Company : LDEO  
Vessel : Marcus G.Langseth  
Client : NSF  
Project : MGL1211  
Area : Juan de Fuca  
Start Date : 10 June 2012  

Vessel Sensor Offsets  
Towing Offsets  
Acoustic Offsets  
Gun Array Offsets  
Gun Configuration  
Streamer Front End  
Tailbuoy Offsets  
Timing Langseth  
Timing Spectra
Sequences 001 - 006 OBS @ 172m COS - CNG
Sequences 007 - 013 MCS @ 172m COS - CNG
Sequence 014 MCS/OBS @ 172m COS - CNG
Sequences 015 MCS @ 172m COS - CNG
Sequences 016 - 022 MCS @ 272m COS - CNG
Sequences 023-027 MCS/OBS @ 272m COS - CNG
Sequences 028-041 OBS

NRP
232.0m
COS

Sequences 014 MCS/OBS @ 172m COS - CNG
Sequences 015 MCS @ 172m COS - CNG
Sequences 016 - 022 MCS @ 272m COS - CNG
Sequences 023-027 MCS/OBS @ 272m COS - CNG
Sequences 028-041 OBS

NRP-Stern 29.5m none
NRP-COS 232m none
NRP-CNG 404.0m 504.0m
COS-CNG 172.0m 272.0m
NRP-CMP 318.0m 368.0m

Layback = 318.0m / 368.0m

*** Offsets used for acquisition seq 01 - 15 ***

All measurements in meters
R/V Marcus G. Langseth - Tailbouy

All measurements in meters
R/V Marcus G. Langseth "tow" configuration

R/V Marcus Langseth
1 x 8000
4 Gunstrings

NOT to Scale
Array total volume (without spares) is 6600 cubic inches. 
String 1 has guns 9 & 10 in a horizontal cluster; Strings 2, 3, 4, have all clusters hanging vertically. 
Gun clusters have 0.75m between guns and hang 0.95m from center of hanger. 
Single guns hang from hanger 1.15m. 
All measurements in meters. 

All gun volumes, numbering, locations, and offsets were inspected and verified by Chief Source Mechanic.
All measurements in meters

<table>
<thead>
<tr>
<th>Device</th>
<th>STBD/PORT (X)</th>
<th>FORE/AFT (Y)</th>
<th>UP/DOWN (Z)</th>
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<tr>
<td>NRP</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>V1G1 C-Nav 3050</td>
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<td>1.20</td>
<td>-16.90</td>
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<tr>
<td>V1R1 PosNet</td>
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<td>-16.90</td>
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<tr>
<td>EM122 Multibeam Transducer Array</td>
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<td>7.49</td>
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<td>MRU Seapath MRU</td>
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<td>-14.16</td>
<td>-4.30</td>
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<tr>
<td>BGM Bell Gravity Meter</td>
<td>4.40</td>
<td>-13.10</td>
<td>-3.49</td>
</tr>
</tbody>
</table>

Note: All Echosounders are used in Spectra with 6.6m ship's draft correction applied.
All measurements in meters
DT = Depth Transducer
A = Acoustic
P = Pressure Sensor - located in front of gun's 1 & 2

Center of Source 1 & 2
Spare Gun

Cluster Guns are mounted 1m apart
String 1 cluster 9 & 10 mounted horizontally
String 2, 3, & 4 all clusters mounted vertically.

All measurements in meters
Lead-in:
Outer = 505m
Inner = 465m

R/V Marcus G. Langseth - Streamer Front End

Radial Head Stretch RVIM
STU
Active Cable Section # 40

30 m 0.4 m 37.5 m 75 m 37.5 m

CNG is 75m from head of section
TO Shot Predict

-170ms DigiShot

-160ms SynTrak

120ms

250ms SonarDyne

150ms

10ms TB - RTNu2

250ms

150ms
Spectra timing for r/v Marcus G. Langseth

[Diagram showing various data points and lines labeled Digicosmic, Syntrak_start, Sonarbyte, DigSHOT_start, with time axis ranging from -150 to 450]