

RV Langseth Data Reduction Summary

MGL1002

Astoria, Oregon – Honolulu, Hawaii

Preliminary

V0.2, 2010-05-19

Lamont-Doherty Earth Observatory, Columbia University

Tues May 18 22:00:00 2010

Date	Julian Date	Time	Port
2010-05-07	2010-127	1330 UTC, 0830L	Astoria, Oregon
2010-05-19	2010-139	1800 UTC, 0800L	Honolulu, Hawaii

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

I. Background and Scientific Objectives

The first part of *R/V Marcus G. Langseth* leg MGL1002 was a transit from Astoria, OR to Oahu, Hawaii. In Hawaii a launch came out to transfer personnel to the vessel. The second part then began, the sea acceptance test and calibration of the Kongsberg EM122 multibeam sonar.

II. Personnel

Shipboard Technical Staff

1	Steinhaus, Robert	Technician-in-charge
2	Johnson, Anthony	Technician, Chief Nav
3	McKiernan, Bern	Technician, ET/Acquisition
5	Ng, David	Technician, IT/Navigation
6	Rupert, Jeff	Marine Science Coordinator

Ship's Crew

1	Landow, Mark C.	Captain
2	Zeigler, Stanley	Relief Captain
3	Zatwarnicki Jr, James R.	Chief Mate
4	Wolford, David H.	2 nd Mate
5	Widerman, Rachel A.	3 rd Mate
6	Woronowicz, Jason J.	Bosun
7	Cereno, George G.	AB
8	Baxter, Gordon M.	AB
9	Paragas, Petronio S.	AB
10	Rimando, Inocencio B	AB
11	Applewhite, Nicky, R.	OS
12	Karlyn, Albert D.	Chief Engr.
13	Tucke, Matthew S.	1 st Engr.
14	Pollock, Thomas Z.	2 nd Engr.
15	Lapham, Trevor M.	3 rd Engr.
16	Billips, Charles W.	Oiler
17	Florendo, Rodolfo A.	Oiler
18	Chase, Jerald F.	Oiler
19	McLean Fuller, Hervin	Steward
20	Rios, Ricardo	Cook
21	Jack Schwartz	Electrician

Science Party

1	John Diebold	Chief Scientist	LDEO
2	Jim Holik	Observer	NSF
3	Colburn, Ted	Inspector	JMS
4	Sandy Shor	Observer	Univ. Hawaii
5	Tim McGovern	Observer	Univ. Hawaii
6	Suzanne O'Hara	Technician	LDEO
7	Tim Newberger	Technician	LDEO
8	Rupert, Jeff		

Technicians

7	Hohing, Chuck	Technician	Kongsberg
8	Harris, Jared	Technician	Kongsberg
9	Gobet, Mauro	Technician	Rolls Royce
10	Whyte, Ian	Technician	Rolls Royce

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	Full	serial logs	MGL-bath01.*	1s
EM120	Kongsberg EM120 Multibeam Sonar	Full	raw output to file	See below	variable
			centerbeam serial logs	MGL-bath02.*	variable
Knudsen	Knudsen 3260 Sub-bottom Profiler	Full	keb files	See below	variable
			kea files	See below	variable
DS50	Furuno DS50 Doppler Speedlog	Full	serial logs	MGL-slog01.*	1s
XBT	Sippican MK21 XBT Launcher	12 Drops	raw output to file	See below	n/a
			converted output to file	See below	n/a
WX1	RM Young 5103 Weather Bird and Translator	Full	serial logs	MGL-wx01.*	1s
			mwv conversion	MGL-mwv01.*	1s
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	On Deploy	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	Kongsberg SeaPath Integrated Nav System	Full	serial logs	MGL-seapath.*	1s
MICROSV1	Applied Microsystems MicroSV	Full	serial logs	MGL-microsv01	1s
MICROSV2	Applied Microsystems MicroSV	Full	serial logs	MGL-microsv02	1s
RAINPYR	RMYoung Rain Gauge & Eppley PSP	Full	serial logs	MGL-rainpyr	1s

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
2010:127:00:00:00.0000		Logging officially started
2010:136:02:40:26.2269 - 2010:136:14:21:40.3144	Missing data	Turned instrument on/off at seabuoy point
2010:136:14:22:24.6273 - 2010:136:14:49:04.2623	Missing data	Turned instrument on/off at seabuoy point
2010:139:06:00:06.1294 - 2010:139:13:39:54.0762	Missing data	Turned instrument on/off at seabuoy point
2010:139:18:00:00.0000		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 MGL1002/raw/multibeam. Center beam depth is recorded separately to serial log. Sound velocity input from the pod MicroSV was used throughout this cruise. XBT's, XCTD's, and a SBE19 cast were used for sound velocity profile input.

The EM122 software was updated on May 16, from 3.6.4 to 3.7.

Logging interval: variable with water depth

File id: bath02

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

Log Date	Event	Comment
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2010:127:00:00:00.0000		Logging officially started
2010:127:19:04:54.6130 - 2010:127:19:08:58.7775	Missing data	Calibration and testing
2010:127:19:09:25.0708 - 2010:127:22:04:36.6213	Missing data	Calibration and testing
2010:127:23:25:23.5184 - 2010:127:23:34:07.2260	Missing data	Calibration and testing
2010:128:18:25:25.2822 - 2010:128:18:29:16.1502	Missing data	Calibration and testing
2010:129:15:27:36.5088 - 2010:129:15:43:39.0353	Missing data	Calibration and testing
2010:130:16:17:11.8747 - 2010:130:16:29:59.3381	Missing data	Calibration and testing
2010:131:04:05:51.2869 - 2010:131:04:29:27.6942	Missing data	Calibration and testing
2010:134:00:04:12.0318 - 2010:134:00:12:56.4066	Missing data	Calibration and testing
2010:136:18:13:53.2531 - 2010:136:18:15:54.3403	Missing data	Calibration and testing
2010:137:01:15:31.9121 - 2010:137:01:19:17.4149	Missing data	Calibration and testing
2010:137:01:31:39.4701 - 2010:137:01:37:02.8621	Missing data	Calibration and testing
2010:137:04:35:17.9120 - 2010:137:04:46:56.7934	Missing data	Calibration and testing
2010:137:05:36:04.1045 - 2010:137:06:22:38.6750	Missing data	Calibration and testing
2010:137:06:22:56.9698 - 2010:137:06:38:18.4298	Missing data	Calibration and testing
2010:137:06:43:13.8986 - 2010:137:06:45:36.2289	Missing data	Calibration and testing
2010:137:08:49:07.6872 - 2010:137:08:51:57.4916	Missing data	Calibration and testing
2010:137:09:59:07.1159 - 2010:137:10:12:29.6018	Missing data	Calibration and testing
2010:137:13:52:40.8602 - 2010:137:13:55:05.6325	Missing data	Calibration and testing
2010:137:14:07:03.1697 - 2010:137:14:13:04.6434	Missing data	Calibration and testing
2010:137:18:12:55.3538 - 2010:137:18:18:37.6547	Missing data	Calibration and testing
2010:137:18:46:59.6366 - 2010:137:18:50:12.9680	Missing data	Calibration and testing
2010:137:19:11:33.3036 - 2010:137:20:02:16.0869	Missing data	Calibration and testing
2010:137:21:11:17.1538 - 2010:137:22:13:35.0713	Missing data	Calibration and testing
2010:137:22:54:17.3835 - 2010:137:23:34:33.8965	Missing data	Calibration and testing
2010:137:23:43:33.1380 - 2010:137:23:50:13.6594	Missing data	Calibration and testing
2010:138:00:00:37.6805 - 2010:138:00:04:16.4400	Missing data	Calibration and testing
2010:138:12:04:08.8701 - 2010:138:12:29:52.2911	Missing data	Calibration and testing
2010:138:12:31:31.1024 - 2010:138:12:47:36.9493	Missing data	Calibration and testing
2010:138:12:54:34.8454 - 2010:138:13:26:36.0119	Missing data	Calibration and testing
2010:138:13:30:35.7133 - 2010:138:13:34:56.1976	Missing data	Calibration and testing
2010:138:18:54:41.4212 - 2010:138:19:19:43.3624	Missing data	Calibration and testing

2010:138:19:31:13.6904 - 2010:138:19:38:54.3984	Missing data	Calibration and testing
2010:138:19:39:23.9477 - 2010:138:19:41:32.6482	Missing data	Calibration and testing
2010:138:21:32:09.9918 - 2010:138:21:41:19.1748	Missing data	Calibration and testing
2010:139:02:47:02.2976 - 2010:139:03:41:54.1679	Missing data	Calibration and testing
2010:139:18:00:00.0000		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
2010:127:00:00:00.0000		Logging officially started
2010:131:04:05:57.6122 - 2010:131:04:06:32.1907	Missing data	Reason not specified
2010:131:18:38:49.9399 - 2010:131:18:39:15.8121	Missing data	Reason not specified
2010:131:20:33:12.1965 - 2010:131:20:33:38.1145	Missing data	Reason not specified
2010:131:22:46:28.7353 - 2010:131:22:46:54.7824	Missing data	Reason not specified
2010:131:22:57:48.9098 - 2010:131:22:58:13.8378	Missing data	Reason not specified
2010:131:23:06:23.9381 - 2010:131:23:06:48.4981	Missing data	Reason not specified
2010:132:20:23:14.7313 - 2010:132:20:23:39.2274	Missing data	Reason not specified
2010:132:20:33:41.9255 - 2010:132:20:34:07.8917	Missing data	Reason not specified
2010:132:21:22:40.4931 - 2010:132:21:23:06.6193	Missing data	Reason not specified
2010:133:00:07:16.9381 - 2010:133:00:08:48.0831	Missing data	Reason not specified
2010:133:15:50:42.1019 - 2010:133:15:51:06.6939	Missing data	Reason not specified
2010:137:23:40:28.6169 - 2010:137:23:43:57.8590	Missing data	Reason not specified
2010:139:18:00:00.0000		Logging officially

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
2010:127:00:00:00.0000		Logging officially started
2010:139:18:00:00.0000		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
2010:127:00:00:00.0000		Logging officially started
2010:139:18:00:00.0000		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
2010:127:00:00:00.0000		Logging officially started
2010:131:22:07:08.3499 - 2010:131:22:07:24.6866	Missing data	Reason not specified
2010:138:12:24:03.7671 - 2010:138:12:24:45.5738	Missing data	Integration testing with EM122
2010:138:13:05:25.7857 - 2010:138:13:07:31.2062	Missing data	Integration testing with EM122
2010:139:18:00:00.0000		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
2010:127:00:00:00.0000		Logging officially started
2010:133:17:27:40.1378 - 2010:133:17:29:13.2788	Missing data	Instrument reset due to reduced reading
2010:139:18:00:00.0000		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

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
n/a	n/a

Logging interval: 1 second

File id: mag01

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

Log Date	Event	Comment
2010:127:00:00:00.0000		Logging officially started
2010:139:18:00:00.0000		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

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.

2010:127:00:00:00.0000		Logging officially started
2010:127:23:44:33.6252 - 2010:127:23:46:03.6222	Missing data	Calibration and testing
2010:127:23:54:13.6174 - 2010:127:23:57:13.6211	Missing data	Calibration and testing
2010:128:00:08:03.6154 - 2010:128:00:09:23.6119	Missing data	Calibration and testing
2010:128:00:10:43.6063 - 2010:128:00:11:13.6186	Missing data	Calibration and testing
2010:128:00:11:43.6199 - 2010:128:00:14:23.6159	Missing data	Calibration and testing
2010:139:18:00:00.0000		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

2010:127:00:00:00.0000		Logging officially started
2010:127:23:54:13.6174 - 2010:127:23:59:23.6088	Missing data	Calibration and testing
010:128:00:07:03.6178 - 2010:128:00:07:43.6085	Missing data	Calibration and testing
2010:128:00:08:03.6154 - 2010:128:00:11:23.6131	Missing data	Calibration and testing
2010:128:00:11:43.6199 - 2010:128:00:14:23.6159	Missing data	Calibration and testing
2010:139:18:00:00.0000		Logging officially ended

tsgconv data sample:

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

BGM-3 Gravimeter

File id: vc01

Logging interval: 1 second

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

2010:127:00:00:00.0000		Logging officially started
2010:139:18:00:00.0000		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.

Applied Microsystems MicroSV

Langseth has three sound velocity probes; one in the pod, one in the uncontaminated seawater system instrumentation array, and one in the wet lab sink.

File id: microSV01

Location: Wet lab sink

Logging interval: 1 second

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

2010:127:00:00:00.0000		Logging officially started
2010:131:04:05:59.0662 - 2010:131:04:06:09.5416	Missing data	Power Failure
2010:139:18:00:00.0000		Logging officially ended

File id: microSV02

Location: USS instrumentation array

Logging interval: 1 second

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

2010:127:00:00:00.0000		Logging officially started
2010:138:19:27:10.6499 - 2010:138:19:27:22.8095	Missing data	Power secured for EM122 noise testing
2010:139:18:00:00.0000		Logging officially ended

RM Young Rain Gauge

The RMYoung Rain Gage was installed during the transit from Astoria. The data has not been qualified.

File id: rainpyr01

Location: OBS Deck winch booth

Logging interval: 1 second

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

2010:127:00:00:00.0000		Logging officially started
2010:139:18:00:00.0000		Logging officially ended

Eppley PSP

The Eppley Rain gage was installed during the transit from Astoria. The data has not been qualified.

Serial # 21260F3

File id: rainpyr01

Location: OBS Deck winch booth

Logging interval: 1 second

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

2010:127:00:00:00.0000		Logging officially started
2010:139:18:00:00.0000		Logging officially

		ended
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IV. RV Langseth Gravity Tie Information

The Gravimeter was tied before and after the cruise at the tie point located at the pier in Astoria.

Date / Time	Ship Location	Reference Location	Mistie
2010-05-21	UH Marine Center 21 18.9603 N 157 53.1743 W	US Army Museum 46 11.42 N 123 51.52 W	Unavailable

Please refer to the documents located under MGL1002/docs/gravtie for detailed records.

V. Archive Contents

Key files are bolded.

MGL1002/docs	Cruise documents and logs
MGL1002/docs/eelog	Cruise eelog
MGL1002/docs/map	Cruise maps, track map
MGL1002/docs/operations/	Operations documents
MGL1002/docs/operations/Daily Reports	Cruise Daily Reports from Tech-in-charge
MGL1002/docs/permits	Clearance Documents
MGL1002/docs/waypoints	Waypoint files
MGL1002/docs/personnel	Personnel rosters, org chart, bunk and phone lists
MGL1002/docs/reports	Cruise Report and supplemental docs
MGL1002/docs/reports/MGL1002_DataReport.doc	This file
MGL1002/docs/ScreenCaps	Screen captures
MGL1002/processed	Processed data
MGL1002/processed/svp	Sound velocity profiles
MGL1002/raw	Raw data
MGL1002/raw/knudsen	Raw Knudsen sub-bottom profiler data
MGL1002/raw/multibeam	Raw EM120 data
MGL1002/raw/serial	Underway data: GPS, tsg, weather, etc.
MGL1002/raw/XBT	Raw XBT data