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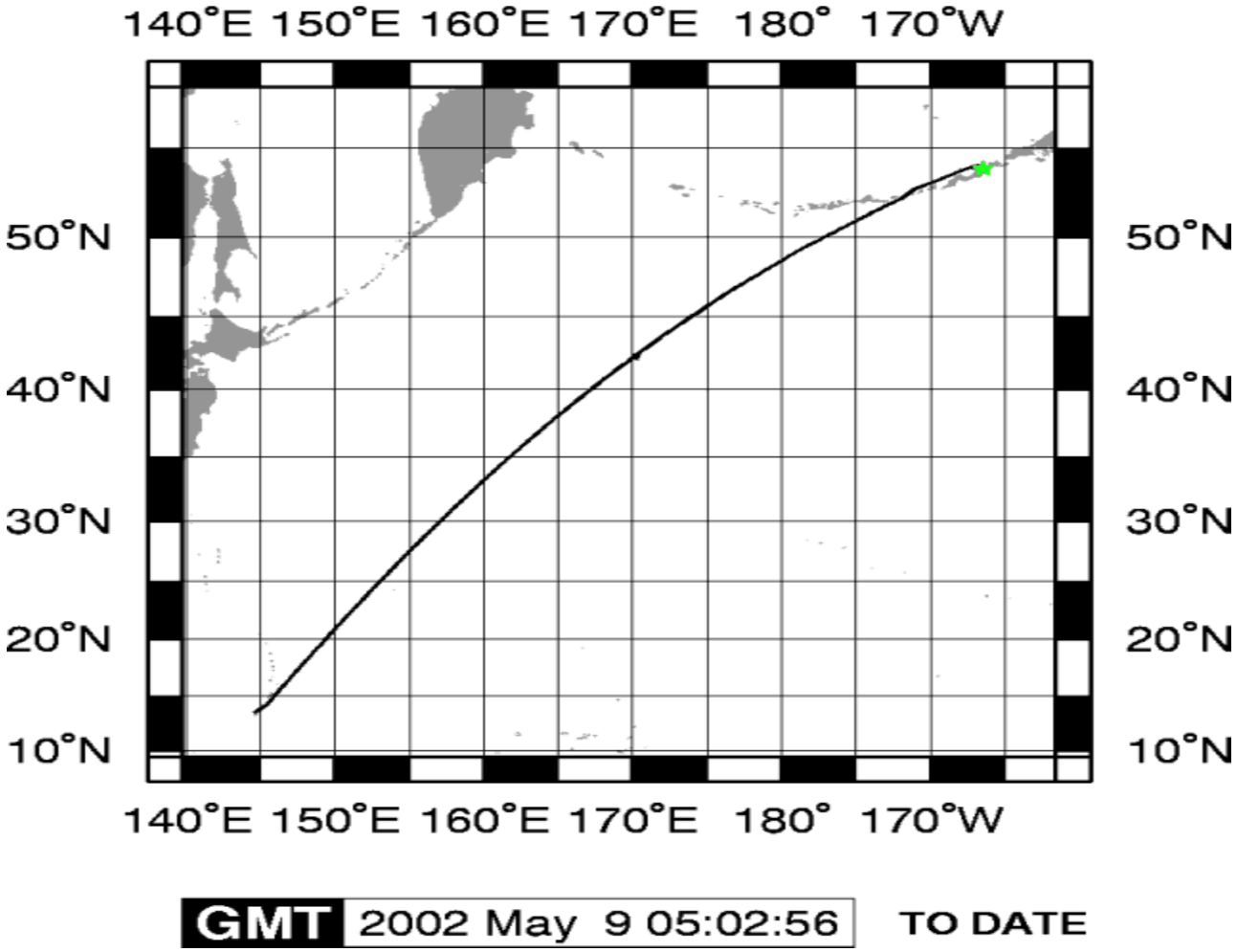
R/V Maurice Ewing Data Reduction Summary

EW−0204 Guam − Dutch Harbor

Date	Julian Date	Time	Port
April 26, 2002	116/2002	08:04:20.154	Apra, Guam
May 8, 2002	128/2002	21:38:30.80	Dutch Harbor, Alaska



Project Summary

DESCRIPTION

Background and Scientific Objectives

1.1. Hydrosweep Upgrade

1.1.1. Outer Beams

The DS2 upgrade needs to report the outermost beams on each side to acomplish the goal of making a 120 degree swath. A software update to meet this requirement has been sent to the ship but the shipboard team were not able to make it work. This is an Atlas issue.

1.1.2. "Bad" pings

Evaluation of data from the Gulf of Corinth cruise has shown that there are too many pings that are reported at the wrong depth. This must be investigated and resolved. This is most likely an Atlas issue.

1.1.3. Automatic (emailed) DS2 statistics

1.1.4. Verify valid c−Keel in real−time

At the end of EW0201 there was some question about functionality of our code that provides sound speed at the keel to the DS2 in real−time.

1.1.5. Roll and Pitch bias

Due to the changes in code within the DS2 that adjust for transmit time, it is necessary to check the pitch and roll bias. During EW0202 Joe Stennett had inserted an improved estimte but had not had time to do a formal calibration.

1.1.6. Re−establish the real−time bathymetry and track plots on the Calcomp

Since the conversion to the DS2, we have not been able to plot bathymetry on the Calcomp plotters in real time due to the combination of internal structural changes in MB−System and old custom code for making contour plots on the Calcomps.

1.1.7. Install updated MB−System

The version of MB−System installed on the ewing is several minor releases out of date. It should be updated.

1.2. Navigation

A number of navigation–related issues are grouped here. These include improved logging and distribution of position and attitude data from the POS/MV. Upgrades and reconfiguration of the POS/MV itself is covered in a separate chapter.

1.2.1. Real–time POS/MV navigation to Hydrosweep

The navigation output from the POS/MV is the highest quality real–time navigation source that we have on the Ewing. It should be available to the Hydrosweep DS2 in real–time

1.2.2. POS/MV heading to ADCP

Accurate current estimates from Acoustic Doppler Current Profiler (ADCP) observations depend upon high quality heading information. The GPS Azimuth Measurement Sysetm (GAMS) subsystem in the POS/MV is capable of providing real–time heading that is accurate to approximately 0.05 degrees and would provide a significant performance improvement in the ADCP data.

1.2.3. POS/MV position to ADCP

As with heading, higly accurate position is a significant augment to the ADCP data.

1.2.4. POS/MV position to bridge (INS)

All sources of shipboard navigation, particulary one as good as the POS should be available to the bridge in real–time for display as well as for use in their navigation system.

There is already a feed for POS/MV data to the steering system to use in line following.

1.2.5. POS/MV navigation to Spectra

During EW0201 we tried to get real–time POS/MV data into the Spectra system but were unable to make it work right and ran out of time. This issue should be re–visited.

1.3. POS/MV

A POS/MV–320 inertial GPS aided attitude, heading and postiong reference system was installed on the Ewing as part of the DS2 upgrade in May, 2001. The navigation and attitude data output has been supurb. Some issues related to performance on our network remain to be resolved.

1.3.1. Check up on "temporary" router

We developed a work–around for the POS/MV network problems by isolating it on a private subnet by providing a (Linux–based) router. This solution has been quite stable and if we need to maintain it, we should check on the status of the router (slug.)

1.3.2. POS/MV Firmware Upgrade

Applanix provided a set of software and firmware updates that are expected to at least partially resolve the network stability issues. These should be installed and tested.

1.3.3. Evaluate Heave Damping

There have been some reports that the default 20 second damping coeficient in the heave output filter is not suitable for all vessels. If the damping is not matched to the vessel, heave data can oscillate in turns. This should be checked and adjusted as necessary.

1.3.4. Evaluate Static Positioning Performance

ONR has invited us to propose to use a POS/MV to provide precision navigation for dynamically positioned shallow water drilling on the New Jersey Margin from the R/V Knorr this fall. We will collect POS/MV (and other GPS data) while the Ewing is at the pier in Dutch Habor for future evaluation of static performance.

1.4. INMARSAT Communications

INMARSAT provided a Thrane and Thrane TT–3084A INMARSAT F (Fleet 77) Ship Earth Station (SES) for the Ewing in return for our participation in a Marine Field Evaluation (MFE.) During the MFE period, airtime for the F77 was provided free of charge. The evalatuion period expires on May 9, 2002 (shortly after arrival in Dutch Harbor) and we should use the remaining time to best advantage.

1.4.1. F77 stability

We have experienced some development issues during the MFE. During this leg we should evaluate the stability of the F77 and associates services with regard to stability.

1.4.2. Quantify F77 throughput

As part of evaluating the efficieny of the various transport methods supported by the F77 we need to measure the throughput. This data will eventually be used to automatically decide which it the most cost effective link for a particular connect. It will also form part of our report on the MFE and may serve as an entree into future collaboration with INMARSAT and/or Telenor.

1.4.3. F77 ISDN implementation

To use the F77 SES to it's full effectiveness, we need to learn how to make use of the ISDN interface for 64 kbps data service.

INMARSAT provided a simple ISDN modem with the PC that they gave us as part of the package. We also sent a PCI ISDN card to the ship for this leg. We need to figure out if either of these is the right interface to provide ISDN service from our Linux–based router.

1.4.4. Voice Call Routing

We need develop one or more profiles for how incoming voice calls to the Ewing (over land line, INMARSAT A, B, and F, etc.) are routed within the ship and then develop a stable, cost–effective, documented solution.

1.4.5. Email Batch Transfer System

Bill Robinson started to migrate our old (~1991) email batch transfer system off of Sun OS 4.1 many years ago. Jeff Turmelle also worked on the task but neither was sucessfully complteted. The pending arrival of the F77 and the looming failure of our INMARSAT A catalyzed this effort in March. Over the last two months, enormous progress since initial design and implementation discussions during EW0201.

We should insure that a stable, efficient and documented version is in place at the end of this leg.

1.4.6. File Transfer Implementation

An efficient and automatic file transfer capability is included in the design of the new batch transfer system. We should evaluate the performance of this capablity.

We should insure that a stable, efficient and documented version is in place at the end of this leg.

1.4.7. MFE Evaluation of F77

We owe INMARSAT an evaluatin form based on our MFE installation of the F77.

1.4.8. INMARSAT F77 Transfer of Comissioning

On May 9th, our F77 status will be transfered from "under test" by INMARSAT to regular commercial status where we are expected to pay as a regular customer. We need to be sure that this event happens with minimum disruption.

1.4.9. Video Options for Openhouse or other Outreach

If time allows, we might experiment with sending video image (MPEG?) files home via MPDS and/or High Speed Data.

1.5. Preparation for NOAA cruises

Four specific items were addressed during this cruise to satisfy requirements for the upcoming NOAA cruises. These were: installation of a Thermosaliograph, installation of a narrow band Acoustic doppler Current Profiler (ADCP) and installation of sliprings on the CTD and Dynacon winches.

Cruise Members

Science Party

Dale Chayes	Hydrosweep Engineer	dale@ldeo.columbia.edu
Val Schmidt	Technician	vschmidt@ldeo.columbia.edu
Martin Dittmer	Atlas Technician	
Ulrich Lutticke	Atlas Technician	

Ship's Science

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Ship Crew

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Cruise Notes

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

Hydrosweep

The Hydrosweep was under heavy repair by the Atlas technicians throughout the entire cruise.

Gravity

The bad gyro was replaced on JD127.

Weather

The temperature sensor on the weatherpack was replaced. Partway through the cruise a glitch was observed. Repairs will be attempted in port.

Thermosalinograph

An interim TSG was intalled with the normal data box. Some data was logged.

The calibration constants have been updated in the logger code for the new instrument.

POS/MV

The firmware on the POS/MV was updated at the end of the cruise. Testing is underway to determine if it will stay on the network. now.

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.

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

Log Date	LogDate	Comment
2002+116:00:05:29.732		Logging officially started
2002+128:21:35:29.732		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.

Work has begun on getting the POS/MV's navigation data into spectra.

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: 2 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.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2002+116:08:04:20.154		Logging officially started
2002+128:21:38:30.800		Logging officially ends

Trimble NT200D

logging interval: 2 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
2002+116:08:06:11.574		Logging officially started
2002+128:21:38:29.915		Logging Ends

Tailbuoy Garmin GP8

logging interval: 10 seconds
file id: tb1

The tailbuoy was not used.

Interruptions greater than 30 minutes are displayed in the following table

Log Date	Log Date	Comment
		Tailbuoy logging starts
		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
2002+116:08:04:34.056		Official start date
2002+128:21:38:30.180		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.

The gravimeter was broken for most of the trip.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	Log Date	Comment
2002+116:08:04:46.244		Official start date
2002+128:21:38:31.281		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 is necessary to process data after June 1, 2001.

The Hydrosweep was under heavy repair throughout the entire cruise. Interruptions will not be listed.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2002+116:08:04:25.000		Official start logging
2002+117:06:08:00.000		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.

The air temperature sensor is repaired, but the bird needs attention.

Log Date	LogDate	Comment
2002+116:08:05:04.356		Official start logging
2002+116:23:20:00.138	2002+116:23:55:51.536	
2002+117:00:09:12.939	2002+117:00:56:42.370	
2002+128:21:38:00.648		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

Seismic Line

There was no seismic data recorded during this cruise.

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

LOCATION 1

EW0203 Apra, Guam

Pier/Ship	Latitude	Longitude
	13 27.624N	144 40.289E

Near the eastern end of the big crane loading pier

Reference	Latitude	Longitude
	13 27.57N	144 39.72E

Commercial Port, Wharf F–1, on the fuel pier as marked on the reference map as DOD#0061–T, Shell Oil/76

	Id	Julian	Date	Mistie	Drift/Day	Prev Mistie
Pre Cruise	EW0202	86	03/27/2002	14.36	0.24	23.80
Post Cruise	EW0203	114	04/25/2002	23.56	0.317	14.36
Total Days			29.00	9.20		

Time	Entry	Value	
04:10	CDeck Level BELOW Pier	1.00	
04:10	Pier 1 L&R Value	2195.50	L&R
04:36	Reference L&R Value	2189.90	L&R
04:57	Pier 2 L&R Value	2195.30	L&R
	Reference Gravity	978514.90	mGals
	Gravity Meter Value (BGM Reading)	978546.30	mGals
	Potsdam Corrected	0	1 if corrected

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

Difference in meters between Gravity Meter and Pier: 6.50 meters

Height Cor = Pier Height* × FAA Constant

6.50	0.31			2.02 mGals/min

Difference in mGals between Pier and Gravity Meter

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

2195.40	2189.90	1.06		5.83 mGals

Gravity in mGals at Pierside

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

978514.90	5.83	0.00		978520.73 mgals

Gravity in mGals at Meter

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

978520.73	2.02			978522.75 mGals

Current Mistie

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

978546.30	978522.75			23.56 mGals

Gravity Ties

Location 2

No gravity tie was taken in Dutch Harbor. The meter will be zeroed and reset for the next geophysical cruise.

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
```

Merged Meteorological Data mmet

```
TSG, WX, CT merged with Nav at 1 minute fixes
date        time        lat       lon       gpu head spd
2001+244:00:00:00.000 12.14071 44.98469 gp1 10.2 83.0

tws  twd   temp hum  press  cti  cte  con sal  ct
26.5 228.0 30.6 87.0 1000.8 28.8 28.8 5.9 36.3 28.8

gpu  = gps unit in use
head = ship's heading
spd  = ship's speed in knots
tws  = true wind speed
twd  = true wind direction
temp = air temp (celcius)
hum  = relative humidity (%)
press= pressure in mb
cti  = sea temp from the internal TSG sensor
cte  = sea temp from the external TSG sensor
con  = conductivity, Siemens/meter
sal  = salinity, practical salinity units
ct   = sea temp from the C-keel sensor (to tenths of a degree)
```

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

EW0204/

CruiseReport_EW0204.pdf	this document
ew0204.cdf	NetCDF database file of this cruise
ew0204.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.