

NBP0207
EM120 Multibeam
End of Cruise Report

Prepared By Lea Martellaro

NBP0207 EM120 Multibeam Description of Work

This report covers the EM120 data collection and processing for the R/V Nathaniel B. Palmer cruise NBP02017. This cruise started from Port Hueneme, California, USA on November 11, 2002 and ended in Lyttelton, New Zealand on December 6, 2002. The chief scientist was Professor Joann Stock, with support from Professor Michael Gurnis, and Professor Robert Clayton. Lea Martellaro (RPSC) was responsible for EM120 data acquisition. The science party performed post processing. The science party stood a 24-hour watch. Each watchstander was responsible for monitoring the computer displays for the EM120 and RVDAS logging. Data was collected for Julian days 2002.315 to 2002.336. Additional Raw data was collected for 2003.337, 2003.228, 2003.339 per the request of the New Zealand government.

The raw EM120 data was logged in approximately hourly files in the Kongsberg-Simrad EM120 raw format. In a few cases the file lasted for more than one hour. The MBSsystem software takes these files as input in a Format 56. The raw files were then converted into MBSsystem 57 format, for gridding and display. This is a complex format that is not described in this report. It is recommended that the latest MB-Systemⁱ software package be used to access the files if additional work is to be done with the data. These raw data files are named xxxx_yyyymmdd_hhmmss_raw.all. Where xxxx is the "line number", yyyy is the year, mm is the month, dd is the day, hh is the hour, mm in the minutes, ss is the seconds that the particular file was started.

The EM120 Multibeam has filtering built into the system. The following options were used on the raw data: 1) Slope Filtering 2) Sector Tracking, 3) Spike Filter Strength of Medium, and Range Gate of Normal.

All of processed data files were edited with mbnedit (one of the MBSsystem programs) to correct heading or navigational problems. The science party was responsible for using mbedit (another MBSsystems program) to remove bad data from these files. The edits are contained in files that end in ".mb57.esf". The edited files were checked with contour plots. If these checks failed, the files were re-edited. All processed files ended with a "p.mb57" at the end of the file name. When the data quality was judged acceptable, page size gridded plots were produced

The EM120 multibeam files are named in the following convention:
xxxx_yyyymmdd_hhmmss.mb57.eee Where xxxx is the “line number”, yyyy is the year, mm is the month, dd is the day, hh is the hour, mm in the minutes, ss is the seconds that the particular file was started, and eee is the extension type. For Example:

0001_20021111_024222.mb57

The line number is 0001

The year is 2002

The month is 11

The day is 11

The hour is 02 UMT

The minute is 42

The second is 22

And the extension is mb57

The raw and processed data was written using the UNIX tar command to DVDs (4.7GB) at the end of the cruise. These DVDs were checked before distribution. The DVDs contain the files raw and processed data for EM120 Multibeam data. Some of the processing scripts for the survey have been included in a scripts directory. These scripts may need to be adjusted to work with different directory structures.

To maintain the long file names all gzipped files were then placed into a tar using:

```
tar -cvbf 20 filename.tar files-archived
```

The tar files are on two DVDs

DVD#1 contains: RawMB.tar (3.35 GB)

ProcessMB_2.tar (1.21 GB)

DVD#2 contains: ScriptsMB.tar (4.6 GB)

ProcessMB_1.tar (8 KB)

ProcessMB_1.tar contains processed line numbers 0001 to 0389.

ProcessMB-2.tar contains processed line numbers 099 to 119 and 0390 to 0474

Note: The processed lines 099 to 119 were processed from the raw data lines 0099 to 0119. These lines were not converted with the standard “0” before the number. And are therefore out of normal order in a listing. The raw data has the actual line numbers 0099 to 0119.

The contents of these DVDs (with any missing line numbers) and an itemized listing are located in Table 1.

MBSYSTEM documentation explains the various extension types.

The xxxx (line number) of the files are not completely consecutive. After the third day the line numbers were allowed to continue in a consecutive numbering system, however for the first two days the “line numbers were repeated” (but the file naming convention allowed for the date to be included in full name thus no files had identical names).

The following Table 1 shows the Processing Days and the files that were processed in that day. Each day contains approximately 24 hours of data. However some days are slightly less and some are slightly more than 24 hours. The processing day does not reflect the exact day the data was accrued, but can be off by +/- 12 hours. A Processing Day was approximately 24 hours of data taken in local time on that day.

In most cases the files were one hour in length, however there were cases where the EM120 system increased the file length to multiple hours. These few files have been processed as the single unit (file) and included in the data.

Table 1: Processing Days with Line Numbers

Processing Day	Line Numbers	Missing Line Number
D315	0001 – 0015	None
D316	0001-0027	
D317	0028-0033 0001-0016	
D318	0017-0043	
D319	0045-0073	0044, 0049, 0050, 0051, 0052
D320	0074-0097	
D321	0098-0118	
D322	0119-0145	
D323	0146-0167	
D324	0168-0192	
D325	0193-0224	0203, 0205
D326	0225-0249	
D327	0250-0273	
D328	0374-0298	
D329	0299-0323	
D330	0324-0347	
D331	0348-0371	
D332	0372-0397	
D333	0398-0421	
D334	0422-0443	
D335	0444-0466	
D336	0467-0474	Processing stopped on 0474

ⁱ The MB-System5 software package was used for all multibeam data handling. This package was developed at Lamont-Doherty Earth Observatory. This system is designed to manipulate, process, list and display many kinds of multibeam bathymetry, amplitude, and sidescan data. It has been successfully

installed on many different computer platforms. To obtain more information about the MB-System programs or to obtain a copy of the current distribution, contact the authors David W. Caress (caress@mbari.org) and Dale N. Chayes (dale@ldeo.columbia.edu).