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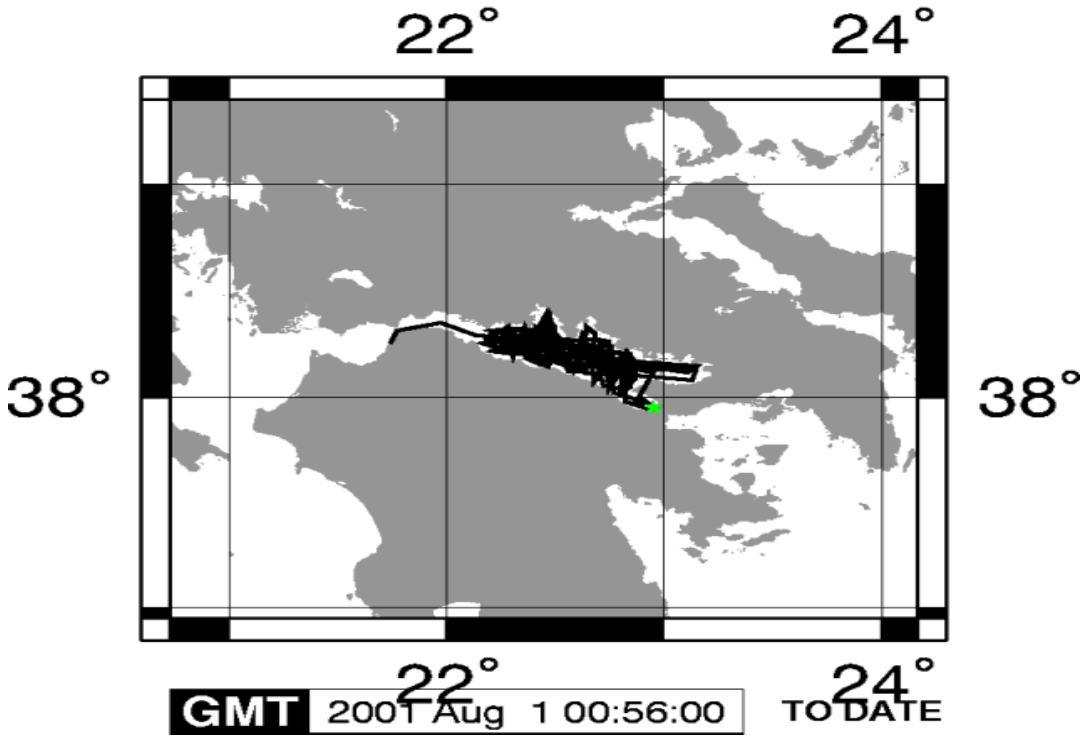
845 365–8677

R/V Maurice Ewing Data Reduction Summary

EW–0108 Patras, Greece – Piraeus, Greece

Date	Julian Day	Time	Port
July 23, 2001	204	00:00:00	Patras, Greece
	212	08:30:00	Piraeus, Greece

EW 0108



Project Summary

DESCRIPTION

Background and Scientific Objectives

Scientists from the University of Hawaii, National Observatory of Athens, and Institut de Physique du Globe de Paris conducted a 10−day cruise in the Gulf of Corinth, leaving Patras on the 23rd July and arriving back in Pireas on the 1st of August. The R/V *Maurice Ewing*, with a 6−km−long streamer and a 20−airgun sound source, was used for the experiment. The airgun blasts were also recorded on an array of 100 land seismometers surrounding the Gulf out to distances of 150 km.

The mechanics of continental extension and the controversial notion that low− and very−low−angle normal faults play a key role at some places/times in lithosphere rifting and break−up are the subject of much debate. Low−angle normal faults appear to be much more common in the geologic record than in earthquake focal mechanism catalogs. Many authors posit that normal faults that dip <30° are not seismically active, whereas others propose that parts of active normal faults could dip at very low angles (<15°), similar to the near−horizontal surfaces that separate basement from tilted sedimentary cover as seen in metamorphic core complexes.

The Gulf of Corinth is an active continental rift with high seismicity and extensional strain rate. The bounding faults are high−angle (40°−50°) where they crop out. In the center−west of the Gulf, earthquake studies reveal faults at 6−11− km depth with low (~30°), and perhaps very low (10−15°), dips whereas in the east the activity is on faults dipping ~45° at 4−13−km depth. New MCS data confirm this contrast and further suggest the exciting prospect that a very low−angle (15°) fault may be active in the center−west. Because the upper crust to 4−6 km depth is aseismic, and existing reflection seismic images don't penetrate >5km, the relation of the seismogenic structures to the shallow structures is unknown. A wide variety of deformation styles have been proposed based on outcrop and seismicity evidence. The deformation (measured by strain and seismicity) is focused beneath the Gulf. Therefore marine seismic reflection data are required to directly determine the fault geometry in the upper 15 km of crust and thereby to distinguish between the competing models of faulting and the extensional deformation of continental lithosphere. These new seismic observations will provide direct images of the structures accommodating the deformation in this actively extending area and a database essential for proposed ocean drilling.

A new teleseismic tomographic study of the crustal structure suggests that the crustal thinning may not be coincident with the rift (Tiberi et al., 2000). Specifically, there is evidence for thinner crust north of the central−west part of the Gulf, which is consistent with the hypothesis of a low−angle normal detachment at 10−12 km depth above ductile lower crust. The result is at the limit of resolution of the teleseismic tomographic study, but can be tested readily by recording our marine shots onshore. Using the 100 land seismic stations, the shot−receiver distances should be sufficient to record Moho reflections (>80 km, given the 30−40 km thick crust). The results will allow us to derive a 3−D crustal velocity structure of the region and test the Tiberi et al (2000) model of asymmetric crustal thinning related to Corinth rifting on low−angle detachments.

Cruise Members

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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.LINE — Contains shot times and positions based on Spectra positioning.
- 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

Dale was working on the Hydrosweep, but the data should be fairly comprehensive. Files are in the new mb183 format.

Gravity

No problems with gravity.

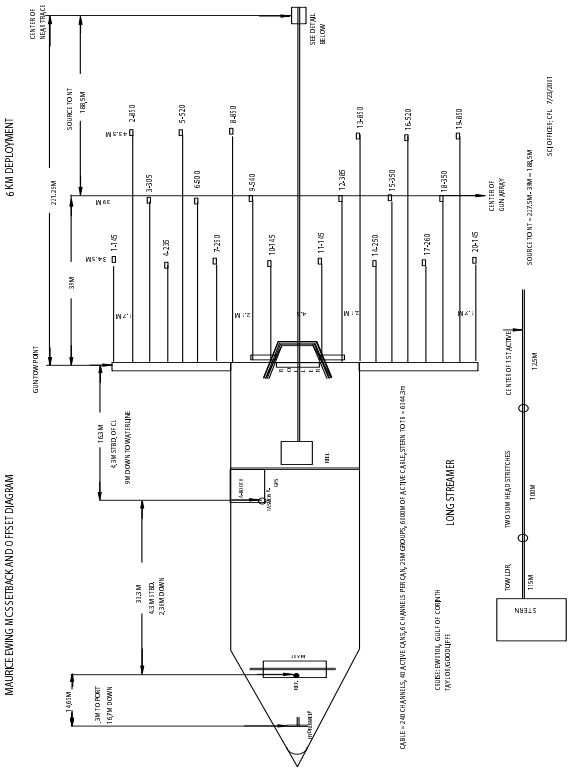
1 *United Kingdom Offshore Operators Association*

Seismic Acquisition

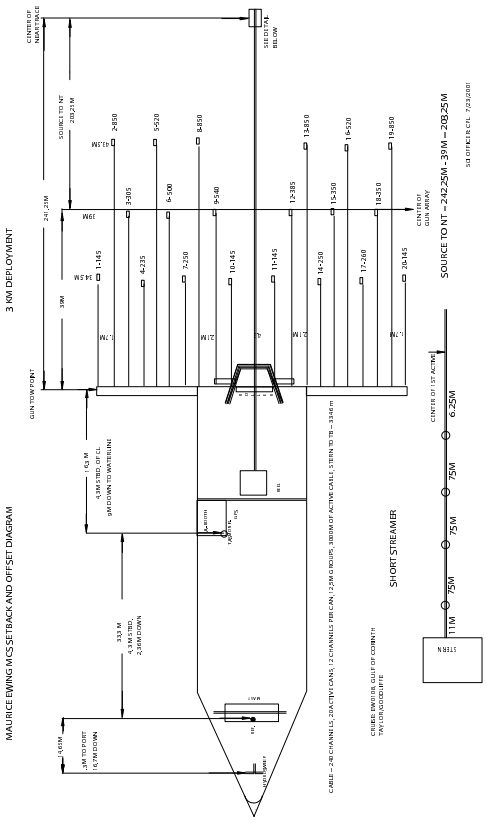
The streamer tension logger was updated on day 205, but read roughly 700lbs low throughout the cruise, as the sensor was calibrated for a different winch. The streamer was shortened to 3km on day 209.

Ship Diagrams

Ship Offset and Guns Diagrams, Long and Short Configurations



Ship Diagrams



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

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.

This clock was running and synchronizing the system the entire cruise.

Log Date	LogDate	Comment
2001+203:13:27:30.071		Logging officially started
2001+213:12:18:00.000		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.

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.

Log Date	LogDate	Comment
2001+203:00:00:04.265		Logging officially started
2001+213:12:18:00.000		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.

Log Date	LogDate	Comment
2001+203:00:00:02.720		Logging officially started
2001+213:12:18:00.000		Logging Ends

Tailbuoy Garmin GP8

logging interval: 10 seconds
file id: tb1

Deploying the streamer took a long time. Several problems had to be fixed, and the tailbuoy electronics were replaced. The tailbuoy fix was very unreliable at first, but then settled down after Karl took it aside and had a few words with it.

Log Date	Log Date	Comment
2001+204:10:23:41.793		Tailbuoy logging starts
2001+212:16:30:34.624		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.

Log Date	Log Date	Comment
2001+204:00:00:02.929		Official start date
2001+213:12:18:00.000		Official end date

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 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.

Log Date	Log Date	Comment
2001+204:00:00:00.028		Official start date
2001+213:12:18:00.000		Official end time

Bathymetry

Krupp Atlas Hydrosweep−DS2

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 5.0beta3 or newer is necessary to process this data.

Log Date	LogDate	Comment
2001+204:08:17:03.000		Official start logging
2001+213:12:18:00.000		Official end logging

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+204:00:00:00.462		Official start logging
2001+213:12:18:00.000		Official end logging

Magnetics

Varian Magnetometer

logging interval: 12 seconds
file id: mg

The magnetometer was not used.

The following table shows the times the magnetometer was logging

Start Log Date	End LogDate	Comment

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, Jeff created a system to use data from the Spectra header, data from the Digicourse cable output, data from the gun depths, and real−time data from the Ewing logging system to compose 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
nb0.LINE	Navigation is from Spectra, and includes tailbuoy, tailbuoy range and bearing
shotlog.p1	Shots are from the p1 file. (should be identical to nb0.LINE), includes source position
shotlog.p2	Shots are from the p2 file, includes source position

LOCATION 1

EW0103 Cristobal, Panama

Pier/Ship	Latitude	Longitude
Between Pier 8 and Pier 9		

Reference	Latitude	Longitude
	09 21.28N	79 54.59 W
Cruise Ship terminal		

	Id	Julian	Date	Mistie	Drift/Day	Prev Mistie
Pre Cruise	EW0103	97	04. Apr 97	8.25	0.04	7.30
Post Cruise	Transit	104	13. Apr 97	8.99	0.082	8.25
Total Days			9.00	0.74		

Time	Entry	Value	
1320	CDeck Level BELOW Pier	0.00	
1320	Pier 1 L&R Value	1929.60	L&R
1330	Reference L&R Value	1929.35	L&R
1335	Pier 2 L&R Value	1929.54	L&R
	Reference Gravity	978253.60	mGals
	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

EW0108 Piraeus, Greece

Pier/Ship	Latitude	Longitude
	37 56.297N	23 38.160E

At the east corner of the pier in front of the Piraeus Port Authority building

Reference	Latitude	Longitude
	37 56.46N	23 38.40E

At the Lat/Lon reported by Andrew's handheld GPS, near the customs gate exit

	Id	Julian	Date	Mistie	Drift/Day	Prev Mistie
Pre Cruise	EW0104	104	04/14/2001	8.99	0.08	8.25
Post Cruise	EW0108	213	08/01/2001	22.69	0.126	8.99
Total Days			109.00	13.70		

Time	Entry	Value	
09:25	CDeck Level BELOW Pier	0.00	
10:13	Pier 1 L&R Value	3636.55	L&R
10:45	Reference L&R Value	3637.11	L&R
11:08	Pier 2 L&R Value	3636.55	L&R
	Reference Gravity	980048.20	mGals
	Gravity Meter Value (BGM Reading)	980072.00	mGals
	Potsdam Corrected	0	1 if corrected

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

Difference in meters between Gravity Meter and Pier: **5.50** meters

Height Cor = Pier Height* × FAA Constant

Pier Height*	FAA Constant			
5.50	0.31			1.71 mGals/min

Difference in mGals between Pier and Gravity Meter

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

Pier (avg)	Reference	1.06 L&R/mGal		Delta L&R
3636.55	3637.11	1.06		−0.60 mGals

Gravity in mGals at Pierside

Reference + Delta mGals [+ Potsdam] = **Pier Gravity**

Reference	Delta mGals	Potsdam		Pier Gravity
980048.20	−0.60	0.00		980047.60 mgals

Gravity in mGals at Meter

Pier Gravity + Height Correction = **Gravity@meter**

Pier Gravity	Height Correction			Gravity@meter
980047.60	1.71			980049.31 mGals

Current Mistie

BGM Reading − Calculated Gravity = **Current Mistie**

BGM Reading	Calculated Gravity			Current Mistie
980072.00	980049.31			22.69 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
```

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:                                          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

Scripts

Included are 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 included in the scripts directory, or at least include that directory in your PERL5LIB environment. The use of perl is beyond the scope of this document.

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

EW0108/

CruiseReport_EW0108.pdf	this document
ew0108.cdf	NetCDF database file of this cruise
ew0108.cdf_nav	NetCDF database file of this cruise's navigation
docs/	File Formats, Spectra manuals
processed/	Processed datafiles merged with navigation
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
XBT/	Sound Velocity profiles