 Ditto
14	0598	SIGMA RHO	Gunseq 152-157 Ditto
15	0286	SIGMA RHO	Gun Seq 703-709 713-720 760-762 771-775 18 NDRs due to Nav giving erratic sp Ditto
16	0538	SIGMA RHO	NDRs 444 466 782 1178 1185 1188 1201 1222 1273 1275 1291 Gun Seq 1188-1190 1234-1237 12571258 1265-1267 1291-1296 (Sigma sp nos.) Ditto
17	0202	SIGMA RHO	NDR 682 683 684 1539 Port guns out of spec SP 100-376
18	0610	SIGMA RHO	Gunseq 692-693 934-942 945-947 952-953 1187-188 1199-1202
19	0298	SIGMA RHO	None None
20	0526	SIGMA RHO	Gun Seq 221-223 745-748 1433-1439 1500-1504 1591-1598 Ditto
21	0190	SIGMA RHO	NDR 100-109, 1178 Gun Seq 1573-1579 100-109 and 1573-1579 Gunseq.
22	0622	SIGMA RHO	None Gun Seq 1552-1555 None
23	0310	SIGMA RHO	None Seq error 672

24	0514	SIGMA	533-536 Gun Seq (Sigma sp nos.)
		RHO	476-483 Gun Seq (Rho sp nos)
25	0178	SIGMA	LGSP 1500 due Nav signals.
		RHO	Ditto
26	0634	SIGMA	NDR 907 1477
		RHO	None
27	0322	SIGMA	ALL DATA SOL-130 Autofires
			131-432 Port Array off.
			Gun Seq 1008,1009,1043-1047
		RHO	1500-1590 Starboard cable shallow
28	0562	RHO	No edits.
29	0562	RHO	No edits
30	0202	RHO	No edits.
31	0634	RHO	No edits.
32	0334	SIGMA	NO EDITS NDR 491,492
		RHO	NO EDITS
33	0502	SIGMA	Gun Seq 774-776
		RHO	None.
34	0166	SIGMA	NO EDITS Gun Seq errors 1413-1415
			NDR 1411 1412
		RHO	Both cables sp 100-109
35	0646	SIGMA	NO EDITS NDR 182 724 729
		RHO	NO EDITS
36	0346	SIGMA	GUNSEQ 543-547
		RHO	NONE
37	0490	BOTH	Both Stbd arrays sp 1181-1239
		SIGMA	NDR 1444-1447
		RHO	NO EDITS
38	0154	SIGMA	Stbd Streamer SP 930-1165 inc.
			GUNSEQ 607-610,654-660
		RHO	NONE
39	0478	SIGMA	NDR 1217
		RHO	NONE
40	0658	BOTH	sp 1321-1630
			GUN SEQ 1174-1184
		SIGMA	NONE
		RHO	NONE

SEQ	LINE	SP RANGE TO RESHOOT	REASON	ACTION TAKEN	CHARGE
1	238	ALL	NAVSIG	DONE SEQ 5	NAM
2	574	ALL	NAVSIG	DONE SEQ 6	NAM
4	562	670-770(1 boat)	Sigma Port Cable	DONE SEQ 12	NAM
		973-1119(2 boat)	Rho Nav	Cols 137-140	GECO
				DONE SEQ 12	
				Cols 135-138	GECO
				DONE SEQ 28	
				Cols 141-144	NAM
				DONE SEQ 29	
		973-1119(Cols 137-140)		DONE SEQ 28	GECO
6	574	500-548 (1 boat)	RHO INST	DONE SEQ 12	GECO
7	262	1045-1064(1boat)	SIG PTGUNS		GECO
		1319-1387(2boat)	GUNSEQ(NAV)		NAM
13	214	100-553 (2 boat)	ALL DATA (SWELL)		NAM
17	202	100-376 (1 boat)	RHO PORT GUNS	DONE SEQ 30	GECO
25	178	1501-1630(2 boat)	NAVSIGS		NAM
27	322	100-130 (2boat)	ALL GUNS		GECO
		131-432 (1boat)	PORT GUNS (SIGMA)		GECO
		1500-1590 (1boat)	STBDCABLE (RHO)		GECO
37	490	1181-1239 (2boat)	BOTH STBD GUN ARRAYS		GECO
38	154	930-1165 (1boat)	SIG STBD CABLE		GECO
40	658	1321-1630(2boat)	NAV		GECO

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-239.TXT/NMM/F03
DATE: Monday 28th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Sunday 27th August 1989 @ 24.00 GMT JD 239

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0346	270	100	1630	1531	28.70625	Complete
0490	090	100	1630	1531	28.70625	Complete
0154	270	100	1630	1531	28.70625	Complete

Summary

Daily Sail Line (Sigma)	86.11875	Kms
Daily Sail Line (Rho)	86.11875	Kms
Accumulated Sail Line	881.38125	Kms
Daily Production (Sigma)	516.7125	Kms
Daily Production (Rho)	516.7125	Kms
Combined Daily Production	1033.4250	Kms
Accumulative Total (Sigma)	5288.2875	Kms
Accumulative Total (Rho)	5288.2875	Kms
Accumulative Combined Vessel Total	10576.5750	Kms
Daily Infill (Sigma)	0.0	
Daily Infill (Rho)	0.0	
Accumulated Infill (both)	68.68100	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:26	03:22	00:00
23/8	00:00	00:00	00:00	24:00	00:00
24/8	00:00	00:00	01:00	23:00	00:00
25/8	00:00	00:00	05:04	18:56	00:00
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
TOTAL	47:59	29:23	22:20	69:18	00:00

Summary for Period Monday 21/8/89 to Sunday 27/8/89

	SIGMA	RHO
No of Prime lines	14	14
No of Infill lines	0	3
No of Reshoot lines	0	2
Prime KM	401.8875	401.8875
Infill Km	0.00	68.68125

3.0C STATUS

3.1 Seismic

Even now with increased stability over the steering and shape of the streamers and acoustic networks and matching feathering we are seeing a slight short fall in the near trace coverage at the edges of the 12 CDP line swaths.This can be due to 3 factors:

1.Poor steering by Geco personnel during periods of good navigation.

2.Steering difficulties during periods of unstable navigation when the Bridge Officers can do nothing but hold a steady course until the navigation settles down when it is revealed that one or both vessels have drifted from the ideal track..

3.The actual vessel separation and off line distances being good but navigation instability positioning the CDPs incorrectly so that the coverage looks deficient when in actual fact it is good but with no method of proving it so.

It is felt,and limited investigations and on-line observations have revealed,that points 2 and 3 are much more prevalent than point 1.These factors have been present since the start of the survey and account for much of the near trace coverage missed so far (the other missing coverage being due to feather mismatch).

The alternatives are to reject lines or part lines on the basis of poor navigation performance which would considerably extend the survey duration or accept these lines and Infill the gaps so that at least we are confident that everything is covered or even over covered.The latter is the most cost efficient.

Heavy seas prevented more production late in the day.

3.2 Diary

0042 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.

0116 SOL 89FA-F0346-S

0451 EOL 89FA-F0346-S

0651 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.

0746 SOL 89FA-F0490-S

1115 EOL 89FA-F0490-S

1130 Since the revised shooting plan came into action the data quality was much better but group 1 coverage was still missing on occasion indicating slack steering by both vessels.This should not have happened and all parties were reminded of the necessity of keeping a tight grip on the steering performance.The relevant Infill, if necessary, will be charged to Geco for any such instances since the new shooting plan was adopted. (However, it should always be remembered that poor

navigation signals can adversely affect the steering through no fault of Geco.)

1315 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.

1414 SOL 89FA-F0154-S

1742 EOL 89FA-F0154-S

1942 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.

2018 Next projected SOL time. Swell noise was excessive and the line was aborted on the run-in. Weather standby.

2400 Standby for weather.

3.3 Status at 0330 GMT

Standby for weather. Noise marginal but cable control bad.

==========

NAV QC REPORT GECO SIGMA SUNDAY 27TH AUGUST 1989 JDAY 239

==========

LINE 89FA0346S DIRN 270 SEQ 36 SP 100-1630

Cocktail in use for whole line. K7 out of cocktail SOL - SP 350 SP 420-EOL H7 out of cocktail. SP 1247-1317 Terschelling lost lock F1 and F2. SP 850-869 lane slip K7. K7 also noisy SP 1200-1250 and was gated out several times by Nor*.
Compass 13 starboard was noisy due to Filter being set to 0.

LINE 89FA0490S DIRN 090 SEQ 37 SP 100-1630

Hyperfix used as primary with H7 suspended. Fix was very stable with only 1% of SDs > 5m.
SP 680-710 Vessel P8 ranges gated out by Nor* resulting in no tailbuoy positions. Omniseis statistics reset therefore SP 750.

LINE 89FA0154S DIRN 270 SEQ 38 SP 100-1630

Hyperfix used as primary SOL - SP 370 with H7 suspended. From SP 370 using cocktail with H7 and K7 suspended. SP 550 K7 and H7 put into cocktail and Borkum taken out. SP 970 - EOL F1 and F2 Terschelling unstable. SP 1580 -EOL DAN C unstable due to low signal strength.
Compasses 1,13 and 26 out of spec DSDs 1.1 degrees.
12% of cocktail SDs > 5m SD. (5% over 6m SD).

New TS dip value 1511.54 m/s.

ACOUSTICS : Rho Port tailbuoy dead.
S2H2 could not be tuned for several frequencies.
Ranges that look good should be treated with care.
F2R1-S2H4 bad in tailnet.

HYPERFIX : All stations now weighted equally EA 7.

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-238.TXT/NMM/F03
DATE: Sunday 27th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Saturday 26th August 1989 @ 24.00 GMT JD 238

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
0334	270	100	1630	1531	28.70625	Complete
0502	090	100	1630	1531	28.70625	Complete
0166	270	100	1630	1531	28.70625	Complete
0646	090	100	1630	1531	28.70625	Complete

Summary

Daily Sail Line (Sigma)		114.825	Kms
Daily Sail Line (Rho)	.....	114.825	Kms
Accumulated Sail Line	.....	795.2625	Kms
Daily Production (Sigma)	.....	688.950	Kms
Daily Production (Rho)	.....	688.950	Kms
Combined Daily Production	.....	1377.900	Kms
Accumulative Total (Sigma)	.....	4771.5750	Kms
Accumulative Total (Rho)	.....	4771.5750	Kms
Accumulative Combined Vessel Total	.....	9543.1500	Kms
Daily Infill (Sigma)		0.0	
Daily Infill (Rho)		0.0	
Accumulated Infill (both)		68.68100	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
20/8	13:24	07:37	02:59	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:26	03:22	00:00
23/8	00:00	00:00	00:00	24:00	00:00
24/8	00:00	00:00	01:00	23:00	00:00
25/8	00:00	00:00	05:04	18:56	00:00
26/8	14:02	07:18	02:40	00:00	00:00

3.QC STATUS

3.1 Seismic

Data is much tidier now we are shooting intothe current. Feathering,cablecontrol and steering aremuch more stable. The water speed log does not always appear to be working correctly. It very often seems to read approx 4.3 knots when shooting into the current and making 4.5 knots over the ground.
The stbd tailbuoy was repaired using the MOB boat. The

float was liftedaboard the "Frans Naerebout"and repaired. Sea state was 1m and the operation was safe.
Stbd 2/5 gun (125 cu.in) misfired 6 consecutive times at SOL 0646. This is 400m on one CDP line which is out of spec and should be reshot, however it was at the SOL and a relatively small gun so it has been accepted.

3.2 Daily Diary

0000 SOL 89FA-F0334-S
At the start of this line the streamer feathering was still affected by the turn on to line and the coverage may be affected.
Any Infill will be at Geco expense.
0341 EOL 89FA-F0334-S Data much improved by shooting against the current.
0531 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
Offset and polarity shots completed.
0632 SOL 89FA-F0502-S
0957 EOL 89FA-F0502-S
Both MOB boats left to repair tailbuoys.
1154 MOB boat back on board. NeSA engineer remained on "Frans Naerebout" to repair tailbuoy.
1300 MOB boat back out.
1307 SOL 89FA-F0166-S
1354 Starboard tailbuoy back in use. Engineers were still working on the Rho tailbuoy and the MOB boat remained at sea.
1638 MOB boat back on board.
1642 EOL 89FA-F0166-S
1842 End of the allocated 2hr line change time. The remainder of the time until the next SOL time was charged as standby.
1911 SOL 89FA-F0646-S
2242 EOL 89FA-F0646-S
2400 On a normal line change.

3.3 Status at 0330 GMT

In production , heading west.

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NAV QC REPORT GECO SIGMA SATURDAY 26TH AUGUST 1989 JDAY 238

==========

LINE 89FA0334S DIRN 270 SEQ 32 SP 100-1630
H7 not in use whole line as fit SD with all 4 stations 6-7m however Rho using all 4 ranges and only SD 2-3m.
6.5% of SDs >5m.

LINE 89FA0502S DIRN 090 SEQ 33 SP 100-1630
SOL - SP 777 three way Hyperfix fit excluding H7. SP 777 lost shot dueto lane slip and instability in K7. GECO using cockatil fit (Terschelling F1, Borkum F1, Terschelling F2, Dan C, Gorm B11/2) however signal from Gorm very weak and unstable (range 77km) SD 3-5m. SP 1546 K7 more stable and included in cocktail however immediately suffered lane slips.

LINE 89FA0166S DIRN 270 SEQ 34 SP 100-1630
SOL-SP640 using 3 way Hyperfix excluding H7. SP 640 - EOL using cocktail dt instability in Terschelling. Cocktail Terschelling F1,
Borkum F1, K7, Dan C, B11/2, Terschelling F2. SP 490 starboard tailbuoy back in use. GridNav cocktail had 12% of SDs over 6m however K7 was also suspended in GridNav.

LINE 89FA0646S DIRN 090 SEQ 35 SP 100-1630
Hyperfix in use with H7 suspended SOL - SP 203. From SP 203 to SP 660 cocktail in use with K7, H7 and Gorm suspended dt instability in K7 and lane slips. SP 740-EOL cocktail in use without K7,H7 and Gorm. Cocktail had 3% of SDs >5m.

HYPERFIX : Expected accurracy set to 7 except for K7 set to 10. Rate Filter set to 8. (T1= 7 T2= 7).
Station H7has not been used in the fix as a 4 way fix with this station has SD of5-6m and H7 has residualsof 5-10m. However any instability in theremaining ranges has resulted in atwo way fix being used. When instabilityhas been experienced inK7 a coctail has been used Terschelling F1, Terschelling F2, BorkumF1, B11/2 Syledis and Dan C Syledis. Signal strength of Gorm has been two low to give a stable signal (range has SD of 3-5m). Rate Filter for Syledis set to 7.

TAILBUOYS : Pulse 8 tailbuoy was dead until 1220 when the tailbuoy was lifted onto the Frans Naerabout and the Pulse 8 antenna. Pulse 8 filter set to 10 (T1, T2 30 secs) replaced.

ACOUSTICS : S2H2 deadat first however ranges to G1R1,G2R1,B1R1 and S4R1 were tuned in by sequence 35.
S3R2-S4H1 and S3R2-S3H1 bad and disabled.
F2R1-S2H4 50% good data intail net. Rho Port tailbuoy dead for all lines shot. Windowset to 7m+-7% max age 5. Navpoint weight 4m.

COMPASSES : Compass 13 noisy for all lines shot , Grid DSDs 1.7 to 2 degrees. Investigation discovered that the filter in the compass was set to zero despite a request when laying cable to check all compasses to prevent this occurring.

OTHER :Hyperfix F2 C-0s on Norstar printout given in metres are incorrect however values in Nor* entered in lanes are correct. Likewise propogation velocityfor Pulse 8 isprinted incorrectly. GECO not using Pulse 8 C-os.

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-237.TXT/NMM/F03
DATE: Saturday 26th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

==========

SUBJ: Progress to Friday 25th August 1989 @ 24.00 GMT JD 237

==========

1. PRODUCTION All Lines prefixed 89FA-F

==========

Line	Hdg	FSP	LSP	SP	Kms	STATUS
					0.0	

Summary

Daily Sail Line	(Sigma)	0.00	Kms
Daily Sail Line	(Rho)	0.00	Kms
Accumulated Sail Line		680.43750	Kms
Daily Production	(Sigma)	0.00	Kms
Daily Production	(Rho)	0.00	Kms
Combined Daily Production		0.00	Kms
Accumulative Total	(Sigma)	4082.6250	Kms
Accumulative Total	(Rho)	4082.6250	Kms
Accumulative Combined Vessel Total		8165.2500	Kms
Daily Infill	(Sigma)	0.0	
Daily Infill	(Rho)	68.681	

==========

2.TIME ANALYSIS

==========

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:37	02:59	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:26	03:22	00:00
23/8	00:00	00:00	00:00	24:00	00:00
24/8	00:00	00:00	01:00	23:00	00:00
25/8	00:00	00:00	05:04	18:56	00:00

==========

3.QC STATUS

==========

3.1 Seismic

Sea state improved byearly morning and conditions wereshootable at 0504 (Tide slot). The Sigma was not ready all day because of cable work. (see diary).
The stbd tailbuoy has no P-8. Geodetic accept this for a few lines.

3.2 Daily Diary

0030 Changed the P-8 receiver. Still no signals received from the stbd tailbuoy.
0400 Changed stretch and water break sections.
0504 Next projected SOL time. Weather decreased to NW4 with a 2m swell. Unable to start because Sigma was not ready

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TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-236.TXT/NMM/F03
DATE: Friday 25th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

==========

SUBJ: Progress to Thursday 24th August 1989 @ 24.00 GMT JD 236

==========

1. PRODUCTION All Lines prefixed 89FA-F

==========

Line	Hdg	FSP	LSP	SP	Kms	STATUS
					0.0	

Summary

Daily Sail Line	(Sigma)	0.00	Kms
Daily Sail Line	(Rho)	0.00	Kms
Accumulated Sail Line		680.43750	Kms
Daily Production	(Sigma)	0.00	Kms
Daily Production	(Rho)	0.00	Kms
Combined Daily Production		0.00	Kms
Accumulative Total	(Sigma)	4082.6250	Kms
Accumulative Total	(Rho)	4082.6250	Kms
Accumulative Combined Vessel Total		8165.2500	Kms

==========

2.TIME ANALYSIS

==========

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
18/8	00:00	00:39	12:34	10:47	00:00
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:37	02:59	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:26	03:22	00:00
23/8	00:00	00:00	00:00	24:00	00:00
24/8	00:00	00:00	01:00	23:00	00:00

==========

3.QC STATUS

==========

3.1 Seismic

All day was spent deploying the equipment in heavy seas. Half a day was lost trying to get the Pulse-8 tailbuoy to work.

It appeared that the radio link between the tailbuoys and the vessel was not frequency selective enough.It was possible for the on board receivers to lock onto the wrong tailbuoy transmitters. Presumably this was because the bandwidths of the vessel receivers overlapped and/or the four relevant frequencies were too close together.Once locked onto a frequency the only way to unlock each receiver was to switch each transmitter off which meant retrieving the streamers as there was no remote link to the tailbuoys.

Deployment of the streamer was considerably slower because of the conditions. Time charged since 1700 on 23/08/89 was as

follows:

Nominal streaming of stbd cable	5hrs.inc measurements
Nominal streaming of port cable	5hrs.inc.measurements
Nominal streaming of guns	2hrs
Approx delay due to Pulse 8	15hrs
Approx time to rewire lead in	3hrs
	30hrs

Which gave Contractor time up to 2300 hours 24/08/89 and then Weather Standby time until the next SOL.

The starboard tailbuoy failed at about 2200. There is apparently no data at all being received.

3.2 Daily Diary

0000 Investigated Pulse 8 problems.
0327 Stbd tailbuoy on deck. Fault finding.
0605 Stbd tailbuoy was working again after changing hardware on float. Started to re-deploy stbd streamer.
0650 Pulse 8 problem returned. Stopped streaming and attempted to retune the system because the vessel stbd receiver was picking up the port tailbuoy.
1030 Tailbuoy was working again.Continued deploying stbd streamer.
Wind W5.Swell 1-2m.
1500 Leakage on the stbd cable was traced to the lead-in and wires had to be bypassed.
1914 Continued to deploy stbd streamer.Weather conditions were poor with W6 wind and 2-3m swell.
2300 End of contractortime. Started to charge weather standby.
2400 Work continued on bypassing leaky wires in the lead-in. The stbd streamer was very nearly lost. All the stress members snapped in the waterbreak section and thestreamer was being towed on the skin. Wind west 6, sea 2-4 m.

3.3 Status at 0330 GMT

Starboard streamer fully out. Stbd tailbuoy not working.
Port streamer on board. Wind now NW 4 sea has decreased
but there is still a 2-3 m swell. Conditions are now shootable.

==========

NAV QC REPORT GECO SIGMA THURSDAY 24TH AUGUST 1989 JDAY 236

==========

00:00 Recovering starboard streamer as starboard receiver is locked on to Port tailbuoy ranges.

03:30 Starboard tailbuoy onboard.

05:40 Problem with starboard tailbuoy traced to the crystals in the receive/transmit unit in the tailbuoy. Transceiver unit changed out. (SN D004 replaced by SN D001)

06:05 Starboard tailbuoy redeployed.

although conditions were shootable.
Contractor downtime started.

0600 The spare tailbuoy tracker was set up on the helideck and the stbd receiver locked-on which confirmed that the tailbuoy was dead. Geodetic rep decided to accept one tailbuoy per vessel for a short time but they had to be repaired as soon as possible.

0645 Starboard streamer out and towed wide.

0700 Started deploying the port streamer.

1400 Trace 132 had leakage. To try to catch the next tide slot it was decided to start with 1 bad trace. The fault was in the slip ring box and this would be rewired during a line change.

1420 Observers noticed a broken stress member in a stretch section. The stretch had to be changed.

1600 The other stretch section was badly holed and had to be changed. This meant that the next tide slot at 1743 was missed.

1830 Portcable out on wide. Some traces werepulsing and there was one dead in the instrument room.

2354 No dead traces and the swell noise was acceptable.

2400 In production, stbd cable slightly unstable. Offset and polarity checks not completed. No starboard tailbuoy.

3.3 Status at 0400 GMT

In production line 0334.

==========

NAV QC REPORT GECO SIGMA FRIDAY 25TH AUGUST 1989 JDAY 237

==========

00:30 Starboard P8 receiver SN052 replaced by SN014. However are now unable to receive starboard tailbuoy. Spare tailbuoy equipment rigged on helicopter deck to detect if problem is with onboard receivers/antenna or with tailbuoy - signals received ok indicating problem is with tailbuoy equipment.

03:30 Informed that Rho Port tailbuoy dead. Decision made to continue deploying cables - tailbuoys to be repaired by Mob boat as soon as weather conditions allow.

04:00 Starboard stretch 1, Waterbreak 1 and front Navtech section changed.

06:40 Starboard streamer in wide.

18:10 Port streamer in wide. Port stretch sections 1 and 2 replaced.

23:15 S2H2 dead.

Geco received telex stating that they were not to use their calibration program due to an error in the software in applying the antenna offsets. Navigators are to request more details.

Checking through previous lines noted that :-
1). Terschelling F1 was assigned an EA (Expected accuracy)

of 7m while all other F1 patterns were assigned EA of 10.

2). Syledis patterns in GECO's cocktail were assigned the same weight as Hyperfix patterns despite the very weak signal strength of Gorm B.

Regards
M.Smith / R. Knight / M.Lanham

06:50 When starboard tailbuoy was approx 300m from the vessel signal lost again and starboard receiver locked on to port tailbuoy signal. Recovered Port tailbuoy and switched this off to allow starboard tailbuoy to be monitored. Starboard receiver then locked on to vessel ranges.

09:30 Vessel P8 receiver dead. RF unit SN 273 replaced by RF unit SN 303.

10:30 Once vessel P8 receiver was repaired starboard tailbuoy ranges were received correctly. Port tailbuoy redeployed.

19:14 Working on stbd leadin.

21:00 Starboard P8 receiver SN 052 down.

23:59 Still working on starboard leadin.

Regards
M.Smith / R. Knight / M.Lanham

TO : NAM - ASSEN
COPY: XGP, XGP/1, XGP/2, XTP/1, XTP2.
REF : SIG-235.TXT/NMM/F03
DATE: Thursday 24th August 1989
ATTN: A. BANDELL/C CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ: Progress to Wednesday 23rd August 1989 @ 24.00 GMT JD 235

1. PRODUCTION All Lines prefixed 89FA-F

Line	Hdg	FSP	LSP	SP	Kms	STATUS
					0.0	

Summary

Daily Sail Line	(Sigma)	0.00	Kms
Daily Sail Line	(Rho)	0.00	Kms
Accumulated Sail Line		680.43750	Kms
Daily Production	(Sigma)	0.00	Kms
Daily Production	(Rho)	0.00	Kms
Combined Daily Production		0.00	Kms
Accumulative Total	(Sigma)	4082.6250	Kms
Accumulative Total	(Rho)	4082.6250	Kms
Accumulative Combined Vessel Total		8165.2500	Kms

2.TIME ANALYSIS

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
17/8	08:35	06:00	02:23	07:02	00:00
18/8	00:00	00:39	12:34	10:47	00:00
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:37	02:59	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:26	03:22	00:00
23/8	00:00	00:00	00:00	24:00	00:00

3.QC STATUS

3.1 Seismic

Crew change and re-deploying equipment. The P-8 failed on the stbd tailbuoy and the streamer had to be recovered. There was a very heavy swell.

The crew change was not as smooth as planned. 2 hour were lost because the oncoming crew were late arriving at Lauersoog. It was more economic for Geco to do the change this way but there were some safety procedures that should have been observed.
The crew boat was more than big enough and had no problem tying alongside. The crew stepped easily from one vessel to the other but had to stand on the curved handrail of the crew boat. There was a rope attached to Sigma as a good hand hold and to help

the crew pull themselves up. They did NOT wear lifevests. This has been discussed with the party chief and the decision was made to change without using them because it was possible that they could catch and impeded movement. Further opinions will be obtained from the Captain later today. If anyone fell between the 2 vessels they would probably not survive anyway. The MOB boat was NOT in the water. It would have been easy to have had a MOB boat standing by even if all the crew were changing over.

3.2 Daily Diary

0610 Alongside the 'C' buoy. Standby for crew vessel 'Deneb'
0849 'Deneb' alongside. Crew and stores transferred.
0950 Crew change completed. Set course back to prospect.
1700 Port tailbuoy deployed and tied off.
1730 Stbd tailbuoy deployed and offsets checked.
1930 Received a call from NAMinforming vessels of a change in shooting sequence.Instead of shooting with a following current we were to use the same tide slots and the same line directions but shoot into the current in an effort to improve the feather matching and reduce the effect on the shot sequencing caused by bad navigational signals.
2230 Pulse-8 dropped out on the stbd tailbuoy.
2400 Investigated the Pulse-8 problems.

3.3 Status at 0300 GMT

Repairing the stbd tailbuoy P-8.Both cables on deck. Very heavy swell (3-4 m).

==========

NAV QC REPORT GECO SIGMA WEDNESDAY 23RD AUGUST 1989 JDAY 235

==========

0849 Crew change. M. Lanham onboard , P. Cohen to Lauwersoog. Handover was less than one hour, the vessel being enroute back to the prospect at 0950. The rapid handover was possible as the chief navigator from the previous crew will stay onboard until the end of the job.

1900 Port tailbuoy deployed and towed wide to give extra room on deck.
1930 Starboard tailbuoy deployed.

New compass 13 on Stbd, BCU#3545 compass was changed due to Geco compass calibration value being up to 1 degree different from Witteveen correction values.

==========

Edits List Geco Sigma/Rho Block F3

SEQ	LINE		EDITS
1	0238	SIGMA RHO	Complete line scratched
2	0574	SIGMA RHO	Complete line scratched
3	0250	SIGMA RHO	No major edits
4	0562	SIGMA RHO	Port cable sp 670-770 Bad Nav sp 973-1119(8 cols bad)
5	0238	SIGMA RHO	Gun Seq 1024-1026,1230-1235
6	0574	SIGMA RHO	None sp 500-548 (GDR, not recording)
7	0262	BOTH SIGMA	1329-1377 (Sigma sp numbers) due to GunSeq errors. 1045-1064 Port Guns Out
8.	0550	BOTH	1614-1619 Gun seq errors
9	0226	SIGMA RHO	Gun Seq 148-153 ditto
10	0586	SIGMA RHO	GunSeq SP 1130-1132 inc. ditto
11	0274	SIGMA RHO	Gunseq errors SP 1572-1580 ditto
12	0574*S	SIGMA	None
13	0214	SIGMA RHO	SP 100-553 Ditto
14	0598	SIGMA RHO	Gunseq 152-157 Ditto
15	0286	SIGMA RHO	Gun Seq 703-709 713-720 760-762 771-775 18 NDRs due to Nav giving erratic sp Ditto
16	0538	SIGMA RHO	NDRs 444 466 782 1178 1185 1188 1201 1222 1273 1275 1291 Gun Seq 1188-1190 1234-12371257 1258 1265-1267 1291-1296 (Sigma sp nos.) Ditto
17	0202	SIGMA	NDR 682 683 684 1539

		RHO	Port guns out of spec SP 100-376
18	0610	SIGMA	Gunseq 692-693 934-942 945-947
		RHO	952-953 1187-188 1199-1202
19	0298	SIGMA	None
		RHO	None
20	0526	SIGMA	Gun Seq 221-223 745-748 1433-1439 1500-1504 1591-1598
		RHO	Ditto
21	0190	SIGMA	NDR 100-109, 1178 Gun Seq 1573-1579
		RHO	100-109 and 1573-1579 Gunseq.
22	0622	SIGMA	None Gun Seq 1552-1555
		RHO	None
23	0310	SIGMA	None
		RHO	Seq error 672
24	0514	SIGMA	533-536 Gun Seq (Sigma sp nos.)
		RHO	476-483 Gun Seq (Rho sp nos)
25	0178	SIGMA	LGSP 1500 due Nav signals.
		RHO	Ditto
26	0634	SIGMA	NDR 907 1477
		RHO	None
27	0322	SIGMA	ALL DATA SOL-130 Autofires 131-432 Port Array off. Gun Seq 1008,1009,1043-1047
		RHO	1500-1590 Starboard cable shallow
28			

Reshoots Block F3

SEQ	LINE	SP RANGE TO RESHOOT	REASON	ACTION TAKEN	CHARGE
1	238	ALL	NAVSIG	DONE SEQ 5	NAM
2	574	ALL	NAVSIG	DONE SEQ 6	NAM
4	562	670-770(1 boat)	Sigma Port Cable	DONE SEQ 12	NAM
		973-1119(2 boat)	Rho Nav	Cols 137-140	GECO
				DONE SEQ 12	
		973-1119(Cols 137-140)		DONE SEQ 28	GECO
6	574	500-548 (1 boat)	RHO INST	DONE SEQ 12	GECO
7	262	1045-1064(1boat)	SIG PTGUNS		GECO
		1319-1387(2boat)	GUNSEQ(NAV)		NAM
13	214	100-553 (2 boat)	ALL DATA (SWELL)		NAM
17	202	100-376 (1 boat)	RHO PORT GUNS		GECO
25	178	1501-1630(2 boat)	NAVSIGS		NAM
27	322	100-130 (2boat)	ALL GUNS		GECO
		131-432 (1boat)	PORT GUNS (SIGMA)		GECO
		1500-1590 (1boat)	STBDCABLE (RHO)		GECO

Regards
M.Smith / R. Knight / M.Lanham

0534 EOL 89FA-F0442*R. Complete. No edits. NOTE THAT FILE NUMBERS ARE 1000 TOO HIGH DUE TO OPERATOR ERROR. Line change now on downtime for Rho.
0806 SOL 89FF-F0322/R. SEQ 68. Single boat 20 fold infill line (Sigma shooting synchronous single boat), with Rho coverage required on cols: 372-375. Operational infill time.
1122 EOL 89FF-F0322/R. Complete. EDIT AUTOFIRE SP 10529 ONLY. Go straight into reshoot.
1122 SOL 89FA-F0322*R. SEQ 68. Single boat 20 fold reshoot line (Sigma shooting synchronous single boat), for sequence 27 (22/08/89), Rho stbd cable shallow. Contractor time.
1138 EOL 89FA-F0322*R. Complete. No edits. Continue line change on contractor time.
1533 SOL 89FF-F0490/R. SEQ 69. Single boat 20 fold infill line (Sigma shooting synchronous single boat), with Rho coverage required on cols: 213-217 various offset groups. Operational infill time.
1640 EOL 89FF-F0490/R. Complete. No edits. Start reshoot immediately.
1640 SOL 89FA-F0490*R. SEQ 69. Single boat 20 fold reshoot line (Sigma shooting synchronous single boat), for sequence 37 (27/08/89) gun sequence errors. Contractor time.
1648 EOL 89FA-F0490*R. Complete. No edits. Start infill immediately.
1648 SOL 89FF-F0490/R1. SEQ 69. Single boat 20 fold infill line (Sigma shooting synchronous single boat), with Rho coverage required on cols: 213-217 various offset groups. Operational infill time.
1742 EOL 89FF-F0490/R1. Complete. No edits. Operational line change time.
1942 Operational line change period expires - standby rate.
2009 SOL 89FF-F0370/R. SEQ 70. Single boat 20 fold infill line (Sigma shooting synchronous single boat), with Rho coverage required on cols: 324-326 various offset groups. Operational infill time.
2400 Continue 89FF-F0370/R. LSPD 11575. Some lost SPs d/t nav on Sigma, though Rho was OK.

3. QC STATUS

3.1 Streamers

No bad traces, except on line 89FF-F0370/R, traces S89 & S109 kicking and killed all line. Front end towing noise on port streamer, amplitude 15/20uB RMS (3 sec analysis) 6-8Hz accepted.

3.2 Weather

Excellent calm shooting weather all day and forecast good.

3.3 Status at 0530 local time.

In production without problems.

3.4 Post-prospect Tests

Full DFS/DSS Instrument tests are being run on Rho today and

are being checked with the uMAX.

Intervessel system timing tests were performed by KSEPL at start-up in April and have been QCd continuously by the Geco QC clocks, recorded on External Header, monitored on Sigma by Geco hardware, and QCd on Rho by the ECLHeader package. I must have plotted out over a hundred lines of ECLHeader Link Delay and Closure/FTB Timing charts; although the telemetry between the two boats (GM2B link) has not been 100%, I have yet to plot a single value from the Link Delay Clock that was outside NAM specifications.

We therefore do not propose that end-of-prospect intervessel system timing tests be conducted, unless NAM specifically requires them.

3.5 Rho Offset Changes

A telex will be sent today from the Rho Party Chief to Geco UK, copy to NAM, regarding the offset changes (centre source to centre first active group), to be made for Rho data from the K07, K08, K10, K11 Blocks, following the Rho cable loss and change of all the stretch sections at the front of both streamer cables.

Sequences affected are:-

BLOCKS K07, K08, K10, K11

STARBOARD CABLE

SEQ 71 - 75	DOCUMENTED	118.5m
	CORRECT VALUE	115.0m
SEQ 76 - 95	DOCUMENTED	118.5m
	CORRECT VALUE	115.0m

PORT CABLE

SEQ 71 - 75	DOCUMENTED	115.6m
	CORRECT VALUE	117.0m
SEQ 76 - 95	DOCUMENTED	119.05m
	CORRECT VALUE	117.0m

NAV QC REPORT GECO RHO TUESDAY 5th SEPTEMBER 1989 JD 248

NAVIGATION : Vessel Navigation using "CockTail" of Hyperfix and Syledis ranges.
Gorm-B, Tercshelling F1 noisy, and K8 lane slips during seq #67.
TailBuoys very noisy all day. Stbd TB out of spec. seq #70, 30% of SD's over 25m..
Lost lock on TB's: seq #67 sp10970-11360 (out of spec). seq #68 sp10314-10536.

COMPASSES : Noting rejects of bad compass readings from Stbd #13 and Port #27..

MISCLOSURES : Misclosures are generally very poor due to noisy TB's for all seq's.

SEPARATION :

ACOUSTICS : Infill and reshoots - single boat acoustics S3R2 still giving poor %ages but Net #1 sol'n o.k.
Net #2 ranges from F3R1 showed poor %ages seq's #69 and #70 in part due to high windows.

Lines Shot :

89FA0442R seq# 67 : Reshoot.

89FA0322R seq# 68 : Reshoot.

89FA0490R seq# 69 : Reshoot.

89FF0370R seq# 70 : Infill.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-247.TXT/NMM/F03
DATE : Tuesday 5th September 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Monday 4th September 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0430	090	100	1630	1531	28.706	Complete
0394	270	10100	11630	1531	28.706	Complete
0418	090	100	1630	1531	28.706	Complete
0214	270	10100	10553	454	8.512	Complete
0178	270	0	0	0	0.000	Reshoot

Total Daily Production Prime 94.631 Kms
Accumulated Prime Production 1406.607 Kms

Total Daily Production Infill 0.000 Kms
Accumulated Infill Production 97.969 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
29/8	06:30	07:54	03:25	06:11	00:00
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	08:00	02:06	00:00	00:00
02/9	00:00	14:34	06:11	03:15	00:00
03/9	00:00	00:58	06:09	16:53	00:00
04/9	11:53	06:00	04:47	01:20	00:00

DAILY DIARY

0000 Turning on to line 89FA-F0430-R two boat prime.
0120 SOL 89FA-F0430-R. SEQ 62. Two boat prime.
0458 EOL 89FA-F0430-R. Complete. No Rho edits. Sigma optical multiplexer failed again and resulted in loss of 3D link, GM2B link and Observer's link, from SP 284 - SP 378. Coverage to be checked after reprocessing. Rho no S3R4 all line and tailnet acoustics virtually non-existent.
0652 MOB boat away to change out S3R4.
0732 SOL 89FA-F0394-R. SEQ 63. Two boat prime.
0750 MOB boat back. S3R4 still bad - they changed the float responder by mistake!
1050 MOB boat away to change out correct responder this time! Also testing Zodiac, away at this time.
1105 EOL 89FA-F0394-R. Complete. No Rho edits. Tailnet acoustics still poor with S3R4 dead. For the last two sequences, since the lead-in change, Rho has had increased LF towing noise at circa 18/20uB max, 6-8Hz, on the first

couple of traces only. Have tried adjusting superwire etc, but it looks like the DILT clamp will have to be modified, which entails missing a slot, as it takes too long to do on a normal linechange. Took a look at this noise after F-K and it is definitely not a problem in real terms. Have decided to continue in production with it while this excellent weather lasts, or until a longer linechange.

1155 Zodiac back on board.
1342 SOL 89FA-F0418-R. SEQ 64. Two boat prime.
1410 MOB boat back on board.
1718 EOL 89FA-F0418-R. Complete. EDIT GUNSEQ ERR SP 1513(S). LF front end towing noise port cable 15/20uB 6-8Hz.
1941 SOL 89FA-F0214-R1. SEQ 65. Two boat prime portion - completion of sequence 13 (19/08/89) where this part was not accepted for swell breakout.
2047 EOL 89FA-F0214-R1. Complete. No Rho edits. Same front end port cable towing noise. Run on down line.
2236 SOL 89FA-F0178*R. SEQ 66. Two boat reshoot on NAM A/C for sequence 25 (22/08/89) for bad Hyperfix signals.
2319 EOL 89FA-F0178*R. Complete. No Rho edits.
2400 Line change.

3. QC STATUS

3.1 Streamers

No bad traces. Front end towing noise on port streamer, amplitude 15/20uB RMS (3 sec analysis) 6-8Hz accepted until line change time available to modify DILT clamp. NOT A PROBLEM

3.2 Weather

Excellent calm shooting weather all day and forecast good.

3.3 Status at 0530 local time.

In production without problems.

NAV QC REPORT GECO RHO MONDAY 4th SEPTEMBER 1989 JD 247

NAVIGATION : Vessel Navigation using "CockTail" of Hyperfix and Syledis ranges except for Seq #63 which was Hyper-Fix only.
Gorm-B as usual- weak signal and was only breifly tried Seq #65 and found to be unstable.
Terschelling F1 taken out of Seq's #62 and #65, it shows some instability at night??.
GECO deleted K8 during seq #62 after some large residuals were noted, GridNav shows K8 should have been used, especially for good geometry.
TailBuoys very noisy all day.

COMPASSES : Port #33 shows good DSD's from Seq #62.

MISCLOSURES : Seq #62 noted as out of spec.. TB's marginal and no acoustic sol'n due to too few ranges.

SEPARATION :

ACOUSTICS : Seq #62, S3R4 and S1H4 dead. During next line change MOB boat changed responder F4R1 by mistake - Seq #63 S3R4,S1H4 still dead. No Net #2 sol'n for either of these lines.
S3R4 replaced and o.k. Seq #64. S1H4 still dead seq #64, #65 and #66.
S3R2 is providing poor data resulting in 4 of it's 5 ranges being deselected. GECO are investigating. Priority was given to the tail responder's problems.
Problems with 3D link causing more problems.

STREAMERS : Port Leadin changed. 145m of leadin off the spool.
Acoustics used to measure the CS-CNG offset when streamer sep'n =100.9m and low feather.
Acoustic measuement = 110.7m
Previous Survey Def'n unchanged at 111.1m.
Line Seq #62, ranges checked against Nominals o.k..

Lines Shot :

89FA0430R seq# 62 : Prime line

89FA0394R seq# 63 : Prime line

89FA0418R seq# 64 : Prime line

89FA0214R seq# 65 : Prime line

89FA0178R SEQ# 66 : 2 Boat Reshoot

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-246.TXT/NMM/F03
DATE : Monday 4th September 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Sunday 3rd September 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS

Total Daily Production Prime 0.000 Kms
Accumulated Prime Production 1311.976 Kms

Total Daily Production Infill 0.000 Kms
Accumulated Infill Production 97.969 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	07:54	03:25	06:11	00:00
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	08:00	02:06	00:00	00:00
02/9	00:00	14:34	06:11	03:15	00:00
03/9	00:00	00:58	06:09	16:53	00:00
TOTAL	54:36	49:26	37:39	26:19	00:00

DAILY DIARY

0000 Heading for line 89FF-F0586-R. SEQ 59. Split infill line. Still investigating Hyperfix problem.
0058 Attempt to start line 89FF-F0586/R without any Hyperfix, Syledis only; the RACAL engineer mixed up the two transceivers and we continued down the line with RF boards from one transceiver installed in the other. Definitely not acceptable and this sequence has been totally rejected On contractor downtime for Navigation equipment failure.
0413 End line 89FF-F0586-R. Swell noise increased rapidly during last portion of line and was marginally acceptable but NAV configuration inadmissible.
0430 RACAL engineer puts original components back in their proper calibrated positions. Although the signal to noise ratio was then poor and K8 F1 was not locking - nevertheless it was considered that the NAV was minimally acceptable, i.e. we would have shot the next prime line if the swell level had not shut us down (no worse than Sigma had been for the previous fortnight). Continue linechange on downtime.
0650 SOL 89FA-F0394-R two boat prime aborted on run-in for

swell levels/cable control not acceptable. Go on to weather standby.

0700 Spikes noticed on port streamer - start investigating.

0705 Start guns on board.

0830 Start port cable on board.

1200 Decide to change out port lead-in for leakage. Meanwhile, RACAL engineer investigating reason for low Hyperfix signal levels. Discovered that problem had started while a radio call was being made last night. Normally, calls are made during the day on 2MHz at medium power levels. Last night the radio operator used 4MHz at high power and the Hyperfix degraded around that time.

1230 Spare Hyperfix antenna tuning unit (ATU) installed at top of mainmast and signals now good. This unit cannot be used as will require calibration, but now attempting to troubleshoot original ATU.

1259 Go on to contractor downtime for cable failure as this is slot-time and swell has come down (Sigma running down to an infill line with reasonable swell burstout levels).

1345 Original ATU repaired and replaced. Failure was due to a burnt-out resistor, which is known tofail when external RF is applied. Monitoring Hyperfix to determine quality.

1400 Hyperfix locked on all stations both F1 and F2 with good SDs almost exactly the same as Sigma's.

1504 Port streamer deployed with new lead-in. Running up North to join Sigma and will do offset checks on line heading. Hyperfix good and navigation satisfactorily revalidated.

1740 Start a 3D test line to verify offsets and streamer separation.

1820 End test line. No change in previous offsets/separation. Port offset = 111.1m, stbd offset = 112.2m, % cable sep = 100.9m all OK.

1900 Rendezvous with Sigma.

2400 Turning on to line 89FA-F0430-R two boat prime.

3. QC STATUS

3.1 Streamers

No production - changing out port streamer lead-in for intermittent leakage across several traces.

3.2 Weather

Increasing during the AM to wind NW 5/6, swell NW 2 to 3 metres and came back down in the afternoon to reasonable shooting conditions.

3.3 Status at 0530 local time.

In production on line 89FA-F0430-R.

NAV QC REPORT GECO RHO SUNDAY 3rd SEPTEMBER 1989 JD 246

NAVIGATION : Vessel Navigation using "CockTail" of Hyperfix and Syledis ranges.
Hyper-Fix receivers #1 and #2 both failed before SOL Seq #59. Low signal strength, just abovethe

general noise level and unable to lock-on.
RACAL engineer swapped RF in and RF out boards from receiver #2 into receiver #1. GECO were informed that this receiver was not now calibrated and thereforeout of spec.. Hyper-Fix was logged from sp390 and used for navigation from sp 585.
RACAL engineer was unable to troubleshoot the problem until after dawn when the signals would be better and he could work on the antennae.
Problem found to be a burnt resistor in the Antenna Tuning Unit (ATU). Probably blown by a high powered transmission from the ships HF radio. Resistor replaced and Receiver #1 back on line as calibrated 14:00 GMT.
Line out of Spec. due to RHO Nav. - NTBF..

COMPASSES : Port #33 DSD >1m for fouth consecutivc line.

MISCLOSURES : Seq #56 GECOshow NAV-Compass SD's of 31m across and 21m along for Stbd tail - out of spec.

SEPARATION :

ACOUSTICS :

Lines Shot :

89FF0586R seq# 59 : Infill line - Not to be Processed.

89FA0394R seq# 60 : Prime line - ABORTED AT SOL (Swell Noise).

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-245.TXT/NMM/F03
DATE : Sunday 3rd September 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Saturday 2ndSeptember 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0670	090	100	847	748	14.025	Infill
0658	090	0	0	0	0.000	Reshoot

Total Daily Production Prime 0.000 Kms
Accumulated Prime Production 1311.976 Kms

Total Daily Production Infill 14.025 Kms
Accumulated Infill Production 97.969 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	07:54	03:25	06:11	00:00
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	08:00	02:06	00:00	00:00
02/9	00:00	14:34	06:11	03:15	00:00

DAILY DIARY

0000 Line change.
0001 SOL 89FF-F0670/R. SEQ 56. Two boat 20 fold split infill line with Sigma on cols: 25-27 and Rho cols: 34-37.
0146 EOL 89FF-F0670/R. EDIT RHO STBD CABLE SHALLOW SPs 523-608 AND ALSO RHO NO DATA RECORDED SPs 100-117 (Guns OK). Considerable swell breakout at 10/240 30uB & 4/240 50uB. Compasses noisy in swell and OmniSeis link failure at SOL to SP172 (GM2B link bad at same time indicating multiplexer problem again on Sigma). Carry on down line on operational line change time to a reshoot.
0251 SOL 89FA-F0658*R. SEQ 57. Two boat reshoot of seq 40 (Sigma nav crash).
0336 EOL 89FA-F0658*R. Complete. No Rho edits. Same swell levels as above and Rho cable stability adequate.
0606 Abort 89FA-F0394-R prime for swell/cable stability and go on to weather standby. Both vessels heading up North to recalibrate Hyperfix.
1900 Calibrations on both Hyperfix units satisfactorily completed - head back to prospect.

2215 No lock on any Hyperfix stations - RACAL engineer investigating.
2400 Heading for line 89FF-F0586-R. Still investigating Hyperfix problem.

3. QC STATUS

3.1 Streamers
Trace 589 o/c - killed all lines.

3.2 Weather
Weather increased during the AM to wind NW 4/5/6, sea state 4/5, swell WNW 2/3 metres - weather standby.

3.3 Status at 0530 local time.
In infill production with poor Hyperfix on Rho. Evaluating same.

NAV QC REPORT GECO RHO SATURDAY 2ndSEPTEMBER 1989 JD 245

NAVIGATION : Vessel Navigation using "CockTail" of Hyperfix and Syledis ranges.
Terschelling F1 noisy at SOL seq #56 and for part of seq #57 where it was dropped from fit.
GORM-B signals were at timesweak and its ranges were dropped during seq #56.
TB's Fixes were still very noisy, especially Stbd TB.

COMPASSES : Seq #57 out of spec.. Port #33 DSD >1m forthird consecutive line. GECO are to replace ASAP.

MISCLOSURES : Seq #56 GECOshow NAV-Compass SD's of 31m across and 21m along for Stbd tail - out of spec.

SEPARATION :

ACOUSTICS : TailNet showing high DSD's due to the relative instability of the TB's in the acoustic solution.

Lines Shot :
89FF0670R seq# 56 : Prime line.
89FA0442R seq# 57 : Prime line.
89FA0394R seq# 58 : Prime line - ABORTED AT SOL (SIGMA NAV).
CALIBRATION LINE : HYPERFIX against SYLEDIS.

Calibration Values Summary :
GECO values, Mean of 90 and 270 degree.

STATION	GECO C-O	Previous C-O	Diff.	GridNav C-O
F1 Terschelling	-0.082	-0.140	4m	-0.08
F1 Borkum	0.122	0.090	2m	0.12
F1 H7	0.497	0.500	0m	0.50
F1 K8	0.120			0.12
F2 Terschelling	0.085	0.030	4m	0.09
F2 Borkum	0.232	0.190	3m	0.23
F2 H7	0.684	0.230	35m	0.65
F2 K8	0.302			0.29

Enclosed : Hyperfix Post Calibration. (NAV QC report)

HYPERFIX POST CALIBRATION

OBSERVATIONS TO DETERMINE C-O VALUES

On the 2nd September 1989, 4 lines were sailed in an area with good Syledis coverage. The approximate coordinates of the lines are :

point 1. 489 405 E 6 122 758 N
point 2. 478 809 E 6 122 796 N

This line was sailed in direction 090 deg and 270 deg both, once in each direction with the Hyperfix online receiver and once with the Hyperfix spare receiver.
The fixes taken on the Gridnav computer need not be the same as on the Nor* computer, since fixing was done on time instead of on a trigger coming from The Nor* computer.

The calculated C-O values are given in the table below :

Receiver 1, Frequency 1

	Dirn 090 deg.		Dirn 270 deg.	
	Gridnav	Geco	Gridnav	Geco
Terschelling	-0.073	-0.084	-0.085	-0.080
Borkum	0.101	0.104	0.147	0.140
H7	0.473	0.479	0.532	0.514
K8-FA2	0.147	0.135	0.080	0.105

Receiver 1, Frequency 2

	Dirn 090 deg.		Dirn 270 deg.	
	Gridnav	Geco	Gridnav	Geco
Terschelling	0.092	0.091	0.084	0.079
Borkum	0.211	0.238	0.237	0.227
H7	0.601	0.681	0.700	0.686
K8-FA2	0.322	0.334	0.265	0.270

Note : Due to a Gridnav crash the line in direction 270 had to be re-played, this replay was done over about 600 SP's.

Receiver 2, Frequency 1

	Dirn 090 deg.		Dirn 270 deg.	
	Gridnav	Geco	Gridnav	Geco
Terschelling	-0.107	-0.118	-0.118	-0.076
Borkum	0.089	0.092	0.112	0.155
H7	0.445	0.451	0.485	0.521
K8-FA2	0.176	0.153	0.102	0.123

Receiver 2, Frequency 2

	Dirn 090 deg.		Dirn 270 deg.	
	Gridnav	Geco	Gridnav	Geco
Terschelling	0.086	0.085	0.064	0.109
Borkum	0.203	0.230	0.215	0.280
H7	0.570	0.644	0.596	0.700
K8-FA2	0.398	0.420	0.317	0.362

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-244.TXT/NMM/F03
DATE : Saturday 2nd September 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Friday 1st September 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0674	090	438	1630	1193	22.369	Complete
0382	270	100	1630	1531	28.706	Complete
0442	090	100	1630	1531	28.706	Complete
0106	270	100	1630	1531	28.706	Complete

Total Daily Production Prime 108.488 Kms
Accumulated Prime Production 1311.976 Kms

Total Daily Production Infill 0.000 Kms
Accumulated Infill Production 83.944 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	07:54	03:25	06:11	00:00
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00
01/9	13:54	09:00	02:06	00:00	00:00

DAILY DIARY

0000 Continue production 89FA-F0694-R. LSPD 437.
0252 EOL 89 FA-F0694-R. Complete. No Rho edits. Stbd Pulse8 TB nav very poor - unstable/high SDs.
0521 SOL 89FA-F0382-R. SEQ 53. Two boat prime.
0900 EOL 89FA-F0382-R. Complete. No Rho edits.
1131 SOL 89FA-F0442-R. SEQ 54. Two boat prime.
1511 EOL 89FA-F0442-R. Complete. No Rho edits.
1743 SOL 89FA-F0106-R. SEQ 55. Two boat prime.
2126 EOL 89FA-F0106-R. Complete. No Rho edits. HOWEVER - 3D link failed, also GM2B link (common to Sigma multiplexer) from SP 1250-1611(3D) & SP1253-1582(GM2B) (Rho SP numbers) This means that no 2 boat gun mask recorded anywhere, but provided individual vessel OmniSeis data is intact, then coverage can be reprocessed after the boats transfer their data to each other. During 3D link failure the vessels are obliged to steer on a combination of NOR* distances, radar, and eyeball, therefore in the past we have seen

severe coverage degradation d/t poor inline/xline separations. COVERAGE TO BE EVALUATED & ANY INFILL TO BE ACQUIRED ON GECO A/C.
2400 Line change.

3. QC STATUS

3.1 Streamers
Trace S89 o/c - killed all lines.

3.2 Weather
Calm at start of period, increasing late in the day to wind NW 4/5, sea state 4, swell WNW 2 metres - some swell breakout observed.

3.3 Status at 0530 local time.
In production.

3.4 ECLHeader
Processed line 89FA-F0106-R for intervessel system timing/GM2B link integrity. Found no jumps in Link Delay Timing, but d/t GM2B telemetry failure, no QC clocks transferred SPs 1253-1582. Gun Masks on 3D must be carefully checked after floppy transfer.

3.5 MicroMAX
Investigating your problem re EOF between SEG-Y tape files. The uMAX has the option to put these on and Dave Filler's documentation states that he so did. Either there is a bug here or he pressed N instead of Y.
File Headers will be more fully annotated in future. Note that we stick to the NAM specified processing sequence and parameters unless stated otherwise. There should be a report in NAM office from the L12 block which fully delineates these.

Excerpts regarding F-K filtering:-

"The desired NAM filter of +/-0.1mS/tr to +/-14mS/tr cosine taper could not be produced exactly, as the uMAX does not have a cosine taper option. However, it was realised that a fairly close approximation could be obtained by utilising the % flat option in the uMAX software."
"The F-K filter is applied in the frequency-wavenumber domain and the taper is applied in the spatial domain."
"After looking at various filter responses, a pass filter of +/-14mS/tr, 10% flat and with a maximum attenuation of 30dB was chosen. The 100% pass limits are 45% of the spatial frequency band in from the limits of the spatial frequency window."
Note that various tests were done using a spike produced at the centre of 120 traces (25m spacing), 4 secs, and input through the F-K filter, with various spectral cuts for velocities. We do not have these plots on board any more but they should be with the report sent to NAM. Hope this answers your queries.

NAV QC REPORT GECO RHO Friday 1st SEPTEMBER 1989

NAVIGATION : Vessel Navigation using "CockTail" of Hyperfix and Syledis ranges.
K7 was back on the air from 18:00.
GORM-B signals wereat times weak andits ranges were not used in Seq #53.
Terschelling F1 was deselected by GECO for Seq #54, GridNav shows 8m residuals.
K8 ranges were monitored for most of this day before K7 signals returned to that channel.
During Seq #53 K8 was monitored with a C-O = 0 against the main fit; resid 8.9m, SD 1.3m.

TB's Pulse/8 vessel pos'n lost sp's 140-160 seq #54.
Pulse-8 TailBuoy fixes were still very noisy, especially Stbd TB. Some retuning was done from the vessel and Stbd signal is better than yesterday.

COMPASSES : Some noisy compasses Seq #55.

MISCLOSURES :

SEPARATION :

ACOUSTICS : TailNet showing high DSD's due to the relative instability of the TB's in the acoustic solution.

Lines Shot :
89FA0382R seq# 53 : Prime line.
89FA0442R seq# 54 : Prime line.
89FA0103R seq# 55 : Prime line.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-243.TXT/NMM/F03
DATE : Friday 1st September 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Thursday 31st August 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0682	090	720	1630	911	17.081	Complete
0370	270	100	1630	1531	28.706	Complete
0454	090	100	1630	1531	28.706	Complete
0118	270	100	1630	1531	28.706	Complete
0674	090	100	437	338	6.337	Complete

Total Daily Production Prime 109.538 Kms
Accumulated Prime Production 1203.488 Kms

Total Daily Production Infill 0.000 Kms
Accumulated Infill Production 83.944 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
25/8	00:00	15:53	02:26	05:41	00:00
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	07:54	03:25	06:11	00:00
30/8	13:47	08:00	02:13	00:00	00:00
31/8	13:55	08:00	02:05	00:00	00:00

DAILY DIARY

0000 Continue production. FPD 720.
0210 EOL 89FA-F0682-R. Complete. No Rho edits.
0438 SOL 89FA-F0370-R. SEQ 49. Two boat prime.
0817 EOL 89FA-F0370-R. Complete. No Rho edits.
1049 SOL 89FA-F0454-R. SEQ 50. Two boat prime.
1428 EOL 89FA-F0454-R. Complete. No Rho edits.
1700 SOL 89FA-F0118-R. SEQ 51. Two boat prime.
2038 EOL 89FA-F0118-R. Complete. EDIT GUNSEQ ERR SP649-655.
2311 SOL 89FA-F0694-R. SEQ 52. Two boat prime.
2400 Continue production 89FA-F0694-R. LSPD 437.

3. QC STATUS

3.1 Streamers
Trace S89 o/c - killed all lines.

3.2 Weather
Good shooting weather throughout.

3.3 Status at 0530 local time.
In production.

3.4 MicroMAX
Very glad to hear that the uMAX report/plots/tapes from the last crew change showed the data quality we are acquiring on this block to be good and also confirmed the onboard decisions regarding line segment acceptance. This shows the advantage of processing with velocities derived onboard (when done correctly!).
Were you able to replay and display the SEG-Y tapes? Are there any improvements you can suggest for the few days remaining?

We have not been able to continue with the crossline section project - for several reasons:

a. Sigma data not available so only 8 of 12 cells to hand.

b. Very poor Geco handover, where the new operator, Jack Craig, had no time whatsoever to be briefed by Dave Filler and has had to find his way through the dataflows etc. that had been set up. Since he almost immediately had to carefully process line 89FA-F0478-R for heavy swell noise, there was a time limitation here on what could be done.
With proper advance planning and briefing crossline sections for each prospect area should certainly be done on a systematic basis next year.

NAV QC REPORT GECO RHO Thursday 31st AUGUST 1989 JD 243

NAVIGATION : Vessel Navigation using "CockTail" of Hyperfix and Syledis ranges.
K7 ranges were erratic and not used in seq #49 and #50. From Seq #51 K7 was reported to have a broken antennae which is to be repaired.
GORM-B signals were at times weak and its ranges were deselected during Seq #49, and not reselected until the start of Seq #52.

Revised C-O values have been received for Hyperfix station H7, but are being investigated before being used.

MARGINAL TB's ========== Pulse-8 TailBuoy fixes were still very noisy, especially Stbd TB which showed 24% of fixes with SD of more than 25m for Seq #52. The RACAL engineer will be asked investigate the Stbd TB tomorrow.

COMPASSES : Seq's #49 and #51 showed mean differences of 1 degree between Stbd. #11/#12 and #12/#13. Both these lines were shot dir'n 270. The compass readings show the Stbd Tail to be towing slightly towards the Port. The

acoustic ranges support this view and the chase boat will investigate in the morning.

MISCLOSURES : Pulse-8 TailBuoy fixes erratic. The Stbd TB showing very large position jumps. Sigma changed this TB to a relaxed point in their Acoustic Sol'n, and Rho followed, during Seq # 52.

SEPARATION : Mean Tailend Sep'n (S1-S4) by Acoustics averaging @85m.
Note. Yesterdays report refered to S3-S4, should have read S1-S4.

ACOUSTICS : TailNet ranges showing high DSD's due to the relative instability of the TB's in the acoustic solution.

BAD RANGE SEQ's #47-#48 : Range 48 (S4R2-S3H1) was noted to be reading 20m longer than the nominal value of 146m. The range was found to tuned into a bottom reflection and was retuned. Upon investigation this long range is seen to appear during Seq #46 but was held out by the window. GECO will inform processing of this problem.

Lines Shot :
89FA0370R seq# 49 : Prime line.
89FA0454R seq# 50 : Prime line.
89FA0118R seq# 51 : Prime line.
89FA0694R seq# 52 : Prime line.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-242.TXT/NMM/F03
DATE : Thursday 31st August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Wednesday 30th August 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0670	090	1025	1630	606	11.363	Complete
0358	270	100	1630	1531	28.706	Complete
0466	090	100	1630	1531	28.706	Complete
0130	270	100	1630	1531	28.706	Complete
0682	090	100	719	620	11.625	Continue

Total Daily Production Prime 109.106 Kms
Accumulated Prime Production 1093.950 Kms

Total Daily Production Infill 00.000 Kms
Accumulated Infill Production 83.944 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
24/8	00:00	00:00	23:04	00:56	00:00
25/8	00:00	15:53	02:26	05:41	00:00
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	07:54	03:25	06:11	00:00
30/8	13:47	08:00	02:13	00:00	00:00

DAILY DIARY

0000 Continue in production. LSPD 913.
0129 EOL 89FA-F0670-R. SEQ 44. Two boat prime. Complete. EDIT GUN SEQ ERRS SPs 681-682(S) 1582-1583(S) & 1603-1604(S).
0353 SOL 89FA-F0358-R. SEQ 45. Two boat prime.
0729 EOL 89FA-F0358-R. Complete. EDIT GUN SEQ ERRS SPs 621-623(S) & 684.
1006 SOL 89FA-F0466-R. SEQ 46. Two boat prime.
1344 EOL 89FA-F0466-R. Complete. No Rho edits. Pulse8 TBs good performance this line.
1621 SOL 89FA-F0130-R. SEQ 47. Two boat prime.
1956 EOL 89FA-F0130-R. Complete. EDIT GUNSEQ ERR SP 1529.
2731 SOL 89FA-F0682-R. SEQ 48. Two boat prime.
2400 Continue production. LSPD 719.

3. QC STATUS

3.1 Streamers

Trace S89 o/c - killed all lines.

3.2 Weather

Good shooting weather throughout.

3.3 Status at 0530 local time.

In production.

NAV QC REPORT GECO RHO Wednesday 30th AUGUST 1989 JD 242

NAVIGATION : Vessel Navigation using "CockTail" of Hyperfix and Syledis ranges. K7 ranges were erratic and not used. GORM-R signalswere at times weak andits ranges were notused in Seq #47, and was dropped during seq's #45 and #46. Residuals of 3-6m were noted whilst in use on seq #48.

OUT OF SPEC : Pulse-8 TailBuoy fixes are very noisey, especially the Stbd TB which was out of Spec. on seq #48 with 27% of SD's over 25m.... Seq. #45 was also poor with 17% over spec.

COMPASSES : Some marginal mean reading differences involving Tail-end compasses.

MISCLOSURES : Pulse-8 TailBuoy fixes erratic.

SEPARATION : Mean Tailend Sep'n (S3-S4) byAcoustics 77m seq. #47, and 76m Seq.#48...

ACOUSTICS : TailNet ranges showing high DSD's due to the relative instability of the TB's in the acoustic solution.

Lines Shot :

89FA0358R seq# 45 : Prime line.

89FA0466R seq# 46 : Prime line.

89FA0130R seq# 47 : Prime line.

89FA0682R seq# 48 : Prime line.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-241.TXT/NMM/F03
DATE : Wednesday 30th August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Tuesday 29th August 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0658	090	1331	1630	300	5.625	Complete
0514	090	100	913	814	15.263	Infill
0142	270	100	1630	1531	28.706	Complete
0670	090	100	1024	925	17.344	Continue

Total Daily Production Prime 51.675 Kms
Accumulated Prime Production 984.844 Kms

Total Daily Production Infill 15.263 Kms
Accumulated Infill Production 83.944 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
23/8	00:00	00:00	00:20	23:40	00:00
24/8	00:00	00:00	23:04	00:56	00:00
25/8	00:00	15:53	02:26	05:41	00:00
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00
29/8	06:30	07:54	03:25	06:11	00:00

DAILY DIARY

0000 Continue in production.
0043 EOL 89FA-F0658-R. Complete. Sigma lost all Hyperfix navigation and this caused SP spacing degradation on Rho etc, so EDIT BOTH VESSELS SPs 1321 - 1630. Port TB still dead. Some swell breakout all line. Some towing noise at front end port streamer - will be fixed on line change. Rho now heading for infill line while Sigma deals with Hyperfix failure.
0100 Start guns on board to repair port streamer for front end towing noise.
0309 Nominal slot time for line 0346 infill. Run down line on contractor downtime while deploying guns.
0607 SOL 89FF-F0346/R. SEQ 41. Single boat 40 fold infill line with coverage required on cols: 349-351 various groups.
0732 EOL 89FF-F0346-R. Complete. EDIT NO PORT GUNS FIRING SPs 1046-1086 (operator error). Some SP numbering

problems associated with this SOL problem have been scrutinised and documented. Checking coverage to see if any missing coverage should be re-acquired at Geco expense. NOTE THIS LINE WAS A QUICK DECISION BY CHIEF NAV ON RHO AND WAS NOT IN FACT PLANNED. DATA HAS BEEN MARKED "POSSIBLE INFILL ONLY - DO NOT PROCESS". This time all contractor downtime. Run to next infill line on downtime.
0920 SOL 89FF-F0514-R. SEQ 42. Single boat 40 fold infill line with coverage required on cols: 189-192 various groups.
1105 MOB boat away to repair port TB.
1114 EOL 89FF-F0514-R. Complete. No edits. No problems. Sigma has been able to fix their Hyperfix and will join us in the next slot for two boat prime line. Meanwhile WX has moderated enough to take port TB to Naarebout for repair.
1542 SOL 89FA-F0142-R. SEQ 43. Two boat prime.
1620 MOB boat back.
1659 Port TB Pulse8 good and running to NOR*.
1917 EOL 89FA-F0142-R. Complete. EDIT GUN SEQ SP 1399-1404(S).
2148 SOL 89FA-F0670-R. SEQ 44. Two boat prime.
2400 Continue in production. LSPD 913.

3. QC STATUS

3.1 Streamers
Trace S89 o/c - killed all lines.

3.2 Weather
Good shooting weather and moderated enough to get Rho port TB on board Naarebout and fix it.

3.3 Status at 0530 local time.
In production.

NAV QC REPORT GECO RHO Tuesday 29th AUGUST 1989 JD 241

NAVIGATION : Port TailBuoy Repaired and in operation from sp 652, 89FA142R sequence #042.
Vessel Navigation using "CockTail" of Hyperfix and Syledis ranges.
K7 ranges were erratic and not used for parts of Seq's 041 and 044.
H7 ranges were not used during seq's #41 and #42 due to residuals @10m. From sp1240 seq #43 resid'd @4m and H7 reselected.

COMPASSES : Low swell - quite compasses.

MISCLOSURES : Pulse-8 TailBuoy fixes erratic but in spec..

SEPARATION :

ACOUSTICS : TailNet ranges showing high DSD's due to the relative instability of the TB's in the acoustic solution.

Lines Shot :

89FF0346R seq# 41 : Infill (Not to be Processed).

89FF0154R seq# 42 : Infill.

89FA0142R seq# 43 : Prime line.

89FA0358R seq# 44 : Prime line.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-240.TXT/NMM/F03
DATE : Tuesday 29th August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Monday 28th August 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0478	090	100	1630	1531	28.706	Complete
0658	090	100	1630	1531	23.081	Continue

Total Daily Production Prime 51.788 Kms
Accumulated Prime Production 933.169 Kms

Total Daily Production Infill 0.000 Kms
Accumulated Infill Production 68.681 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
22/8	10:04	07:08	03:04	00:00	00:00
23/8	00:00	00:00	00:20	23:40	00:00
24/8	00:00	00:00	23:04	00:56	00:00
25/8	00:00	15:53	02:26	05:41	00:00
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
28/8	06:30	02:00	15:30	00:00	00:00

DAILY DIARY

0000 Weather standby.
0802 SOL 89FA-F0478-R. SEQ 39. Two boat prime.
1219 EOL 89FA-F0478-R. Complete. No Rho edits. Moderate to heavy swell throughout of 2.5/3.0 metres but from NNE which gave us side seas and affected noise much less. Circa 24 of 240 at 30uB, with 10 at 50uB and 2/3 up to 80/100uB all fairly short period and low frequency content (all measurements over 2 seconds minimum). Line accepted which was confirmed by uMAX processing, see below. Cable stability marginal and compasses very noisy, coverage being looked at to see if vessel separations were maintained, but a very adequate line for purely processed seismic data quality.
2107 SOL 89FA-F0658-R. SEQ 40. Two boat prime.
2400 Continue in production.

3. QC STATUS

3.1 Streamers

Trace S89 o/c - killed all lines.

3.2 Weather

Heavy side seas swell from NE at 2.5/3.5 metres interrupted shooting in the 270 direction.

3.3 Status at 0530 local time.

Rho preparing to shoot infill and Sigma to recalibrate Hyperfix.

3.4 MicroMAX

Processed line 89FA-F0478-R for swell noise and compared it with the benchmark line 89FA-F0498-R shot in calm weather. No significant degradation visible and line accepted. Regional velocity derived by D.Filler employed on both lines as they are only 600 metres apart and a direct comparison could be made.

NAV QC REPORT GECO RHO Monday 28th AUGUST 1989 JD 240

NAVIGATION : Port TailBuoy Dead.
Vessel Navigation using "CockTail" of Hyperfix and Syledis ranges. K7 ranges were noted several times as erratic and prone to lane slip. H7 ranges were not used and showed resid's of up to 10m..
Both Vessel and Stbd TB in spec for both sequences #39 and #40.

COMPASSES : Compasses during Seq #39 were out of spec. with 8 compasses showing DSD's of more than 1 deg.. The weather detiorated in the course of this line and the next time slot was not shot due to swell noise.
Sequence #40 showed much quiter compasses.
Stbd Compass #13 - Since Sequence #37 some erratic readings have been noted on this compass. Investigation of Seq #37 showed the following anomallies :
sp1218 reading 275deg. should be @95deg.
sp1504 277deg. @95deg..
Cable Tracker has rejected the following number of readings for being over 50deg. different from adj. compasses:
Seq#39 3 rejects.
Seq#40 8 rejects.
These bad readings were filtered out by GECO. The number of rejections is being monitored for each line.

MISCLOSURES :

SEPARATION :

ACOUSTICS : TailNet ranges Sequence #40 were noted as noisy - low %ages and high DSD's. Sequence #40 acoustics were currupted due to high vessel sep'n caused by Sigma's navigation crash and will be reviewed after reprocessing.

Lines Shot :

89FA0478R seq# 39 : Prime line.

Weather Down time between Sequences #39 and #40.

89FA0658R seq# 40 : Prime line.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-239.TXT/NMM/F03
DATE : Monday 28th August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Sunday 27th August 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0346	270	100	1630	1531	28.706	Complete
0490	090	100	1630	1531	28.706	Complete
0154	270	100	1630	1531	28.706	Complete

Total Daily Production Prime 86.119 Kms
Accumulated Prime Production 881.382 Kms

Total Daily Production Infill 0.000 Kms
Accumulated Infill Production 68.681 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:04	03:44	00:00
23/8	00:00	00:00	00:20	23:40	00:00
24/8	00:00	00:00	23:04	00:56	00:00
25/8	00:00	15:53	02:26	05:41	00:00
26/8	14:02	07:18	02:40	00:00	00:00
27/8	10:32	06:42	06:46	00:00	00:00
TOTAL	47:59	44:16	41:44	34:01	00:00

DAILY DIARY

0000 Line change.
0116 SOL 89FA-F0346-R. SEQ 36. Two boat primw,
0451 EOL 89FA-F0346-R. Complete. EDIT GUN SEQ ERR SPs 543-547 and otherwise an incident-free line.
0740 MOB boat away for a last attempt at port TB Pulse8.
0850 MOB boat back - replaced Pulse8 antenna but still only an UHF carrier with no Pulse8 modulation and seas too rough to open up waterproof boxes while TB in the water.
0746 SOL 89FA-F0490-R. SEQ 37. Two boat prime.
1115 EOL 89FA-F0490-R. Complete. An odd gun sequence split, caused by one of the Sigma Litton Boxes misbehaving, and not noticed by observers, led to EDIT BOTH VESSELS STARBOARD SOURCE SPs 1181 - 1239 (Reshoot missing columns on GECO A/C). Rho port TB still dead and WX now too rough to use MOB boat - however three out of four are working.
1414 SOL 89FA-F0154-R. SEQ 38. Two boat prime.

1742 EOL 89FA-F0154-R. Complete. EDIT GUN SEQ ERR SPs 607-610 & 654-660. Weather increasing during line and swell breakout at EOL was 8 of 240 traces at 30/50uB RMS (2s analysis). Weather increased on line change.
2018 Aborted line start with swell level at 40/50 traces bursting out at 100/200uB RMS (2s analysis). Weather standby.
2400 Weather standby.

3. OC STATUS

3.1 Streamers
Trace S89 dead on line 0154 only.

3.2 Weather
Calm for first part of period, increasing during evening to wind NNW 6/7, sea state 5, swell N 3 metres. Forecast to gradually decrease during the AM.

3.4 MicroMAX
Complete benchmark processing of good line 89FA-F0502-R.

3.5 Rho Offsets
It has become apparent since the crewchange that there is a discrepancy in the Source to First Receiver Offsets of both cables of 3 to 5 metres shorter than documented. We are backtracking through the several cable/configuration/deployment changes since the streamer "accident" and rebuild of 04/08/89 to determine exactly what happened and when. NAM/GECO Processing etc. will be telexed as to any retrospective changes in the documentation.

3.6 Coverage/Steering/Navigation
We are still getting near group gaps along the line swath boundaries, though better than before. Reason is that the vessels seem to be unable to maintain themselves in the correct columns. Since the steering abilities of the marine crew have not changed, and also from looking at crossline speed plots, we see that the main culprit is the poor navigation, which, coupled with the need to use high Kalman filtering, leads to difficulties in maintaining the crossline separation.
Both vessels have been asked to pay extra special attention to steering quality and on Rho the Captain will spend several hours per day on the bridge to see if position-keeping can be improved; however - I am not sanguine that we will get much improvement.
Comparing ECLHeader plots of F-3 blocks with the K-8 blocks shows clearly the difficulties we face.
Once again - let it be emphasised that an improvement in coverage is already noticed in shooting in this direction against the current.

Regards,
N.Morrison
^Z

NAV QC REPORT GECO RHO Sunday 27th AUGUST 1989 JD 239

89FA0346R seq# 36 : Prime line.
Port TailBuoy is dead.
Nav out of Spec. - "CockTail" fit in use and showing 15% of SD's over 5m.
H7 and K7 gating periodically.
Lost Lock F1 and F2 Terschelling at sp1255 to EOL, the remaining 2 Syledis and 2 Hyperfix stations provide only marginal geometry (@30deg each).

89FA0490R seq# 37 : Prime line.
Port TailBuoy is dead.
Main Fit using 3 Hyperfix stations as per Sigma. H7 notused due to Noise;resids 11m.
Acoustics stat's werenot available at EOL, but were QC'd after reprocessing and are good.

In the course of Sequence #37 the Antennae was replaced on the Port TailBuoy. Still only receiving signals from other TB's, the options now available with regard to fixing this equipment are reduced to three; taking on board the chase boat for troubleshooting, similiarly bring the streamer in, or complete replacement of the TB.
NB. the weather forcast is bad..

89FA0154R seq# 38 : Prime line.
Port TailBuoy is dead.
From sp 320 reverted to "CockTail" of Hyperfix and Syledis, due to instabilityof K7.
Terschelling unstable again and dropped from sp's 1060-1490.
Nav. out of Spec. - NB. 8% of main fit SD's over 5m.
Weather detiorating, several compasses and TailNet acoustics noted as noisey.

Line 89FA0658 was aborted at runin, down for weather 20:22 hours.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-238.TXT/NMM/F03
DATE : Sunday 27th August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Saturday 26th August 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0334	270	100	1630	1531	28.706	Complete
0502	090	100	1630	1531	28.706	Complete
0166	270	100	1630	1531	28.706	Complete
0646	090	100	1630	1531	28.706	Complete

Total Daily Production Prime 114.825 Kms
Accumulated Prime Production 795.263 Kms

Total Daily Production Infill 0.000 Kms
Accumulated Infill Production 68.681 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
20/8	13:24	07:38	02:58	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:04	00:00	00:00
23/8	00:00	00:00	00:20	23:40	00:00
24/8	00:00	00:00	23:04	00:56	00:00
25/8	00:00	15:53	02:26	05:41	00:00
26/8	14:02	07:18	02:40	00:00	00:00

DAILY DIARY

0000 SOL 89FA-F0334-R. SEQ 32. Two boat prime.
0331 EOL 89FA-F0334-R. Complete. No Rho edits. Port TB dead. Note NO MISSED SPs, reasonable feathers/cable separations and good cable depthkeeping.
0632 SOL 89FA-F0502-R. SEQ 33. Two boat prime.
0736 MOB boat away to check TBs.
0900 MOB boat back. No obvious problems. Will mount full expedition later to get TBs to Naarebout for repair.
0957 EOL 89FA-F0502-R. Complete. EDIT GUN SEQ ERR SPs 774-776 (Sigma nos). Rho 2 SPs behind Sigma at EOL. Hyperfix was unstable from around SP 800 and the cocktail solution was used in the prime fit until EOL. Port TB dead. Low ambient noise all line - weather has moderated, but should pick up again later.
1030 MOB boat away for TB repairs.
1130 MOB boat back.

1307 SOL 89FA-F0166-R. SEQ 34. Two boat prime.
1612 Sigma TBs now OK. MOB boat away to work on Rho port TB on line as weather is now quite calm.
1642 EOL 89FA-F0166-R. Complete. Rho was 10 SPs behind Sigma from SOL and 12 SPs behind at EOL. Rho was shooting but not recording for the first 10 SPs. EDIT RHO NO DATA RECORDED SPs 100-109 (Sigma SP numbers). EDIT GUN SEQ ERR SPs 1413-1415 (Sigma SP numbers). Port TB still dead.
1716 MOB boat back; changed UHF link antenna cable but Rho port TB still bad.
1911 SOL 89FA-F0646-R. SEQ 35. Two boat prime.
2242 EOL 89FA-F0646-R. Complete. No Rho edits. Port TB dead.
2400 Line change.

3. QC STATUS

3.1 Streamers

Line 89FA-F0334-R trace S71 open circuit and killed all line. All other lines 240 good traces.

3.2 Weather

Good shooting weather throughout with wind NW 2/4, sea state 2/4, swell NW 0.5/1.0 metres.

3.3 Status @ 0530 L

In production.

3.4 MicroMAX

Processing line 89FA-F0502-R as benchmark during this good weather spell.

3.5 RACAL Pulse8

We knew before job start that the Pulse8 TBs would not provide TB positioning of Syledis quality. Having said this, it is therefore very important that they be kept working at the best of their capabilities.
From the first line we saw that the quality of the four TBs was not uniform; at least on Rho we observe transient noise on the 'scope outputs from the Pulse8 receivers and this noise is present on one TB more than the other and so on.
There is no test equipment on board to determine what is happening, although we believe that the degradation is occurring on the 1.3GHz analogue RF link from the TBs to the boat.
In addition, although the UHF transmitters on the TBs are crystal controlled, the Drake 1.3GHz receivers have to be manually tuned and can be tuned to any of the four TBs; when there are problems, it can be difficult and timeconsuming to tell which TB is which.
The RACAL man on board Rho is competent and hardworking; he requested RACAL to supply some test gear for the crew change, namely at least a microwave frequency counter; I personally asked him to ask for a GHz spectrum analyser, which is the only instrument which would really have shown us what was going on in the RF domain. Analysers cost $10,000+ so this was a faint hope, but we received no test equipment at all.
It now transpires that RACAL would have brought some test eqpt

to the boats if they had got to Den Helder, though this eqpt would not have stayed on board. Since they have a workshop in Den Helder, this represented no commitment on their part at all and would have been of no use since the equipment is needed during production.
To summarise - The RACAL system has not been operating within its capabilities. Support to bring the equipment up to specification has NOT been forthcoming.

NAV QC REPORT GECO RHO Saturday 26th AUGUST 1989 JD 238

89FA0334R seq# 32 : Prime line.
Port TailBuoy is dead.
Sensor S2H2 is dead (8 ranges).

General Note. From Sequence #029 through #032, Main fit comprised 4 Hyperfix stations used with the following filtering by GECO:
EA 7m, Rate Filter 8m, Rate Limit 3sec's, and Range Gate 10m.
Filtering in use for Pulse 8 fits:
Rate Limit 2 microsec's, Rate Filter 10m.

89FA0502R seq# 33 : Prime line.
Port TailBuoy is dead.
Sensor S2H2 is still dead.
From sp802 due to problems with navigation, Sigma Main fit, is "Cocktail" of Hyperfix and Syledis ranges.

General Note. Hyperfix filtering unchanged, No filtering of Syledis ranges.

In the course of Sequence #33 the batteries and fuses were checked on the Port TailBuoy and the Antennae alignment corrected. Still only receiving signals from other TB's.

89FA0166R seq# 34 : Prime line.
Port TailBuoy is dead.
Sensor S2H2 is dead.
Main Fit - "CockTail" of Hyperfix and Syledis.
Sp100-440 no F1H1, fixed Sigma Stbd TB.

89FA0166R seq# 35 : Prime line.
Port TailBuoy is dead.
Main Fit sp100-210 Hyperfix,
sp210-EOL CockTail.
H7 (F1) noisey most of line.

The Port TailBuoy will taken aboard the Chase Boat for a thourgh check at the first opportunity.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-237.TXT/NMM/F03
DATE : Saturday 26th August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Friday 25th August 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0562	090	593	1490	898	16.838	Infill
0202	270	0	0	0	0.000	Reshoot
0202	270	377	1630	1254	23.513	Infill
0634	090	120	1630	1511	28.331	Infill

Total Daily Production Prime 0.000 Kms
Accumulated Prime Production 680.438 Kms

Total Daily Production Infill 68.681 Kms
Accumulated Infill Production 68.681 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:38	02:58	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:04	00:00	00:00
23/8	00:00	00:00	00:20	23:40	00:00
24/8	00:00	00:00	23:04	00:56	00:00
25/8	00:00	15:53	02:26	05:41	00:00

DAILY DIARY

0000 Port cable off DILT.
0100 Removed repair adaptor (1 metre special section at tail of lead-in used for rerouting wires) and modified chains on DILT clamp.
0305 Port TB Pulse8 not working.
0330 Both cables out in DILT. No spiking on port streamer. Deploy sources.
0504 Nominal slot-time for infill line 0562 - go off contractor downtime and on to operational infill time.
0640 SOL 89FF-F0562/R. SEQ 29. Single boat 40 fold chargeable infill line with coverage required on cols: 141-146 various groups.
0842 EOL 89FF-F0562-R. Complete. No edits. Port TB dead. Front acoustics just adequate as still being tuned in on line (only way to do it) and tail acoustics poor.
1133 SOL 89FA-F0202*R. SEQ 30. Single boat reshoot at 40 fold of sequence 17 (Rho port guns air leak - off) with coverage required on cols: 493-496.

1210 EOL 89FA-F0202*R. Complete. No edits. Port TB dead. Carry on without stopping straight into infill line.
1210 SOL 89FF-F0202/R. SEQ 30. Single boat 40 fold infill line with coverage required on same cols:1493-496.
1457 EOL 89FF-F0202/R. Complete. No edits. Port TB dead. Front acoustics OK but tailnet still has an unresolved problem with position displayed on 3D (will not be used in processing).
1746 SOL 89FF-F0634/R. SEQ 31. Single boat 40 fold infill line with coverage required on cols: 72-74 mostly groups 2/3/4.
2114 EOL 89FF-F0634/R. Complete. No edits. Port TB dead. Some swell burstout at low levels 10/30uB RMS. OmniSeis crash on run-in led to a bit of a panic at SOL and though up and running at SOL, in the meantime vessel had wandered several columns to port and therefore coverage will be missing at this end of the line (line is just being reprocessed). MISSING INFILL COVERAGE ON THIS LINE PORTION TO BE REACQUIRED AT GECO EXPENSE. Also lost 21 shots and had degraded SP spacing d/t usual dusk nav instability. For some reason the very stable Syledis ranges were not used in the prime fit, which would have improved matters. This will be corrected in future.
2400 SOL 89FA-F0334-R. SEQ 32. Two boat prime.

3. OC STATUS

3.1 Streamers

Trace S28 open-circuit and killed all lines. Streamer stability much improved shooting against the current.

3.2 Weather

Start of period wind NW 4, sea state 3, swell NW 2 to 3 metres reducing gradually to wind NNW 4, sea state 4, swell NNW 1.5 to 2.0 metres.

3.3 Status @ 0530 L

In prime production.

3.4 Feather/Speed/Balance/Coverage

First two lines shot against the current show much improved feathers, cable stability and nav stability. These were single boat lines but results are encouraging. Maximum feather experienced on lines 0562 and 0202 was 2.5 degrees and we maintained an average shooting speed of 4.5 knots without problem. Water speed was logged at no more than 5 knots though Rho still has spikes on the speed log which often indicate 0.5 knot high.
Third line 0634 infill 1 boat suffered a 3D crash on run-in which led to us being well port of the required columns at line start; subsequent manoeuvres to get back on line make the feather plot for this line meaningless for slot feather evaluation.
Since then, shooting a prime line next morning has confirmed the wisdom of changing the slot allocations. This will save both NAM and GECO money and time.

3.5 MicroMAX

As a rider to yesterday's comments - I have been trying for some time to find out whether the updated uMAX software package, already six months old, could be obtained for the remainder of this prospect. It turns out that this is already in London and has been for some time, but Geco apparently do not consider this of importance. Jack Craig wanted it but was unable to generate interest. It appears that the responsible people ashore are unaware that it is in Geco's interest to actively support on board processing. It has somehow to be made clear to GECO management that the uMAX has been of considerable value to GECO as well as to NAM and that this is a department that has to be supported, not just an afterthought.

NAV QC REPORT GECO RHO Tuesday 22nd AUGUST 1989 JD 234

89FA0178R (virgin) sequence 025 dir 270 deg

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prime fit : Hyperfix F1. (4 ranges). K7 several lane slips (sps 308, 597, 1490)
sd jumped from aver. 2.5 to aver. 8/9 at approx sp 1453-EOL due to instability of K7. Qc stats continued with K7 in fit wher as Geco took out K7 at Sp1507-EOL.
Herefore positioning out of spec between sp 1507-EOL
for not having good configuration.
Syledis : unstable troughout line and therefor unusefull for cocktail
pulse/8 : port over limits.
misclosure : port is marginal

89FA634R (virgin) sequence 026 dir 090 deg

Compasses and Separation	Y	Compasses #'s 6 & 24 possibly a little high # 11 a little low, but all within spec.
	Y	Tail seperation wider than usual, SP's 970-1300 out of spec in parts.

89FA322R (virgin) sequence 027 dir 270 deg

Compasses	Y	Compasses #'s 13 & 33 have Dsd's of 1.1. Compass # 6 reading 1 deg. high. Compass # 11 reading approx. 1 deg low.

89FA562R (virgin) sequence 028 dir 090 deg

Single boat reshoot.

Radio Nav ranges	Y	Some instability noted but sufficient good available.

Compasses	Y	Compass 33 had Dsd 1.2.
Misclosure to		Port misclosures higher than Starboard due less stable Pulse 8 on that float.
Acoustics Single	Y	Raw data good, some stats corrupted in boat reshoot mode.

NAV QC REPORT GECO RHO Wednesday 23nd AUGUST 1989 JD 235

Both Cables on board and on course for crew change rendevous.

Crew change : K. baker and B. v.d. Heyd off.
S. Balmforth and D de Boer on.

Stbd. Cable being deployed and Measured.

NAV QC REPORT GECO RHO Thursday 24th AUGUST 1989 JD 236

Port Cable being deployed and Measured.

Port TB 10m rope snapped and replaced.

The stretch and rope measurements were not changed in Survey Definition. Measurements made at start of prospect were found to be still valid; largest diff. was 0.6m.

New Port Compass #27 ; New BCU #1731 (old # 3110).

21.00 Standing by for weather.

NAV QC REPORT GECO RHO Friday 25th AUGUST 1989 JD 237

89FF0562R seq# 29 : Single Boat Infill.
Port TailBuoy dead, GECO to investigate when by MOB boat when weather improoves.

89FF0202R seq# 30 : Single Boat Infill\Reshoot.
Port Tailbuoy still dead.
Compasses out of spec. - 9 compasses showing DSD more than 1.0 deg..

89FF0634R seq# 31 : Single Boat Infill.
Port TailBuoy still dead.
Hyperfix station K7 noisey for part of line.

General Note - Acoustic Stats corrupted when in Single Boat Mode.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-236.TXT/NMM/F03
DATE : Friday 25th August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Thursday 24th August 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS

Total Daily Production Prime 0.000 Kms
Accumulated Prime Production 680.438 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
18/8	00:00	00:00	12:34	11:26	00:00
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:36	02:58	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:04	00:00	00:00
23/8	00:00	00:00	00:20	23:40	00:00
24/8	00:00	00:00	23:04	00:56	00:00

DAILY DIARY

0000 Preparing port TB.
0030 Launching port TB and measuring tail stretch etc.
0600 Start recovering port cable d/t forecast force 8.
0745 Port TB rope parted while hauling it up the slip.
1030 Port TB recovered on board; fortunately chase boat was able to get a line on it.
1130 Start port TB out.
1210 Recover port TB - Pulse8 not working.
1255 Start port TB out again after fuses replaced/fixed.
1525 Measure port cable front stretches.
1900 Port streamer out in wide (both now out).
1955 Turn on heading 090 to check swell breakout - still 40/60% traces at up to 600uB. Swell height still 3 to 4 metres.
2236 At SOL position for line 89FA-F0322*R reshoot and still far too noisy to shoot.
2300 Port cable spiking as it did a couple of weeks ago - bring in port lead-in.
2304 Off weather standby on to Contractor downtime - this is retrospective - see explanation tomorrow's .TXT.
2400 Port cable off DILT.

3. QC STATUS

3.1 Streamers

No production d/t weather - streamers OK until spiking on port cable still being investigated.

3.2 Weather
Came up during the day to force 6/8 with swells 3 to 4 metres. Still too rough to shoot at end of period.

3.3 Status @ 0530 L
Spiking caused by "repair adaptor", a 1m section at tail of lead-in, removed and changed DILT arrangement and all now OK. Preparing to shoot infill single boat on 0562.

3.4 MicroMAX
I am very upset with Geco that the new uMAX operator, Jack Craig, was not sent out with the "chiefs" on this crewchange and as a result swung past his offgoing colleague, David Filler, without even one minute of briefing as to what had been going on the last couple of weeks. Geco seem to think that it is not very important, whereas the fact is that both NAM and GECO have been saved a lot of money and the uMAX operator is therefore a key man and should be treated as such. Fortunately Jack was already on the Rho for K14 and therefore can make out OK, but all the careful and complicated data flows, supergathers, etc. etc. which Dave set up and was going to brief Jack on, he now has to go through and work out for himself what they all do and how. This is a very unsatisfactory situation and is part of the general mishandling of this last crew change.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-235.TXT/NMM/F03
DATE : Thursday 24th August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Wednesday 23rd August 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
Total Daily Production Prime					0.000	Kms
Accumulated Prime Production					680.438	Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
17/8	08:35	06:00	02:23	07:02	00:00
18/8	00:00	00:00	12:34	11:26	00:00
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:38	02:58	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:04	00:00	00:00
23/8	00:00	00:00	00:20	23:40	00:00

DAILY DIARY

0000 Retrieve trailing equipment.
0100 All trailing equipment on board. Pick up speed to rendezvous with vessel "Deneb" at 11:30 hours.
0800 At rendezvous point off Lauwerzoog.
1530 Start back out to prospect after crew change.
1850 Start stbd streamer out. Weather has been picking up all afternoon.
2340 Stbd streamer out in wide and good. Definitely not shooting weather - breakout present with streamer at 15 metres depth. At 7 metres 80/90% traces breaking out. Continue deploying port streamer on weather standby.

3. QC STATUS

3.1 Streamers
Both streamers should be in good condition. Test OK on reels and stbd cable deployed and looking good.

3.2 Weather
Increasing during afternoon/evening to 5/6 gusting 7 and swell height around 3 metres.

3.3 Status @ 0530 L
Deploying port cable. Stbd cable out in wide.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-234.TXT/NMM/F03
DATE : Wednesday 23rd August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Tuesday 22nd August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0178	270	100	1630	1531	28.706	Complete
0634	090	100	1630	1531	28.706	Complete
0322	270	100	1630	1531	28.706	Complete
0562	090	0	0	0	0.000	Reshoot

Total Daily Production Prime 86.119 Kms
Accumulated Prime Production 680.438 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	06:00	02:23	07:02	00:00
18/8	00:00	00:00	12:34	11:26	00:00
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:38	02:58	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00
22/8	10:04	07:08	03:04	03:44	00:00

DAILY DIARY

0000 Line Change.
0208 SOL 89FA-F0178-R. SEQ 25. Two boat prime.
0529 EOL 89FA-F0178-R. Complete. Poor nav (K7 F1 slipping and erratic Syledis) led to EDIT ALL SPs 1501-1630 (Two boat reshoot on NAM A/C).
0819 SOL 89FA-F0634-R. SEQ 26. Two boat prime.
1140 EOL 89FA-F0634-R. Complete. No Rho edits.
1429 SOL 89FA-F0322-R. SEQ 27. Two boat prime.
1751 EOL 89FA-F0322-R. Complete. Sigma autofires and a couple of misfires from each vessel led to EDIT ALL (GUNS) SPs 100-130 (Two boat reshoot on GECO A/C). Rho stbd cable caught in swell when speed dropped and led to EDIT RHO STBD CABLE (SHALLOW) SPs 1500-1590 (Single boat reshoot on GECO A/C). Also EDIT GUN SEQ ERR SPs 1008-1009 & 1043-1047. Some breakout all line. Scrappy line altogether (Sigma had port source problems too). Sigma now picking up streamers for crew change and Rho going for a single boat reshoot.
1951 Allocated 2hr operational line change period expires.
2016 SOL 89FA-F0562*R. SEQ 28. Single boat low feather reshoot. Reshoot of Seq: 4 (14/08/89) where Rho nav

failed. Sigma already had a go at the top four columns and got group 1s OK but groups 2, 3 & 4 required still on columns 135-139.

2046 EOL 89FA-F0562*R. Complete. No edits. Pick up trailing equipment for Geco crew change off Lauwerzoog.

2400 Retrieve trailing equipment.

3. QC STATUS

3.1 Streamers

Trace S60 spiking and killed all lines today except 0562 no bad traces..

3.2 Weather

Came up slightly during period to wind NW 4/5, sea state 3/4, swell W 1.5/2.0 metres.

3.3 Status @ 0530 L

Heading inshore for Geco crew change.

Regards,
N.Morrison

TO : NAM Aseen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-233.TXT/NMM/F03
DATE : Tuesday 22nd August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Monday 21st August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0190	270	100	1630	1531	28.706	Complete
0622	090	100	1630	1531	28.706	Complete
0310	270	100	1630	1531	28.706	Complete
0514	090	100	1630	1531	28.706	Complete

Total Daily Production Prime 114.825 Kms
Accumulated Prime Production 594.319 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	06:02	02:23	07:02	00:00
18/8	00:00	00:00	12:34	11:26	00:00
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:38	02:58	00:00	00:00
21/8	13:21	07:15	03:24	00:00	00:00

DAILY DIARY

0000 On Line Change.
0119 SOL 89FA-F0190-R. SEQ 21. Two boat prime.
0443 EOL 89FA-F0190-R. Complete. EDIT GUN SEQ ERRS SPs 1573-1579(S) and also Sigma GDR and GUN SEQ PROBLEM led to EDIT BOTH SPs 100-109.
0730 SOL 89FA-F0622-R. SEQ 22. Two boat prime.
1046 EOL 89FA-F0622-R. Complete. EDIT GUN SEQ ERRS SPs 1552-1555(S) ONLY.
1341 SOL 89FA-F0310-R. SEQ 23. Two boat prime.
1704 EOL 89FA-F0310-R. Complete. EDIT GUN SEQ ERR SP 672(S) ONLY.
1950 SOL 89FA-F0514-R. SEQ 24. Two boat prime.
2308 EOL 89FA-F0514-R. Complete. EDIT GUN SEQ ERRS SPs 476-483(R) & SPs 533-536(S).
2400 Line Change.

3. QC STATUS

3.1 Streamers
Trace 560 spiking and killed all lines today.

3.2 Weather
Start of period wind SW 4, sea state 3, swell SW 0.5/1.0 metres increasing slightly towards end of period with wind W 4, sea state 4, swell SSW 1.0/1.5 metres. Reasonable shooting weather throughout.

3.3 Status @ 0530 L
In production.

3.4 Speed/Shooting Direction/Norstar/OmniSeis
Here is the situation regarding slot times as seen from the Rho. Note that I have been using the ECLHeader to plot out our Speeds (along track/across track/water log) and also system and gyro heading and using these to derive current on line heading and crab angles. Combined with feather logs from OmniSeis, GDR error reporting, Nav line logs, Observers logs etc. - a clear picture has emerged.
Essentially we have a following current of up to 1 knot on most lines. The AVERAGE bottom speed has therefore had to be kept up by Sigma to keep the cable depths in spec and also to keep reasonable cable separations. Average bottom speed is 4.7 knots on nearly all lines - the least has been 4.6 knots. Since RHO has to adjust speeds to match Sigma along and across line, we find that RHO regularly experiences bottom speeds of up to 5.5 knots.
At these high speeds there are several adverse (for NAM) results; the ND computer on RHO handling OmniSeis is unable to process fast enough and we lose shots - when we lose a shot and Sigma does not, then there is often a GUN SEQ ERROR - this averages 0.5% to 1% of shots - lost and gone forever because of the gun errors.
Secondly the OmniSeis is subject to Modus errors, which result in gaps in RHO coverage on every line (note that reprocessed coverage on Sigma is OK I am told - it is only the display on Rho that is wrong).
Another result is that the GM2B errors on the External Header Link have increased from 10 per line to 30 per line and I believe this is also caused by the priority interrupt real-time operating system used by the Nord Computers having to work too hard. Note however that this is a minor though annoying problem, as the Gun Mask transfer on OmniSeis link appears to be clean and is used for binning. EXT HDR GM2B is a QC tool only.
And perhaps the most serious result for NAM is the unpredictable feathers caused by the following current leading to extra INFILL requirements. The strange tidal flow here means that we need very good feather matches and we are NOT getting this.

To SUMMARISE from RHO:-
a) 1% lost data (missed SPs/Gun seq errors).
b) Modus resets (Rho reprocessing looks horrible - Sigma's is OK).
c) GM2B errors on EXT HDR link (QC problem only provided OmniSeis gun mask data is OK which it is so far).
d) Extra Infill required on swath boundaries d/t feather.

The alternatives available are:-
a) Carry on regardless.
b) Slow down the average shooting speed so that the gun sequence errors are avoided (will make cable control in both planes worse and increase the infill requirements).
c) Shoot against the current - which will immediately sort out all the above problems - but will lead to extra infill on the swath boundaries where the feathers have been changed.
My own recommendation from Rho is the same as Sigma - we should reverse the slot timings and shoot against the current and change over as soon as possible.

NAV QC REPORT GECO RHO SUNDAY 20TH AUGUST 1989 JD 232

89FA202R (virgin) sequence 017 dir 270 deg

Prime fit Hyperfix F1. TB port unstable but mean misclosure within 25m. Frontnet 2 ranges with low counts. Tailnet 3 ranges with low counts.

89FA610R (virgin) sequence 018 dir 090 deg

At sp226 swapped prime fit from Hyperfix F1 to cocktail. K7 had few laneslips between sp 1130-1185 and sp 1375-1490. QC stats are corruptedaccording prime fit. Acoustics quiet on this line.

89FA298R (virgin) sequence 019 dir 270 deg

Prime fit is cocktail. Misclosures pulse/8 <-> compasses high but within 25m.

89FA526R (virgin) sequence 020 dir 090 deg

Prime fit is cocktail.K7 (F1) unstable. Pulse/8 losthappisburgh signal between sp 690-750. TB port pulse/8 unstable.
Misclosure at port TB high. No acoustic stats available due to hangup in Norstar system.

NAV QC REPORT GECO RHO SUNDAY 22nd AUGUST 1989 JD 233

89FA0190R (virgin) sequence 021 dir 270 deg

Pulse 8 : Tb port stable but not within expected tolerance
Misclosure : Pulse/8 <-> compasses average within similar ranges.
Frontnet : S1R2-S1H1, G4R1-S4H2, S1R2-S4H2 (LOW COUNT)
Tailnet : F2R1-S2H4, F3R1-F1H1 (low count)

89FA622R (virgin) sequence 022 dir 090 deg

Radio Nav	Y	Occasional instability noted on K7 and Borkum (Hyper-Fix) and Gorm. (Syledis). Port tailbuoy Pulse 8 continues to be less stable than Starboard.
Compasses	Y	1 deg difference between #'s 6 & 7.
Misclosure	N	A little high particularly Port tailbuoy.

89FA310R (virgin) sequence 023 dir 270 deg

Radio Nav	Y	SP 140-180 ship's Pulse 1 cycle out. Instability noted on several Hyper-Fix and Syledis ranges during line but always sufficient good ranges available. Port tailbuoy Pulse 8 continues to produce higher SD's than Starboard.
Compasses	Y	Compass #'s 13, 30 and 33 have Dsd's of 1-1.2. Compass # 6 0.9degs higher than adjacent and compass # 11 reading a little low.
Misclosure	N	Port tailbuoy misclosures higher than starboard.
Separation	Y	Low seperation between streamers 1 and 4.

89FA514R (virgin) sequence 024 dir 090 deg

Prime fit : sp 501 - 445 Cocktail
: sp 446 - eol hyperfix F1.
K7 slipped several times. Pulse/8 TB port not within its capabilities. Misclosure TB port <-> compasses near limits. Acoustics very well.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-232.TXT/NMM/F03
DATE : Monday 21st August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Sunday 20th August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0202	270	100	1630	1531	28.706	Complete
0610	090	100	1630	1531	28.706	Complete
0298	270	100	1630	1531	28.706	Complete
0526	090	100	1630	1531	28.706	Complete

Total Daily Production Prime 114.825 Kms
Accumulated Prime Production 479.494 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	04:00	02:23	07:02	00:00
18/8	00:00	00:00	12:34	11:26	00:00
19/8	12:20	08:00	03:40	00:00	00:00
20/8	13:24	07:37	02:59	00:00	00:00
TOTAL	56:01	41:47	49:08	21:04	00:00

DAILY DIARY

0000 On line change.
0033 SOL 89FA-F0202-R. SEQ 17. Two boat prime.
0402 EOL 89FA-F0202-R. Complete. One Rho array (P2) developed an air leak on run-in and had to be pulled in and repaired at SOL. EDIT RHO NO PORT GUNS (air leak) SP 100-376 (single boat reshoot required on SECO A/C). Vessel and stbd TB nav good. Port TB nav unstable as usual though locked OK.
0641 SOL 89FA-F0610-R. SEQ 18. Two boat prime.
0958 EOL 89FA-F0610-R. Complete. EDIT GUN SEQ ERRORS SPs 692-693(S), 934-942(R), 945-947(S), 952-953(S), 1187(R) & 1199-1202(S). All caused by vessel nav instability mainly on Sigma. Mechanism appears to be closure loss from Sigma to Rho, resulting in FLIP on Sigma but not on Rho and overshooting until sequence corrected.
1255 SOL 89FA-F0298-R. SEQ 19. Two boat prime.
1614 EOL 89FA-F0298-R. Complete. No Rho edits. Hyperfix more stable this line - reason unknown.
1904 SOL 89FA-F0526-R. SEQ 20. Two boat prime.

2223 EOL 89FA-F0526-R. Complete. Hyperfix instabilities returned and caused EDIT GUN SEQ ERRS SP 221-223(S), 745-748(S), 1433-1439(S), 1500-1504(S) & 1591-1598(S) (all Sigma SP numbers).
2400 On Line Change.

3. QC STATUS

3.1 Streamers

Trace 560 spiking and killed for all lines.

3.2 Weather

Start of period wind SSE 3, sea state 3, swell SW 1 metre steady throughout the day ending with wind S 3, sea state 2/3, swell SSW 0.5/1.0 metres, good shooting weather.

3.3 Status @ 0530 L

In production.

Regards,
N. Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-231.TXT/NMM/F03
DATE : Sunday 20th August 1989
ATTN : C.CORSTEN/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Saturday 19th August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0214	270	554	1630	1077	20.194	Incomplete
0598	090	100	1630	1531	28.706	Complete
0286	270	100	1630	1531	28.706	Complete
0538	090	100	1630	1531	28.706	Complete

Total Daily Production Prime 106.313 Kms
Accumulated Prime Production 364.669 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	06:00	02:23	07:02	00:00
18/8	00:00	00:00	12:34	11:26	00:00
19/8	12:20	08:00	03:40	00:00	00:00

DAILY DIARY

0000 Running on in line direction line 89FA-F0214-R, deviated off-line. Swell noise, severe on run-in reducing very quickly. Rho PC decided to get back on line and start acquisition.
0003 Start recording but still offline and gun sequence out.
0027 First Good SP on line SP 360 - but d/t operator error Rho port guns not firing.
0052 First SP with all four arrays firing was SP 554. After uMAX processing this was accepted as first good SP as swell was reducing rapidly from Cable Noise Strip time at around 2330.
0312 EOL 89FA-F0214-R. SEQ 13. Incomplete. Line processed with uMAX for swell noise and accepted SPs 554-1630.
0558 SOL 89FA-F0598-R. SEQ 14. Two boat prime.
0915 EOL 89FA-F0598-R. Complete. Good line. EDIT GUN SEQ R&R SPs 152-157(Sigma nos). Some swell noise reducing on line.
1210 SOL 89FA-F0286-R. SEQ 15. Two boat prime.
1533 EOL 89FA-F0286-R. Complete. Good line in all respects except propagation conditions appear to have changed (we have mobile 'fone working for 1st time on this prospect); Pulse-8

is good but Hyperfix adversely affected, leading to laneslip (especially Hyperfix K7 F1 & F2) and use of HYPERFIX/SYLEDIS cocktail in prime vessel solutions. Vsl mean SD was good at 1.9 metres but many lost shots especially circa SPs 700-870 caused sequence reversals. EDIT GUN SEQ ERR SPs 703-709, 713-720, 760-762 & 771-775 (all Sigma nos).
1820 SOL 89FA-F0538-R. SEQ 16. Two boat prime.
2140 EOL 89FA-F0538-R. Complete. Same type of Hyperfix difficulties led to instabilities around SPs 750-1300 and EDIT GUN SEQ ERR SPs 393-407, 1188-1190, 1234-1237, 1257-1258, 1265-1267 & 1291-1296 (all Sigma nos).
2400 On line change.

3. QC STATUS

3.1 Streamers

Line 0598 - trace S60 spiking and killed all line; trace P63 low amplitude all line.
Lines 0286 & 0538 - no bad traces.

3.2 Weather

Fairly heavy swell at SOD reducing quickly to manageable levels.

3.3 Status @ 0530 L

In production.

3.4 MicroMAX

Processed line 89FA-F0214-R SEQ 13 for swell noise. Swell noise was reducing rapidly from Cable Noise Strip Time onwards; brute stack had merge problem around SP 400 and we are not sure of the first portion of this line, but definitely from SP554, when all gun arrays started firing properly, the processed brute stack is indistinguishable in quality from a reference neighbour line 89FA-F0238-R. SEQ 13 therefore accepted as an Incomplete Prime Line SPs 554-1630.

NAV QC REPORT GECO RHO Saturday 19TH AUGUST 1989 JD 231

89FA0214R sequence 013 dir 270 deg

Pulse/8 : Port is miserable.
Compasses : Acoording Geco stats stbd streamer very noisy and port streamer marginal. Gridnav QC stats show better.
C01,C03,C07 (stbd) DSD >= 1
C30,C33 (port) DSD >=1
Misclosure : Port float (p/8 <-> comp) average 25m.
Frontnet : S1R2-S1H1 (low count)
Tailnet : F2R1-S2H4 (low count)

89FA0598R sequence 014 dir 090 deg

Radio Nav Y Majority of Hyperfix fixes with SD's over 5m occur at SOL due to instability on K7.

Compasses	Y	Compass # 6 reading a little high but within spec.
Acoustics	Y	Front net, active mode. Tail net, passive mode.

89FA0286R sequence 015 dir 270 deg

Radio Nav	Y	Dan syledis unstable removed from fix. SP 690-850, Hyper-Fix unstable, several shots missed but most instability on Sigma.
Compasses	Y	Compasses #'s 6, 10, 24 and 28 reading approx.1 deg. high. All disabled in Gridnav between Sp's 845 and 880.
Misclosure	Y	High misclosures during first part of line improved when 4 compasses above disabled.
Acoustics	Y	Revised acoustic velocity 1511.2 used following Temperature salinity profile.

89FA0538R sequence 016 dir 090 deg

Radio Nav	Y	Several lane slips on K7 (F1 & F2) SP's900-1200. Terschelling unstable from SP700 particularly F2. Where GECO change from Hyper-Fix to "Cocktail"fix position relative to Gridnav moves approx.5m.
Misclosure	N	Port misclosures higher than Starboard.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-230.TXT/NMM/F03
DATE : Saturday 19th August 1989
ATTN : C.CORSTEN/A.BANDELL/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Friday 18th August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS

Total Daily Production Prime 0.000 Kms
Accumulated Prime Production 258.356 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
12/8	00:00	06:32	00:00	17:28	00:00
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	06:00	07:23	07:02	00:00
18/8	00:00	00:00	12:34	11:26	00:00

DAILY DIARY

0000 Deploying port cable. Leakage observed so having to chase this while deploying.
0345 D/t port streamer leakage problems, Rho will not be ready for next time slot at 0513. Sigma for single boat reshoot while Rho continues streamer repair work.
0600 Working on port cable. Port TB Pulse8 very noisy. RACAL investigating. Head East for line slot at 1126.
0630 MOB boat deployed to Sigma to collect spare UHF TB receiver and receiving antenna.
0800 Port cable out in DILT with no leakage. Rho port TB still problems - appears to be locking on to Sigma stbd TB.
1120 Abort line 89FA-F0286-R on run-in d/t swell noise over 30/40% traces with several traces at 100/200uB (2 second analysis). On weather downtime. Troubleshooting Rho port TB Pulse8 - now looks like problem may be that TB is not transmitting.
1220 Commence retrieving guns to check out port TB.
1300 4 gun strings on board - start port cable on board.
1545 Port cable and TB up. Checking TB Pulse8 and UHF link.
1700 Port TB ready to go out with new batteries and new transmitter.
2145 Deploying port streamer out in wide.
2245 Turn onto run-in to line 89FA-F0214-R.
2348 Abort run-in on line d/t swell breakout.
2400 Running on in line direction, deviated off-line.

3. QC STATUS

3.1 Streamers

No production today - repaired F4H1 port cable and also port TB Pulse8.

3.2 Weather

Increased during first part of period to wind SW 5/6, sea state 4/5, swell SW 1.5/2.5 metres and remained at this level.

3.3 Status @ 0530 L

Party Chief on Rho decided to shoot 0214 anyway and check swell with uMAX, but vessels were not back on line and in production until SP 360. This line is being uMAXed.

NAV QC REPORT GECO RHO FRIDAY 18TH JULY 1989 JD 230

Cablework done. Port streamer and tailbuoy on deck to repair F4H4 hydrophone. Pulse/8 receiver/UHF transmitter replaced.

HCU 3110 replaced to position #20
BCU 2900 replaced to position #27

Line 89FA0206R aborted due to swell noise.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-229.TXT/NMM/F03
DATE : Friday 18th August 1989
ATTN : C.CORSTEN/A.BANDELL/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Thursday 17th August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0226	270	811	1630	820	15.375	Complete
0586	090	100	1630	1531	28.706	Complete
0274	270	100	1630	1531	28.706	Complete

Total Daily Production Prime 72.787 Kms
Accumulated Prime Production 258.356 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
11/8	00:00	13:56	00:00	10:04	00:00
12/8	00:00	06:32	00:00	17:28	00:00
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00
17/8	08:35	06:00	02:23	07:02	00:00

DAILY DIARY

0000 Continue in production 89FA-F0226-R. FSPD 811.
0149 EOL 89FA-F0226-R. Complete. EDIT GUN SEQ BAD SPs148-153 (Sigma SP nos). Port TB hydrophone F4H1 dead all line.
0431 SOL 89FA-F0586-R. SEQ 10. Two boat prime.
0750 EOL 89FA-F0586-R. Complete. EDIT GUN SEQ BAD SPs1130-1132 (Sigma SP nos). F4H1 still dead all line.
0800 MOB boat away to fix F4H1.
0850 MOB boat reports wiring broken inside streamer ahead of breakout point at tail of tail stretch. Probably connector at tail of tail stretch corroded - has happened before. MOB boat now changing out Compass/Bird C28 (Port 8) which had 90 degree wrong readings in one line direction.
0950 MOB boat back on board.
1044 SOL 89FA-F0274-R. SEQ 11. Two boat prime.
1411 EOL 89FA-F0274-R. Complete. EDIT GUN SEQ BAD SPs1571-1576 (Rho SP nos). Rho stbd cable shallow for a portion, mainly Bird 10 to 3.5m followed briefly by Bird 11. This line portion (SPs 1333-1465) being evaluated by MicroMAX for acceptance or not. Both Rho TBs poor (intermittent loss of lock) from SOL-SP230 then adequate after that. Sigma also had TB problems this line (NAM evaluation),

with their stbd TB mast reported broken and port TB signals corrupted. Decision was made for both vessels to pull streamer, Rho for F4H1 and Sigma for stbd Pulse8 TB

1500 Heading West - start port cable on board.

1730 Port cable up as far as TB rope. Looking for F4H1 wire break.

2230 Start port cable back out. F4H1 was corroded/broken wire at tail of tail stretch section inside connector.

2400 Deploying port cable. Leakage observed so having to chase this while deploying.

3. QC STATUS

3.1 Streamers

Lines 0226 & 0586 240 good traces.
Line 0274 trace P81 noisy all line circa 25uB.
Port cable being deployed/troubleshooting leakage after repairing F4H1.

3.2 Weather

SOD wind VAR 3, sea state 3, swell SSW 1/1.5 metres - came up slightly during the period to wind WSW 5, sea state 4, swell WSW 2 metres.

3.3 Status @ 0530 L

Still deploying port cable and chasing leakage. Sigma will go off for single boat reshoot(s).

3.4 MicroMAX

Waiting to see Rho stbd cable line 89FA-F0274-R SEQ 11 to evaluate Marginal/shallow depths (Compass/Bird 10).

NAV QC REPORT GECO RHO THURSDAY 17TH AUGUST 1989 JD229

89FA0226R sequence 009 dir 270 deg

Hyperfix prime : occasionally a lane slip on K7.
Pulse/8 : Tailbuoys marginal.
Acoustics : F4H1 non operational.
NO STATS AVAILABLE FROM OMNISEIS DUE TO HANGUP

89FA0586R sequence 010 dir 090 deg

Hyperfix : prime fit is Hyperfix F1 (4 ranges)
Pulse/8 : TB port marginal.
Compasses : C28 (port) out of operation
Acoustics : F4H1 non operational.

89FA0274R sequence 010 dir 270 deg

Radio Nav Y Except Tailbuoy Pulse 8 SOL to SP 230 where loss of lock and heavy instability prevailed.
Hyper-Fix, particularly Freq.2, unstable at very end of line.

Compasses	Y	BCU 06 reading 1.1 and 0.7 degs higher than BCU's 05 and 07 respectively.
Acoustics	Y	Front net in spec.
	N	Tail net very poor with both F1H1 and F4H1 non operational. Most remaining ranges show very low number of successful interrogations caused by time taken by software to resolve limited network rather than hardware faults.

Starboard streamer recovered in order to rectify F4H1 fault.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-228.TXT/NMM/F03
DATE : Thursday 17th August 1989
ATTN : C.CORSTEN/A.BANDELL/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Wednesday 16th August 1989@2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0574	090	100	1630	1531	28.706	Complete
0262	270	100	1630	1531	28.706	Complete
0550	090	100	1630	1531	28.706	Complete
0226	270	100	810	711	13.331	Continue

Total Daily Production Prime 99.450 Kms
Accumulated Prime Production 185.569 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
10/8	00:00	17:22	02:30	04:08	00:00
11/8	00:00	13:56	00:00	10:04	00:00
12/8	00:00	06:32	00:00	17:28	00:00
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00
16/8	11:31	06:00	06:29	00:00	00:00

DAILY DIARY

0000 Continue working on/deploying port streamer.
0416 SOL 89FA-F0574-R. SEQ 6. Two boat prime.
0738 EOL 89FA-F0574-R. Complete. EDIT RHO NO DATA RECORDED SPs 500-548 (GDR hang - shooting OK) RESHOOT GECO A/C. Port TB hydrophone F4H1 dead all line. Strong following current caused variable tail cable separations over much of the line.
1001 SOL 89FA-F0262-R. SEQ 7. Two boat prime.
1319 EOL 89FA-F0262-R. Complete. EDIT GUN SEQ BAD SPs1329-1377 caused by Hyperfix lane slip on Sigma. RESHOOT WITH 10SP OVERLAP EITHER SIDE SPs 1319-1387 on NAM A/C (poor Nav propagation). Rho tail positioning very marginal on this line and is being put to NAM TOPO for evaluation. Rho stbd TB Pulse8 very high SDs 50% of line when in lock and also lost lock SPs 380-500, 650-675, 750-840 & 850-880 (no lock - no position generated). Port TB much better though on edge of spec. This situation compounded by port TB hydrophone F4H1 being dead from SOL-SP550. With the hydrophone down we end up with one TB Pulse8 OK but hydrophone down and other TB Pulse8 bad and responder OK - not a good situation. We think that

only 2 of the 4 Pulse8 receivers on board have full sensitivity and tuning, because swapping TB receivers changes the bad TB. Spare is just as bad. We require RACAL to provide more Pulse8 receivers ASAP.
1618 SOL 89FA-F0550-R. SEQ 8. Two boat prime.
1936 EOL 89FA-F0550-R. Complete. EDIT GUN SEQ BAD SPs1614-1619(Sigma SP nos). TB Pulse8 adequate. F4H1 dead all line. Tailnet positioning just acceptable. Rho port traces P15 & P17 spiking occasionally from SP 1350-EOL and very occasional random spikes across port streamer from SP 1380 - EOL (checking raw shots with uMAX).
2227 SOL 89FA-F0226-R. SEQ 9. Two boat prime.
2400 Continue in production 89FA-F0226-R. LSPD 810.

3. QC STATUS

3.1 Streamers
No dead/weak/noisy traces 3 of 4 lines, but 89FA-F0550-R had a short period of spiking on port streamer, very occasional. This did NOT reoccur again, seems to have been a one off.

3.2 Weather
Good shooting WX all through the period.

3.3 Status @ 0530 L
In production.

3.? Pulse8 TBs/Acoustics
Line 89FA-F0262-R saw Rho with very poor TB positioning caused by a combination of port TB hydrophone F4H1 dead from SOL-SP550 and stbd TB Pulse8 totally out of spec, losing lock and very high SDs. Acceptability to be determined by NAM TOPO.
At 0730 local, Party Chief intends next line change to fix F4H1 by MOB boat.
We need more Pulse8 receivers - believe 2 of the 4 on board are not performing to spec and also believe Sigma spare receiver non-operational. RACAL Engineer will talk with his office this AM.

NAV QC REPORT GECO RHO TUESDAY 15TH AUGUST 1989 JD 227

Last line shot was 89FA0238R. (see report JD 226)

On request of NAM another calibration was needed. This was done
during the day. Results are given in following text.

==========

HYPER-FIX CALIBRATION

OBSERVATIONS TO IDENTIFY ERRORS CAUSED BY
RE-RADIATION OR SHIP'S HEADING
15th August 1989

In order to ascertain any possible effects of re-radiation on

the Hyperfix positioning system that may occur with the RHO and SIGMA sailing in shooting formation the following procedure was adopted.

In an area of good Syledis cover the two vessels were sailed along a line in an Easterly direction 200 metres apart. Syledis and Hyperfix data were recorded.

The Vessels continued Eastward 400 metres apart and a second set of observations was recorded.

A third set of data was acquired with the vessels 1000 metres apart.

The procedure was repeated with the SIGMA and RHO sailing Westward.
But due to deteriorating Hyper-Fix stability at dusk observations were not taken with 1000 metre seperation.

The table below shows the C-O's computed from each of the six sets of data together with the working C-O's derived from observations taken on 11th and 12th August 1989.

Ship's heading ->	090	090	090	270	270	270
Ship seperation ->	200m	400m	1000m	200m	400m	1000m
STATION	Calibration 11-12/08/89					
Freq.1						
Tersch.	-.14	-.18	-.15	-.16	-.16	-.17
H7	+.50	+.43	+.48	+.49	+.56	+.53
K7	+.45	+.46	+.43	+.45	+.41	+.42*
Borkum	+.09	+.05	+.06	+.06	+.10	+.08
Freq.2						
Tersch.	+.03	+.01	+.01	+.03	+.02	+.01
H7	+.23	+.16	+.21	+.20	+.28	+.26
K7	+.44	+.47	+.47	+.48	+.44	+.45*
Borkum	+.19	+.14	+.18	+.17	+.21	+.19

* indicates values estimated from time series as stats were corrupted by lane slip.

Final C-O s are not changed against previous ones.

Summary C-O :

Terschelling	F1	:	-0.14
Borkum	F1	:	+0.09
H7	F1	:	+0.50

K7	F1	:	+0.45
Terschelling	F2	:	+0.03
Borkum	F2	:	+0.19
H7	F2	:	+0.23
K7	F2	:	+0.44
Germ B		:	300.0
Dan C		:	353.3
B 11.2		:	439.2

NAV OC REPORT GECO RHO WEDNESDAY 16TH AUGUST 1989
JD228

89FA0574R (rerun) sequence 006 dir 090 deg

Pulse/8 Tailbuoy port noisy. Compass C28 (port) out of spec due to malfunction. Seperation on Geco higher as on OC system. Special on last bit of line. Will be proceesed on board to find out the reason. Tailnet F4H1 hydrophone is not used because of interference with seismic somewhere along the cable.

89FA0262R (virgin) sequence 007 dir 270 deg

Hyperfix : H7-F2 appeared to be 0.25 low towards EOL. Pulse/8 aboard vessel OK but losing lock at tailbuoys. TB stbd lost lock between sp 380-500, 650-675, 750-840, 850-880. TB port more stable but losing locking as well. Misclosure on tailbuoys high due to instabillity of tailbuoy pulse/8. F4H1 non operational between sp SOL-550. Tailnet 8 ranges with low readings.

89FA0550R (virgin) sequence 008 dir 090 deg

Hangup on Cabletracker programm at sp 999. Lost all data. Compass 28 suspended due to malfunctioning. Reading +90 deg troughout whole line. Tailnet F4H1 hydrophone non operational. 3 poor ranges in tailnet.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-227.TXT/NMM/F03
DATE : Wednesday 16th August 1989
ATTN : C.CORSTEN/A.BANDELL/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Tuesday 15th August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0238	270	1494	1630	137	2.569	Complete

Total Daily Production Prime 2.569 Kms
Accumulated Prime Production 86.119 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
09/8	00:00	05:35	15:30	02:55	00:00
10/8	00:00	17:22	02:30	04:08	00:00
11/8	00:00	13:56	00:00	10:04	00:00
12/8	00:00	06:32	00:00	17:28	00:00
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00
15/8	00:18	10:10	10:56	02:36	00:00

DAILY DIARY

0000 Continue in production on 89FA-F0238-R. LSPD 1493.
0018 EOL 89FA-F0238-R. Complete. EDIT GUN SEQ BAD SPs 1024-1026 & 1230-1235. Rho 8 SP behind Sigma at EOL. Both TBs Pulse8 unstable/high SDs. Have experimented on last linechange using the best combinations of receivers/UHF links and this is about the best we will get. Occasional swell noise all line and ship noise SPs 930-1150 maximum 33uB from abeam. Acoustics F4H1 and S4H4 dead all line - found after EOL to be a relay problem in the Kalamos M6 cable fault locator (now fixed).
0030 Turn North for 2 boat Hyperfix calibration runs/checks. Start guns on board.
0150 All guns on board.
0218 Allocated 2hr operational line change time expired.
0700 Start calibration check run.
0725 Cal run complete. Turn to head into weather to recover port streamer as wind/swell increasing rapidly and force 6/8 predicted imminent.
1055 Port cable and TB on board. Centre compartment had water inside. Change out regulator and check batteries etc.
1245 Sigma and Rho both one cable on board and heading North for 2 boat cal runs.
1502 Start two boat calibration runs.
2015 End calibration runs/checks - no problems observed. Both

vessels heading for prospect.
2105 Port TB deployed. UHF link, Pulse8 and Navtech hydrophone all checked OK.
2300 Changing out section 25 for trace P73 has been dead since start-up.
2400 Continue working on/deploying port streamer.

3. QC STATUS

3.1 Streamers

Trace P73 dead on line shot - changing out AS 25 to fix while deploying streamer.

3.2 Weather

Came up fast in the AM but never increased to the predicted 6/8 imminent. By the time cal runs completed, WX stabilised and ready to deploy the streamer that had been retrieved.

3.3 Status @ 0530 L

Heading for line 0574 second attempt - looks like may be late for slot.

3.4 MicroMAX

Line 89FA-F0250-R SEQ 3 has been processed through to brute stack using the regional velocities Dave has derived from inspection of the old marine data back to 1972. Swell noise degradation is minimal and line accepted. Now deriving velocities from the line itself and processing again, which should improve data especially above 2 seconds.

3.5 ECLHeader

Logging and plotting data - number of GM2B errors through to EXTERNAL HEADER has increased to 30 per line or 2% which is annoying; however the Gun Mask transfer through the OmniSeis link is still clean and so reprocessing is not affected. NOTE that processing do not look at Ext. Hdr. unless data is missing elsewhere, so this GM2B EXT. HDR. corruption is not a problem, though it would be nice to have it fixed.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-226.TXT/NMM/F03
DATE : Tuesday 15th August 1989
ATTN : C.CORSTEN/A.BANDELL/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Monday 14th August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
0250	270	100	1630	1531	28.706	Complete
0562	090	100	1630	1531	28.706	Complete
0238	270	100	1493	1394	26.138	Continue

Total Daily Production Prime 83.550 Kms
Accumulated Prime Production 83.550 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
08/8	04:48	18:15	00:57	00:00	00:00
09/8	00:00	05:35	15:30	02:55	00:00
10/8	00:00	17:22	02:30	04:08	00:00
11/8	00:00	13:56	00:00	10:04	00:00
12/8	00:00	06:32	00:00	17:28	00:00
13/8	00:00	13:53	03:56	06:11	00:00
14/8	09:53	04:00	10:07	00:00	00:00

DAILY DIARY

0000 Line change to next tidal slot on standby.
0216 SOL 89FA-F0574-R. SEQ 2. Two boat prime.
0534 EOL 89FA-F0574-R. All data scratched due to poor Hyperfix signals (night conditions). Large variations in Bottom Speed caused by Hyperfix instability, produced lost shotpoints, degraded SP spacing and made cable balance difficult. Note that heavy showers contributed materially to poor Hyperfix performance in addition to the night skywave problem. Line change on standby.
0835 SOL 89FA-F0250-R. SEQ 3. Two boat prime.
1200 EOL 89FA-F0250-R. Complete. No Rho edits. Stbd TB Pulse8 unstable - high SDs. Swell noise all line - should not be a problem but processing with MicroMAX anyway.
1446 SOL 89FA-F0562-R. SEQ 4. Two boat prime.
1808 EOL 89FA-F0562-R. Complete. EDIT RHO NAV BAD SPs 973 - 1119 (Hyperfix outputs corrupted). EDIT GUN SEQ WRONG SPs 295 - 302. Rho 6 SP behind Sigma at SOL - 9 behind at EOL. Rho Navtech hydrophones F4H1 & S4H4 dead all line. Stbd TB no Pulse8 SPs 166 - 176.
2054 SOL 89FA-F0238-R. SEQ 5. Two boat prime.
2400 Continue in production on 89FA-F0238-R. LSPD 1493.

3. OC STATUS

3.1 Streamers

Trace P73 dead all lines - otherwise electrically good. Ballast generally good but slightly heavy at front when speeds are low and minor adjustments from MOB boat will be done when swell conditions permit.

3.2 Weather

Wind SW/SSW 4/5, sea state 3/4, swell S/SW 1.0/2.5 metres.

3.3 Status @ 0530 L

Heading for calibration lines together with Sigma.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RH0-225.TXT/NMM/F03
DATE : Monday 14th August 1989
ATTN : C.CORSTEN/A.BANDELL/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Sunday 13th August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS
Total Daily Production Prime					0.000 Kms	
Accumulated Prime Production					0.000 Kms	

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
07/8	05:01	14:22	04:37	00:00	00:00
08/8	04:48	18:15	00:57	00:00	00:00
09/8	00:00	05:35	15:30	02:55	00:00
10/8	00:00	17:22	02:30	04:08	00:00
11/8	00:00	13:56	00:00	10:04	00:00
12/8	00:00	06:32	00:00	17:28	00:00
13/8	00:00	13:53	03:56	06:11	00:00
RH0 TOTALS Week Ending 2400UTC 13/08/89					
HOURS	09:49	89:55	27:30	40:46	00:00

Weekly Prime Production	0.000	Kms
Weekly Prime Lines	0	
Weekly Reshoot Production	0.000	Kms
Weekly Reshoot Lines	0	
Weekly Infill Production	0.000	Kms
Weekly Infill Lines	0	
Weekly Undershoot Production	80.512	Kms
Weekly Undershoot Lines	14	

DAILY DIARY

0000 Continue streamer adjustments.
0200 Port cable going out in wide.
0240 Both streamers out in DILT. Heading for prospect area while observing balance/wing angles.
0330 Start stbd streamer on board - front end heavy.
0900 Both cables out in DILT. Start guns out.
1353 Missed tidal slot on F0406 because Sigma not in position.
2004 Start line but Hyperfix signals too poor to use.
2327 End line - scratch all data.
2400 Line change to next tidal slot on standby.

3. QC STATUS

3.1 Streamers
Good - front end noise good and no spiking observed after changing out the port streamer paravane door.

3.2 Weather
Swell increasing slowly during period.

3.3 Status @ 0530 L
In production.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-224.TXT/NMM/F03
DATE : Sunday 13th August 1989
ATTN : C.CORSTEN/A.BANDELL/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Saturday 12th August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS

Total Daily Production Prime 0.000 Kms
Accumulated Prime Production 0.000 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
06/8	01:42	02:31	04:42	15:05	00:00
07/8	05:01	14:22	04:37	00:00	00:00
08/8	04:48	18:15	00:57	00:00	00:00
09/8	00:00	05:35	15:30	02:55	00:00
10/8	00:00	17:22	02:30	04:08	00:00
11/8	00:00	13:56	00:00	10:04	00:00
12/8	00:00	06:32	00:00	17:28	00:00

DAILY DIARY

0000 Continue with test line, but Hyperfix very unstable.
0050 Finish Hyperfix test line with Sigma; Hyperfix too unstable for any conclusive results.
0115 Turn to head West; stay in vicinity of nominated calibration line; continue with streamer work.
0315 Hyperfix K7 (F2) still experiencing lane slippage.
0525 Lane slip again.
0600 Commence Hyperfix calibration run (090 degrees) with RACAL GNS & GRiD monitoring (unable at present to run all three systems simultaneously - GRiD is online all the time, but only choice of either RACAL or NOR* at present - seems to be problem without data format output from the InterSite CDUs - being investigated).
0648 Same cal run - RACAL changing to BORKUM.
0800 End cal run - turn for 270 degree cal run.
0834 Commence Hyperfix calibration run (270 degrees) with RACAL GNS and GRiD monitoring. BORKUM in at this time.
0910 Finish part with BORKUM - put in TERSCHELLING.
1004 Finish calibration run. Continuing with streamer work throughout all this period while turns etc. permitted.
1100 Measured front stretch sections stbd cable and installed Navtech sensors etc.
1300 Stbd cable fully deployed in DILT. Probably a bit heavy at the front but otherwise looking good. Will put out port cable now and do fronts for ballast when both are out,

1300 SYLEDIS B11/2 OFF AIR. This puts the dampeners on any further calibration runs until repaired - nav QC and navigators analysing calibration data to see whether we can accept the Hyperfix C-Os. Evaluating Pulse-8 data.
1315 Port TB deployed.
1405 Measuring port TB rope etc. Continue deploying port streamer.
2055 Sigma MOB boat picks up RACAL engineer Jeff Smith to go over to assist hid colleague on Sigma in setting up the RACAL systems.
2200 Measuring port front stretches and installing Navtech sensors etc.
2400 Working on port streamer - this was the one with both spiking and LF front end noise.

3. QC STATUS

3.1 Streamers

Being deployed.

3.2 Weather

Wind SW then W 4/5, swell 0.5/1.0 metres.

3.3 Status @ 0530 L

Streamer adjustments.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-223.TXT/NMM/F03
DATE : Saturday 12th August 1989
ATTN : C.CORSTEN/A.BANDELL/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Friday 11th August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS

Total Daily Production Prime 0.000 Kms
Accumulated Prime Production 0.000 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
05/8	00:00	11:49	09:00	03:11	00:00
06/8	01:42	02:31	04:42	15:05	00:00
07/8	05:01	14:22	04:37	00:00	00:00
08/8	04:48	18:15	00:57	00:00	00:00
09/8	00:00	05:35	15:30	02:55	00:00
10/8	00:00	17:22	02:30	04:08	00:00
11/8	00:00	13:56	00:00	10:04	00:00

DAILY DIARY

0000 Continue baseline crossings.
0245 Last baseline crossing (B11/2 - GORM/B extension) complete. Evaluating the problem results.
0345 Chaseboat sent off to centre prospect area to obtain TS dip to aid in cable reballasting.
0440 Start deploying stbd TB to check same and take physical measurements of TB rope etc.
0700 TS dip results - 1509.26 m/s. Continue deploying stbd streamer.
0900 Receiving Syledis & Hyperfix OK.
1000 Stbd TB Pulse-8 transferring through OK.
1045 F2 Hyperfix being received through to NOR* OK.
1100 RACAL Syledis not coming through - NOR* Syledis OK.
1135 RACAL Syledis OK.
1150 RACAL Syledis not coming through.
1230 Stbd streamer fully deployed. Checking balance/wing angles for reballast.
1418 Start trial C-O calibration run (270 degrees) with GRiD and NOR* OK but RACAL not able to run their program.
1454 Complete 1st trial calibration run. Start 2nd trial calibration run (090 degrees) still without RACAL.
1540 Complete 2nd trail calibration run. NOTE - working on stbd streamer ballasting throughout except when making turns for cal runs. Continue streamer ballasting.
2039 Start cal run 3 (270 degrees) with RACAL GNS running. Very poor/noisy Syledis and Hyperfix skywave problems (dusk).

2200 Start turning to get alongside Sigma for test of Hyperfix with vessels at shooting separation (200m).
2214 BORKUM Hyperfix failed - technician has gone to investigate.
2334 Start 2 boat Hyperfix test line at 200m separation with Sigma on stbd side.
2400 Continue with test line, but Hyperfix very unstable.

3. OC STATUS

3.1 Streamers

Reballasting stbd streamer.

3.2 Weather

Increasing during period SW/WSW 6/7 but never quite bad enough to stop streamer work.

3.3 Status @ 0530 L

Hyperfix calibration runs with RACAL and GRiD.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-222.TXT/NMM/F03
DATE : Friday 11th August 1989
ATTN : C.CORSTEN/A.BANDELL/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Thursday 10th August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS

Total Daily Production Prime 0.000 Kms
Accumulated Prime Production 0.000 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
04/8	00:00	03:09	00:00	20:51	00:00
05/8	00:00	11:49	09:00	03:11	00:00
06/8	01:42	02:31	04:42	15:05	00:00
07/8	05:01	14:22	04:37	00:00	00:00
08/8	04:48	18:15	00:57	00:00	00:00
09/8	00:00	05:35	15:30	02:55	00:00
10/8	00:00	17:22	02:30	04:08	00:00

DAILY DIARY

0000 Alongside - Den Helder - rigging HyperFix etc.
0230 Eighteen hours allocated operational time for rig-up at the dock has now expired. Continue rigging at dockside on contractor downtime.
0638 Depart Den Helder for prospect. Now on operational time for travel to prospect. Continue setting up navigation and tailbuoys etc.
2000 Commence first baseline crossing. Still on operational time, but now starting nav calibration period.
2345 Continue with baseline crossings.

3. OC STATUS

3.1 Streamers

On board - filling new sections etc.

3.2 Weather

Calm to slight/moderate - increases predicted for tomorrow.

3.3 Status @ 0530 L

Deploying stbd TB for measurements.

Regards,
N.Morrison

TO : NAM Assen
COPY : XGP, XGP/1, XGP/2, XTP/1, XTP/2.
REF : RHO-221.TXT/NMM/F03
DATE : Thursday 10th August 1989
ATTN : C.CORSTEN/A.BANDELL/L.ZEIJLMAKER/B.BOUWMEESTER

SUBJ : SURVEY PROGRESS TO Wednesday 9th August 1989 @2400Z

1.PRODUCTION (F-03)

LINE	DIR	FCSP	LCSP	SHOTS	KM	STATUS

Total Daily Production Prime 0.000 Kms
Accumulated Prime Production 0.000 Kms

2.TIME ANALYSIS (hh:mm)

DATE	PRIME	OPERATIONAL	STAND-BY	CONTRACTOR	DISPUTED
03/8	00:00	00:00	02:24	21:36	00:00
04/8	00:00	03:09	00:00	20:51	00:00
05/8	00:00	11:49	09:00	03:11	00:00
06/8	01:42	02:31	04:42	15:05	00:00
07/8	05:01	14:22	04:37	00:00	00:00
08/8	04:48	18:15	00:57	00:00	00:00
09/8	00:00	05:35	15:30	02:55	00:00

DAILY DIARY

0000 Travel to Den Helder for NAM-requested port call to rig navigation etc. for F-03 blocks.
0525 Fast alongside Den Helder pier 35.
0535 Gangway down - no sign of RACAL; all other companies present, including Intersite, Geodetic, Radio Holland etc.
0830 Racal arrive with equipment.
2400 Alongside - Den Helder - rigging HyperFix etc.

3. OC STATUS

3.1 Streamers
On board - received cable sections on board.

3.2 Weather
Calm.

3.3 Status @ 0530 L
Alongside working on navigation rig-up.

3.4 MicroMAX
Dave Filler is overlaying the previously shot sections on to the current prospect map. Please let us know if there is a particular crossline swath that you wish us to use for making up this pseudo-2D crossline section(s). Do you want it(them) across a previous tie point, or middle of the lines or where?

We will see how many of these it is practical to do in the time available. Will also find out whether the Sigma can generate control tapes so that if possible the 4 Sigma-unique CDF lines can be included.

Regards,
N.Morrison

SECTION 9: APPENDICES

9.1 Instrument Tests

9.1.1 Geco Sigma Monthly Tests, 19th August 1989

1. DSS Noise

The offsets were poor on channels 60 and 79.
Channel 60 was very noisy and this was repaired.

2. DFS Noise

All good.

3. Dynamic Range

Good result.
DFS V 1 was set up differently to DFS 2.

Both were set up within specification but the average offset on DFS 1 was -1.0 and on DFS 2 it was +0.1. The input value on channel 2 was high (346 mV instead of 324 mV). This was apparent on the daily tests after 19th August and was brought to the attention of the Chief Observer.

Channel 100 showed a slightly low input level but this was not seen on later daily tests.

4. Gain Accuracy

Overall average values were within specification. There were a lot of channels outside the specification on most steps.

72-84 dB step : Channel 100 outside specification.
60-72 dB step : All good.
48-60 dB step : 6 channels marginally out of specification.
36-48 dB step : 80 channels slightly more negative than the specification.

24-36 dB step : Channel 45 out, positive.
64 channels out, negative.
12-24 dB step : All good.
00-12 dB step : 46 channels out, negative.

Most of the channels that were out of specification were in blocks which might suggest that the signals were adequately extracted from the noise.

5. Crossfeed

Good. All channels $>$ 80 dB.

6. Linearity

This test was done 3 times. The set-up was unbalanced on the first test but the others were good.

7. Filter Analysis

This test was also repeated. The lowest bandwidth on either file was 171.9 but this was not on the same channels on both tests.

9.1.2 Geco Sigma Monthly Tests, 8th September 1989

At the end of the survey a set of monthly tests was completed without making any adjustments to the DFS V. The results were very good except for the following:

1. Gain Accuracy

The 36-48 dB step was well out of specification. The majority of groups were negative. The rest of the files in this test were better than normal which suggests that a mistake had been made in the recording parameters for the 36-48 dB file.

2. Dynamic Range

The input to channel 2 was high as in the previous tests (19th August). This had not been seen on recent daily tests but appeared again here. The low-cut filter slope was also poor for this channel.

3. Filter Pulse Test

Channel 77 had a low bandwidth of 159 Hz.

9.2 Navigation Station Co-ordinates and Datum (Geco Sigma)

Hyperfix

F1	Terschelling	E 516629.7	N 5916876.2
		C-O -0.03	(-0.005)
F2	Terschelling	E 516629.7	N 5916876.2
		C-O 0.05	(0.154)
F1	H7	E 567081.2	N 6040751.8
		C-O -0.359	(-0.422)
F2	H7	E 567081.2	N 6040751.8
		C-O 0.288	(0.154)
F1	K7	E 387705.0	N 5937480.7
		C-O -0.452	N/A
F2	K7	E 387705.0	N 5937480.7
		C-O 0.542	N/A
F1	Borkum	E 611419.9	N 5940821.6
		C-O 0.137	(0.220)
F2	Borkum	E 611419.9	N 5940821.6
		C-O 0.208	(0.303)
F1	K8	E 395142.7	N 5930883.7
		C-O N/A	(0.295)
F2	K8	E 395142.7	N 5930883.7
		C-O N/A	(0.352)

Syledis

Gorm B	E 484790.8	N 6159412.3
	C-O 0.0	
Dan C	E 508576.2	N 6147275.0
	C-O 0.0	
B11/2	E 471675.1	N 6146450.9
	C-O 0.0	

Pulse 8

Pattern 1-3	C-O 0.153
Pattern 1-4	C-O 0.08
Pattern 1-5	C-O 0.066

All figures are for the actual receiver used.

Figures in brackets are those used after Hyperfix calibration on 2nd September (subsequent to Line Sequence 58) using the spare receiver.

Datum	: ED 50.
A	: 6378388.000.
RF	: 297.000.
dx	: 83.0.
dy	: 110.0.
dz	: 113.5
Rotation	: .55 sec.
Scale	: 0.00 ppm.
CM	: 5.0 E.
SF	: .99960.
False E	: 500000.0.
False N	: 0.0.

9.3 Streamer Configuration

****
* CABLE-CONFIGURATION FOR GECO SIGMA 1989 *
****

JOB: 06919/05 25.AUG 1989 TIME: 08.45 GMT

PORT. STREAMER

****

BIRD	TYPE		TRACE	NO	NAME		BCU	C.F.C.=
	LEAD-IN			1	HSFUQ	L-046		
	WB			1	HSWQ	L-028 sn.???		
	NAVTEK-HYD (3m)			1	HS0Q	L-028		
	STRETCH SECTION			1	HSYQ	L-244		
H-14	STRETCH SECTION			3	HSYQ	L-240		
	NAVTEK-HYD (1m)			2	HS0Q	L-004 3/88		
F-2	WB			2	HSFWQ	L-015	110	
B-15	LIVE SECTION	7.2	1-3	1	HSSQ	388-765-08	074	
	WB			3	HSFWQ	L-013	067	
	LIVE SECTION		4-6	2	HSSQ	186-656-10	127	
	LIVE SECTION		7-9	3	HSSQ	L-280	039	
B-16	LIVE SECTION	7.2	10-12	4	HSSQ	883-359-33	024	
	LIVE SECTION		13-15	5	HSSQ	385-535-3	025	
	LIVE SECTION		16-18	6	HSSQ	L-279	036	
	LIVE SECTION		19-21	7	HSSQ	388-766-04	015	
B-17	LIVE SECTION	2,4	22-24	8	HSSQ	L-400	043	
	LIVE SECTION		25-27	9	HSSQ	187-669-05	005	
	LIVE SECTION		28-30	10	HSSQ	985-590-5	094	
	LIVE SECTION		31-33	11	HSSQ	883-359-20	018	
B-18	LIVE SECTION	7.2	34-36	12	HSSQ	985-588-10	074	
	LIVE SECTION		37-39	13	HSSQ	L-399	097	
	LIVE SECTION		40-42	14	HSSQ	L-273	032	
	LIVE SECTION		43-45	15	HSSQ	985-592-9	004	
B-19	LIVE SECTION	2.4	46-48	16	HSSQ	L-127	096	
	LIVE SECTION		49-51	17	HSSQ	L-106		
	LIVE SECTION		52-54	18	HSSQ	985-590-7	101	
	LIVE SECTION		55-57	19	HSSQ	389-876-05	045	
	LIVE SECTION		58-60	20	HSSQ	985-590-1	053	
B-20	LIVE SECTION	7,2	61-63	21	HSSQ	985-591-5	108	
	LIVE SECTION		64-66	22	HSSQ	L-076	050	
	LIVE SECTION		67-69	23	HSSQ	L-213	007	
	LIVE SECTION		70-72	24	HSSQ	985-588-7	068	
	LIVE SECTION		73-75	25	HSSQ	985-591-10	127	
B-21	LIVE SECTION	7.2	76-78	26	HSSQ	985-588-6	082	
	LIVE SECTION		79-81	27	HSSQ	985-592-4	096	
	LIVE SECTION		82-84	28	HSSQ	389-876-03	035	
	LIVE SECTION		85-87	29	HSSQ	L-275	038	
	LIVE SECTION		88-90	30	HSSQ	L-392	077	
B-22	LIVE SECTION	7,2	91-93	31	HSSQ	883-359-10		
	LIVE SECTION		94-96	32	HSSQ	186-656-6	009	
	LIVE SECTION		97-99	33	HSSQ	1184-498-2	054	
	LIVE SECTION		100-102	34	HSSQ	L-180	105	
	LIVE SECTION		103-105	35	HSSQ	L-179	055	
B-23	LIVE SECTION		106-108	36	HSSQ	585-558-5	006	
	LIVE SECTION		109-111	37	HSSQ	1184-496-4	008	
	LIVE SECTION		112-114	38	HSSQ	887-731-04	013	
B-24	LIVE SECTION	2,4	115-117	39	HSSQ	L-216	005	
F-1	LIVE SECTION		118-120	40	HSSQ	887-727-01	041	
	NAVTEK-HYD (1m)			3	HS0Q	L-009 4/88		
B-25+26	STRETCH SECTION				HSYQ	L-233		
	NAVTEK-HYD (3m)				HS0Q	L-019		

TAIL-BOUY ROPE 50m

REMARKS:

LIVE SECTION 75m (HSSQ)
STRETCH 50m (HSYQ)
WATERBREAK 1m (HSFWQ)
NAVTEK 1m or 3m (HS0Q) pistail

****
* CABLE-CONFIGURATION FOR GECO SIGMA 1989 *
****

JOB:06919/05 25.AUG.1989 TIME: 19:00 UTC

STB. STREAMER
****

BIRD	TYPE	TRACE	NO	LEAD-IN	NAME		BCU
	LEAD-IN		1	S	HSFU0	L-038	
	WB/DT		1		HSW0	L-028	
	NAVTEK-HYD (3m)		1		HS00	L-022	
F-1	STRETCH		1		HSY0	L-170	
B-1	STRETCH		2		HSY0	787-720-01	
	NAVTEK-HYD (1m)		2		HS00	L-008	
F-3	WB/DT		2		HSFW0	L-012	014
B-2	LIVE SECTION 7,2	1-3	1	0	HSS0	985-596-05	009
	WB/DT		3		HSFW0	L-017	
	LIVE SECTION	4-6	2	0	HSS0	885-583-2	046
	LIVE SECTION	7-9	3	0	HSS0	L-406	110
B-3	LIVE SECTION 2,4	10-12	4	0	HSS0	L-236	119
	LIVE SECTION	13-15	5	0	HSS0	985-603-02	089
	LIVE SECTION	16-18	6	0	HSS0	887-731-08	017
	LIVE SECTION	19-21	7	0	HSS0	985-587-6	015
B-4	LIVE SECTION 2,4	22-24	8	0	HSS0	L-271	028
	LIVE SECTION	25-27	9	0	HSS0	L-151	123
	LIVE SECTION	28-30	10	0	HSS0	L-203	
	LIVE SECTION	31-33	11	0	HSS0	L-097	122
B-5	LIVE SECTION 2,4	34-36	12	0	HSS0	L-281	035
	LIVE SECTION	37-39	13	0	HSS0	L-390	083
	LIVE SECTION	40-42	14	6	HSS0	985-591-2	105
	LIVE SECTION	43-45	15	6	HSS0	587-711-07	124
B-6	LIVE SECTION 7,2	46-48	16	9	HSS0	985-594-74	001
	LIVE SECTION	49-51	17	8	HSS0	186-655-3	024
	LIVE SECTION	52-54	18	7	HSS0	185-517-3	022
	LIVE SECTION	55-57	19	7	HSS0	985-588-2	076
	LIVE SECTION	58-60	20	7	HSS0	1185-633-5	030
B-7	LIVE SECTION 7,2	61-63	21	7	HSS0	184-424-23	079
	LIVE SECTION	64-66	22	8	HSS0	188-765-6	071
	LIVE SECTION	67-69	23	8	HSS0	388-766-07	040
	LIVE SECTION	70-72	24	4	HSS0	L-391	045
	LIVE SECTION	73-75	25	5	HSS0	186-655-6	028
-8	LIVE SECTION 2,4	76-78	26	0	HSS0	L-290	047
	LIVE SECTION	79-81	27	0	HSS0	184-424-10	092
	LIVE SECTION	82-84	28	0	HSS0	186-655-8	037
	LIVE SECTION	85-87	29	0	HSS0	388-766-01	003
	LIVE SECTION	88-90	30	2	HSS0	L-387	132
B-9	LIVE SECTION 7,2	91-93	31	3	HSS0	685-566-7	082
	LIVE SECTION	94-96	32	4	HSS0	883-359-39	
	LIVE SECTION	97-99	33	7	HSS0	187-698-07	112
	LIVE SECTION	100-102	34	7	HSS0	L-397	087
	LIVE SECTION	103-105	35	10	HSS0	985-588-9	070
B-10	LIVE SECTION 7,2	106-108	36	6	HSS0	985-587-9	112
	LIVE SECTION	109-111	37	0	HSS0	385-530-9	095
	LIVE SECTION	112-114	38	0	HSS0	L-261	008
B-11	LIVE SECTION 7,?	115-117	39	0	HSS0	L-393	119
	LIVE SECTION	118-120	40	0	HSS0	985-588-4	081
	NAVTEK-HYD 1m		3		HS00	L-014 5/88	
B-12+13	STRETCH 3.2/3.5m		3		HSY0	L-176 11/85	
	NAVTEK PIG 3m				HS00	L-021 4/89	
	TAIL-BOUY ROPE 47+10m						

REMARKS:

LIVE SECTION	75M	(HSS0)
STRETCH	50M	(HSY0)
WATERBREAK	1M	(HSFW0)

9.4 Crew Lists

Crew List for the period 09/08/89 - 23/08/89

NAME	POSITION
MARINE CREW	
G Storvik	Captain
J Solheim	Ch.Off
E Mjeltvik	1st.Off
G Gundersen	Ch.Eng
E Schioets	1st.Eng
A Helle	Electrician
S Hetleflaat	Steward
K Egseth	Cook
T Anderson	Messman
H Ristesund	Seaman
P Myren	Seaman
R Solvang	Seaman
SEISMIC CREW	
A Dale	P.Chief
G Kvalheim	Ch.Nav
S Eliassen	Nav.SL
D Cottingham	Nav.SL
K Olaussen	Nav.Op
S Grimen	DFS.Ch

F Andersen	DFS.Ch
G Guttormsen	DFS.Op
J Vindvik	DFS.Op
B Sorebotten	Ch.Gunner
T Klokseth	Gun.SL
K Bye	Gun.Op
F Rettenberger	Gun.Op
E Gotaas	Trainee

ECL QC REPS

Malcolm Smith	3D coordinator
Roger Knight	Seismic QC.

GEODECTIC QC REPS

P Cohen	Nav.QC
R Hill	Nav.QC

INTERSITE ENGINEER

J Bes	Intersite

RACAL ENGINEER

J Burns	Racal

Crew list for the period 23/08/89 - 08/09/89

Marine Crew.

Ola Brevik	Captain
Halstein Hovden	Chief Officer
Harald Kolaas	1st Officer
Einar Ervik	Chief Engineer
Tor Jacob Haanstad	1st Engineer
Johan Eggesbo	Electrician
Alfon Ryeng	Steward
Herleif Martinussen	Cook
Aksel Retta	Ships Mechanic
Johan Nerland	Ships Mechanic
John Leikanger	Ships Mechanic
Bambang Tjahjadi	Meesman

Seismic Crew

Svein Anderson	Party Chief
Jan Sovik	Navigation Chief
Gerhard Kvalheim	Navigation S/L
Charles Williams	Navigation S/L
Knut Eltvik	Navigation Opr
Ulf Oppegard	DFS Chief
Geir Valsvik	DFS S/L
Reider Skuseth	DFS Opr
Nicholas Holms	DFS Opr

Helge Notanes	Gun Chief
Ole Dimmen	Gun S/L
Ivar Haavik	Gun S/L
Toralf Stokke	Gun Opr

ECL NAM QC Reps

Malcolm Smith	3D Coordinator
Roger Knight	Seismic QC

Geodectic Nav QC

Mark Langham	Navigation QC
Richard Hill	Navigation QC

Racal/NeSA Engineer.

John Burns	NeSA
William Spray	NeSA(from 2nd September)

9.4.1 Geco Sigma

9.4.2 Geco Rho

CREW LIST FOR THE PERIOD 9/08/89 - 23/08/89

NAME	POSITION
MARINE CREW	
ALF BAKKE	CAPTAIN
NAVAL K. BHATTIA	CHIEF OFFICER
DHAR DIPANKAR	2ND OFFICER
SINHA MEHUL	2ND OFFICER
C. SINGH	3RD OFFICER
SAMPATH KUMAR	RADIO OFFICER
I.G KARA	A.B
J.T KUNNATH	A.B
N.M SOUNDARARA	A.B
I.A.H. MULLA	A.B
TERJE ENDERSEN	CHIEF ENGINEER
N.M JANARDHANAN	2ND ENGINEER
PAUL EDWIN	3RD ENGINEER
A.T. PERIS	4TH ENGINEER
SHAKTI CHAND	ELECTRICIAN
TING LOKA	PEON
P. PRABHAKARAN	MTM
K.S VARMA	MTM
N. LAKSHMANAN	MTM
ASSISI RODRIGUES	CHIEF STEWARD
P. FERNANDES	2ND COOK

S.L FURTADO	MSM
M.S SOLANKI	MSM

SEISMIC CREW

HOVLAND KARE PER	PARTY CHIEF
M.F BURWOOD	CHIEF OBSERVER
ANDY NORTHCOTE	S/L OBSERVER
ED FERRIS	OBSERVER
CRAIG DOUGLAS	OBSERVER
PHILIP CARDNO	OBSERVER
DAVID FILLER	MICROMAX OPR
EARL HARRISON	CHIEF NAVIGATOR
A.J HECTOR	NAVIGATOR
DERIK SINGER	NAVIGATOR
JOHN WARDROPE	GUN CHIEF
G. PRYME	GUN MECHANIC
TERJE RUGSVEEN	GUN MECHANIC

ECL NAM REP.

NICK MORRISON	SEISMIC QC REP

GEODETIC NAVIGATION QC.

KEN BAKER	NAVIGATION QC
B. VAN DER HEIJDT	NAVIGATION QC

RACAL ENGINEER

SMITH JEFFREY	HYPERFIX ENGINEER

CREW LIST FOR THE PERIOD 23/08/89 - 08/09/89

NAME	POSITION
MARINE CREW	
AUDUN BAKKE	CAPTAIN
DHAR DIPANKAR	CHIEF OFFICER
SINHA MEHUL	2ND OFFICER
N.M SOUNDARARAJ	3RD OFFICER
SAMPATH KUMAR	RADIO OFFICER
I.G KARA	A.B
J.T KUNNATH	A.B
I.A.N. MULLA	A.B
RAO P.V.	O/S
ODD JAKOBSEN	CHIEF ENGINEER
N.M JANARDHANAN	2ND ENGINEER
PAGARKAR A.W.Y	3RD ENGINEER
PERIS A.T.	4TH ENGINEER
SHAKTI CHAND	ELECTRICIAN
TING LOKA	PEON
P. PRABHAKARAN	MTM
MOHAMED V.K.	MTM
N. LAKSHMANAN	MTM
ASSISI RODRIGUES	CHIEF STEWARD
P. FERNANDES	2ND COOK
S.L FURTADO	MSM
PEREIRA J.F.	MSM

SEISMIC CREW

PETER SHUTTLEWORTH	PARTY CHIEF
NIGEL MASSEY	CHIEF OBSERVER
DAVID WAUGHMAN	S/L OBSERVER
JOHN STIRLING	OBSERVER
JUSTIN SHELDON	OBSERVER
LEWIS J.S.	OBSERVER
CRAIG J.R.	MICROMAX OPR
MIKE MARTIN	CHIEF NAVIGATOR
W. ANTHONY	NAVIGATOR
A. WARNER	NAVIGATOR
J.L. HUNT	NAVIGATOR
BOWE M.	NAVIGATOR
ROSE S.O.	TRAINEE NAV.
IAN HALFPENNY	GUN CHIEF
MAY PAUL W.	GUN MECHANIC
AYRE DAVID	GUN MECHANIC
STOKKE TORALF	GUN MECHANIC
ECL NAM REP.	
NICK MORRISON	SEISMIC QC REP

GEODETIC NAVIGATION QC.

BALMFORTH STEVE	NAVIGATION QC
J.D.J DE BOER	NAVIGATION QC
RACAL ENGINEER	
SMITH JEFFREY	HYPERFIX ENGINEER

9.5 Line Edits, Re-shoots and Infill Lists

Reshoots Block F3

SEQ	LINE	SP RANGE TO RESHOOT	REASON	ACTION TAKEN	CHARGE
4	562	670-770(1 boat)	Sigma	DONE SEQ 12:	NAM
			Port Cable:		
		973-1119(2 boat)	Rho Nav	Cols 137-140	GECO
				DONE SEQ 12:	
				Cols 135-138	GECO
				DONE SEQ 28:	
				Cols 141-144	NAM
				DONE SEQ 29:	
		973-1119(Cols 137-140)		DONE SEQ 28:	GECO
6	574	500-548 (1 boat)	RHO INST	DONE SEQ 12:	GECO
7	262	1045-1064(1boat)	SIG PTGUNS	CANCEL	GECO
		1319-1387(2boat)	GUNSEQ(NAV)	DONE SEQ 72:	NAM
13	214	100-553 (2 boat)	ALL DATA	DONE SEQ 65:	NAM
			(SWELL)		
17	202	100-376 (1 boat)	RHO PORT	DONE SEQ 30:	GECO
			GUNS		

25	178	1501-1630(2 boat)	NAVSIGS	DONE SEQ 66	NAM
27	322	100-130 (2boat)	ALL GUNS	Done SEQ 68	GECO
		131-432 (1boat)	PORT GUNS (SIGMA)	Done SEQ 68	GECO
		1500-1590 (1boat)	STBDCABLE (RHO)	Done SEQ 68	GECO
37	490	1181-1239 (2boat)	BOTH STBD GUN ARRAYS	Done SEQ 69	GECO
38	154	930-1165 (1boat)	SIG STBD CABLE	DONE SEQ 74	GECO
40	658	1321-1630(2boat)	NAV EQUIP FAILURE	DONE SEQ 57	GECO
45	358	100-570(1 boat)	SIG PORT GUNS	Done SEQ 70	GECO
46	466	478-498(1 boat)	SIG GDR	CANCEL	GECO
54	442	1123-1630(1 boat)	SIG STBD GUNS	Done SEQ 67	GECO
63	394	11148-EOL(1boat)	SIG STBD GUNS	Done SEQ 79	GECO
72	262/	11398-11630 (1)	MISSED RHO	Done SEQ 76	GECO

Infill/Reshoot requirement F3

CELLS AND CDP LINES ARE APPROXIMATE(DEPENDING ON CABLE GROUP)

MARG=MARGINAL AND TO BE SHOT ONLY IF PASSING ANYWAY.

DEF =DEFINITE

SWATHES 1 AND 3 (090)

	CDP	CELLS	STATUS	ACTION
1	25-27	1-500	MARG.INFILL	NTBP SEQ 56 SIGMA Not Completed
2	34-37	1-500	DEF.INFILL	DONE SEQ 56 RHO
3	37-48	900-1100	RESHOOT(GECO)	DONE SEQ 57 BOTH
4	58-60	120-950	DEF.INFILL	DONE SIGMA SEQ 73
5	107-110	300-800	DEF.INFILL	DONE SEQ 59 SIGMA
6	121,122	130-400	DEF.INFILL	ALL NTBP NAV EQUPT.SEQ 59
		850-1100	DEF.INFILL	DITTO. DONE RHO SEQ 73 (GP 1 MISSED) COMPLETED SIGMA SEQ 80 and 81
7	179,180	600-1100	DEF.INFILL	DONE SIGMA SEQ 60
8	204	450-600	MARG.INFILL	DONE SIG SEQ 69
9	204-216	800-860	RESHOOT(GECO)	DONE BOTH SEQ 69
10	238-240	1-1100	DEF.INFILL	DONE SIGMA SEQ 67
11	254,256	750-1100	RESHOOT(GECO)	DONE RHO SEQ 67

12	264,265	1-560	GECO INFILL	DONE RHO SEQ 67
13	288,289	1-1100	DEF.INFILL	DONE SIGMA SEQ 77

Swathes 2 and 4 (270)

	COLS	CELLS	STATUS	ACTION
1	325	1-1100	DEF.INFILL	DONE RHO SEQ 70
2	346,348	750-1100	RESHOOT(GECO)	DONE SIGMA SEQ 70
3	349,351	1-450	MARG.INFILL	DONE RHO SEQ 41
4	373,374	1-50	RESHOOT(GECO)	DONE RHO SEQ 68
		50-1100	DEF.INFILL	DONE RHO SEQ 68
5	385	1-500	DEF.INFILL	DONE SIGMA SEQ 68
6	382-385	850-1100	RESHOOT(GECO)	DONE SIGMA SEQ 68
7	431,432	1-250	DEF.INFILL	MISSED RHO SEQ 72
				DONE SIGMA SEQ 76
		450-550	DEF.INFILL	DONE RHO SEQ 72
8	433-444	130-200	RESHOOT(NAM)	DONE BOTH SEQ 72
9	444	200-550	DEF.INFILL	DONE SIGMA SEQ 72
10	468-471	1-1100	DEF INFILL	DONE SIG SEQ 61
11	481-493	750-1100	RESHOOT(NAM)	DONE BOTH SEQ 65
12	505,506	1-650	DEF.INFILL	DONE SIGMA SEQ 75
13	518-529	1-170	RESHOOT(NAM)	DONE BOTH SEQ 66
14	549-550	300-550	RESHOOT(GECO)	DONE RHO SEQ 74
15	588,589	200-1100	DEF.INFILL	DONE SIGMA SEQ 74
16	309,311	1-350	RESHOOT(GECO)	DONE SIGMA SEQ 79
17	552	900-1100	INFILL	DONE RHO SEQ 74
18	313-315	900-1100	INFILL	DONE SIGMA SEQ 78

PLUS

====

SEQ 46	230-232	CELLS 230-270	GECO RESHOOT(CANCEL)
SEQ 7	441-449	CELLS 380-400	GECO RESHOOT(CANCEL)
SEQ 27	373-382	CELLS 1060-1100	GECO RESHOOT DONE SEQ 68 BUT NOT CHARGED TO GECO

ALL VERY SMALL HOLES

THESE 3 LINES HAVE BEEN"TRADED" FOR THE MARG.INFILL LINE SHOT BY RHO WITHOUT AUTHORISATION,SEQ 41.

12 Column narrow stripes on coverage are due to data transmission errors.All data exists and is good in these cases.

Other similar cases less clearly defined are gunsequence errors.

INFILLS FOR FURTHER CONSIDERATIONS

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COLS	CELLS	
24,25	420-650	see above
34,36	800-1000	
96	900-1000	
132	890-1060	
192	830-910	
337	930-1030	
409	various	
479-481	various	

ALL SUBSEQUENTLY ACCEPTED AS IS.

Edits List Geco Sigma/Rho Block F3

SEQ	LINE		EDITS
1	0238	SIGMA	Complete line scratched
		RHO	Ditto
2	0574	SIGMA	Complete line scratched
		RHO	Ditto
3	0250	SIGMA	No major edits
		RHO	None
4	0562	SIGMA	Port cable sp 670-770
		RHO	Bad Nav sp 973-1119(8 cols bad)
5	0238	SIGMA	Gun Seq 1024-1026,1230-1235
		RHO	Ditto
6	0574	SIGMA	None
		RHO	sp 500-548 (GDR, not recording)
7	0262	BOTH	1329-1377 (Sigma sp numbers)
			due to GunSeq errors.
		SIGMA	1045-1064 Port Guns Out
8	0550	BOTH	1614-1619 Gun seq errors
9	0226	SIGMA	Gun Seq 148-153
		RHO	ditto
10	0586	SIGMA	GunSeq SP 1130-1132 inc.
		RHO	ditto
11	0274	SIGMA	Gunseq errors SP 1572-1580
		RHO	ditto
12	0574*S	SIGMA	None

13	0214	SIGMA	SP 100-553
		RHO	Ditto
14	0598	SIGMA	Gunseq 152-157
		RHO	Ditto
15	0286	SIGMA	Gun Seq 703-709 713-720 760-762
			771-775
			18 NDRs due to Nav giving erratic sp
		RHO	Ditto
16	0538	SIGMA	NDRs 444 466 782 1178 1185 1188 1201
			1222 1273 1275 1291
			Gun Seq 1180-1190 1234-1237 12571258
			1265-1267 1291-1296 (Sigma sp nos.)
		RHO	Ditto
17	0202	SIGMA	NDR 682 683 684 1539
		RHO	Port guns out of spec SP 100-376
18	0610	SIGMA	Gunseq 692-693 934-942 945-947
		RHO	952-953 1187-188 1199-1202
19	0298	SIGMA	None
		RHO	None
20	0526	SIGMA	Gun Seq 221-223 745-748 1433-1439
			1500-1504 1591-1598
		RHO	Ditto
21	0190	SIGMA	NDR 100-109, 1178 Gun Seq 1573-1579
		RHO	100-109 and 1573-1579 Gunseq.
22	0622	SIGMA	None Gun Seq 1552-1555
		RHO	None
23	0310	SIGMA	None
		RHO	Seq error 672

24	0514	SIGMA	533-536 Gun Seq (Sigma sp nos.)
		RHO	476-483 Gun Seq (Rho sp nos)
25	0178	SIGMA	LGSP 1500 due Nav signals.
		RHO	Ditto
26	0634	SIGMA	NDR 907 1477
		RHO	None
27	0322	SIGMA	ALL DATA SOL-130 Autofires
			131-432 Port Array off.
			Gun Seq 1008,1009,1043-1047
		RHO	1500-1590 Starboard cable shallow
28	0562	RHO	No edits.
29	0562	RHO	No edits
30	0202	RHO	No edits.
31	0634	RHO	No edits.
32	0334	SIGMA	NO EDITS NDR 491,492
		RHO	NO EDITS
33	0502	SIGMA	Gun Seq 774-776
		RHO	None.
34	0166	SIGMA	EDITS Gun Seq errors 1413-1415
			NDR 1411 1412
		RHO	Both cables sp 100-109
35	0646	SIGMA	NO EDITS NDR 182 724 729
		RHO	NO EDITS
36	0346	SIGMA	GUNSEQ 543-547
		RHO	NONE
37	0490	BOTH	Both Stbd arrays sp 1181-1239
		SIGMA	NDR 1444-1447
		RHO	NO EDITS

38	0154	SIGMA	Stbd Streamer SP 930-1165 inc.
			GUNSEQ 607-610,654-660
		RHO	NONE
39	0478	SIGMA	NDR 1217
		RHO	NONE
40	0658	BOTH	SP 1321-1630
			GUN SEQ 1174-1184
		SIGMA	NONE
		RHO	DITTO
41	0346	RHO	ALL Data SP 1029-1045(NAV)
			Port guns 1029-1086
42	0514	RHO	NONE
43	0142	BOTH	GUNSEQ 1399-1404
		SIGMA	NDR 1399 1535
		RHO	NONE
44	0670	BOTH	GUNSEQ 681 682 1582 1583 1603 1604
		SIGMA	NDR 697 1220 1274 1300
		RHO	NONE
45	0358	SIGMA	100-570 Port array
		RHO	NONE
		BOTH	GUNSEQ 621-623,684
46	0466	SIGMA	478-498 GDR Fail
			NDR 590 700 708-712 714 716
47	0130	SIGMA	GUNSEQ 1529
		RHO	NONE
48	0682	SIGMA	NDR 123
		RHO	NONE

49	0370	SIGMA	NONE
		RHO	NONE
50	0454	SIGMA	NDR 1472 1473 1469
		RHO	NONE
51	0110	BOTH	Gun Seq 649-655 , 873-878
		SIGMA	NONE
		RHO	NONE
52	0694	SIGMA	NONE
		RHO	NONE
53	0382	SIGMA	NDR 1257
		RHO	NONE
54	0442	SIGMA	Starboard guns SP 1123 to EOL
		RHO	NONE
55	0106	SIGMA	GUNSEQ 1383-1387
		RHO	NONE
56	0670/	SIGMA	ALL NTBP DUE SWELL/STREAMER BALANCE
		RHO	NDR 100-117
			EDIT STBD CABLE 523-607
57	0658*	SIGMA	NONE
		RHO	NONE
58	0394	SIGMA	ALL DUE SWELL
		RHO	ALL DUE SWELL
59	0586/	SIGMA	GUNSEQ 1146-1155
		RHO	ALL NTBP DUE NAV EQUPT
60	0526/	SIGMA	NDR 1226
61	0226/	SIGMA	Stbd streamer sp 100-262
			NDR 130 1009 1073 1108 1440

75	0190/	SIGMA	NDR 780 1206
76	0274/	SIGMA	NONE
77	0418/	SIGMA	NDR 194 200 765.Autofire 334
			No guns 207 208
78	0382/	SIGMA	NONE
79	0394*	SIGMA	NDR 21580
80	0574/	SIGMA	NONE
81	0586/	SIGMA	NONE

62	0430	SIGMA	NONE
		RHO	NONE
63	0394	SIGMA	STBD ARRAY 11148-EOL
		RHO	NONE
64	0418	SIGMA	GUNSEQ 1513
		RHO	NONE
65	0214	SIGMA	NONE
		RHO	NONE
66	0178*	SIGMA	NONE
		RHO	NONE
67	0466/	SIGMA	NONE
	0442/*	RHO	
68	0322*	SIGMA	NONE autofire sp 10530 (Sig Sp No.)
	0322/	RHO	NONE autofire sp 10529 (Rho Sp No.)
69	0490/*	SIGMA	NONE
		RHO	NONE
70	0358*/	SIGMA	GUNSEQ 10261-10263,10314.NDR 10208 10300 10308
	0370/	RHO	NONE
71	0406	SIGMA	NONE
		RHO	NONE
72	0262/*	SIGMA	NDR 10931-10933.
		RHO	NONE
73	0646/	SIGMA	NDR 10794.Gunseq 10548-10549
	0586/	RHO	NONE
74	0106/	SIGMA	NDR 10363-10375
	0154/*	RHO	NONE

9.6 Log for MicroMAX Onboard Seismic Processing System

APPENDIX 8.6 MicroMAX Processing Log

This is the log of MicroMax processing work performed on board M/V GECO RHO from 10 August 1989 to 7 September 1989 in block F03.

Data from K8 block was presented and reviewed in Den Helder on the 9th at which time blue line seismic sections and a base map of previous work in the F03 block were received. Initial brute stack processing parameters were derived from these.

The Time-Velocity pairs listed below were used as the regional velocity function for brute stack NMO correction.

TIME msec	-	VELOCITY meters/sec	TIME msec	-	VELOCITY meters/sec
0	-	1480	2450	-	2450
50	-	1480	3000	-	2600
450	-	1725	3600	-	2800
1250	-	2000	4000	-	3000
1650	-	2075	5000	-	3300
2000	-	2250			

Velocity analysis was done in the form of constant velocity stacks and gathers according to structure.

The displays produced during brute stack sequences included selected shot records before and after FK filtering, CDP gathers, near trace plot and brute stack.

The following is a listing of lines and tests processed.

1. Line: RHO Monthly Inst. Tests FFID: 1-61
   Recorded: 9/08/89 Processed: 12/08/89

Reason for processing: Monthly DFSV instrument tests run prior to departure from Den Helder.

All tests passed within specified tolerances.

2. Line: 89FA-0238-R Seq 1 FFID: 120-1504
   Recorded: 15/8/89 Processed: 15/8/89

Reason for processing: First line of the block. Processed as benchmark line. Although this line was rejected for navigation problems, swell noise was minimal.

Velocity analysis was done to verify regional velocity.

3. Line: 89FA-0250-R Seq 3 FFID: 103-755
   Recorded: 15/8/89 Processed: 15/8/89

Reason For Processing: Moderate to high swell noise. Records were acceptable after FK filter. Velocity analysis was performed to update the regional velocity function. In addition to constant velocity stacks, CDP supergathers were made. Ten consecutive CDP's were sorted with source-receiver offset as the secondary key. Velocities are fairly inconsistent due to extensive faulting. The brute stack with updated velocities shows very good data quality.

Conclusion: Line accepted.

4. Line: 89FA-0238-R Seq 5 FFID: 100-1630
Recorded:

Reason for processing: Swell noise. Reshoot of sequence 1, which was shot in calm weather. Comparison shows the two brute stacks to be of comparable data quality.

Conclusion: Line accepted.

5. Line: 89FA-0550-R Seq 8 FFID: 1380-1420
Recorded: 17/8/89 Processed: 17/8/89

Reason for processing: Spiking on port streamer at 5.7 seconds from shotpoint 1380 to EOL. This is visible on fixed gain records. Shot with FK filter, Decon and Bandpass filter show insignificant levels of noise remaining.

Conclusion: Line accepted.

6. Line: 89FA-0274-R Seq 11 FFID: 760-1630
Recorded: 18/8/89 Processed: 18/8/89

Reason for processing: Bird 10 on starboard streamer was shallow from shotpoint 1300-1450. Streamer depth was back in spec by shotpoint 1470.

Conclusion: Line accepted.

7. Line:89FA-0214-R Seq 13 FFID: 363-1627
Recorded: 19/8/89 Processed: 19/8/89

Reason for processing: Moderate swell noise. Started recording with Rho port guns only. The first shotpoint with all Rho and Sigma guns firing was 554. Processed Rho starboard streamer/Sigma port source.

The regional velocity function was inappropriate due to the long perpendicular offset. Updated velocities were picked from constant velocity stacks and gathers. The stack was compared with sequence 5, line 89FA-0238-R and

no difference could be seen other than the delayed first arrival times.

Conclusion: Line accepted from shotpoint 550-1630.

8. Line: North-South Test FFID: 870-880
Recorded: 15-20/8/89 Processed: 20/8/89

Reason for processing: After a good bit of trial and error, shots centred around shotpoint 875 were sorted and assigned a north-south geometry with group numbers based on the original east-west line numbers. Shotpoint interval was set at 25 meters, CDP interval was set at 12.5 meters. Only the eight shots received by Rho receivers were used. No Sigma tapes were available.

CDP gathers for brute stack were limited to a 350 meter offset. Trace summing of adjacent traces was not done, but all other steps in the normal brute stack sequence were applied.

At this time, the only lines recorded are the south half of the south half, and the south half of the north half leaving a gap of 3600 meters in the middle. Until more lines are recorded, it is impossible to determine how well the north half and south half will tie. Also, the logistics for organizing the individual shots will need a little refining to become practical.

9. A SEGY output tape was produced containing near trace stacks and brute stacks of lines processed to date. There are 9 files on tape separated by single EOF's.

TAPE FILE LISTING

1. Seq 1 Line 89FA-0238-R brute stack
2. Seq 3 Line 89FA-0250-R near trace stack
3. Seq 3 Line 89FA-0250-R brute stack
4. Seq 5 Line 89FA-0238-R near trace stack
5. Seq 5 Line 89FA-0238-R brute stack
6. Seq 11 Line 89FA-0274-R near trace stack
7. Seq 11 Line 89FA-0274-R brute stack
8. Seq 13 Line 89FA-0214-R near trace stack
9. Seq 13 Line 89FA-0214-R brute stack

End of Block F03 Report Part I. Crew change 23/8/89.

10. Line: 89FA-0502-R Seq 33 FFID: 100-1628
Recorded: 26/8/89 Processed: 26/8/89

Reason for processing: For use as a benchmark. This line was acquired in calm seas.

Conclusion: NMO-corrected gathers produced for velocity control show good results using the new regional velocity above for Block F03.

11. Line: 89FA-0478-R Seq 38 FFID: 83,101-112
Recorded: 28/8/89 Processed: 28/8/89

Reason for processing FFID 83: RMS amplitude test. This DFSV BOL noise record was processed on the MicroMax for an RMS amplitude comparison with the plot generated by the GECO system.
Conclusion: Results were the same, allowing the MicroMax to be used for quantitative determination of noise levels.

Reason for processing FFID 101-112: Swell noise.

Conclusion: These files from the BOL were processed, and together with the conclusion drawn from FFID 83 it was determined that the noise level was acceptable for data acquisition.

12. Line: 89FA-0478-R Seq 39 FFID: 1081-1629
Recorded: 28/8/89 Processed: 28/8/89

Reason for processing: This line was acquired in strong swells; seas around Force 6. As a result of the previous test, the acquisition of this line was continued to completion. The seas worsened as the acquisition progressed, so the second half of the line was processed and compared with the second half of the section from the nearby benchmark line.

Conclusion: Comparison was favourable, line accepted.

Testing: This line was stacked with the regional velocity (Vel 1), as well as two other test velocity functions (Vels 2 and 3). The velocity functions and stacks are included in the documentation.

13. Monthly Tests FFID: 1-31
Recorded: 5/9/89 Processed: 5-6/9/89

Reason for processing: Monthly DFSV instrument tests run at the end of Block F03 acquisition.

Conclusion: All channels performing well, except channel 66 which had a faulty switch during the tests. The results are contained in the documentation.

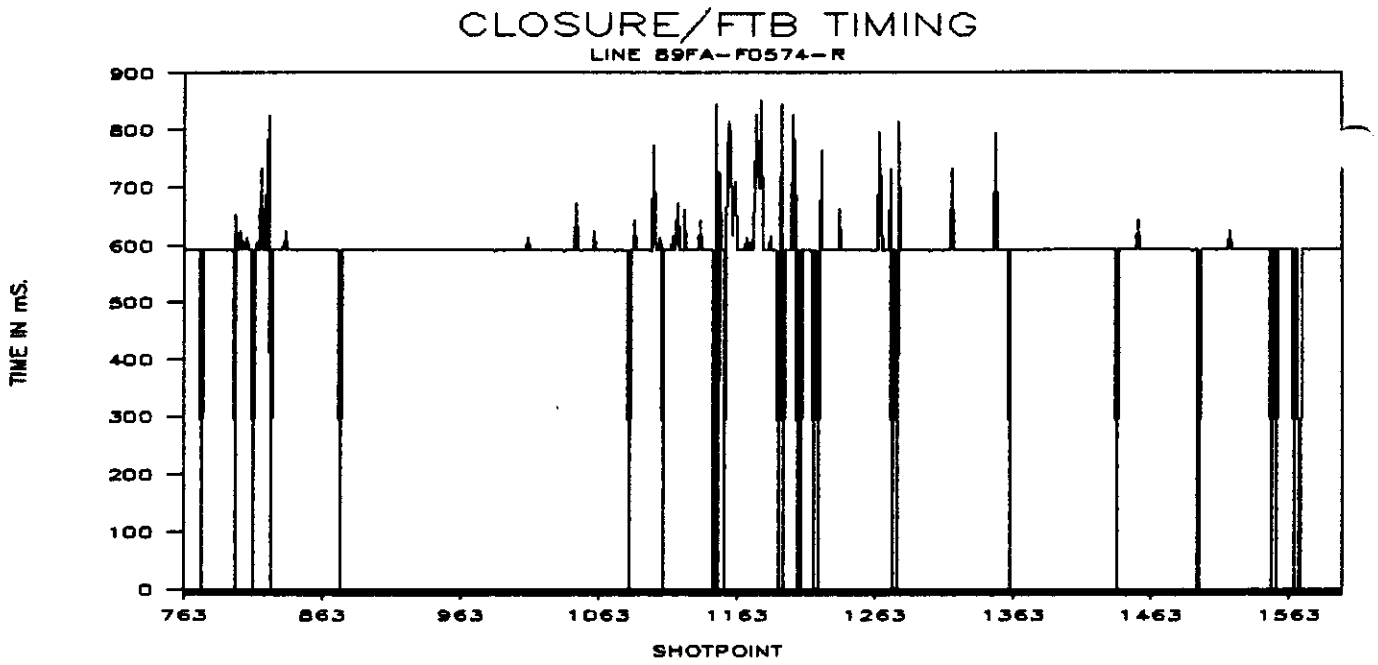
14. A SEGY output tape was produced containing near trace stacks and brute stacks of lines processed to date. There are 4 files on tape separated by single EOF's.

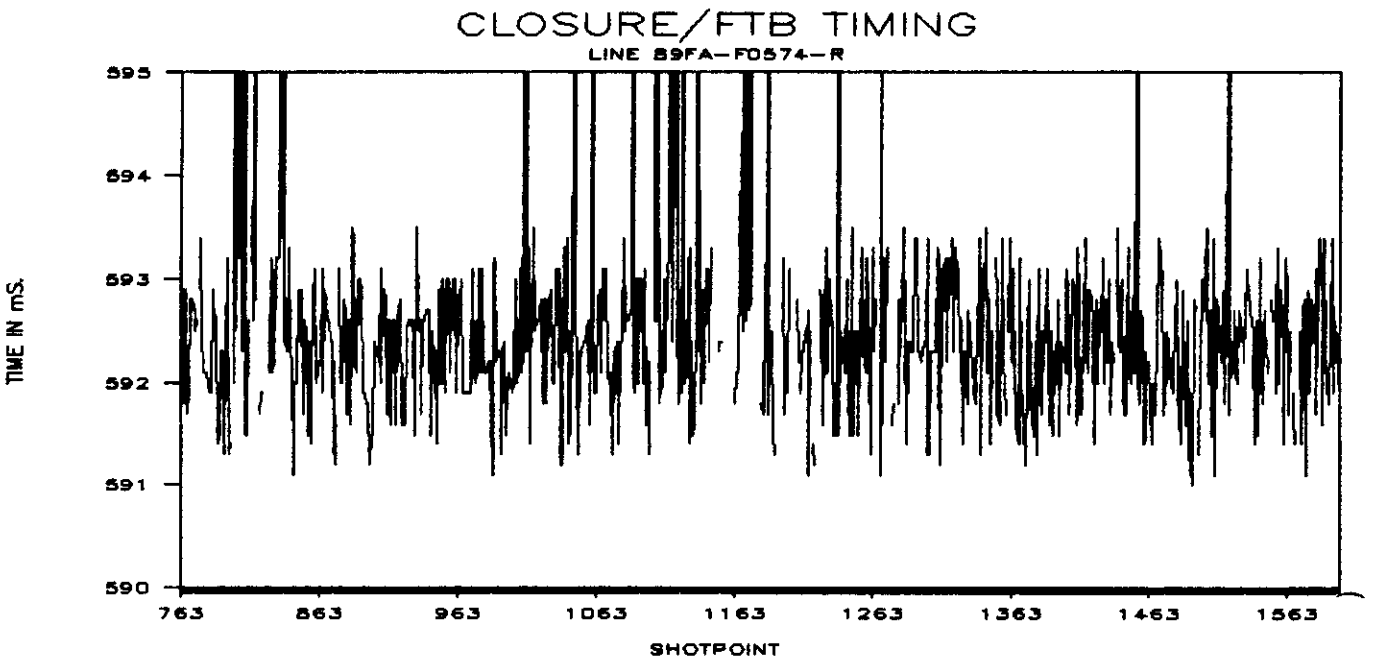
TAPE FILE LISTING

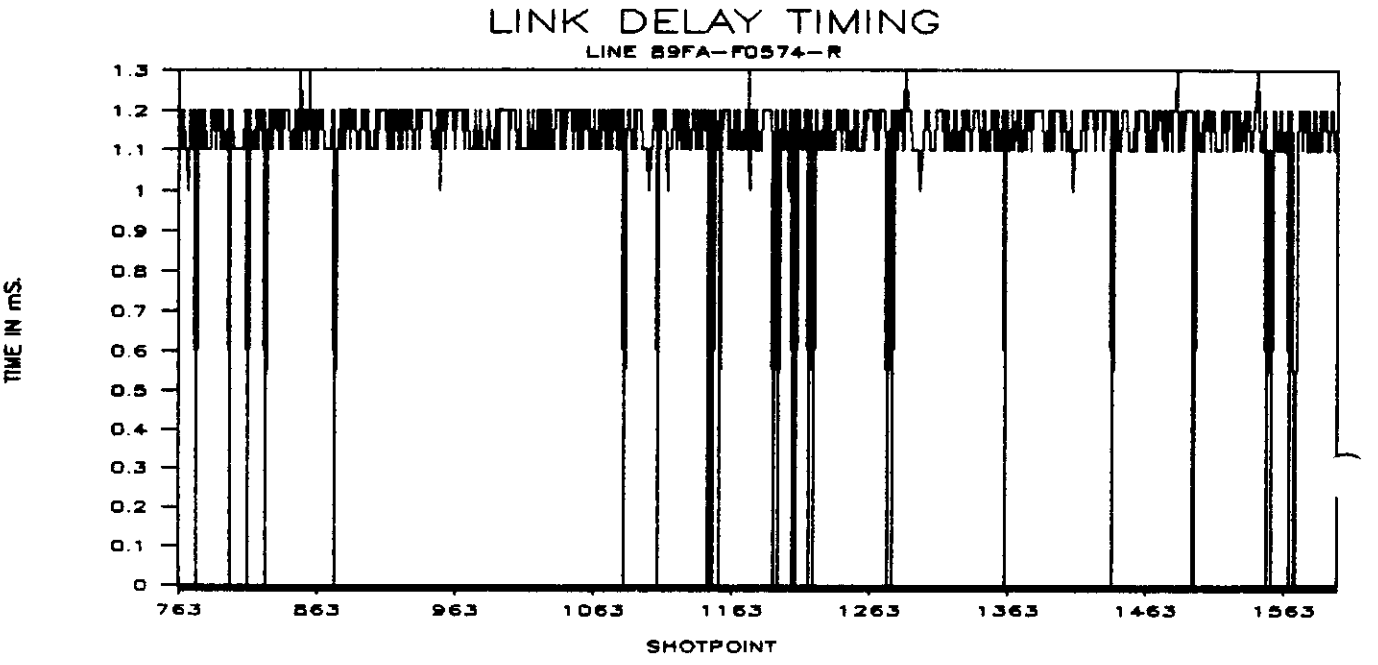
1. Seq. 33 Line 89FA-0502-R brute stack
2. Seq. 39 Line 89FA-0478-R brute stack
3. Seq. 39 Line 89FA-0478-R near trace stack
4. Seq. 59 Line 89FA-0586-R brute stack

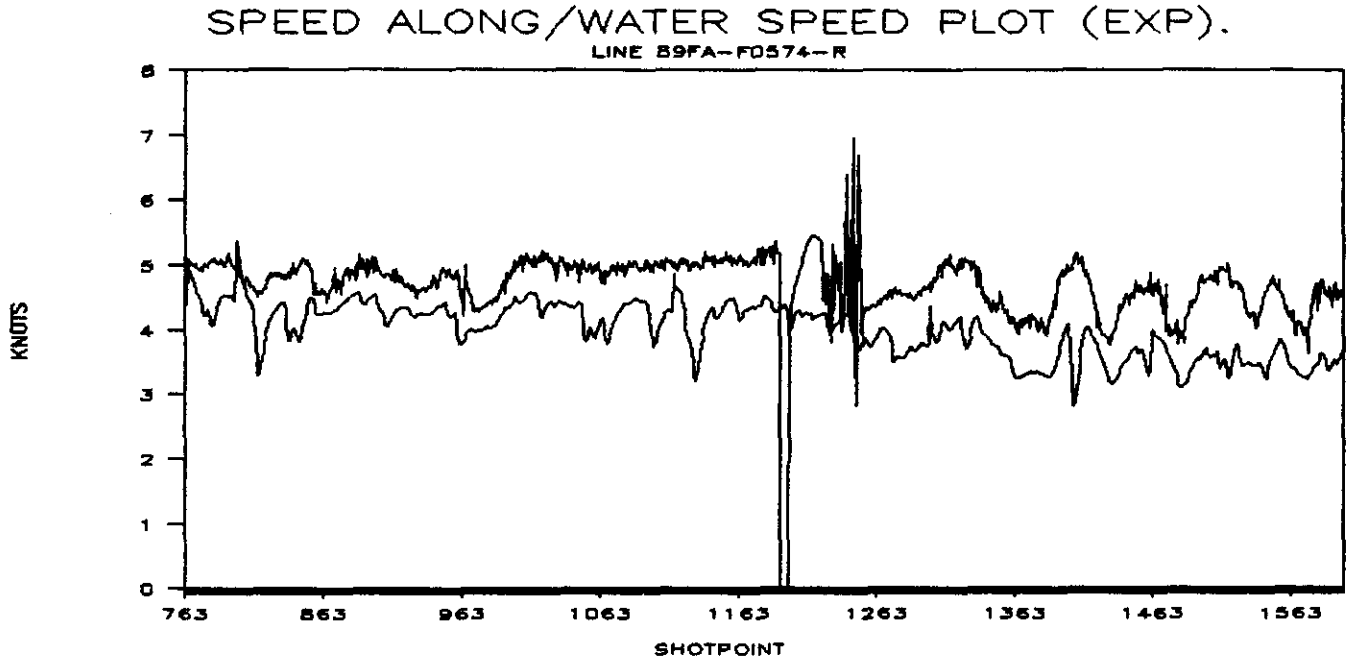
End of Block F03 Report/prospect. 7/9/89.

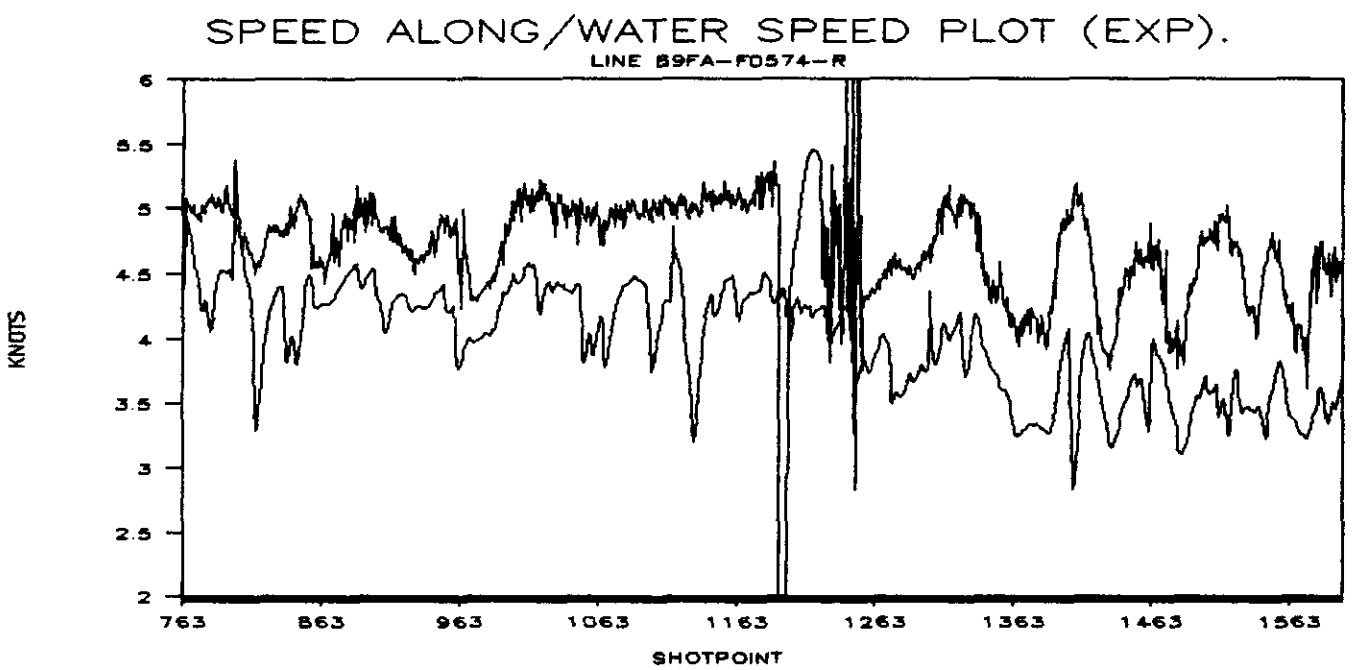
9.7 ECL Header QC Package; Plots and Evaluations

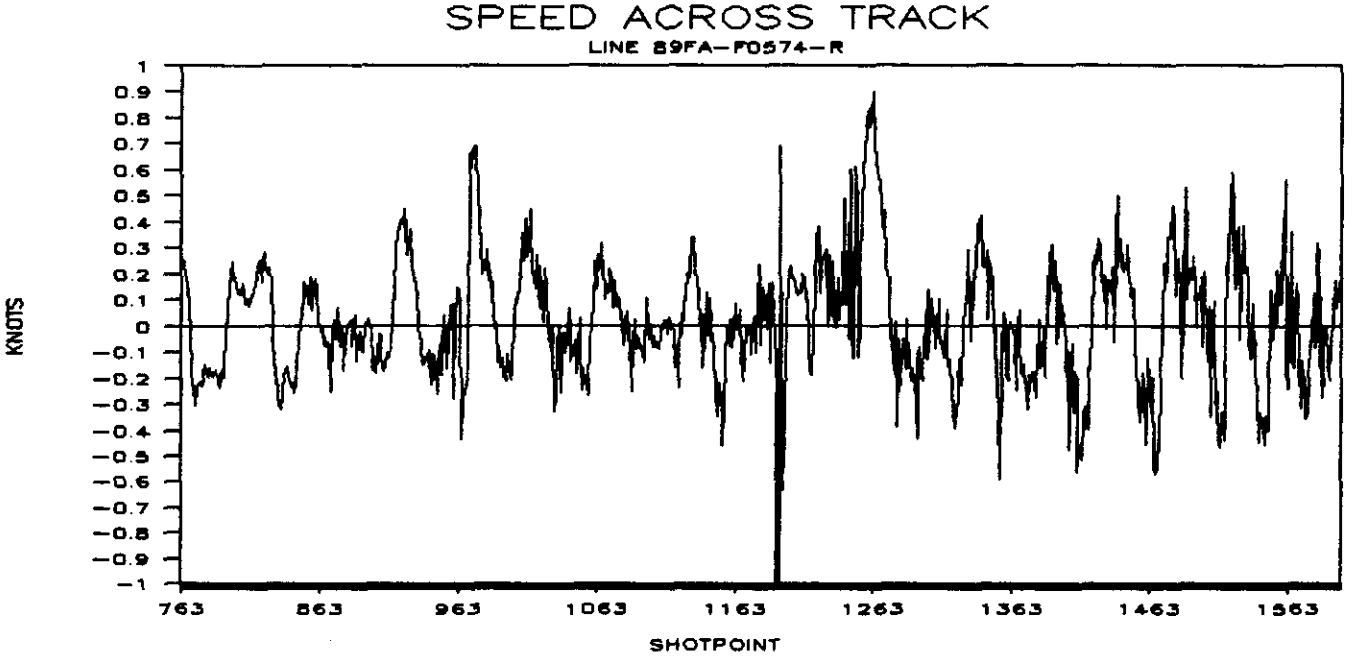

CLOSURE/FTB TIMING
LINE 89FA-F0574-R
TIME IN mS.
900
800
700
600
500
400
300
200
100
0
763
863
963
1063
1163
1263
1363
1463
1563
SHOTPOINT

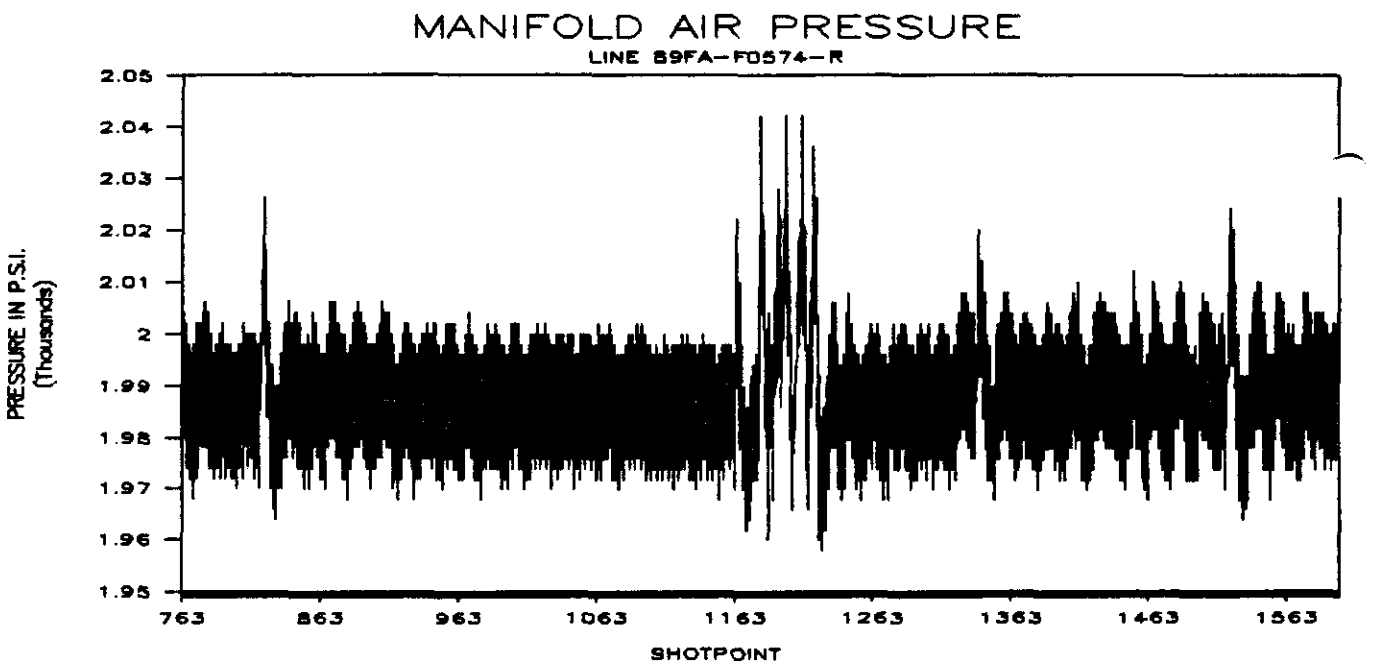

CLOSURE/FTB TIMING
LINE 89FA-F0574-R
TIME IN mS.
595
594
593
592
591
590
763
863
963
1063
1163
1263
1363
1463
1563
SHOTPOINT

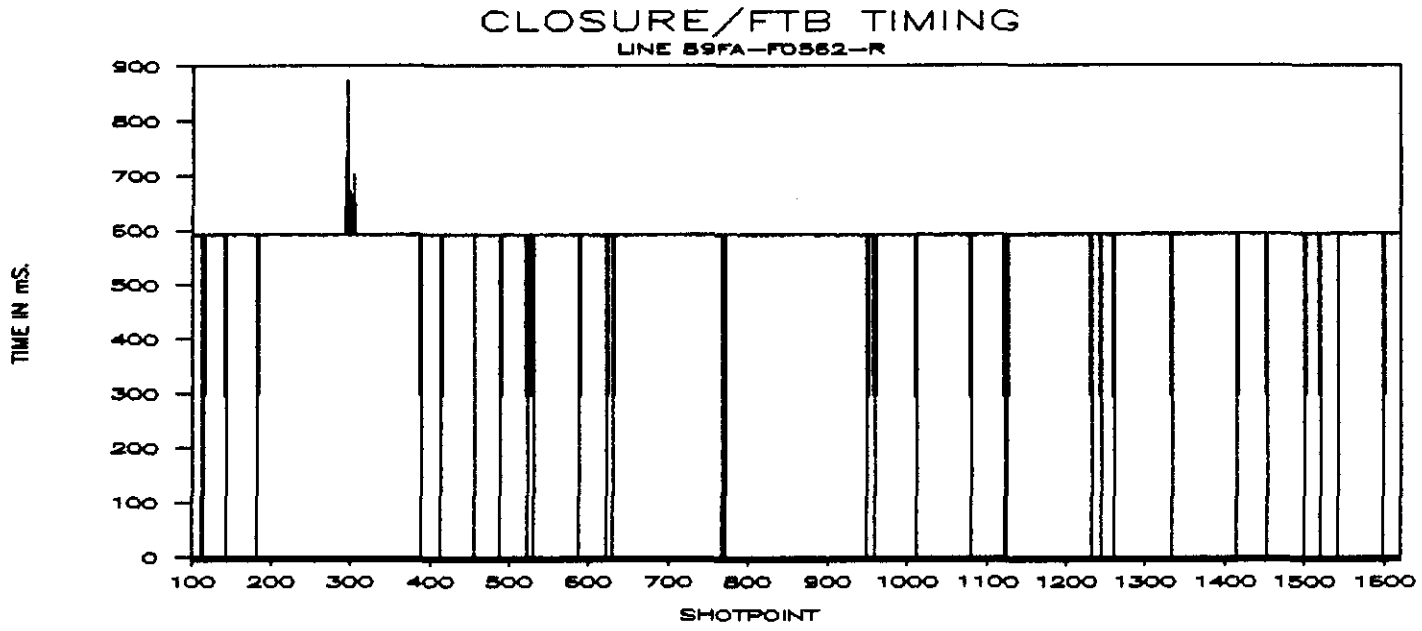

LINK DELAY TIMING
LINE 89FA-F0574-R
TIME IN mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
763
863
963
1063
1163
1263
1363
1463
1563
SHOTPOINT

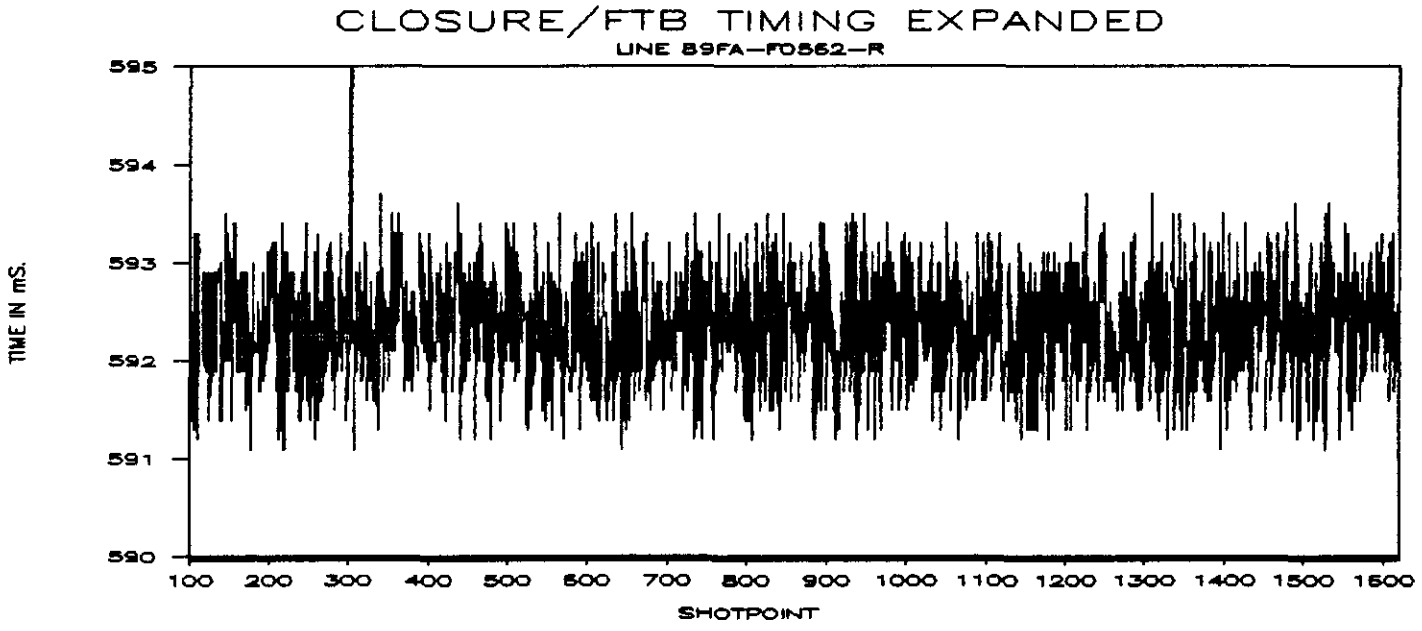

SPEED ALONG/WATER SPEED PLOT (EXP).
LINE 89FA-F0574-R
KNOTS
0
1
2
3
4
5
6
7
763
863
963
1063
1163
1263
1363
1463
1563
SHOTPOINT

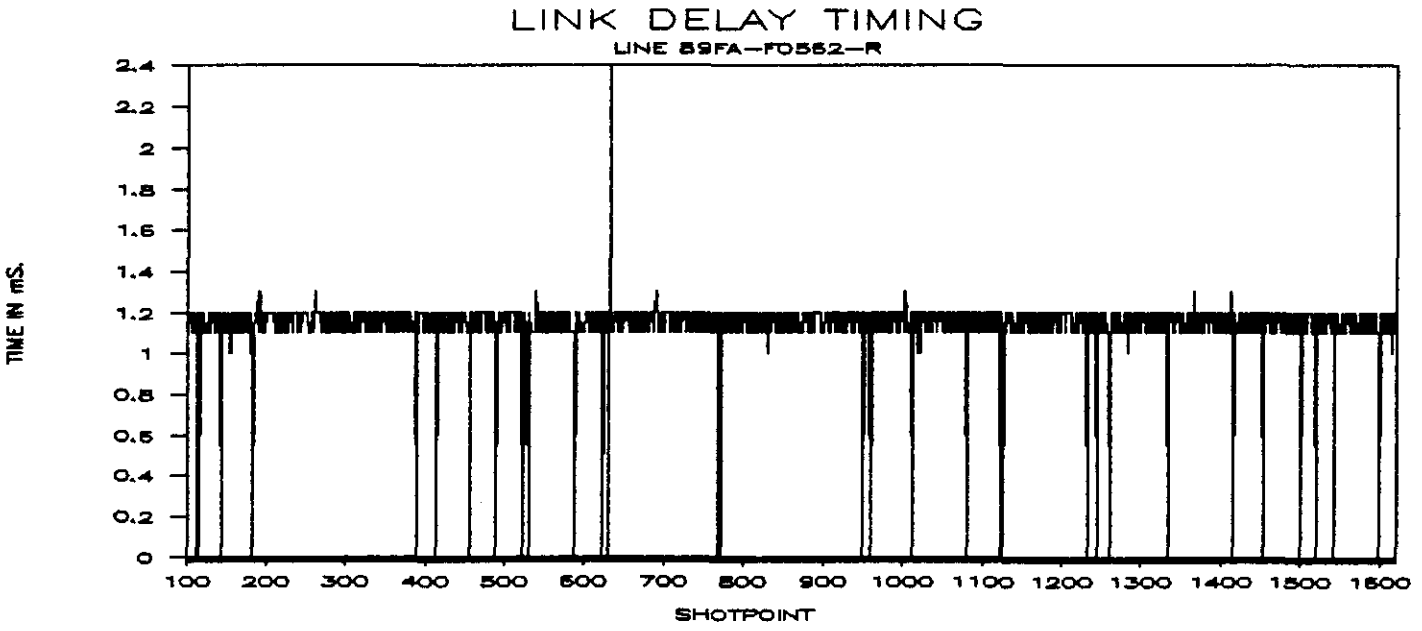

SPEED ALONG/WATER SPEED PLOT (EXP).
LINE 89FA-F0574-R
KNOTS
2
2.5
3
3.5
4
4.5
5
5.5
6
763
863
963
1063
1163
1263
1363
1463
1563
SHOTPOINT

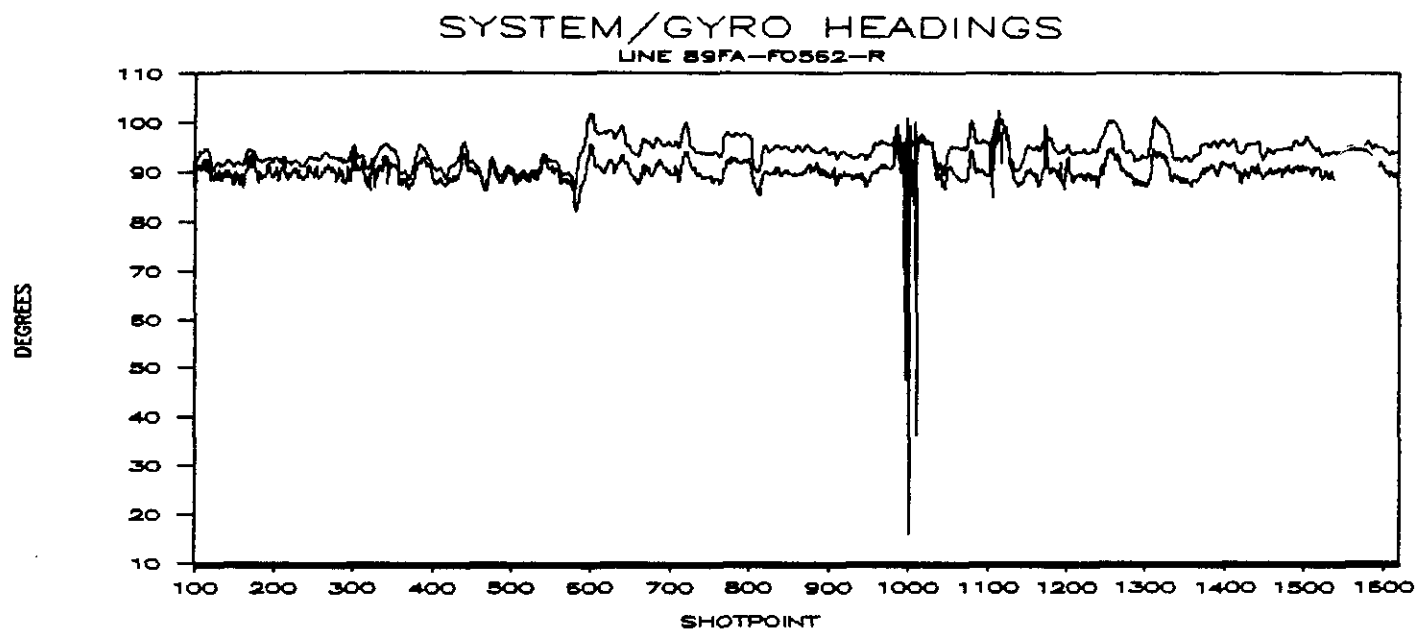

SPEED ACROSS TRACK
LINE 89FA-F0574-R
KNOTS
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
-0.9
-1
763
863
963
1063
1163
1263
1363
1463
1563
SHOTPOINT

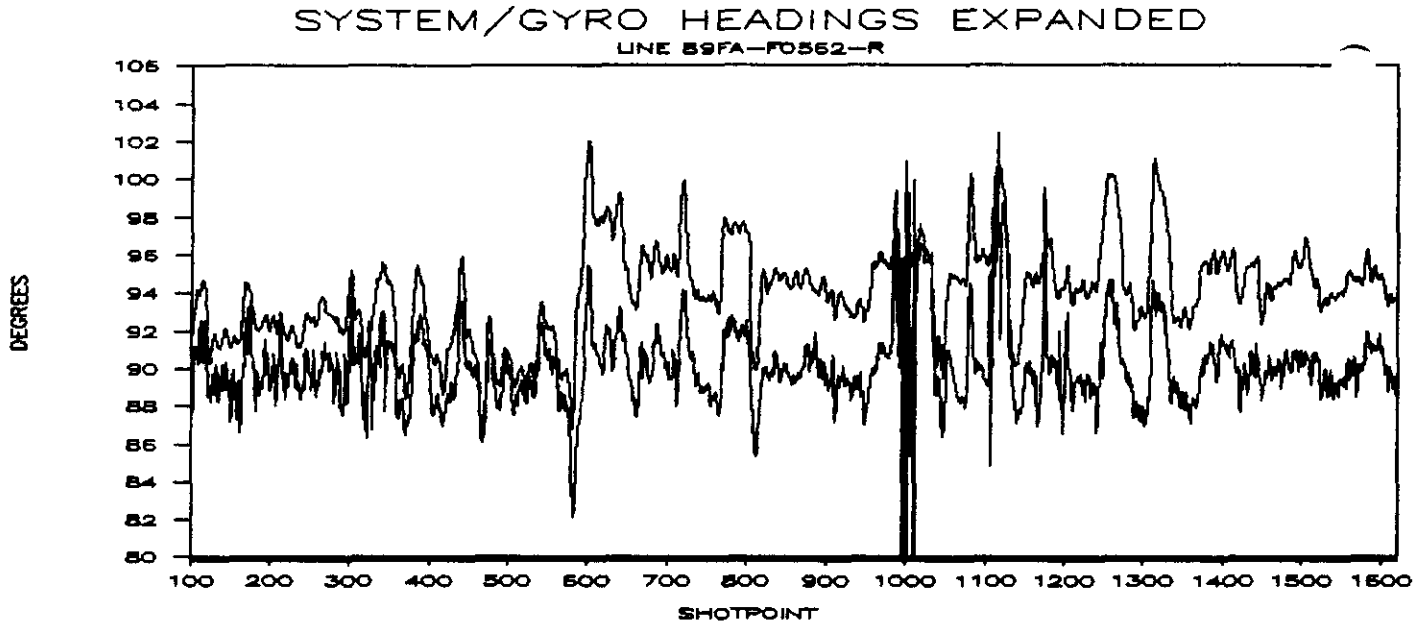

MANIFOLD AIR PRESSURE
LINE 89FA-F0574-R
PRESSURE IN P.S.I.
(Thousands)
2.05
2.04
2.03
2.02
2.01
2
1.99
1.98
1.97
1.96
1.95
763
863
963
1063
1163
1263
1363
1463
1563
SHOTPOINT

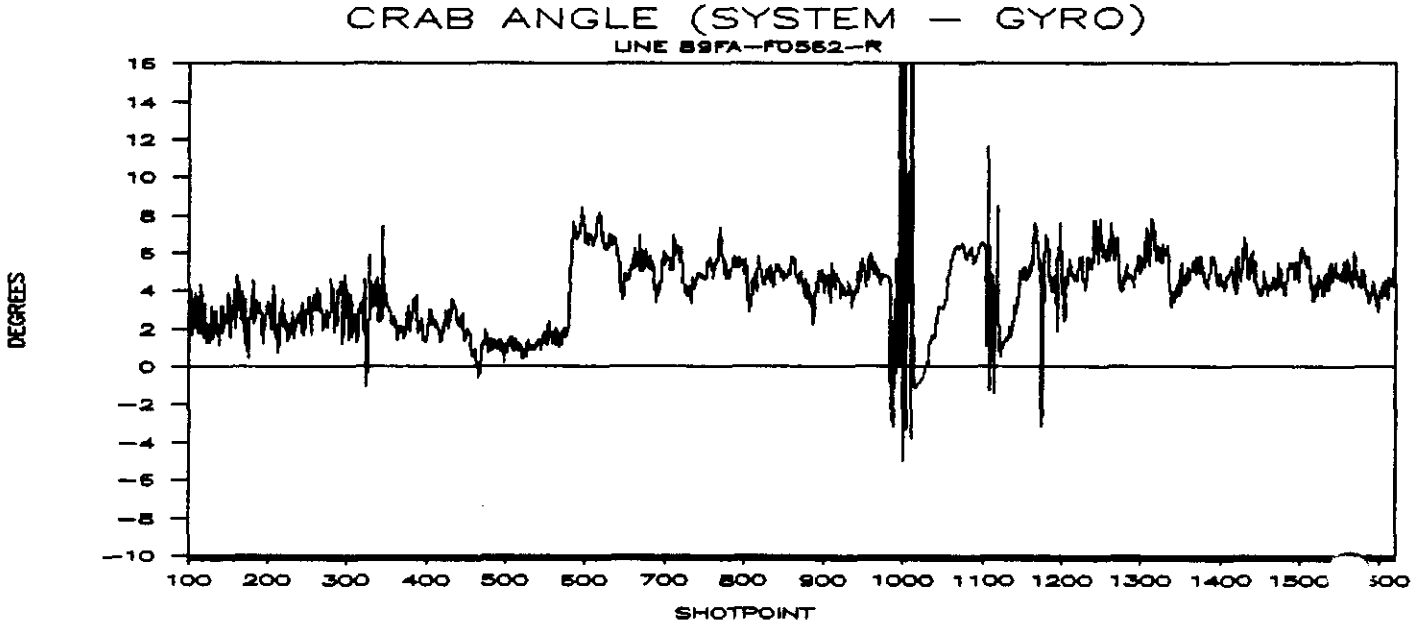

CLOSURE/FTB TIMING
LINE 89FA-F0562-R
TIME IN mS.
900
800
700
600
500
400
300
200
100
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT

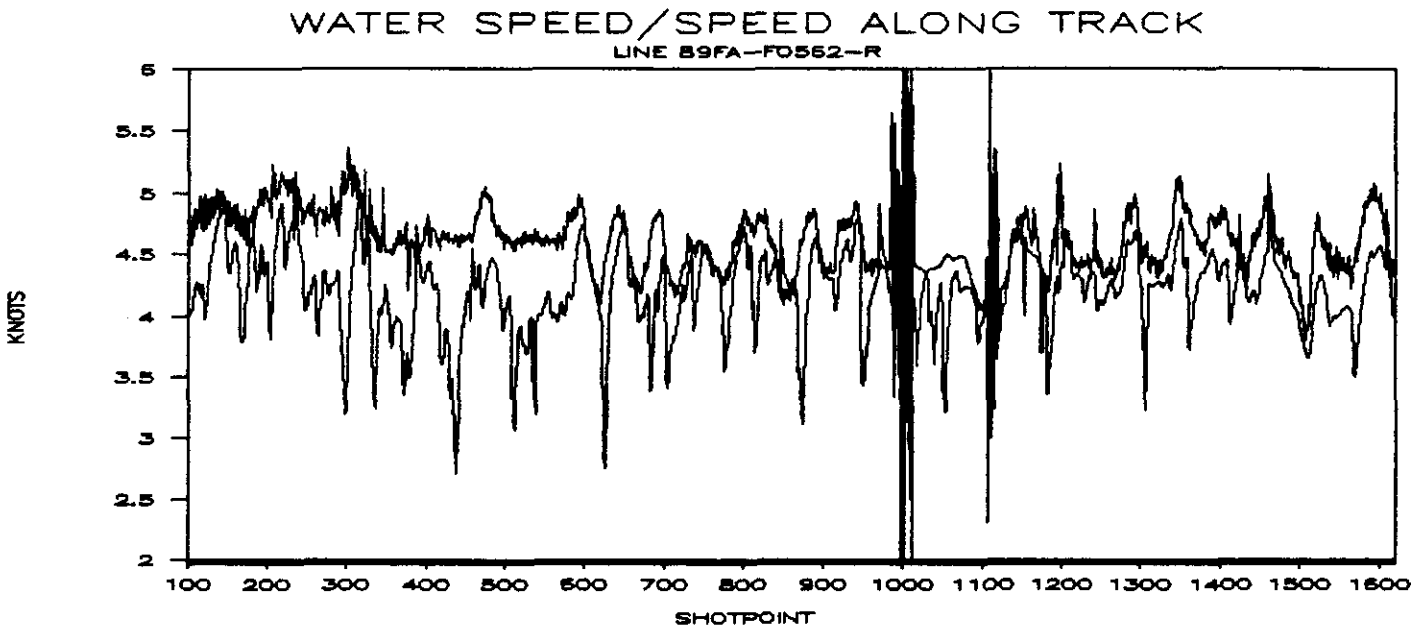

CLOSURE/FTB TIMING EXPANDED
LINE 89FA-F0562-R
TIME IN mS.
595
594
593
592
591
590
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT

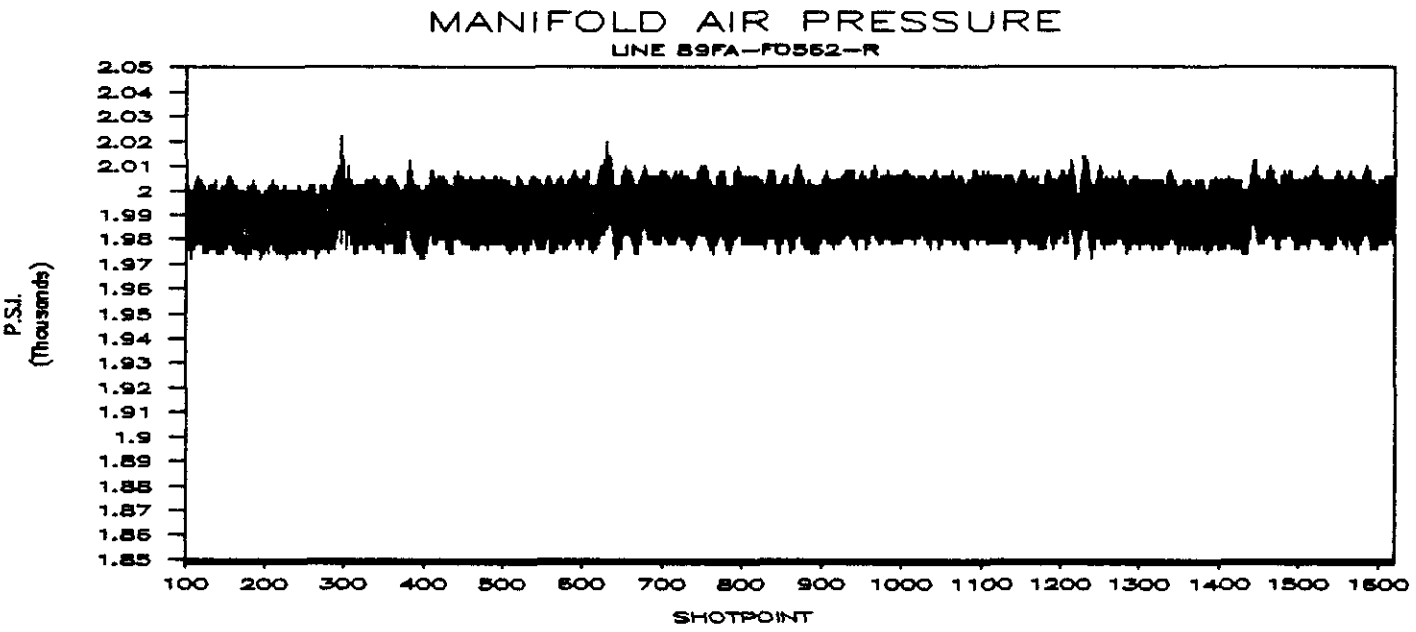

LINK DELAY TIMING
LINE 89FA-F0562-R
TIME IN mS.
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT


SYSTEM/GYRO HEADINGS
LINE 89FA-F0562-R
DEGREES
110
100
90
80
70
60
50
40
30
20
10
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT


SYSTEM/GYRO HEADINGS EXPANDED
LINE 89FA-F0562-R
DEGREES
106
104
102
100
98
96
94
92
90
88
86
84
82
80
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT

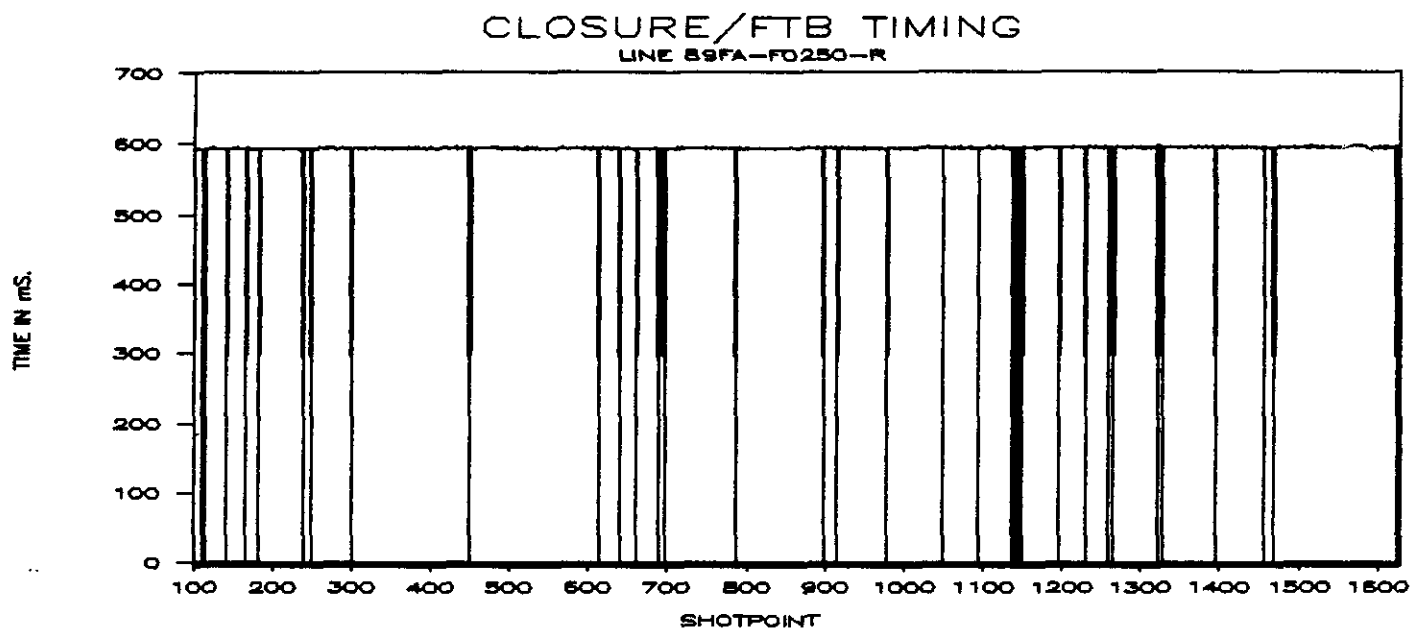

CRAB ANGLE (SYSTEM - GYRO)
LINE 89FA-F0562-R
DEGREES
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500
SHOTPOINT

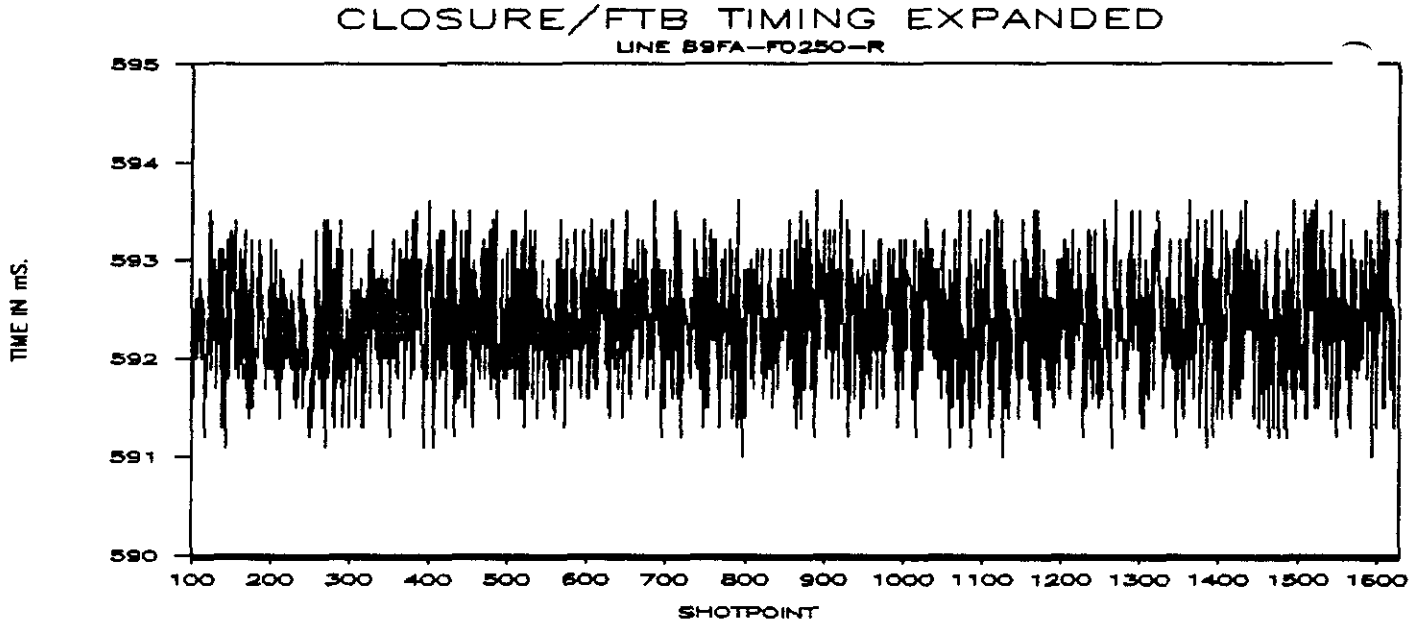


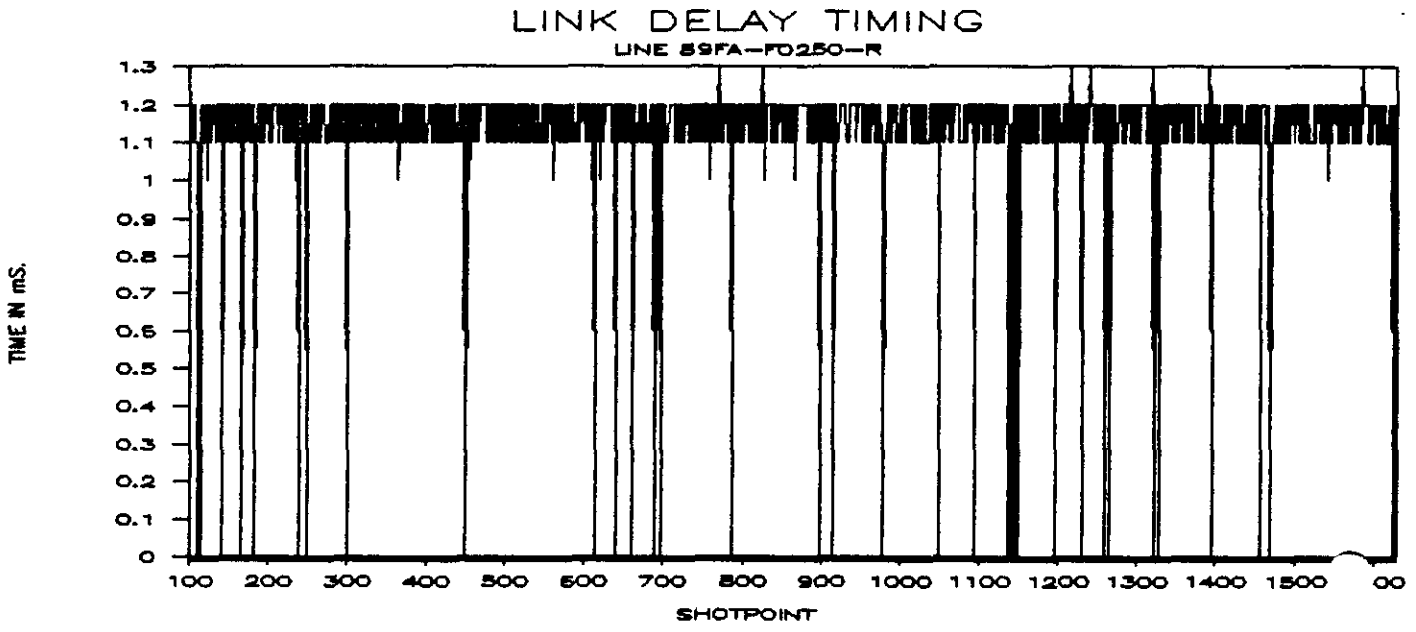


Edits List Geco Sigma Block F3

SEQ	LINE		EDITS
1	0238	SIGMA RHO	Complete line scratched
2	0574	SIGMA RHO	Complete line scratched
3	0250	SIGMA RHO	No major edits
4	0562	SIGMA RHO	Port cable sp 670-770 Bad Nav sp 973-1119
5	0238	SIGMA RHO	No major edits

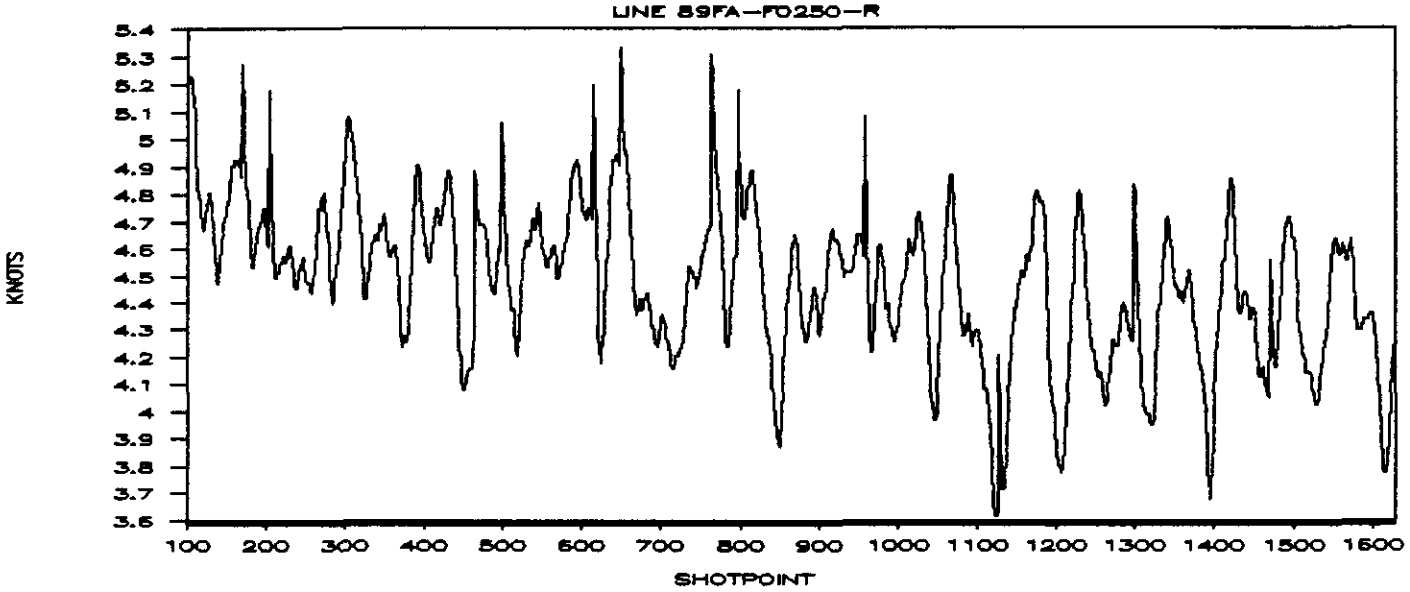

CLOSURE/FTB TIMING
LINE 89FA-F0250-R
TIME IN mS.
700
600
500
400
300
200
100
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT


CLOSURE/FTB TIMING EXPANDED
LINE 89FA-F0250-R
TIME IN mS.
595
594
593
592
591
590
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT


LINK DELAY TIMING
LINE 89FA-F0250-R
TIME IN mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500
SHOTPOINT

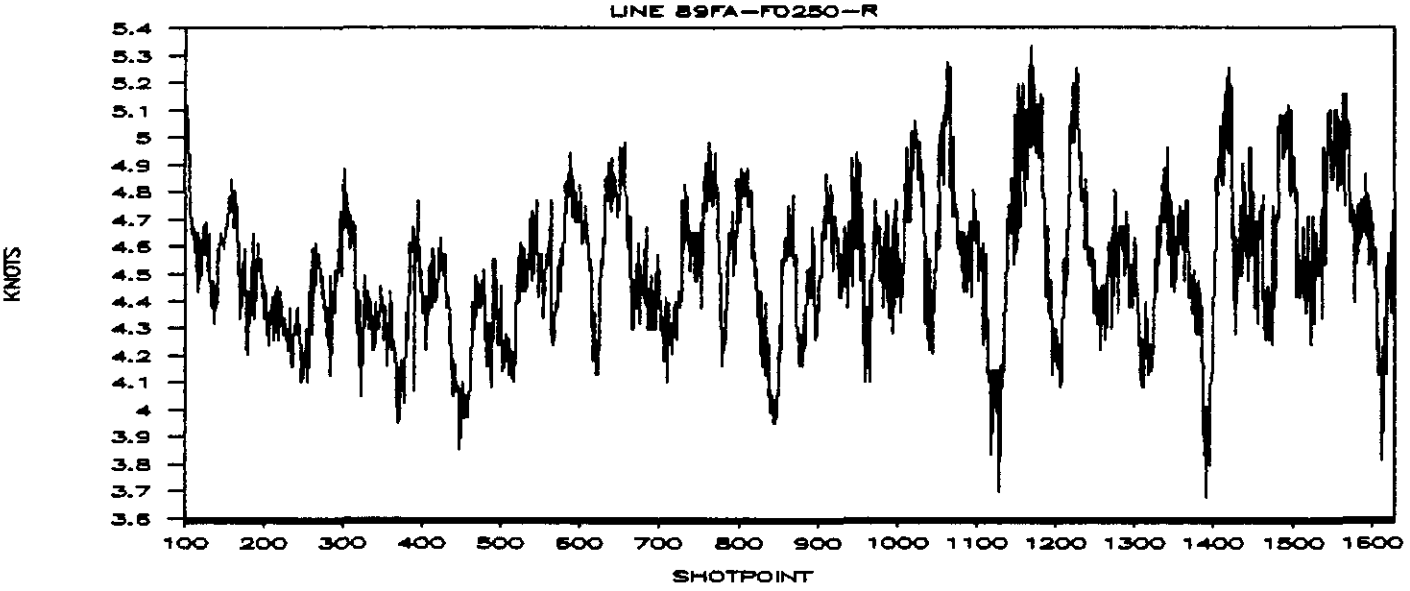
WATER SPEED

LINE 89FA-F0250-R



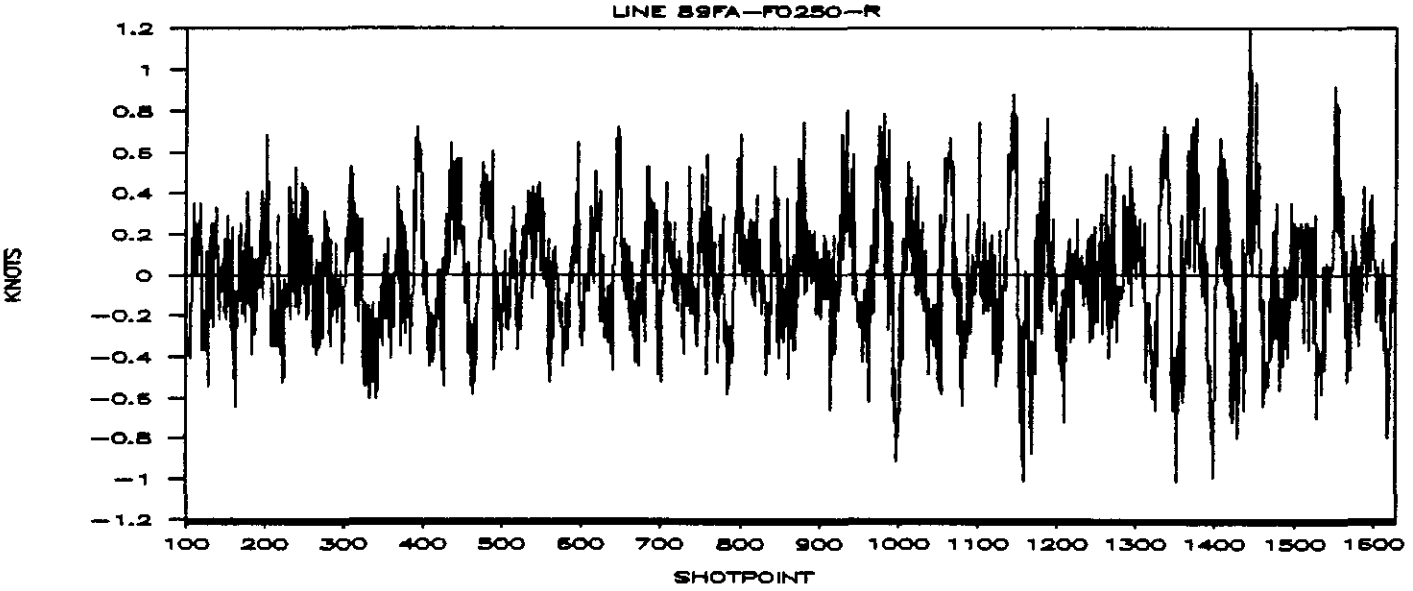
SPEED ALONG TRACK

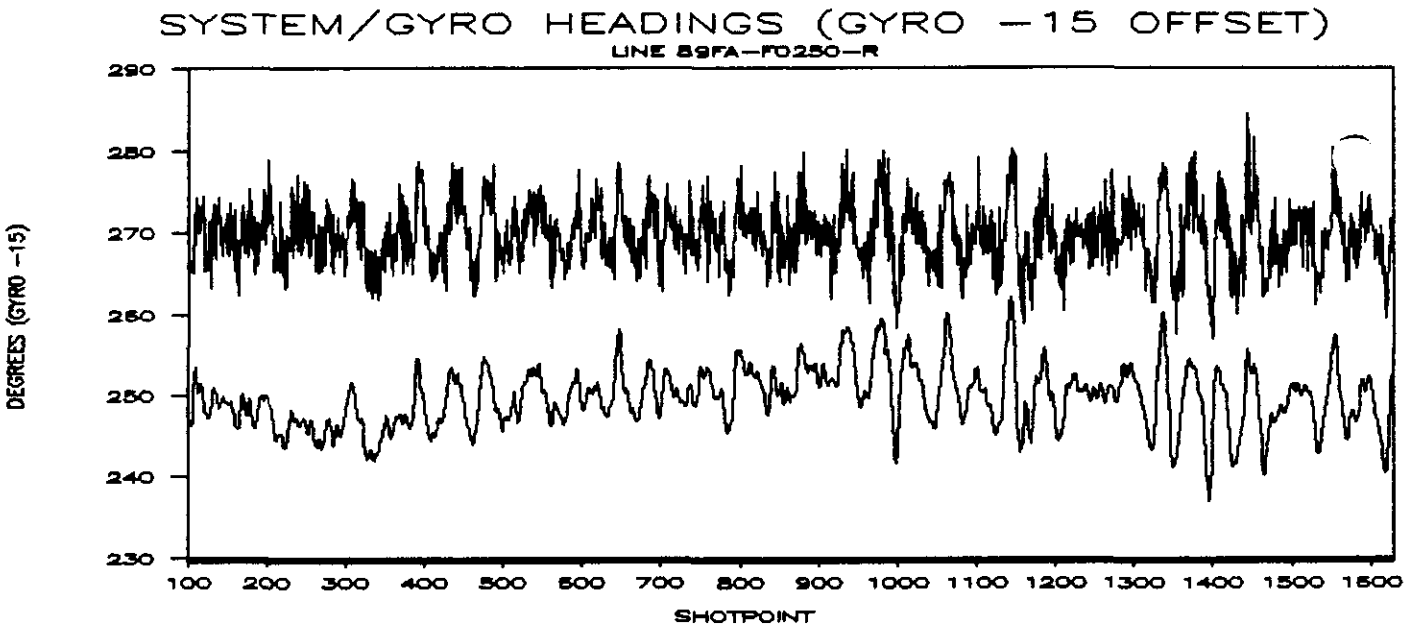
LINE 89FA-F0250-R

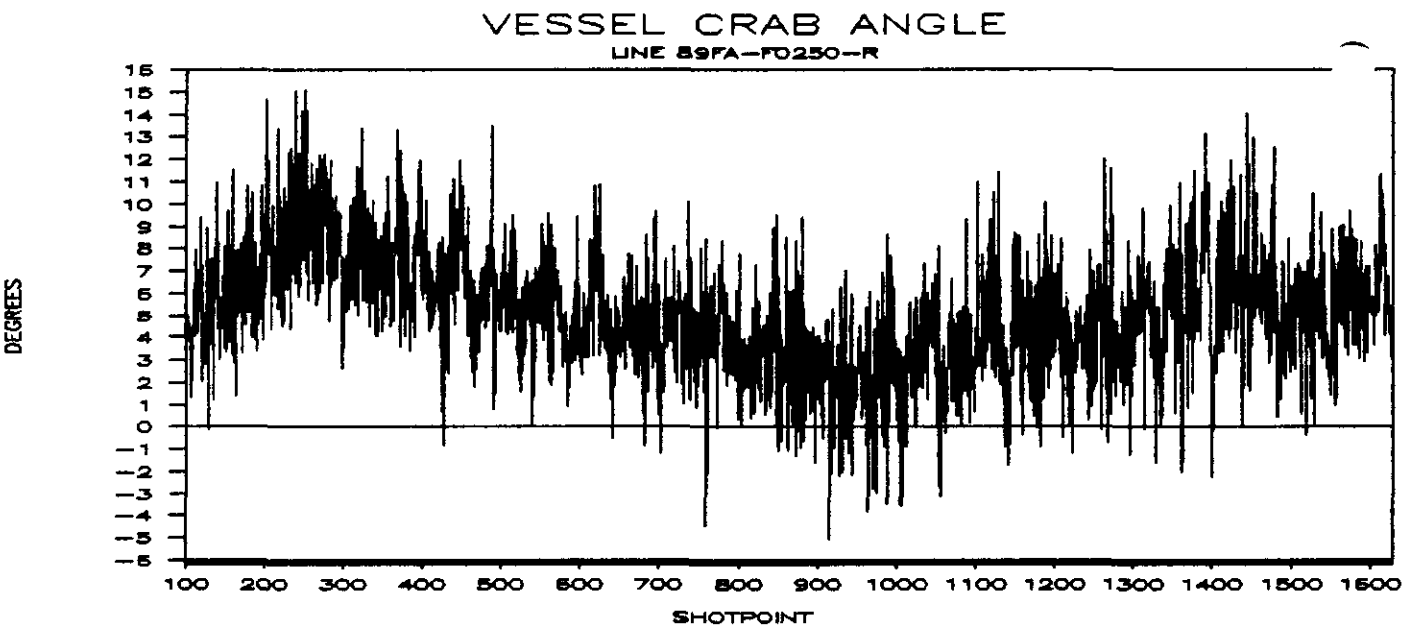


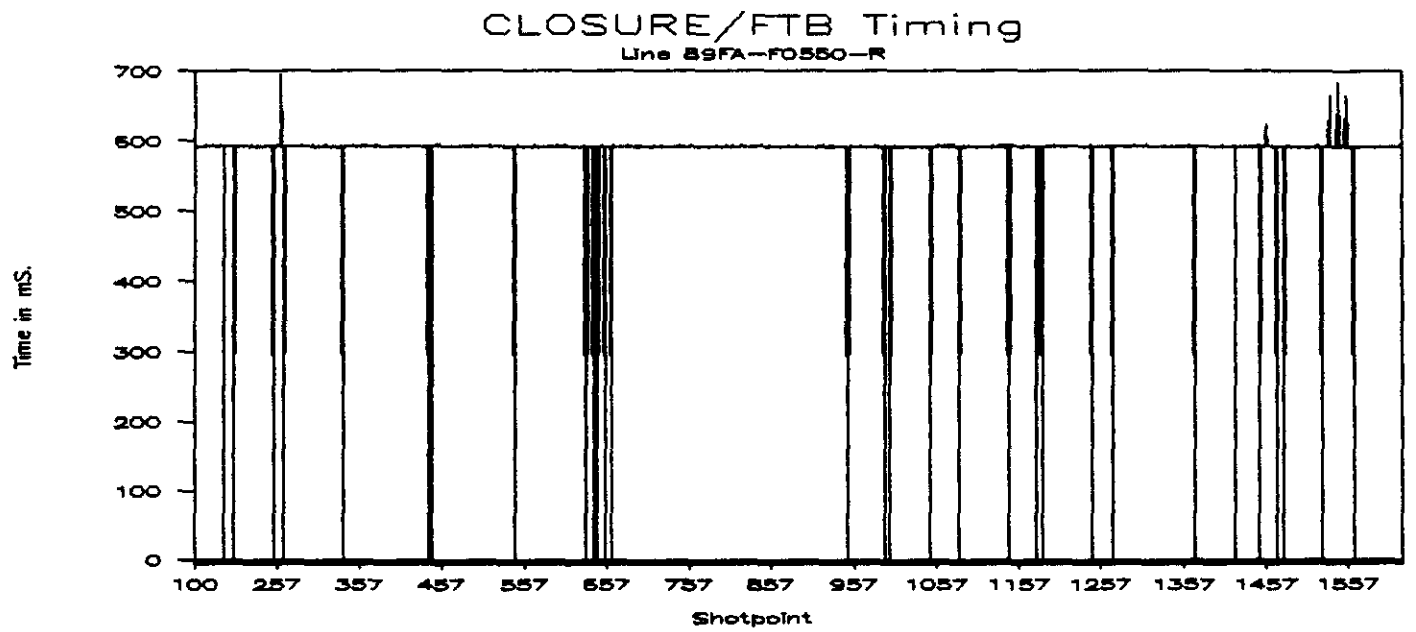
SPEED ACROSS TRACK

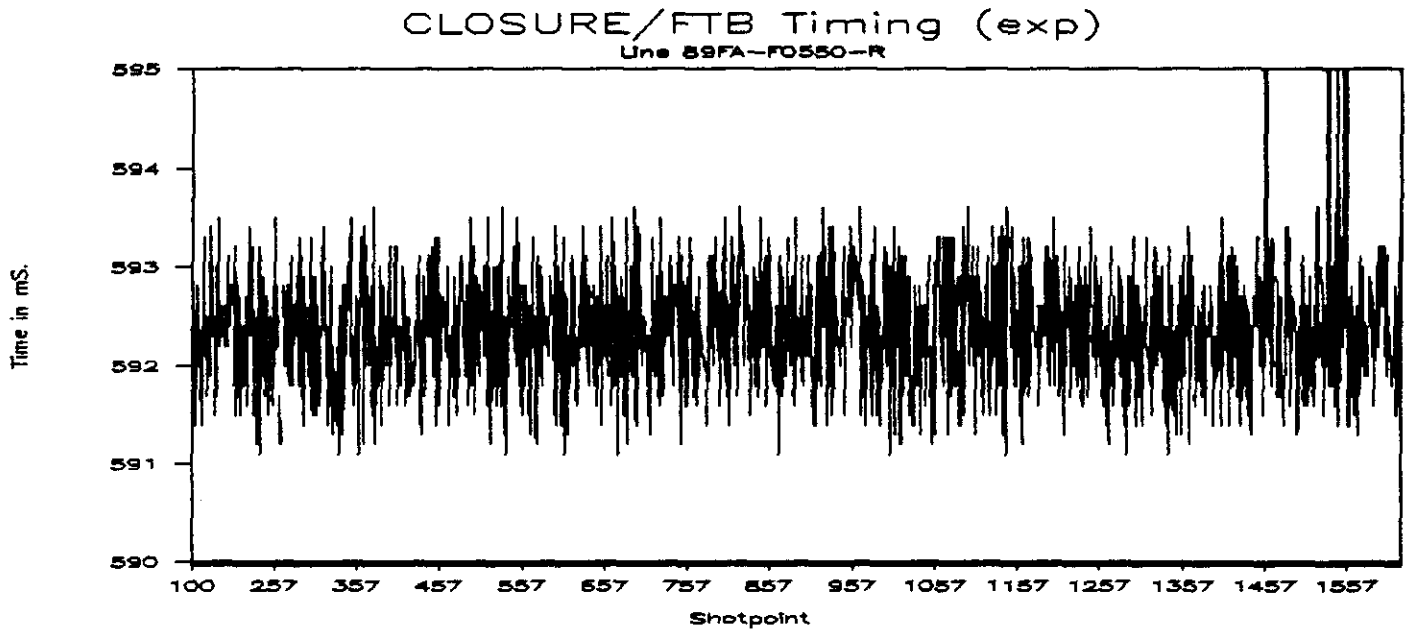
LINE 89FA-F0250-R

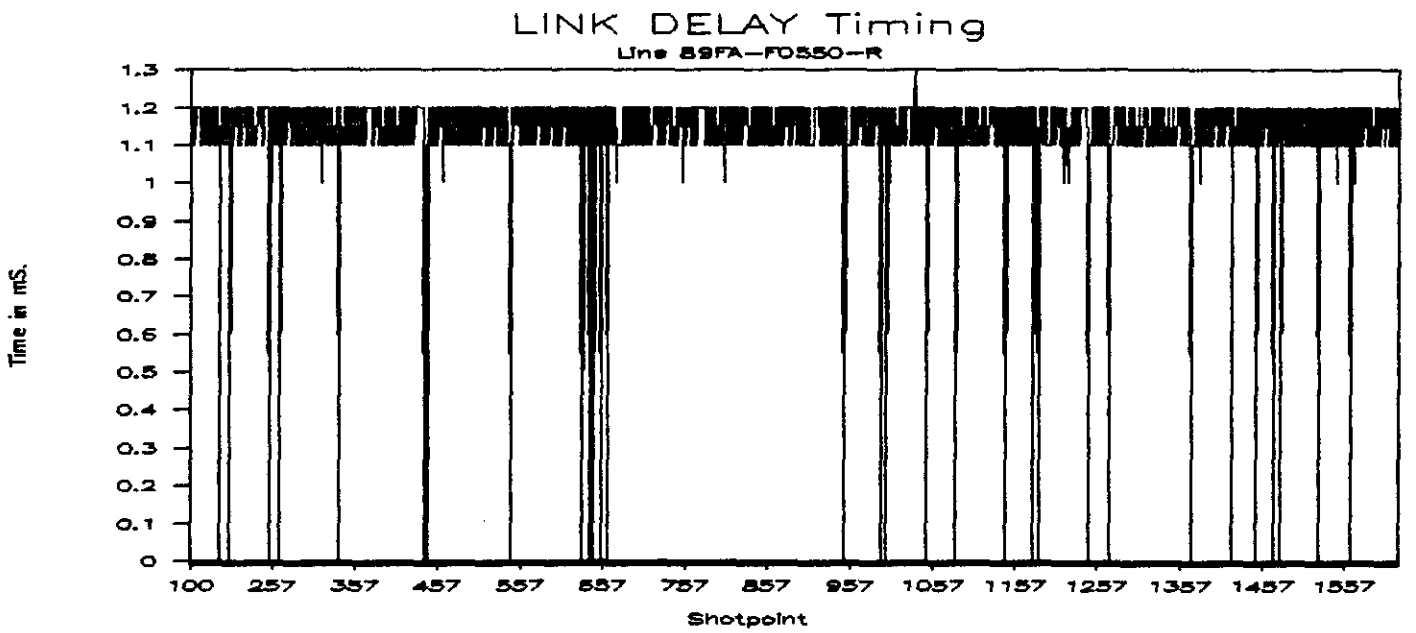


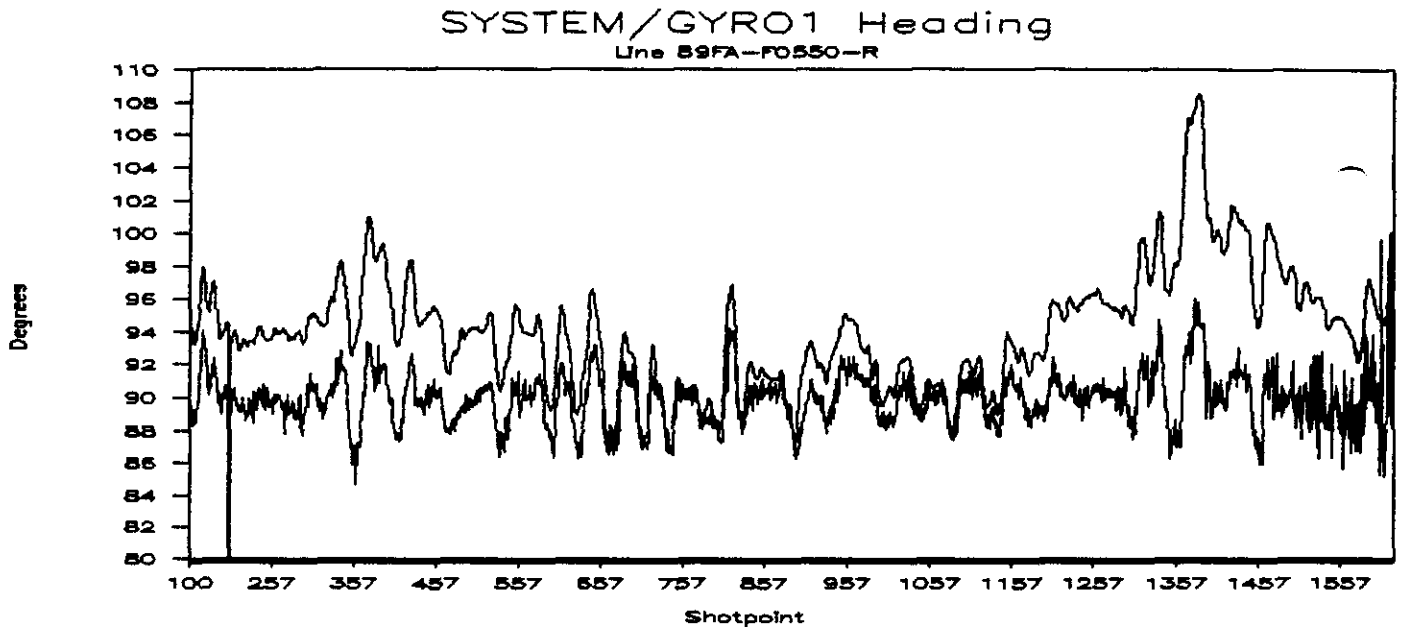

SYSTEM/GYRO HEADINGS (GYRO −15 OFFSET)
LINE 89FA−FD250−R
DEGREES (GYRO −15)
290
280
270
260
250
240
230
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT

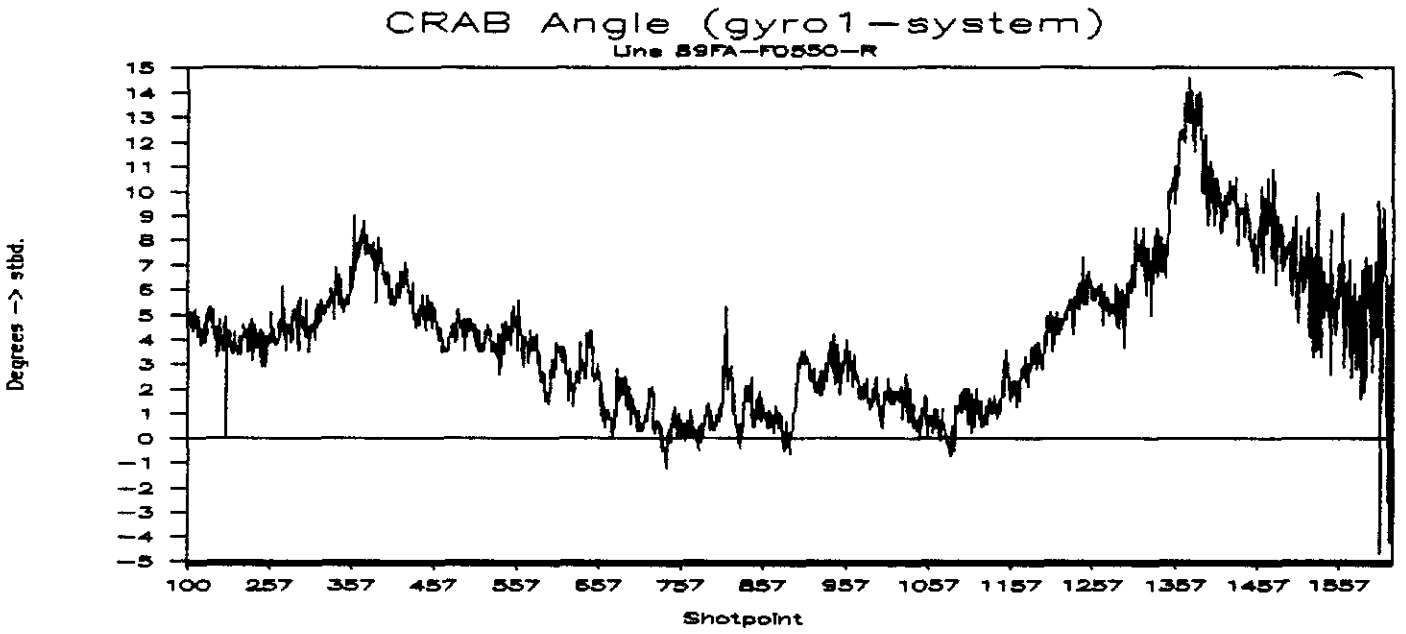

VESSEL CRAB ANGLE
LINE 89FA−FD250−R
DEGREES
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 −1 −2 −3 −4 −5 −6
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT

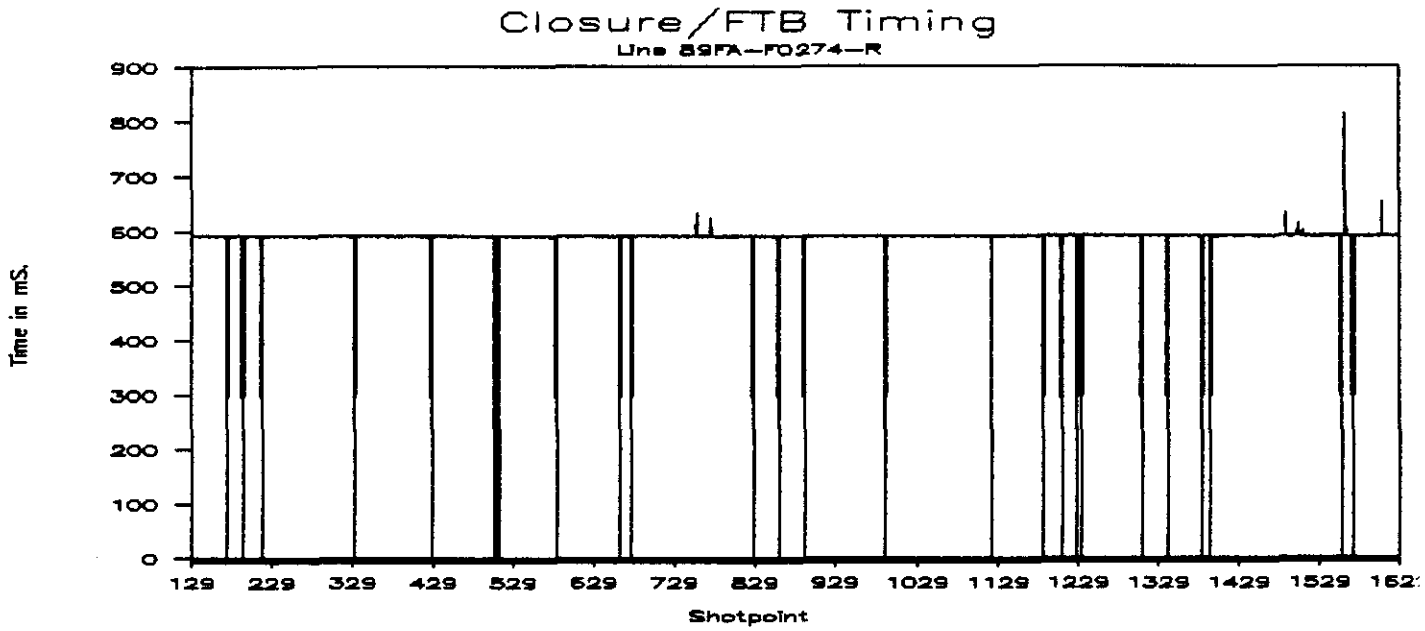

CLOSURE/FTB Timing
Line 89FA-F0550-R
Time in mS.
700
600
500
400
300
200
100
0
100 257 357 457 557 657 757 857 957 1057 1157 1257 1357 1457 1557
Shotpoint

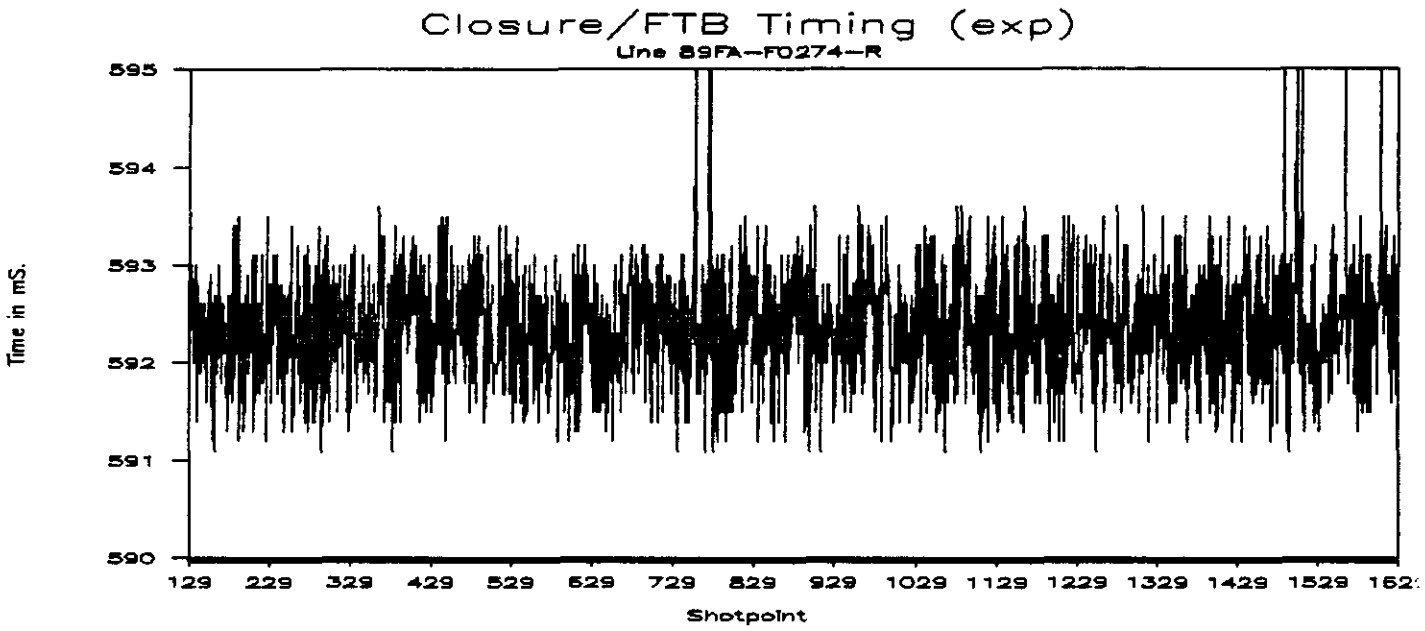

CLOSURE/FTB Timing (exp)
Line 89FA-F0550-R
Time in mS.
595
594
593
592
591
590
100 257 357 457 557 657 757 857 957 1057 1157 1257 1357 1457 1557
Shotpoint

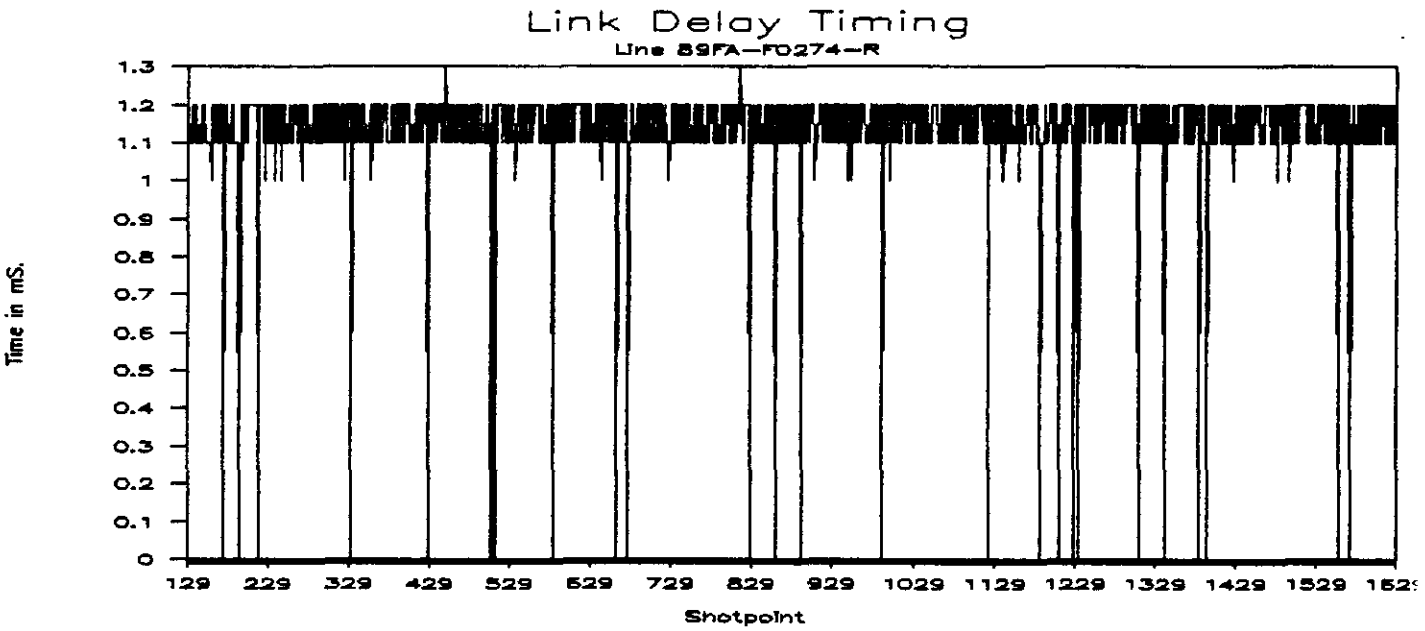

LINK DELAY Timing
Line 89FA-F0550-R
Time in mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
100 257 357 457 557 657 757 857 957 1057 1157 1257 1357 1457 1557
Shotpoint

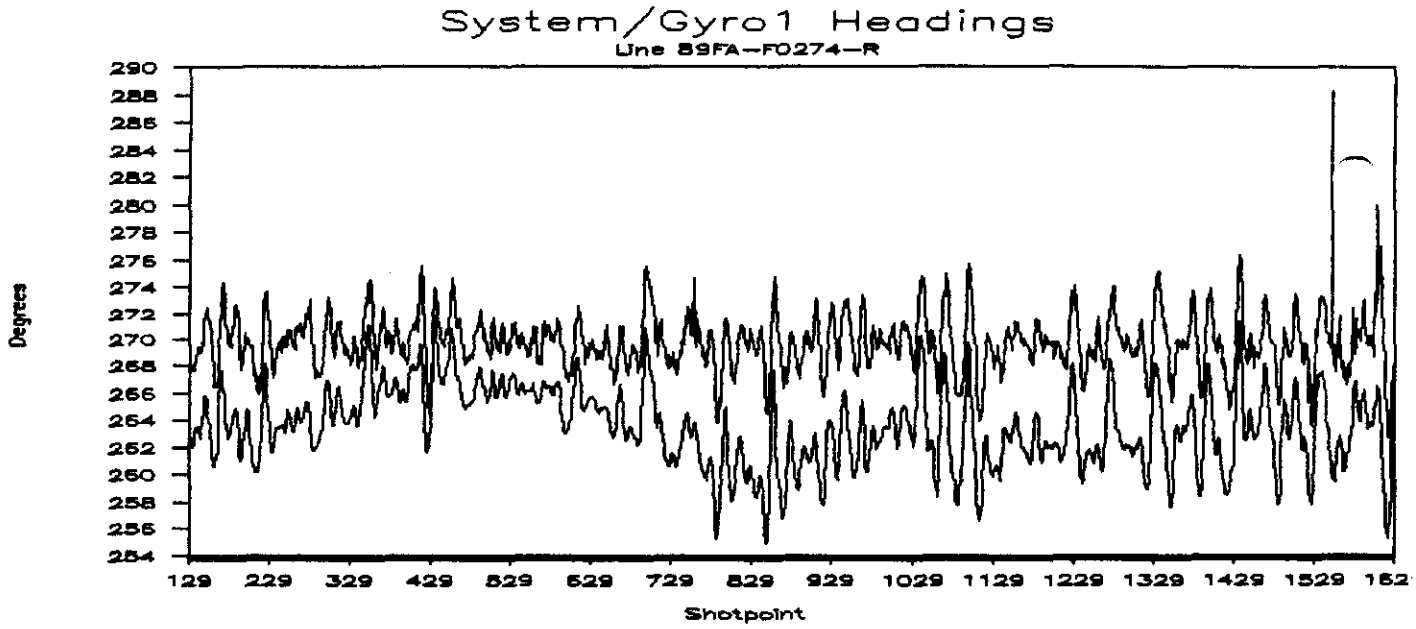

SYSTEM/GYRO1 Heading
Line 89FA-F0550-R
Degrees
110
108
106
104
102
100
98
96
94
92
90
88
86
84
82
80
100 257 357 457 557 657 757 857 957 1057 1157 1257 1357 1457 1557
Shotpoint

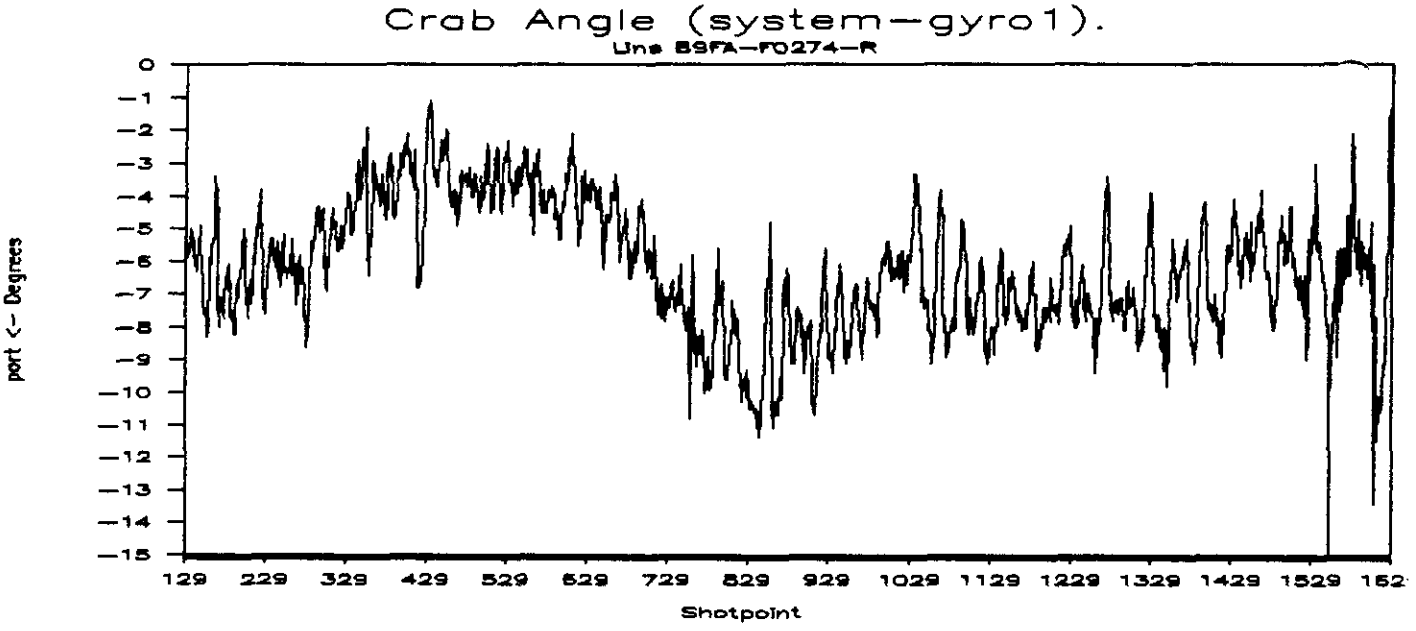

CRAB Angle (gyro1-system)
Line 89FA-F0550-R
Degrees -> stbd.
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
100 257 357 457 557 657 757 857 957 1057 1157 1257 1357 1457 1557
Shotpoint

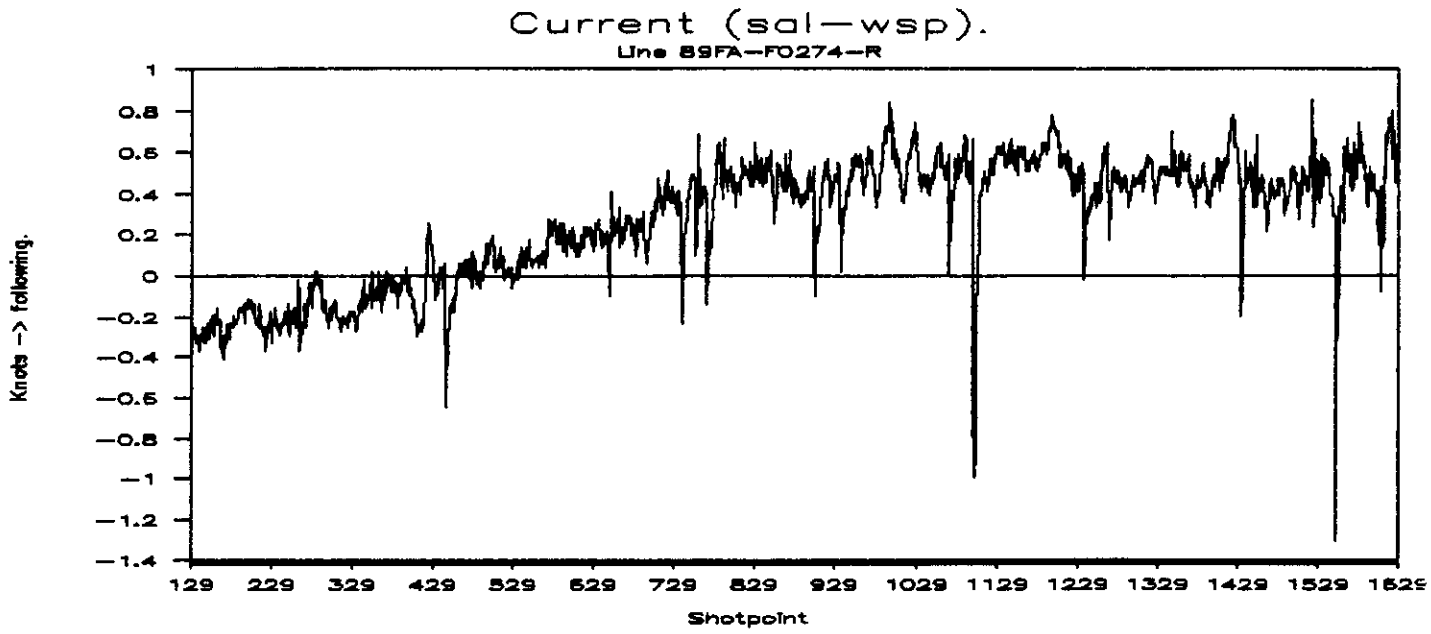

Closure/FTB Timing
Line 89FA-F0274-R
Time in mS.
900
800
700
600
500
400
300
200
100
0
129
229
329
429
529
629
729
829
929
1029
1129
1229
1329
1429
1529
Shotpoint

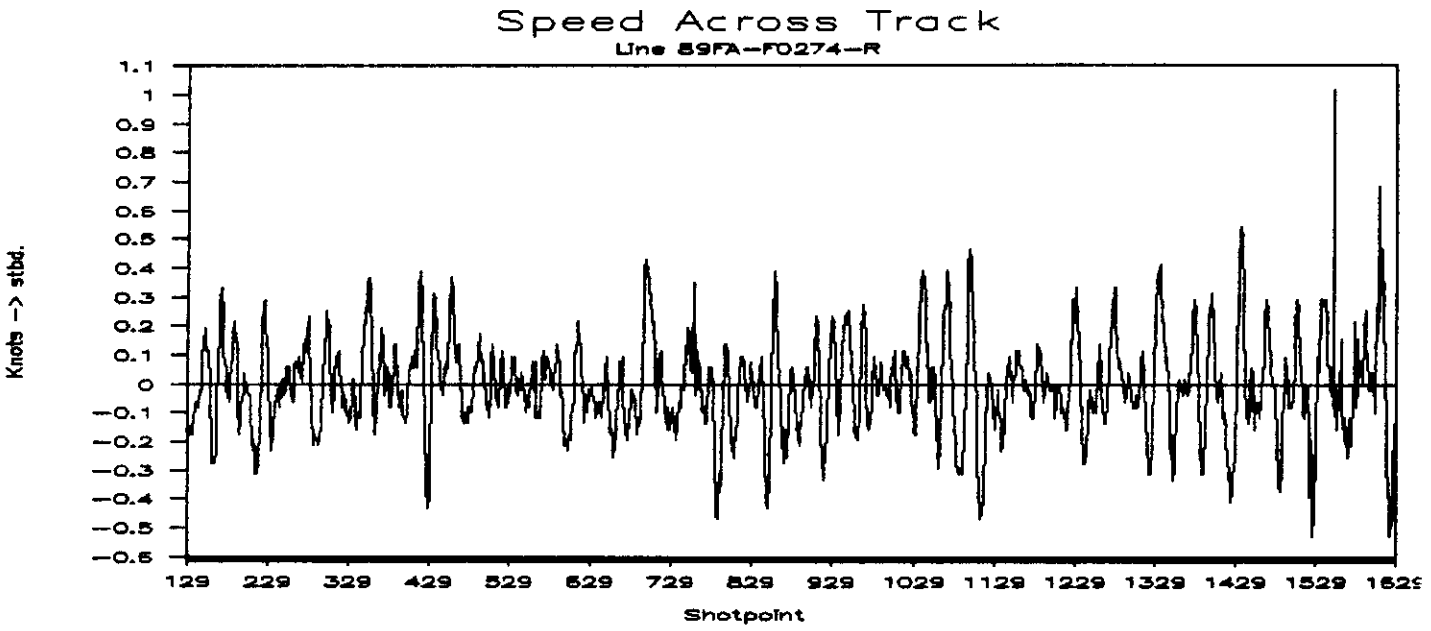

Closure/FTB Timing (exp)
Line 89FA-F0274-R
Time in mS.
595
594
593
592
591
590
129
229
329
429
529
629
729
829
929
1029
1129
1229
1329
1429
1529
Shotpoint

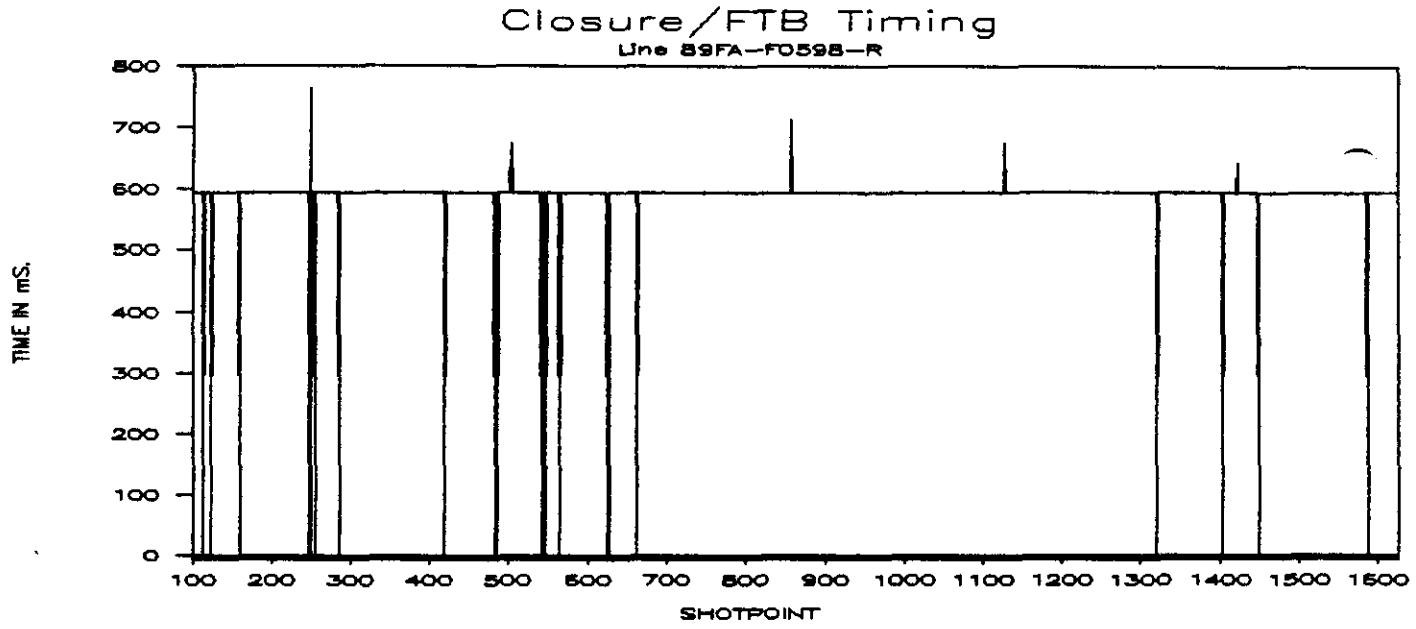

Link Delay Timing
Line 89FA-F0274-R
Time in mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
129
229
329
429
529
629
729
829
929
1029
1129
1229
1329
1429
1529
Shotpoint

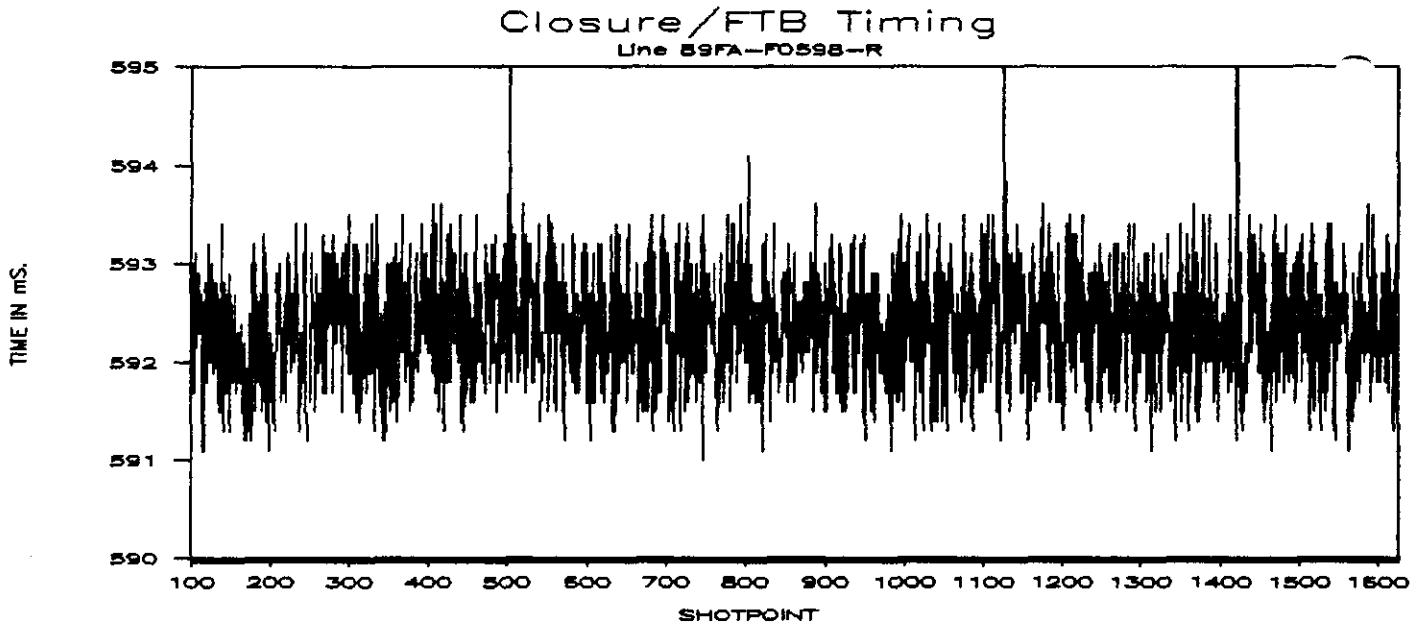

System/Gyro1 Headings
Line 89FA-F0274-R
Degrees
290
288
286
284
282
280
278
276
274
272
270
268
266
264
262
260
258
256
254
129
229
329
429
529
629
729
829
929
1029
1129
1229
1329
1429
1529
Shotpoint

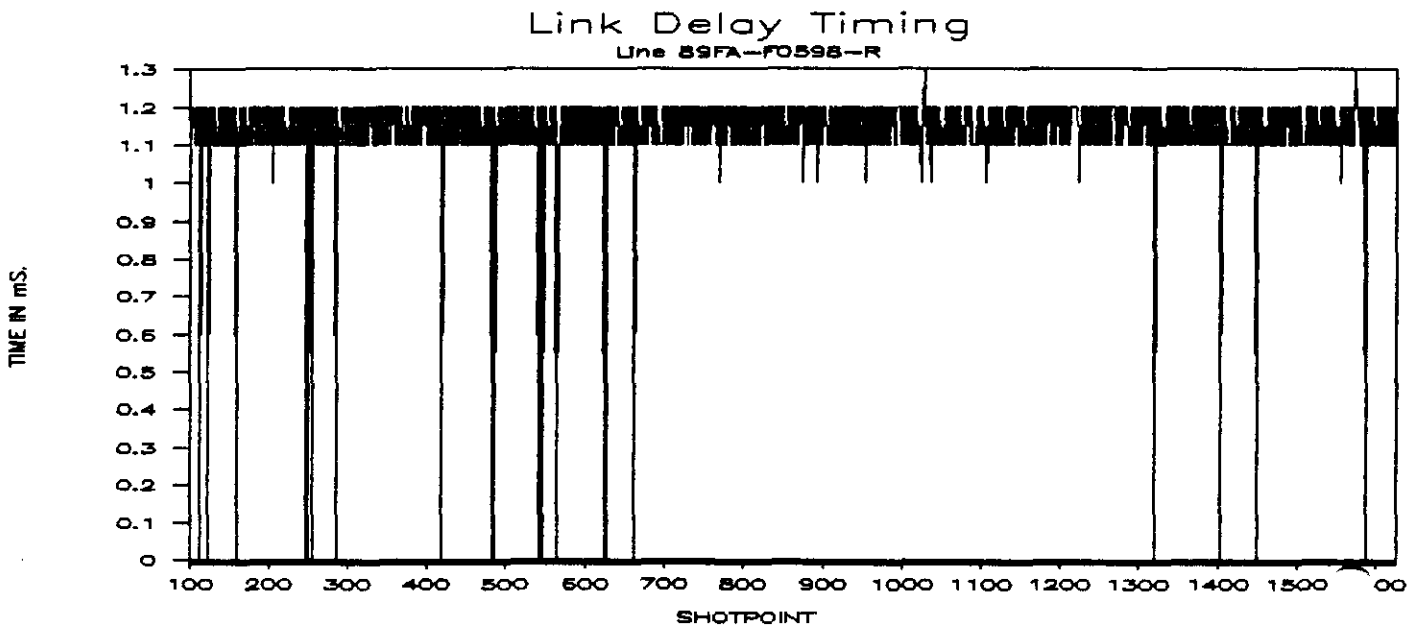

Crab Angle (system-gyro1).
Line 89FA-F0274-R
port <- Degrees
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
-11
-12
-13
-14
-15
129
229
329
429
529
629
729
829
929
1029
1129
1229
1329
1429
1529
Shotpoint

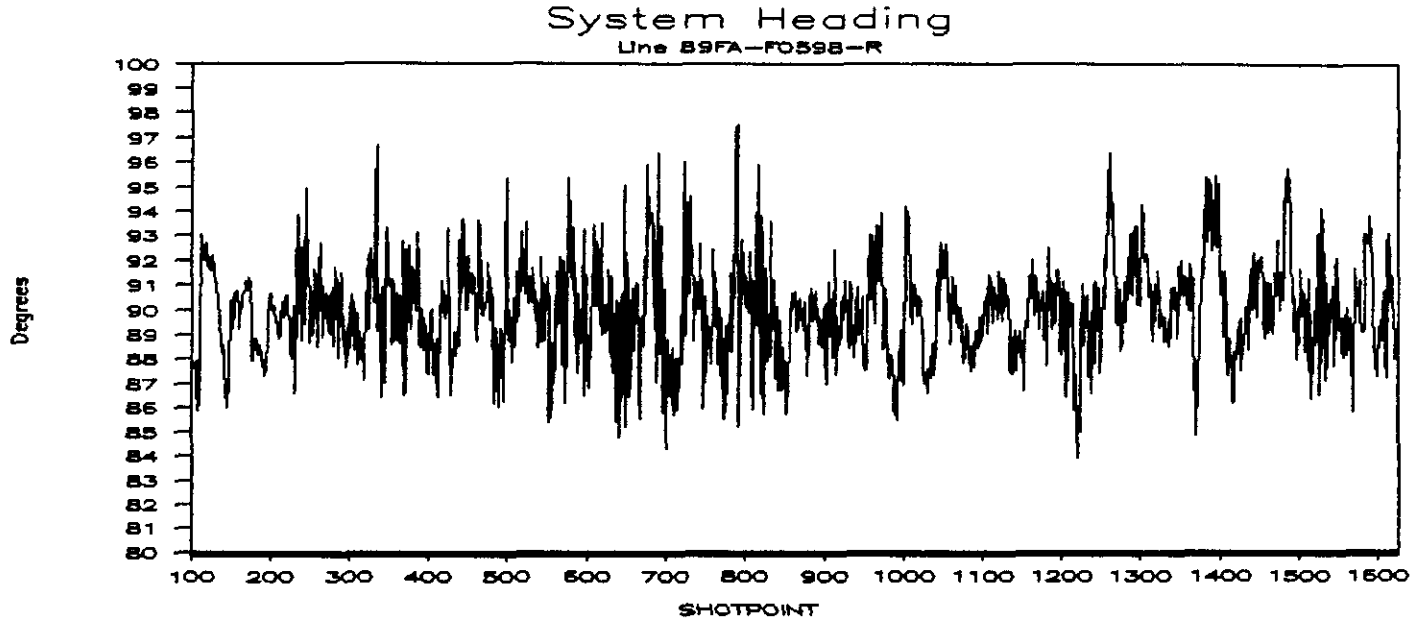

Current (sal—wsp).
Line 89FA—F0274—R
Knots —> following.
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1.2
−1.4
129
229
329
429
529
629
729
829
929
1029
1129
1229
1329
1429
1529
Shotpoint

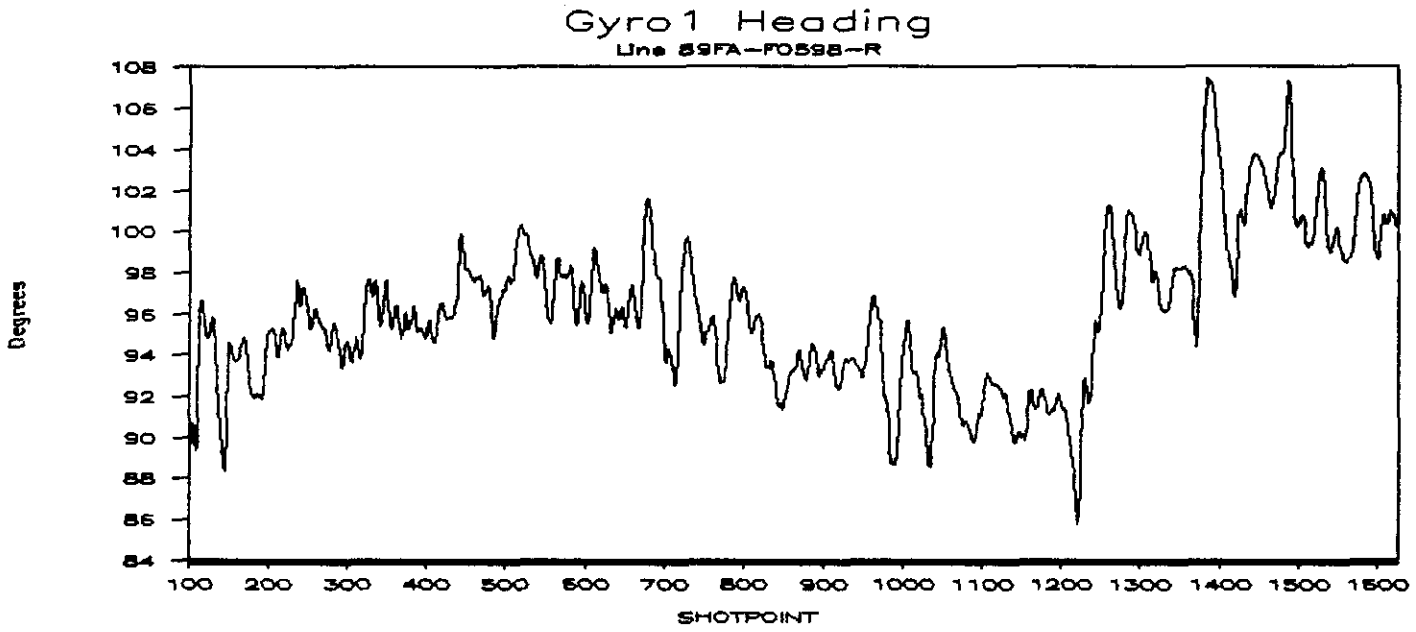

Speed Across Track
Line 89FA—F0274—R
Knots —> stbd.
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
−0.1
−0.2
−0.3
−0.4
−0.5
−0.6
129
229
329
429
529
629
729
829
929
1029
1129
1229
1329
1429
1529
Shotpoint

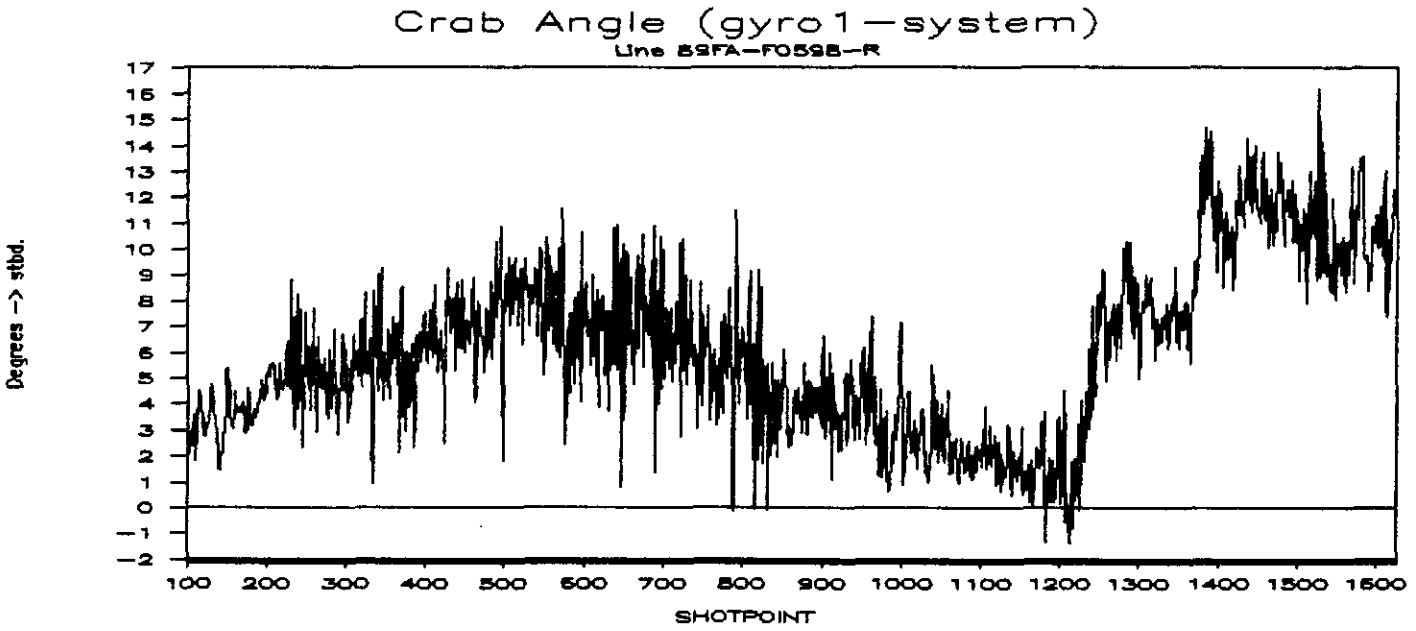

Closure/FTB Timing
Line 89FA-F0598-R
TIME IN mS.
800
700
600
500
400
300
200
100
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT

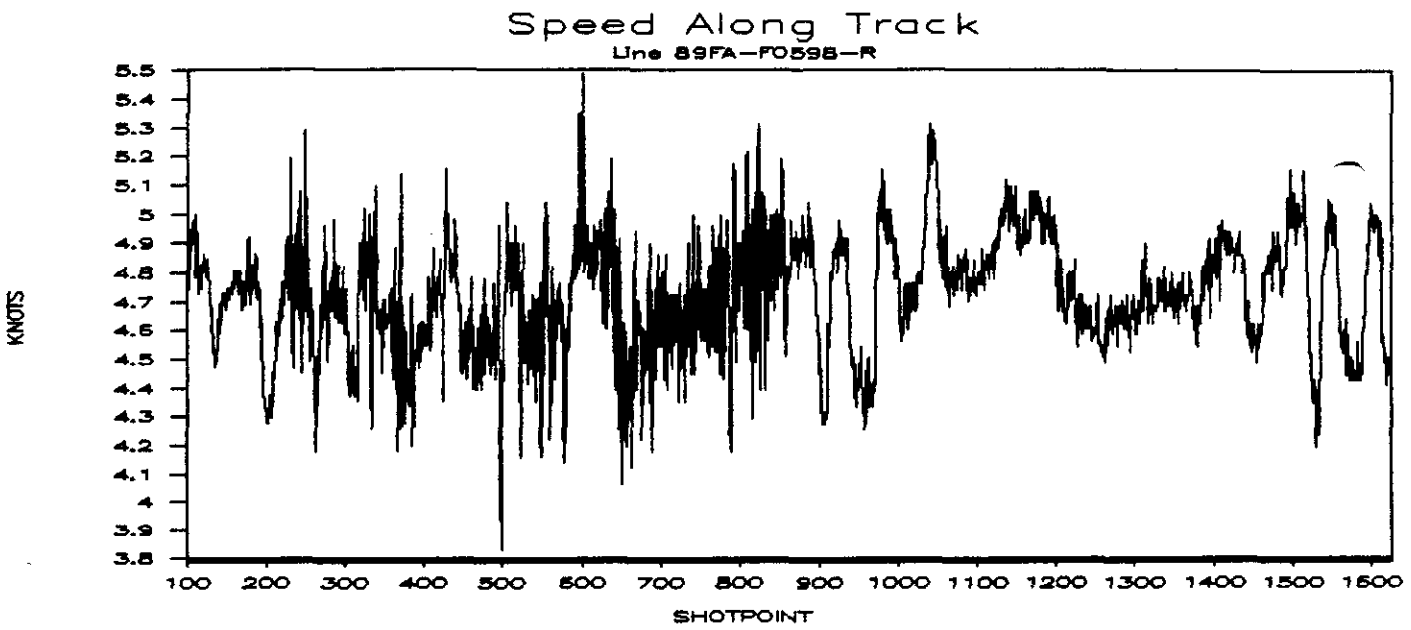

Closure/FTB Timing
Line 89FA-F0598-R
TIME IN mS.
595
594
593
592
591
590
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT

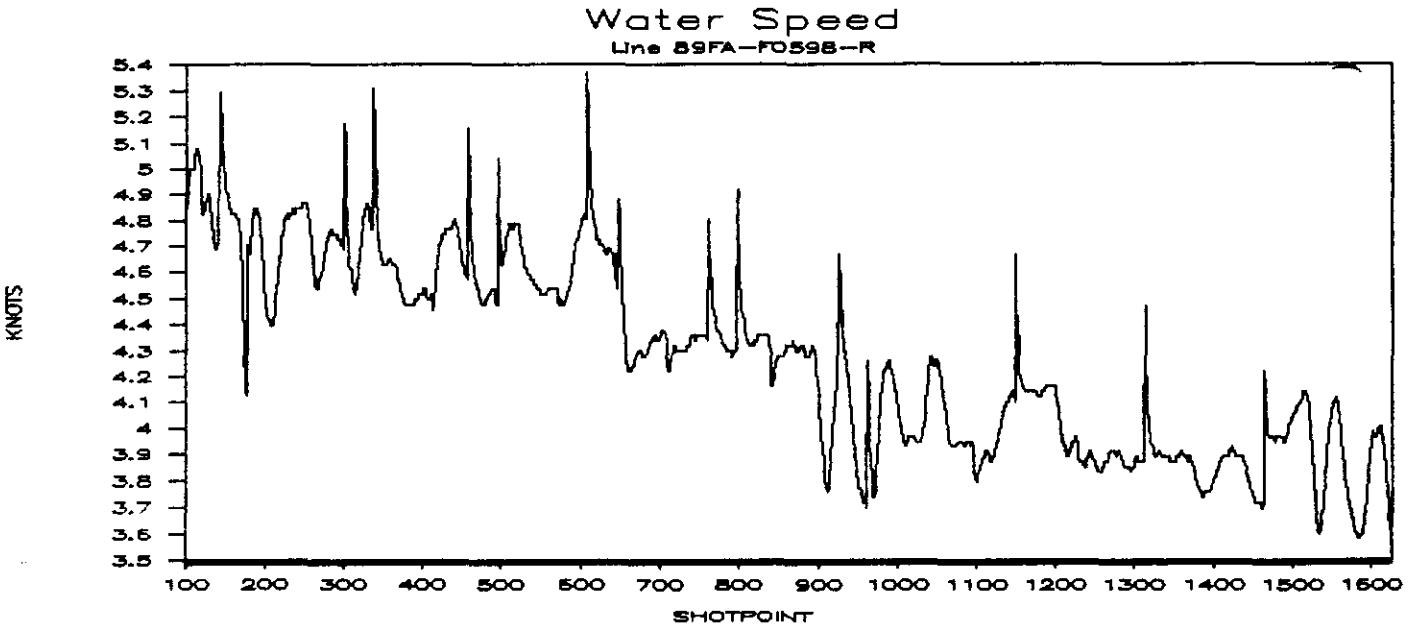

Link Delay Timing
Line 89FA-F0598-R
TIME IN mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500
SHOTPOINT

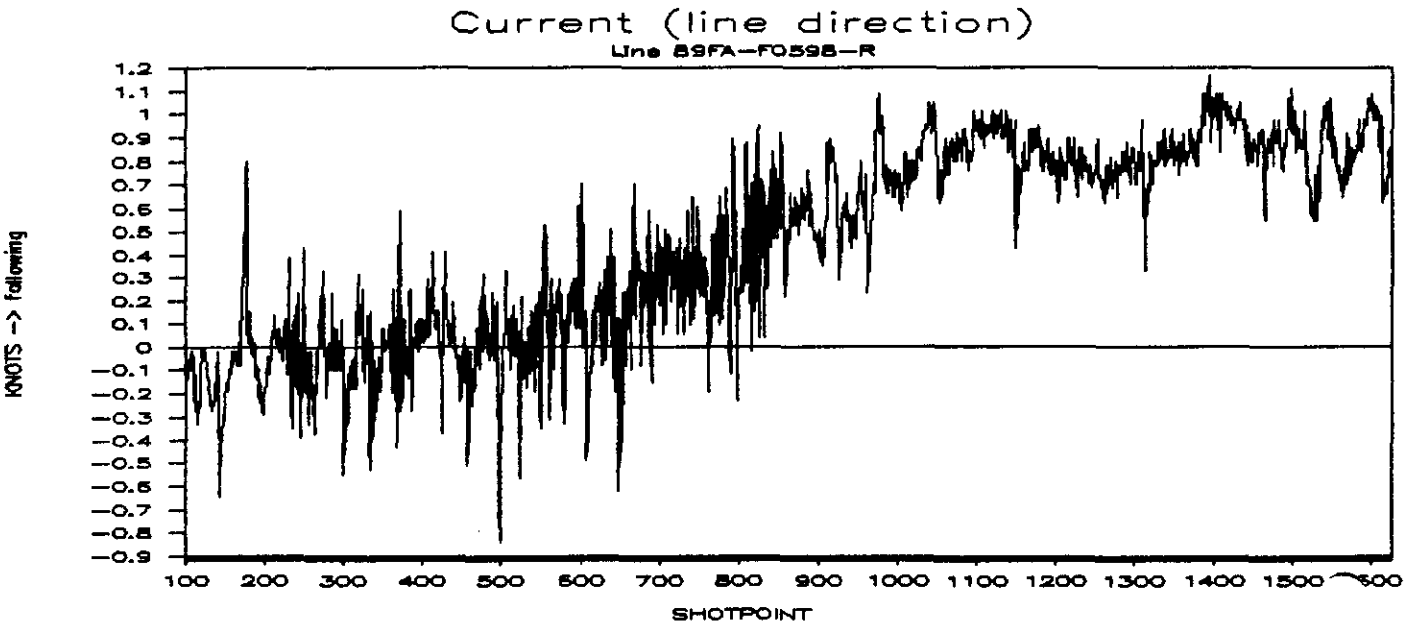

System Heading
Line 89FA-F0598-R
Degrees
SHOTPOINT

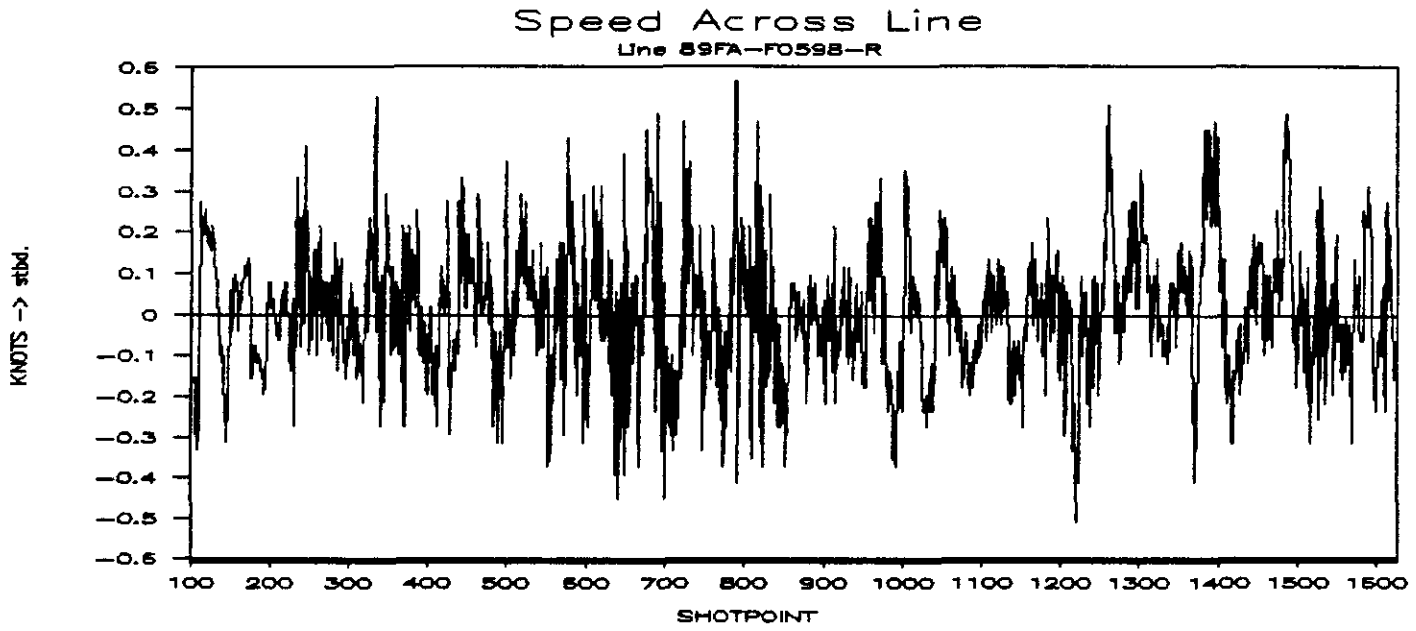

Gyro1 Heading
Line 89FA-F0598-R
Degrees
SHOTPOINT

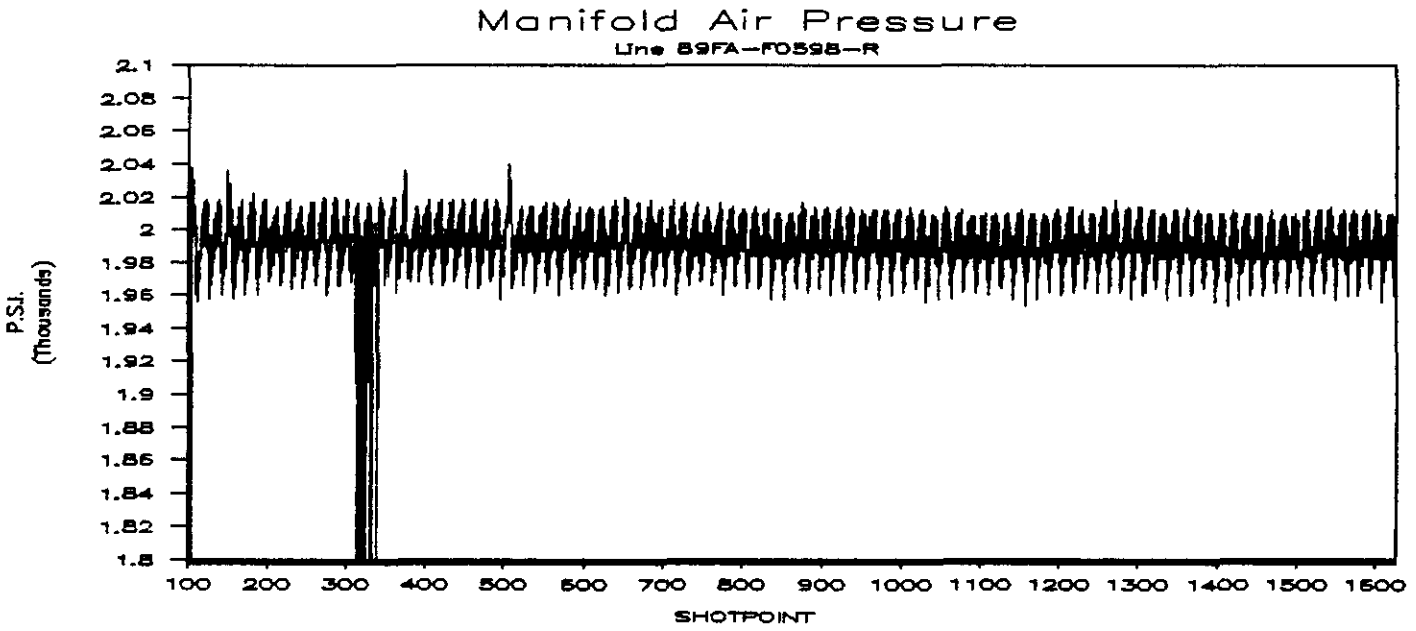

Crab Angle (gyro1-system)
Line 89FA-F0598-R
Degrees -> stbd.
SHOTPOINT

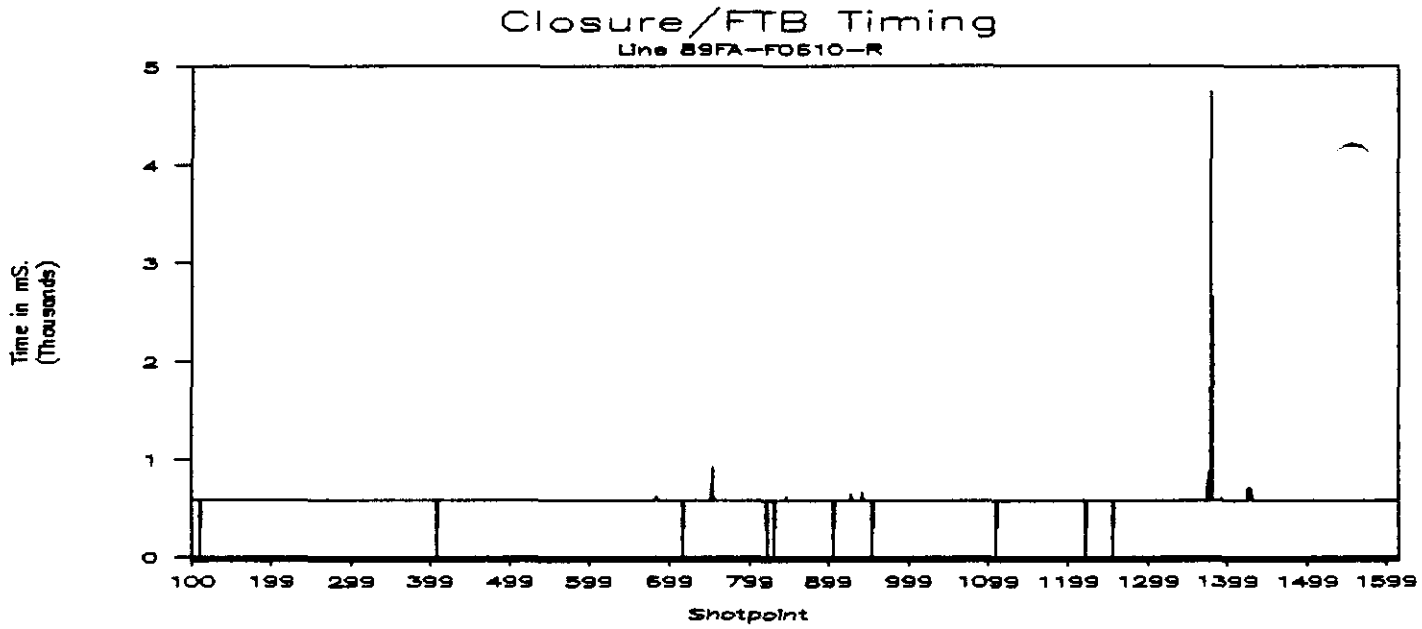

Speed Along Track
Line 89FA-F0598-R
KNOTS
SHOTPOINT

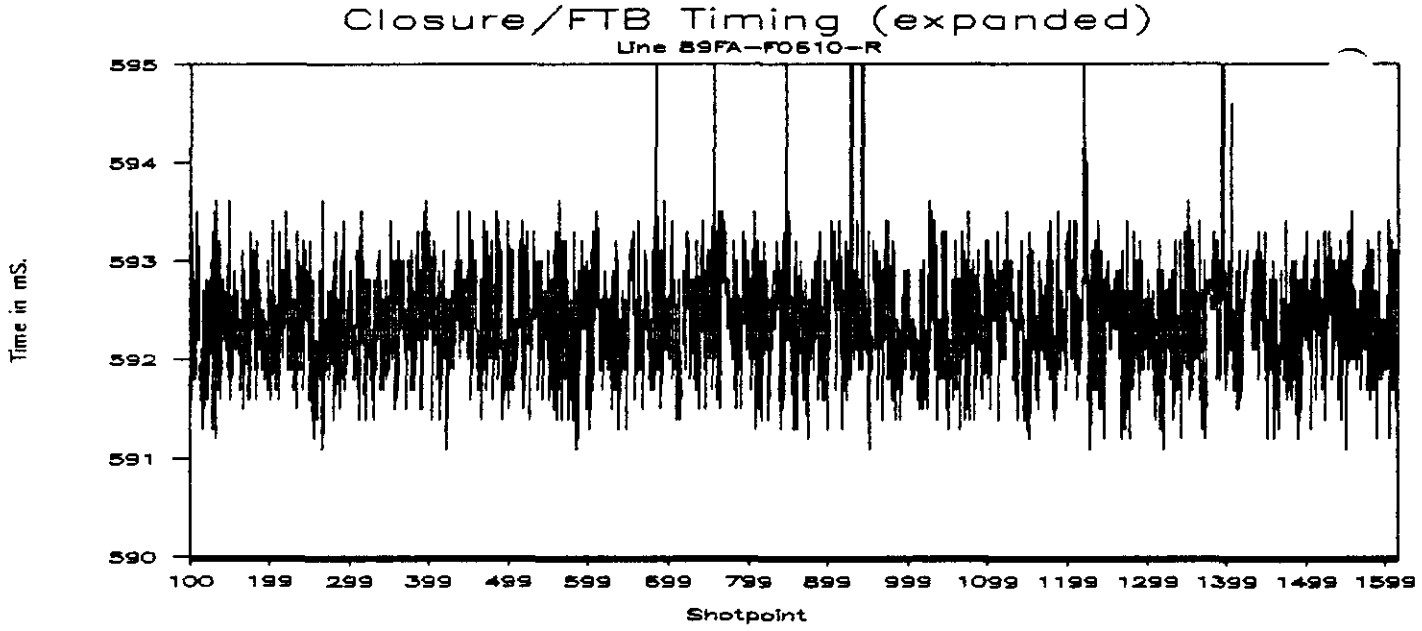

Water Speed
Line 89FA-F0598-R
KNOTS
SHOTPOINT

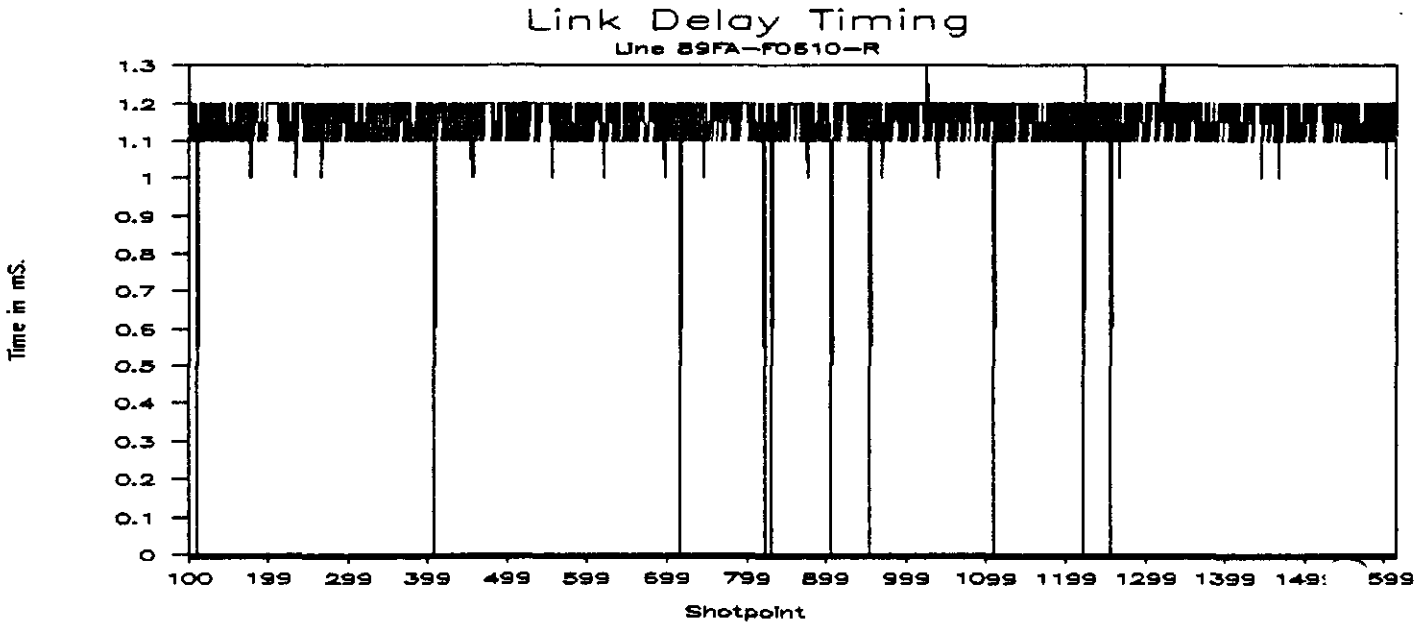

Current (line direction)
Line 89FA-F0598-R
KNOTS --> following
SHOTPOINT

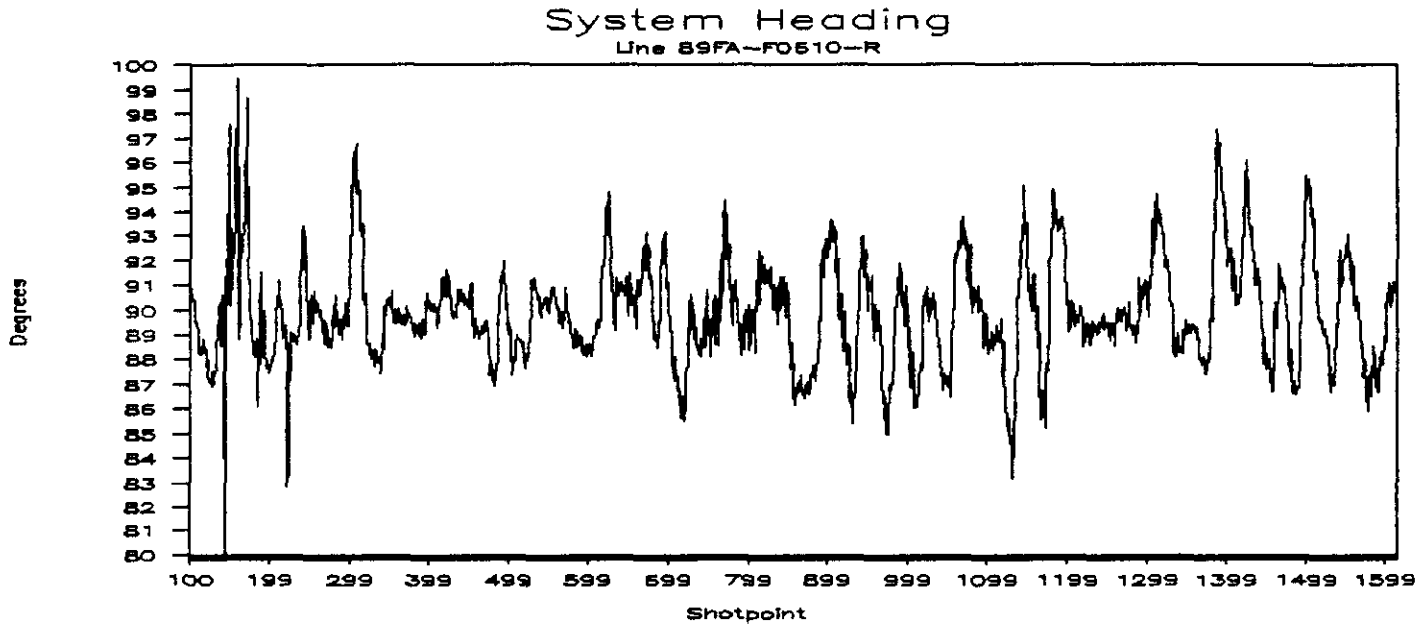

Speed Across Line
Line 89FA-F0598-R
KNOTS -> stbd.
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT

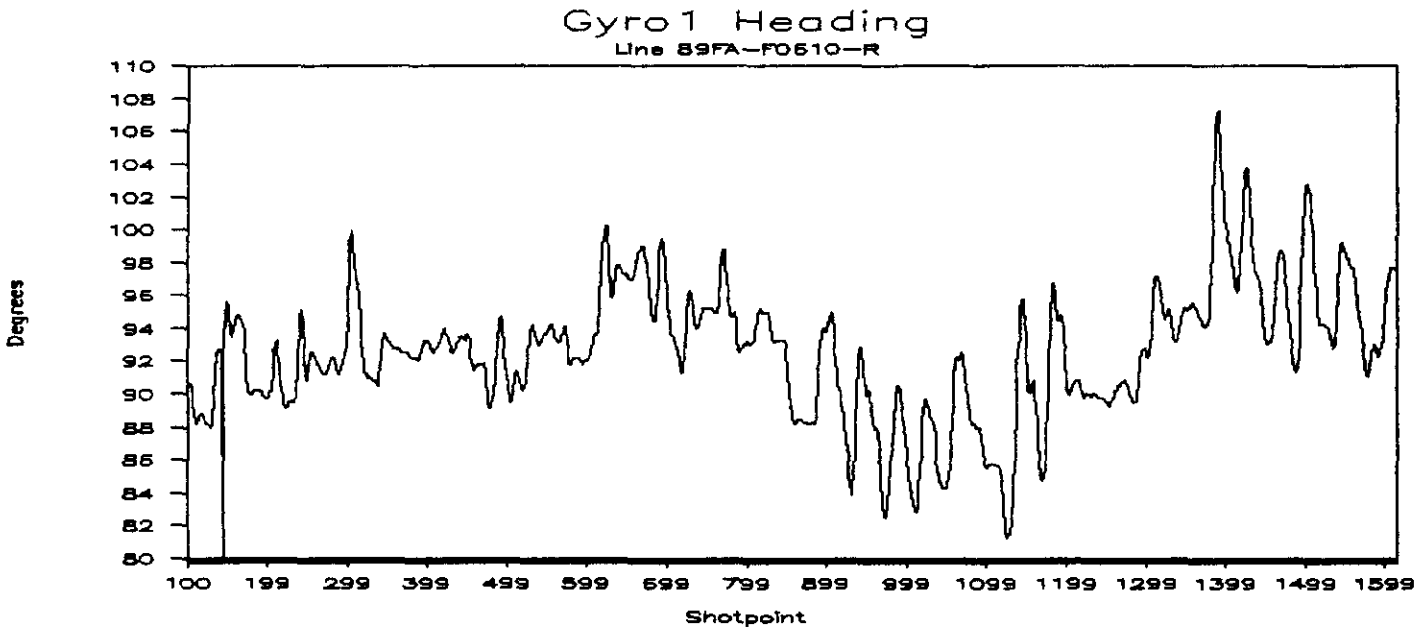

Manifold Air Pressure
Line 89FA-F0598-R
P.S.I.
(Thousands)
2.1
2.08
2.06
2.04
2.02
2
1.98
1.96
1.94
1.92
1.9
1.88
1.86
1.84
1.82
1.8
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
SHOTPOINT

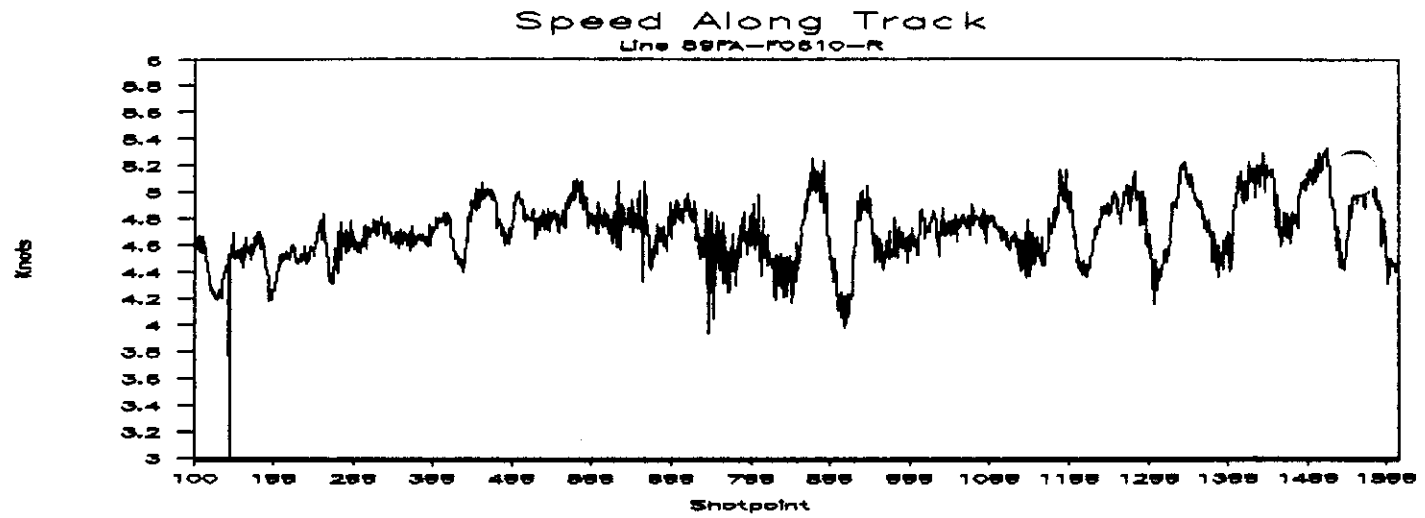

Closure/FTB Timing
Line 89FA-F0610-R
Time in mS. (Thousands)
0
1
2
3
4
5
100 199 299 399 499 599 699 799 899 999 1099 1199 1299 1399 1499 1599
Shotpoint

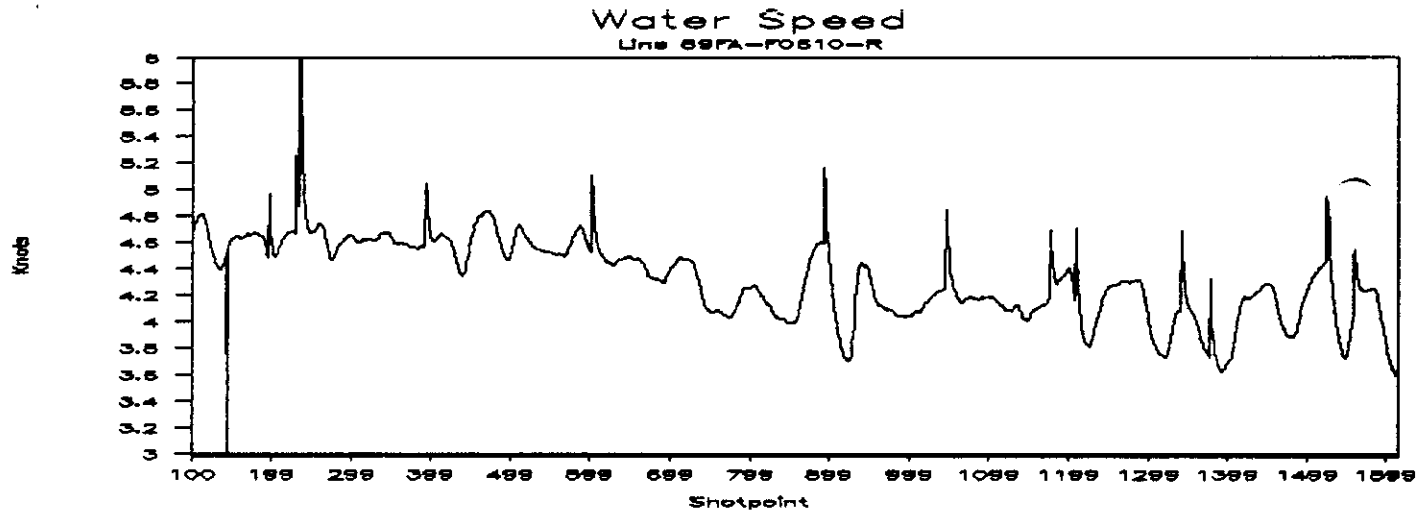

Closure/FTB Timing (expanded)
Line 89FA-F0610-R
Time in mS.
590
591
592
593
594
595
100 199 299 399 499 599 699 799 899 999 1099 1199 1299 1399 1499 1599
Shotpoint

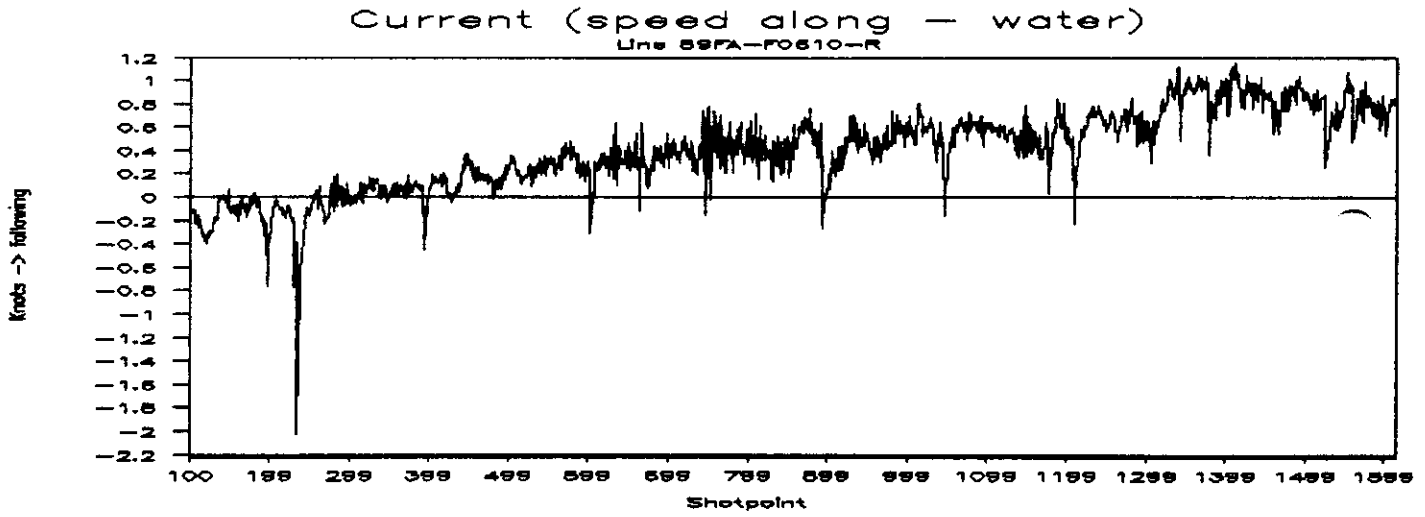

Link Delay Timing
Line 89FA-F0610-R
Time in mS.
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
100 199 299 399 499 599 699 799 899 999 1099 1199 1299 1399 1499 1599
Shotpoint

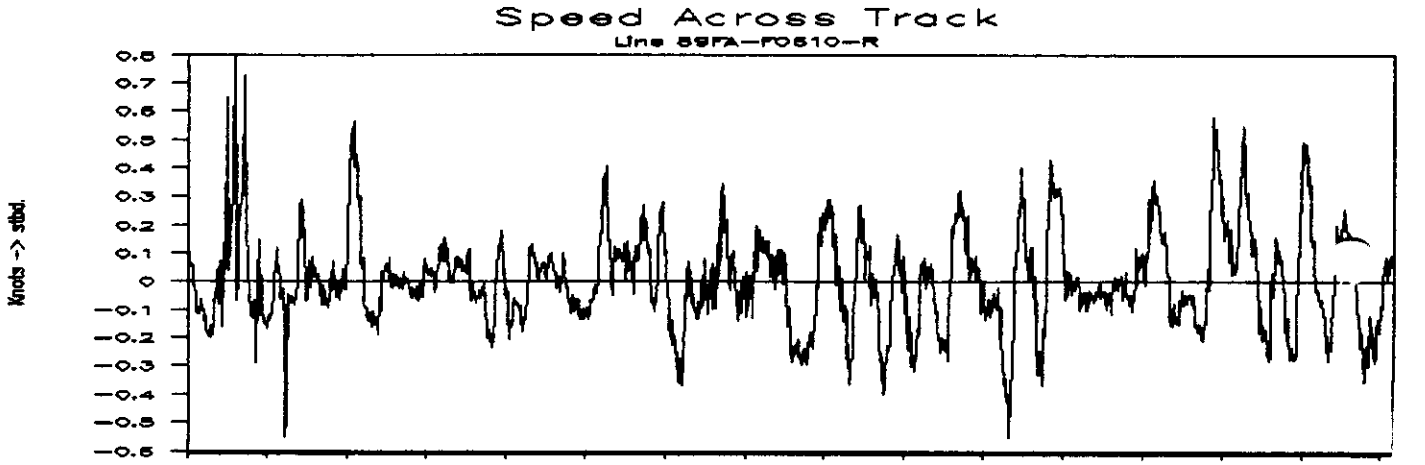

System Heading
Line 89FA-F0510-R
Degrees
100
99
98
97
96
95
94
93
92
91
90
89
88
87
86
85
84
83
82
81
80
100 199 299 399 499 599 699 799 899 999 1099 1199 1299 1399 1499 1599
Shotpoint

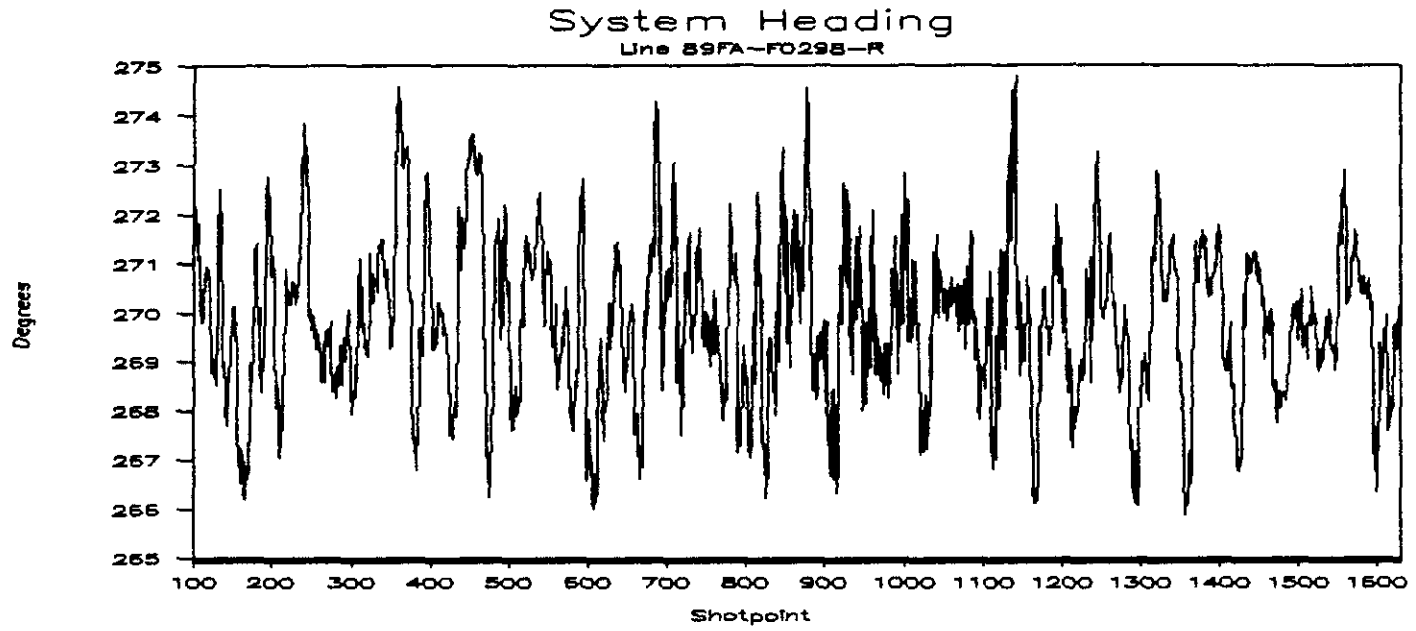

Gyro1 Heading
Line 89FA-F0510-R
Degrees
110
108
106
104
102
100
98
96
94
92
90
88
86
84
82
80
100 199 299 399 499 599 699 799 899 999 1099 1199 1299 1399 1499 1599
Shotpoint

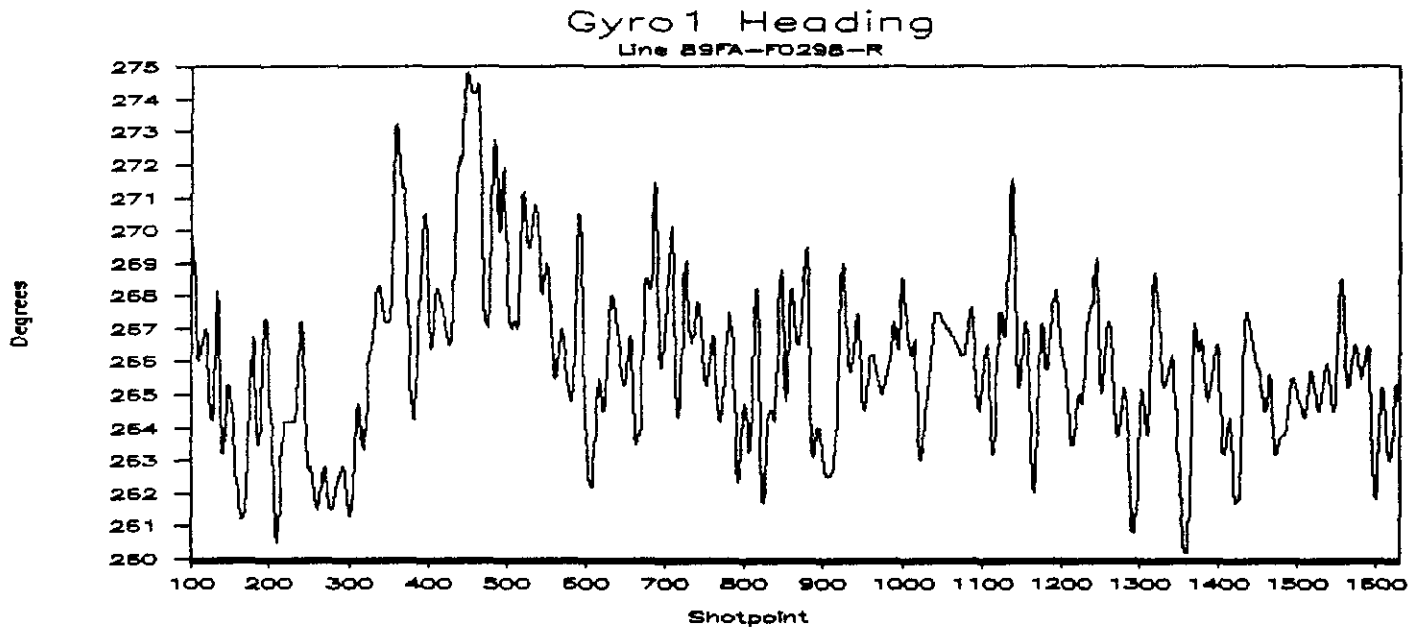

Speed Along Track
Line 89FA-F0610-R
Knots
Shotpoint

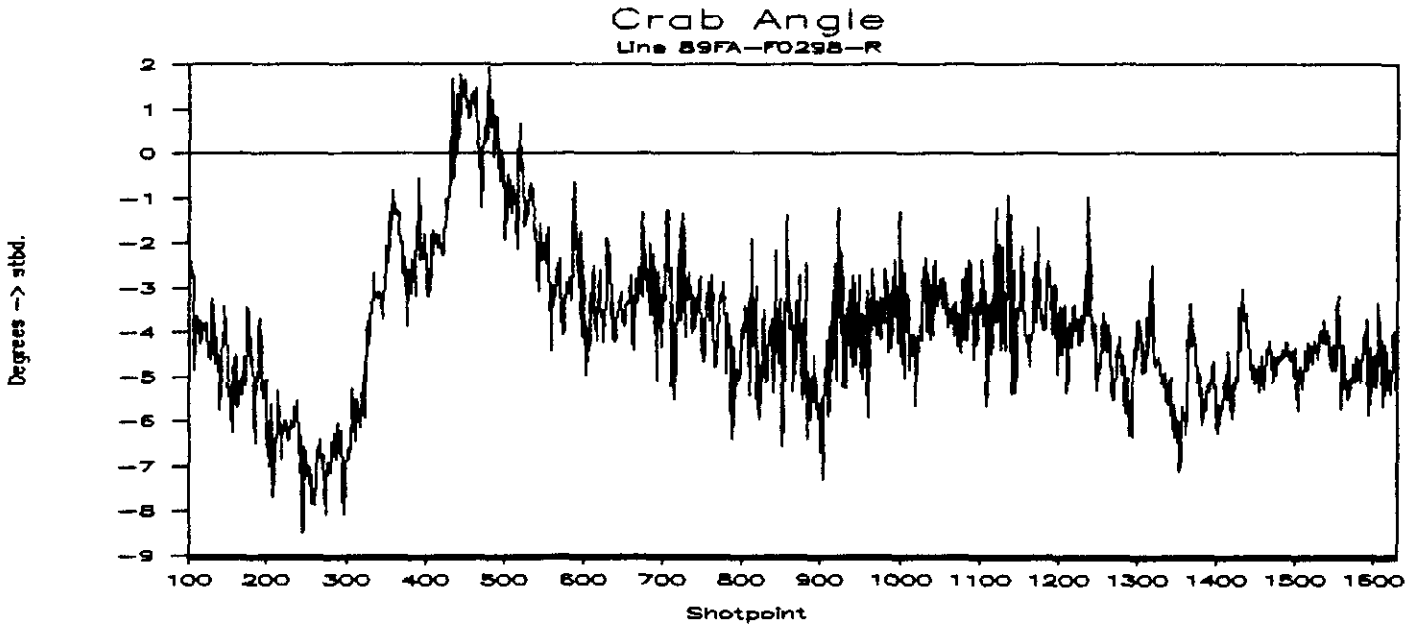

Water Speed
Line 89FA-F0610-R
Knots
Shotpoint

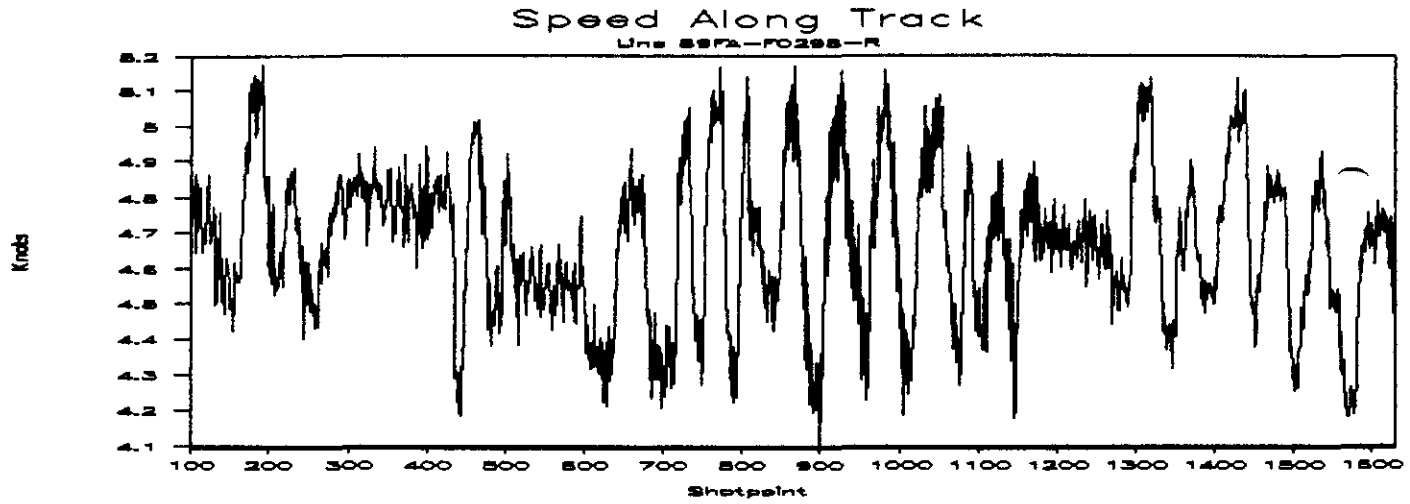

Current (speed along - water)
Line 89FA-F0610-R
Knots -> following
Shotpoint

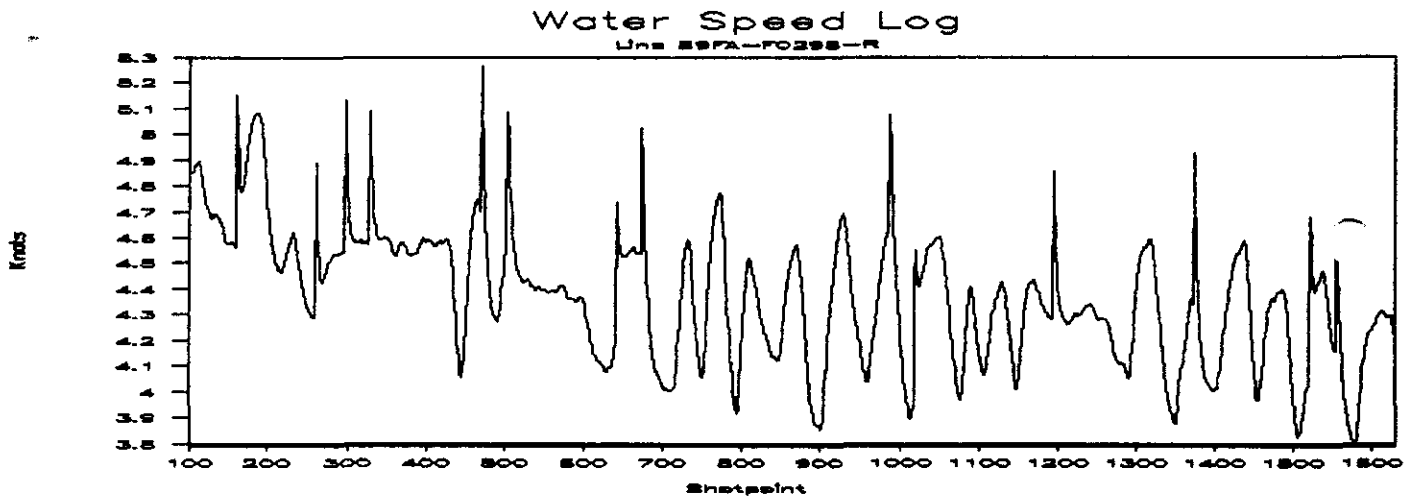

Speed Across Track
Line 89FA-F0610-R
Knots -> stbd.

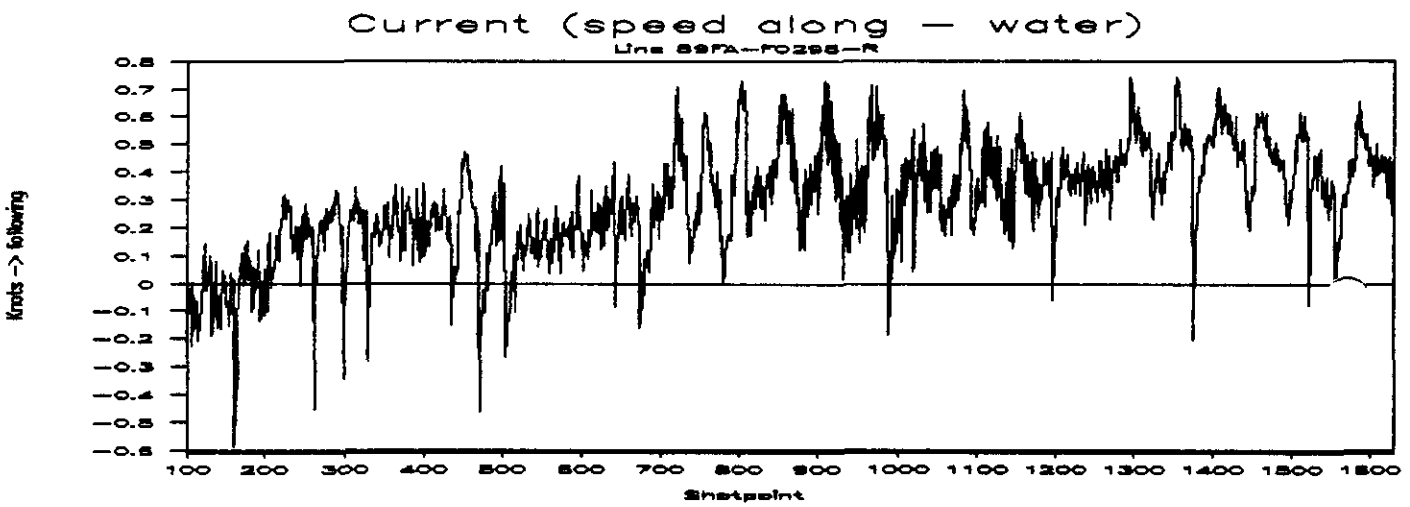

System Heading
Line 89FA-F0298-R
Degrees
275
274
273
272
271
270
269
268
267
266
265
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

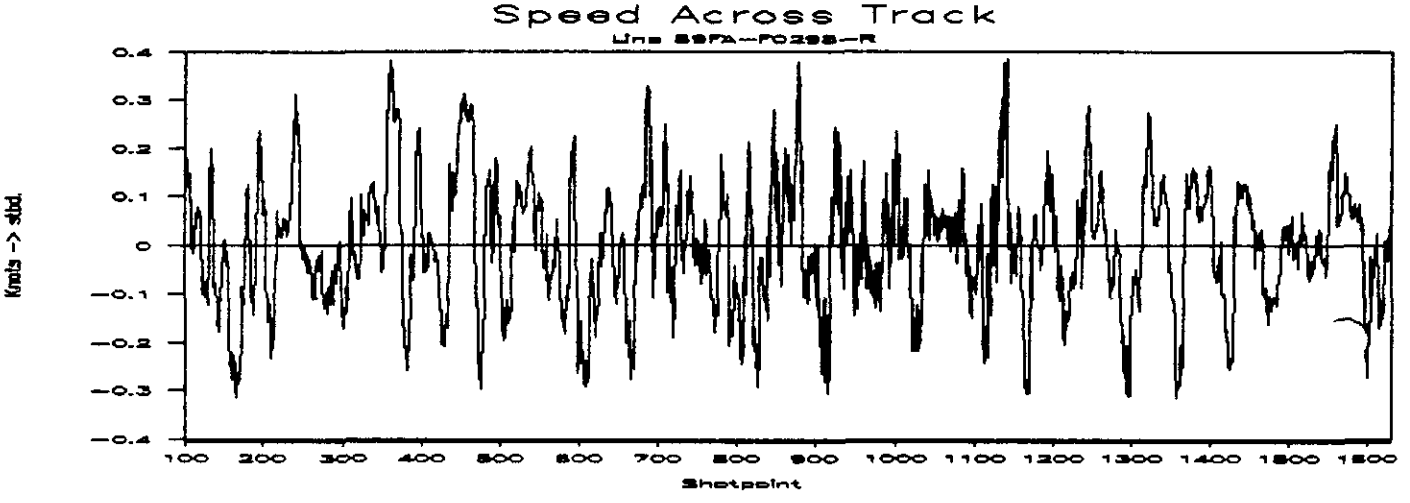

Gyro1 Heading
Line 89FA-F0298-R
Degrees
275
274
273
272
271
270
269
268
267
266
265
264
263
262
261
260
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

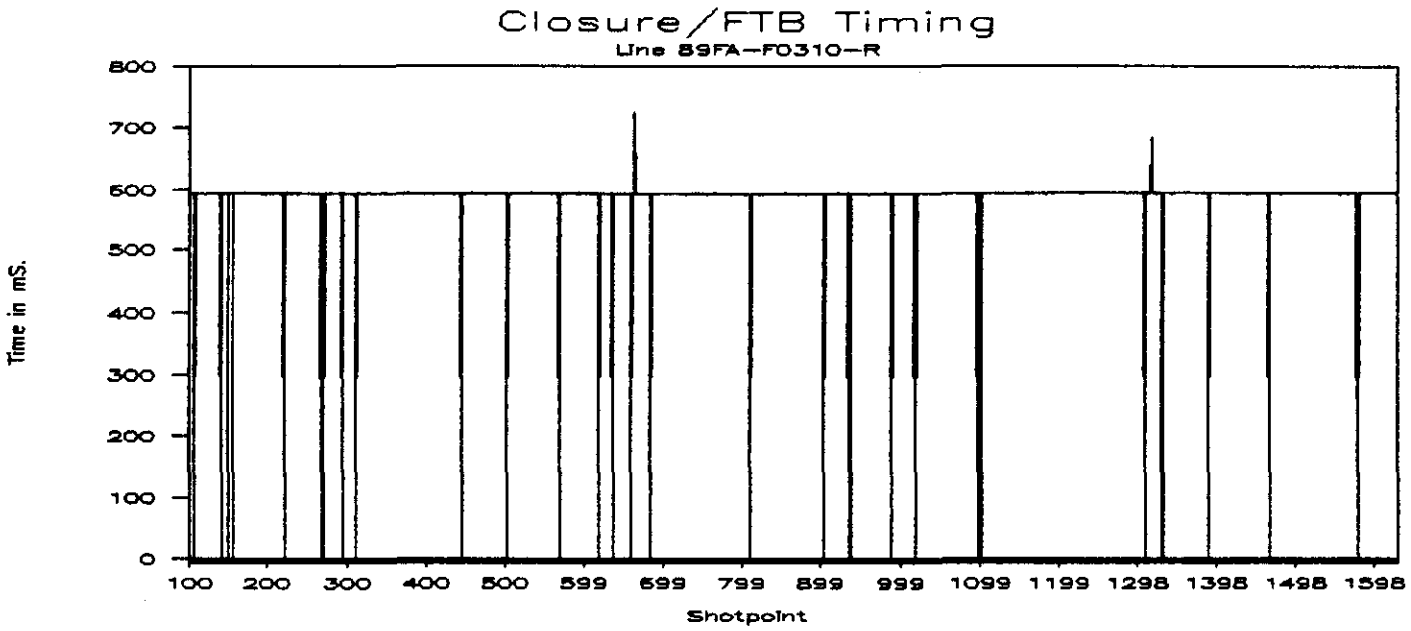

Crab Angle
Line 89FA-F0298-R
Degrees -> stbd.
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

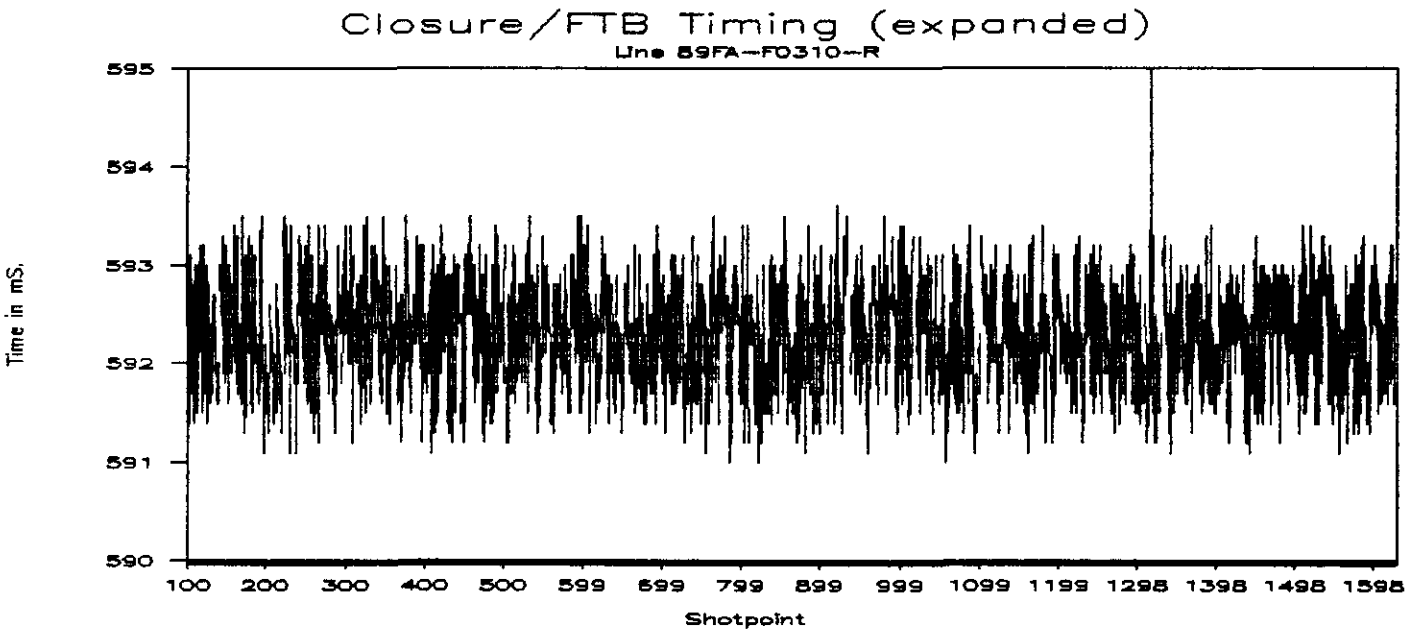

Speed Along Track
Line 89FA-FO298-R
Knots
Shotpoint

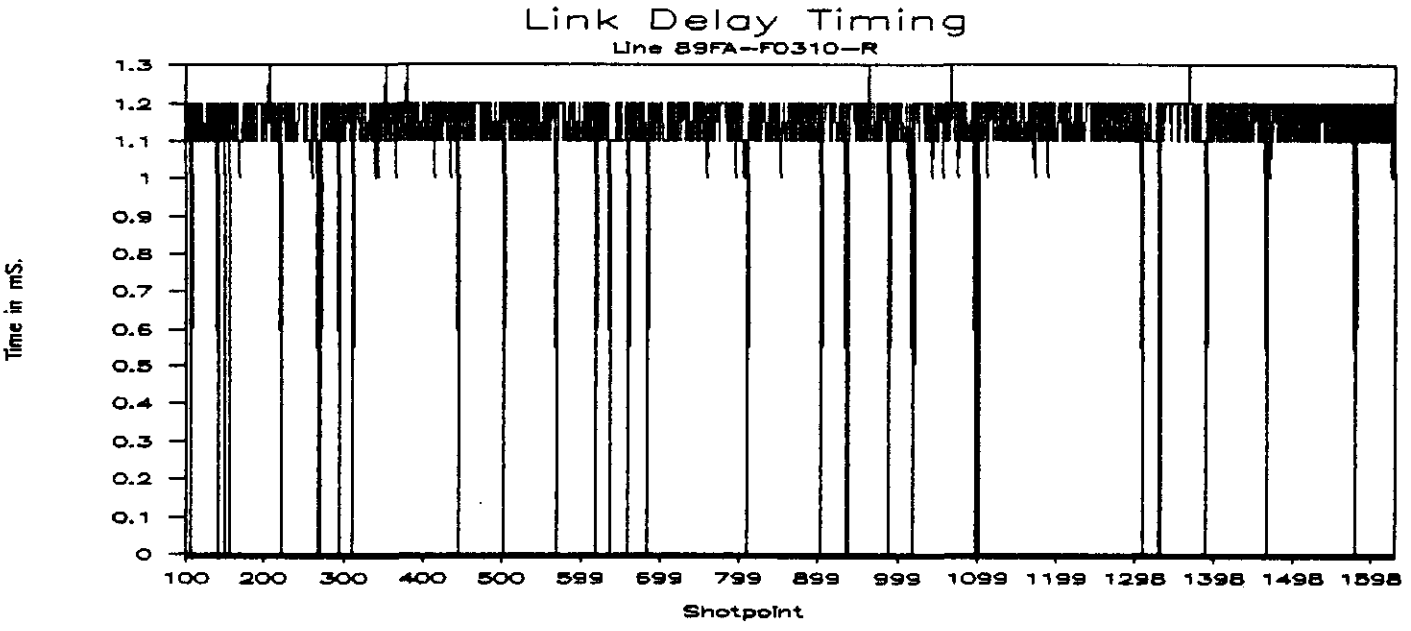

Water Speed Log
Line 89FA-FO298-R
Knots
Shotpoint

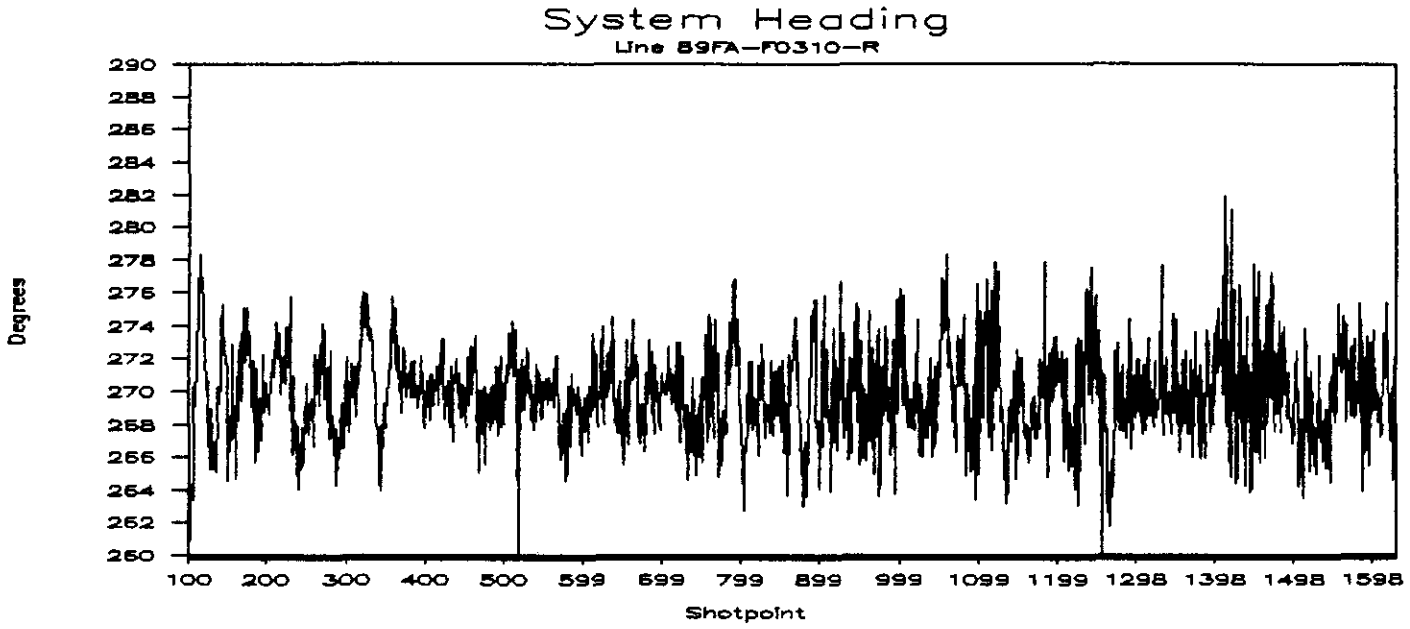

Current (speed along — water)
Line 89FA-FO298-R
Knots -> following
Shotpoint

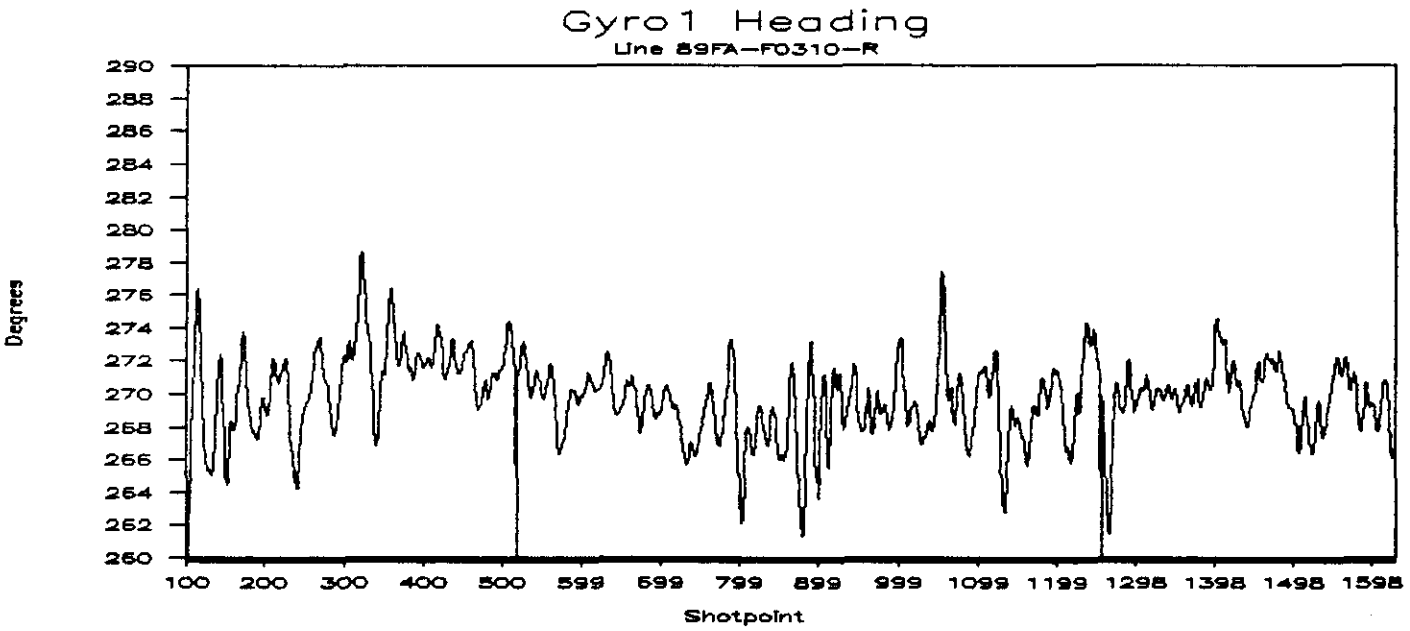

Speed Across Track
Line 89FA-FO298-R
Knots -> stbd.
Shotpoint

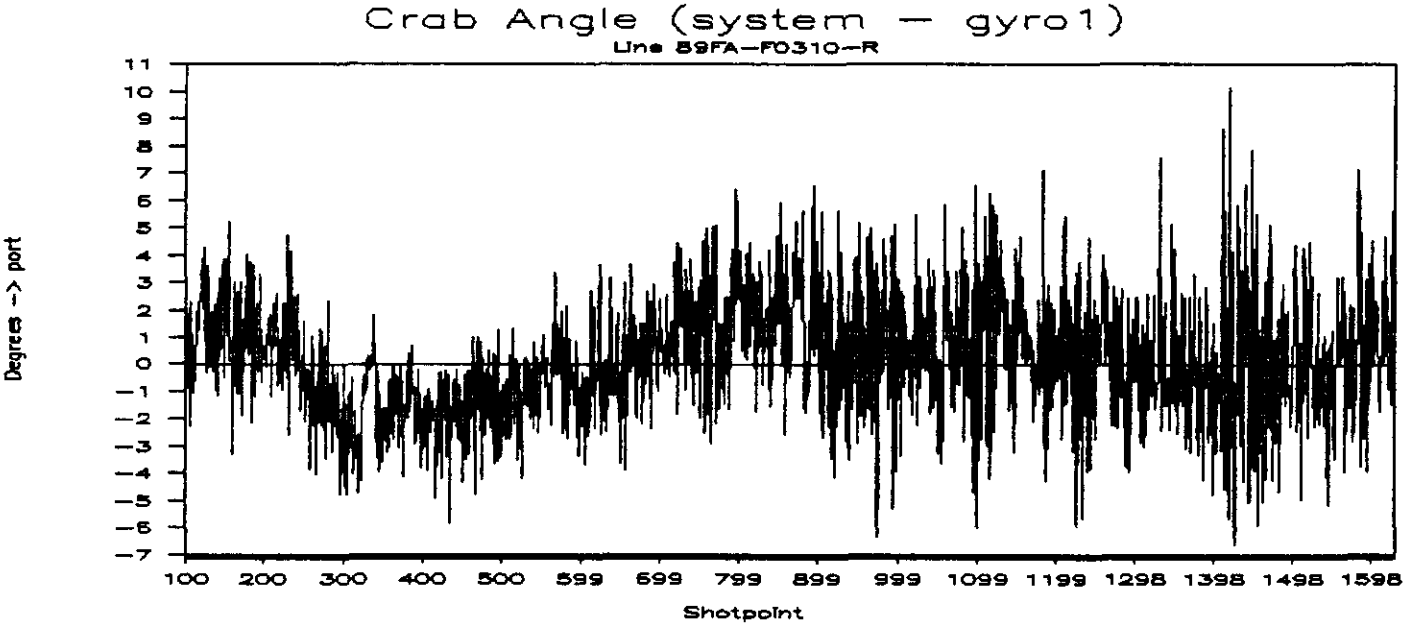

Closure/FTB Timing
Line 89FA-F0310-R
Time in mS.
800
700
600
500
400
300
200
100
0
100 200 300 400 500 599 699 799 899 999 1099 1199 1298 1398 1498 1598
Shotpoint

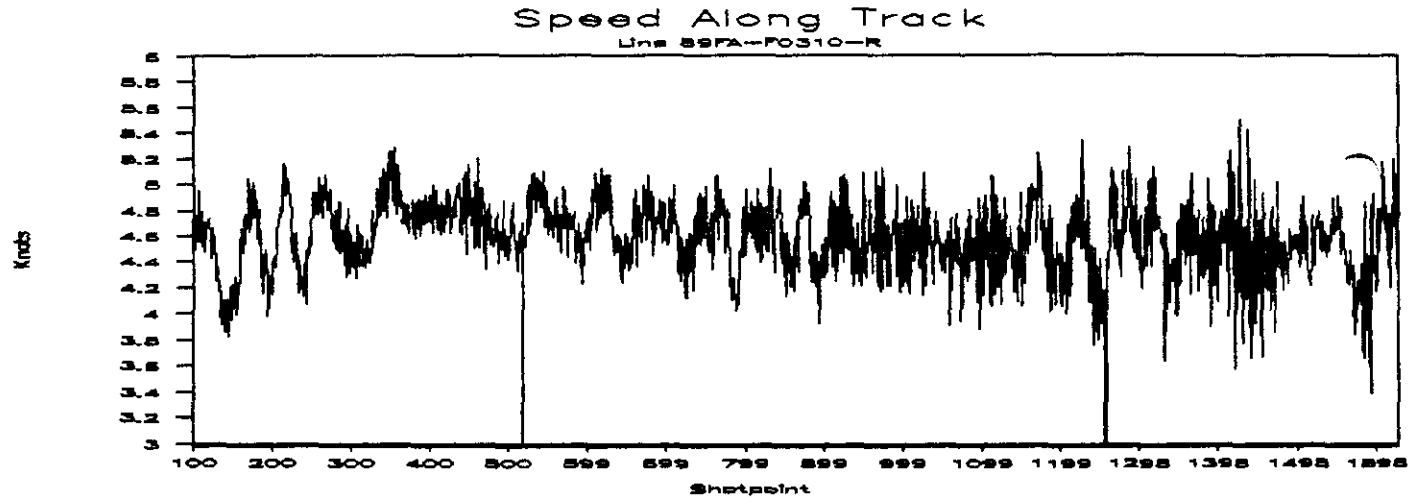

Closure/FTB Timing (expanded)
Line 89FA-F0310-R
Time in mS.
595
594
593
592
591
590
100 200 300 400 500 599 699 799 899 999 1099 1199 1298 1398 1498 1598
Shotpoint

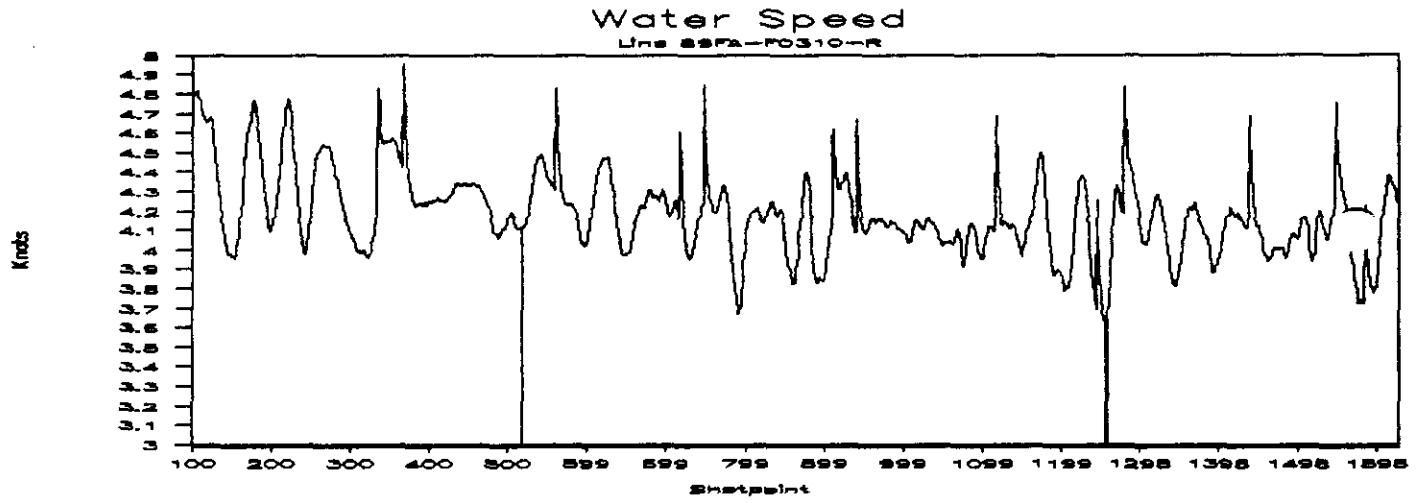

Link Delay Timing
Line 89FA-F0310-R
Time in mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
100 200 300 400 500 599 699 799 899 999 1099 1199 1298 1398 1498 1598
Shotpoint

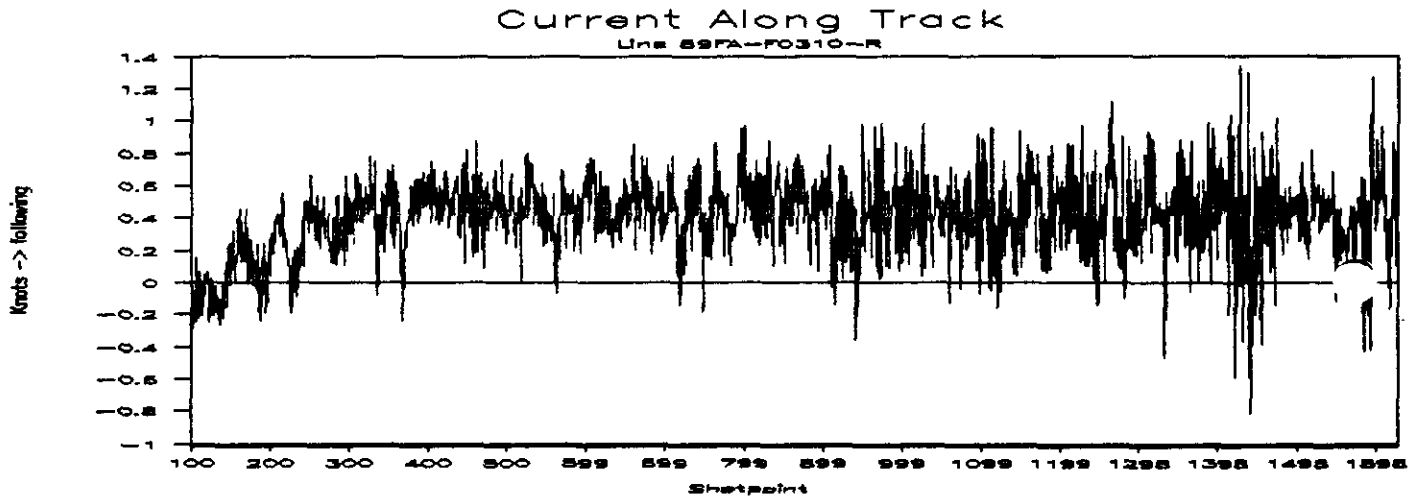

System Heading
Line 89FA-F0310-R
Degrees
290
288
286
284
282
280
278
276
274
272
270
268
266
264
262
260
100 200 300 400 500 599 699 799 899 999 1099 1199 1298 1398 1498 1598
Shotpoint

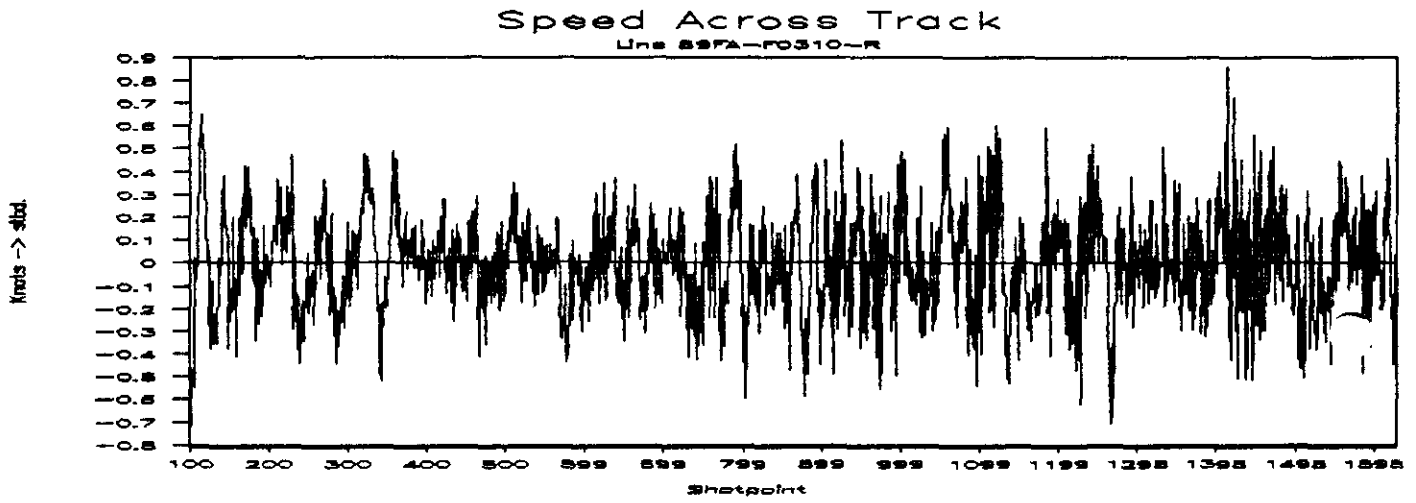

Gyro1 Heading
Line 89FA-F0310-R
Degrees
290
288
286
284
282
280
278
276
274
272
270
268
266
264
262
260
100 200 300 400 500 599 699 799 899 999 1099 1199 1298 1398 1498 1598
Shotpoint

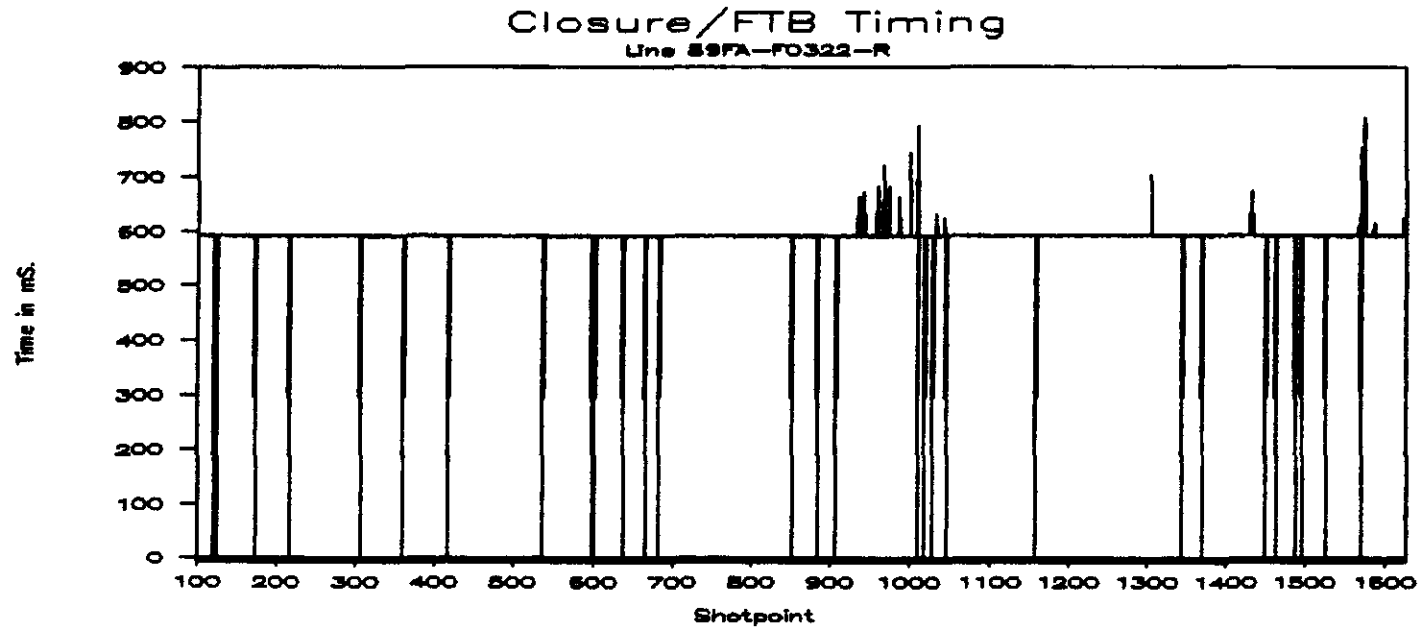

Crab Angle (system - gyro1)
Line 89FA-F0310-R
Degrees -> port
11
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
100 200 300 400 500 599 699 799 899 999 1099 1199 1298 1398 1498 1598
Shotpoint

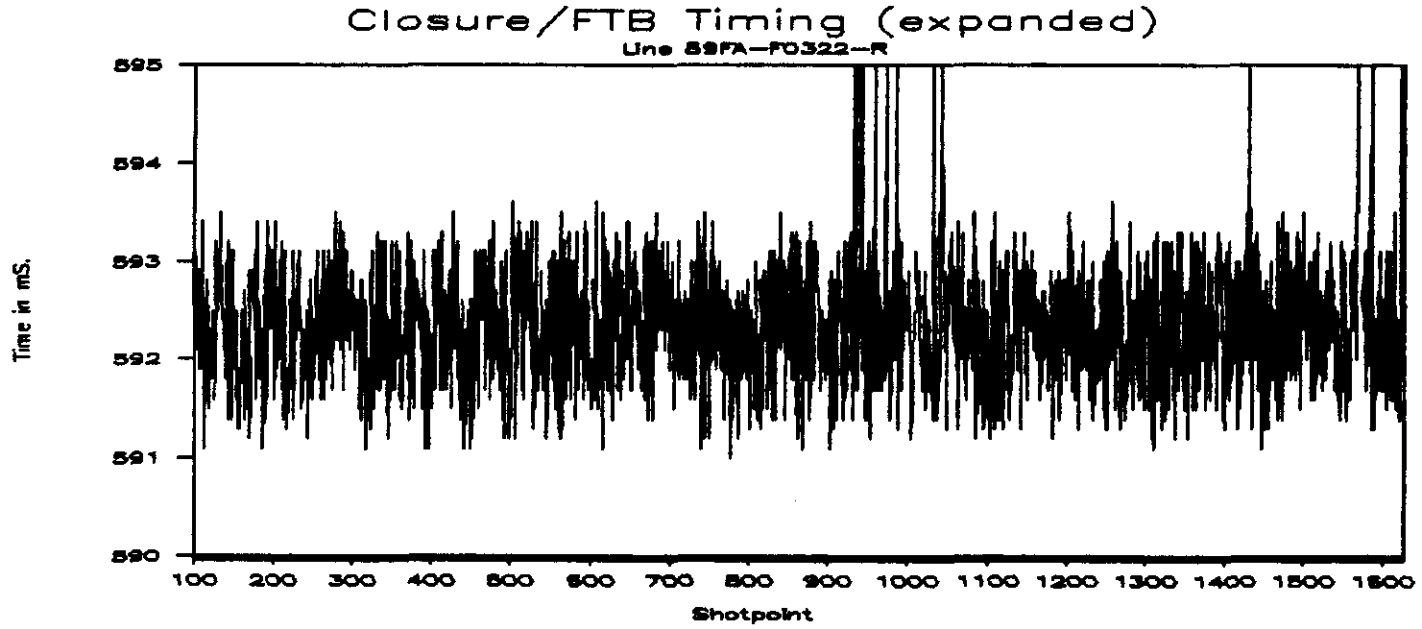

Speed Along Track
Line 89FA-F0310-R
Knots
Shotpoint

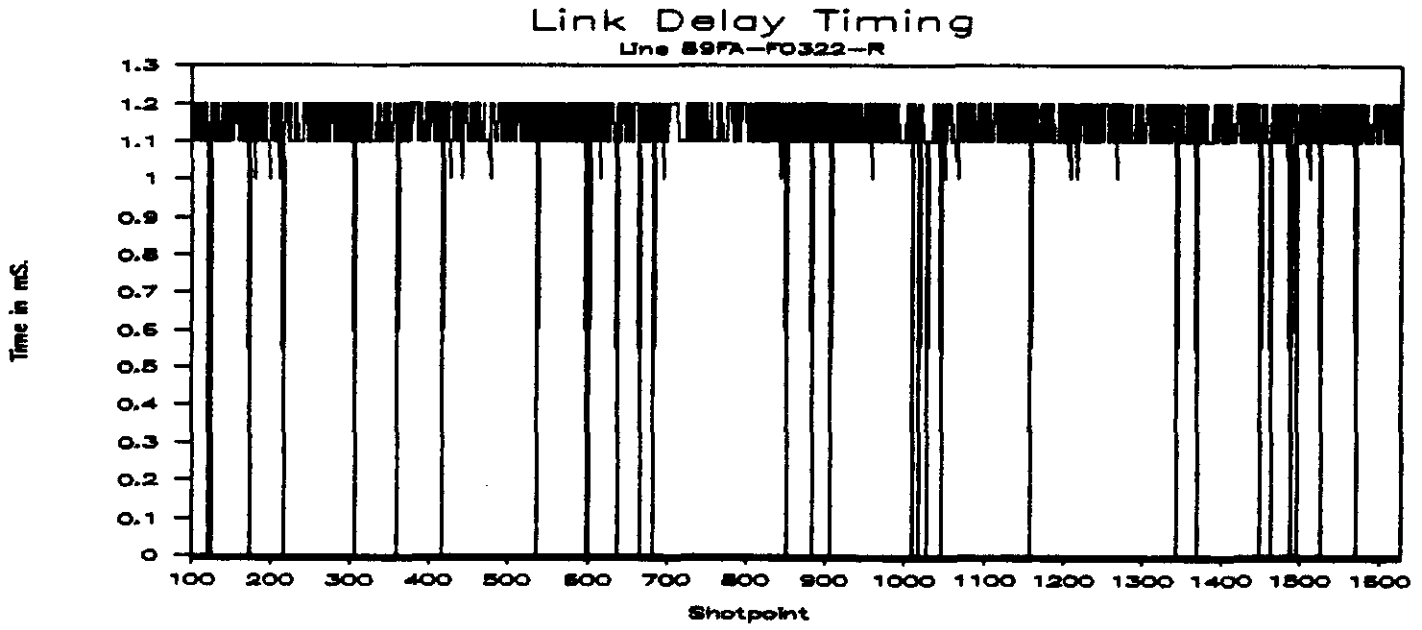

Water Speed
Line 89FA-F0310-R
Knots
Shotpoint

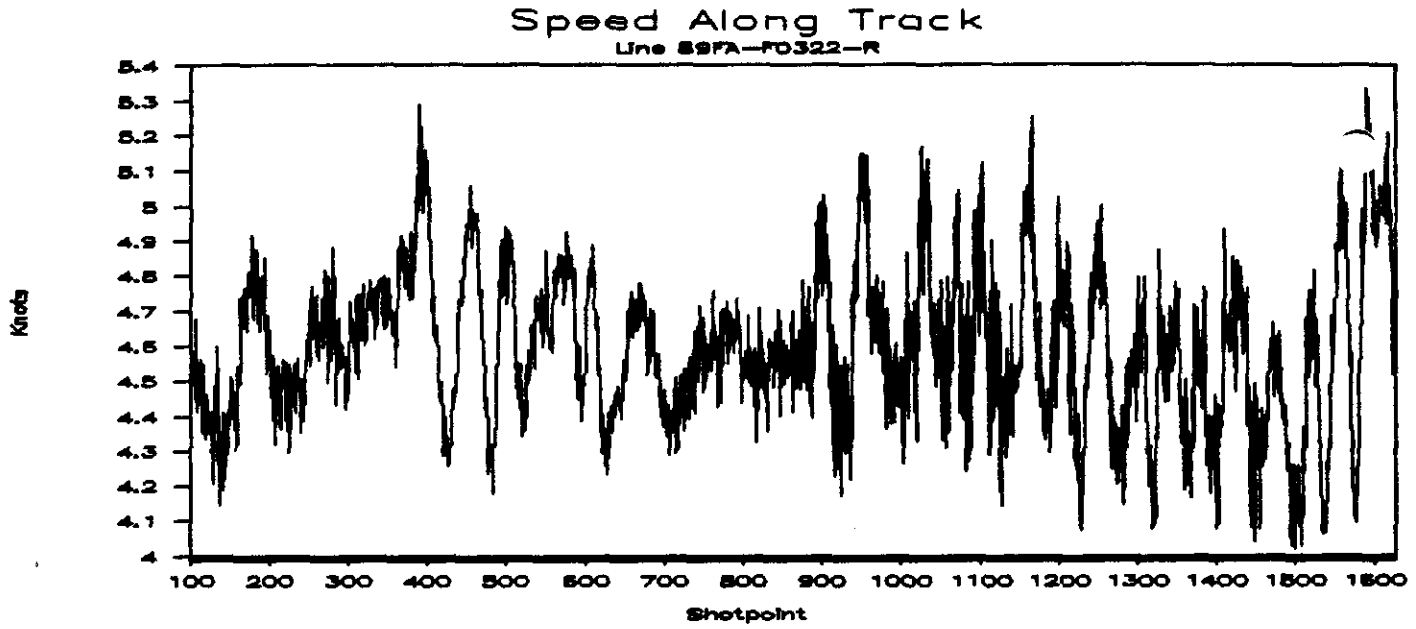

Current Along Track
Line 89FA-F0310-R
Knots -> following
Shotpoint

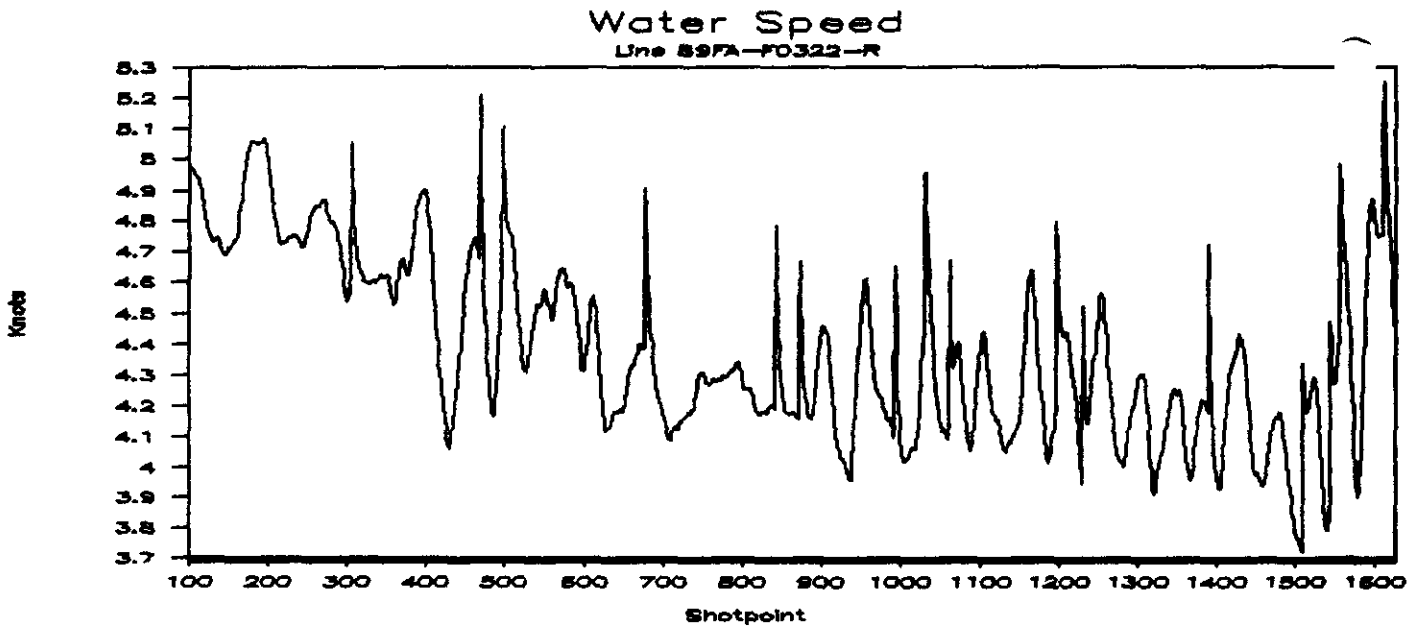

Speed Across Track
Line 89FA-F0310-R
Knots -> stbd.
Shotpoint

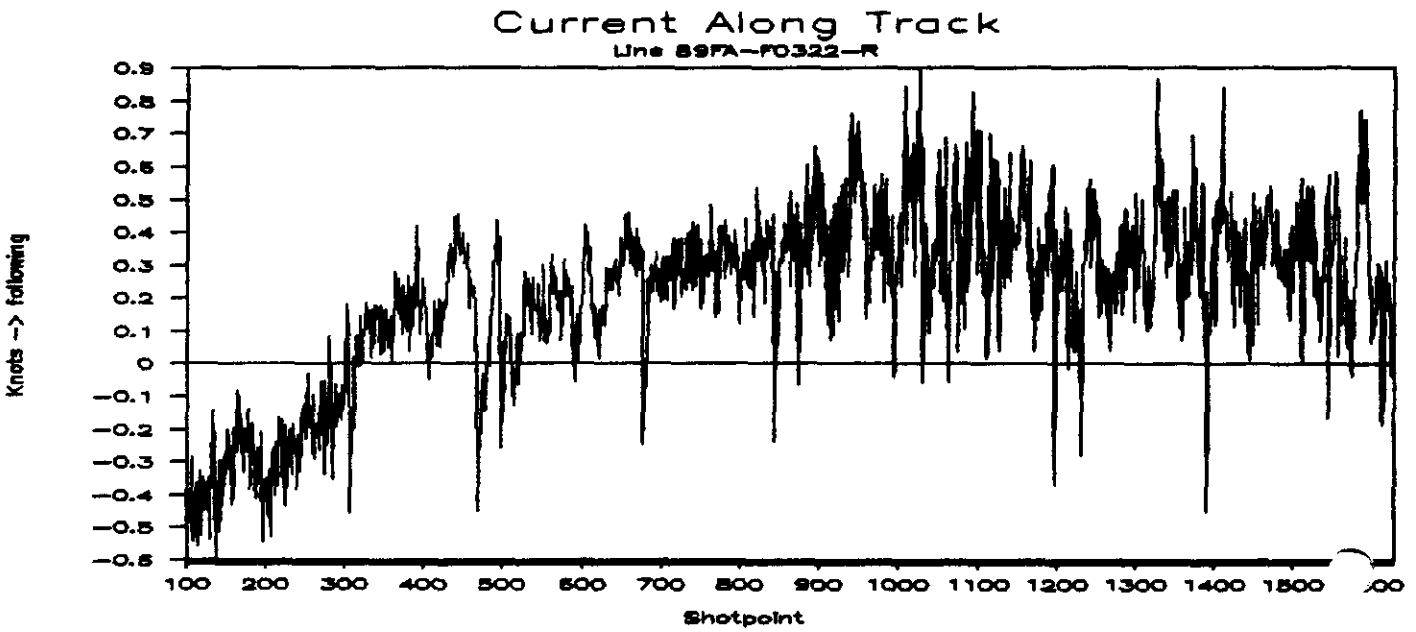

Closure/FTB Timing
Line 89FA-F0322-R
Time in mS.
900
800
700
600
500
400
300
200
100
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

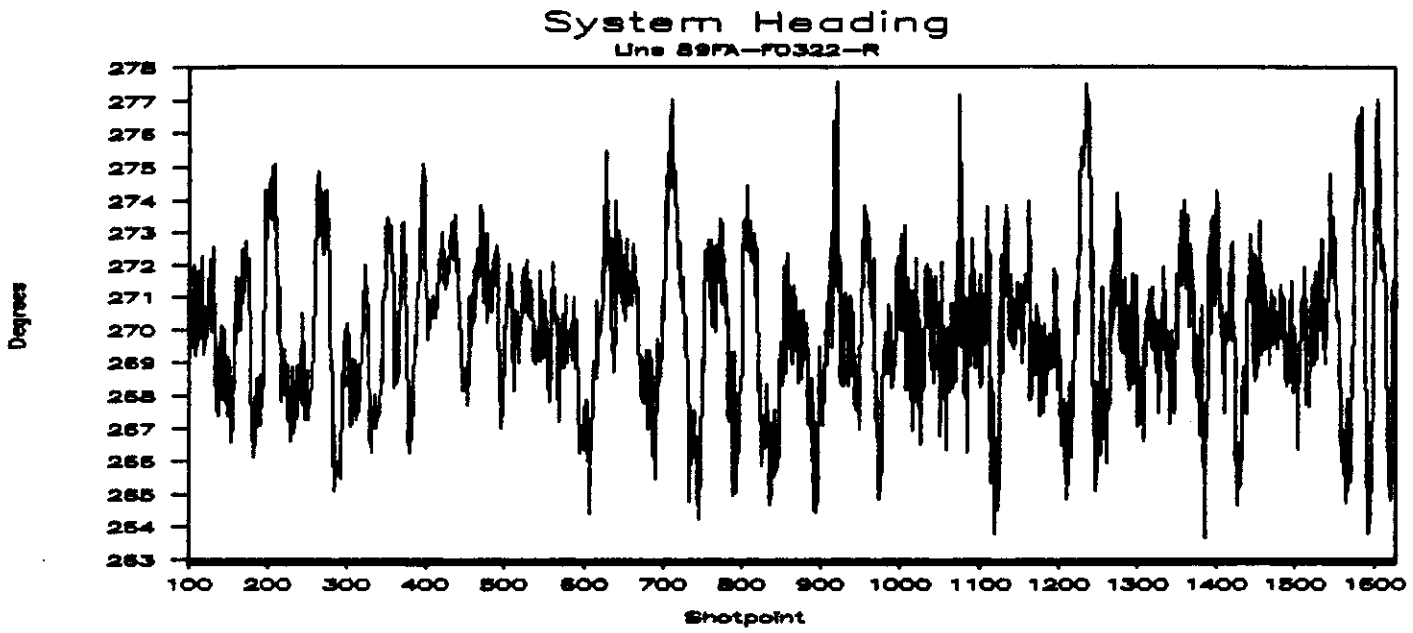

Closure/FTB Timing (expanded)
Line 89FA-F0322-R
Time in mS.
595
594
593
592
591
590
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

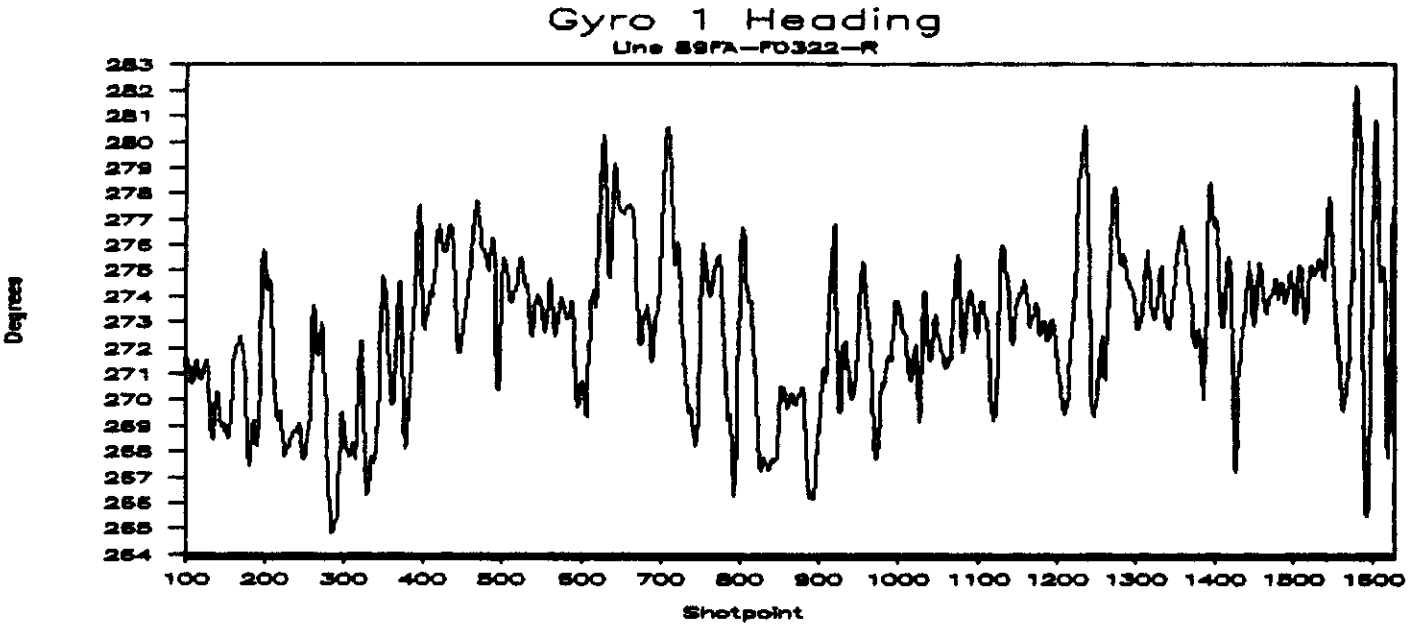

Link Delay Timing
Line 89FA-F0322-R
Time in mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

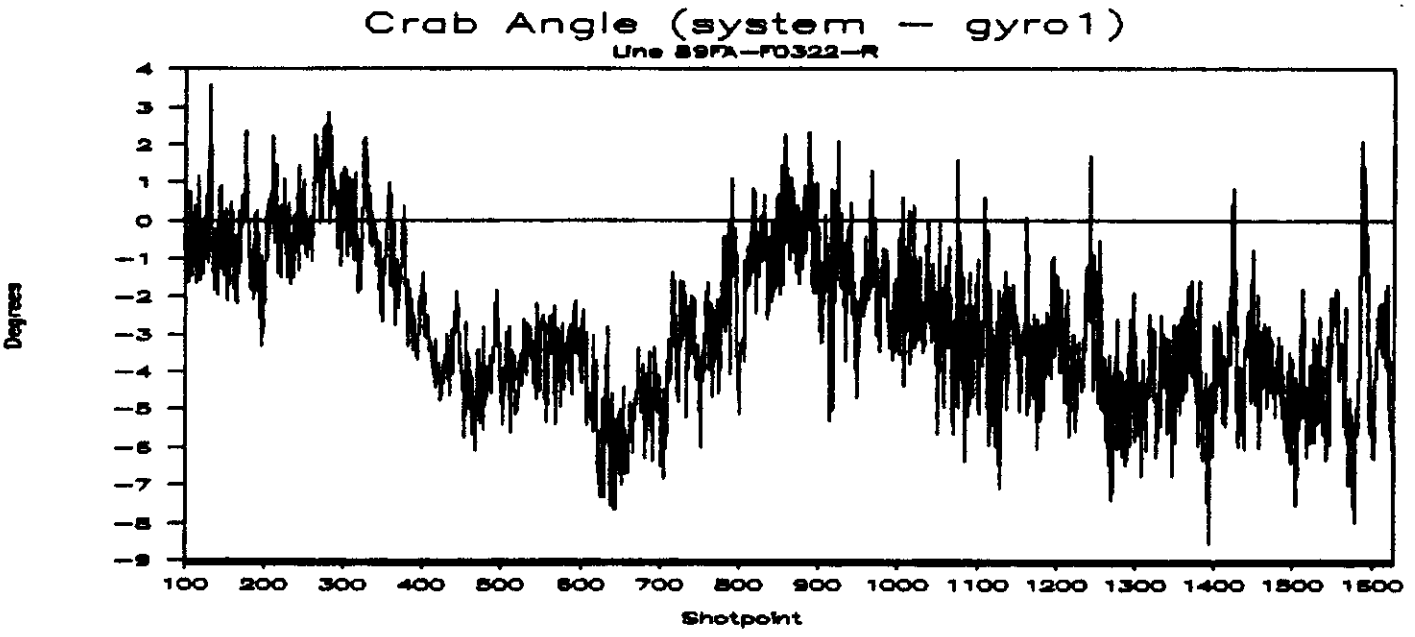

Speed Along Track
Line 89FA-F0322-R
Knots
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

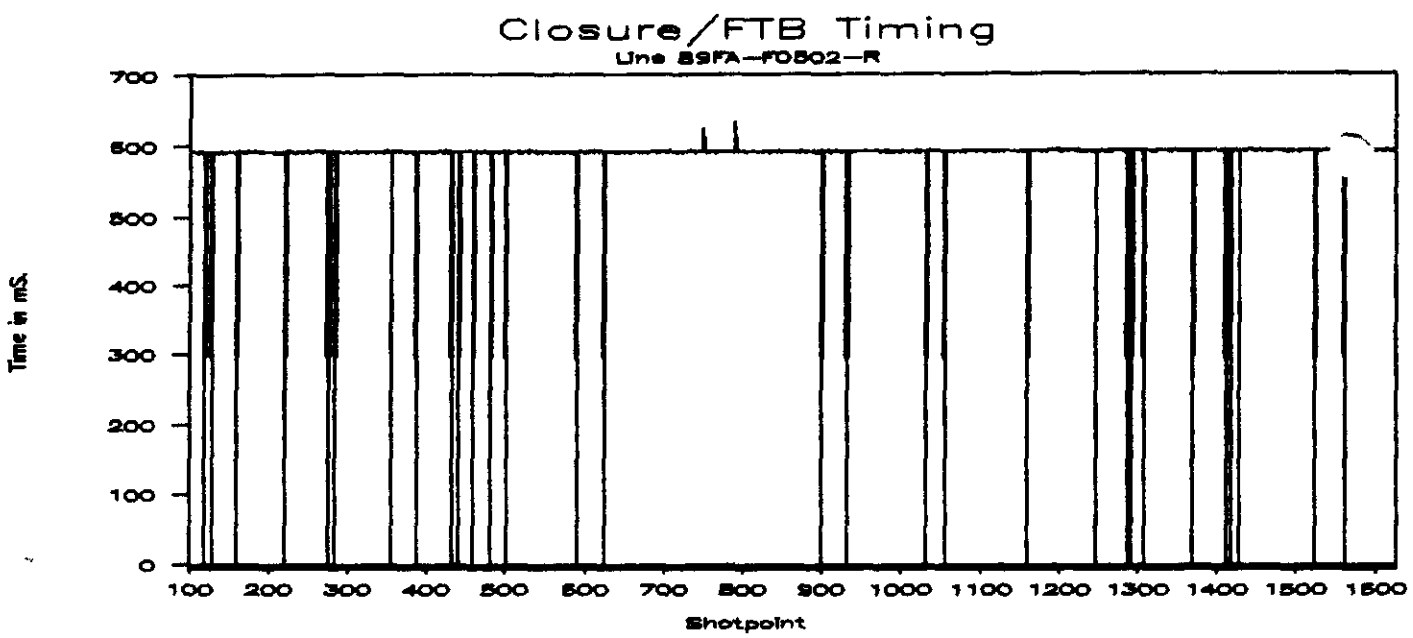

Water Speed
Line 89FA-F0322-R
Knots
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4
3.9
3.8
3.7
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

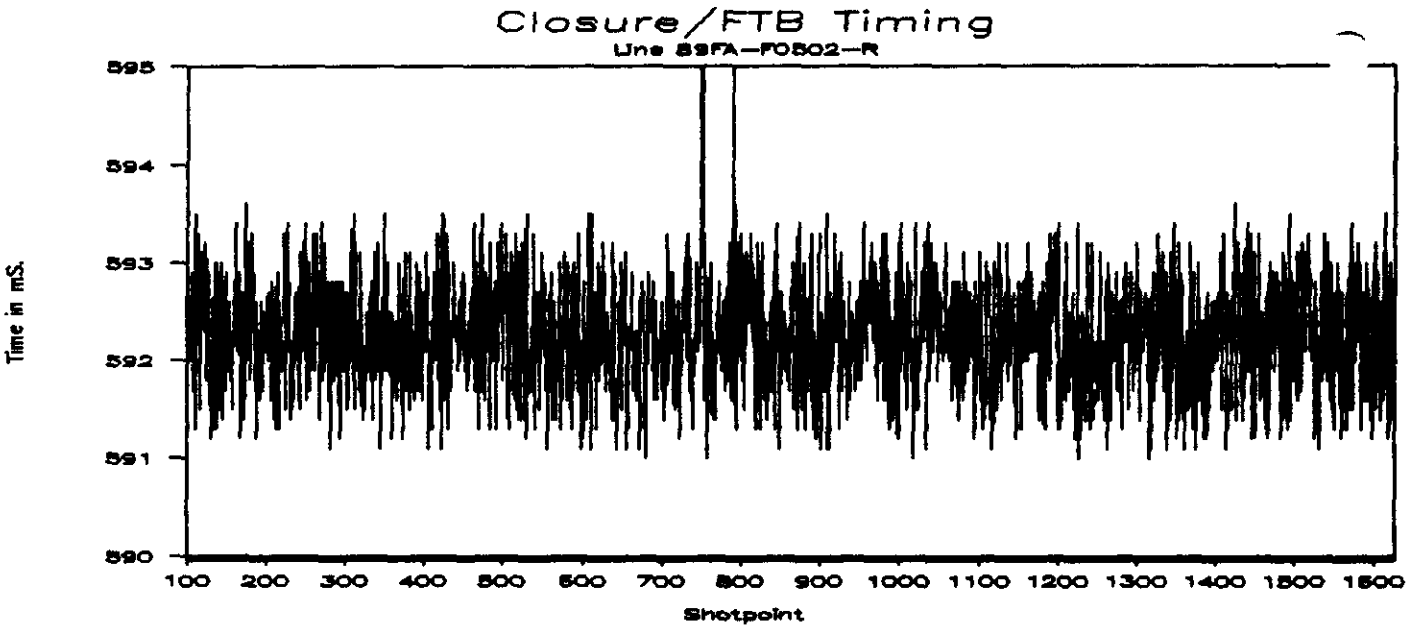

Current Along Track
Line 89FA-F0322-R
Knots -> following
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500
Shotpoint

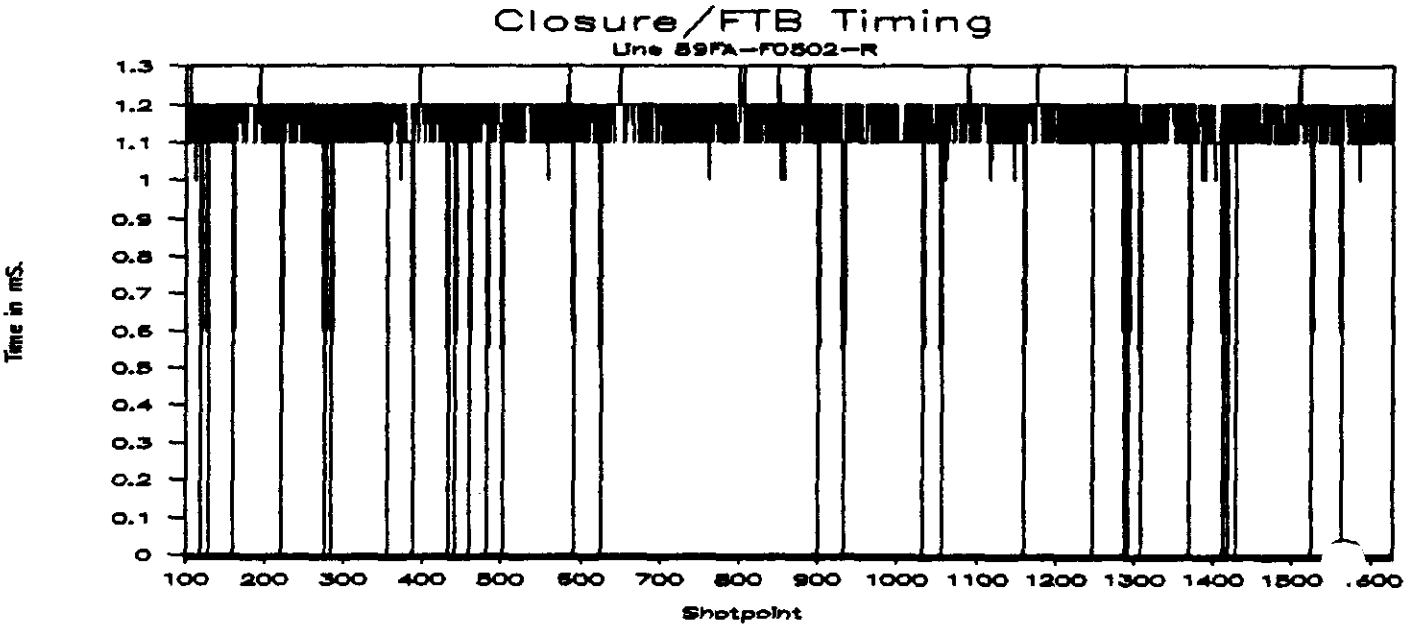

System Heading
Line 89FA-F0322-R
Degrees
278
277
276
275
274
273
272
271
270
269
268
267
266
265
264
263
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

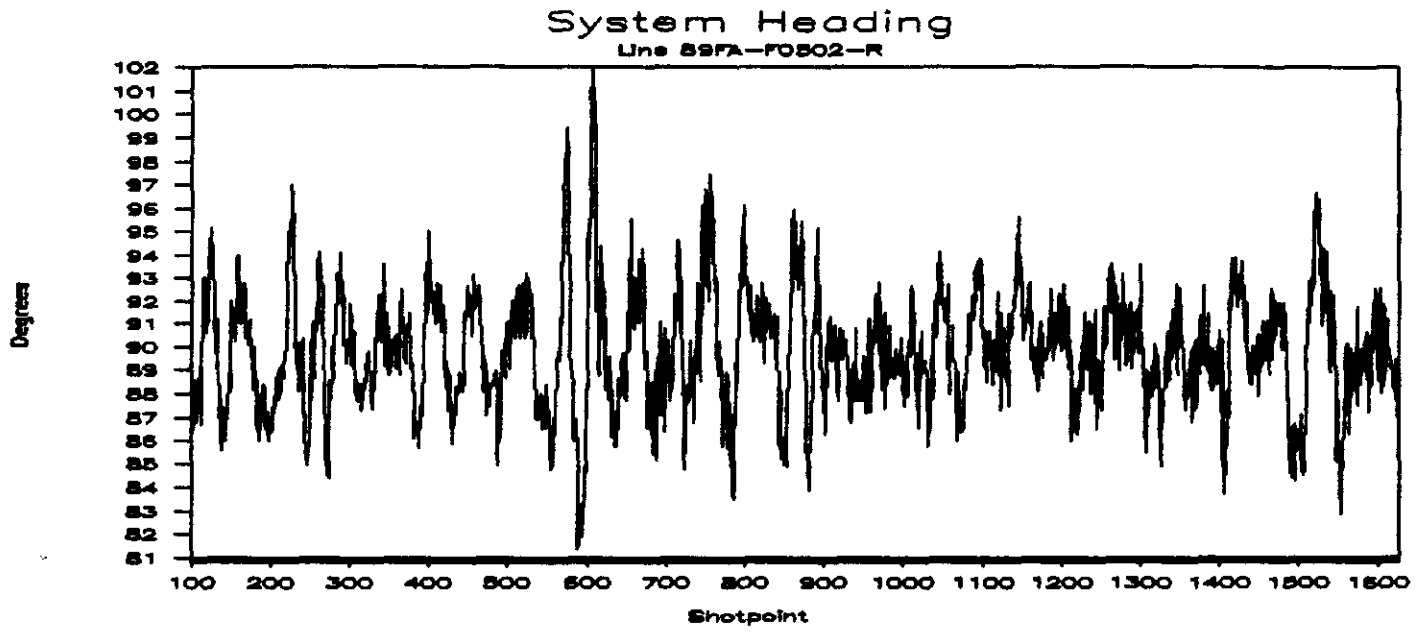

Gyro 1 Heading
Line 89FA-F0322-R
Degrees
283
282
281
280
279
278
277
276
275
274
273
272
271
270
269
268
267
266
265
264
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

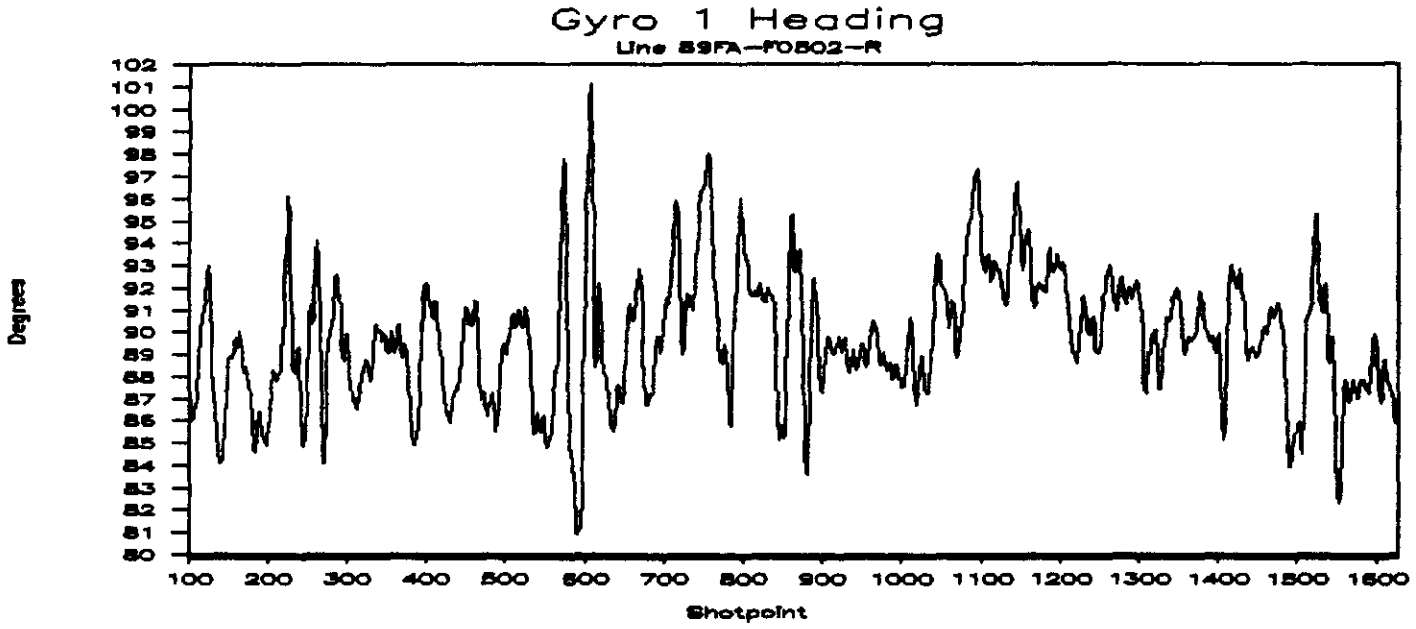

Crab Angle (system — gyro1)
Line 89FA-F0322-R
Degrees
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

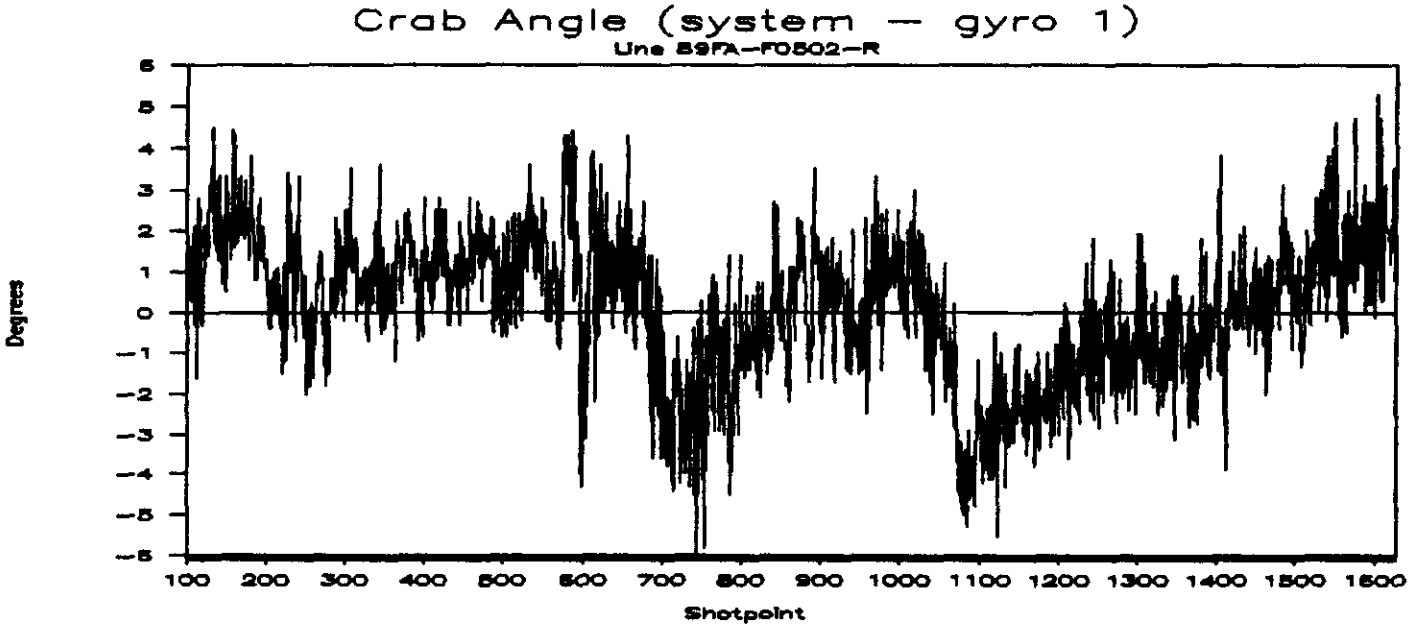

Closure/FTB Timing
Line 89FA-F0502-R
Time in mS.
700
600
500
400
300
200
100
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

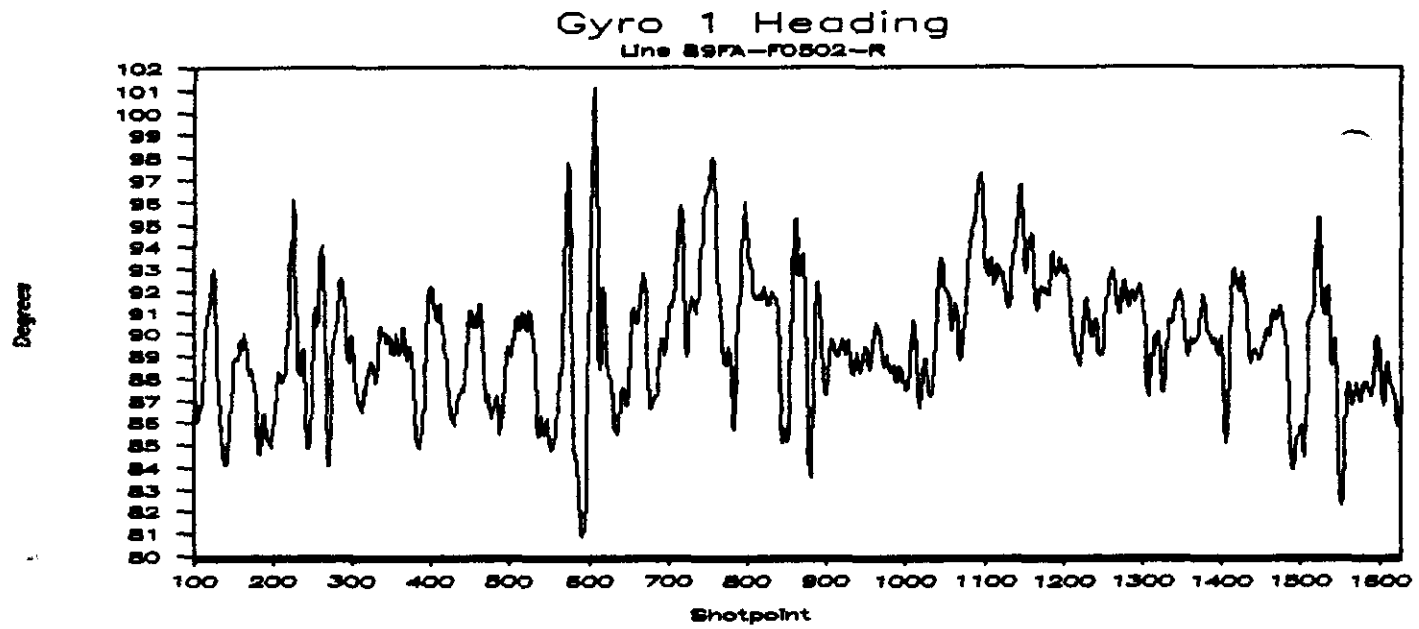

Closure/FTB Timing
Line 89FA-F0502-R
Time in mS.
595
594
593
592
591
590
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

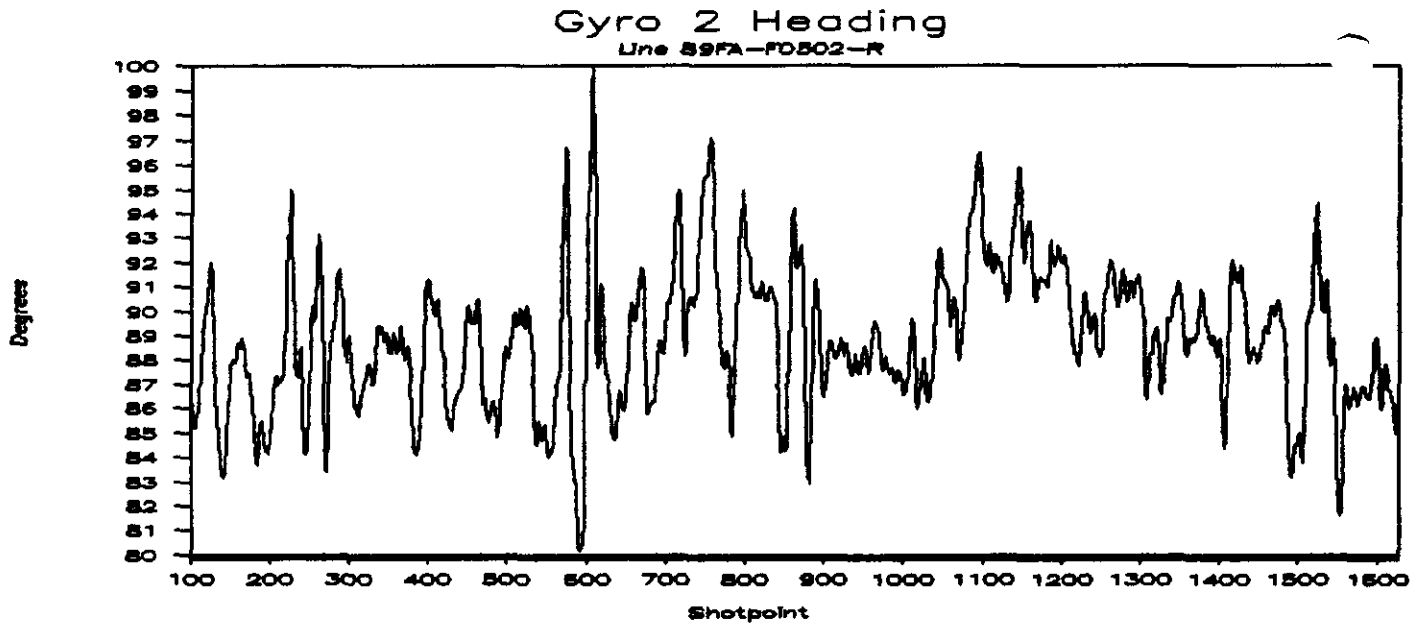

Closure/FTB Timing
Line 89FA-F0502-R
Time in mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

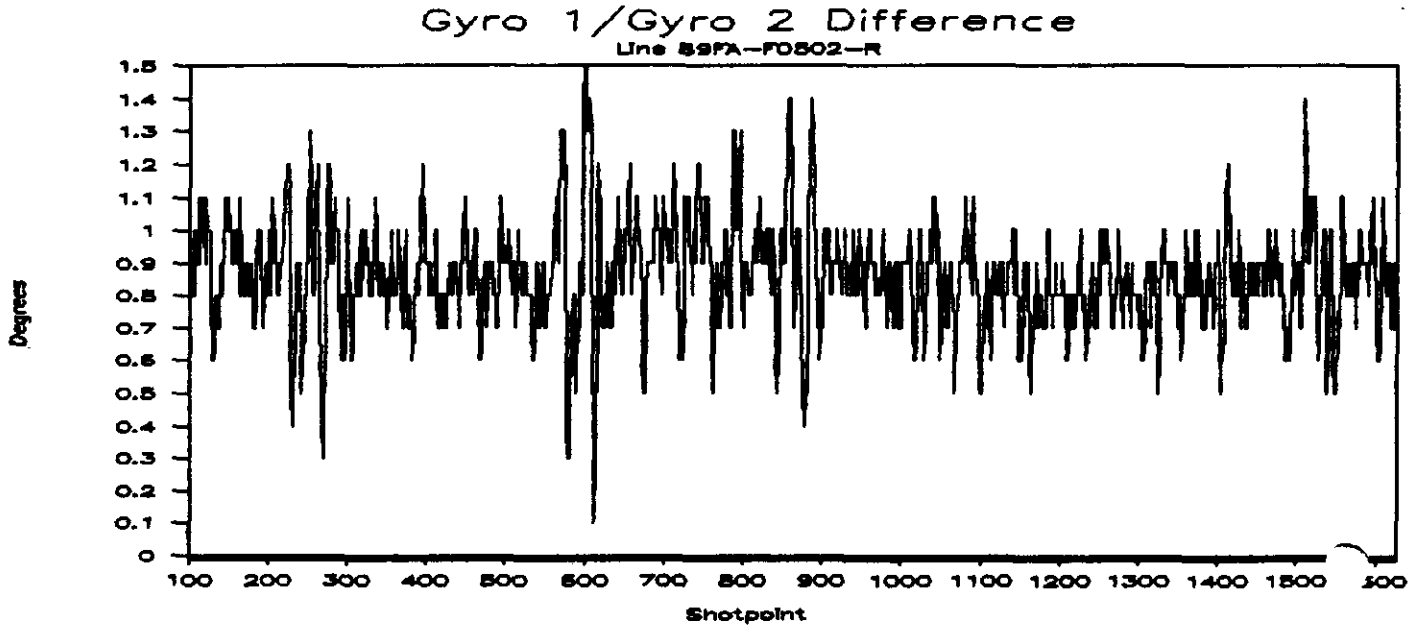

System Heading
Line 89FA-F0502-R
Degrees
Shotpoint

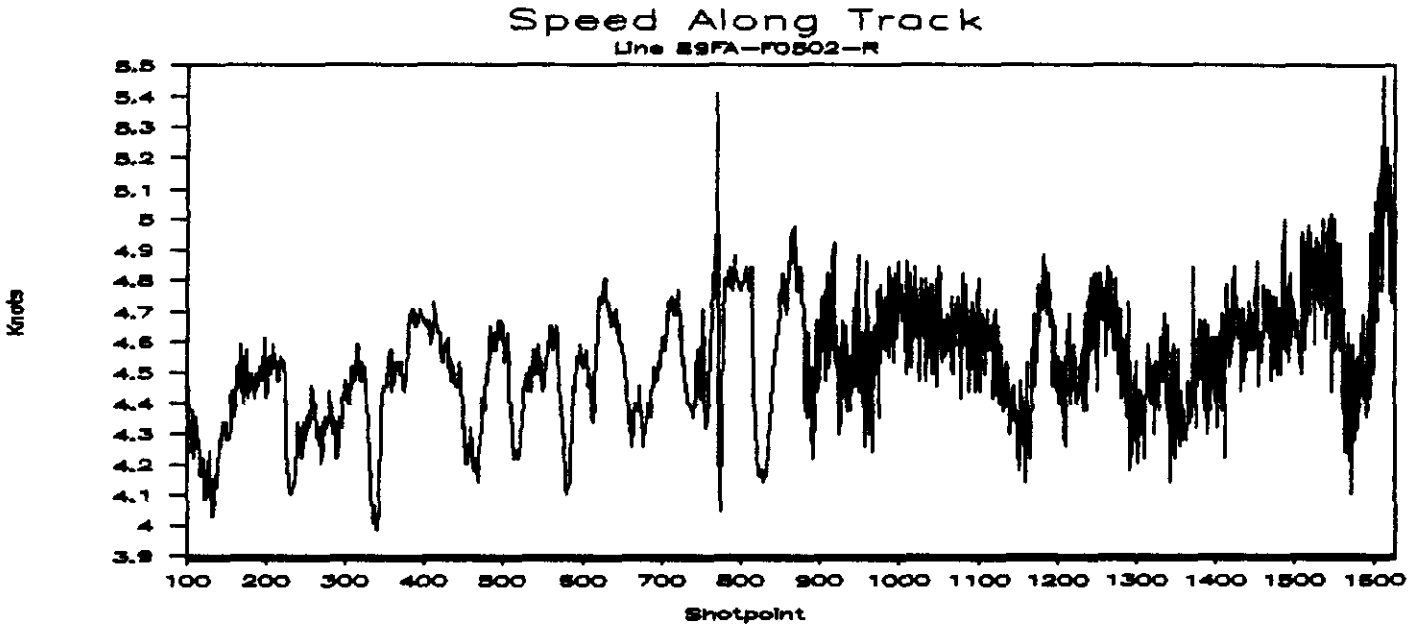

Gyro 1 Heading
Line 89FA-F0502-R
Degrees
Shotpoint

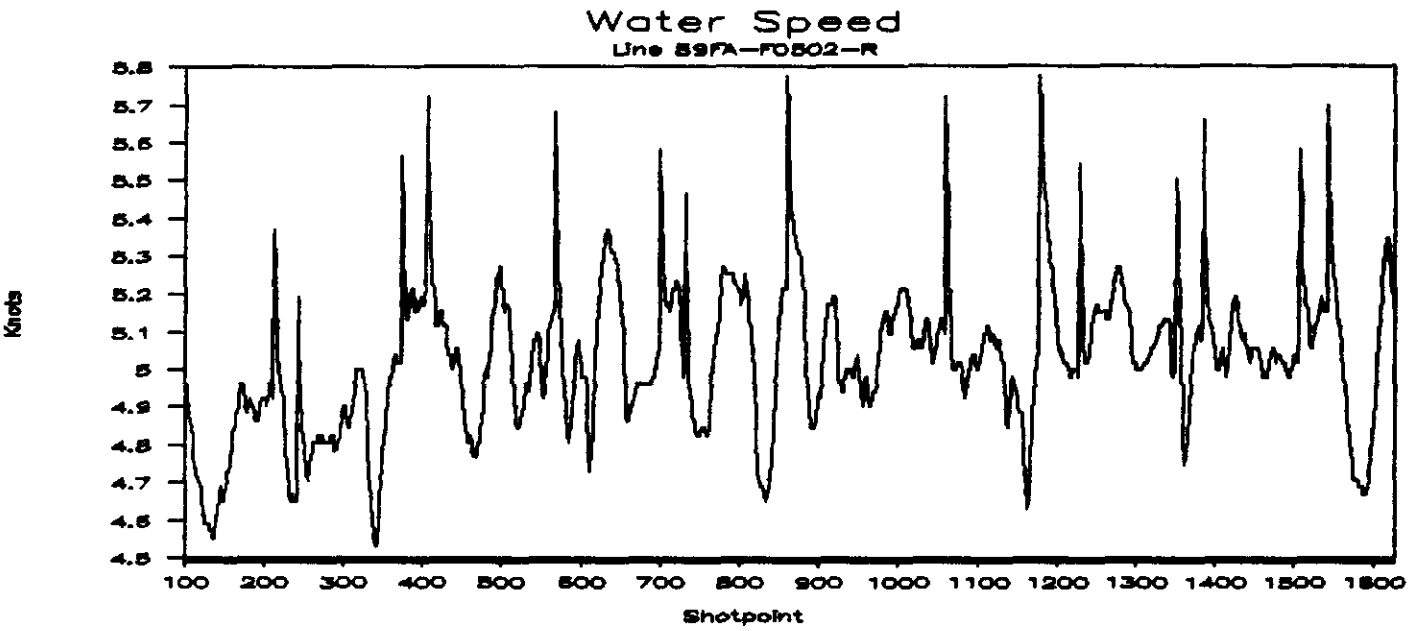

Crab Angle (system - gyro 1)
Line 89FA-F0502-R
Degrees
Shotpoint

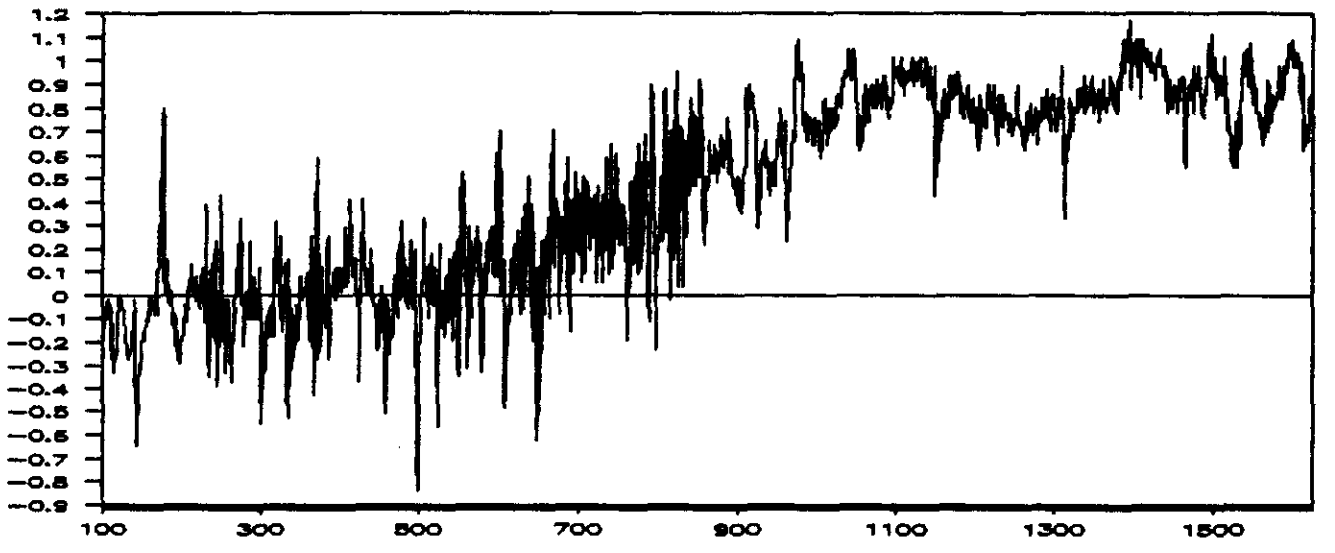

Gyro 1 Heading
Line 89FA-F0502-R
Degrees
Shotpoint

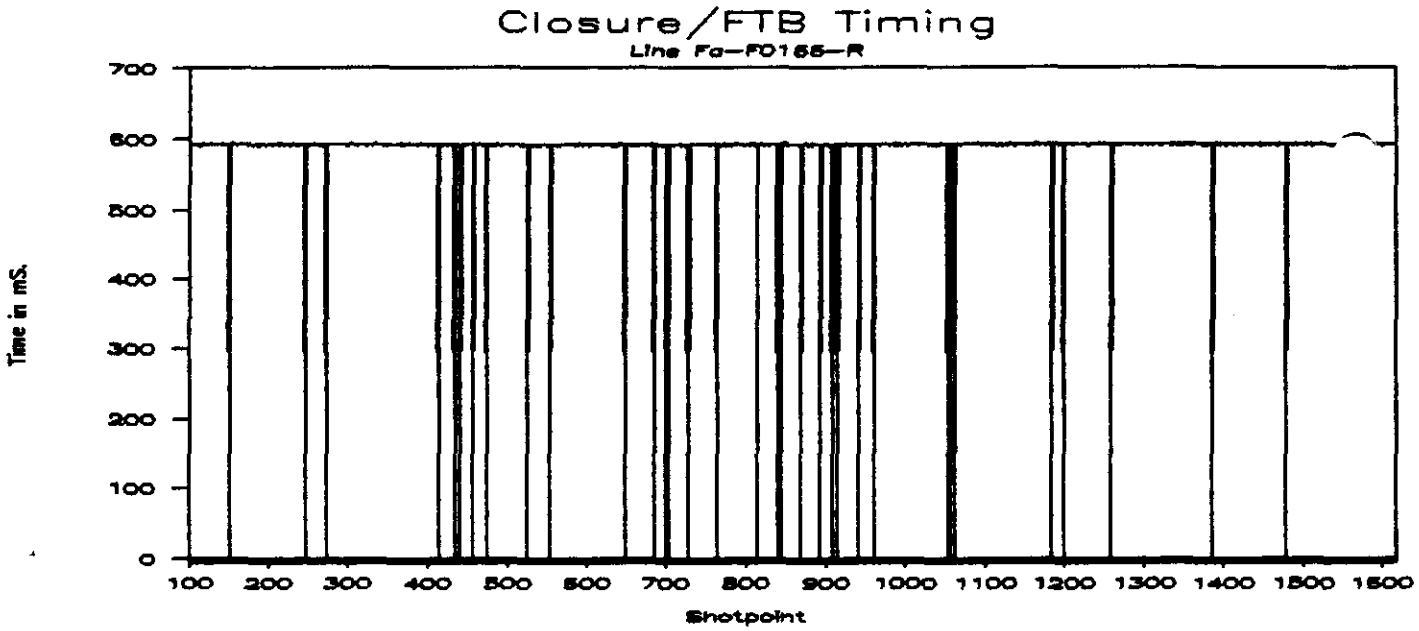

Gyro 2 Heading
Line 89FA-F0502-R
Degrees
Shotpoint

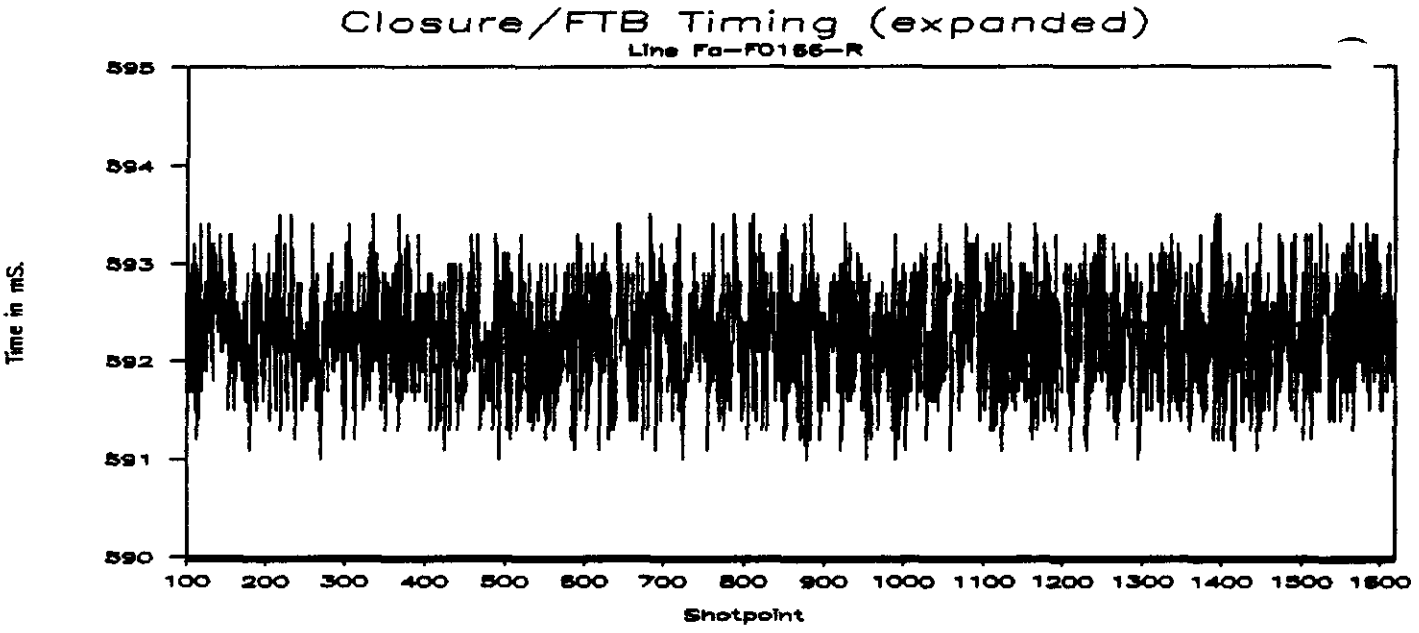

Gyro 1/Gyro 2 Difference
Line 89FA-F0502-R
Degrees
Shotpoint

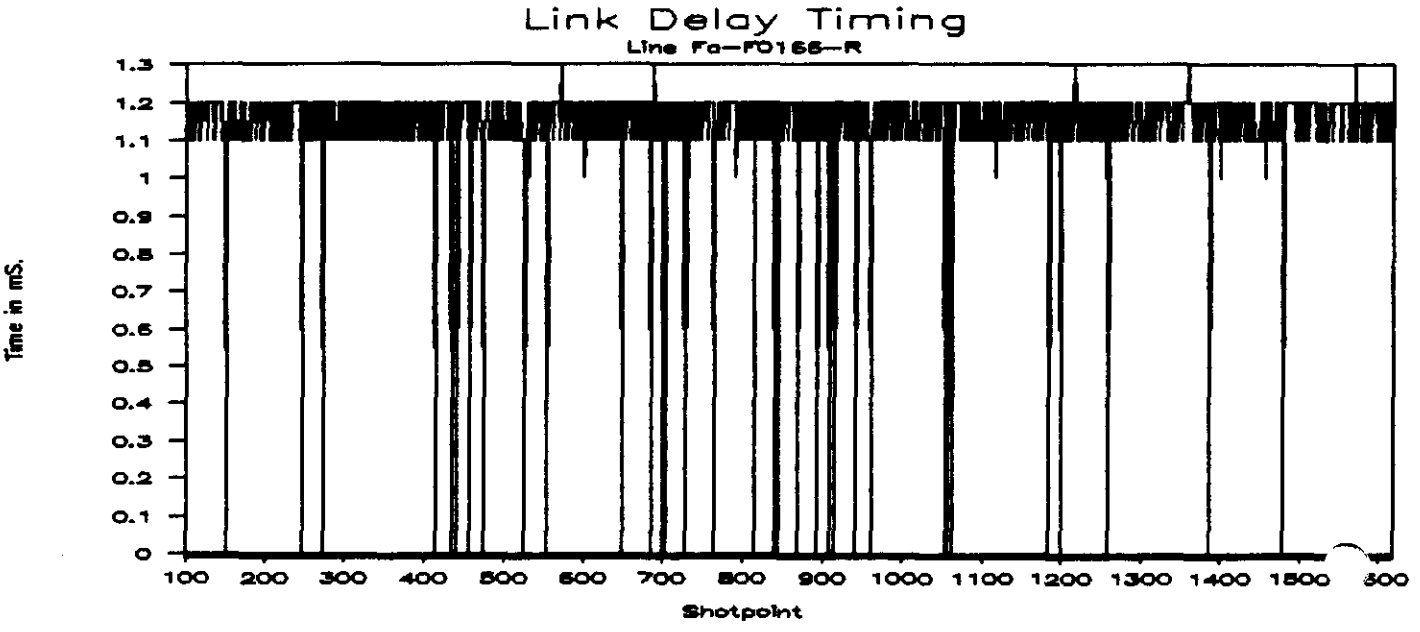

Speed Along Track
Line 89FA-F0502-R
Knots
5.5
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4
3.9
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

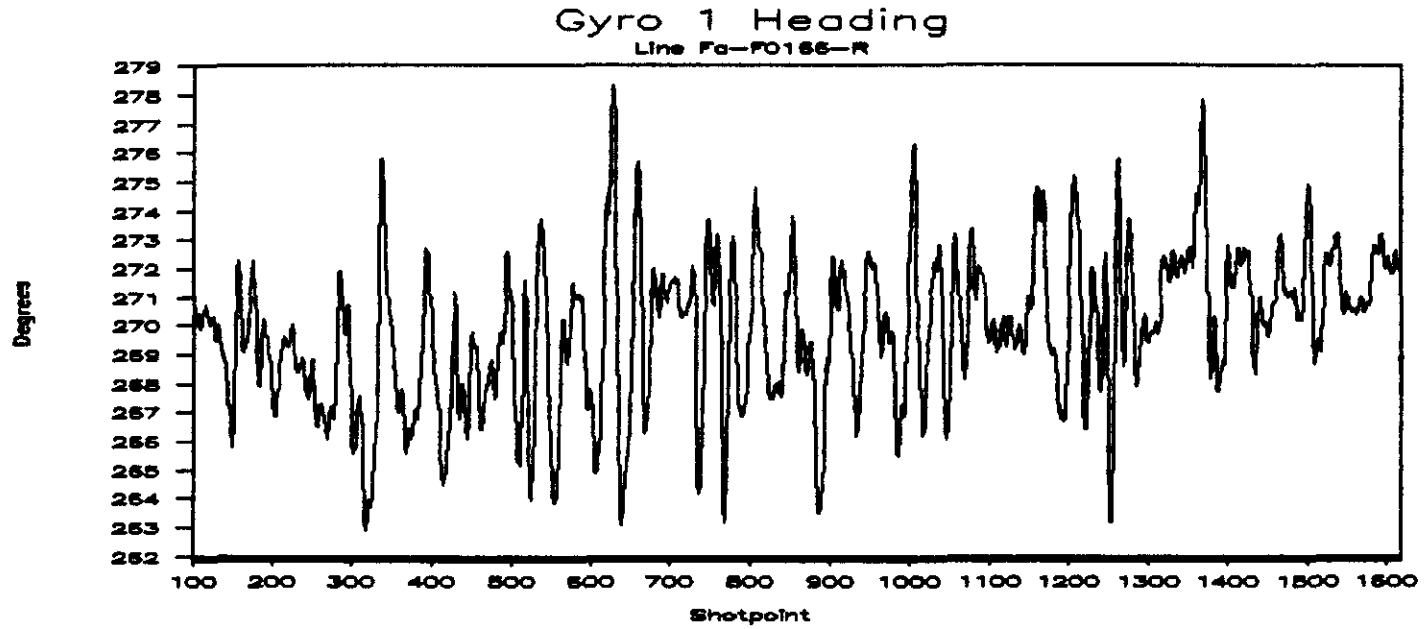

Water Speed
Line 89FA-F0502-R
Knots
5.8
5.7
5.6
5.5
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

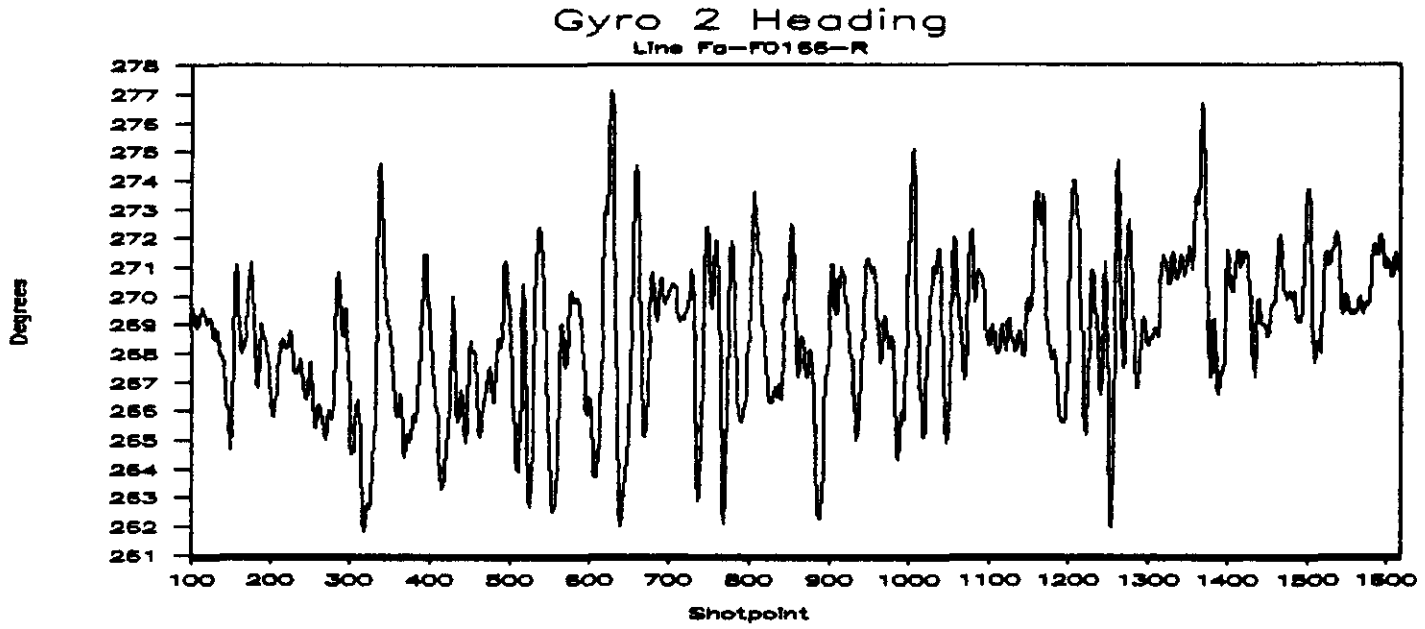

1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
-0.9
100 300 500 700 900 1100 1300 1500

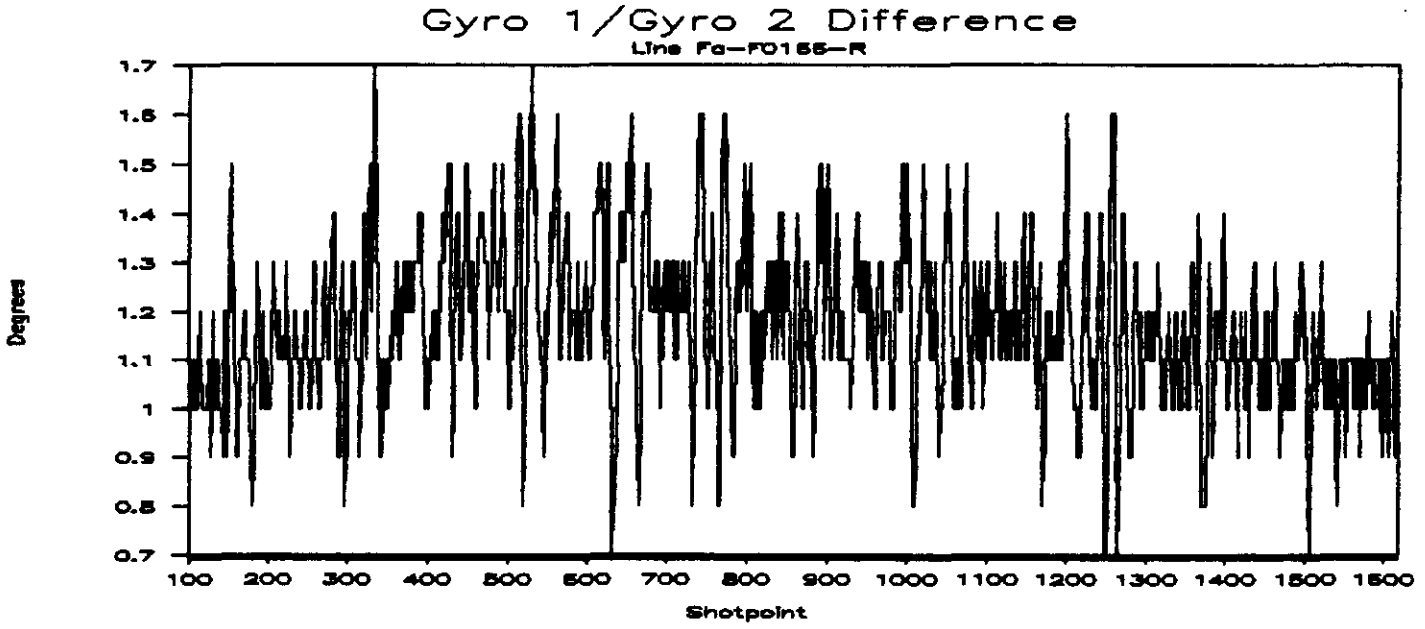

Closure/FTB Timing
Line Fa-F0166-R
Time in mS.
700
600
500
400
300
200
100
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

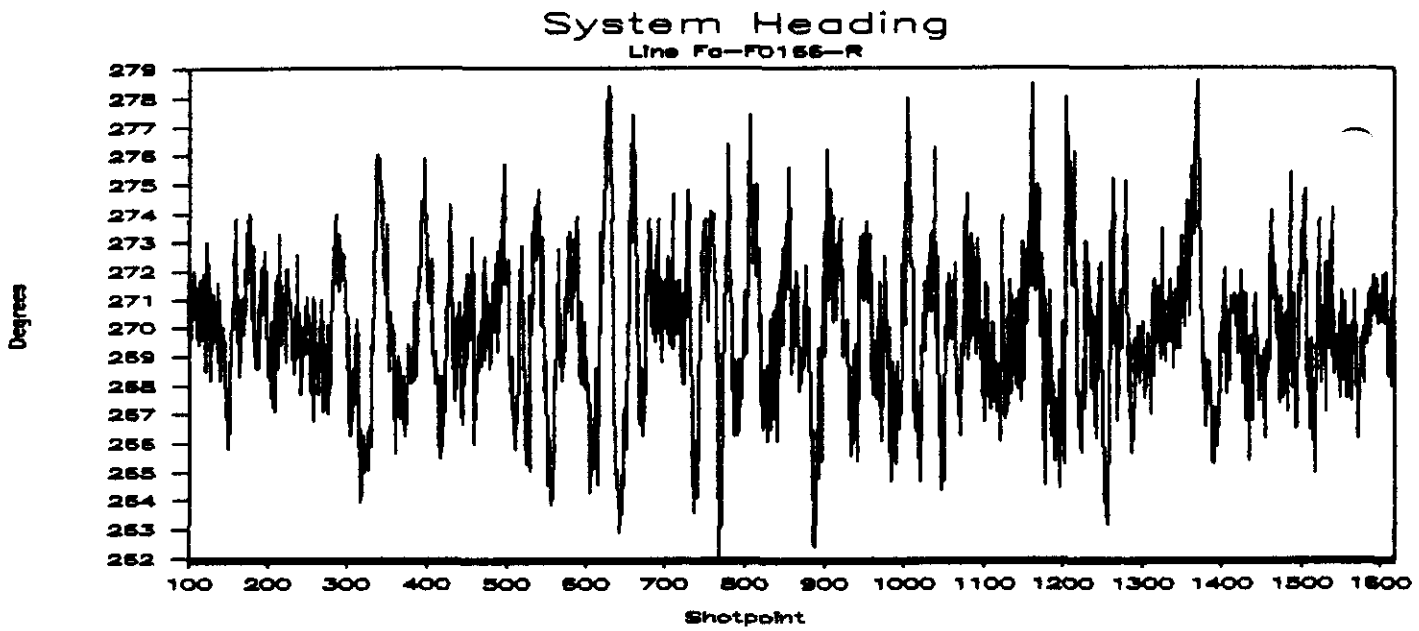

Closure/FTB Timing (expanded)
Line Fa-F0166-R
Time in mS.
595
594
593
592
591
590
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

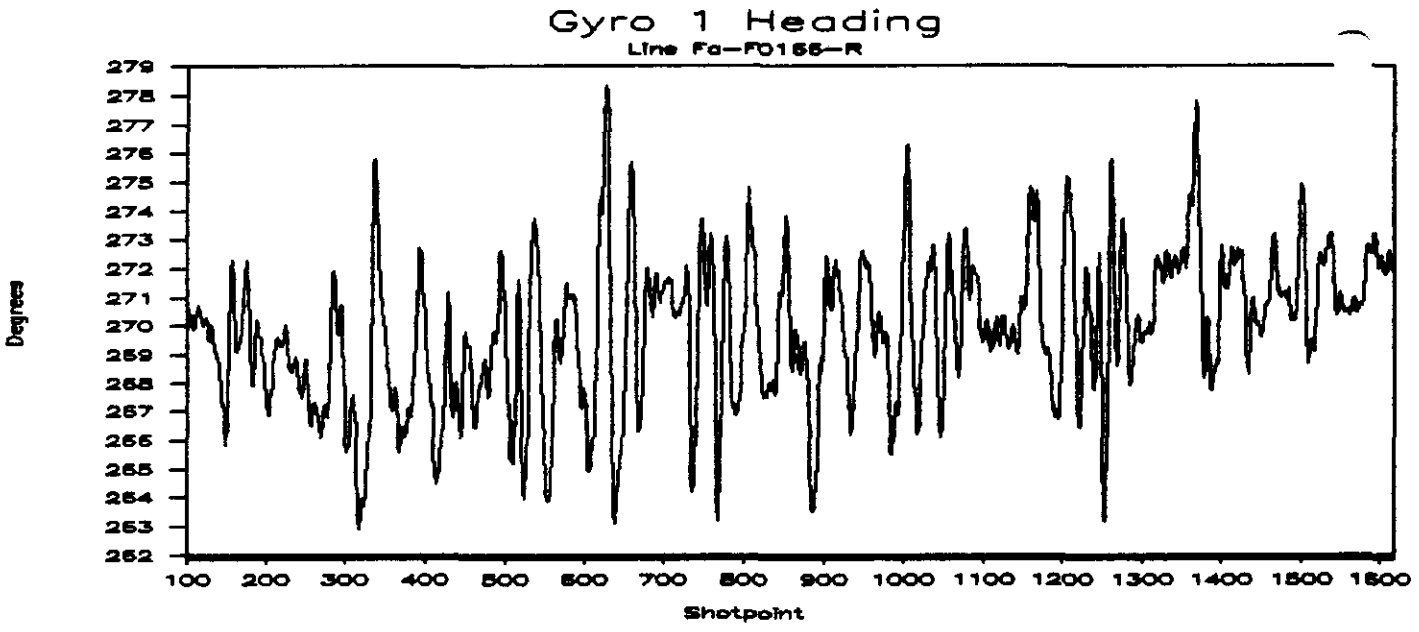

Link Delay Timing
Line Fa-F0166-R
Time in mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

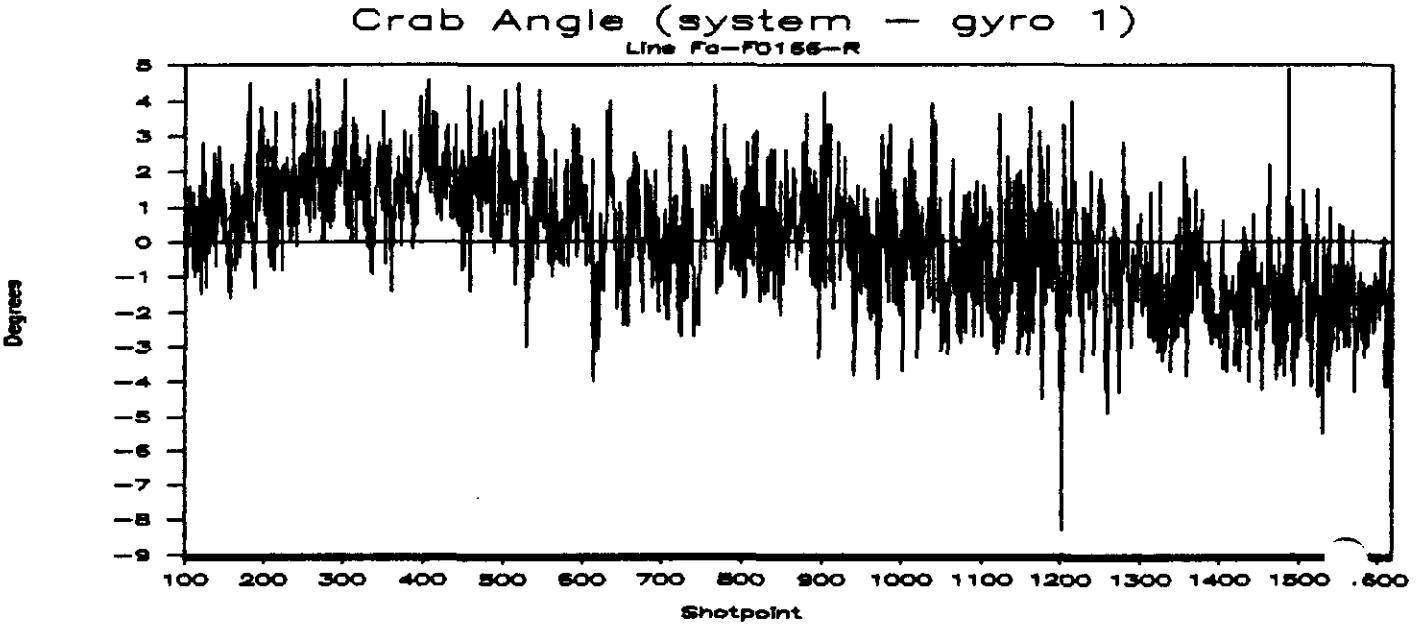

Gyro 1 Heading
Line Fa-F0166-R
Degrees
279
278
277
276
275
274
273
272
271
270
269
268
267
266
265
264
263
262
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

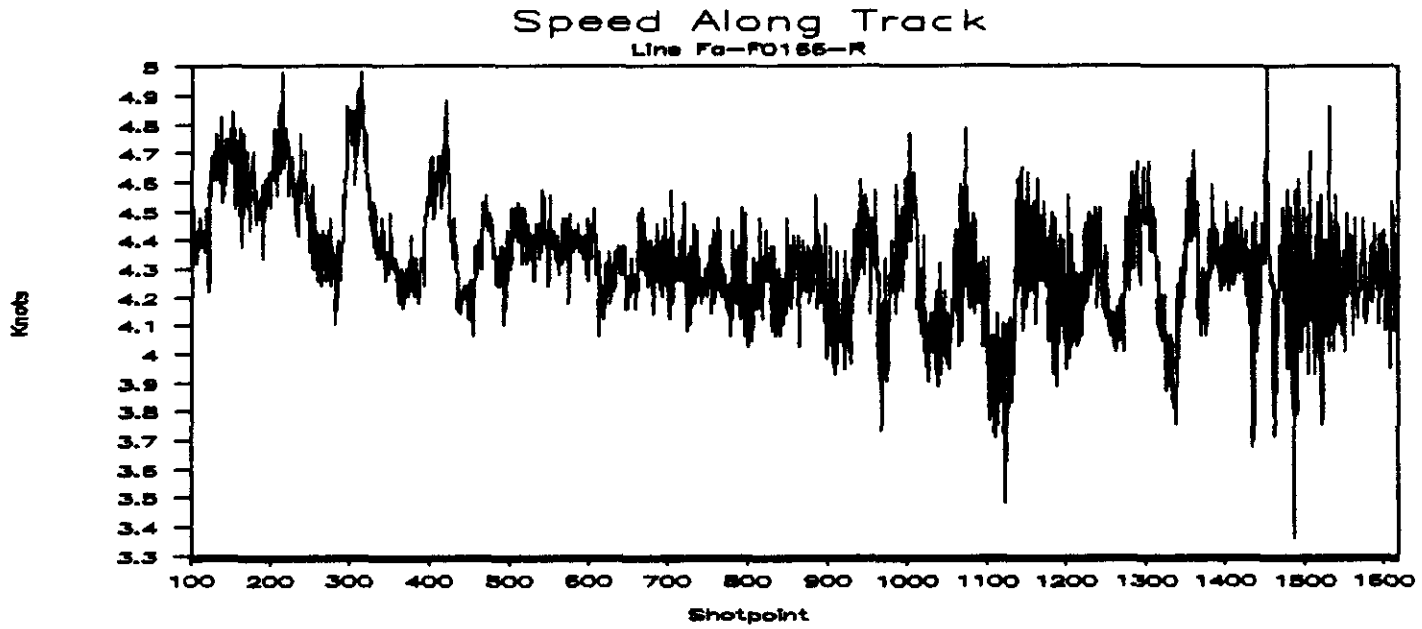

Gyro 2 Heading
Line Fa-F0166-R
Degrees
278
277
276
275
274
273
272
271
270
269
268
267
266
265
264
263
262
261
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

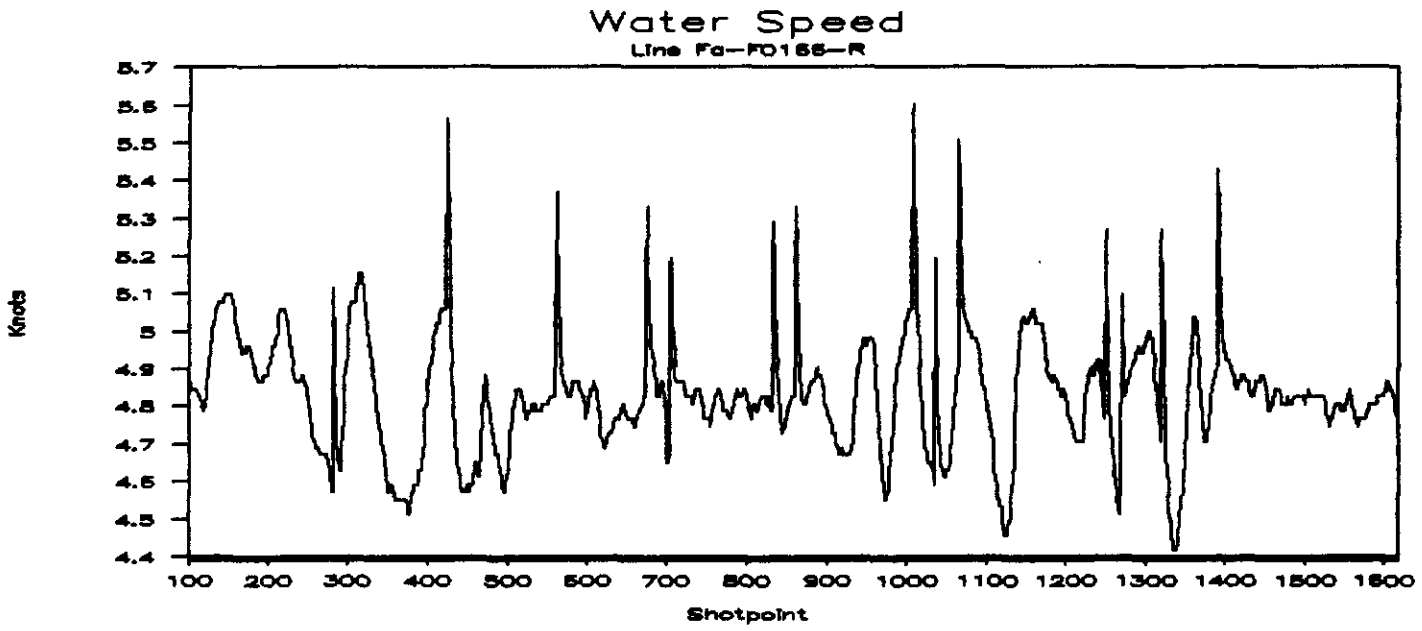

Gyro 1/Gyro 2 Difference
Line Fa-F0166-R
Degrees
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500
Shotpoint

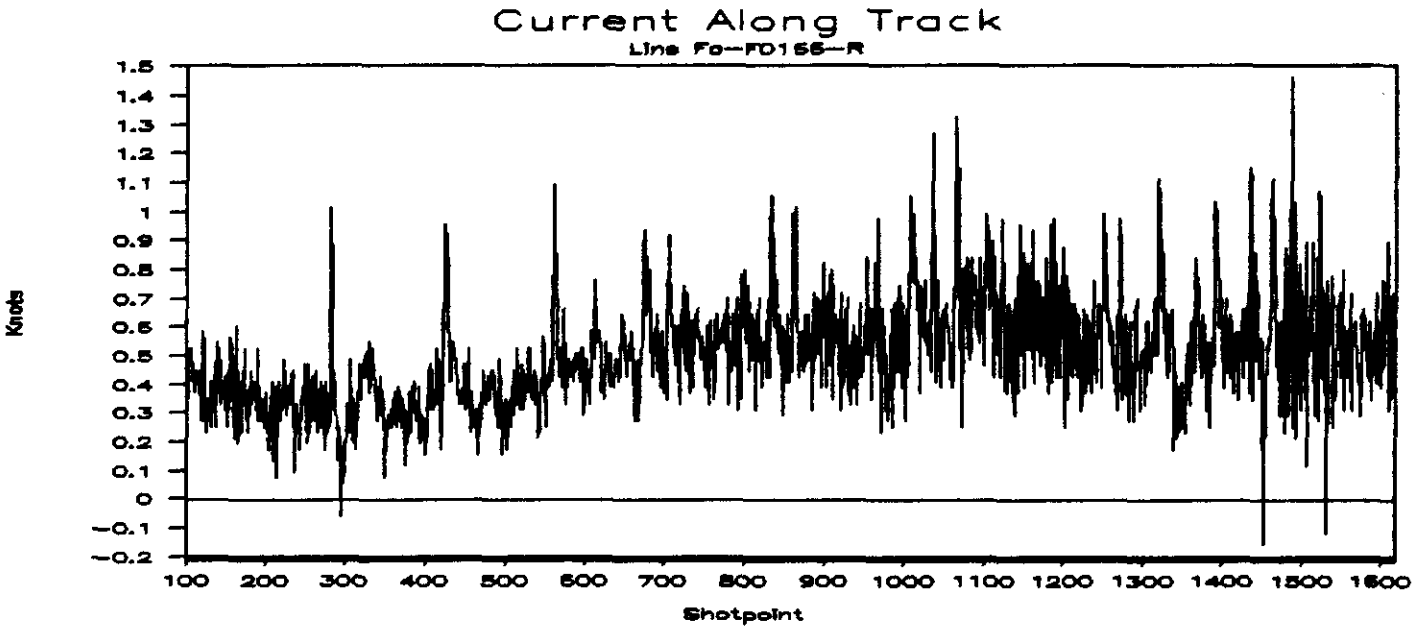

System Heading
Line Fa-F0156-R
Degrees
279
278
277
276
275
274
273
272
271
270
269
268
267
266
265
264
263
262
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

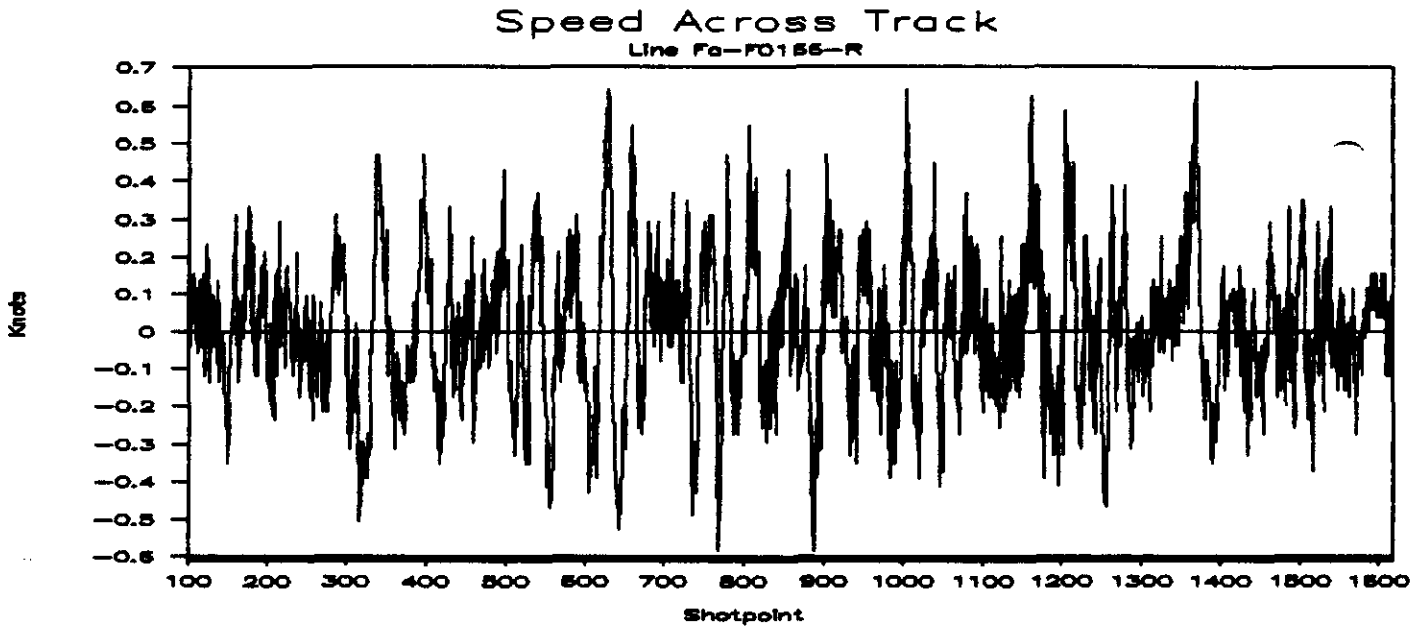

Gyro 1 Heading
Line Fa-F0156-R
Degrees
279
278
277
276
275
274
273
272
271
270
269
268
267
266
265
264
263
262
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

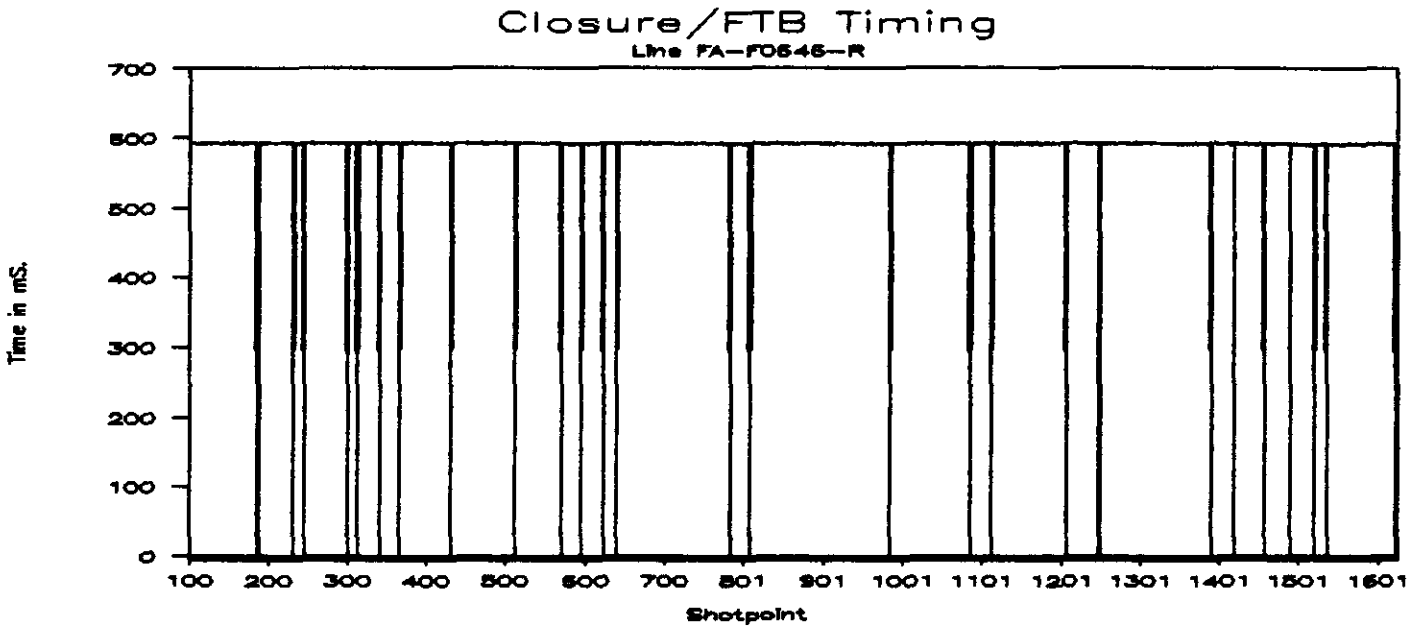

Crab Angle (system — gyro 1)
Line Fa-F0156-R
Degrees
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

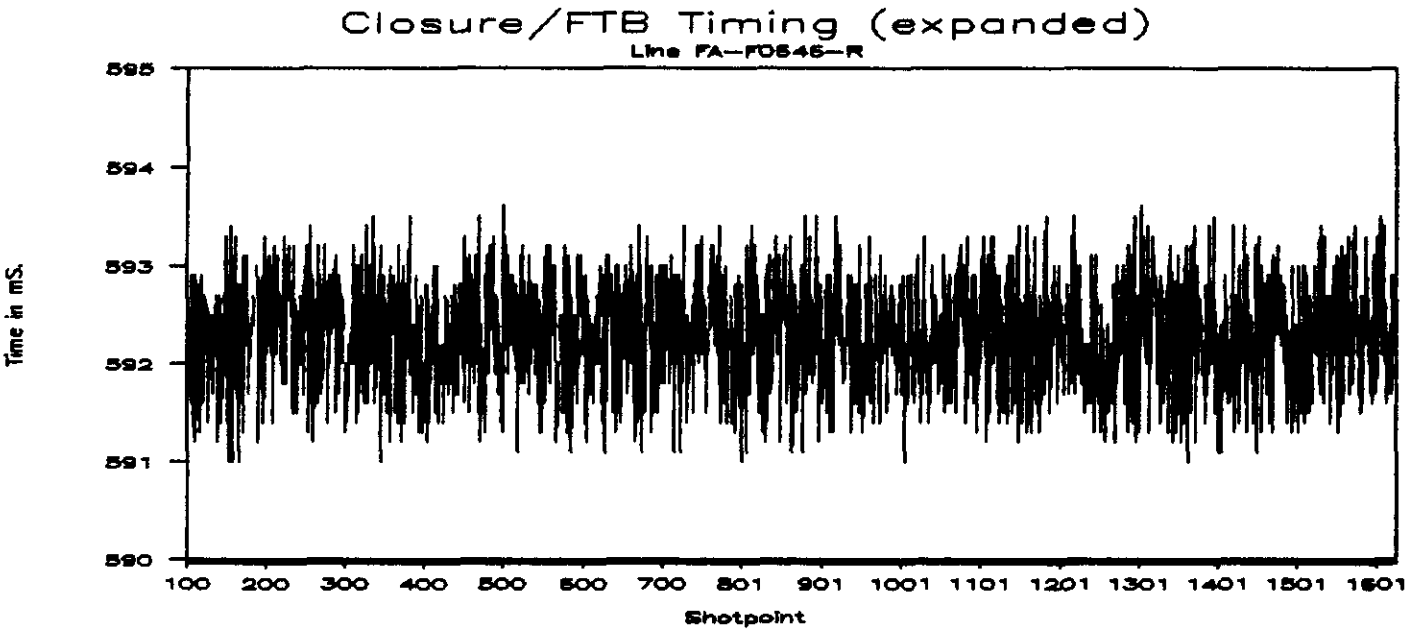

Speed Along Track
Line Fa—FD155—R
Knots
5
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4
3.9
3.8
3.7
3.6
3.5
3.4
3.3
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

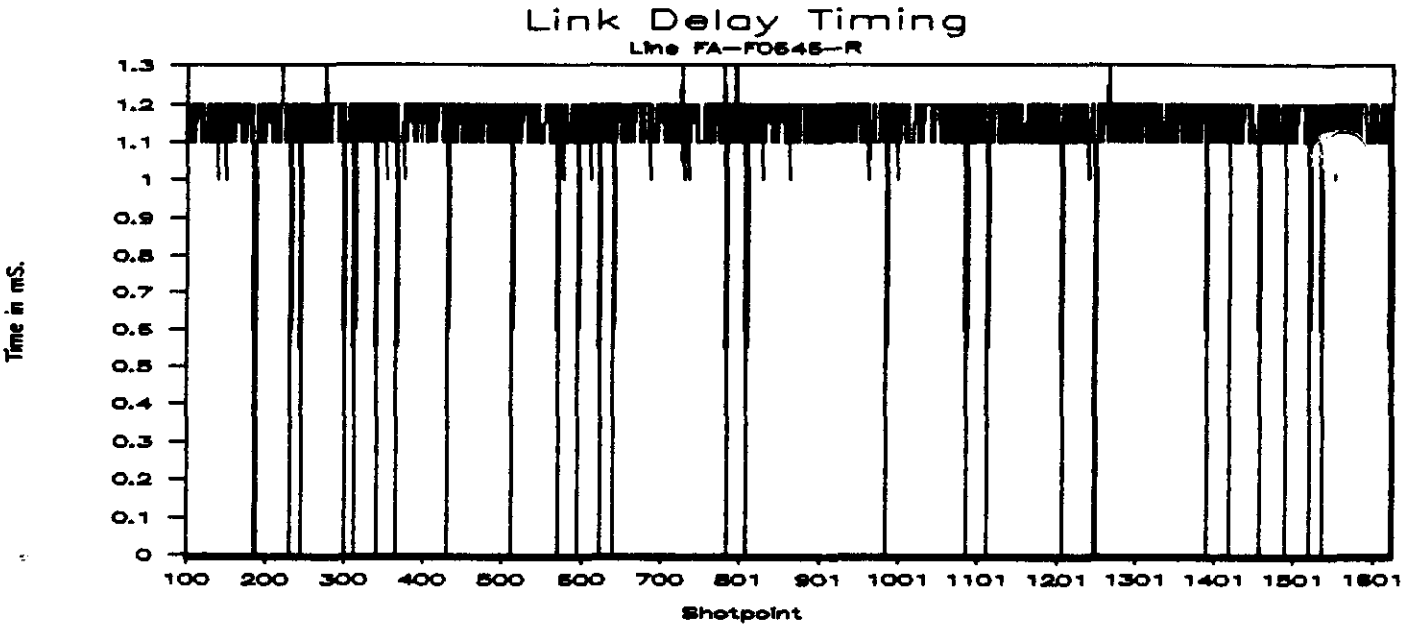

Water Speed
Line Fa—FD155—R
Knots
5.7
5.6
5.5
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
4.4
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

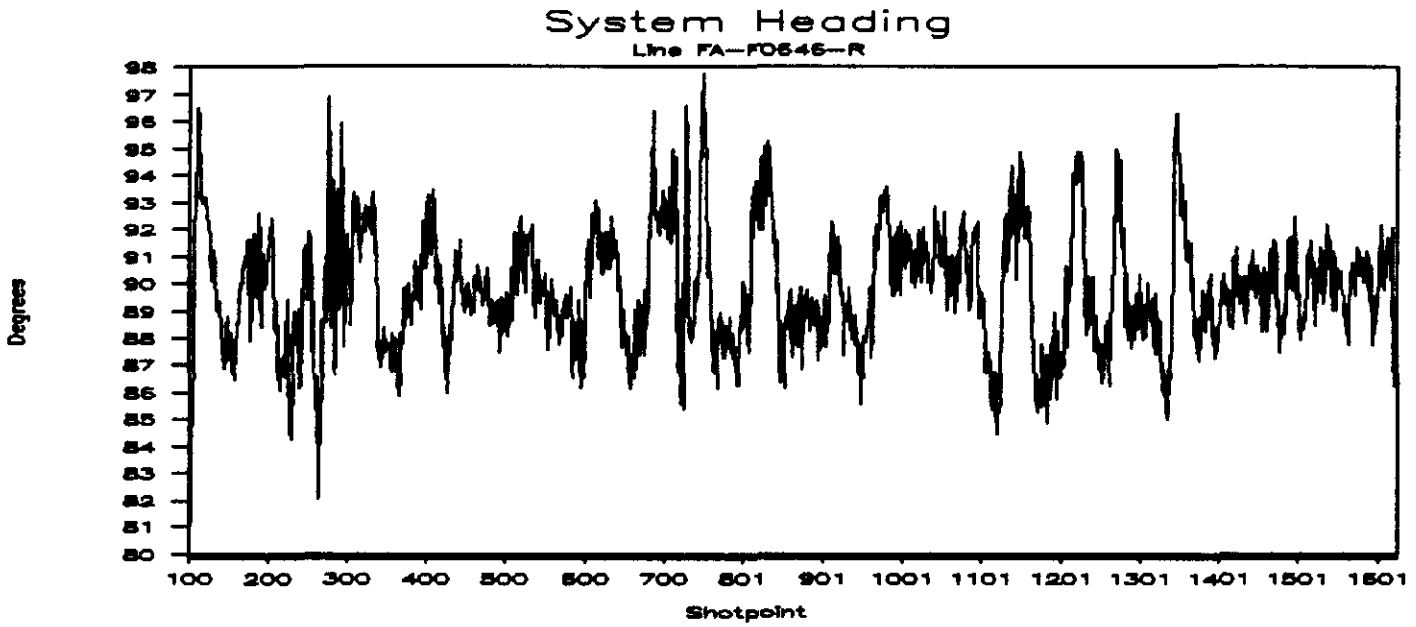

Current Along Track
Line Fa—FD155—R
Knots
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
−0.1
−0.2
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

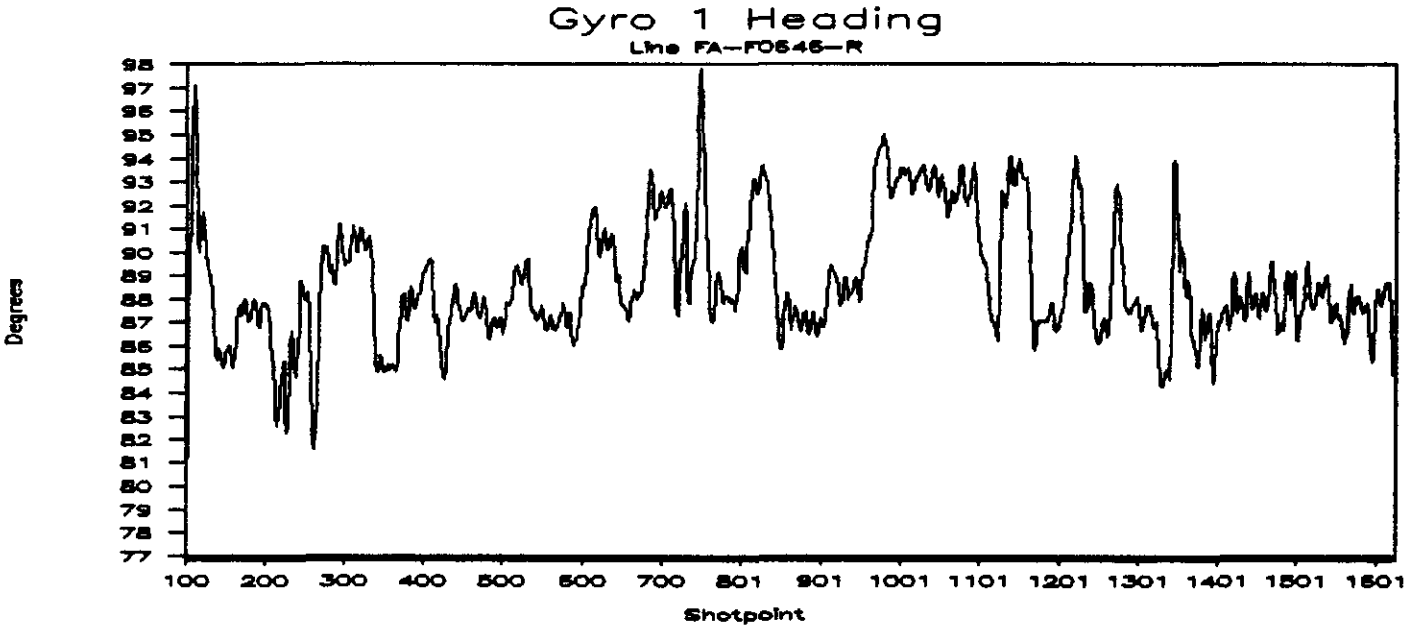

Speed Across Track
Line Fa—F0155—R
Knots
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
−0.1
−0.2
−0.3
−0.4
−0.5
−0.6
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

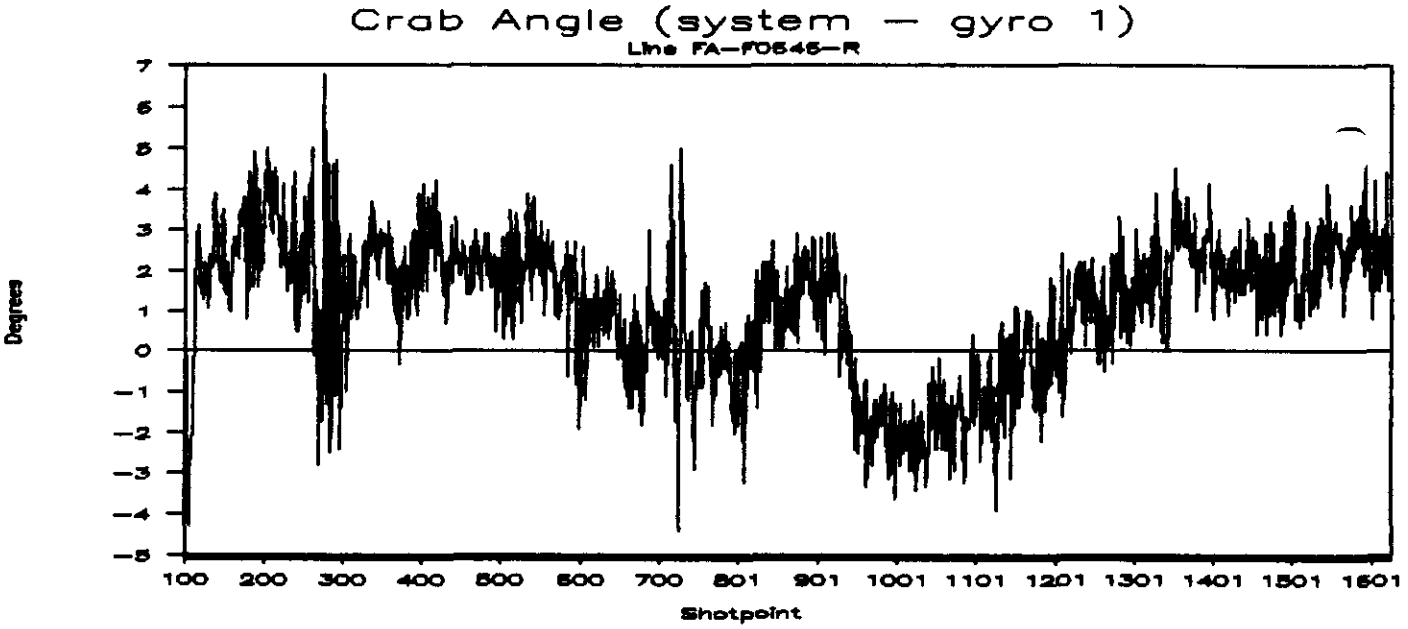

Closure/FTB Timing
Line FA-F0545-R
Time in mS.
700
600
500
400
300
200
100
0
100 200 300 400 500 600 700 801 901 1001 1101 1201 1301 1401 1501 1601
Shotpoint

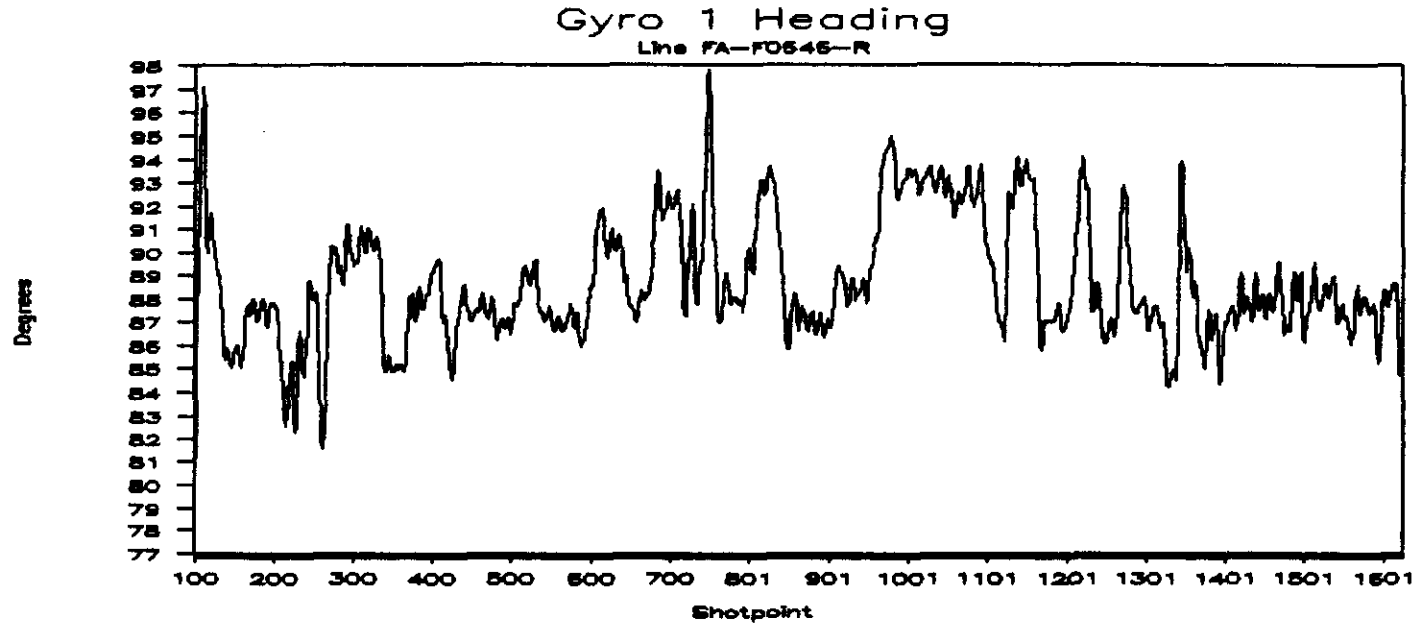

Closure/FTB Timing (expanded)
Line FA-F0545-R
Time in mS.
595
594
593
592
591
590
100 200 300 400 500 500 700 801 901 1001 1101 1201 1301 1401 1501 1601
Shotpoint

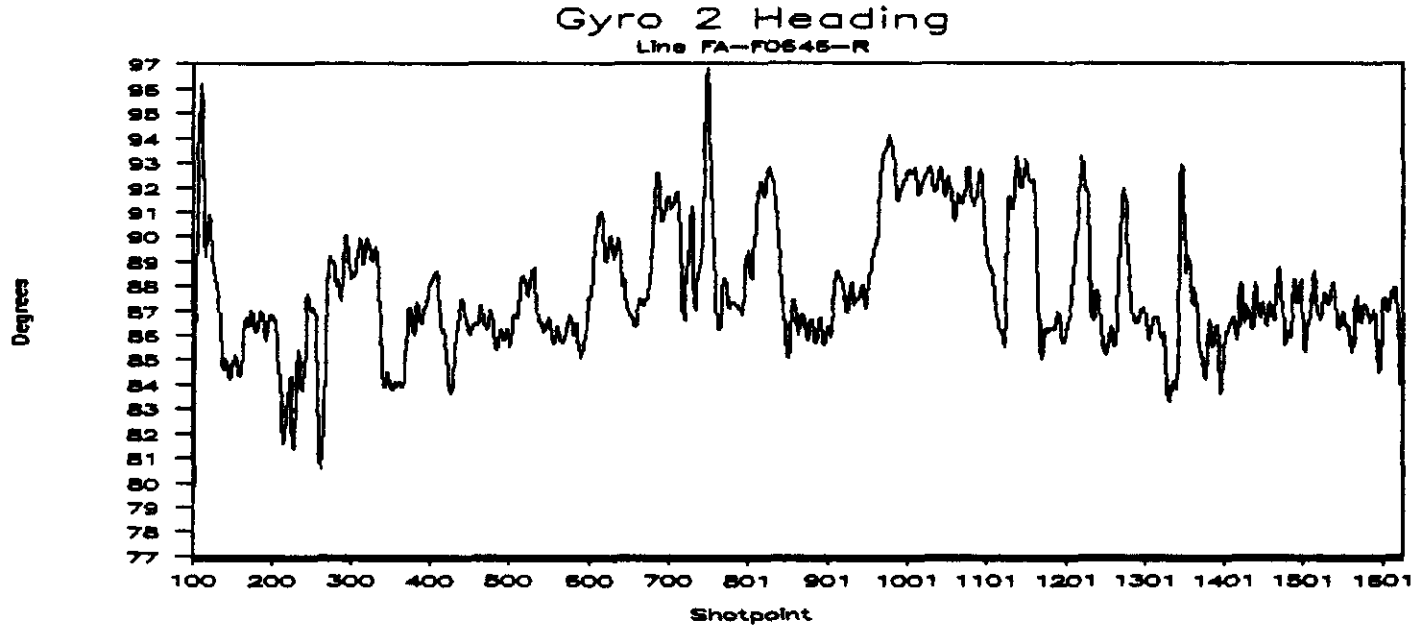

Link Delay Timing
Line FA—F0645—R
Time in mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
100 200 300 400 500 600 700 801 901 1001 1101 1201 1301 1401 1501 1601
Shotpoint

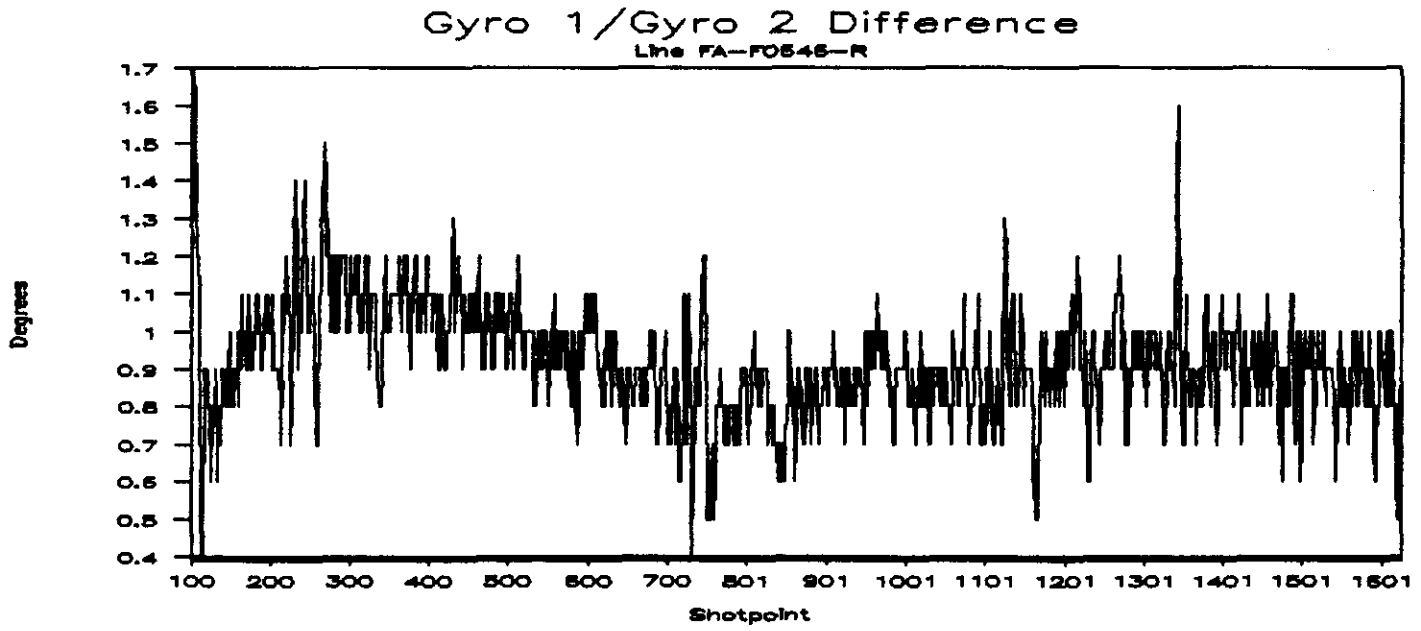

System Heading
Line FA-F0646-R
Degrees
98
97
96
95
94
93
92
91
90
89
88
87
86
85
84
83
82
81
80
100 200 300 400 500 600 700 801 901 1001 1101 1201 1301 1401 1501 1601
Shotpoint

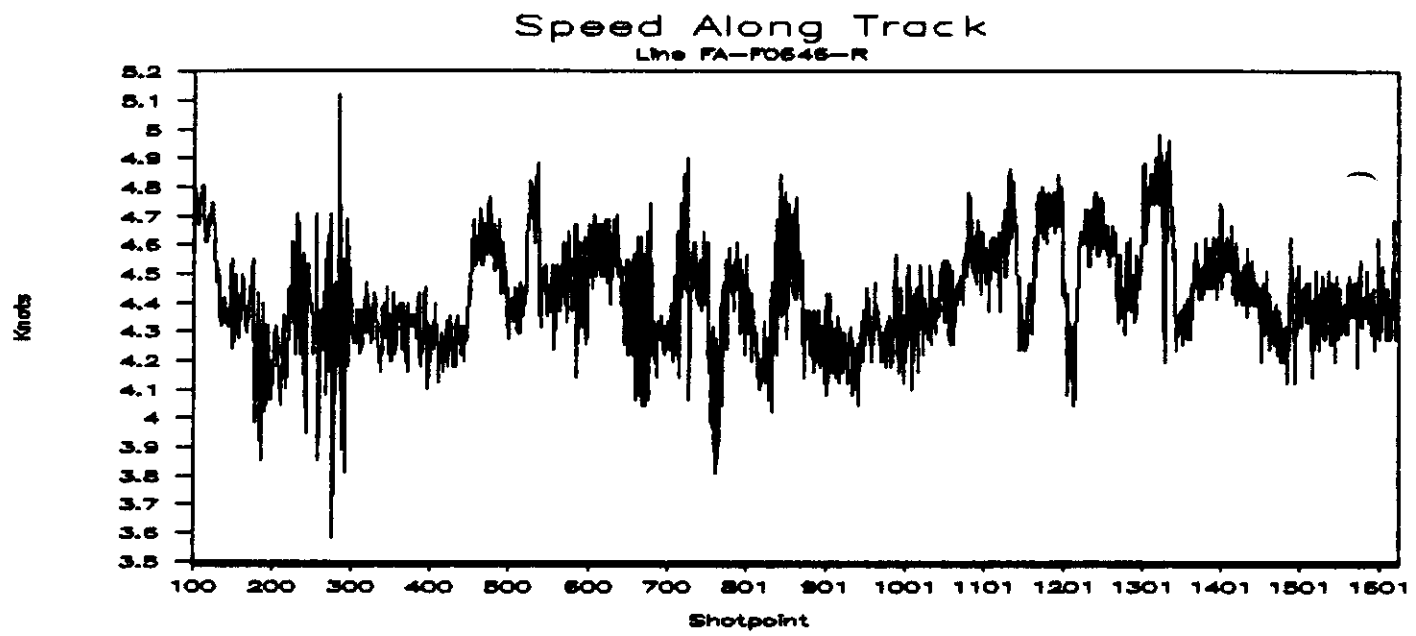

Gyro 1 Heading
Line FA-F0646-R
Degrees
98
97
96
95
94
93
92
91
90
89
88
87
86
85
84
83
82
81
80
79
78
77
100 200 300 400 500 600 700 801 901 1001 1101 1201 1301 1401 1501 1601
Shotpoint

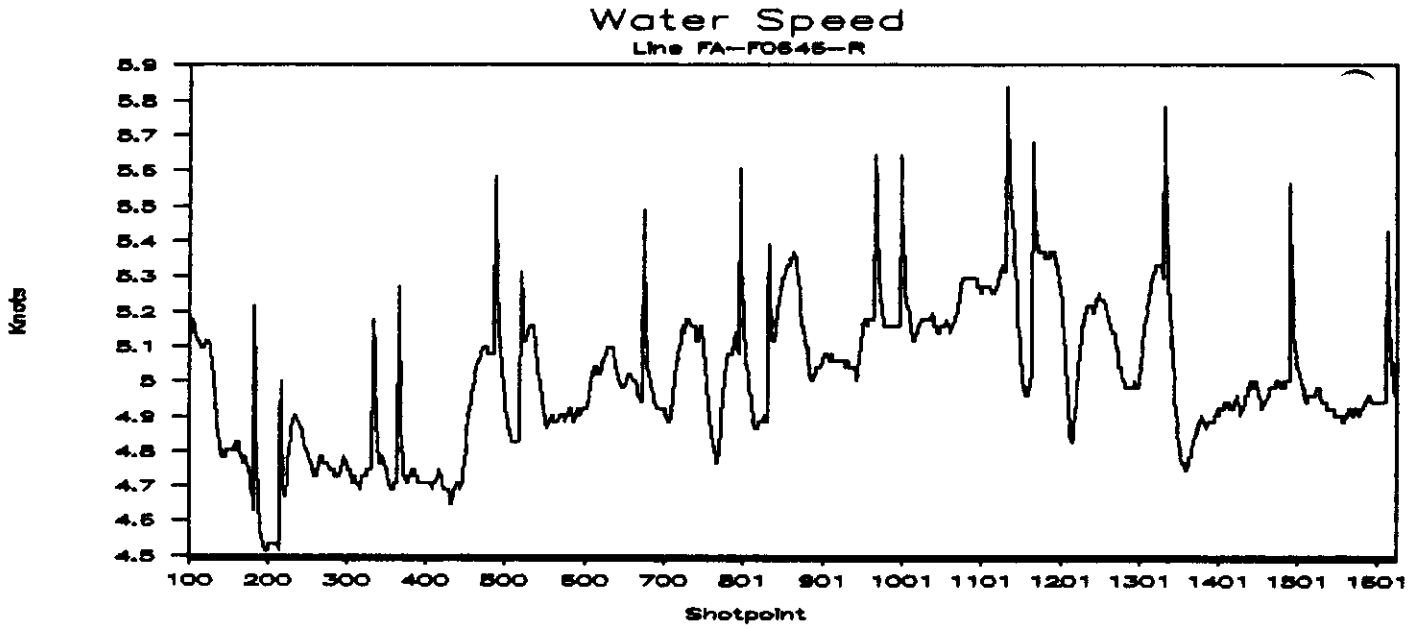

Crab Angle (system — gyro 1)
Line FA-F0545-R
Degrees
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
100
200
300
400
500
600
700
801
901
1001
1101
1201
1301
1401
1501
1601
Shotpoint

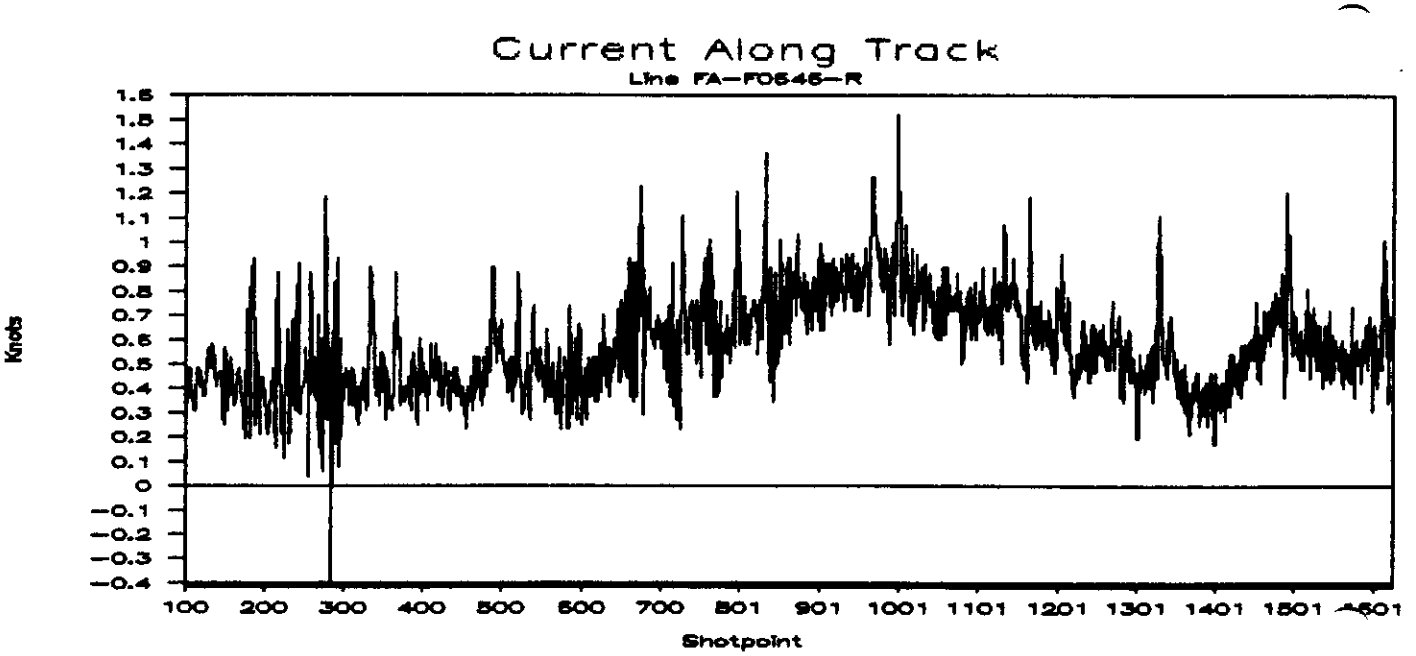

Gyro 1 Heading
Line FA-F0545-R
Degrees
Shotpoint

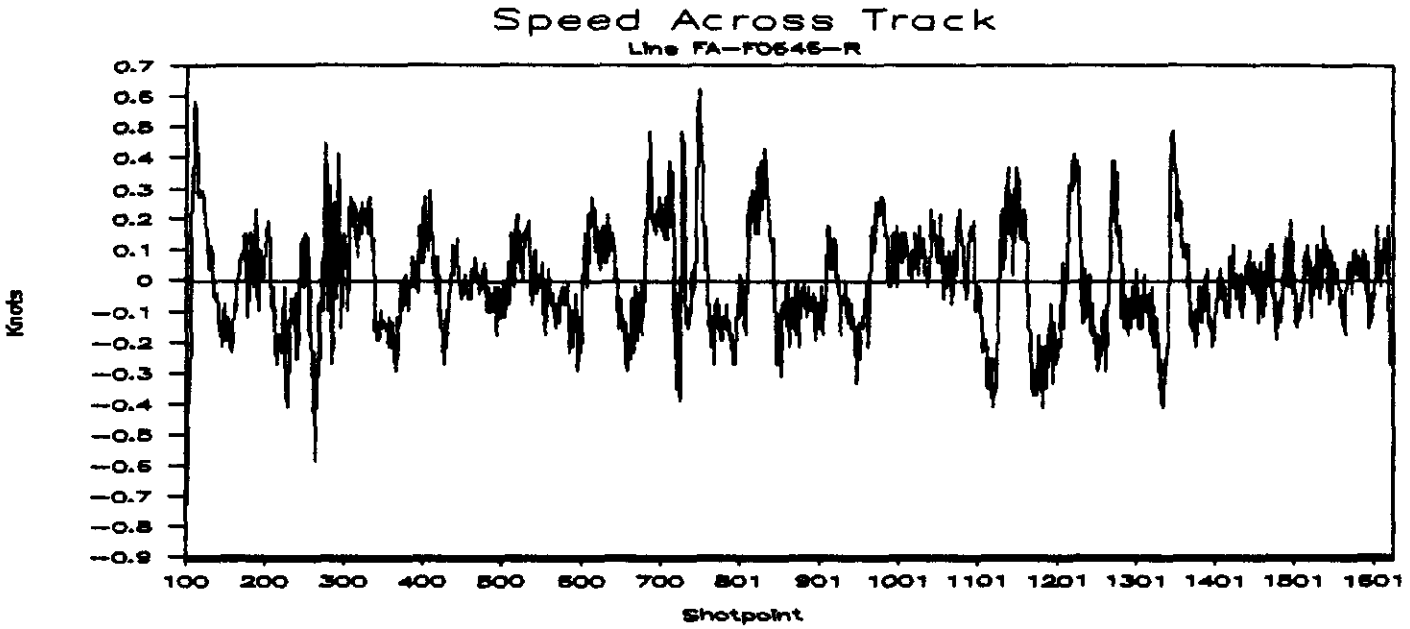

Gyro 2 Heading
Line FA-F0545-R
Degrees
Shotpoint

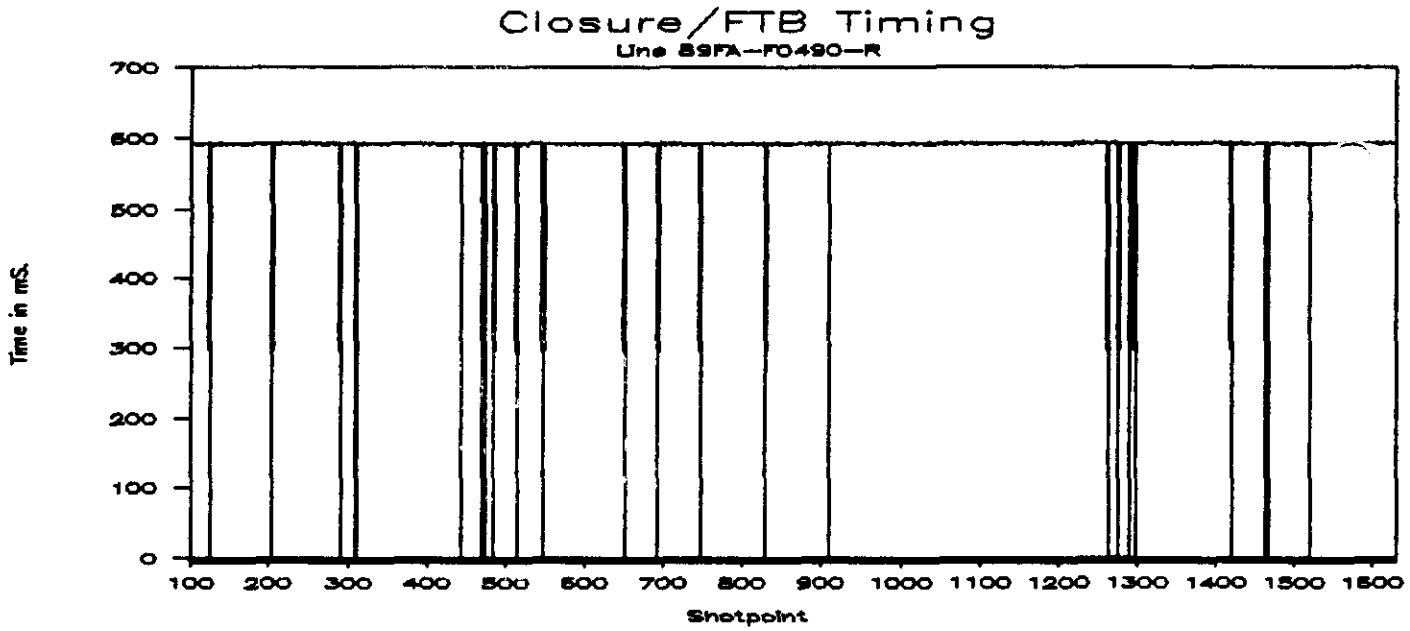

Gyro 1/Gyro 2 Difference
Line FA-F0545-R
Degrees
Shotpoint

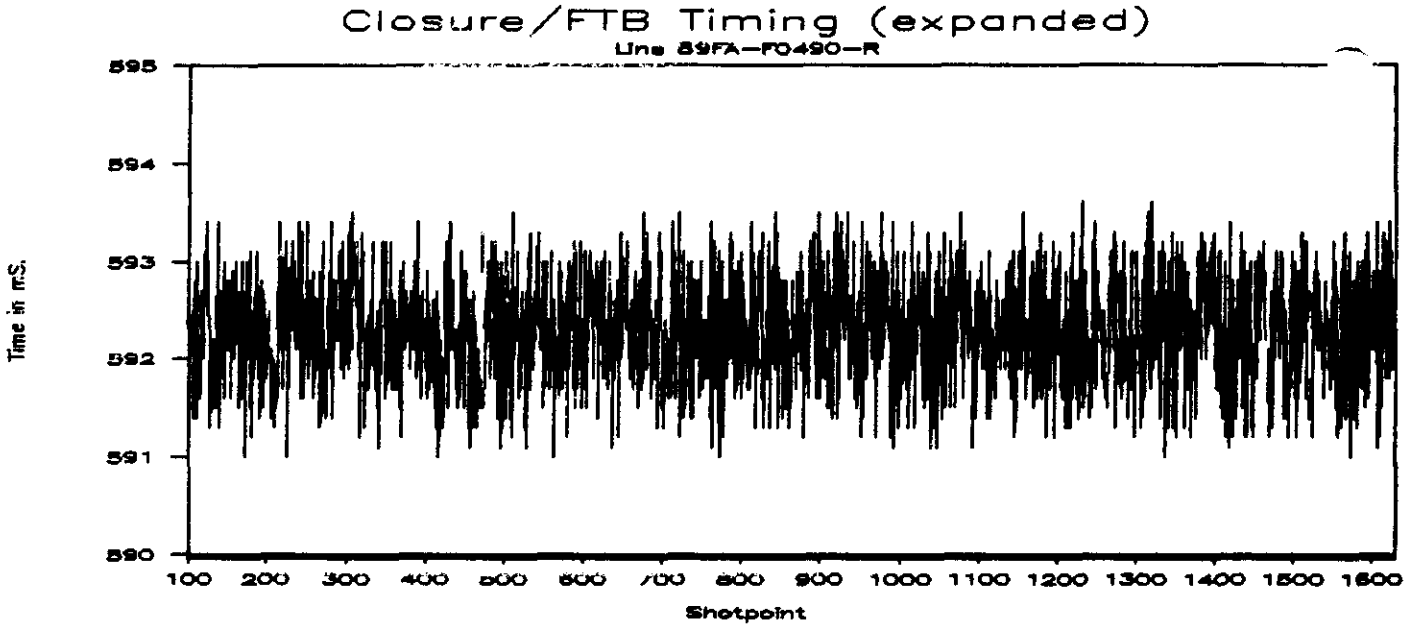

Speed Along Track
Line FA-F0645-R
Knots
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4
3.9
3.8
3.7
3.6
3.5
100 200 300 400 500 600 700 801 901 1001 1101 1201 1301 1401 1501 1601
Shotpoint

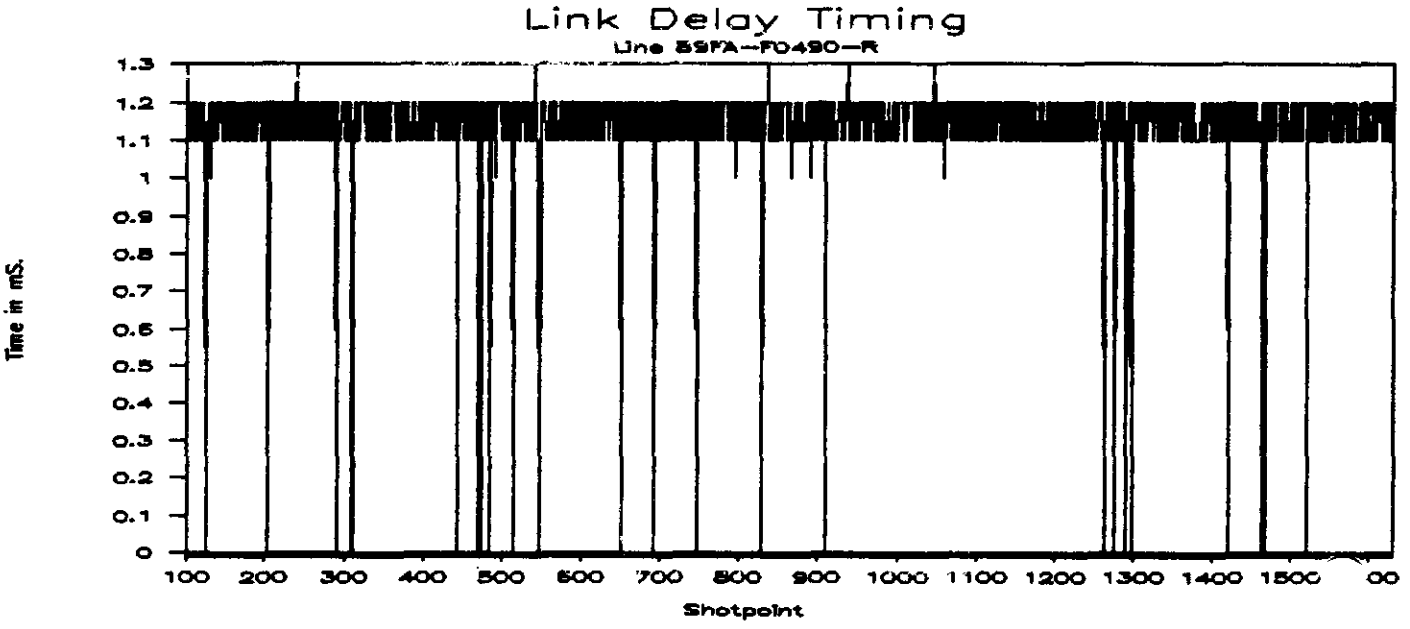

Water Speed
Line FA-F0645-R
Knots
5.9
5.8
5.7
5.6
5.5
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
100 200 300 400 500 600 700 801 901 1001 1101 1201 1301 1401 1501 1601
Shotpoint

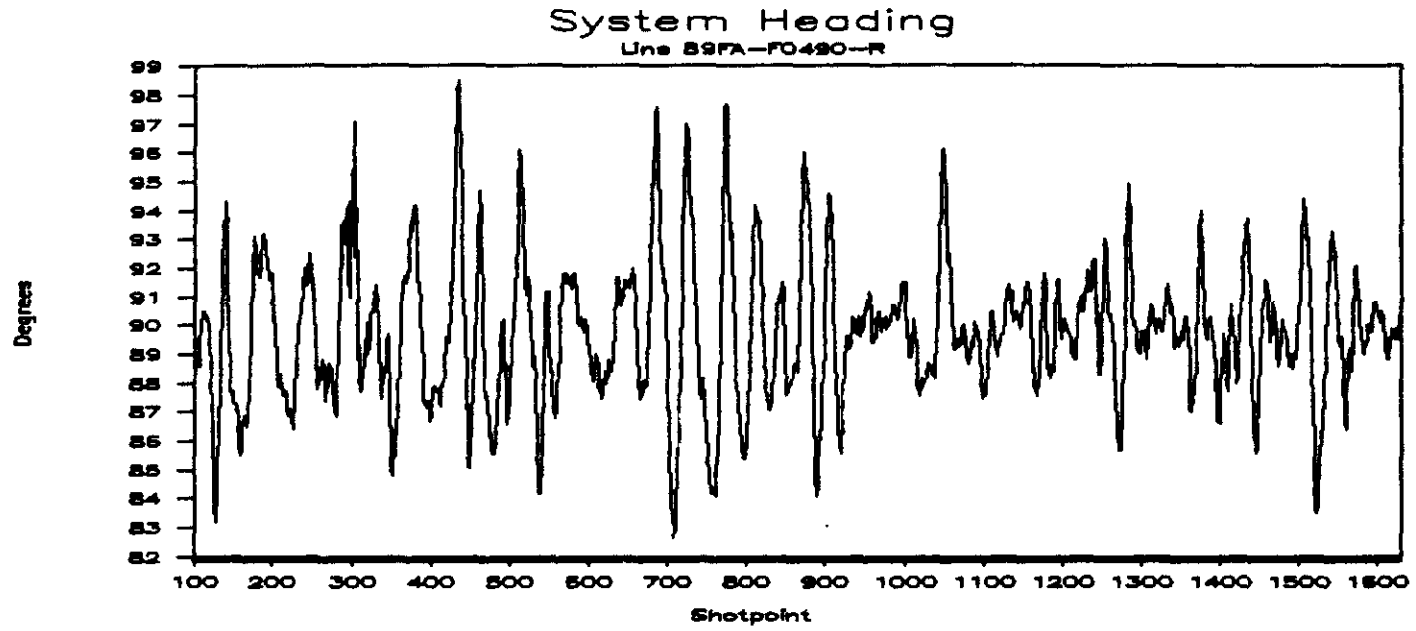

Current Along Track
Line FA-F0645-R
Knots
1.5
1.3
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
100 200 300 400 500 600 700 801 901 1001 1101 1201 1301 1401 1501 1601
Shotpoint

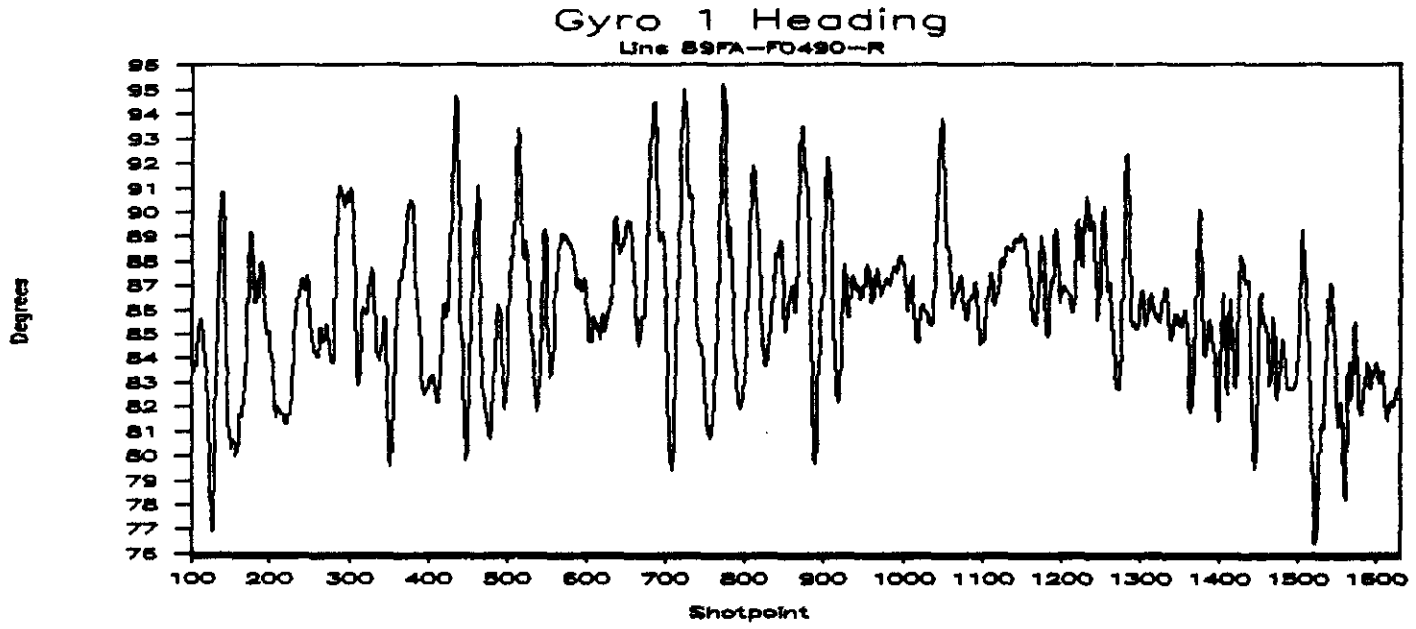

Speed Across Track
Line FA-F0646-R
Knots
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
-0.9
100 200 300 400 500 600 700 801 901 1001 1101 1201 1301 1401 1501 1601
Shotpoint

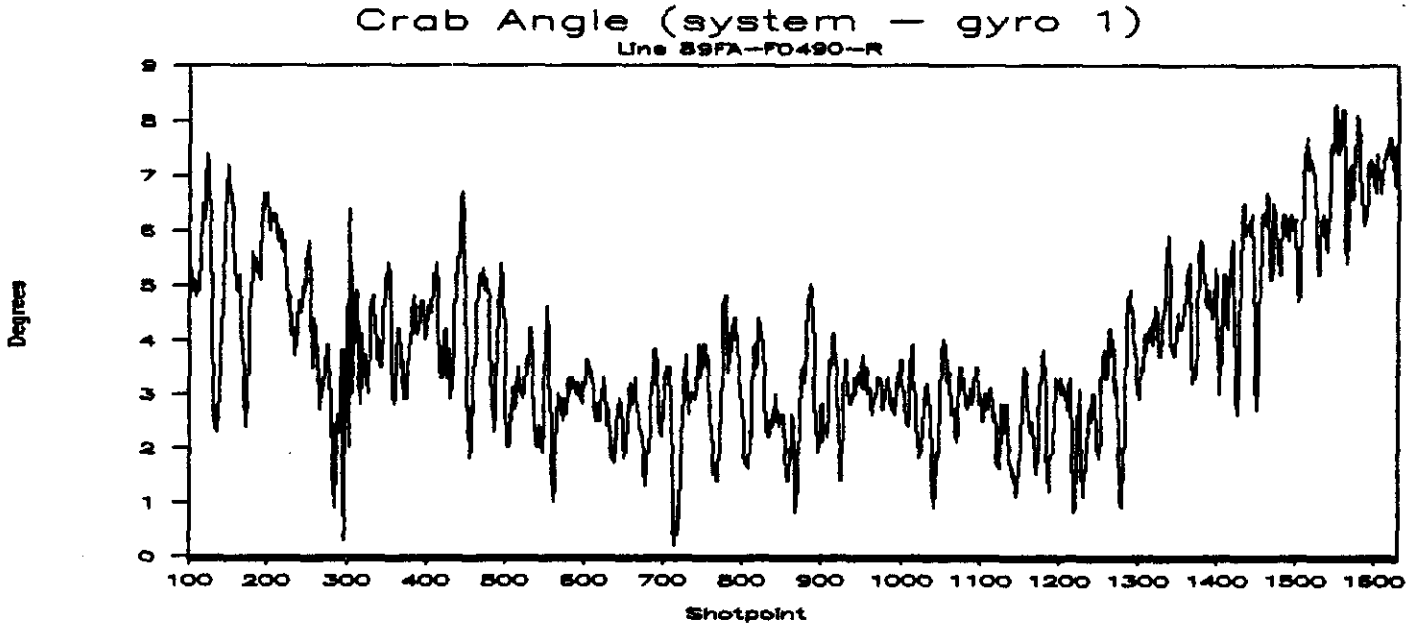

Closure/FTB Timing
Line 89FA-F0490-R
Time in mS.
700
600
500
400
300
200
100
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

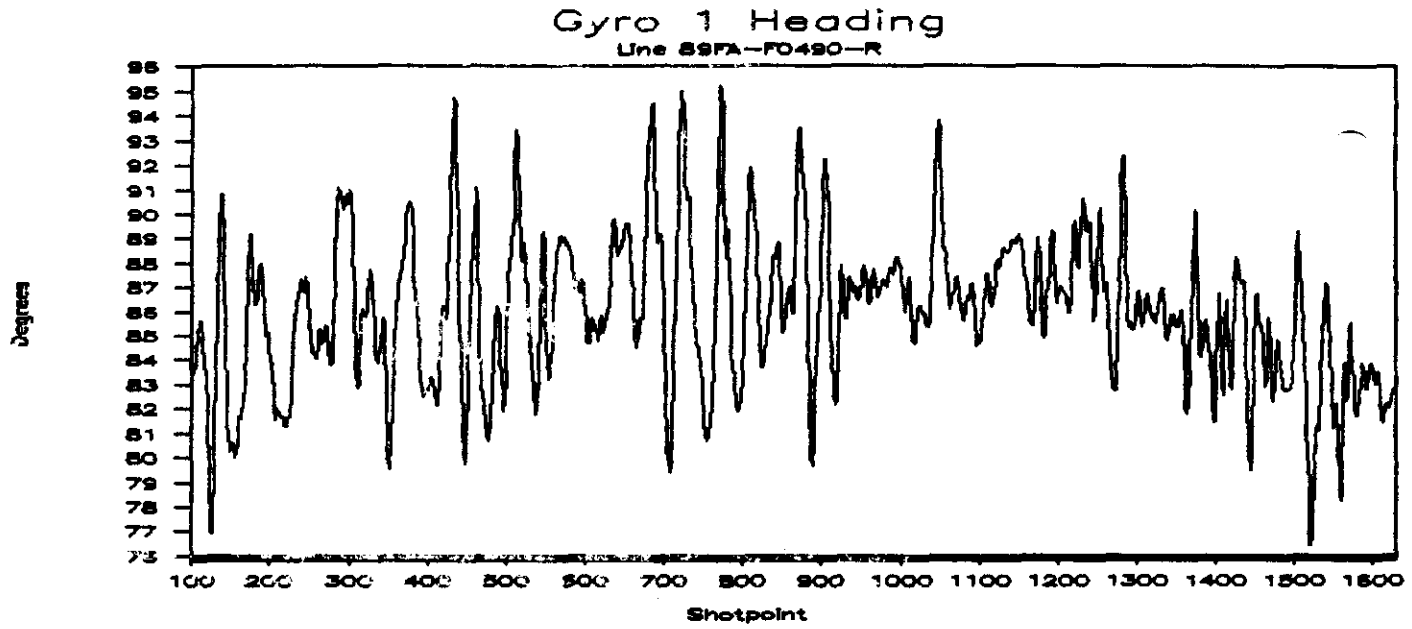

Closure/FTB Timing (expanded)
Line 89FA-F0490-R
Time in mS.
595
594
593
592
591
590
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

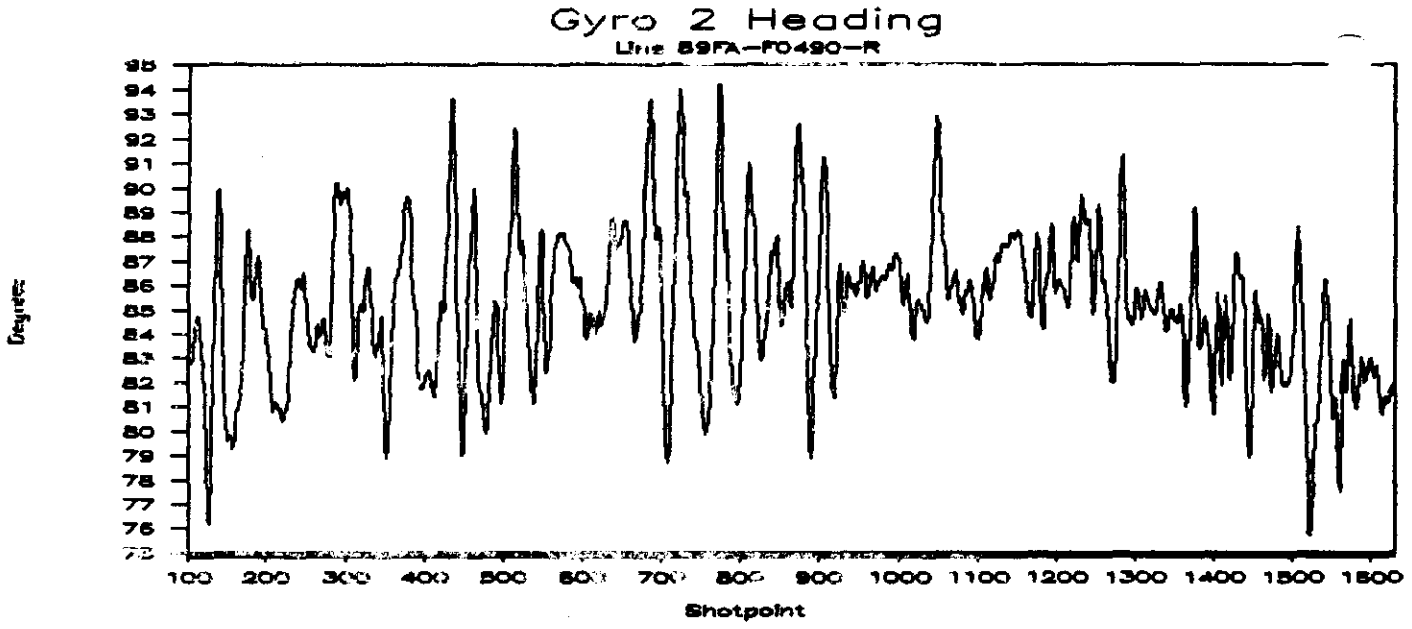

Link Delay Timing
Line 89FA-F0490-R
Time in mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 00
Shotpoint

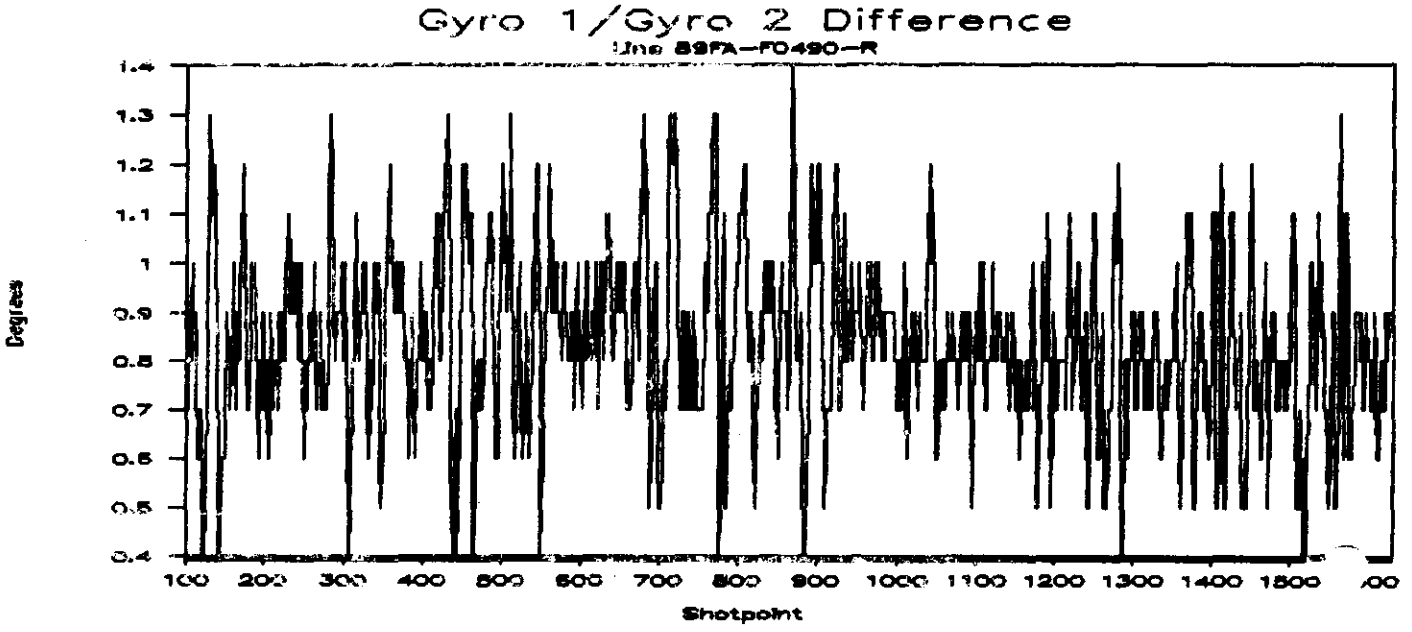

System Heading
Line 89FA-F0490-R
Degrees
Shotpoint

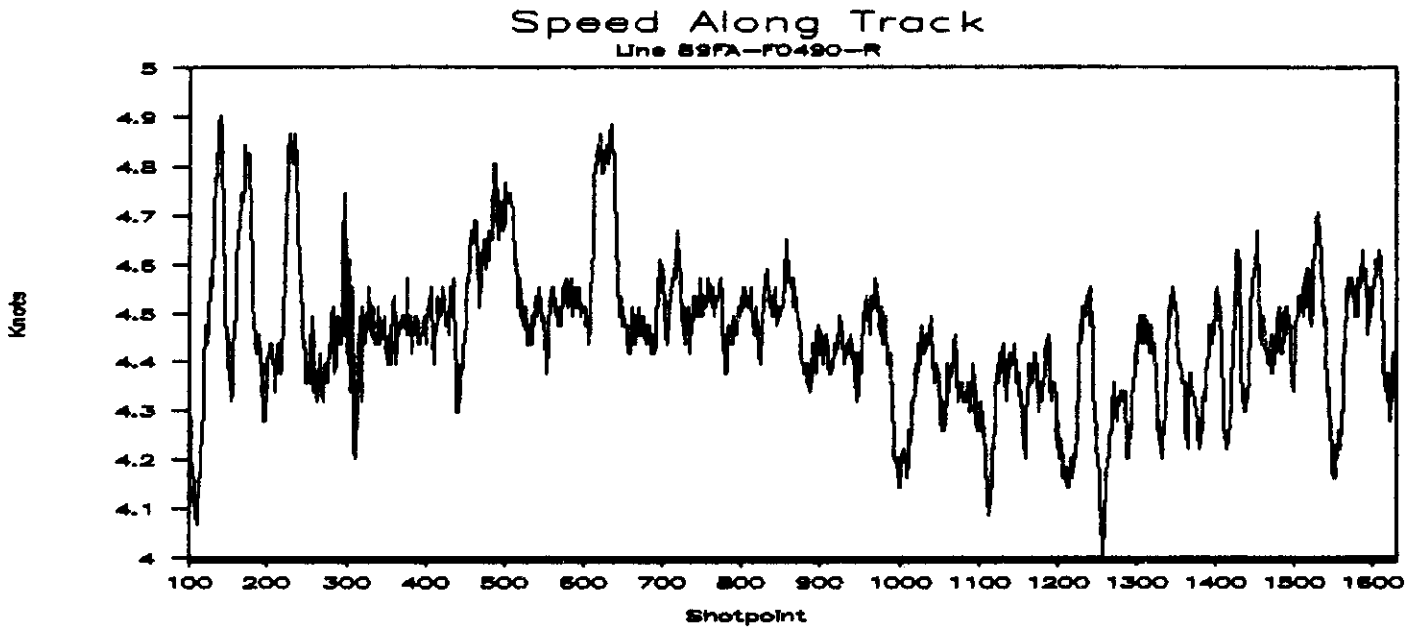

Gyro 1 Heading
Line 89FA-F0490-R
Degrees
Shotpoint

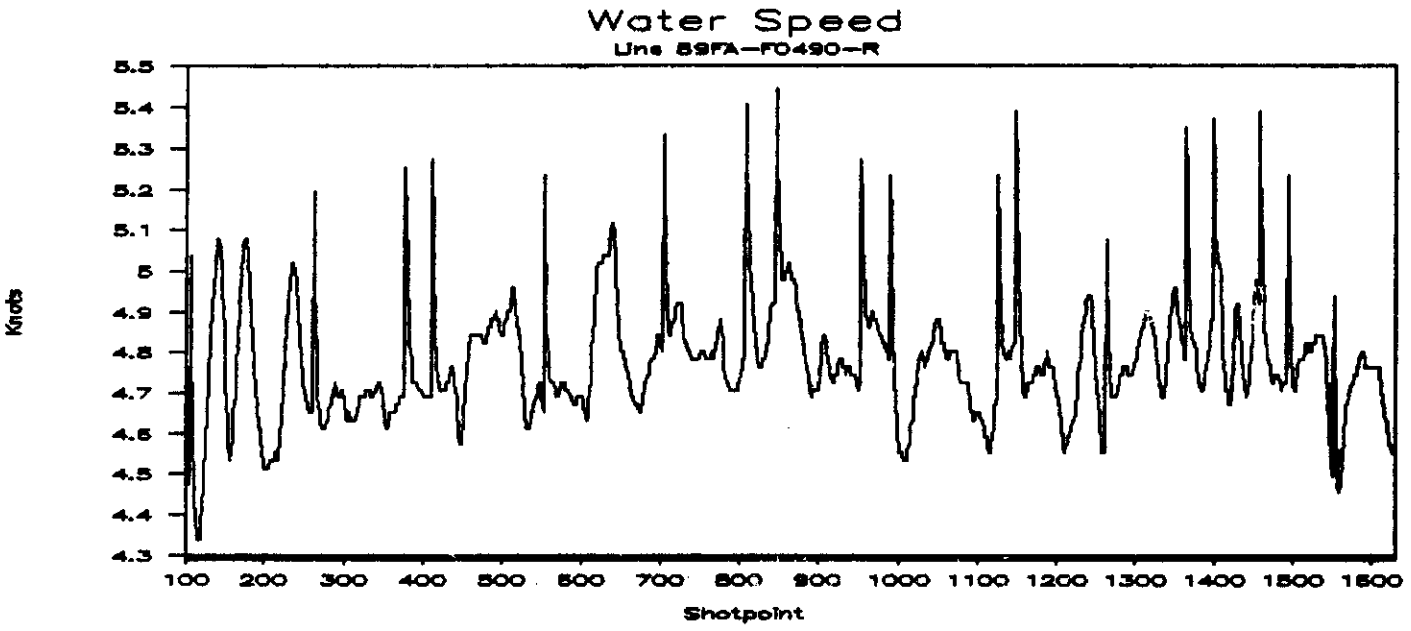

Crab Angle (system - gyro 1)
Line 89FA-F0490-R
Degrees
Shotpoint

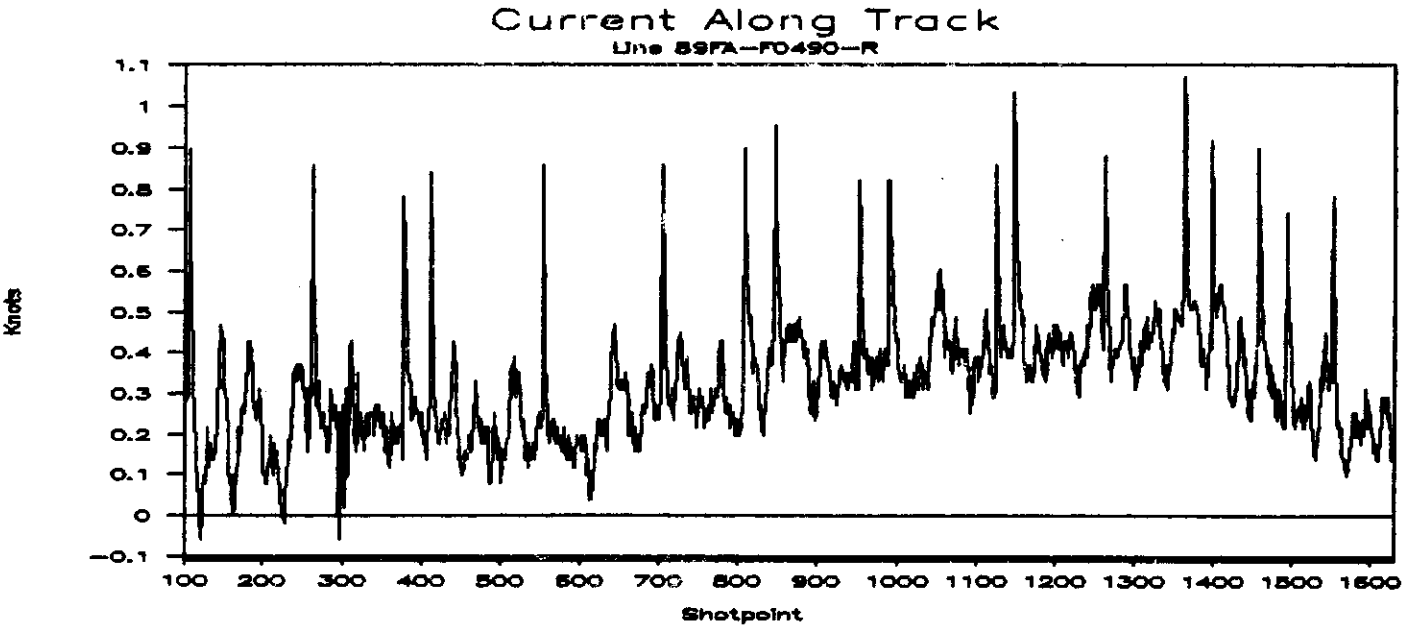

Gyro 1 Heading
Line 89FA-F0490-R
Degrees
Shotpoint

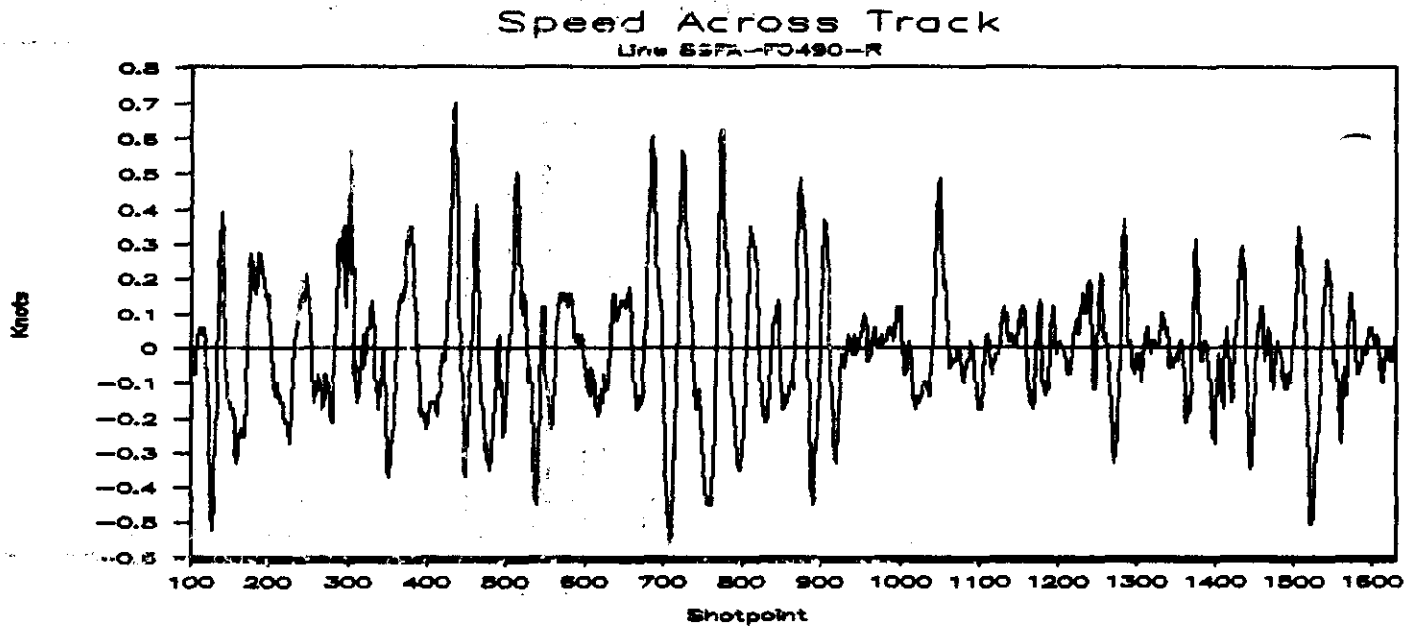

Gyro 2 Heading
Line 89FA-F0490-R
Degrees
Shotpoint

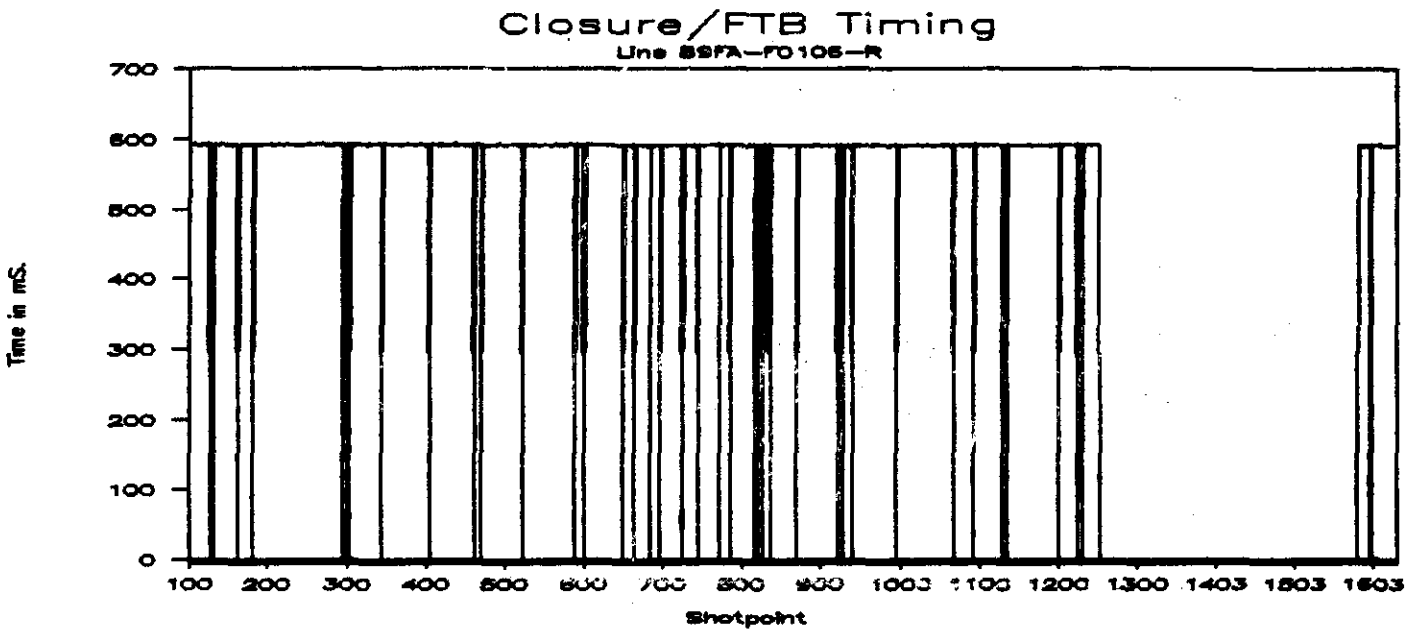

Gyro 1/Gyro 2 Difference
Line 89FA-F0490-R
Degrees
Shotpoint

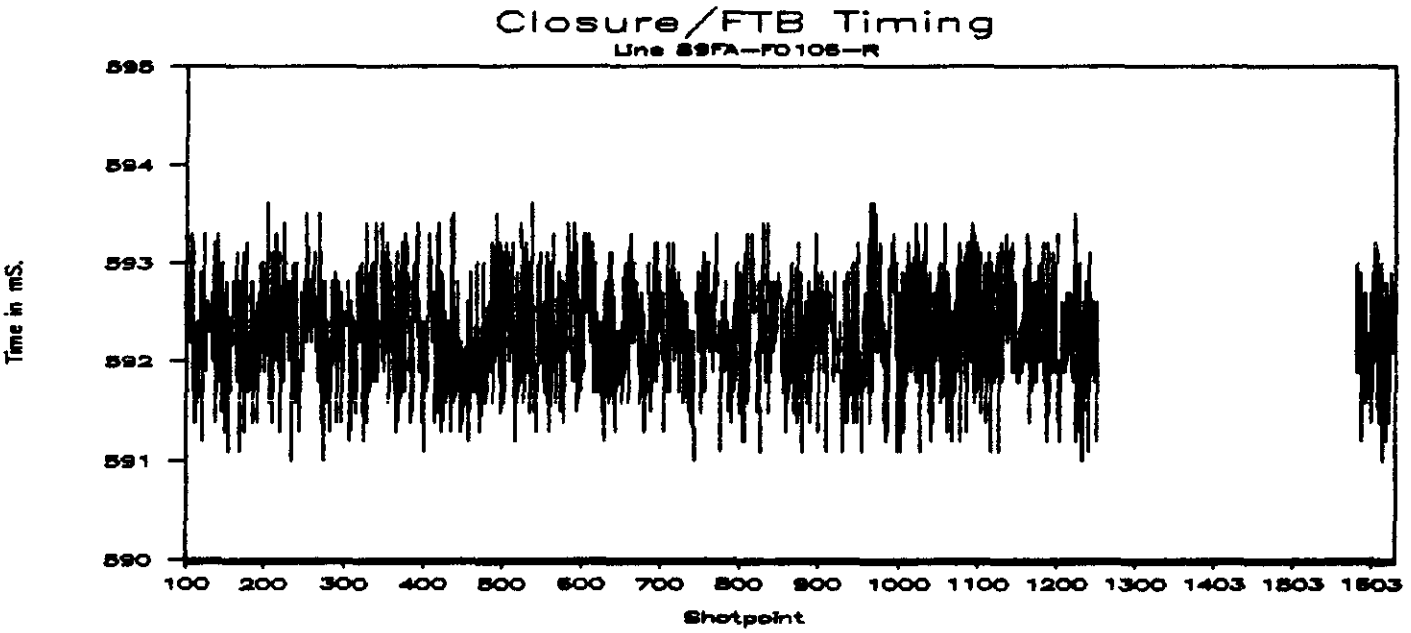

Speed Along Track
Line 89FA-F0490-R
Knots
5
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint

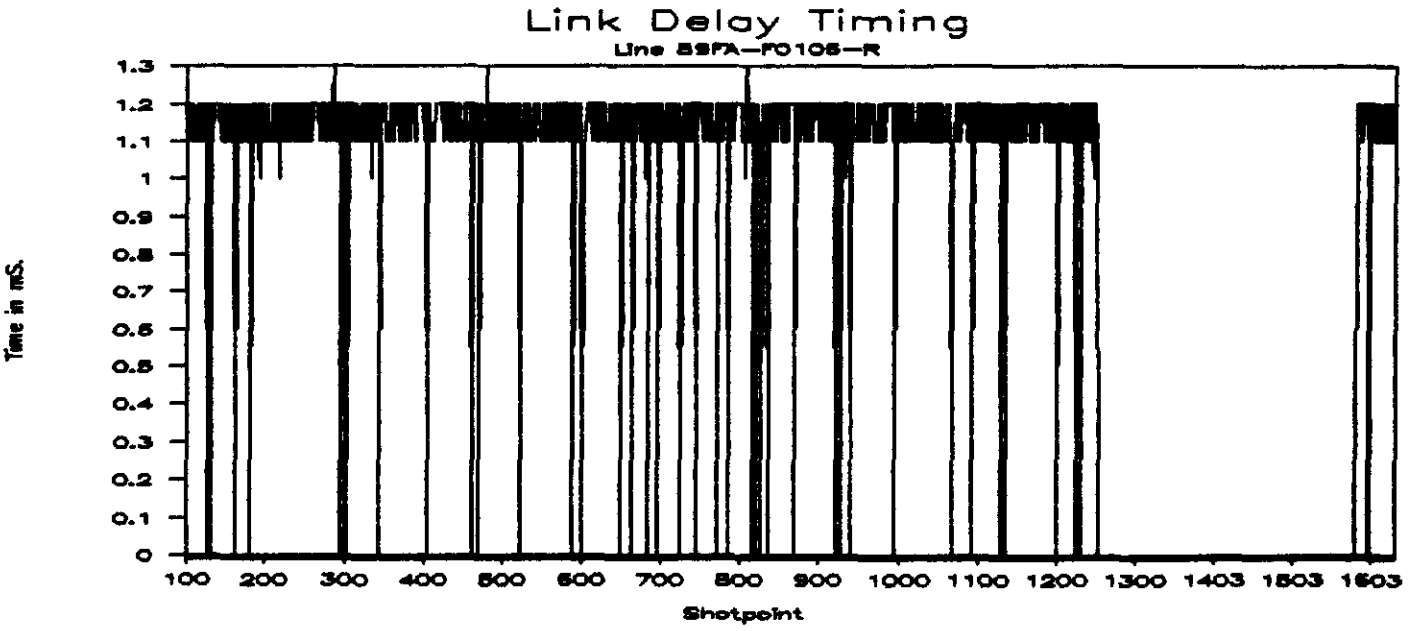

Water Speed
Line 89FA-F0490-R
Knots
5.5
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
4.4
4.3
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint


Current Along Track
Line 89FA-F0490-R
Knots
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint


Speed Across Track
Line SSFA-FD490-R
Knots
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
Shotpoint


Closure/FTB Timing
Line 8SFA-FD106-R
Time in mS.
700
600
500
400
300
200
100
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1403 1503 1603
Shotpoint


Closure/FTB Timing
Line 8SFA-FD106-R
Time in mS.
595
594
593
592
591
590
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1403 1503 1603
Shotpoint


Link Delay Timing
Line 8SFA-FD106-R
Time in mS.
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1403 1503 1603
Shotpoint