

0	Front Page
1	General Survey Information
2	Nominal Configuration
3	Nominal CMP Coverage
4	Survey Area
5	Geodetic Parameters
6	Recording System Parameters
7	Streamer Parameters
8 (1)	Cable #1 Layout
8 (2)	Cable #2 Layout
8 (3)	Cable #3 Layout
8 (4)	Cable #4 Layout
8 (5)	Cable #5 Layout
8 (6)	Cable #6 Layout
8 (7)	Cable #7 Layout
8 (8)	Cable #8 Layout
9	Cable Section Nominal Offsets
10	Cable Active Section Offsets
11	Source Parameters / Sub Array Layout
12	Source Layout
13	Navigation System Parameters
14	P2/94 Naming Conventions
15	Vessel & Antennae Offsets
16	Streamer Offsets
17	Source & Towfish Offsets
18	Parameter Changes

Woodside Energy Ltd
Job No : 1999-35D-EH
Investigator 3D
Victoria, Australia
6 Cable / Dual Source

WESTERN PRIDE Party 140

3D PARAMETER REPORT



Western Geophysical



CLIENT	: Woodside Energy Ltd
SURVEY	: Investigator 3D
AREA	: Bass Straits, Victoria, Australia
JOB #	: 1999-035D-EH
DATE	: 30th December 1999 -
SEQUENCES	: 009-xxx : Six Cable Configuration

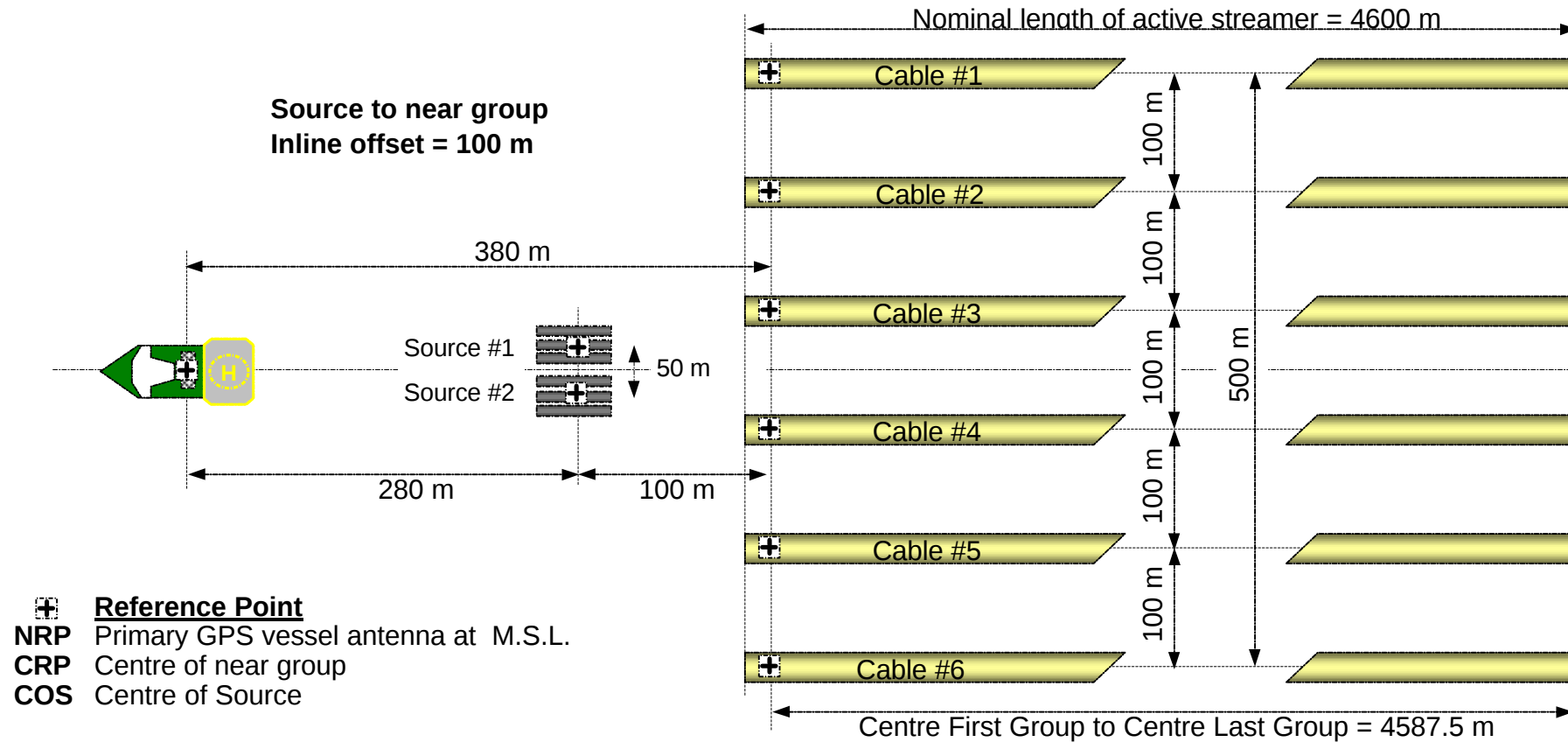
GENERAL SURVEY PARAMETERS



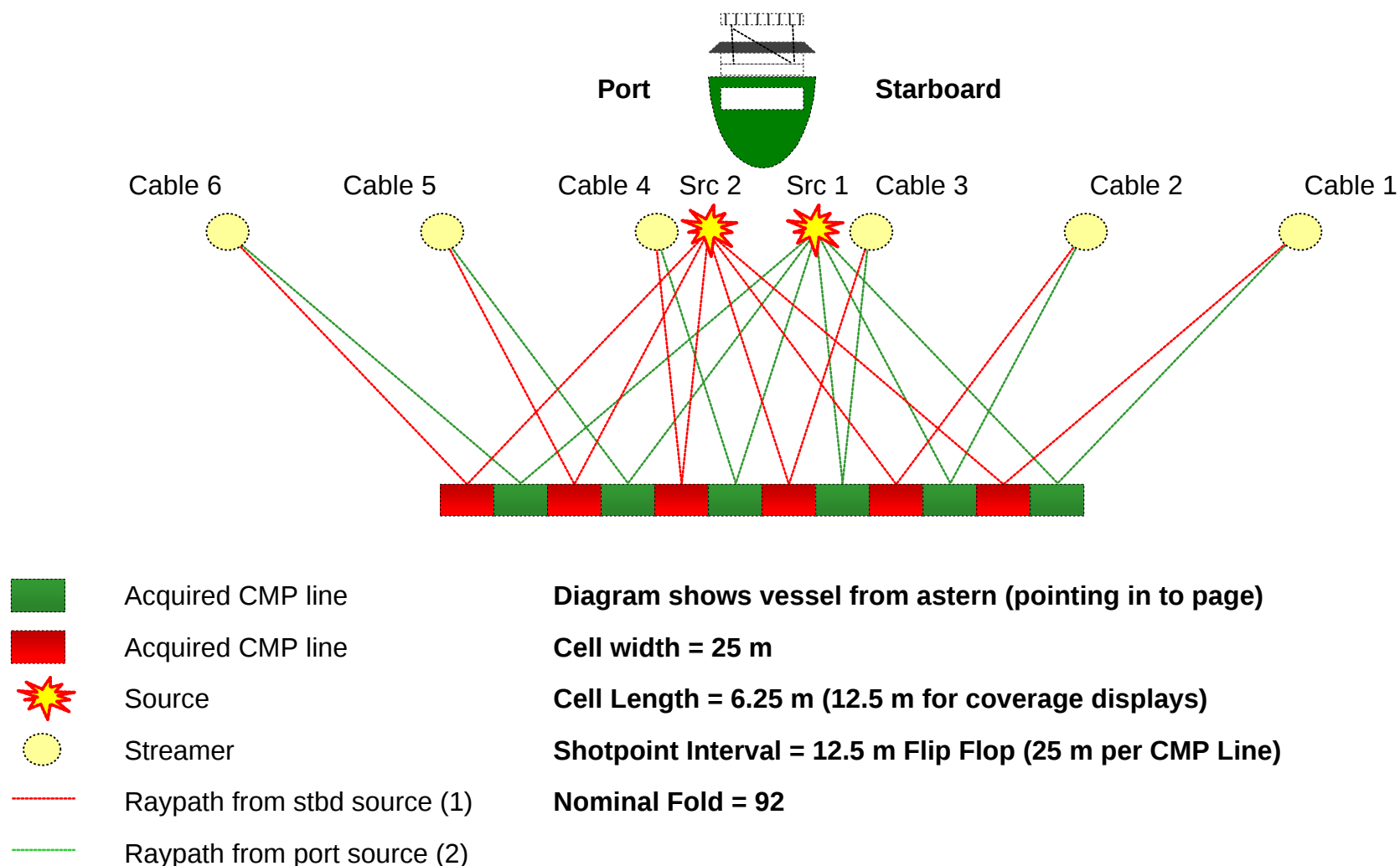
Woodside Energy Ltd.
Investigator 3D
Bass Straits, Victoria, Australia
1999-35D-EH

Recording System: (MSX/CRS)	L.C. Filter	2 Hz @ 12 dB/Oct
	H:C. Filter	206 Hz @ 264 dB/Oct.
	Record Length	4608 ms
	Sample Rate	2 ms
Seismic Cable: (TMS Solid Streamer)	Number of cables	6
	Number of channels	368 Per Cable, 2208 Total Seismic
	Cable length	4600 m
	Group Interval	12.5 m (centre to centre)
Sources:	Depth	6 m (+/- 1 m)
	Number of sources	2 Arrays
	Source type	Tuned Air Gun Array
	Volume	2250 cu.in.
	Pressure	2000 p.s.l. (+/- 150 p.s.l.)
	Depth	5 m (+/- 0.5 m)
	Shot Point Interval	12.5 m
Configuration:	Inline Source to Near Group	100 m (no greater than 150 m)
	Source Separation	50.00 m
	Cable Separation	100 m between cables, 500 m total spread
Coverage:	Inline CMP Cell Length	6.25 m (12.5 m used in coverage displays)
	Cross Line CMP Cell Width	25.0 m
	Nominal Fold	92
	Acquisition Line Azimuth	009°/189°
Vessel Positioning:	System #1	Racal Multifix Differential GPS
	System #2	Fugro MRdGPS Differential GPS
	QC System	QPS Muliref Differential GPS
Onboard Processing:	Seismic Processing	Omega (Ver 1.8.0)
	Navigation Processing	Unavchk (Ver 1.9.6)

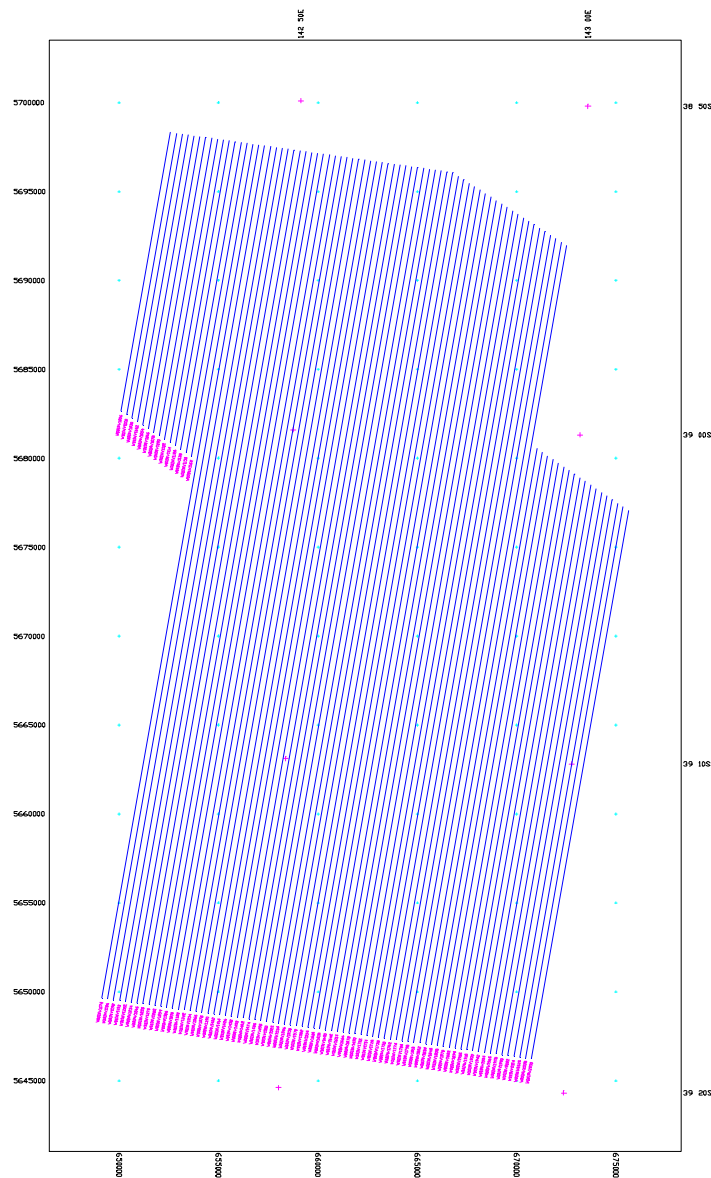
NOMINAL CONFIGURATION



NOMINAL CMP COVERAGE



SURVEY AREA



6 Cable Waypoints Full Fold Area

	Easting	Northing
1	649973.0	5682748.5
2	652442.7	5698341.7
3	666764.2	5696073.4
4	672656.9	5691887.5
5	670871.6	5680615.5
6	675759.3	5676955.8
7	670890.3	5646214.0
8	648988.3	5649683.0
9	653800.6	5680066.7

GEODETIC PARAMETERS



Geodetic Parameters

Local Datum

AGD84
Spheroid Australian National Spheroid
Semi-major axis 6378160.000
1/flattening 298.25

Satellite Datum

WGS 84
Spheroid WGS 84
Semi-major axis 6378137.000
1/flattening 298.257224

Datum Shift

Shift Parameters From WGS 84 to Local Datum

Dx = +116.0	Rx = -0.23	arc sec*
Dy = +50.47	Ry = -0.39	arc sec*
Dz = -141.69	Rz = -0.344	arc sec*

Scale factor= -0.0983 ppm *as entered in Spectra

Mapping Projection

AMG ZONE 54 (UTM)
Origin of Latitude 000° 00' 00.00" N
Origin of Longitude 141° 00' 00.00" E
False Northing 10,000,000.0 m
False Easting 500,000.0 m
Central Meridian 141° 00' 00.00" E
Scale factor at CM 0.9996
Grid Units Metres

Vertical Datum

Mean Sea level

Binning Parameters

Binning Systems

Online real-time binning	Spectra	Ver 7.6.5
Post line binning	Reflex	Ver 1.7.2

Binning Grid

Map Grid Origin Easting	643880.97	(bin centre)
Map Grid Origin Northing	5647960.68	(bin centre)
Map Grid Bearing (°)	009.00°	(In-line axis)

Bin Grid Extent (m)

Bin Number at Origin	801
Bin Number Increment	1
Bin Dimensions (m)	12.5

Apply scale factor

Nominal Offset Distribution

Minimum Offset (m)	150
Maximum Offset (m)	4750
Offset Increment (m)	50

Coverage Groups

	<u>Near Offset (m)</u>	<u>Far Offset (m)</u>
Nears	150	1300
Near Mids	1300	2450
Far Mids	2450	3600
Fars	3600	4750

RECORDING SYSTEM **PARAMETERS**



Recording System
 System Version

I/O Systems MSX
 Version 2.0

Tape Interface System
 System Version

Western Geophysicals CRS (Continuous Recording System)
 3.0.2

MSX Record length
 CRS Record length
 Sample rate
 Time break
 Low Cut Filter
 High Cut Filter
 Multishot Acquisition

4.5 Binary Seconds (4608 ms)
 4.5 Binary Seconds (4608 ms)
 2 ms
 Co-incident with digital start
 2 Hz @ 12 dB/Oct.
 206 Hz @ 264 dB/Oct.
 Not used

Recorded data format
 Trace polarity
 Recording media type
 Maximum Number of Files per Cartridge

8058 SEG D - DMX
 positive pressure = negative number on tape = negative pulse on plot
 3M 3590 cartridge tapes
 400 (1 file contains 2944 channels at 4068 ms length + auxiliaries)

Number of Channels
 Channel set 1-6 (368 channels each)
 Channel set 7-12 (4 channels each)
 Channel set 13 (1 channel)
 Channel set 14 (1 channel)
 Channel set 15-18 (1 channel each)
 Channel set 19-27 (1 channel each)
 Channel set 28 (1 channel)
 Channel set 29 (64 channels at 512 ms)

2208 seismic + 104 auxiliaries
 Seismic data
 Waterbreaks
 Recording System Start
 Combined Timebreak
 Array Timebreak
 Spare
 Sample Count
 Gun signature

Real Time Data QC
 Camera Recorder

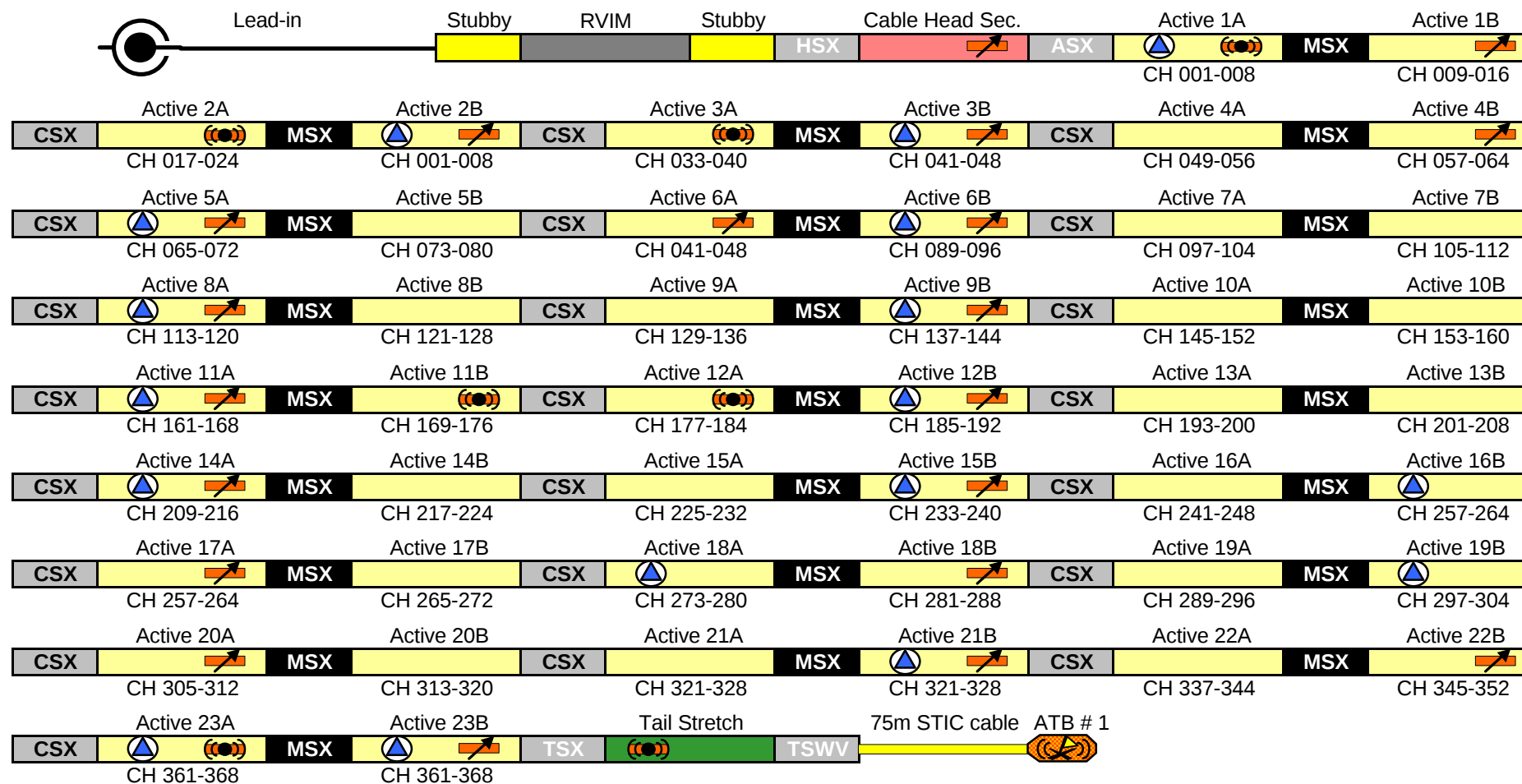
SeisView
 Enhanced Visualisation Processor (EVP)

STREAMER PARAMETERS

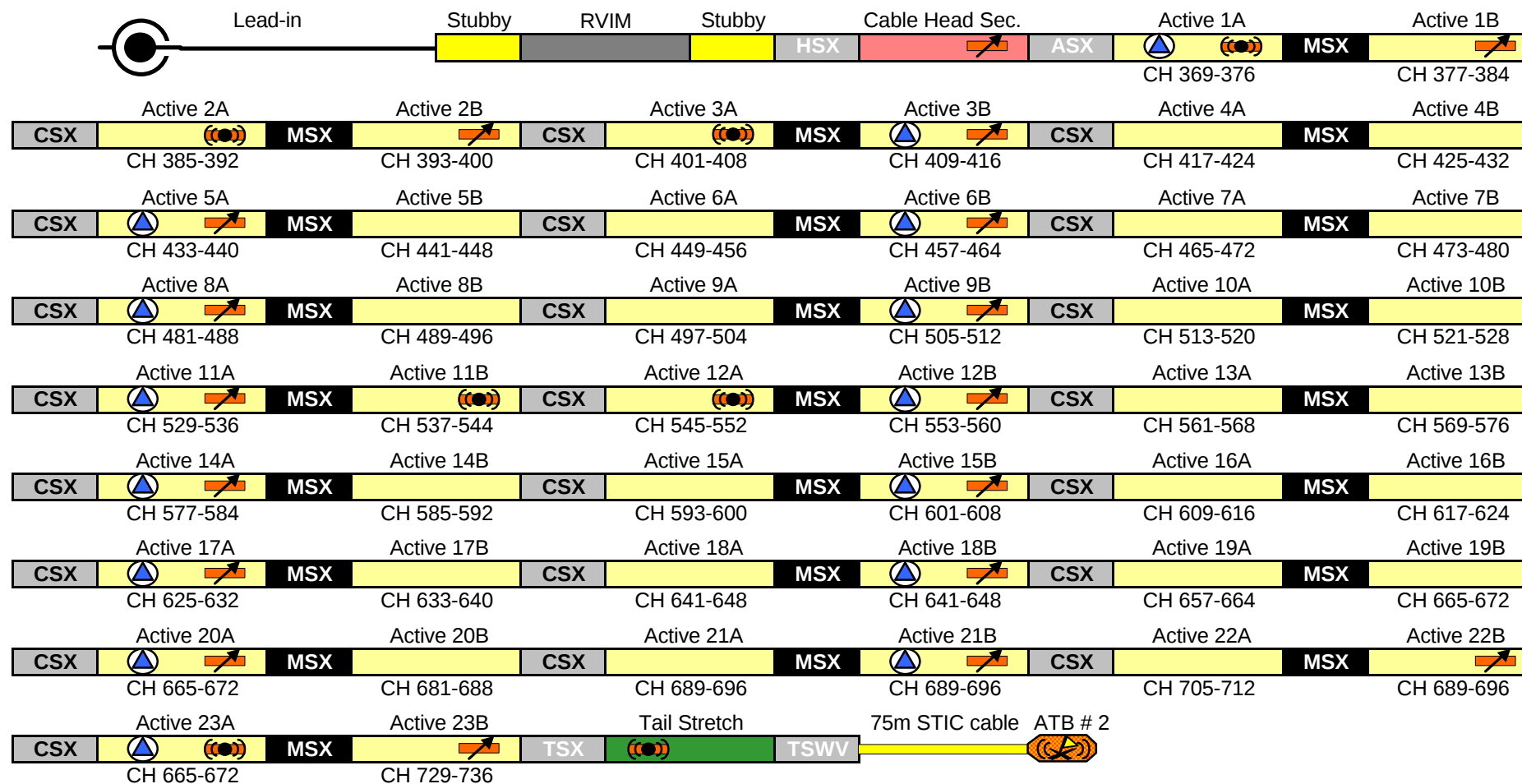


Streamer Type	Thompson Marconi Sonar Solid Streamer	
Number of Streamers	6	
Group Length	17.55 m	
Nominal Group Interval	12.5 m (12.45 m in Spectra / P294 for stretch calculation)	
Streamer Length	4600 m	
Streamer Depth	6.0 m +/- 1.0 m	
Streamer Separation	100 m inter-cable, 500 m total spread	
Number of Groups	368 total per cable, 2208 total seismic	
Nominal Section Length	100 m (46 sections per streamer)	
Number of Groups per Module	16 (group interval 12.5 m)	
Number of Groups per Section	8 (group interval 12.5 m)	
Streamer Sensitivity	14 V/Bar	
Hydrophone type	Piezo-electric Ceramic	
Number of Hydrophones per Group	14 (group interval 12.5 m)	
Trace numbering in SEG-D data	Near Group each cable =1	Far Group each cable = 368
Trace numbering in P1/90 data	Near Group Cable #1 = 1	Far Group Cable #1 = 368
	Near Group Cable #2 =369	Far Group Cable #2 = 736
	Near Group Cable #3 = 737	Far Group Cable #3 = 1104
	Near Group Cable #4 = 1105	Far Group Cable #4 = 1472
	Near Group Cable #5 = 1473	Far Group Cable #5 = 1840
	Near Group Cable #6 = 1841	Far Group Cable #6 = 2208
Compasses/Levellers	Input/Output Pro2000 Combined Compass/Birds	
Streamer Positioning	Input/Output Pro2000 Acoustics, Input/Output Pro2000 Compasses POSNET remote rGPS targets on each tailbuoy	

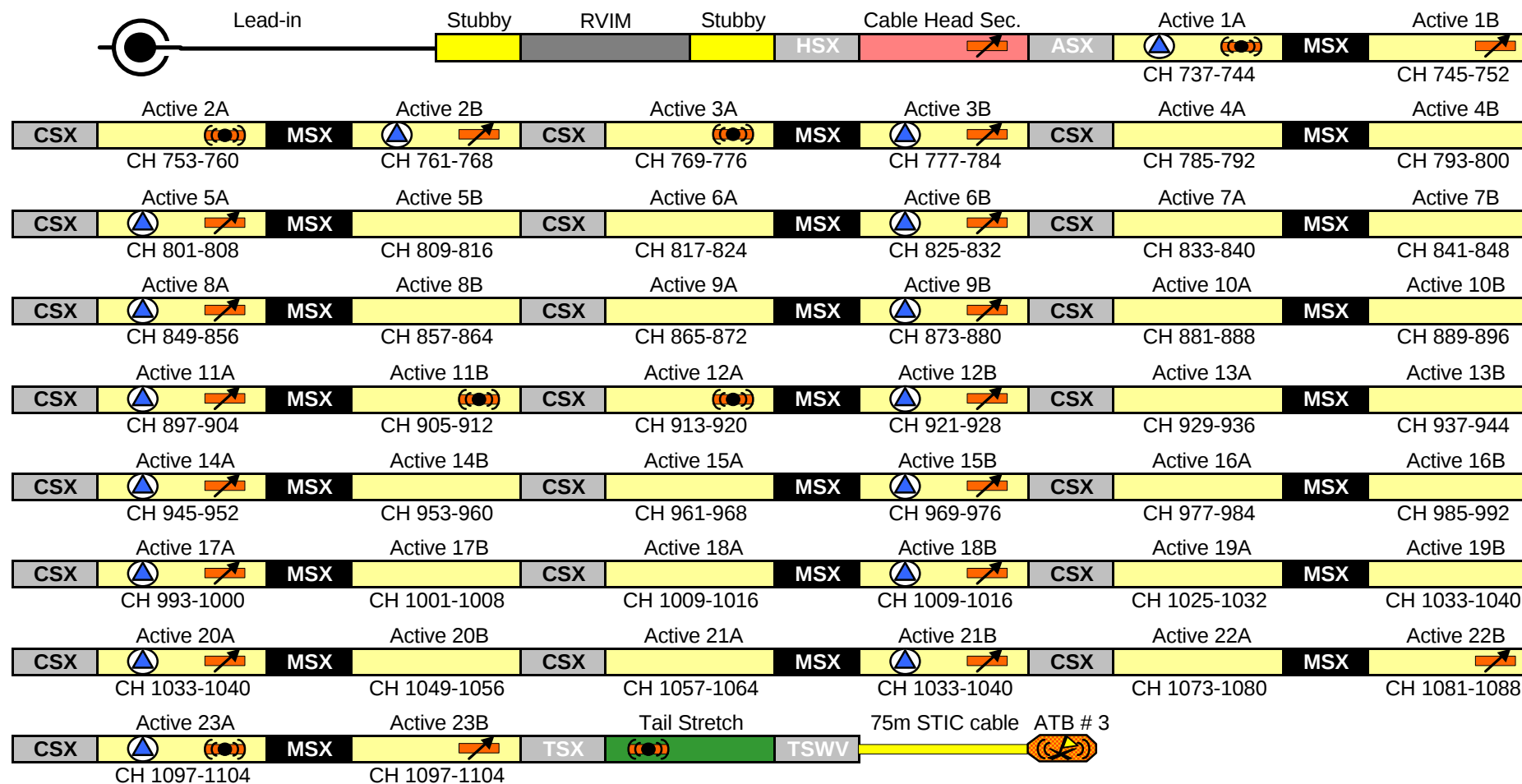
CABLE #1 (STBD OUTER) LAYOUT



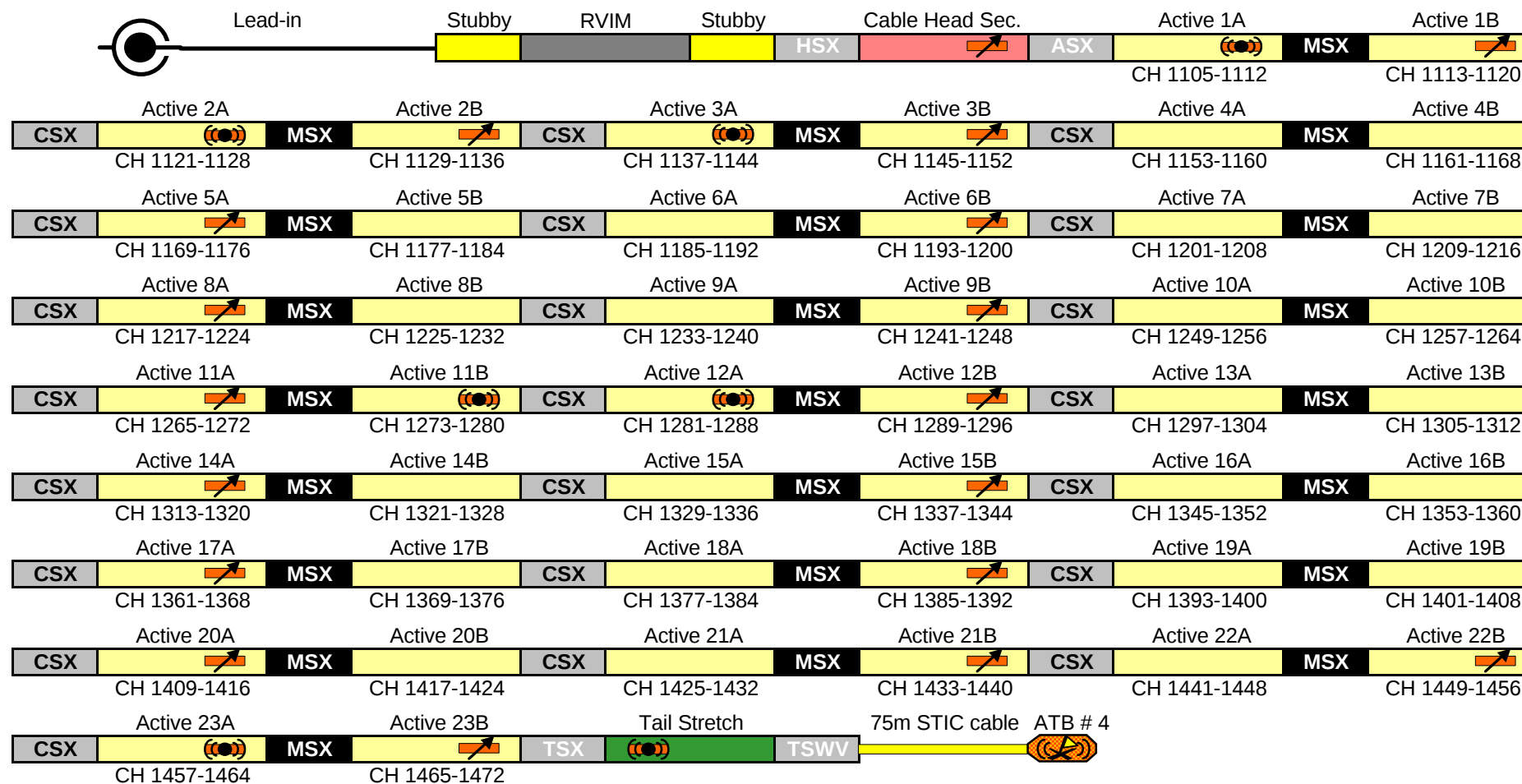
CABLE #2 LAYOUT



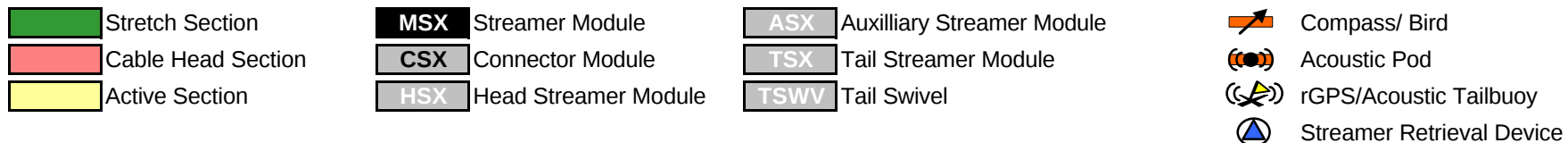
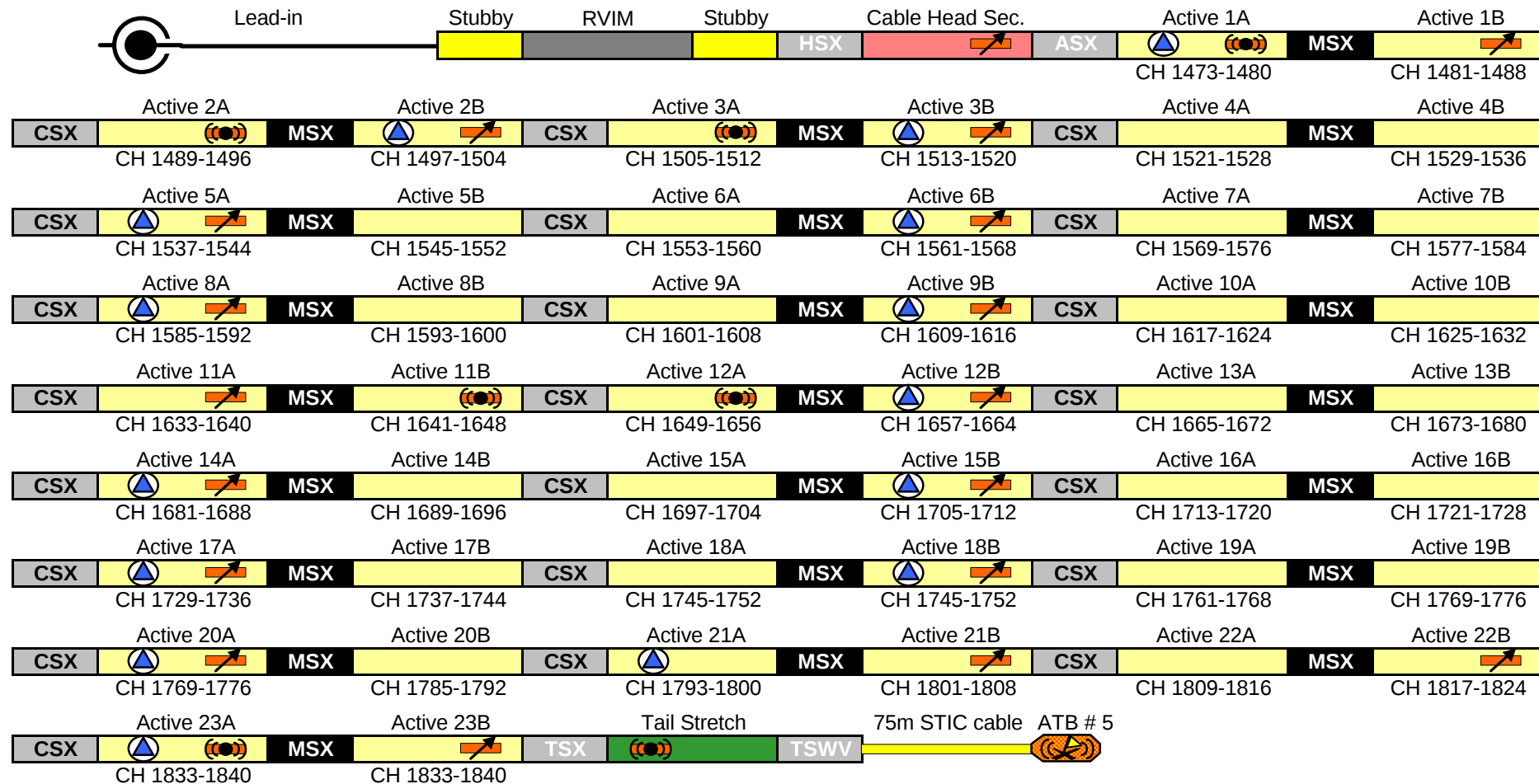
CABLE #3 LAYOUT



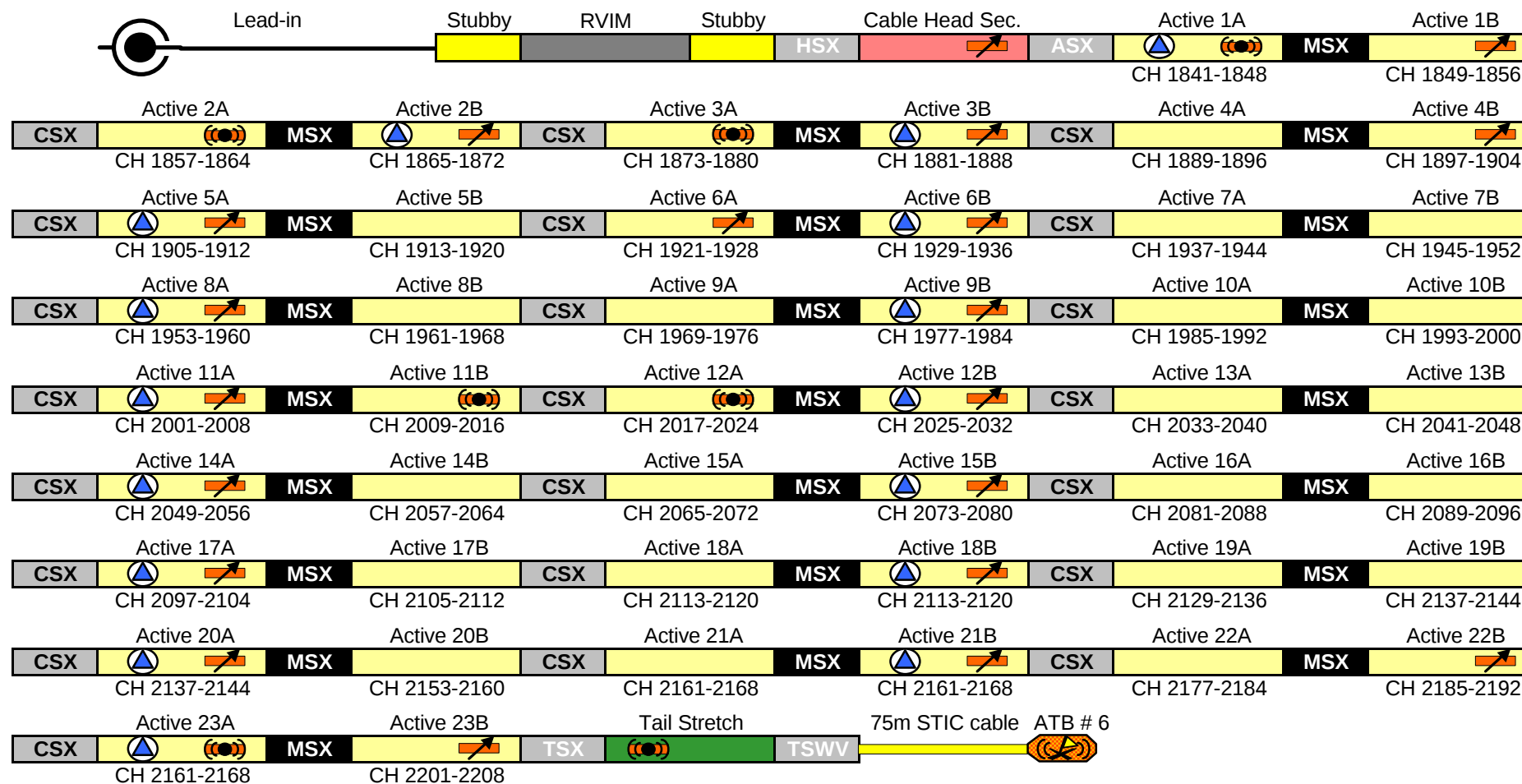
CABLE #4 LAYOUT



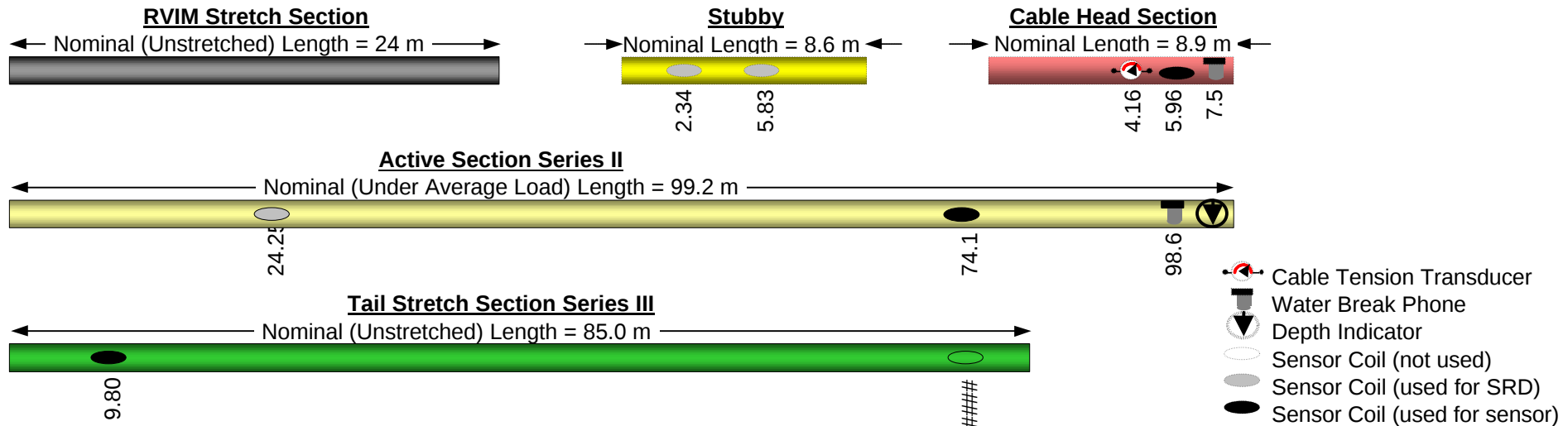
CABLE #5 LAYOUT



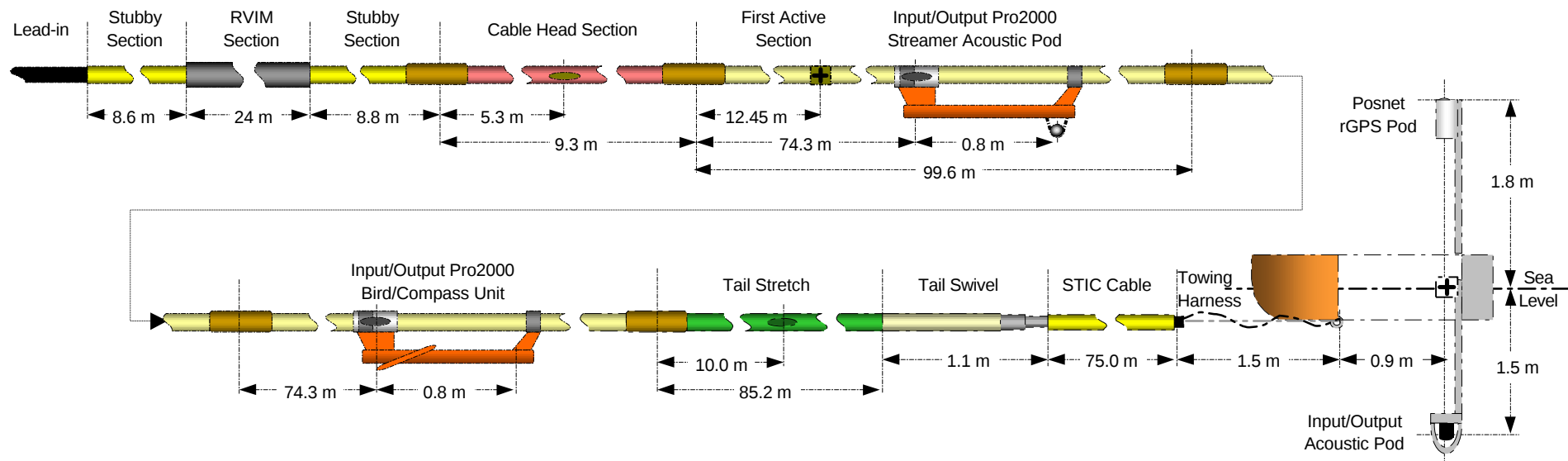
CABLE #6 (PORT OUTER) LAYOUT



CABLE COMPONENT NOMINAL OFFSETS



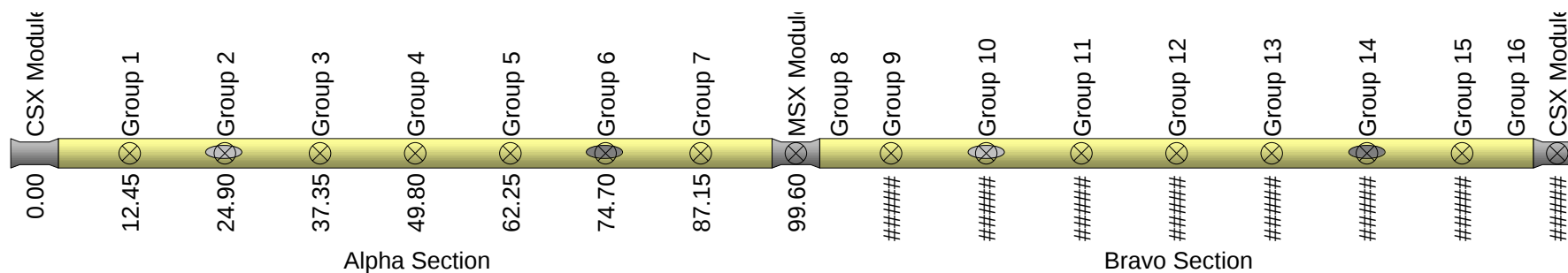
NB Modules are approximately 0.4 m long and are not included in the measurements given above



GROUP AND HYDROPHONE LOCATIONS

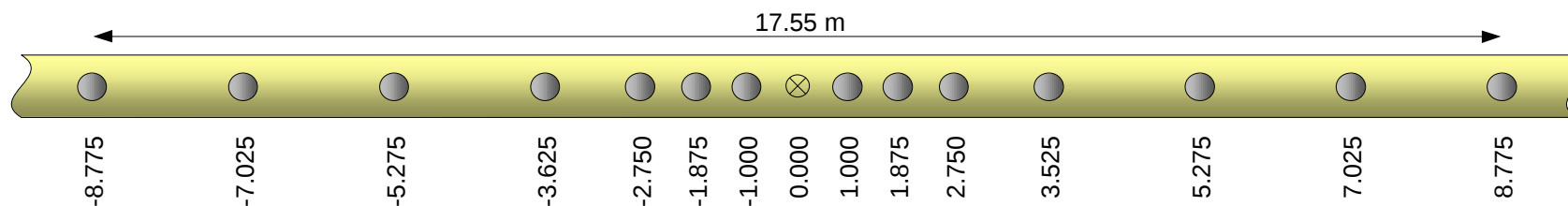


Active Section Assembly And Receiver Group Locations

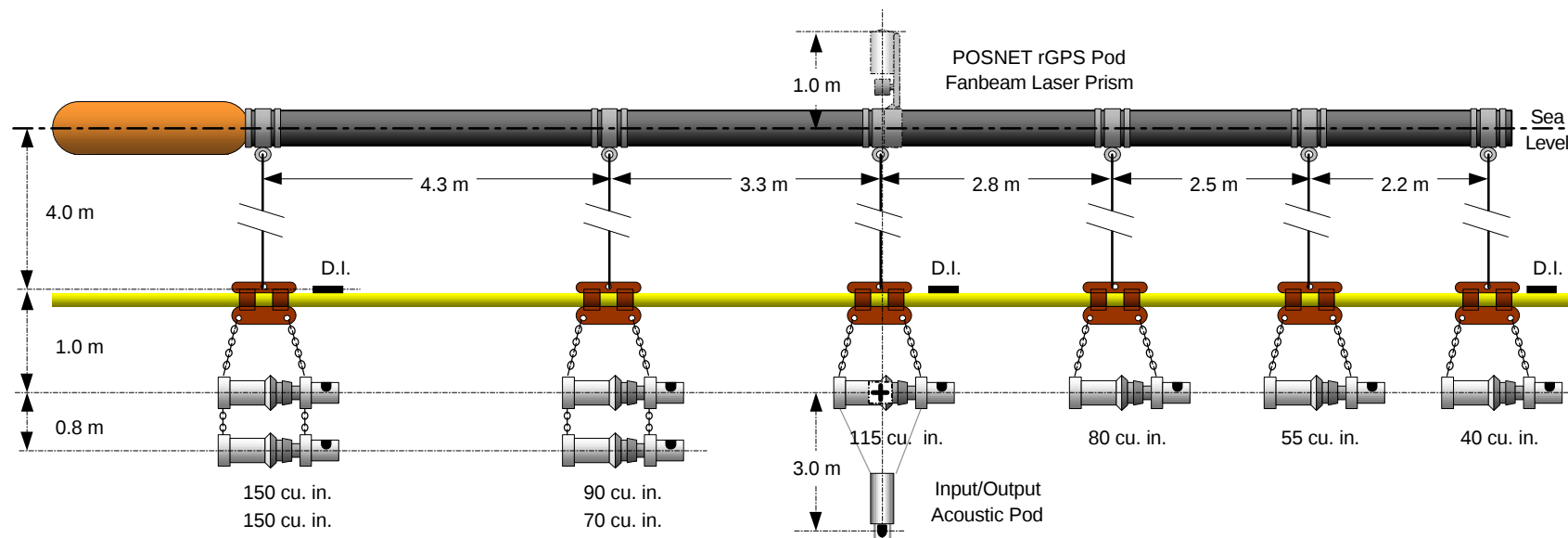


- Sensor Coil (not used)
- Sensor Coil (used for SRD)
- Sensor Coil (used for sensor)
- ⊗ Location of group centre

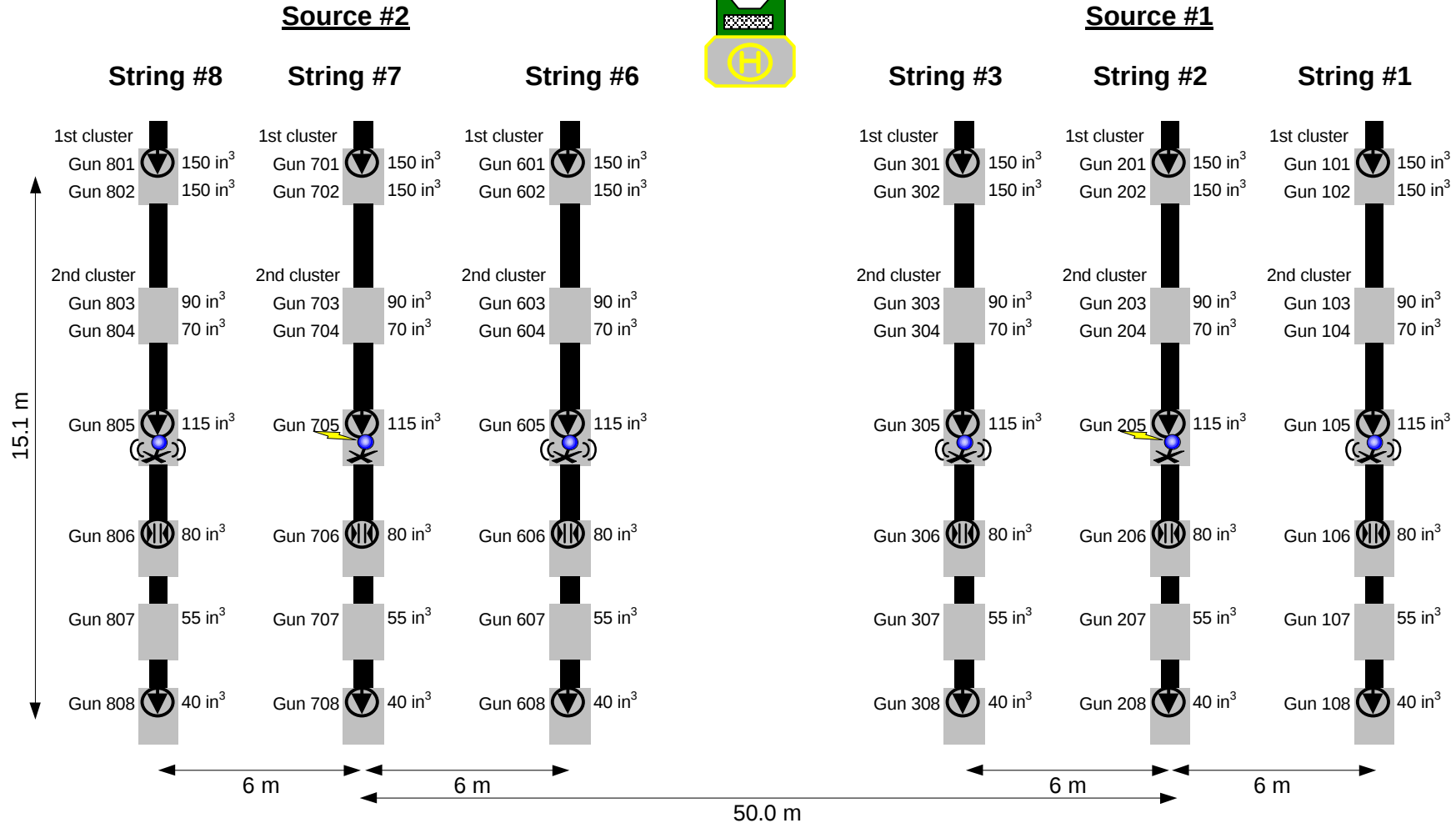
Receiver Group Hydrophone Locations



- ⊗ Location of group centre
- Hydrophone



ENERGY SOURCE LAYOUT



▼ Depth Indicator
 ⊕ Pressure Indicator

⊕ Co-located Posnet rGPS Pod and DigiCOURSE Acoustic CTX Pod
 ⊕ Co-located Posnet rGPS Pod and Fanbeam Reflective Prism

NAVIGATION SYSTEM PARAMETERS



Data Acquisition System	Spectra Integrated Navigation System RTNU (Real Time Navigation Unit)		Ver 7.6.5 Ver 7.6.5 (ILC)
Vessel Positioning	Primary System	Racal Multifix Differential GPS	Ver 2.10
	Secondary System	Fugro MRdGPS Differential GPS	Ver 2.04.01
	QC System	QPS Muliref Differential GPS	Ver 2.42
	Other System	Posnet Differential GPS	Ver 1.57
Source/Streamer Positioning	Acoustic Systems	DigiCOURSE Acoustic System	Pro2000
	Ranging Systems	Posnet Relative GPS	Ver 1.57
		MDL Fanbeam Laser Ranging Unit	Ver 1.59
	Compass Systems	Input/Output Pro2000 Compasses	Pro2000
Other Systems	Backup Gyrocompass	Sperry Mk227 (Gyro #1)	C-O = +0.45°
	Primary Gyrocompass	Sperry Mk227 (Gyro #2)	C-O = -0.04°
	Test Pseudo Gyro	Posnet rGPS (Gyro #3)	C-O = -0.04°
	Prime Fathometer	Simrad EA-500 18 kHz Xducer	No draught correction in sensor*
	Backup Fathometer	Echotrac DF3200 Mk II	No draught correction in sensor [†] Xducer depth = *5.94, [†] 5.0
Magnetic declination	+11.103	(From IGRF95 model; 25-Dec-99; Average of 9 corners of Survey Area)	
Geoidal Undulation	-2.624	(From OSU91A model; Average of 9 corners of Survey Area)	
Binning Systems	Real-time binning	Spectra	Ver 7.6.5
	Post line binning	Reflex	Ver 1.7.2
Processing Systems	Real-time processing	Spectra	Ver 7.6.5
	Post line processing	Unavchk	Ver 1.9.6

NB : All C-Os are entered in the Spectra Spread Configuration. All data output by the sensors is raw, with no C-O applied.

P2/94 HEADER NODE NAMING CONVENTION



Each sensor is referenced to a platform. The following Alpha numeric codes are used to refer to the platform

Vessel	V#	<i>where # is replaced by an identifying number</i>
Gun Array	G##	<i>where ## is replaced by an identifying number incrementing from stbd to port</i>
Streamer	S##	<i>where ## is replaced by an identifying number incrementing from stbd to port</i>
Tailbuoy	T##	<i>where ## is replaced by an identifying number incrementing from stbd to port</i>

The sensors are identified by the platform, then by the system type, and finally by an identifying number

Acoustic	T##	<i>where ## is replaced by an identifying number incrementing from front to back</i>
dGPS	G#	<i>where # is replaced by an identifying number incrementing from front to back</i>
Echosounder	E#	<i>where # is replaced by an identifying number incrementing from front to back</i>
Gun String	S#	<i>where # is replaced by an identifying number incrementing from front to back</i>
Gyro	GY#	<i>where # is replaced by an identifying number incrementing from front to back</i>
Laser	L#	<i>where # is replaced by an identifying number incrementing from front to back</i>
Pitch/Roll	PR#	<i>where # is replaced by an identifying number incrementing from front to back</i>
rGPS	R##	<i>where ## is replaced by an identifying number incrementing from front to back</i>
Water Speed	WS#	<i>where # is replaced by an identifying number incrementing from front to back</i>
Velocimeter	V#	<i>where # is replaced by an identifying number incrementing from front to back</i>
User Defined	UD##	<i>where ## is replaced by an identifying number incrementing from front to back</i>

For example T04R01 refers to the rGPS sensor on tailbuoy 4

Exceptions are the compass and depth sensors on the streamers. These are referenced by the following convention

VC## *where V is replaced by the vessel number, C by the streamer number,
and ## by an identifying number incrementing from front to back*

For example 1608 refers to the 8th compass/depth sensor on vessel 1, cable 6

VESSEL AND ANTENNAE OFFSETS



	Fore (+)	Stbd (+)	Height (+)
Navigation Reference Point (NRP V1) [Primary GPS Antenna at sea level]	0.00	0.00	0.00
Primary GPS Antenna (V1G1-5)	0.00	0.00	20.29
rGPS Antenna (P2/94 offset, V1R01)	0.00	0.00	0.00* (20.29)
Fanbeam Laser Head (V1L1)	0.00	0.00	18.73
Primarty (Simrad) Fathometer	10.71	1.59	-5.94
Backup (Echotrac) Fathometer	-3.90	-8.90	-5.00
Input/Output Hull Acoustic Xducer (V1T01)	-1.51	0.34	-5.60
Gyrocompass 1 (V1GY1)	-3.30	-1.80	-1.80
Gyrocompass 2 (V1GY2) (Primary)	-3.30	0.60	-1.80

NB : All offsets are in metres and are referenced to the NRP

* Posnet antenna heights are all set to MSL in Spectra as the ranges are slant corrected within the Posnet system

TAILBUOY OFFSETS

Cable	Tailbuoy ID	TRP Distance from CRP		Tailbuoy Sensor Offsets from TRP			
		Fore (+)	Height (+)	Acoustic ID	Height (+)	rGPS ID	Height (+)
S01	T01	-4732.85	6.00	S01T08	-1.50	T01R01	0.00* (1.80)
S02	T02	-4732.85	6.00	S02T08	-1.50	T02R01	0.00* (1.80)
S03	T03	-4732.85	6.00	S03T08	-1.50	T03R01	0.00* (1.80)
S04	T04	-4732.85	6.00	S04T08	-1.50	T04R01	0.00* (1.80)
S05	T05	-4732.85	6.00	S05T08	-1.50	T05R01	0.00* (1.80)
S06	T06	-4732.85	6.00	S06T08	-1.50	T06R01	0.00* (1.80)

NB : All offsets are in metres and are referenced to the CRP (centre near group) or TRP (tailbuoy antenna at MSL)

* Posnet antenna heights are all set to MSL in Spectra as the ranges are slant corrected within the Posnet system

STREAMER POSITIONING SENSOR OFFSETS



Streamer Acoustic Sensors

CABLE #1		CABLE #2		CABLE #3		CABLE #4		CABLE #5		CABLE #6	
ID #	Fore (+)	ID #	Fore (+)	ID #	Fore (+)	ID #	Fore (+)	ID #	Fore (+)	ID #	Fore (+)
S01T01	-62.67	S02T01	-62.67	S03T01	-62.67	S04T01	-62.67	S05T01	-62.67	S06T01	-62.67
S01T02	-261.87	S02T02	-261.87	S03T02	-261.87	S04T02	-261.87	S05T02	-261.87	S06T02	-261.87
S01T03	-461.07	S02T03	-461.07	S03T03	-461.07	S04T03	-461.07	S05T03	-461.07	S06T03	-461.07
S01T04	-2154.27	S02T04	-2154.27	S03T04	-2154.27	S04T04	-2154.27	S05T04	-2154.27	S06T04	-2154.27
S01T05	-2253.87	S02T05	-2253.87	S03T05	-2253.87	S04T05	-2253.87	S05T05	-2253.87	S06T05	-2253.87
S01T06	-4445.07	S02T06	-4445.07	S03T06	-4445.07	S04T06	-4445.07	S05T06	-4445.07	S06T06	-4445.07
S01T07	-4579.95	S02T07	-4579.95	S03T07	-4579.95	S04T07	-4579.95	S05T07	-4579.95	S06T07	-4579.95

Streamer Compass Sensors

CABLE #1		CABLE #2		CABLE #3		CABLE #4		CABLE #5		CABLE #6	
ID #	Fore (+)	ID #	Fore (+)	ID #	Fore (+)	ID #	Fore (+)	ID #	Fore (+)	ID #	Fore (+)
1101	+15.65	1201	+15.65	1301	+15.65	1401	+15.65	1501	+15.65	1601	+15.65
1102	-162.27	1202	-162.27	1302	-162.27	1402	-162.27	1502	-162.27	1602	-162.27
1103	-361.47	1203	-361.47	1303	-361.47	1403	-361.47	1503	-361.47	1603	-361.47
1104	-560.67	1204	-560.67	1304	-560.67	1404	-560.67	1504	-560.67	1604	-560.67
1105	-759.87									1605	-759.87
1106	-859.47	1205	-859.47	1305	-859.47	1405	-859.47	1505	-859.47	1606	-859.47
1107	-1058.67									1607	-1058.67
1108	-1158.27	1206	-1158.27	1306	-1158.27	1406	-1158.27	1506	-1158.27	1608	-1158.27
1109	-1457.07	1207	-1457.07	1307	-1457.07	1407	-1457.07	1507	-1457.07	1609	-1457.07
1110	-1755.87	1208	-1755.87	1308	-1755.87	1408	-1755.87	1508	-1755.87	1610	-1755.87
1111	-2054.67	1209	-2054.67	1309	-2054.67	1409	-2054.67	1509	-2054.67	1611	-2054.67
1112	-2353.47	1210	-2353.47	1310	-2353.47	1410	-2353.47	1510	-2353.47	1612	-2353.47
1113	-2652.27	1211	-2652.27	1311	-2652.27	1411	-2652.27	1511	-2652.27	1613	-2652.27
1114	-2951.07	1212	-2951.07	1312	-2951.07	1412	-2951.07	1512	-2951.07	1614	-2951.07
1115	-3249.87	1213	-3249.87	1313	-3249.87	1413	-3249.87	1513	-3249.87	1615	-3249.87
1116	-3548.67	1214	-3548.67	1314	-3548.67	1414	-3548.67	1514	-3548.67	1616	-3548.67
1117	-3847.47	1215	-3847.47	1315	-3847.47	1415	-3847.47	1515	-3847.47	1617	-3847.47
1118	-4146.27	1216	-4146.27	1316	-4146.27	1416	-4146.27	1516	-4146.27	1618	-4146.27
1119	-4345.47	1217	-4345.47	1317	-4345.47	1417	-4345.47	1517	-4345.47	1619	-4345.47
1120	-4544.67	1218	-4544.67	1318	-4544.67	1418	-4544.67	1518	-4544.67	1620	-4544.67

NB : All offsets are in metres and are relative to the Cable Reference Point (CRP) which is the centre of the first group.
Inline (fore is +ve) offsets only are given as all other offsets are zero.

SOURCE POSITIONING SENSOR OFFSETS



SOURCE #1 (STBD)				
Stbd (Outer) String				
	ID #	Fore (+)	Stbd (+)	Up (+)
Acoustic	G01T01	0.00	6.00	-3.00
rGPS	G01R01	0.00	6.00	5.00* (6.0)
Fanbeam	N/A			
Fore D.I.	101	6.60	6.00	1.00
Mid D.I.	105	-1.00	6.00	1.00
Aft D.I.	108	-8.50	6.00	1.00
Centre String				
	ID #	Fore (+)	Stbd (+)	Up (+)
Acoustic	N/A			
rGPS	G01R02	0.00	0.00	5.00* (6.0)
Fanbeam	G01L01	0.00	0.00	5.50
Fore D.I.	201	6.60	0.00	1.00
Mid D.I.	205	-1.00	0.00	1.00
Aft D.I.	208	-8.50	0.00	1.00
Port (Inner) String				
	ID #	Fore (+)	Stbd (+)	Up (+)
Acoustic	G01T02	0.00	-6.00	-3.00
rGPS	G01R03	0.00	-6.00	5.00* (6.0)
Fanbeam	N/A			
Fore D.I.	301	6.60	-6.00	1.00
Mid D.I.	305	-1.00	-6.00	1.00
Aft D.I.	308	-8.50	-6.00	1.00

SOURCE #2 (PORT)				
Stbd (Inner) String				
	ID #	Fore (+)	Stbd (+)	Up (+)
Acoustic	G02T01	0.00	6.00	-3.00
rGPS	G02R01	0.00	6.00	5.00* (6.0)
Fanbeam	N/A			
Fore D.I.	601	6.60	6.00	1.00
Mid D.I.	605	-1.00	6.00	1.00
Aft D.I.	608	-8.50	6.00	1.00
Centre String				
	ID #	Fore (+)	Stbd (+)	Up (+)
Acoustic	N/A			
rGPS	G02R02	0.00	0.00	5.00* (6.0)
Fanbeam	G02L01	0.00	0.00	5.50
Fore D.I.	701	6.60	0.00	1.00
Mid D.I.	705	-1.00	0.00	1.00
Aft D.I.	708	-8.50	0.00	1.00
Port (Outer) String				
	ID #	Fore (+)	Stbd (+)	Up (+)
Acoustic	G02T02	0.00	-6.00	-3.00
rGPS	G02R03	0.00	-6.00	5.00* (6.0)
Fanbeam	N/A			
Fore D.I.	801	6.60	-6.00	1.00
Mid D.I.	805	-1.00	-6.00	1.00
Aft D.I.	808	-8.50	-6.00	1.00

NB. Source offsets are in metres and are relative to the geometric centre of source (COS)

* Posnet antenna heights are all set to MSL in Spectra as the ranges are slant corrected within the Posnet system

PARAMETER CHANGES

VELOCITY OF SOUND

Velocity of sound in water was determined from Temperature/Salinity (TS) Dips taken periodically throughout the survey :

Seq 009-023	1512 m/s	Average of top 15 m of water column on 02-Jan-2000
Seq 024-075	1514 m/s	Average of top 15 m of water column on 09-Jan-2000 & 10-Feb-2000
Seq 076-080	1517.6 m/s	Average of top 15 m of water column on 17-Feb-2000

The fathometer used a fixed value of 1500 m/s throughout the survey within the sensor, except for sequences 024-028 where the value in the Simrad fathomer was changed to 1513 m/s

The depths output to the P1/90 were scaled within the Unavchk processing system using the following values :

Seq 009-023	1512 m/s	Average of complete water column on 02-Jan-2000
Seq 024-066	1513 m/s	Average of complete water column on 09-Jan-2000
Seq 067-080	1514 m/s	Average of complete water column on 10-Feb-2000 & 17-Feb-2000

POSITIONING SENSOR OFFSET CHANGES

None

TOWING CONFIGURATION CHANGES

Note that prior to sequence 009 the data was acquired with an 8 cable configuration

Seq 009-029 There were continual minor adjustment to gun tows in order to improve inter-string separations

Prior to Seq 030 Additional rope added to the vane towing harness, to further isolate the vane wash from the streamers
New NRP to source centre inline offset = 315 m
New NRP to centre first group inline offset = 440 m
New source centre to first group inline offset = 125 m