Introduction

The NBP data acquisition systems continuously log data from several instruments throughout the cruise. This document describes the format of that data and its location on the distribution CD-ROMS. It also contains important information which may affect how this data is processed such as instrument failures or other known problems with acquisition.

The data collected during this cruise is distributed on a set of two CD-ROMs written in ISO9660 level-1 format. This data format has very strict requirements on filenames and organization. However, it is readable by virtually every computing platform. Just below each section heading in this document, a "Location" statement will show where the data is located on the distribution CD's. The location is written in terms of a UNIX path, using "/" as the field delimiter. Other platforms have different path delimiters, but the directory structure remains the same.

Unix "tar" archiving is used extensively as well as "gzip" compression. A Pkzip-compatible archiving/compression algorithm is also used on native DOS files. Tools are available on all platforms for decompressing and de-archiving these formats. On Macintosh, Stuffit Expander, the free product from Aladdin Software is the only tool needed. On Windows9X, WinZip, a shareware utility, will do all the work.

IMPORTANT: Read the last section in this document, Acquisition Problems and Events, for important information that may affect the processing of this data.

Archive Data Extraction

The UNIX tar command has many options. It is often useful to know exactly how an archive was produced when expanding its contents. All archives were created using the following comands:

tar -cvf - [target directory or file] > [archivename.tar].

Extraction requires a command like:

tar –xvf [archivename.tar] [archivedfilename].

The contents of an archive can be examined with the command:

tar –tvf [archivename.tar] > [filelist.txt].

Often, files originating on the UNIX platform are compressed using gzip before being placed in the tar archive. A g-zipped file will have a ".gz" extension on the filename. These files can be decompressed after de-archiving, using:

gunzip [filename.gz].

Files originating on the DOS platform are "zipped" using PKzip compatible algorithms. Files archived by this method have a ".zip" filename extension. Most UNIX platforms also have PKzip compatible utilities. To decompress a zipped file use:

unzip [archivename.zip].

To list the contents of a zip archive use:

unzip –l [archivename.zip] > [filelist.txt].

In each directory on the distribution where an archive is present, an index file is also present named [xxx]lst.txt, which lists the contents of the accompanying archive in a plain text file.

NOTE: The tools for dealing with these file formats on the Windows and Macintosh platforms, especially those mentioned in the last section, typically recognize file formats automatically so that prior knowledge of the exact archiving method is not necessary.

ADCP

Location: CD-1, /ADCP/adcpdat.zip

The ADCP data set is broken up into files representing 24 hours of data collection. The files are named pingdata.xxx (xxx representing a day number). Please note that these extensions do NOT represent Julian day numbers. Please refer to the file's creation date. All files are placed into a single zip archive named adcpdat.zip. The contents of the archive are listed in a text file in the same directory: adcplst.txt.

CTD

Location: CD-1, /CTD/ctddat.zip

Individual CTD casts are represented by a set of four files containing a bottle-firing file (.bl), a configuration file (.con), a data file (.dat) and a header file (.hdr). Casts are numbered according to the three-digit Julian date followed by the number of casts for this cruise. For example; the twenty-seventh cast on this cruise was conducted on January 19. Therefore, files associated with this cast are: 019027.bl, 019027.con, 019027.dat, 019027.hdr. The configuration and data files are in binary format. The SeaSoft package may be used to convert these files to text if necessary. All files are placed into a single zip archive named ctddat.zip. The contents of the archive are listed in a text file in the same directory: ctdlst.txt.

SeaBird's SeaSoft software used to acquire the data is included in the CTD data distribution in the "Seasoft" directory. SeaSoft is DOS-based software packages, but can be run in a DOS window under the Windows9X operating systems for cast playback and data analysis. The latest available software version (v. 2.234) is included in this data collection.

PUV – GUV

Location: CD-1, /puvguv/puv.zip and CD-1, /puvguv/guv.zip

All files are placed in two zip-archives named puv.zip and guv.zip. The contents of the archives are in the files puvlst.txt and guvlst.txt respectively. GUV data was acquired continuously from the instrument mounted on the top of the science mast until Julian day 032 when acquisition was ceased, PUV data consists of a single cast on most days. A copy of the PUV/GUV calibration file used for Biospherical Instruments' PUV500 acquisition software is included in the puvguv directory on CD1 as calibr8.puv.

The PUV files were converted to CSV (Comma Separated Value) format using the Biospherical Instruments' PUVLOG program. Similarly, the GUV files were converted to CSV format using the Biospherical Instruments' PUVPROF program. For additional information on the PUV/GUV data collected during NBP9901, contact:

Dr. Chris Fritzen, at cfritsen@dri.edu cfritsen@dri.edu or at: University and Community College System of Nevada, Desert Research Institute, Biological Sciences Center, 7010 Dandini Blvd, Reno, NV 89512, USA (715) 673-7487.

The columnar format of the CSV file is listed below:

Puv files: (l.csv)*

Field	Parameter
1	Depth
2	308 U
3	320 U
4	Temp U
5	MATFL
6	340 U
7	380 U
8	PAR U
9	Temp U
10	308 S
A	Batt S
B	320
C	340
D	380
E	Gnd
F	PAR
G	K308
H	K320
I	K340
J	K380
K	Kpar
L	Chl
M	Prod

Guv files: (p.csv)*

Field	Parameter
1	Depth
2	306 U
3	320 U
4	Temp U
5	MATFL
6	340 U
7	380 U

8	PAR U
A	Temp S
B	300 S
C	Batt S
D	320 S
E	340 S
F	380 S
G	Gnd S
H	PAR S

Satellite Images

Location: CD-1, /imagery

Satellite Images processed for this cruise were organized into folders named with a four-digit year followed by a three-digit Julian date. For example, images processed for January 22, 1999 are to be found in a folder named 1999-022. Due to the ISO-9660 "8.3" filename requirement, the original filenames of most of the image files were shortened. Each day's folder contains a text file called key-xxx (where xxx is the Julian date). This text file contains the original filename, which includes the date and time the image was acquired, as well as the image's classification and file type.   DMSP files refer to visible light images while SSMI images are formed by passive microwave measurement. For example, a visible light image showing an overview of the Ross Sea taken on January 23, 1999 at 0545 hours would be labeled: dmsp0123.0545.ov.jpg. Occasionally, the National Ice Center sent summary information that was labeled NBP(Julian date).file type.

Cruise Track

Location: CD-1, /track

A cruise track file has been produced for this cruise: nbp99-01.trk. It is a single file containing longitude and latitude stripped from the JGOFS data set, which means 1 minute resolution. It can easily be used to produce cruise plots in GMT (General Mapping Tool) on the UNIX platform. Also included is a text file "icestn.txt" which lists the longitude and latitude of each ice station worked during the cruise in chronological order. This file was used to print symbols on the cruise track. A Post-Script file displaying the cruise track and ice stations can also be found in this directory as: nbp9901.ps.

Science Report

Location: CD-1, /scirept

The weekly science reports in text format.

NBP Geophysical Data Products (MGD77 / JGOFS)

Location: CD-1, /jgofs/jgdata.tar
Location: CD-1, /mgd77/mgd77.tar

Two data products are created on each cruise of the NBP: JGOFS and MGD77. The JGOFS data set consists of a single file produced each day named jgDDD.dat.gz where DDD is the Julian day the data was acquired. The ".gz" extension indicates that the individual files are compressed before archiving with tar under the filename jgdata.tar. The daily file consists of 20 separate columnar fields in text format which are described below. The JGOFS data set is obtained primarily by applying calibrations to raw data and decimating to whole minute intervals. However several fields are derived measurements from more than one raw input. For example, Course Made Good (CMG) and Speed Over Ground (SOG) are calculated from gyro and GPS inputs by the NGL software package. Similarly, the wind direction field is the vector sum of the separate X and Y inputs received from the wind instrument. The JGOFS data set was used to produce the daily data plots during the cruise.

Note: Null, unused, or unknown fields are filled with 9's in the JGOFS data.
Note: TSG data may be processed by either RTDAS or RVDAS.

The fields consist of the following values:

FIELD	DATA	UNITS
01	GMT date	(dd/mm/yy)
02	GMT time	(hh:mm:ss)
03	NGL latitude	(-dd.dddd)
04	NGL longitude	(-ddd.dddd)
05	SOG (speed over ground)	knots
06	GPS HDOP	-
07	Gyro Heading	degrees
08	CMG (course made good)	degrees
09	mast PAR	microeinsteins/meter/sec^2
10	sea surface temperature	degrees C
11	sea surface conductivity	siemens/meter
12	sea surface salinity	PSU
13	sea depth	meters (uncorrected for salinity)
14	true wind speed	meters/sec (STARBOARD ONLY)

JGOFS data set (continued)

FIELD	DATA	UNITS
15	true wind direction	degrees (STARBOARD ONLY)
16	ambient air temperature	degrees C
17	relative humidity	percent
18	barometric pressure	millibars
19	sea surface fluorometry	volts (0-5 FSO)
20	not used	-

The MGD77 data set is contained in a single file for the entire cruise named NBP9901.mgd, There is also a file named NBP9901.gmt. This file is the output of the mgd77togmt utility using NBP9901.mgd as input. The "gmt" file can be useful for plotting and other purposes. Finally, a tar archive named "mgd77.tar" contains a file from each day of data acquisition named: JDddd.fnl.gz, where ddd is the Julian day. These files contain all the data used to produce the "mgd" file, but in a space-delimited columnar format that may be more accessible for some purposes. In addition, these files contain data on one-second intervals rather than one minute and are individually "gzipped" to save space. Below is a detailed description of the MGD77 data set format.

Format Conventions:

All decimal points are implied. Leading zeros and blanks are equivalent.
Unknown or unused fields are to be filled with 9's (DO NOT BLANK FILL).
All "corrections", such as time zone, diurnal magnetics, and Eotvos, are understood to be added (e.g., time-zone correction is the number of hours, which must be added to the recorded time to determine GMT).

Columns	Length	Type	Description
1	1	int	DATA RECORD TYPE Set to "3" for data record.
2-9 given	8	char	SURVEY IDENTIFIER Identifier supplied by the contributing organization, else NGDC in a manner which represents the data. Identical to hat in the header record.
10-14	5	int	TIME-ZONE CORRECTION In hundredths of hours. Corrects time (in characters 13-27) to GMT when added: equals zero when time is GMT.
15-16	2	int	YEAR 2 digit year
17-18	2	int	MONTH (e.g. May is represented as 05)
19-20	2	int	DAY Day of month
21-22	2	int	HOUR Hour of day
23-27	5	real	MINUTES X 1000
28-35	8	real	LATITUDE X 100000 + = North; - = South. Between –9000000 and 9000000
36-44		real	LONGITUDE X 100000 + = East; - = West. Between –18000000 and 18000000
45	1	int	POSITION TYPE CODE Indicates how lat/long was obtained: 1 = Observed fix 3 = Interpolated 9 = Unspecified

Columns	Length	Type	Description
46-51	6	real	BATHYMETRY, 2- WAY TRAVELTIME In ten-thousandths of seconds. Corrected for transducer depth and other such corrections, especially in shallow water
52-57	6	real	BATHYMETRY, CORRECTED DEPTH In tenths of meters.

| 58-5 | 2 | int | BATHYMETRIC CORRECTION CODE |

This code details the procedure used for determining the sound velocity correction to depth:

01-55   Matthews' Zones with zone
59   Matthews' Zones, no zone
S. Kuwahara Formula
Wilson Formula
Del Grosso Formula
Carter's Tables
Other (see Add. Doc.)
Unspecified

| 60 | 1 | int | BATHYMETRIC TYPE CODE |

Indicates how the data record's bathymetric value was obtained:
1 = Observed
3 = Interpolated (Header Seq. 12)
9 = Unspecified

| 61-66 | 6 | real | MAGNETICS TOTAL FIELD, 1ST SENSOR |

In tenths of nanoteslas (gammas). For leading sensor. Use this field for single sensor.

Columns	Length	Type	Description
67-72	6	real	MAGNETICS TOTAL FIELD, 2ND SENSOR In tenths of nanoteslas (gammas). For trailing sensor.
73-78	6	real	MAGNETICS RESIDUAL FIELD In tenths of nanoteslas (gammas). The reference field used is in Header Seq. 13.
79	1	int	SENSOR FOR RESIDUAL FIELD 1 = 1st or leading sensor 2 = 2nd or trailing sensor 9 = Unspecified
80-84	5	real	MAGNETICS DIURNAL CORRECTION – In tenths of nanoteslas (gammas). (In nanoteslas) if 9-filled (i.e., set to "+9999"), total and residual fields are assumed to be uncorrected; if used, total and residuals are assumed to have been already corrected.
85-90	6	F6.0	DEPTH OR ALTITUDE OF MAGNETICS SENSOR In meters. + = Below sea level 3 = Above sea level
91-9	7	real	OBSERVED GRAVITY In tenths of milligals. Corrected for Eotvos, drift, and tares.
98-10	6	real	EOTVOS CORRECTION In tenths of milligals. E = 7.5 V cos phi sin alpha + 0.0042 V*V
104-108	5	real	FREE-AIR ANOMALY In tenths of milligals. Free-air Anomaly = G(observed) – G(theoretical)
109-113	5	char	SEISMIC LINE NUMBER Used for cross-referencing with seismic data.
114-119	6	char	SEISMIC SHOT-POINT NUMBER
120	1	int	QUALITY CODE FOR NAVIGATION – 5 – Suspected, by the originating institution 6 – Suspected, by the data center 9 – No identifiable problem found (NOTE – Institution will most frequently 9-fill this field; however, should they wish to code a "5", the data center will not contradict. The data center's quality control program, which performs (among other checks) a vectorial analysis of the navigation, is available in a printout form upon request.)

RVDAS and RTDAS Data Acquisition Systems

Why are there two data sets? What is RVDAS and how does it differ from RTDAS?

RTDAS (Real Time Data Acquisition System) has been used on the NBP for several years. For the most part, it has performed well during that period. However, it is a complex system made up of no less than 5 separate computers. The increase in computing power during that time has made it

possible to accomplish all the functions of RTDAS and more, using a less complex, and consequently more robust, data acquisition system: RVDAS (Research Vessel Data Acquisition System).

RV-DAS has been in development for nearly two years. It is now in final testing on both the NBP and her sister ship the R/V Laurence M. Gould. Soon, it will replace RT-DAS entirely.

RV-DAS and RT-DAS log exactly the same set of inputs. Hence, the raw data sets are theoretically identical. At the present time, daily data processing and quality control is still carried out on data logged by RTDAS. Both the raw and processed data sets from RTDAS are included in data the distribution. The RVDAS raw data set is provided for redundancy. Below you will find detailed information on the data included in these sets. Be sure to read the "Significant Acquisition Events" section below for important information about data acquisition during this cruise.

RTDAS Raw Data Set

Location: CD-1, /rtdas

Available sensors supported and logged through the Real Time Data Acquisition System (RTDAS) consisted of the following

Meteorological and Light Data

Ambient Air Temperature
Relative Humidity
Wind Speed (starboard and port instruments)
Wind Direction vectors (starboard and port instruments)
PIR & PSP (Long-wave and Short-wave Light Spectrum)
PAR (Photo-Active Radiation)

Barometer

Barometric Pressure measured in millibars

GPS (Global Positioning System) Navigational Data

Ashtec GPS (NMEA and PBEN), Model: XII
PBEN – Standard PBEN Format from Ashtech receiver RAW string
ATT – Pitch and Roll NMEA Format String from Ashtech RAW string

Trimble Centurion GPS, Model: 20636-00 SM

P-code receiver GPS.
NMEA Output: GLL, GGA, and VTG

Please note that because of DOD actions, P-Code service was lost after December 26, 1998 (Julian Date 360) and reverted from 7 meter to 100 meter resolution (spoofing turned "off") for the remainder of the cruise.

Yokogawa Gyro

Gyro heading from ship's navigation system.

NGL – Processed Navigational Data

NGL is a navigation software package that takes inputs from the Ashtec and Trimble GPS's and the Yokogawa Gyro. Using this information, it calculates Speed over Ground (SOG) and Course Made Good (CMG). The output string has the following fields.

Latitude
Longitude
Heading
Speed over ground
Course made good

Lacoste & Rhomberg Gravity Meter System (version 1.10)

Gravity

Ocean Data Equipment Corporation Bathy 2000 Sonar

Depth only, logged continuously

Simrad EK500 Sonar

Depth only, ceiling is 2500 meters, used sporadically throughout this cruise.

Sea-Bird Model 21 Thermosalinograph, including Turner Fluorometry

Sea-Bird Underway Temperature, Conductivity, and Salinity data
Remote (sea water intake) Temperature
RAW data string in SeaBird hexadecimal format, includes fluorometry from
Turner 10-AU instrument.

All of the sources listed above are connected to RT-DAS via RS-232 serial interface and configured as individual channels for data logging. Data from sensor inputs can be logged to disk in two different formats, either RAW or PROCESSED. RAW data files consist of a time stamp and the RAW RS-232 data string. No data manipulation is performed on these files.

PROCESSED data files consist of a time stamp, and parsed data fields when applicable. PROCESSED fields also provide for limited mathematical calculations of the individual field or data sets. These calculations are primarily used for applying calibration coefficients and performing conversions, such as hexadecimal to decimal. These processed files should not be confused with the JGOFS and MGD77 processed data sets.

|The files from each data stream are g-zipped and tarred. Along with each tar archive is a file listing the contents of the archive in plain text format.

The following outline explains the format of each available raw and processed RTDAS channel:

File Naming Conventions

All files are logged to disk on the RTDAS system follow the same naming convention. Each RTDAS channel consists of a three-letter name abbreviation. As an example, the naming scheme for the MET (meteorological) data stream is shown below. If a logging process is interrupted for any reason, RTDAS will begin writing new log files. The sequential data file number will be incremented by 1 when this occurs.

Raw data: MET?????.R##
Processed data: MET?????.D##

Where,

MET   Channel name, e.g. meteorological data
??????   Three digit Julian date & two-digit year (ex. 00199)
R   Raw data indicator
D   Processed data indicator.
Sequential number of the data file. (Usually 00.)

Field Formats

Below are the field formats for all channels logged on this cruise. Not all channels are logged in both raw and processed formats.

ASH Channel – raw data – PBEN String

Field	Parameter
1	Data
2	GMT time (hhmm)
3	Header Strings
4	Receive Time (GPS seconds of the week)
5	Station Position ECEF – X
6	Station Position ECEF – Y
7	Station Position ECEF – Z
8	Latitude
9	Longitude
10	Altitude
11	Velocity in ECEF – X
12	Velocity in ECEF – Y
13	Velocity in ECEF – Z
14	Site Name
15	PDOP
16	HDOP
17	TDOP

ASH Channel – raw data – ATT string

Note: Ignore single character fields between "data" fields.

Field	Parameter
1	Date
2	Time (HHMM)
3	Header string
4	Receive time (GPS seconds of the week)
5	Heading in degrees
6	Pitch in degrees
7	Roll in degrees
8	Measure RMES (MRMS) in meters
9	Baseline RMS (MRMS) error in meters
10	Attitude reset flag

BAR Channel – Processed data

Field	Parameter
1	Parameter
2	Epoch seconds
3	Milliseconds
4	Barometric pressure

Note: Ignore single character fields between "data" fields

BAT Channel – Raw Data

Field	Parameter
1	Date mm/dd/yy
2	Time hh:mm:ss
3	Digitized depth in meters to 5 significant digits to the left of the fixed decimal point and 1 digit to the right. I = invalid or lost bottom, V = valid or digitized bottom.
4	Empty field I00000.0
5	Empty field –99.99
6	date in month/day/year format
7	time in hours / minutes / seconds / hundredths
8	transmit pulse window type PW1 = Rectangular, PW2 = Hamming, PW3 Cosine, PW4 Blackman
9	Primary transmit frequency PF1 = 3.5 kHz, PF2 = 12.0 kHz
10	Parametric mode secondary frequency SF1 = 3.5 kHz, SF2 = 12.0 kHz
11	Transmit pulse length PL1 = 200 usec, PL2 = 500 usec, PL3 = 1 msec, PL4 = 2 msec, PL5 = 5 msec, PL6 = 10 msec, PL7 = 25 msec, If transmit mode is set to FM, then: PL1 = 25 msec, PL2 = 50 msec, PL3 = 100 msec.
12	System Operating Mode: MO1 = CW parametric, MO2 = CW, MO3 = FM parametric, MO4 = FM
13	Frequency sweep bandwidth: SB1 = 1 kHz, SB2 = 2 kHz, SB3 = 5 kHz
14	Transmit power level: PO1 = 0 dB, PO2 = -6 dB, PO3 = -12 dB, PO4 = -18 dB, PO5 = -24 dB, PO6 = -30 dB, PO6 = -30 dB, PO7 = -36 dB, PO8 = -42 dB
15	Transmit Mode: TX1 = single ping active, TX2 = pinger listen, TX3 = multipinging TR, TX4 = multipinging TR, TX5 = multipinging TTRR, TX6 = mulitpinging TTTTRRRR, TX7 mulitpinging TTTTTRRRRR
16	Transmit Rate: TR3 = 4 Hz, TR4 = 2 Hz, TR4 = 2 Hz, TR5 = 1 Hz, TR6 = .5 Hz, TR7 = .33 Hz, TR8 = .25 Hz, TR9 = .20 Hz, TR: = .10 Hz, TR; = .05 Hz
17	System Gain Mode: GM0 = hydrographic AGC, GM1 through GM9 = hydrographic +3db through + 27db manual. GM(ASCII A through D) = hydrographic + 30db through + 60db manual, GM(ASCII E through K) = sub-bottom 1 through sub-bottom 7.
18	Speed if sound in meters
19	Draft of vessel in meters (location of sonar window below water level)
20	Background Noise Level in fixed point reference to dB/V

BAT Channel – Processed Data

Field	Parameter
1	Date
2	Epoch seconds
3	Milliseconds
4	Digital Depth

Note: Ignore single character fields between "data" fields.

GRV Channel – Raw data

Field	Parameter
1	Date
2	GMT Time
3	(Ignore)
4	Gravity

Note: Ignore single character fields between "data" fields.

GYR Channel – Processed data

Field	Parameter
1	Date
2	GMT time
3	Gyro heading

Note: Ignore single character fields between "data" fields.

MET Channel – raw data

Field	Parameter
1	Date
2	GMT time
3	Sensor header
4	Starboard wind vector Y
5	Starboard wind vector X
6	Portside wind vector Y
7	Portside wind vector X
8	Dry temp
9	PSP (Pyrgeometer)
10	PIR (Pyranometer)
11	Wet temperature
12	Relative humidity
13	PAR
14	Spare field
15	Spare field
16	Spare field
17	Spare field
18	Spare field
19	UPS voltage
20	uMac
21	Temperature
22	uMac
23	DC voltage

MET Channel – processed data

Field	Parameter
1	Epoch Seconds
2	Milliseconds
3	Dry temperature
4	Relative humidity
5	Wet temperature
6	PSP (Pyrgeometer)
7	PIR (Pyranometer)
8	Starboard wind vector Y
9	Starboard wind vector X
10	Portside wind vector Y
11	Portside wind vector X
12	PAR

Note: Ignore single character fields between "data" fields.

NGL Channel – Raw Data

Field	Parameter
1	Date
2	Time
3	Latitude
4	Longitude
5	Speed
6	Course
7	Gyro heading
8	PDOP
9	HDOP
10	Quality
11	GPS up
12	Fix Number

NGL Channel – Processed Data

Field	Parameter
1	Epoch Seconds
2	Milliseconds
3	Latitude
4	Longitude
5	Speed
6	Course made good
7	Gyro
8	PDOP
9	HDOP
10	Number of Satellites seen
11	Quality
12	GPS up
13	Fix number

Note: Ignore single character fields between "data" fields.

PCD Channel – Raw Data: GGA, GGL, VTG NMEA Strings

Each String proceeded with:

Field	Parameter
1	Date
2	Time

3	GGA String: $GPGGA, hhmmss.ss,xxxx.xxxx,a,yyyyy.yyyy,a,m,nn,o.o,p.p,M,q.q,M,r.r.wwww*hh<CR><LF> hhmmss.ss: UTC of position xxxx.xxxx,a: Latitude N/S yyyyy.yyyy,a: Longitude, E/W m: GPS quality indicator nn: Number of satellites in use. o.o: Horizontal dilution of precision p.p,M: Antenna altitude above/below mean sea level (geoid) (meters) q.q,M: Geoidal separation (meters) r.r: Age of differential GPS data^2 wwww:Differential Reference Station ID
4	GLL String: $GPGLL, xxxx.xx,a,yyyyy.yy.a,hhmmss.ss,A*hh<CR><LF> xxxx.xxxx,a: Latitude N/S yyyyy.yyyy,a: Longitude, E/W hhmmss.ss: UTC of position A: Status of data (A = valid)
5	VTG String: $GPVTG, www.w,T,xxx.x,M,yyy.y,N,zzz.z,K*hh<CR><LF> www.w,T: Track, degrees True xxx.x,M: Track, degrees Magnetic yyy.y,N: Speed knots zzz.z,K: Speed, km/hour

Note: precision of some fields may vary.

SIM Channel – Raw data

Field	Parameter
6	Date
7	Time (HHMM)
8	Header string
9	SIMRAD time flag
10	Digital depth in meters
11	Bottom back-scatter strength
12	Not used – spare
13	Not used – spare

SIM Channel – Processed data

Field	Parameter
1	Epoch seconds
2	Milliseconds
3	Digital depth in meters

Note: Ignore single character fields between "data" fields.

Date TSG Channel – Raw data

Field	Parameter
1	Time
2	Sea-Bird hexadecimal string, broken down as follows:
3	Bytes Number:

1 – 4	Temperature
5 – 8	Conductivity
9 – 14	Remote temperature
15 – 17	V0, Currently Unused
18 – 20	V1, Flourometer

TSG Channel – Processed data

Field	Parameter
1	Epoch seconds
2	Milliseconds
3	TSG Temperature
4	Conductivity
5	Remote Temperature (sea-water intake)

Note: Ignore single character fields between "data" fields.

RVDAS Raw Data Set

Location: CD-2, /rvdas/uw
/rvdas/nav

File Naming Conventions

The RVDAS logged data file-naming convention differs from that of RTDAS. There is only one file type with RVDAS: raw data. Data arriving at RVDAS is time-stamped and written to disk. All processing for analysis or display is carried out by other processes.

An RVDAS data files is named following the convention: [CruiseID][ChannelID].dDDD.

The CruiseID is the numeric name of the cruise, for example: NBP9901.
The ChannelID is a 4-character code representing the instrument of system being logged, for example: met1 (for meteorology)
DDD is the Julian day during which the data is logged.

Unlike RTDAS, RVDAS only writes one file per day regardless of how many times logging is started or stopped.

File Structure and Channel ID's

RVDAS data is divided into two broad categories, ***Underway*** and ***Navigation***. The groups are abbreviated "uw" and "nav". Thus, these two subdirectories exist under the top-level rvdas directory. The instruments are broken down as shown. Each data file is g-zipped to save space on the distribution CD.

Underway (/rvdas/uw)

Barometer – bar1
Bathy 2000 – bat1
Gravity – grv1
Meteorological – met1
Flourometer – flr1
Thermosalinograph – tsg1

Navigation (/rvdas/nav)

Ashtech GPS – 3df1
Trimble P-Code GPS – PCOD
Gyrocompass – gyr1
NGL – ngl1

Time Stamps

All RVDAS data is time stamped in the following manner before it is written to disk.

YY+DDD:HH:MM:SS.SSS [data stream from instrument]

Where,
   YY: two-digit year
   DDD: Julian Day
   HH: two digit GMT hours
   MM: two digit GMT minutes
   SS.SSS: seconds, with millisecond resolution, GMT

Calibrations

Location: CD-1, /cal

Included on the CD-1 is a directory with all available calibration information as well as some other helpful information on calculations, etc. Some of these files are text and others are JPEG images of scanned calibration sheets. A text file named readme.txt identifies all the files available in the calibration directory.

Acquisition Problems and Events

This section lists all know problems with acquisition during this cruise including instrument failures, data acquisition system failures and any other factor affecting this data set. All times are in GMT.

98-360   P-Code GPS keys became invalid at 23:58. GPS output becomes invalid until 98-61,00:52. After which the GPS is reset to civilian mode. Accuracy drops from approximately +/- 7 meters to +/- 100 meters in civilian mode.

98-361   RTDAS logging went down at 08:35, reason unknown. Since this was very early in the cruise, several hours were spent trying to diagnose the problem, but no firm conclusions were reached. RTDAS restarted, data logging continues at 23:31. RVDAS logged continuously during this period.

98-365   RTDAS has a yearly bug affecting date rollover on December 31, at 23:59. The problem was "caught" immediately and RTDAS was restarted. Acquisition began at 99-001,00:14.

99-013   Problems reported with Starboard wind bird. The problems were diagnosed as "binding" in the directional rotation of this instrument. It was completely replaced on 99-015. Data from the starboard wind bird should be used with caution around this period. Note: The starboard wind bird is used to produce the JGOFS processed data set. The port wind bird functioned properly throughout this period.

99-029   Bathymetry data was not collected by RTDAS on 99-029 but is available from the RVDAS data set.