



*Lamont-Doherty  
Earth Observatory  
of Columbia University*

**EW 9706 DATA REDUCTION CRUISE SUMMARY**

**August 18 - September 6, 1997**

**Chief Scientist:** N/A

**Science Party** N/A

**Science Crew *LDEO*:**

Elizabeth Jackson  
Tom Jackson  
Ropate Maiwiriwiri  
Greg Vsevolozhsky

Hydrosweep Processor  
Electronic Tech  
Core Bosun  
Systems

**R/V Ewing Crew**

James O'Loughlin

Master  
Chief Engineer

**Science Overview**

**Transit**

## Data Collected During Cruise

All times are specified in GMT.

### True Time Clock

**Instrument** Kinematic/TrueTime Division Model GPS-DC GPS Synchronized Clock  
**Logging** 1 minute intervals

The True Time clock is used to adjust the CPU clock of the logging computer. The logging computer captures the continuous time records from the clock and provides these as a service to the rest of the network via a UDP broadcast. This enables the computers on the network to adjust their CPU times to UTC time.

Day	Time	Comments
232	1200	Start Logging
248	0000	End Processing

### Speed and Heading

**Instrument:** Furuno CI-30 2-axis Doppler speed log, Sperry MK-27 gyro  
**Logging:** 3 second intervals  
**Processing:** The raw Furuno data is processed by taking the mean of all values within the even minute range and outputting the speed and heading on the even minute. All values taken during the 30 seconds before and after the even minute are used to calculate the median.

Day	Time	Comments
232	1200	Start Logging
248	0000	End Processing

**GPS SATELLITE FIXES:**

- (1) GPS Trimble NT200D. (*denoted by gp1 in the logs*)  
 (2) Magnavox MX-4200 Global Positioning System receivers (*denoted by gp3 or gp4*)

**Logging** 10 second intervals on all three receivers  
**Checking**

Minimum number of SATs: 3  
 Dilution of precision maximum: north = 4.0, east = 4.0  
 Speed maximum: 20.0  
 Compared GPS speed and course with Furuno smooth speed and heading  
 Reject fixes with high drifts in navigation  
 Reject fixes producing Eotvos correction errors in gravity larger than 5 mGals

**Interpolation** interpolated positions at 00, 30 seconds of each minute

**Smoothing** smoothed interpolated positions with 9 point running average.

**Note** Continued troubles with the MX 4200s. Mx4200 #2 would not remain turned on for the first day. Eventually came back at ... and has been reliable since. MX4200 #1 regularly fails to track enough satellites for valid navigation.

Day	Time	Comments
232	1200	Started Logging
248	0000	End Processing GPS

The 10 second GPS points are interpolated to produce evenly spaced 30 second fixes, with gaps of 3 minutes or less filled in with linear interpolation. This data is smoothed with a running average of interpolated data points. The smoothing window size used was 9 points. Data is output only when the averaged value is made with a full window. Gaps of time greater than 30 seconds empty the window.

A *one-minute navigation* is produced from the GPS. The smooth speed and heading data from the **Furuno** is used to fill any gaps of 2 minutes or longer by computing *dead reckoned* positions corrected for set and drift. This data is used for the final navigation data.

**Final Data** 1 minute navigation.

**Format:** n.ddd

yy+ddd:hh:mm:ss.mmm N 12 12.1234 E 123 12.1234 id 123.1 12.1  
 yr. day time lat. lon id set drift

where **id** is one of [*gp1, gp3, gp4*] or *dr*, if dead reckoning was necessary.

Day	Time	Comments
232	1200	Navigation data processing began
248	0000	End of navigation data processing

**BATHYMETRY:**

**Instrument:** Krupp Atlas Hydrosweep Center Beam  
**Logging:** Each Hydrosweep Ping is logged, and center beam data is extracted and logged separately.  
**Processing:** Raw data is checked to process only good centerbeam records that were acquired in *survey* mode. This data is then processed to produce a median value for each even minute. The median is the median of all records 30 seconds before and after the even minute.  
**Final Data:** The median is merged with the one-minute navigation fixes to provide the final centerbeam data.  
**Notes:** During the cruise, hydrosweep data was occasionally turned off when retrieving the OBS and OBH. There was also at least one equipment failure where the hydrosweep failed to pick up the rapid change in depth.  
**Format:** hb.nddd  
 yy+ddd:hh:mm:ss:mmm    N 12 12.1234    E 123 12.1234    2222.0  
 date/time                    lat                    lon                    depth/meters

Day	Time	Comments
232	1200	Acquisition Started
248	0000	Acquisition Stopped

**SEA TEMPERATURE:**

**Instrument:** Omega DP10 Series  
**Logging:** 1 minute intervals  
**Checking:** none  
**Smoothing:** none

Chief scientist's final data: none.

Lamont database: one minute data, merged with navigation.

FORMAT: ct.nddd

yy+ddd:hh:mm:ss:mmm N 12 12.1234 E 123.1234 26.3

yr day time lat lon sea\_temp (in °C)

Day	Time	Comments
232	1200	Acquisition Started
248	0000	Acquisition Stopped

**WEATHER STATION:**

**Instrument:** R.M./ Young Precision Meteorological Instruments 26700 Series

**Logging:** 1 minute interval

**Final Data:** none.

**Notes:** During this cruise, the starboard weather station was damaged and replaced with a new weather station in the center of the mast.

**Format:** wx.rddd

Port bird is bird #1; Center bird is bird #2.

97+185:00:07:00.747	13.7	130	20.9	19.3	20.7	22.7	29	27	2	21.5	20.0	2 1.4
date/time	tspd	tdir	ws1	wss1	wsm1	wsx1	wdc1	wds1	wdm1	ws2	wss2	wsm2
232	36	33	2	22.4	22.6	22.4	22.5	47	47	47	1030.7	
wsx2	wdc2	wds2	wdm2	tcur	tavg	tmin	tmax	rh	rhn	rhx	baro	

tspd	=	true speed	tcur	=	temperature, current
tdir	=	true wind direction	tavg	=	temperature, 60 minute average
ws1/2	=	wind speed, instantaneous	tmin	=	temperature, 60 minute minimum
wss1/2	=	wind speed, 60 second average	tmax	=	temperature, 60 minute maximum
wsm1/2	=	wind speed, 60 minute average	rh	=	relative humidity
wsx1/2	=	wind speed, 60 minute maximum	rhn	=	relative humidity, 60 minute minimum
wdc1/2	=	wind direction, current	rhx	=	relative humidity, 60 minute max
wds1/2	=	wind direction, 60 second average	baro	=	barometric pressure
wdm1/2	=	wind direction, 60 minute average			

Day	Time	Comments
232	1200	Acquisition Started
248	0000	Acquisition Stopped