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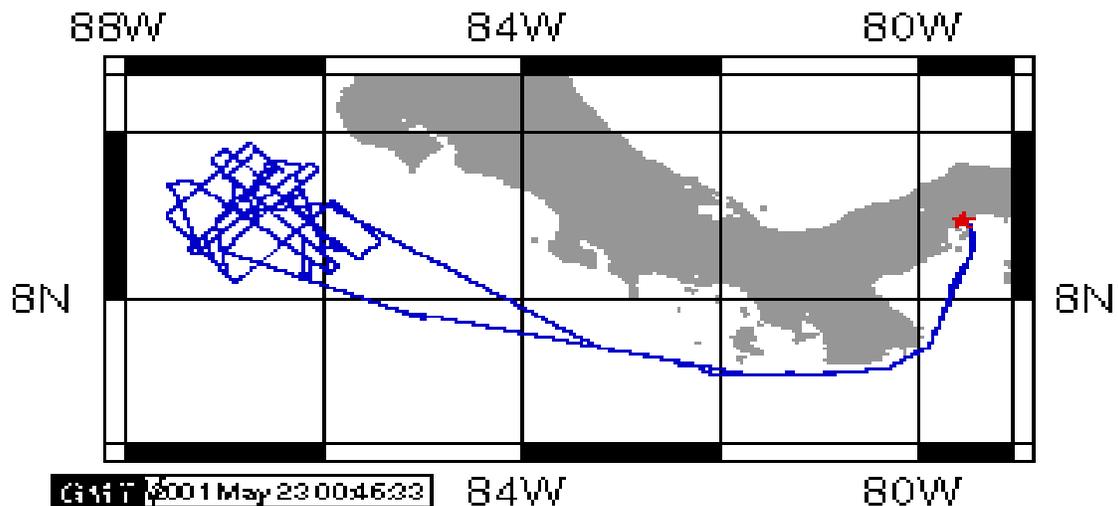
845 365-8677

R/V Maurice Ewing Data Reduction Summary

EW-0104 Colon, Panama - Costa Rica

Date	Julian Date	Time	Port
April 14, 2001	104	08:00:00	Colon, Panama
May 19, 2001	139	09:02:00	Balboa, Panama

EW-0104 Cristobal, Panama - Costa Rica

GMT 2001 May 23 004633

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Bailey, James	A/B	
Benjamin, Aubrey	A/B	
Florendo, Rodlofo	Oiler	
Matos, Francisco	Electrician	
Mecketsy, Meredith	A/B	
Moqo, Luke	Utility	
Smith, John	Steward	
Sypongco, Arnold	O/S	
Taylor, Kelly	Cook	
Tomas, Kelly	A/B	

Uribe, Fernando	Oiler
Wyatt, Richard	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

Hydrosweep acquisition improved markedly during this cruise with 8% average dropouts.

Gravity

There were no gravity data interruptions.

Seismic Acquisition

There were two failures of the Syntron system during this cruise, both attributed to tape drive failures.

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

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1. *United Kingdom Offshore Operators Association*

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

Datum StarTime 9390-1000

- logging interval:30 minutes
  file id:tr2

- 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.

- Unfortunately, due to human error, the datum clock was not being logged for several days during the cruise. During this period, CPU time and GPS time grew to a disparity of 4.929 seconds. As a result, positioning of all the relevant data may be affected by several meters where clock times differ by more than several seconds.

- 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+105:00:15:29.731		Logging officially started
2001+106:23:45:29.725	2001+113:15:40:30.083	Data interruption
2001+138:16:37:02.852		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. However, early in the cruise (~julian day 108), we did experience chronic loss of P-code. On julian day 112, Chris discovered the Tasmon antennae was displaced and repositioned it.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2001+105:00:15:29.731		Logging officially starts
2001+105:14:45:58.873	2001+105:15:09:56.076	Data interruption
2001+138:16:37:02.852		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.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2001+105:00:15:29.731		Logging officially started
2001+105:14:45:57.584	2001+105:15:22:25.662	Data Interruption
2001+106:00:15:18.234	2001+106:00:42:19.988	Data Interruption
2001+106:20:09:58.083	2001+106:21:06:51.875	Data Interruption
2001+106:23:42:20.123	2001+107:00:01:11.866	Data Interruption
2001+120:18:30:31.755	2001+120:19:02:13.870	Data Interruption
2001+126:13:13:53.863	2001+127:00:52:21.906	Data Interruption
2001+138:16:37:02.852		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+107:01:45:52.977		Tailbouy logging starts
2001+116:01:55:25.709		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

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Log Date	Log Date	Comment
2001+105:00:15:29.731		Logging officially starts
2001+138:16:37:02.852		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: 0.035

•The BGM consists of a forced feedback accelerometer mounted on a gyro stabilized plat-
   form. 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+105:00:15:29.731		Official start date
2001+105:14:45:57.013	2001+105:15:13:29.324	Lost BGM output
2001+106:23:42:25.380	2001+106:23:54:23.162	Lost BGM output
2001+138:16:37:02.852		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 fre-
   quency 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 the heat-flow portion of operations, the hydrosweep was routinely sus-
   pended to avoid interference with the standard wide beam profilers. Those interrup-
   tions are not listed.

•Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2001+105:00:15:29.731		Logging officially starts
2001+105:14:37:21.000	2001+105:15:15:04.000	HS Interruption
2001+105:19:35:13.000	2001+105:20:06:27.000	HS Interruption
2001+105:20:06:27.000	2001+105:23:15:10.000	HS Interruption
2001+106:15:25:04.000	2001+106:18:14:54.000	HS Interruption
2001+106:19:01:29.000	2001+107:01:18:31.000	HS Interruption
2001+108:22:14:23.000	2001+108:22:29:11.000	HS Interruption
2001+138:16:37:02.852		Logging officially ends

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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+105:00:15:29.731		Logging officially starts
2001+105:14:46:00.168	2001+105:15:14:36.555	Data Interruption
2001+106:20:10:00.155	2001+106:20:15:10.229	Data Interruption
2001+106:23:42:00.512	2001+106:23:55:17.334	Data Interruption
2001+108:21:52:00.506	2001+108:21:57:20.566	Data Interruption
2001+138:16:37:02.852		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+107:03:20:32.674		Official start logging
2001+116:01:46:15.243		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:

- **•1** The P2 and P1 formats do not store the shot time in millisecond range
- **•2** 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 Digi-course 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
TicoFlux1	107:02:45:42 108:03:53:21	0002-5643	3294, 5642	0001-5641	0001-5643	5642
TicoFlux2	108:04:42:23 108:20:09:29	5660-9436	7320,7423, 7556, 7557, 7617-7621, 8519, 9408	5660-9436	5660-9436	
TicoFlux3	108:22:26:21 109:17:43:52	9350-13870		9350-13870	9350-	
TicoFlux4	109:19:46:03 110:11:24:19	14000-17699	14159, 14389, 14708, 14888, 16992	14000-17699	-17699	
TicoFlux5	110:12:01:42 110:16:24:38	17700-18746		17700-18746	17700-18746	
TicoFlux6	110:16:53:28 111:07:14:22	18749-22114	19949, 19975-19980, 20143, 20144, 21286-21289	18749-22114l	18749-22114	
TicoFlux7	111:07:50:01 111:20:26:32	22201-25147		22201-25147	22201-25147l	
TicoFlux8	111:21:21:40 112:13:19:34	25151-29020	25468, 25707, 27227	25151-29020	25151-29020	
TicoFlux9	112:14:05:46 112:21:33:04	29050-30789		29050-30789	29050-30789	
TicoFlux 10	112:22:13:24 113:01:36:32	30800-31581		30800-31581	30800-31581	

TicoFlux 11	113:02:01:51 114:00:39:56	31590-47400	**Although, the ts.n114.status file suggests missing shots, further inspection of the nb0.r114 and ts.n114 files show shots (37014 - 37017) were merely mis-numbered.**	31590-47400	31590-47400	
TicoFlux 12	114:01:03:48 114:03:30:18	37018-37538	36963-37019	37018-37538	37018-37538	
TicoFlux 13	114:03:51:40 115:01:36:20	37550-42747	40575, 41734	37550-42747	37550-42747	
TicoFlux 14	115:03:57:13 116:01:36:46	42750-42581	43201,	42750-42581	42750-42581	

EW0103 Cristobal, Panama

Pier/Ship	Latitude	Longitude

No Lat/Lon recorded. Docked at the end of Pier 9.

Reference	Latitude	Longitude
	09 21.28N	079 54.59W

Southwest corner of Tide Gauge House, flush with deck of boat landing between piers 8 a room and the elevator.

EW0007		230	09.03.01	3.44	0.02	3.44
	Id	**Julian**	**Date**	**Mistie**	**Drift/Day**	**Prev Mistie**
Pre Cruise	EW0103	97	05.04.01	8.25	0.04	7.30
Post Cruise	Transit	104	14.04.01	8.99	0.082	8.25
Total Days			9.00	0.74		

Time	Entry	Value	
13:20	**CDeck Level BELOW Pier**	1.524m	
13:20	**Pier 1 L&R Value**	1929.60	L&R
13:30	**Reference L&R Value**	1929.35	L&R
13:35	**Pier 2 L&R Value**	1929.54	L&R
###	**Reference Gravity**	978253.60	mGals
22:55	**Gravity Meter Value (BGM Reading)**	978265.00	mGals
	Potsdam Corrected	0	1 if corrected

Gravity meter is   *5.5 meters below CDeck*

	Difference in meters between Gravity Meter and Pier		7.02	meters
Height Cor =	Pier Height*	FAA Constant		
	7.02	0.31		2.18 mGals/min

Difference in mGals between Pier and Gravity Meter

Pier (avg) -	Reference * 1.06 L&R/mGal		Delta L&R	
1929.57	1929.35	1.06		0.23 mGals

Gravity in mGals at Pierside

Reference + Delta mGals [+ Potsdam]			Pier Gravity	
978253.60	0.23	0.00		978253.83 mgals

Gravity in mGals at Meter

Pier Gravity+	Height Correction		Gravity@meter	
978253.83	2.18			978256.01 mGals

Current Mistie

BGM Reading-	Calculated Gravity		Current Mistie	
978265.00	978256.01			8.99 mGals

EW0104 Balboa, Panama

Pier/Ship	Latitude	Longitude
	08 57.250N	079 34.006N

Dry Dock between Pier 14 and Pier 15

Reference	Latitude	Longitude

Used J.S. Readings (see diagram)

	Id	Julian	Date	Mistie	Drift/Day	Prev Mistie
Pre Cruise	Transit	104	14. Apr 01	8.99	0.08	8.25
Post Cruise	EW0104	139	19. May 01	9.82	0.024	8.99
Total Days			35.00	0.83		

Time	Entry	Value	
1400	CDeck Level BELOW Pier	1.57	
1400	Pier 1 L&R Value	1919.60	L&R
1400	Reference L&R Value	1920.81	L&R
1400	Pier 2 L&R Value	1919.25	L&R
	Reference Gravity	978224.17	mGals
	Gravity Meter Value (BGM Reading)	978248.30	mGals
	Potsdam Corrected	1	1 if corrected

Gravity meter is 5.5 meters below CDeck

	Difference in meters between Gravity Meter and Pier			7.07	meters
Height Cor =	Pier Height*	FAA Constant			
	7.07	0.31		2.19	mGals/min

Difference in mGals between Pier and Gravity Meter

Pier (avg) -	Reference *	1.06 L&R/mGal		Delta L&R	
1919.43	1920.81	1.06		-1.47	mGals

Gravity in mGals at Pierside

Reference +	Delta mGals	[+ Potsdam]		Pier Gravity	
978224.17	-1.47	13.60		978236.30	mgals

Gravity in mGals at Meter

Pier Gravity+	Height Correction			Gravity@meter	
978236.30	2.19			978238.49	mGals

Current Mistie

BGM Reading-	Calculated Gravity			Current Mistie	
978248.30	978238.49			9.81	mGals

FILE FORMATS

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    LongitudeLatitude    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     LatitudeLongitude   Depth

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

MERGED DATA   M

```
                                           GPS
CPU Time StampLatitude    LongitudeUsed  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   AnomalyFAA  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 Thermosalino-
graph, which is not usually the case.
```

MAGNETICS DATA   MG.N

```
•1 A minus sign in the time stamp is flagged as a spike point, probably noise...
```

•**2** 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 Smooth	Drift Total	DC Shift	Raw Velocity North	East	Smooth Velocity North	East
-74.78	0.06	4.16	1.875	-10.373	1.927	\10.166

DATUM TIME *TS2.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: Speed Inst	60sA	Direction 60mA	60sM	Speed Inst	60sA	60mA	Bird 2 Inst	60sA	Direction 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 Inst	60mA	60mm	60mM	Humidity 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
```

•**1** Source is the Center of the Guns

•**2** TB is the Tailbuoy, according to Spectra

•**1** Vessel Ref is the location of the center of the Mast

•**2** Antenna GPS is the location of Antenna 1 (-a 1 flag); in this case is the Tasmon GPS

•**1** 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
```

•**1** Vessel Ref is the location of the center of the Mast

•**2** 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
```

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

EW0104/

EW0104.pdf	this document
ew0104.cdf	NetCDF database file of this cruise
ew0104.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.
scripts/	Perl scripts and their friends
spectra/	P1/90 and P2/94 files from MCS lines
streamer/	Excel spreadsheets of streamer configuration