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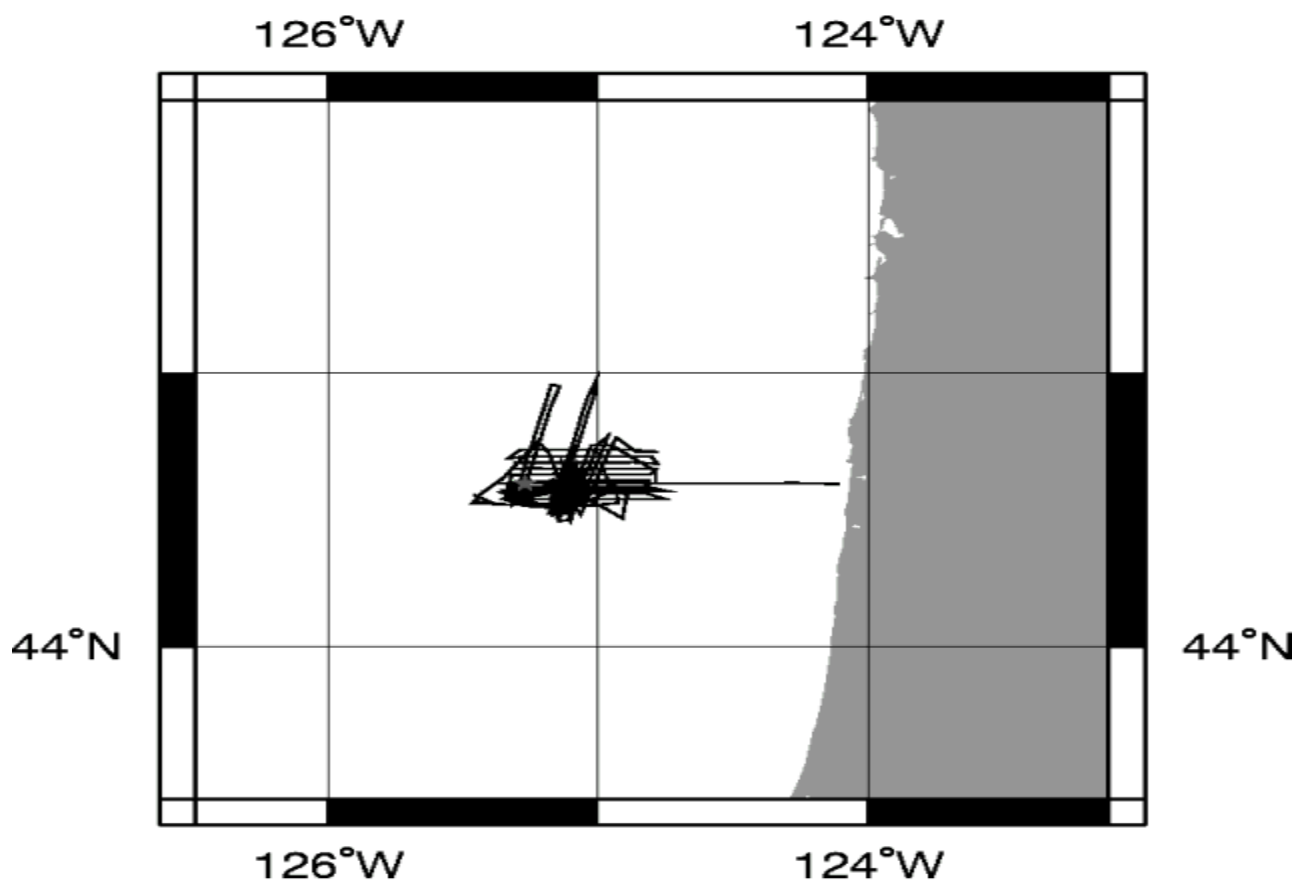
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R/V Maurice Ewing Data Reduction Summary

EW-0208 Newport – Newport

Date	Julian Date	Time	Port
August 12, 2002	224	18:00:00UTC	Newport, Oregon
September 6, 2002	249	14:20:00UTC	Newport, Oregon



GMT 2002 Sep 6 01:31:57 **TO DATE**

Project Summary

DESCRIPTION

Hydrate Ridge Two–Ship Seismic Experiment

This cruise was designed to acquire three different sets of seismic data to map the elastic properties of gas hydrate and free gas beneath Hydrate Ridge, offshore Oregon. Hydrate Ridge is a thrust ridge within the Oregon margin accretionary complex, where high concentrations of methane gas hydrates have been discovered. The quantities of gas hydrates globally are believed to be vast; however, the occurrence, habit, and mechanisms for concentrating gas hydrates are poorly known. The main objective of this cruise was to map out hydrate concentrations and free gas by measuring full elastic properties of hydrate and free gas bearing sediments within Hydrate Ridge.

The primary experiment was a two–ship vertical seismic profile (VSP) experiment conducted with the Ewing and the drill ship JOIDES Resolution. This experiment was designed to generate and record both P–wave arrivals and shear waves converted within the hydrate layer. The work was conducted as part of the drilling operation of the Ocean Drilling Program (ODP) Leg 204. The Ewing operated as the seismic source vessel to conduct both constant offset VSPs (C–VSPs), and offset ranging, or walkaway, VSPs (W–VSPs). The Ewing fired two 105/105 in³ GI guns to receivers placed in the borehole and recorded on the drill ship. We acquired the C–VSPs at a fixed position from the borehole, which was either 700 or 1000 m south of the drill site, and a receiver placed at stations every 5 m up the length of the borehole. The W–VSPs required shooting to a receiver station through a range of source offsets from 3,500 m to our closest approach to the Resolution of about 150 m. For each W–VSP, two of these lines were shot in perpendicular directions crossing at the borehole. Despite some unfortunate failures of the borehole receivers and difficulty clamping the tool to the soft sediment encountered in these holes, we managed to acquire C–VSPs at 4 sites, and 5 W–VSPs at three different drill sites.

As a secondary experiment we acquired seismic data with ocean bottom seismometers recording GI–gun shots. These experiments were designed to record p–wave arrivals and converted shear waves on the seafloor at drill sites and between them, to map the lateral variability of gas hydrates. During the leg we deployed two types of instruments: the Woods Hole 4–component instrument, and the Institute for Geophysics 4–component device. We deployed both instruments because of the advantages of each of the different instrument designs for high–resolution data acquisition. In total we had 14 deployments of WHOI instruments of which we lost one and another recorded no data. We had 17 deployments of UTIG instruments and recovered all with recorded data.

The third component of the cruise was high–resolution multichannel seismic imaging of Hydrate Ridge. We acquired approximately 1250 km of seismic reflection data with a 120–channel, 1500 m long streamer and two 105/105 in³ GI guns. These data provide a regional context for the drilling and seismic data acquired as part of this two–ship seismic experiment.

Cruise Members

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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.

Spectra

Spectra logs data to files in UKOOA¹ 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.

Spectra was only used to shoot some of the lines. The other lines were shot by the control software on the JOIDES Resolution. Raw shot times are recorded for the JR-controlled shots, but nothing else.

The streamer was 1500 meters long and Spectra was configured appropriately for this smaller configuration. Every bird on the streamer was a compass bird.

The tailbuoy performance was satisfactory.

Due to conflicting logging processes running during line "obs21" on day 229, the shotlog files were corrupted. Merged shotnav files were reconstructed from shot times and nav data and stored in a comprehensive daily file called ts.d229-reconstructed in the processed directory on the tape.

Seismic walkaway lines and VSP shottimes were reconstructed from smoothed nav to the standard Ewing processed shotfile format. Shot numbers may differ from those of the Resolution, and shottimes are all in UTC, whereas JR shottimes may be in localtime.

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, the shots have also been processed using our normal navigation filtering.

Therefore you will find the following shotlog files:

- nb0.r Contains shot times and positions based on Spectra positioning.

¹ United Kingdom Offshore Operators Association

- 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

A sound velocity profile based on a local XBT and Levitus was entered into the hydrosweep on day 226.

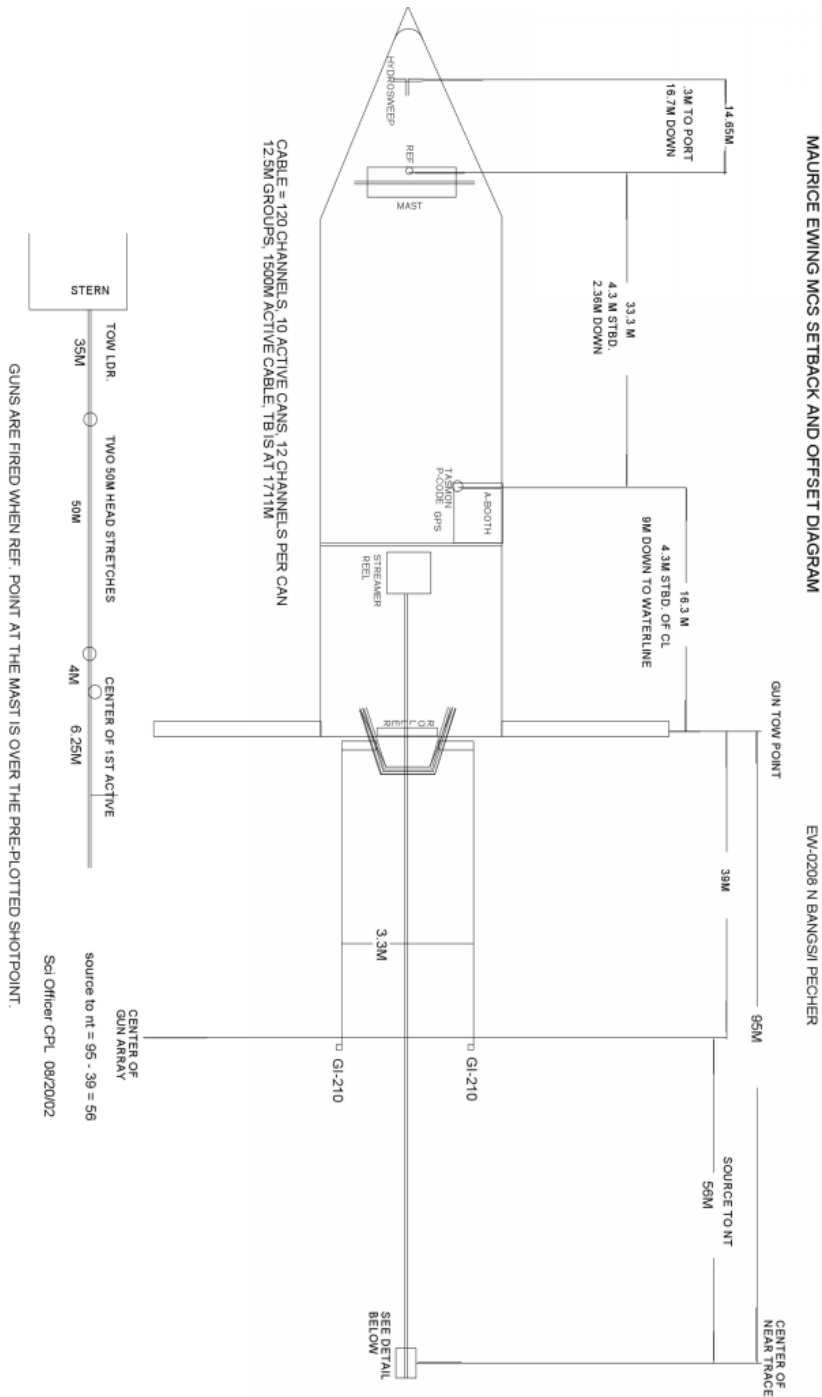
Gravity

Seismic Acquisition

Data Logging/Processing

Ship Diagrams

Ship Offset Diagram



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.

Interruptions greater than 30 minutes are displayed in the following table

Log Date	LogDate	Comment
2002+224:00:28:29.734		Datum logging starts
2002+249:16:28:29.726		Datum logging 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: 1 second
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+224:17:52:37.576		Tasmon logging starts
2002+249:14:51:20.928		Tasmon logging ends

Trimble NT200D

logging interval: 2 seconds
file id: gp2

The Trimble is the secondary receiver for GPS data. Data is logged at 2 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+224:17:52:43.006		Trimble logging started
2002+249:14:51:21.002		Trimble logging ends

TSS POS/MV 320

logging interval: 1 second
file id: pm01

The POS/MV is the tertiary receiver for Gps data. Data is logged at 2 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	Log Date	Comment
2002+224:18:08:07.123		POS/MV logging starts
2002+249:14:51:21.491		POS/MV logging officially ends

Tailbuoy Garmin GP8

logging interval: 1 second
file id: tb1

The tailbuoy GPS is a WAAS receiver. Tailbuoy receiver performance was significantly better than in other recent cruises.

Interruptions greater than 30 minutes are displayed in the following table

Log Date	Log Date	Comment
2002+226:18:40:03.735		Tailbuoy logging starts
2002+226:18:40:03.735	2002+226:21:36:48.573	Data Interruption
2002+227:04:19:26.709	2002+227:04:53:23.513	Data Interruption
2002+227:15:15:00.711	2002+239:16:45:31.985	Data Interruption
2002+239:16:47:19.018	2002+239:18:43:45.786	Data Interruption
2002+239:18:59:31.268	2002+239:20:00:09.416	Data Interruption
2002+239:20:00:53.726	2002+239:20:38:47.674	Data Interruption
2002+239:21:38:25.579	2002+239:22:20:52.894	Data Interruption
2002+242:12:01:40.533	2002+243:00:40:51.783	Data Interruption
2002+245:22:31:30.506	2002+245:23:03:56.490	Data Interruption
2002+249:04:01:18.549		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+224:17:53:09.243		Furuno logging starts
2002+249:14:51:19.687		Furuno logging 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 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
2002+224:17:53:14.564		Gravity logging starts
2002+249:14:51:20.628		Gravity logging ends

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.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2002+224:18:29:10.000		Hydrosweep logging starts
2002+249:14:51:29.000		Hydrosweep logging 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
2002+224:17:53:38.279		Weather logging starts
2002+249:14:51:00.182		Official end logging

Magnetics

Varian Magnetometer

logging interval: 12 seconds
file id: mg

The following table shows the times the magnetometer was logging

Log Date	LogDate	Comment
----------	---------	---------

Seismic Line

Currently, we 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
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

Gravity Ties

LOCATION 1

EW0207 Newport, Oregon

Pier/Ship	Latitude	Longitude
	44 37.533N	124 02.654W
Pier 8		
Reference	Latitude	Longitude
	44 37.2N	124 02.8N
Tied to the center of the electronics lab room 30A over the chiseled X on the floor of The Newport Marine Science Building.		

	Id	Julian	Date	Mistie	Drift/Day	Prev Mistie
Pre Cruise	EW0206	189	08. Jul 02	0.00	0.03	11.44
Post Cruise	EW0207	220	07. Aug 02	11.98	0.399	0.00
Total Days			30.00	11.98		

Time	Entry	Value	
1015L	CDeck Level BELOW Pier	-2.20	
1015	Pier 1 L&R Value	4262.45	L&R
1110	Reference L&R Value	4261.79	L&R
1020	Pier 2 L&R Value	4262.45	L&R
	Reference Gravity	980609.70	mGals
	Gravity Meter Value (BGM Reading)	980623.40	mGals
	Potsdam Referenced	0	1 if referenced

Gravity meter is 5.5 meters below CDeck

Difference in meters between Gravity Meter and Pier	3.30			meters	
Height Cor = Pier Height* FAA Constant	3.30	0.31		1.02	mGals/min

Difference in mGals between Pier and Gravity Meter

Pier (avg) –	Reference * 1.06 L&R/mGal	Delta L&R
4262.45	4261.79	1.06
		0.70 mGals

Gravity in mGals at Pierside

Reference + Delta mGals [+ Potsdam]			Potsdam Referenced Pier
980609.70	0.70	0.00	980610.40mgals

Gravity in mGals at Meter

Pier Gravity+ Height Correction			Gravity@meter
980610.40	1.02		980611.42mGals

Current Mistie

BGM Reading		Calculated Gravity		Current Mistie
980623.40	980611.42			11.98mGals

Gravity Ties

Location 2

EW0208 Newport, Oregon

Pier/Ship	Latitude	Longitude
	44 37.535N	124 02.675W
OSU Pier		
Reference	Latitude	Longitude
	44 37.2N	124 02.8N
Tied to the center of the electronics lab room 30A over the chiseled X on the floor of The Newport Marine Science Building.		

	Id	Julian	Date	Mistie	Drift/Day	Prev Mistie
Pre Cruise	EW0207	220	07. Aug 02	11.98	0.40	0.00
Post Cruise	EW0208	249	06. Sep 02	12.68	0.023	11.98
Total Days			30.00	0.70		

Time	Entry	Value	
1537	CDeck Level BELOW Pier	-2.20	
1015	Pier 1 L&R Value	4262.45	L&R
1110	Reference L&R Value	4261.79	L&R
1020	Pier 2 L&R Value	4262.45	L&R
	Reference Gravity	980609.70	mGals
	Gravity Meter Value (BGM Reading)	980624.10	mGals
	Potsdam Referenced	0	1 if referenced

Gravity meter is 5.5 meters below CDeck

Difference in meters between Gravity Meter and Pier	3.30	meters
Height Cor = Pier Height* FAA Constant	3.30	0.31
		1.02 mGals/min

Difference in mGals between Pier and Gravity Meter

Pier (avg) - Reference * 1.06 L&R/mGal	Delta L&R
4262.45 4261.79 1.06	0.70 mGals

Gravity in mGals at Pierside

Reference + Delta mGals [+ Potsdam]	Potsdam Referenced Pier
980609.70 0.70 0.00	980610.40 mGals

Gravity in mGals at Meter

Pier Gravity+ Height Correction	Gravity@meter
980610.40 1.02	980611.42 mGals

Current Mistie

BGM Reading	Calculated Gravity	Current Mistie
980624.10	980611.42	12.68 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.

<u>Shot Time</u>	<u>Line</u>	<u>Shot</u>	<u>Latitude</u>	<u>Longitude</u>
2000+079:00:08:40.085	strike1	000296	N 15 49.6217	W 060 19.8019
<u>2nd GPS Position</u>		<u>Tailbuoy Position</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>Latitude</u>	<u>Longitude</u>	
N 15 49.6189	W 060 19.8101	N 15 47.1234	W 060 20.1901	
<u>Furuno Streamer Gyro Compasses & Heading</u>				
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.

<u>Shot Time</u>	<u>Gun Depths</u>																		
	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.

<u>CPU Time Stamp</u>	<u>Track</u>	<u>Speed</u>	<u>Hdg</u>	<u>Gyro</u>
2000+166:00:01:53.091	-	4.4	140.5	148.3

Hydrosweep Centerbeam

hb.n

Hydrosweep data merged with navigation

<u>CPU Time Stamp</u>	<u>Centerbeam</u>		<u>Depth</u>
	<u>Latitude</u>	<u>Longitude</u>	
2000+074:09:55:00.000	N 13 6.6206	W 59 39.3908	134.9

Merged Data

m

<u>CPU Time Stamp</u>		<u>Latitude</u>	<u>Longitude</u>	<u>GPS</u>			<u>Drift</u>	<u>Depth</u>
				<u>Used</u>	<u>Set</u>			
2000+200:12:25:00.000		N 45 54.1583	W 42 47.1770	gp1	0.0	0.0		
<u>Magnetic</u>		<u>Gravity</u>		<u>EOTVOS</u>		<u>Drift</u>		
<u>Total Intensity</u>	<u>Anomaly</u>	<u>FAA</u>	<u>GRV</u>					<u>Shift</u>
49464.7	55.5	22.2	980735.0	-8.4	-0.1	2.8		
<u>Temperature Salinity Conductivity</u>								
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	gpl	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
2565.1	20.7	16.4	164	N 30 12.0427	W 042 14.7319	6296.3

Bearg Name	Speed	Heading
MEG-10	4.2	101.1

Tailbuoy Navigation

tbl.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	strikel

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 strikel: 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 (strikel and dip2) were run: the end of strike 1 (shots 000283 to 002286) and the start of dip2 (shots 000002 to 000151).

Line strikel 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	

Latitude	Longitude	Tailbuoy 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:
$$\text{eotvos_corr} = 7.5038 * \text{vel_east} * \cos(\text{lat}) + .004154 * \text{vel} * \text{vel}$$

* 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:
$$\text{faa} = \text{corrected_grv} - \text{theoretical_grv}$$

* 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:
Speed              Direction
Inst 60sA 60mA 60sM Inst 60sA 60mA
7.8  6.6  8.5  16.8 277 291 5

Bird 2
Speed              Direction
Inst 60sA 60mA 60sM Inst 60sA 60mA
0.0  0.0  0.0  0.0  0  0  0

Temperature
Inst 60mA 60mm 60mM
15.0 14.2 14.3 15.1
Humidity
Inst 60mm 60mM
92 90 93
Barometer
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

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

EW0208/

CruiseReport_EW0208.pdf	this document
ew0208.cdf	NetCDF database file of this cruise
ew0208.cdf_nav	NetCDF database file of this cruise' navigation
configs/	Ewing logging/reduction configuration files
docs/	File Formats, Spectra manuals
sodar/	3.5kHz sonar digital recordings
XBT/	XBT and SVPs from Hydrosweep
processed/	Processed datafiles merged with navigation
shotlogs/	processed Shot Files
trackplots/	daily cruise track plots (<i>postscript</i>)
raw/	Raw data directly from logger
reduction/	Reduced data files
clean/	daily processing directory, includes daily postscript plots of the data.
spectra/	Raw P1/90 and raw P2/94 files from MCS lines