RV Langseth
Data Reduction Summary

MGL0903

Nuku'Alofa, Tonga – Suva, Fiji

PRELIMINARY

v0.1, 2009-03-07

Lamont-Doherty Earth Observatory, Columbia University

Fri March 06 20:00:00 2009

Date	Julian Date	Time	Port
2009-01-24	2009-024	1900 UTC, 0800L	Nuku'Alofa, Tonga
2009-03-08	2009-067	2000 UTC, 0800L	Suva, Fiji

Robert Dunn
Chief Scientist
University of Hawaii
dunnr@hawaii.edu

Prepared by:

Anthony Johnson
Chief Navigator, Technician-in-Charge
ajohnson@ldeo.columbia.edu

David Ng
IT/Navigation
dng@ldeo.columbia.edu

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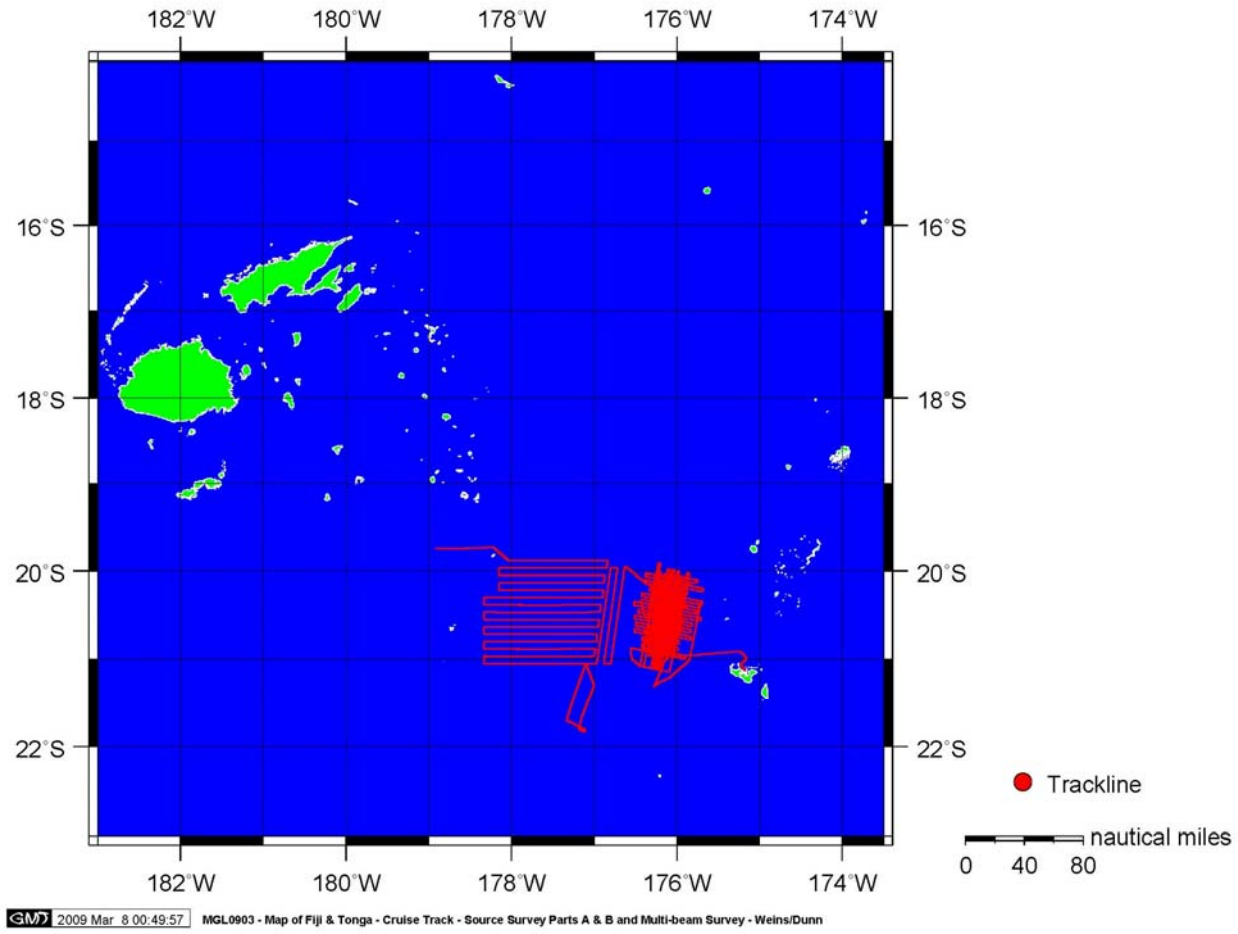
Please refer to the Langseth Data Report Supplement for information regarding data formats.

Cruise
Track



I. Background and Scientific Objectives

The Eastern Lau Spreading Center (ELSC) is a RIDGE Integrated Study Site where researchers from many disciples come together to study the integrated mantle-to-microbes processes interacting within the ridge system. The spreading center exhibits a tremendous along-strike variation in geochemistry, petrology, spreading rate, crustal structure, and morphology. Because of this variation, the ELSC represents the optimum location for an experiment to study the relationship between mantle melt production, mantle flow, and spreading center processes. This active-source seismic experiment is one part of a two-part study (the other being a large broadband seismic study of the mantle beneath the ELSC) that is designed to test the following hypothesis: Variations in the mantle melt supply control ridge crest features such as morphology, thermal structure, and hydrothermal venting. The experiment consists of 84 OBS deployments along a 150 km section of the ELSC extending from north of the inflated Valu Fa region to the magma-starved northern ELSC where the axial melt lens is absent. Lines of ridge-parallel and ridge-perpendicular airgun shots cover the area and provide seismic sources for imaging the crust and uppermost ~2 km of the mantle. This experiment will image structure on a scale of 1-3 km, and will provide detailed constraints on thermal structure and melt distribution immediately beneath the ELSC.

Planned Source Survey

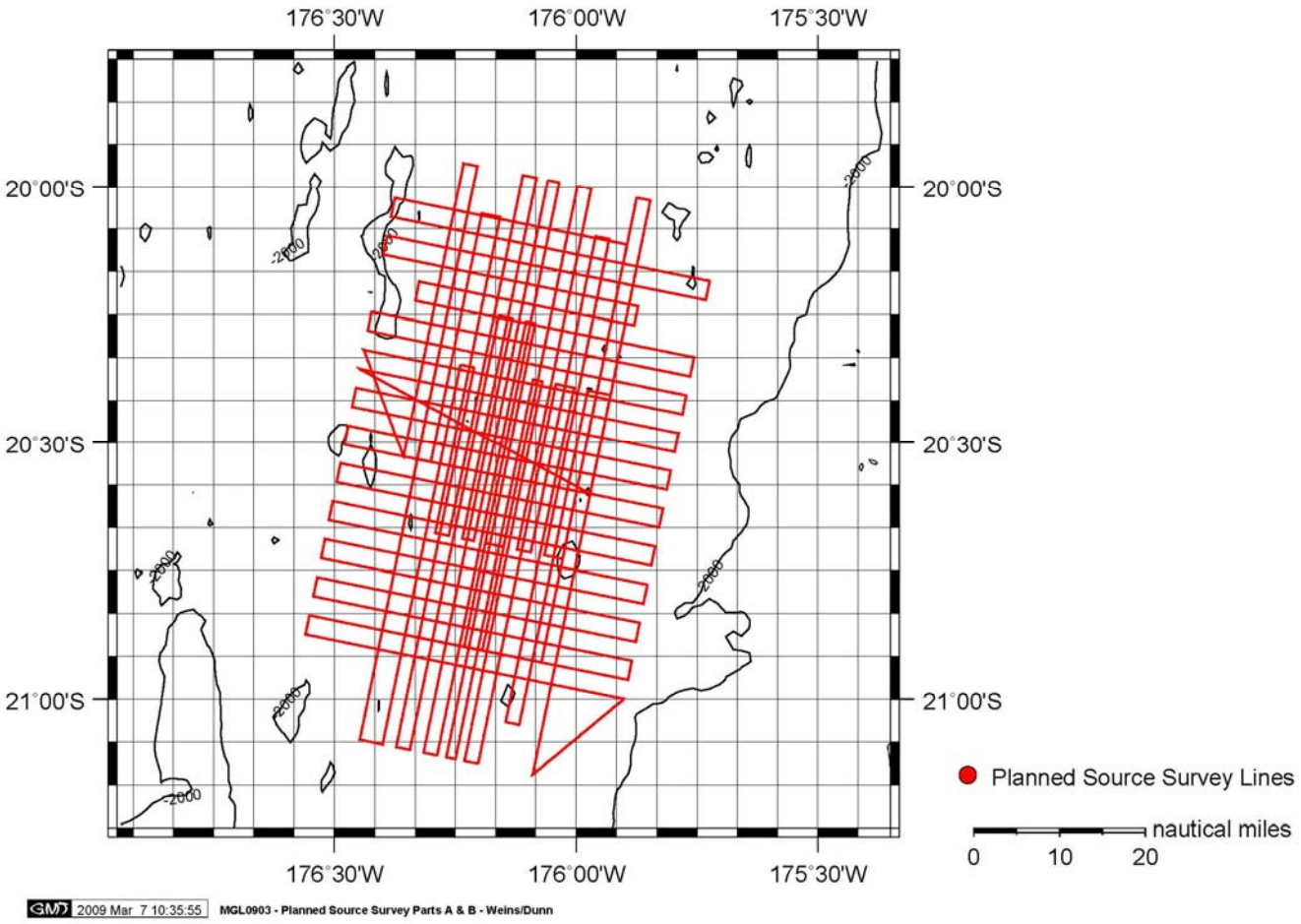


Figure 1A. Source Survey, track and shot log

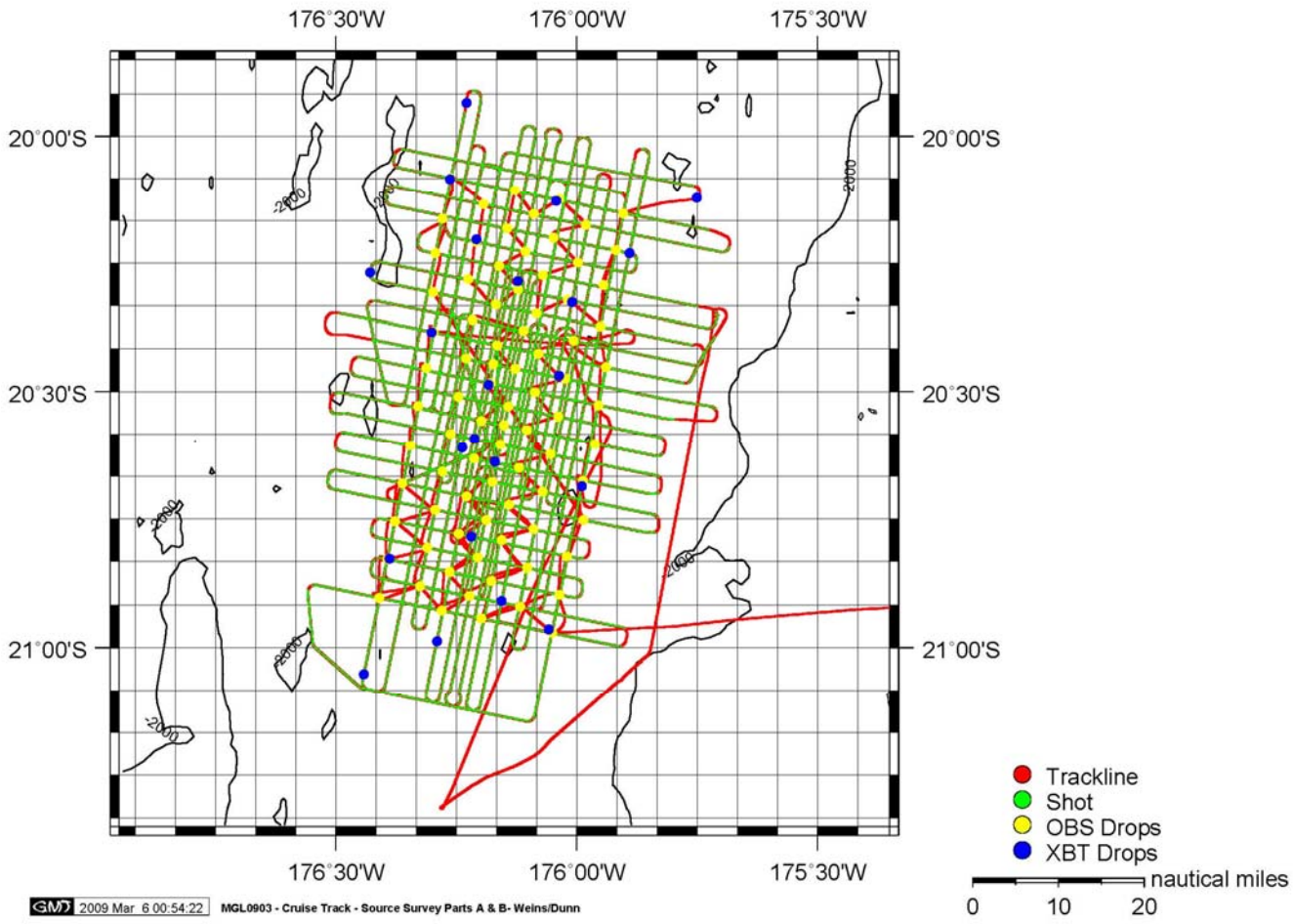


Figure 1B – Multibeam survey track

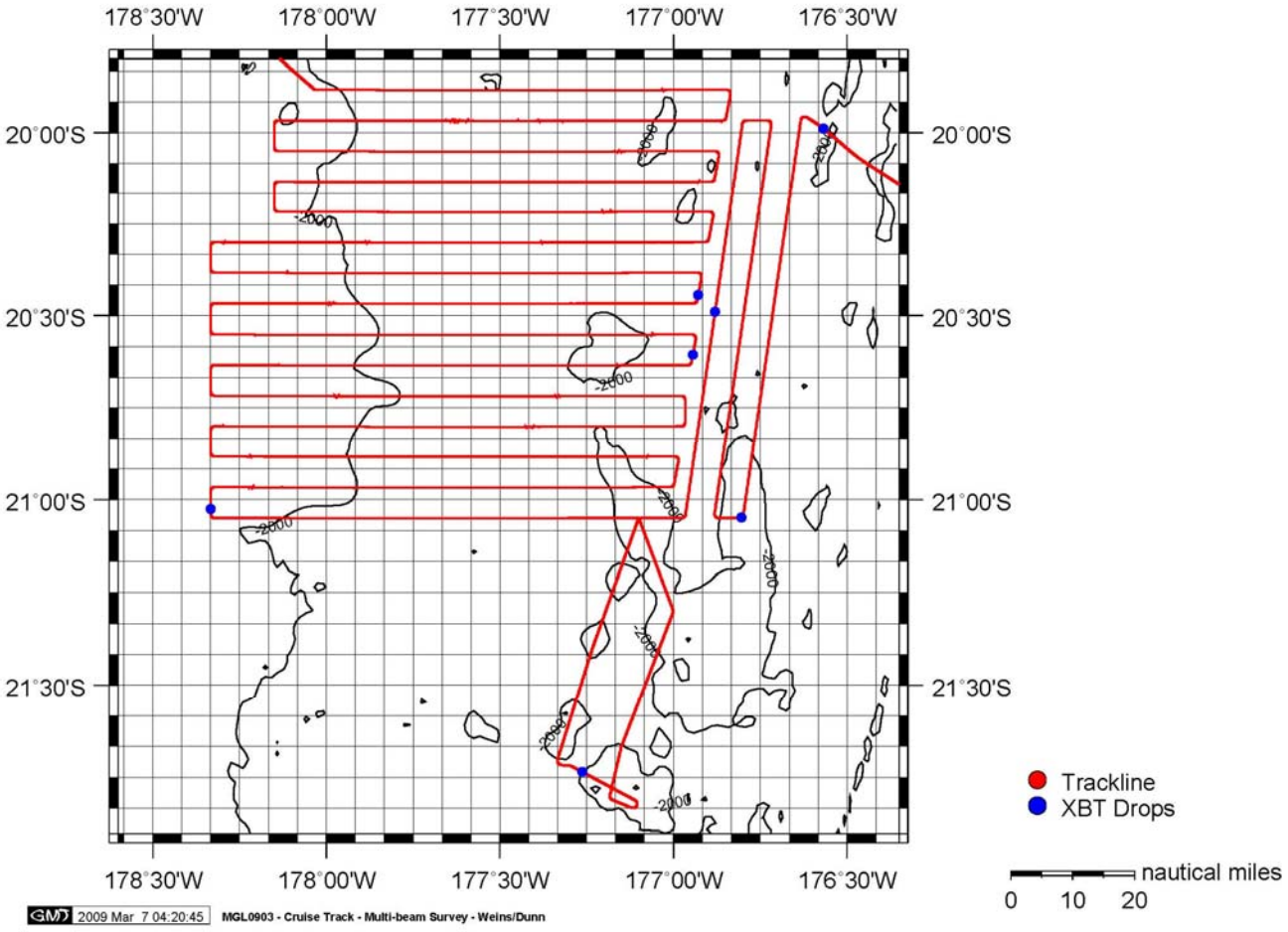
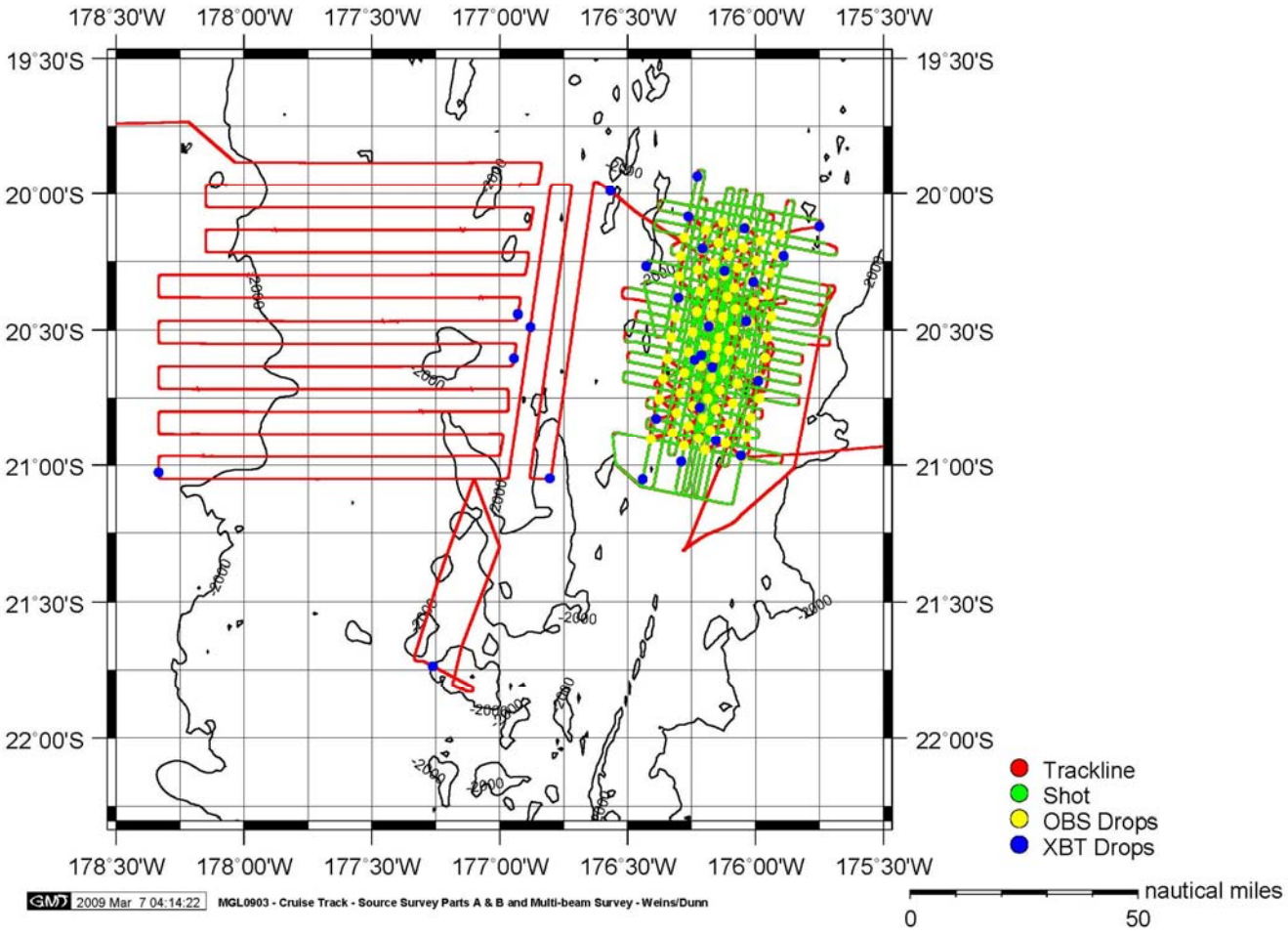


Figure 1C. -- Combined survey
area



II. Personnel

Science Party

1	Robert Dunn	Chief Scientist	Univ. Hawaii
2	Fernando Martinez	Scientist	Univ. Hawaii
3	James Condor	Scientist	S. Illinois Univ.
4	Michaela Conley	Graduate Student	Univ. Hawaii
5	Regan Austin	Graduate Student	Univ. Hawaii
6	Jonathan Sleeper	Graduate Student	Univ. Hawaii
7	Erica Emry	Graduate Student	Washington U.
8	Olga Hernandez	Scientist	Univ. Toulouse
9	Alan Gardner	OBSIP	WHOI
10	David Dubois	OBSIP	WHOI
11	Timothy Kane	OBSIP	WHOI
12	Martin Rapa	OBSIP	Scripps
13	Philip Thai	OBSIP	Scripps
14	Crispin Hollinshead	OBSIP	Scripps

Shipboard Technical Staff

1	Anthony Johnson	Technician-in-charge, Chief Navigator/IT
2	Ted Koczynski	Chief Acquisition, Watch Leader
3	David Ng	Nav/IT
4	Bern McKiernan	Watch Leader, Acq/Nav Shift Leader
5	Thomas Spoto	Chief Sound Source/Handing
6	Carlos Gutierrez	Sound Source/Handling Shift Leader
7	Brian Goodick	Sound Source/Handling Shift Leader
8	Jenny White	Sound Source Mechanic
9	Chip Maxwell	Sound Source Mechanic
10	Claudio Fossati	Lead Marine Mammal Observer
11	Meike Holst	Marine Mammal Observer
12	John Nicolas	Marine Mammal Observer
13	Bradley Dawe	Marine Mammal Observer
14	Brendan Hurley	Marine Mammal Observer

Ship's Crew

1	Stanley Zeigler	Captain
2	David Wolford	Chief Mate
3	Breck Crum	2nd Mate
4	Nick Gasper	3rd Mate
5	Jason Woronowicz	Bosun
6	George Cereno	AB
7	Ricky Redito	AB

8	Gordon Baxter	AB
9	Nicky Applewhite	OS
10	Villiami Maea	OS
11	Al Karlyn	Chief Engineer
12	Peter Chizmar	1st Asst. Engineer
13	Josh Reed	2nd Asst. Engineer
14	Ryan Vetting	3rd Asst. Engineer
15	Jack Schwartz	Electrician
16	Fernando Uribe	Oiler
17	Charles Billips	Oiler
18	Rudy Florendo	Oiler
19	Gary Brodock	Steward
20	Ricky Rios	Cook

III. Instrumentation Summary

All science instruments aboard the Langseth are listed in the science_sensors spreadsheet in the docs section of the cruise archive. Summary notes on operation during this cruise are listed below. Seismic equipment is not listed here, refer to Part IV for the seismic summary. Other instruments not listed were not in operation.

For details on the data formats and interpretation notes, see Appendix A, Data Formats, included on the cruise archive.

Instrument Data Files

Instrument	Description	Data Set	Data Outputs	Files	Interval
FE700	Furuno FE700 Echosounder	Partial	serial logs	MGL-bath01.*	1s
EM120	Kongsberg EM120 Multibeam Sonar	Full	raw output to file	See below	variable
			centerbeam serial logs	MGL-bath02.*	variable
DS50	Furuno DS50 Doppler Speedlog	Full	serial logs	MGL-slog01.*	1s
XBT	Sippican MK21 XBT Launcher		raw output to file	See below	n/a
			converted output to file	See below	
WX1	RM Young 5103 Weather Bird and Translator	Full	serial logs	MGL-wx01.*	1s
			mwv conversion	MGL-mwv01.*	
TSG	SeaBird SBE23 Thermosalinograph	Full	raw serial logs	MGL-tsg.*	1s
			converted data	MGL-tsgconv.*	
CNAV	C&C Tech. CNAV DGPS Receiver	Full	serial logs	MGL-cnav.*	1s
MAG01	GeoMetrics 882 Magnetometer	Partial	serial logs	MGL-mag01.*	1s
BGM	Bell Aerospace BGM-3 Gravimeter	Full	serial logs	MGL-vc01.*	1s
GYRO	Simrad GC80 Gyrocompass/AD100	Full	serial logs	MGL-gy01.*	1s
POSMV	Applanix POSMV Integrated Nav System	Full	serial logs	MGL-posmv.*	1s
SEAPATH	Konsberg SeaPath Integrated Nav System	Full	serial logs	MGL-seapath.*	1s
STU	Sercel Streamer Tension	None	serial logs	MGL-stu1.*	10s
TAGGER	Spectrum Instruments intelligent reference TM-4	Full	serial logs	MGL-tagger01.*	shot
			filtered logs	MGL-shot01.*	shot
PCO2				MGL-pco2.*	160 s

All timestamps in this report are presented using UTC time and day of year in order to avoid confusion with local time changes.

Science Navigation Instrumentation

FE700

Logging interval: 1 second

File id: bath01

The FE700 only operated to 800m depth. The echosounder is normally switched off before the unit goes out of depth. The unit was not logged during this cruise.

Interruptions greater than twenty seconds are displayed in the following table.

Log Date	Event	Comment
2009:060:12:55:01.9630		Logging officially started
2009:067:20:00:00.0000		Logging officially ended

bath01 data sample:

```
bath01      2008:220:13:45:42.0681  $SDDBT,,,,,,
bath01      2008:220:13:45:42.0690  $SDDBS,,,,,,
bath01      2008:220:13:45:42.0691  $SDDPT,,0006.6*49
bath01      2008:220:13:45:42.1482  $PFEC,Alarm,0,0*6F
bath01      2008:220:13:45:42.1483  $PFEC,xdr,FORE,050*79
```

EM-122 Mutibeam

The EM122 multibeam sonar was operated throughout the cruise. The system is designed for deeper water, and does not track ground well in less than 50m of water.

EM122 swath data is saved to the cruise archive under MGL0903/multibeam. Center beam depth is recorded separately to serial log. MicroSV sound velocity was used up through Feb 28. TSG sound velocity was used beginning 0900 on Feb 28.

Logging interval: variable with water depth

File id: bath02

Interruptions greater than sixty seconds are displayed in the following table.

Log Date	Event	Comment
2009:023:19:47:40.3971		Logging officially started
2009:023:19:48:50.6779 -- 2009:023:20:52:05.7294	Missing data	Reason unrecorded
2009:023:20:52:50.0721 -- 2009:023:21:18:00.3868	Missing data	Reason unrecorded
2009:023:21:18:00.3868 -- 2009:023:23:06:29.6104	Missing data	Reason unrecorded
2009:023:23:06:29.6104 -- 2009:023:23:34:21.2369	Missing data	Reason unrecorded
2009:023:23:36:48.2192 -- 2009:023:23:39:39.4832	Missing data	Reason unrecorded
2009:024:00:03:40.8997 -- 2009:024:00:07:53.0834	Missing data	Reason unrecorded
2009:024:02:04:57.4973 -- 2009:024:02:18:33.2945	Missing data	Multibeam secured
2009:024:03:07:04.3844 -- 2009:024:18:56:15.9304	Missing data	Stopped EM122

2009:024:19:36:31.2734 -- 2009:024:19:41:35.1739	Missing data	Multibeam secured
2009:024:20:46:13.6946 -- 2009:024:20:51:35.9222	Missing data	Multibeam secured
2009:024:22:05:30.7558 -- 2009:024:22:15:48.5272	Missing data	Multibeam secured
2009:024:22:15:48.5272 -- 2009:024:22:51:07.0960	Missing data	Failed to restart after deployment
2009:024:23:09:19.0420 -- 2009:024:23:30:22.9708	Missing data	Multibeam secured
2009:025:00:16:53.5700 -- 2009:025:00:52:35.1826	Missing data	Lost connection
2009:025:01:39:49.7358 -- 2009:025:01:52:53.4707	Missing data	Multibeam secured
2009:025:02:37:23.3235 -- 2009:025:02:41:02.5684	Missing data	Multibeam secured
2009:025:03:27:00.7951 -- 2009:025:03:33:20.7085	Missing data	Multibeam secured
2009:025:04:17:34.9059 -- 2009:025:04:23:28.5859	Missing data	Multibeam secured
2009:025:05:11:34.4817 -- 2009:025:05:25:27.3391	Missing data	Multibeam secured
2009:025:06:06:05.8056 -- 2009:025:06:10:48.0662	Missing data	Multibeam secured
2009:025:06:52:38.5154 -- 2009:025:07:00:07.8358	Missing data	Multibeam secured
2009:025:07:45:39.2329 -- 2009:025:07:51:26.9127	Missing data	Reason unrecorded
2009:025:08:31:25.5356 -- 2009:025:08:47:06.2660	Missing data	Multibeam secured
2009:025:09:29:04.1043 -- 2009:025:09:34:18.0043	Missing data	Multibeam secured
2009:025:10:15:31.5782 -- 2009:025:10:22:05.4144	Missing data	Multibeam secured
2009:025:11:06:53.2815 -- 2009:025:11:12:01.9163	Missing data	Multibeam secured
2009:025:12:03:32.9465 -- 2009:025:12:13:00.6057	Missing data	Multibeam secured
2009:025:12:54:39.8363 -- 2009:025:13:03:00.2952	Missing data	Multibeam secured
2009:025:13:57:10.7916 -- 2009:025:14:08:07.0119	Missing data	Displaying inaccurate data
2009:025:14:44:08.0473 -- 2009:025:14:55:32.2987	Missing data	Displaying inaccurate data
2009:025:15:36:21.3260 -- 2009:025:15:49:16.8892	Missing data	Multibeam secured
2009:025:16:36:07.4576 -- 2009:025:16:46:57.2726	Missing data	Multibeam secured
2009:025:17:28:28.7222 -- 2009:025:17:37:38.5843	Missing data	Multibeam secured
2009:025:18:17:47.2557 -- 2009:025:18:33:00.9250	Missing data	Multibeam secured
2009:025:19:30:23.0269 -- 2009:025:19:46:08.5076	Missing data	Multibeam secured
2009:025:20:32:11.9202 -- 2009:025:20:48:52.5257	Missing data	Multibeam secured
2009:025:21:50:48.6221 -- 2009:025:22:04:41.6827	Missing data	Multibeam secured
2009:025:22:43:12.5743 -- 2009:025:22:53:39.3589	Missing data	Multibeam secured
2009:025:23:55:30.2840 -- 2009:026:00:00:10.1691	Missing data	Multibeam secured
2009:026:00:37:36.7822 -- 2009:026:00:43:42.7888	Missing data	Multibeam secured

2009:026:01:13:18.7686 -- 2009:026:01:19:09.1058	Missing data	Multibeam secured
2009:026:01:52:15.3311 -- 2009:026:01:58:29.6208	Missing data	Multibeam secured
2009:026:02:36:16.6841 -- 2009:026:02:42:18.8019	Missing data	Multibeam secured
2009:026:03:13:51.3898 -- 2009:026:03:21:20.4742	Missing data	Multibeam secured
2009:026:03:58:54.6322 -- 2009:026:04:04:17.5636	Missing data	Multibeam secured
2009:026:05:08:13.1898 -- 2009:026:05:14:12.3217	Missing data	Multibeam secured
2009:026:05:52:34.3699 -- 2009:026:05:58:26.3156	Missing data	Multibeam secured
2009:026:06:44:51.4948 -- 2009:026:06:50:33.6749	Missing data	Multibeam secured
2009:026:07:36:05.4173 -- 2009:026:07:41:50.8312	Missing data	Multibeam secured
2009:026:08:32:17.2715 -- 2009:026:08:37:30.9214	Missing data	Multibeam secured
2009:026:09:15:11.6562 -- 2009:026:09:20:57.4618	Missing data	Multibeam secured
2009:026:10:18:44.4865 -- 2009:026:10:24:56.6820	Missing data	Multibeam secured
2009:026:11:06:55.3347 -- 2009:026:11:18:10.2276	Missing data	Multibeam secured
2009:026:11:55:04.5578 -- 2009:026:12:02:56.9863	Missing data	Multibeam secured
2009:026:12:42:20.9539 -- 2009:026:12:56:31.6872	Missing data	Multibeam secured
2009:026:13:33:40.9390 -- 2009:026:13:44:33.8325	Missing data	Multibeam secured
2009:026:14:36:50.5361 -- 2009:026:14:49:29.0058	Missing data	Multibeam secured
2009:026:15:33:00.2042 -- 2009:026:15:42:24.7553	Missing data	Multibeam secured
2009:026:16:36:43.7528 -- 2009:026:16:41:13.6374	Missing data	Multibeam secured
2009:026:17:27:41.5832 -- 2009:026:17:32:49.5452	Missing data	Multibeam secured
2009:026:18:31:09.0693 -- 2009:026:18:36:49.9217	Missing data	Multibeam secured
2009:026:19:49:11.0374 -- 2009:026:19:59:00.9335	Missing data	Multibeam secured
2009:026:20:44:08.5347 -- 2009:026:20:48:52.4042	Missing data	Multibeam secured
2009:026:21:35:05.9564 -- 2009:026:21:40:54.7935	Missing data	Multibeam secured
2009:026:23:15:41.4581 -- 2009:026:23:22:35.1366	Missing data	Multibeam secured
2009:027:00:23:28.8586 -- 2009:027:00:28:44.8214	Missing data	Multibeam secured
2009:027:01:14:16.3429 -- 2009:027:01:19:20.2591	Missing data	Multibeam secured
2009:027:21:26:51.9937 -- 2009:027:22:19:28.9418	Missing data	Datalogger down
2009:040:22:51:22.3192 -- 2009:042:12:30:56.2388	Missing data	Multibeam off/Knudsen 3.5 KHz off
2009:042:19:07:23.8364 -- 2009:042:19:15:55.2016	Missing data	Multibeam/Knudsen secured
2009:042:20:13:03.1945 -- 2009:042:20:28:22.6132	Missing data	Multibeam/Knudsen secured

2009:042:21:18:28.0999 -- 2009:042:21:27:52.6500	Missing data	Multibeam secured
2009:042:22:14:35.0482 -- 2009:042:22:24:37.1454	Missing data	Multibeam secured
2009:042:23:20:17.6087 -- 2009:042:23:30:58.4719	Missing data	Multibeam secured
2009:043:00:12:55.2642 -- 2009:043:00:22:18.3630	Missing data	Multibeam/Knudsen secured
2009:043:01:11:06.0394 -- 2009:043:01:18:46.6545	Missing data	Multibeam/Knudsen secured
2009:043:01:51:47.4749 -- 2009:043:01:57:53.4207	Missing data	Multibeam/Knudsen secured
2009:043:02:23:49.6534 -- 2009:043:02:32:36.5668	Missing data	Multibeam/Knudsen secured
2009:043:02:59:36.0653 -- 2009:043:03:06:04.5261	Missing data	Multibeam/Knudsen secured
2009:043:03:34:38.7736 -- 2009:043:03:41:24.3119	Missing data	Multibeam/Knudsen secured
2009:043:04:08:26.0766 -- 2009:043:04:14:18.1171	Missing data	Multibeam/Knudsen secured
2009:043:05:09:37.8141 -- 2009:043:05:15:17.0737	Missing data	Multibeam/Knudsen secured
2009:043:05:47:06.0656 -- 2009:043:05:51:16.7491	Missing data	Multibeam/Knudsen secured
2009:043:06:26:22.9102 -- 2009:043:06:36:50.9206	Missing data	Multibeam/Knudsen secured
2009:043:07:20:13.5154 -- 2009:043:07:38:47.9929	Missing data	Multibeam/Knudsen secured
2009:043:08:19:42.4105 -- 2009:043:08:31:00.4749	Missing data	Multibeam/Knudsen secured
2009:043:09:08:48.9752 -- 2009:043:09:20:24.3060	Missing data	Multibeam/Knudsen secured
2009:043:10:01:45.7856 -- 2009:043:10:16:41.0179	Missing data	Multibeam/Knudsen secured
2009:043:10:55:27.4543 -- 2009:043:11:05:24.5681	Missing data	Multibeam/Knudsen secured
2009:043:11:38:25.1359 -- 2009:043:11:48:04.7336	Missing data	Multibeam/Knudsen secured
2009:043:12:25:30.4852 -- 2009:043:12:35:18.7556	Missing data	Multibeam/Knudsen secured
2009:043:13:10:13.2918 -- 2009:043:13:21:12.6241	Missing data	Multibeam/Knudsen secured

2009:043:13:53:15.0188 -- 2009:043:14:02:04.4328	Missing data	Multibeam/Knudsen secured
2009:043:14:33:53.5041 -- 2009:043:14:44:09.6793	Missing data	Multibeam/Knudsen secured
2009:067:20:00:00.0000		Logging officially ended

Bath02 data format

```
bath02      2008:192:00:00:12.6663  $KGDPT,2938.25,0.0,12000.0*4a
bath02      2008:192:00:00:30.3301  $KGDPT,2954.08,0.0,12000.0*4f
bath02      2008:192:00:00:46.5831  $KGDPT,2958.32,0.0,12000.0*4a
bath02      2008:192:00:01:03.0606  $KGDPT,2954.18,0.0,12000.0*4e
```

DS50 Speedlog

File id: slog01
Logging interval: 1 second

The Furuno DS-50 is a Doppler speed log. It was in operation for the length of the cruise.

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2009:021:00:00:01.2939		Logging officially started
2009:027:21:26:59.5577 -- 2009:027:22:19:04.7342	Missing data	Datalogger down
2009:044:18:44:39.7935 -- 2009:044:18:45:30.8277	Missing data	Rebooted speed log
2009:067:20:00:00.0000		Logging officially ended

Slog01 data format:

```
slog01      2008:231:00:00:00.0744  $VDVHW,,T,,M,09.68,N,17.93,K*4C
slog01      2008:231:00:00:00.1906  $VDVBW,009.68,000.09,A,009.68,000.09,V*46
slog01      2008:231:00:00:00.1908  $VDVLW,0005960.30,N,0005960.30,N*5F
```

RMYoung Integrated Weather

File id: wx01
Logging interval: 1 second

The weather station is used to log wind speed, direction, air temperature, and barometric pressure. The unit was functioning during the cruise. See also mwv01 below.

Log Date	Event	Comment
2009:021:00:00:00.5846		Logging officially started
2009:026:02:10:54.0145 -- 2009:026:02:19:47.0282	Missing data	Equipment malfunction
2009:027:21:26:59.5150 -- 2009:027:22:19:51.5942	Missing data	Datalogger down
2009:067:20:00:00.0000		Logging officially ended

File id: mwv01
Logging interval: 1 second

The weather station is used to log wind speed, direction, air temperature, and barometric pressure. The wx01 strings are converted in real-time to produce mwv strings for the DP. The mwv output is strictly a derivative of the w01 output. See also the wx01 description above.

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2009:021:00:00:00.5846		Logging officially started
2009:026:02:10:54.0145 -- 2009:026:02:19:47.0282	Missing data	Equipment malfunction
2009:027:21:26:59.5150 -- 2009:027:22:20:15.5933	Missing data	Datalogger down
2009:067:20:00:00.0000		Logging officially ended

Mwv01 data sample:

```
mwv01 2008:231:00:00:00.5173  6.1   6.6   6.6   8.8 354 321   5   0.0   0.0   0.0
0.0 355 355   0 ***** ***** ***** *****  8  8  8 1009.7
mwv01 2008:231:00:00:01.5172  5.9   6.6   6.6   8.8 353 321   5   0.0   0.0   0.0
0.0 355 355   0 ***** ***** ***** *****  8  8  8 1009.6
mwv01 2008:231:00:00:02.5190  6.3   6.6   6.6   8.8 354 321   5   0.0   0.0   0.0
0.0 355 355   0 ***** ***** ***** *****  8  8  8 1009.8
```

CNAV
Logging interval: 1 second

File id: cnav

The C-NAV is a global satellite-based differential receiver. This is the best individual receiver currently on the ship. This system was operational during the cruise.

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2009:021:00:00:00.0666		Logging officially started
2009:027:21:27:00.0327 -- 2009:027:22:17:52.6440	Missing data	Datalogger down

2009:067:20:00:00.0000		Logging officially ended

Cnav data format:

```
cnav  2008:231:00:00:00.6936
$GPGGA,000000.00,1434.94372,N,10444.85748,W,2,8,1.1,15.52,M,-20.60,M,9,0108*65
cnav  2008:231:00:00:00.7137  $GPVTG,006.5,T,,M,9.64,N,17.85,K*53
```

GC80 Gyrocompass

The GC80 gyrocompass is installed on the bridge and used for ship and seismic navigation.

File id: gy01
Logging interval: 1 second

The GC80 gyrocompass operated normally.

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2009:021:00:00:00.0476		Logging officially started
2009:027:21:26:59.7902 -- 2009:027:22:18:37.9368	Missing data	Datalogger down
2009:067:20:00:00.0000		Logging officially ended

Gy01 data format:

```
gy01  2008:231:00:00:00.4110  $PTKM,HEALM,0000,0,G1*09
gy01  2008:231:00:00:00.6395  $HEHDT,005.8,T*22
gy01  2008:231:00:00:00.6396  $HEROT,-005.25,A*34
gy01  2008:231:00:00:01.6394  $HEHDT,005.7,T*2D
gy01  2008:231:00:00:01.6395  $HEROT,-004.53,A*34
```

POSMV Integrated Nav

The POS/MV is a receiver that uses CNAV input in addition to its own antennae, an inertial sensor and optional RTG, WTC, or WAAS corrections and a Kalman filter to produce a smooth navigation output and very accurate heading.

The PosMV operated normally during the cruise.

File id: posmv
Logging interval: 1 second

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2009:021:00:00:00.0236		Logging officially started
2009:027:21:26:59.5726 -- 2009:027:22:19:29.4037	Missing data	Datalogger down
2009:048:03:46:59.3769 -- 2009:048:04:05:11.0644	Missing data	Not getting output
2009:067:20:00:00.0000		Logging officially ended

Posmv data format:

```
posmv 2008:231:00:00:00.0885
      $INGGA,235959.842,1434.95002,N,10444.85734,W,2,,1.1,12.71,M,,,9.0,0108*2E
posmv 2008:231:00:00:00.0889  $INHDT,15.0,T*11
posmv 2008:231:00:00:00.2047  $INVTG,7.0,T,,M,9.7,N,17.9,K*46
posmv 2008:231:00:00:00.3208  $INGST,235959.842,,0.9,0.9,0.0,0.9,0.9,2.5*51
posmv 2008:231:00:00:00.4411  $PASHR,235959.842,15.05,T,-
0.58,0.48,0.15,0.069,0.069,0.045,2,0*05
posmv 2008:231:00:00:00.4412  $INZDA,235959.0000,17,08,2008,,*73
```

SeaPath Integrated Nav

The Kongsberg Seapath is an integrated navigation system. It was in operation for the length of the cruise.

Logging interval: 1 second

File id: seapath

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2009:021:00:00:00.0728		Logging officially started
2009:027:21:26:59.9406 -- 2009:027:22:18:16.1935	Missing data	Datalogger down
2009:054:23:31:47.1625 -- 2009:054:23:32:40.1723	Missing data	Power cycle
2009:067:20:00:00.0000		Logging officially ended

Seapath data format:

```
seapath     2008:231:00:00:00.0504  $INZDA,235959.99,17,08,2008,,*73
seapath     2008:231:00:00:00.1686
      $INGGA,235959.99,1434.953109,N,10444.859147,W,2,08,1.1,-
16.30,M,,M,1.0,0291*70
seapath     2008:231:00:00:00.1687  $INVTG,5.97,T,,M,9.7,N,,K,D*03
seapath     2008:231:00:00:00.1688  $INHDT,5.82,T*1A
```

Spectrum Instruments TDM-4 Event Logger

The Event logger time stamps time-break triggers from DigiShot in all fire modes.

File id: tagger1

Logging interval: 1 second

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2009:022:21:05:44.0296		Logging officially started
2009:022:21:09:42.4120 -- 2009:022:21:09:53.8442	Missing data	Reason unrecorded
2009:022:21:13:03.4802 -- 2009:022:21:27:47.4796	Missing data	Reason unrecorded
2009:022:21:28:18.2876 -- 2009:022:21:28:31.6413	Missing data	Reason unrecorded
2009:022:21:28:39.8616 -- 2009:022:21:28:52.7455	Missing data	Reason unrecorded
2009:026:06:37:31.8607 -- 2009:026:06:45:57.3620	Missing data	Reason unrecorded
2009:027:21:27:00.0306 -- 2009:028:19:53:44.0443	Missing data	Datalogger down
2009:067:20:00:00.0000		Logging officially ended

Tagger1 data format:

```
tagger1     2008:231:00:00:00.0383  #51,08182008,000001
tagger1     2008:231:00:00:00.2027  #79,00000000
tagger1     2008:231:00:00:00.2948  #68,2
tagger1     2008:231:00:00:00.3689  #70,0
tagger1     2008:231:00:00:00.4010  #56,-00000
tagger1     2008:231:00:00:00.4210  #72,FF
```

Geometrics 882 Magnetometer

The Geometrics 882 magnetometer is towed behind the ship. Raw serial output is logged using LDS. Deployment is dependent upon seismic operations. See the deployment notes below. Except where noted, the source was not deployed when the magnetometer was at 300m, and the source was deployed when the magnetometer was at 100m.

Magnetometer Deployment Notes

Time	Event
2009:029:03:02	Deployed at 100 m
2009:029:04:14	Maggie cable crossed over string 3 cable
2009:029:20:08	Recovered
2009:031:01:02	Recovered
2009:031:02:42	Deployed at 100 m
2009:031:10:01	Recovered
2009:031:11:56	Deployed at 100 m
2009:032:00:43	Recovered
2009:032:02:13	Deployed at 100 m
2009:032:07:17	Recovered

2009:032:08:44	Deployed at 100 m
2009:034:01:40	Recovered
2009:034:02:43	Deployed at 100 m
2009:035:03:33	Recovered
2009:035:04:24	Deployed at 100 m
2009:035:21:18	Recovered
2009:035:22:54	Deployed at 100 m
2009:036:17:58	Recovered
2009:035:23:05	Deployed at 100 m
2009:040:21:46	Recovered
2009:042:12:19	Deployed at 300 m
2009:042:18:52	Recovered
2009:043:14:51	Deployed at 100 m
2009:043:17:48	Recovered
2009:044:23:57	Deployed at 100 m
2009:044:07:30	Recovered
2009:044:09:00	Deployed at 100 m
2009:045:02:27	Recovered
2009:045:02:52	Deployed at 100 m
2009:046:07:15	Recovered
2009:046:08:15	Deployed at 100 m
2009:047:04:19	Recovered
2009:047:07:15	Deployed at 100 m
2009:048:07:02	Recovered
2009:048:08:28	Deployed at 100 m
2009:049:03:13	Recovered
2009:049:04:41	Deployed at 100 m
2009:049:23:37	Recovered
2009:050:01:00	Deployed at 100 m
2009:050:18:22	Recovered
2009:050:20:06	Deployed at 100 m
2009:051:04:06	Recovered
2009:051:04:47	Deployed at 100 m
2009:052:01:50	Recovered
2009:052:03:30	Deployed at 100 m
2009:054:03:46	Recovered
2009:054:05:04	Deployed at 100 m
2009:054:19:19	Recovered
2009:054:20:49	Deployed at 100 m
2009:055:15:14	Recovered
2009:059:08:21	Deployed at 100 m, no source deployed
2009:059:11:25	Recovered
2009:059:11:35	Deployed at 300 m

Logging interval: 1 second

File id: mag01

Interruptions greater than ten seconds are displayed in the following table.

Log Date	**Event**	**Comment**
2009:028:05:54:29.4916		Logging officially started
2009:028:05:55:17.4878 -- 2009:028:06:17:39.8995	Missing data	Reason unrecorded
2009:028:18:30:03.0353 -- 2009:029:03:01:01.5188	Missing data	Reason unrecorded
2009:029:20:08:17.1084 -- 2009:029:23:04:49.5156	Missing data	Maggie powered down
2009:031:01:02:10.3831 -- 2009:031:02:42:24.5061	Missing data	Maggie powered down
2009:031:10:01:14.3884 -- 2009:031:11:55:12.9675	Missing data	Maggie powered down
2009:032:00:43:31.0126 -- 2009:032:02:17:08.8548	Missing data	Maggie powered down
2009:032:07:11:18.1037 -- 2009:032:08:43:59.7886	Missing data	Maggie powered down
2009:034:01:30:31.5542 -- 2009:034:04:45:08.8356	Missing data	Maggie powered down
2009:035:03:29:13.3583 -- 2009:035:04:29:08.0500	Missing data	Maggie powered down
2009:035:21:17:33.4807 -- 2009:035:22:53:59.9810	Missing data	Maggie powered down
2009:036:17:57:59.0672 -- 2009:036:23:05:44.2374	Missing data	Maggie powered down
2009:040:21:46:10.7950 -- 2009:042:12:52:00.2072	Missing data	Maggie powered down
2009:042:18:43:07.3125 -- 2009:043:14:57:46.2567	Missing data	Maggie powered down
2009:043:17:41:23.8384 -- 2009:043:23:56:16.0431	Missing data	Maggie powered down
2009:044:07:29:59.8911 -- 2009:044:09:00:25.7480	Missing data	Maggie powered down
2009:045:02:21:12.1070 -- 2009:045:02:59:45.5902	Missing data	Maggie powered down
2009:046:07:07:04.3109 -- 2009:046:09:03:26.8094	Missing data	Maggie powered down
2009:047:04:14:46.8868 -- 2009:047:07:16:53.4840	Missing data	Maggie powered down
2009:048:06:54:31.8917 -- 2009:048:08:29:17.9842	Missing data	Maggie powered down
2009:049:03:08:16.1526 -- 2009:049:04:44:33.5480	Missing data	Maggie powered down
2009:049:23:24:25.7174 -- 2009:050:00:58:05.6692	Missing data	Maggie powered down
2009:050:18:22:31.0286 -- 2009:050:20:06:00.6030	Missing data	Maggie powered down
2009:051:04:03:21.3932 -- 2009:051:04:46:33.3202	Missing data	Maggie powered down
2009:052:01:46:35.1308 -- 2009:052:03:33:51.8951	Missing data	Maggie powered down
2009:054:03:40:46.5847 -- 2009:054:05:07:48.1352	Missing data	Maggie powered down
2009:054:19:18:58.9778 -- 2009:054:20:50:34.1417	Missing data	Maggie powered down
2009:059:11:24:46.0632 -- 2009:059:11:36:30.5219	Missing data	Maggie powered down
2009:067:20:00:00.0000		Logging officially ended

Mag01 data sample:

```
mag01 2008:185:09:45:58.1820  $107714.673,0042,0024,0110,3533,1143
mag01 2008:185:09:46:01.0333  $ 63703.933,0042,0024,0110,3533,1143
mag01 2008:185:09:46:04.0330  $ 44031.029,0042,0027,0110,3533,1143
```

SBE-23 Thermosalinograph

The Seabird TSG output is logged by LDS to the "tsg" set. Output is also converted in real-time and recorded to the "tsgconv" data set.

File id: tsg

Logging interval: 1 second

Interruptions greater than ten seconds are displayed in the following table.

2009:023:19:52:43.0749		Logging officially started
2009:024:20:02:12.9541 -- 2009:024:20:02:52.9529	Missing data	Reason unrecorded
2009:024:20:19:42.9513 -- 2009:024:20:20:32.9499	Missing data	Reason unrecorded
2009:027:21:26:52.5918 -- 2009:027:22:20:42.5870	Missing data	Datalogger down
2009:043:02:00:50.7993 -- 2009:043:03:49:29.8030	Missing data	Reason unrecorded
2009:043:03:49:30.0353 -- 2009:043:04:24:08.7866	Missing data	Memory failed
2009:058:12:57:46.9628 -- 2009:058:13:03:26.9625	Missing data	Reason unrecorded
2009:067:20:00:00.0000		Logging officially ended

tsg data sample:

```
tsg   2008:231:00:00:01.9179  B479CB5528A6D6ABFB2D
tsg   2008:231:00:00:11.9187  B474CB5428A799ABBB2D
tsg   2008:231:00:00:21.9176  B46FCB5328A70CAB8B2D
```

File id: tsgconv

Logging interval: 1 second

2009:023:19:52:43.0749		Logging officially started
2009:024:20:02:12.9541 -- 2009:024:20:02:52.9529	Missing data	Reason unrecorded
2009:024:20:19:42.9513 -- 2009:024:20:20:32.9499	Missing data	Reason unrecorded
2009:027:21:26:52.5918 -- 2009:027:22:20:42.5870	Missing data	Datalogger down
2009:043:02:00:50.7993 -- 2009:043:03:49:29.8030	Missing data	Reason unrecorded
2009:043:03:49:30.0353 -- 2009:043:04:24:08.7866	Missing data	Memory failed
2009:058:12:57:46.9628 -- 2009:058:13:03:26.9625	Missing data	Reason unrecorded

2009:067:20:00:00.0000		Logging officially ended

tsgconv data sample:

```
tsgconv     2008:231:00:00:01.9179  B479CB5528A6D6ABFB2D 1531.59 28.85 24.35 5.53
33.74
tsgconv     2008:231:00:00:11.9187  B474CB5428A799ABBB2D 1531.61 28.85 24.36 5.53
33.74
tsgconv     2008:231:00:00:21.9176  B46FCB5328A70CAB8B2D 1531.60 28.85 24.35 5.53
33.74
```

BGM-3 Gravimeter

File id: vc01
Logging interval: 1 second

Interruptions greater than ten seconds are displayed in the following table.

2009:021:00:00:00.8242		Logging officially started
2009:027:21:26:59.1062 -- 2009:027:22:19:42.1197	Missing data	Datalogger down
2009:067:20:00:00.0000		Logging officially ended

PCO2

File id: pco2
Logging interval: 160 second

Interruptions greater than three hundred seconds are displayed in the following table.

2009:024:21:42:49.0623		Logging officially started
2009:027:21:26:34.0057 -- 2009:027:22:24:04.0931	Missing data	Datalogger down
2009:030:08:22:51.3739 -- 2009:031:03:33:54.0277	Missing data	pCO2 offline
2009:031:03:48:15.6461 -- 2009:031:04:01:55.6666	Missing data	Restarted pCO2
2009:034:05:36:42.1454		Logging officially ended

Mk21 XBT System

Files: *.RDF,*.EDF

Many XBT drops were made during this cruise. Refer to the Expendable_Drops spreadsheet in the operations directory of the cruise archive.

IV. Seismic Summary

A. Acquisition Parameter Table

Acquisition Parameter Table	
AcquisitionParameterID	MGL0903_ACQ01
FieldActivityID	MGL0903
ReceiverType	Sourve-only/Ocean-Bottom Seimometer
SourceType	Airgun
Acquisition System Name	SIO, WHOI OBS
Acquisition System Type	OBS
Seismic_Nav_System	C-Nav primary
Survey_datum	WGS84
Navigation Reference Point	Fore/Aft+4.87 m, Stb/pt +8.055 m, vertical +14.5 m
NRP_to_Antennae	4.87 m
NRP to source	165 m
Antenna_to_Source	
Source_to_Near_Channel	200 m
Number _of_channels_recorded	0
Number _of_cables	0
Number_of_channels_each_cable	N/A
Channel_length	N/A
Cable_length	N/A
Cable_spacing	N/A
Near_Channel_Number	N/A
Cable_depth	N/A
Number_source_arrays	1
Alternate_Shooting	No
Source_array_separation	N/A
Source_volume	6600 cu in
Source_pressure	2000 psi nominal
Source_make,model	Bolt
Source_number	36
Source_depth	9.0 m
Shot_control	Distance
Shot_Interval	450m, 475m, 500m
Sample_interval	N/A
Record_length	N/A
Compass_birds	N/A
Tail_buoy_Positioning	N/A
Recording_delay	N/A

B. Seismic Overview

Insert objectives here

Physical Configuration

The towing configuration for the air guns and streamers is detailed in the document titled ***MGL0903_TowConfig.doc***.

Offsets

All antenna and in-water offset drawings are in the file ***MGL0903_OffsetConfig.xls***

Spectra

Spectra was used for all timing and navigation during the cruise. Shotlogs were generated from spectra P190 and P294 files using shotlog processing code contained on the archive in /supplemental/code/shotlog

V. Client Instrumentation

59 OBS instrument were used during this cruise. 25 were deployed twice. Refer to the

VI. RV Langseth Gravity Tie Information

Insert gravity time info here.

VII. Archive Contents

Key files are bolded.

MGL0903/docs	Cruise documents and logs
MGL0903/docs/elog	Cruise elog
MGL0903/docs/Operations/	Operations documents
MGL0903/docs/Operations/Nav_Logs	Seismic navigation logs (spectra)
MGL0903/docs/Operations/Observer_Logs	Seismic acquisition logs (gun controller)
MGL0903/docs/Operations/MGL0903_B15_line_log_multi_channel_seismics.xls	**Master line log table**
MGL0903/docs/Operations/ShipmentDocuments	Shipment logs/invoices
MGL0903/docs/Operations/StreamerSheets	Streamer logs (deploy/recovery, ballast)
MGL0903/docs/Operations/Waypoints	Waypoint files
MGL0903/docs/Personnel	Personnel rosters, org chart, bunk and phone lists
MGL0903/docs/planning	Planning documents
MGL0903/docs/Report	Cruise Report and supplemental docs
MGL0903/docs/Report/MGL0903_NavReport.doc	**Seismic navigation report**
MGL0903/docs/Report/MGL0903_DataReport.doc	**This file**
Cruisedata/MGL0903/docs/Report/MGL0903_TowConfig.xls	**Seismic tow drawings**
MGL0903/docs/Report/Sequence_Report.xls	**Sequence report**
MGL0903/docs/ScreenCaps	Screen captures
MGL0903/processed	Processed data
MGL0903/processed/svp	Sound velocity profiles
MGL0903/raw	Raw data
MGL0903/raw/knudsen	Raw Knudsen sub-bottom profiler data
MGL0903/raw/multibeam	Raw EM120 data
MGL0903/raw/serial	Underway data: gps, tsg, weather, etc.
MGL0903/raw/spectra/P1	Spectra underway p190
MGL0903/raw/spectra/P2	Raw seismic navigation, p294
MGL0903/raw/spectra/survey	Spectra config archive
MGL0903/raw/XBT	Raw XBT data
MGL0903/scratch	Miscellaneous files