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R/V Maurice Ewing Data Reduction Summary

EW–0113 Freemantle, W. Australia – Freemantle, W. Australia

Date	Julian Date	Time	Port
October 29, 2001	302	02:00:00	Freemantle, W.A.
December 2, 2001	336	06:30:00	Freemantle, W.A

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John Smith	Steward	
David Philbrick	Bosun	
Bachelor, John	Cook	
Ewing, Robert	A/B	
Lee, Daniel	Oiler	
McNeal, Fred	O/S	
Moqo, Luke	Utility	
Noonan, Meg	A/B	
Scanlan, Elizabeth	A/B	
Strickland, Gordon	Oiler	
Uribe, Fernando	Oiler	

All data in this report is logged using GMT time and Julian days in order to avoid confusion with local time changes.

Spectra

Spectra logs data to files in UKOOA[1] P1/90 format and P2/94 Format. The file formats are included in separate PDF documents on the tape. The contents of these files contain all the parameters used during shooting each of the lines, as well as the positions of all the sensors. I have included perl scripts for extracting shot times and positions from the P1 and P2 files on the tape.

Positioning of Sensors

The Spectra system defines a reference point which is used as a reference to all points which need an offset (range and bearing to TB, for example). This reference point has been defined as the center of the ship's mast, at sealevel.

Any documentation included herein that refers to the vessel reference or reference or master will be referring to this reference point.

However, daily navigation files that are not related to spectra (ie. n., hb.n, mg.n, files) are referenced to the Tasmon P−Code GPS filtered positions.

Offset information can be found under the **Ship Diagrams** section of this document.

Data Reduction

Since spectra positions its shots precisely based on a Kalman filtering algorithm, we will assume that it has the correct shot location. However, as a fallback measure, I have also processed the shots using our normal navigation filtering.

Therefore you will find the following shotlog files:

- nb0.r Contains shot times and positions based on Spectra positioning.
- nb2.r Contains shot times and positions based on Spectra navigation
- ts.n Contains shot times and positions based on Ewing navigation
- shots.p1 Contains shot times and positions based on Spectra P1 files
- shots.p2 Contains shot times and positions based on Spectra P2 files

Please see the File Formats section for more information on these files.

Hydrosweep

There were several chronic problems with hydrosweep data acquisition.

1. Examination of raw multi−beam data revealed a 0.5 degree roll bias error.
2. The system intermittenly went into a "narrow" swath mode, losing several beams.

1 United Kingdom Offshore Operators Association

Gravity

There were no gravity data interruptions.

Seismic Acquisition

Streamer configuration files are included on the tape in Excel 97 format.

Data Logging

The R/V Maurice Ewing data logging system is run on a Sparc Ultra Enterprise Server. Attached are 48 serial ports via 3 16−port Digi International SCSI Terminal Servers. Generally, all data logged by the Ewing Data Acquisition System (DAS) is time stamped with the CPU time of the server, and broadcast to the Ewing network using UDP packet broadcasts. The CPU time of the server is synchronized once every half hour to a Datum UTC gps time clock.

GPS times are also time−tagged with cpu time, although the time of the GPS position is from the GPS fix itself.

The following tables describe the data instruments which performed logging during this cruise. The tables associated with the instruments describe logging periods and data losses for that instrument.

Time Reference

JoeTime 9390−1000

logging interval: 30 minutes
file id: tr3

Used as the CPU synchronization clock. This clock is polled once every half hour to synchronize the CPU clock of the data logger to UTC time. The logger (octopus) is responsible for updating the times of the other CPUs.

Note that the Spectra system uses its own Trimble gps receiver for synchronizing its hardware to UTC time. This is the time the shot points are referenced to; not the CPU time.

Interruption s greater than 30 minutes are displayed in the following table

Log Date	LogDate	Comment
2001+302:00:10:29.724		Logging officially started
2001+106:23:45:29.725	2001+113:15:40:30.083	Data interruption
		Logging officially ends

Spectra

Spectra uses its own Trimble gps receiver for synchronizing its hardware to UTC time. This is the time the shot points are referenced to; not the CPU time.

Spectra P1 and P2 files were logged for each

GPS Receivers

GPS data is usually logged at 10 second intervals. The NMEA strings GPGGA and GPVTG are logged for position, speed, and heading fixes. This data was logged constantly throughout the cruise.

The Tasmon GPS was the primary GPS for this cruise.

Trimble Tasmon P/Y Code Receiver

logging interval: 10 seconds
file id: gp1

The Tasmon is the primary GPS receiver for the Ewing Logging system and the primary GPS for Spectra fixes. The accuracy is around 15 meters. There were no interruptions during this cruise.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2001+302:01:18:00.205		Logging officially starts
2001+303:14:36:30.632	2001+303:14:59:01.708	Data interruption
2001+303:15:19:56.594	2001+303:15:32:36.367	Data interruption
2001+303:15:33:38.547	2001+303:15:51:54.035	Data interruption
2001+303:15:52:24.521	2001+303:16:04:14.460	Data interruption
2001+305:11:11:48.897	2001+305:11:56:57.604	Data interruption
2001+335:23:59:55.226		Logging officially ends

Trimble NT200D

logging interval: 10 seconds
file id: gp2

The Trimble is the secondary receiver for GPS data. Data is logged at 10 second intervals and is also used as an input to Spectra, although it is weighed at a lower value than the Tasmon receiver. During this cruise, there were several Trimble outages.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2001+302:01:24:19.777		Logging officially started
2001+303:14:32:54.132	2001+303:14:59:09.902	Data Interruption
2001+303:15:19:55.919	2001+303:15:51:59.616	Data Interruption
2001+303:15:52:23.601	2001+303:16:04:27.617	Data Interruption
2001+305:11:12:13.943	2001+305:12:00:47.707	Data Interruption
2001+306:16:32:49.901	2001+306:16:48:41.718	Data Interruption
2001+309:01:41:37.948	2001+309:03:05:15.659	Data Interruption
2001+309:03:15:35.836	2001+310:03:27:13.634	

Log Date	LogDate	Comment
2001+313:11:44:21.803	2001+313:11:59:11.604	
2001+314:00:08:01.860	2001+316:06:35:17.623	
2001+319:04:53:39.818	2001+319:11:15:07.612	
2001+326:07:44:15.825	2001+326:08:12:49.617	
2001+327:15:46:27.582	2001+327:19:12:47.604	
2001+328:07:21:27.829	2001+328:23:44:14.160	
2001+331:05:01:19.822	2001+332:05:29:45.621	
2001+333:16:22:31.819	2001+334:00:16:57.637	
2001+335:23:59:54.152		Logging officially ends

Tailbuoy Garmin GP8

logging interval: 10 seconds
file id: tb1

The tailbuoy receiver was working during all lines with the exception of minor blackouts during deployment and turns.

Interruptions greater than 30 minutes are displayed in the following table

Log Date	Log Date	Comment
2001+312:22:49:00.314		Tailbouy logging starts
2001+320:16:21:47.635	2001+320:17:16:27.532	Data Interruption
2001+325:22:59:05.583		Tailbuoy logging officially ends

Speed and Heading

Furuno CI−30 Dual Axis Speed Log
Sperry MK−27 Gyro

logging interval: 6 seconds
file id: fu

The Furuno and Gyro are combined to output speed, heading and course information to a raw Furuno file, as well as an NMEA VDVHW signal used as an input to various systems including steering and Spectra.

Interruptions greater than 30 minutes are displayed in the following table

Log Date	Log Date	Comment
2001+302:01:19:07.159		Logging officially starts
2001+305:11:09:41.607	2001+305:11:57:23.523	Data Interruption
2001+335:23:59:58.206		Logging officially ends

Gravity

Bell Aerospace BGM−3 Marine Gravity Meter System

logging interval: 1 second
file id: vc. (raw), vt. (processed)
drift per day:

The BGM consists of a forced feedback accelerometer mounted on a gyro stabilized platform. The gravity meter outputs raw counts approximately once per second which are logged and processed to provide real−time gravity displays during the course of the cruise as well as adjusted gravity data at the end of the cruise.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	Log Date	Comment
2001+302:01:19:52.788		Official start date
2001+303:15:35:26.788	2001+303:16:05:16.761	Lost BGM output
2001+305:11:08:14.925	2001+305:11:57:40.863	Lost BGM output
2001+335:23:59:59.826		Logging officially ends

Bathymetry

Krupp Atlas Hydrosweep−DS

logging interval: variable based on water depth
file id: hb (centerbeam), hs (swath)

The hydrosweep full swath data is continuously logged for every cruise, and centerbeam data is extracted and processed separately. The centerbeam operates at a logging frequency dependent on the water depth.

The full swath data is not routinely processed, but can be processed with the MB−System software which can be downloaded for free. For instructions, use the website: http://www.ldeo.columbia.edu/MB−System.

MBSystem, version 4.6.10 is necessary to process data after Jan 1, 2000.

Note: During OBS deployment and recovery, the hydrosweep was routinely suspended to avoid interference with the standard wide beam profilers. Those interruptions should not be listed.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2001+302:18:27:11.000		Logging officially starts
2001+303:15:13:14.000	2001+303:16:07:59.000	HS Interruption
2001+303:16:07:59.000	2001+303:16:34:51.000	HS Interruption
2001+314:05:22:08.000	2001+314:05:51:57.000	HS Interruption
2001+334:22:42:49.000		Logging officially ends

Weather Station

RM Young Precision Meteorological Instruments, 26700 series

logging interval: 1 minute
file id: wx

The weather station is used to log wind speed, direction, air temperature, and barometric pressure. We log this information at 1−minute intervals.

Log Date	LogDate	Comment
2001+302:01:21:01.016		Logging officially starts
2001+302:01:21:01.016	2001+302:18:28:43.574	Data Interruption
2001+303:15:36:00.199	2001+304:02:12:00.084	Data Interruption
2001+305:11:09:00.082	2001+305:11:58:23.098	Data Interruption
2001+335:23:59:00.868		Official end logging

Magnetics

Varian Magnetometer

logging interval: 12 seconds
file id: mg

Interruptions greater than 10 minutes are displayed in the following table

Start Log Date	End LogDate	Comment
2001+303:08:44:28.457		Official start logging
2001+303:15:34:48.808	2001+303:16:05:54.601	Data Interruption
2001+305:03:00:41.531	2001+305:12:02:25.935	Data Interruption
2001+306:01:41:54.369	2001+307:08:20:18.800	Data Interruption
2001+309:20:58:03.877	2001+313:03:24:46.205	Data Interruption
2001+314:02:57:41.605	2001+314:03:18:09.486	Data Interruption
2001+314:03:18:20.883	2001+314:04:08:36.312	Data Interruption
2001+314:04:22:30.460	2001+314:04:50:03.944	Data Interruption
2001+314:05:09:58.349	2001+314:10:46:37.695	Data Interruption
2001+325:21:09:35.346	2001+328:23:43:24.850	Data Interruption
2001+328:23:52:27.952	2001+329:01:21:45.205	Data Interruption
001+329:05:29:25.924		Official end logging

As this was the second cruise using the Spectra system to fire the guns and log the shot times, we are still in the process of integrating the Spectra system into the Ewing system. this has resulted in some compromises in shot logging.

The following items were of concern during this cruise:

- The P2 and P1 formats do not store the shot time in millisecond range
- SIOSEIS cannot handle the Spectra output header for SEG−D

Due to these facts, a system has been created where the Spectra header, data from the Digicourse cable output, data from the gun depths, and real−time data from the Ewing logging system are all used to create a Ewing standard SEG−D header readable by SIOSEIS to place on the 3490 tape for each shot.

There are several files for each line reflecting the line status:

File	Description
ts.n	Shot time is merged with Ewing navigation to determine shot location
nb2.r	Navigation is from Spectra, and includes tailbuoy, tailbuoy range and bearing
shotlog.p1	Shots are from the p1 file. (should be identical to nb2.r), includes source position
shotlog.p2	Shots are from the p2 file (should be identical to tss.n), includes source position

Shot Files Table

Line Name	Times ()	Ewing(ts.n, nb2.r)		Spectra (shots.p1, shotlog.p2)		
		Shots	Missing	P1 Shots	P2 Shots	Missing
Ex_OBS_ Line1	307:11:13:52 20:53:39.464	0019−2385	0006−0018	0006−2385	0001−2385	
Ex_MCS_ Line1	313:05:53:02 314:05:04:14	0004−3866		0004−3862 (last shots misnumbered)	0004−3862 (last shots misnumbered)	
Ex_MCS_ Line1B	314:05:50:36 315:15:49:15	3998−9961		3998−9961	3998−9961	
Ex_MCS_ Line2	315:23:13:25 318:09:05:06	0001−9509	2979,2980	0001−9509	0001−9509	
Ex_MCS_ Line3	318:17:19:24 320:16:11:07	0002−7533	0001,4643, and 4644	0001−7533	0001−7533	
Ex_MCS_ Line4	320:18:36:06 321:13:27:11	0023−3283		0023−3283	0023−3283	
Ex_MCS_ Line5	321:13:44:22 323:09:41:20	0033−7489	4159	0033−7489	0033−7489	

Line Name	Times ()	Ewing(ts.n, nb2.r)		Spectra (shots.p1, shotlog.p2)		
		Shots	Missing	P1 Shots	P2 Shots	Missing
Ex_MCS_Line6	323:18:46:05 325:09:50:20	0001−6863	2334, 5451, 6405	0001−6863	0001−6863	
Ex_MCS_Line7	325:18:27:38 325:21:12:41	0019−0466		0019−0466	0019−0466	
Ex_OBS_Line2	329:01:36:22 330:13:44:37	0051−1707		0051−1707	0051−1707	

Freemantle, W.A.

EW0113 Fremantle, Australia

Pier/Ship	Latitude	Longitude
	32 03.156S	115 44.251E

The pier tie was taken at Bollard "E", which is the 6th Bollard from the end of the pie

Reference	Latitude	Longitude
	31 58.900S	115 48.800E

The reference tie was made to ACIC 3651-1. This in the basement of the Geology Building at the University of Western Australia.

	Id	Julian	Date	Mistie	Drift/Day	Prev Mistie
Pre Cruise	EW0112	296	10/23/2001	34.68	0.22	27.73
Post Cruise	EW0112	299	10/26/2001	8.94	-8.580	34.68
Total Days			3.00	-25.74		

Time	Entry	Value	
15:00	CDeck Level BELOW Pier	2.00	
13:30	Pier 1 L&R Value	3028.48	L&R
14:00	Reference L&R Value	3006.91	L&R
14:40	Pier 2 L&R Value	3028.48	L&R
	Reference Gravity	979394.47	mGals
	Gravity Meter Value (BGM Reading)	979428.60	mGals
	Potsdam Corrected	0	1 if corrected

*Gravity meter is **5.5** meters below CDeck*

Difference in meters between Gravity Meter and Pier: 7.50 meters

Height Cor = Pier Height* FAA Constant

7.50	0.31			2.33 mGals/min

Difference in mGals between Pier and Gravity Meter

Pier (avg) – Reference *1.06 L&R/mGal = Delta L&R

3028.48	3006.91	1.06		22.86 mGals

Gravity in mGals at Pierside

Reference + Delta mGals [+ Potsdam] = Pier Gravity

979394.47	22.86	0.00		979417.33 mgals

Gravity in mGals at Meter

Pier Gravity+ Height Correction = Gravity@meter

979417.33	2.33			979419.66 mGals

Current Mistie

BGM Reading Calculated Gravity = Current Mistie

979428.60	979419.66			8.94 mGals

Freemantle, W.A.

EW0113 Fremantle, Australia

Pier/Ship	Latitude	Longitude
	32 02.960S	115 44.720E

The pier tie was taken at Bollard 57, which is near Shed D at

Reference	Latitude	Longitude
	32 03.156S	115 48.800E

The reference tie was made to Bollard "E" which is the 6th Bollard from the end of th

	Id	Julian	Date	Mistie	Drift/Day	Prev Mistie
Pre Cruise	EW0112	299	10/26/2001	8.94	−8.58	34.68
Post Cruise	EW0113	338	12/03/2001	9.22	0.007	8.94
Total Days			38.00	0.28		

Time	Entry	Value	
10:30	CDeck Level BELOW Pier	2.00	
10:00	Pier 1 L&R Value	3025.70	L&R
14:00	Reference L&R Value	3028.20	L&R
10:05	Pier 2 L&R Value	3025.70	L&R
	Reference Gravity	979417.30	mGals
	Gravity Meter Value (BGM Reading)	979426.20	mGals
	Potsdam Corrected	0	1 if corrected

*Gravity meter is **5.5** meters below CDeck*

Height Cor = Difference in meters between Gravity Meter and Pier Height* FAA Constant

7.50 meters	7.50	0.31			2.33 mGals/min

Difference in mGals between Pier and Gravity Meter

Pier (avg) −	Reference	*1.06 L&R/mGal		Delta L&R
3025.70	3028.20	1.06		−2.65 mGals

Gravity in mGals at Pierside

Reference	+ Delta mGals	[+ Potsdam]		Pier Gravity
979417.30	−2.65	0.00		979414.65 mgals

Gravity in mGals at Meter

Pier Gravity+	Height Correction			Gravity@meter
979414.65	2.33			979416.98 mGals

Current Mistie

BGM Reading	Calculated Gravity			Current Mistie
979426.20	979416.98			9.22 mGals

For all formats, a – in the time field means an invalid value for some reason.

Streamer Compass/Bird Data cb.r

This data is not processed, but can still be found in the "processed" data directory.

```
Shot Time               Line     Shot     Latitude      Longitude

2000+079:00:08:40.085  strike1 000296  N 15 49.6217 W 060 19.8019

2nd GPS Position                      Tailbuoy Position
Latitude     Longitude                Latitude     Longitude

N 15 49.6189 W 060 19.8101    N 15 47.1234 W 060 20.1901

Furuno  Streamer
Gyro    Compasses & Heading

344.1       C01 2.3 C02 1.7  ...
```

Gun Depths dg

Gun depths in tenths of meters. There will always be 20 gundepths even if only one gun was configured and shooting.

```
                        Gun Depths
Shot Time               1   2   3  4    5   6   7   8   9  ...  20

2001+089:06:47:05.909 189 068 005 005 096 005 060 054 005 ... 6
```

Raw Furuno Log fu.s

This data has been smoothed and output 1 fix per minute.

```
CPU Time Stamp         Track Speed Hdg   Gyro

2000+166:00:01:53.091 –     4.4   140.5 148.3
```

Hydrosweep Centerbeam hb.n

Hydrosweep data merged with navigation

```
                              Centerbeam
CPU Time Stamp       Latitude Longitude          Depth

2000+074:09:55:00.000  N 13 6.6206    W 59 39.3908   134.9
```

Merged Data m

```
                                                        GPS
CPU Time Stamp         Latitude     Longitude          Used  Set  Drift Depth

2000+200:12:25:00.000  N 45 54.1583 W 42 47.1770       gp1   0.0  0.0

Magnetic                        Gravity
Total Intensity   Anomaly     FAA  GRV       EOTVOS   Drift   Shift

49464.7           55.5        22.2 980735.0   –8.4     –0.1     2.8

Temperature Salinity Conductivity

0.0         0.0      0.0
```

The gravity drift and shift are values that have been added to the raw gravity to make up for drift in the meter that has been lost in accordance with a gravity check at each port stop.

Temperature,Salinity and Conductivity will only be valid while logging a Thermosalinograph, which is not usually the case.

Magnetics Data mg.n

- A minus sign in the time stamp is flagged as a spike point, probably noise...
- Anomaly is based on the International Geomagnetic Reference Field revision 2000

```
CPU Time Stamp        Latitude     Longitude      Raw Value Anomaly
200+077:00:23:00.000 N 16 11.2918 W  59 47.8258 36752.2   -166.8
```

Navigation File n

```
CPU Time Stamp         Latitude     Longitude       Used  Set  Drift
2000+074:00:03:00.000 N 13 6.2214  W  59 37.9399   gp1   0.0   0.0
```

Navigation Block nb0

Navigation is a compendium of Ewing logged data at shot time. The shot position here is the shot position from the Spectra system.

```
Shot Time               Shot # CPU Time               Shot Position
2001+088:00:00:00.606 016967 2001+088:00:00:03.031 N 30 11.8324 W 042 10.8162

Water  Sea    Wind   -------------Tailbuoy------------------ Line
Depth  Temp Spd  Dir Latitude     Longitude     Range Bearg Name   Speed Heading
2565.1 20.7 16.4 164 N 30 12.0427 W 042 14.7319 6296.3 93.5 MEG-10 4.2   101.1
```

Tailbuoy Navigation tb1.c

Raw tailbuoy fixes

```
CPU Time Stamp         Latitude     Longitude       GPS Precision
2001+088:00:00:02.000 N 30 12.0424 W 042 14.7309   SA
```

GPS Precision is either SA, DIFF or PCODE

Ewing Processed Shot Times ts.n

Shot times and positions based on the Ewing navigation data processing

```
CPU Time Stamp         Shot # Latitude     Longitude     Line Name
2000+079:00:08:01.507 000295 N 15 49.5703 W 060 19.7843 strike1
```

Shot Data Status ts.n.status

The ts.nxxx.status file describes the line information for that day, giving some basic statistics about the line: start, end times; missing shots; start and end shots.

```
LINE   strike1: 98+079:00:00:15.568 : 000283 .. 002286
        MISSING: 347, 410, 1727
LINE   dip2: 98+079:23:05:22.899 : 000002 .. 000151
```

This example says that on Julian Day 079 of 1998, two lines (strike1 and dip2) were run: the end of strike 1 (shots 000283 to 002286) and the start of dip2 (shots 000002 to 000151).

Line strike1 had some missing shots in the data file (probably missing on the SEG-d header as well).

Spectra Shot Times — nb2.r

The shot times and positions based on the Spectra positioning; with raw tailbuoy range and bearing.

```
CPU Time Stamp          Shot # Latitude      Longitude      Line Name
2001+084:00:00:05.924 009245 N 23 31.2410 W 045 25.0894

                                 Tailbuoy
Latitude      Longitude      Range  Bearing  Line Name
N 23 30.4540 W 045 21.4338 6389.8 283.2    KANE-4
```

Raw Gravity Counts — vc.r

sample BGM-3 gravity count record (without time tag):

```
pp:dddddd ss
|    |    |___________ status: 00 = No DNV error; 01 = Platform DNV
|    |                         02 = Sensor DNV;   03 = Both DNV's
|    |________________ count typically 025000 or 250000
|_____________________ counting interval, 01 or 10
                       The input of data can be at 1 or 10 seconds.
```

Gravity Data — vt.n

* A minus sign in the time stamp is flagged as a spike point
* m_grv3 calculates the Eotvos correction as:
  eotvos_corr = 7.5038 * vel_east * cos(lat) + .004154 * vel*vel
* The theoretical gravity value is based upon different models for the earth's shape.
  - 1930 = 1930 International Gravity Formula
  - 1967 = 1967 Geodetic Reference System Formula
  - 1980 = 1980 Gravity Formula
* The FAA is computed as:
  faa = corrected_grv – theoretical_grv
* Velocity smoothing is performed w/ a 5 point window

```
CPU Time Stamp          Latitude      Longitude      Model FAA      RAW
2000+148:00:10:00.000 N 09 34.7255 W 085 38.5826 1980  9.48    978264.16

Eotvos  Drift DC      Raw  Velocity     Smooth Velocity
Smooth  Total Shift   North     East     North    East
-74.78  0.06  4.16    1.875 -10.373     1.927 \10.166
```

Joe Time — ts3.r

```
CPU Time                Datum Time        Time Reference
2001+069:00:15:29.727 069 00 15 29.378 datum
```

Raw GPS — gp(12).d, tb1.d

Raw GPS is in NMEA Format.

Meteorological Data — wx

```
                          True
CPU Time Stamp          Spd Dir

2001+045:00:00:00.967   7.8  22

Bird1:                                          Bird 2
Speed                    Direction              Speed                    Direction
Inst  60sA   60mA  60sM  Inst 60sA 60mA         Inst  60sA  60mA  60sM   Inst 60sA 60mA

7.8   6.6    8.5   16.8  277  291  5           0.0   0.0   0.0   0.0    0    0    0

Temperature                    Humidity
Inst  60mA  60mm  60mM         Inst 60mm 60mM          Barometer

15.0  14.2  14.3  15.1         92   90   93            1027.5

Inst:       Current

60sA:       60 second average

60mA:       60 minute average

60sM:       60 second maximum

60mm:       60 minute minimum

60mM:       60 minute maximum
```

Shot Times from Spectra P1 Files — shots.p1

These files were created with the script: *extract_shots_from_p1* ***–a 1***

```
Epoch Time     Shot#  Source Lat/Lon          TB Lat      TB Lon
985788741.000 015570 30.283881 –41.854536  30.320144  –41.886642
Vessel Ref Lat/Lon    Antenna GPS Lat/Lon      Water Depth
30.283478 –41.854117 30.283531  –41.854078  2894.2
```

- Source is the Center of the Guns
- TB is the Tailbuoy, according to Spectra
- Vessel Ref is the location of the center of the Mast
- Antenna GPS is the location of Antenna 1 (–a 1 flag); in this case is the Tasmon GPS
- Water Depth is the HS Centerbeam depth

Shot Times from Spectra P2 Files — shots.p2

These files were created with the script: *extract_shots_from_p2 –o "V1 G1"*

```
Epoch Time   Shot#     Vessel Ref Lat/Lon    Source Lat/Lon
985716772.4 00015572 30.282803 –41.866136 30.283207 \41.866540
```

- Vessel Ref is the location of the center of the Mast
- Source is the Center of the Guns

I have included some scripts for extracting information out of the P1 and P2 formatted files. In order to use these scripts you will also need to install the Ewing Perl libraries I have included in the scripts directory, or at least include that directory in your PERL5LIB environment. It is not my intention to describe how to use perl in this document though.

extract_shots_from_p1 [−a antenna] [−h] filename

Given an input P1 File, create a shotpoint file with the times, and the positions of the given antenna [1 = tasmon, 2 = Trimble] and optionally the header records at the beginning of the file.

The output will be:

```
epochtime shotnumber sourcePos tbPos vesselPos antennaPos depth
```

- **epochtime** is the # of seconds since Jan 1, 1970
- **shotnumber** is the shot number
- **sourcePos** is the center position of the sound source [lat lon]
- **tbPos** is the position of the tailbuoy [lat lon]
- **vesselPos** is the position of the vessel reference (center of mast) [lat lon]
- **antennaPos** is the position of the specified antenna [lat lon]
  1 = tasmon, 2 = trimble
- **depth** is the water depth in meters

extract_shots_from_p2 [−s shotnumber] [−o "output values"]

−s define if you only want the statistics for a single shot

−o "*outputs*" defines the outputs you want from the P2 file.

This routine will output by default the shotpoint, the line name and the shot time. Optionally, you can output position (Lat Lon) info for a number of items:

Outputs can be one or more of the following:

- V1 Vessel 1 Reference
- V1G1 Tasmon GPS Receiver
- V1G2 Trimble GPS Receiver
- V1E1 Hydrosweep Transducer
- TB1 Tailbuoy 1
- S1 Streamer 1
- V1SC Streamer Compasses
- G1 Gun Array 1

All the formats output a Lat Lon pair in decimal degrees. (*West and South being negative*)

Output will be: `epochtime shotnumber [output lat/lon pairs]`

Tape Contents

EW0113/

EW0113.pdf	this document
ew0113.cdf	NetCDF database file of this cruise
ew0113.cdf_nav	NetCDF database file of this cruise' navigation
docs/	File Formats, Spectra manuals
processed/	Processed datafiles merged with navigation
shotlogs/	processed Shot Files
trackplots/	daily cruise track plots (*postscript*)
raw/	Raw data directly from logger
reduction/	Reduced data files
clean/	daily processing directory, includes daily postscript plots of the data.
fixes/	fixes for the RTNu HS loss of d088
scripts/	Perl scripts and their friends
spectra/	P1/90 and P2/94 files from MCS lines
streamer/	Excel spreadsheets of streamer configuration