SeaBird SBE 19 SEACAT CTD Deployment and Data Processing Notes / Methods

Written: 11/12/02 wkoz; last updated 09/19/08 wkoz

I. Pre-Deployment Checks

A. Be sure Data Transfer Cable is unattached and Dummy Plug is securely in place.
B. Check that tubing from Pump to CTD is securely attached with the white clip.
C. Assure that CTD has been stored with switch in "OFF" position (ie. check that you have adequate battery power).

II. Instrument Deployment

A. Attach instrument securely to winch cable with zip-tied D-Ring (shackle).
B. With CTD on the pontoon, flip power switch to "ON" position.
C. Rotate CTD to outboard position and take down to approximately 10 meters.
D. Soak CTD for a few minutes at this depth, then bring back to just below the surface (top ring just out of water).
E. While watching Depth Sounder for bottom depth, send CTD down to within approximately 10m of the bottom.
    1. If bottom topography is changing rapidly (you're drifting), watch depth carefully – err on the shallow side if at all unsure!
F. With someone level winding the cable, bring CTD all the way back up to the surface and onboard the boat.
G. Turn power "OFF" and store.

III. Post-Deployment

A. With fresh-water, rinse instrument thoroughly.
    1. Be sure to rinse sensor surfaces on fluorometer and transmissometer (both ends).
    2. Be sure to rinse water through pump – detach tubing and flow water up hose and out through waste vent.

IV. Data Upload from Instrument

A. Remove Dummy Plug and plug in Data Transfer Cable to CTD and computer (easiest is laptop - COM1)
B. Accessible on laptop from c:\ProgramFiles\Sea-Bird\SeaTerm\SeaTerm.exe (or shortcut icon)
C. Press Connect Button
    1. This may not work the first time – try again – it should connect at 9600 baud, even parity, 7 data bits

D. At S> prompt, press Status Button to view Instrument Status
   1. Check that instrument has correct date and time, and that battery status is good (vmain > 8V)
   2. If the date and time are wrong, type “ST” at the S>prompt to set the date and time.
   3. If the battery is low, change the battery.

E. At S> prompt, press Upload Button to begin file upload
   1. Once “Upload Parameters” interface box appears, select cast number you want to upload and select “OK”
      2. Note that the first cast saved is cast 0, not 1 ***add information about data headers here***

   (ADD Header INFO)
   3. Select Data file name for raw data and press Open (or double click)
      a. save raw data to appropriate location
      b. file nomenclature is: XYYMMDDZ with:
         X : representing a CTD data file
         YY: two digit year
         MM: two digit month
         DD: two digit day
         Z: sequential letter of cast within one day, starting with “a”

F. Repeat step E as necessary for any casts that need to be uploaded.
G. Manually type the letters “qs” to put instrument back to sleep.
   1. After data successfully processed we will return to clear off memory card on CTD.

V. Converting Raw (.hex) Data to Text (.cnv) Data

A. Starting from c:\ProgramFiles\SeaBird\SBEDataProcessing-Win32 \SBEDataProc.exe
B. From Drop Down Menus, select Run -> Data Conversion…
C. Program Setup File should be in working folder: *DatCnv*.psu
D. Instrument Configuration File should be in working folder: xxxx.con (name comes from factory calibration – be sure you’re using the latest)
E. Input Directory should be in raw data working folder
F. Select Input File
G. Output Directory should be cnv data working folder
H. Output File should default to correct name (same as raw but with .cnv extension ***Name append leave blank***
I. Press “Start Process” ** see appendix for output parameter listing**
J. Repeat for all files which need to be converted
K. Exit

VI. Matlab Processing

A. Open Matlab; be sure you’re in the correct working directory
B. Run plot_ctd. by typing in plot_ctd
C. For standard data processing, select “Single File”
D. Select .cnv file that you want to run by either highlighting and pressing open, or double clicking on the file name.
   1. Remember that data files are usually located in a cnv directory

E. For standard data processing, Default settings usually OK, although check to make sure that Save Plots is set to yes if that's what you're trying to do.
   1. Sometimes it is helpful for comparisons to change "Close Open Figures" to "NO" in order to keep more than one plot visible at a time.

F. If you're trying to save the data, select yes on Write to Summary File and select the appropriate file (ie. \ctd\cnv*0607*ctdsum.cnv). You might want to wait on this bit until you have looked at the graphs and know that you want to keep them with the axes scales that they have.
   1. To change axes, open the ctd_defaults in \ctd\matlab. Scroll to the end of the script where it says AXES LIMITS in green. Change what's needed. If these are "odd" axes, it might be nice to go back after you're done and change them to the normal axes.

G. Enter necessary depths at prompts (data from PRR cast at same station).

H. When script has run, print Figure 5 (downcast profile)
   1. File -> Print Preview, Color tab, check that the Background Color is set to Custom-white.
   2. Print

G. Repeat for all casts that need to be processed.

VII. Data Management and Instrument Storage

A. Printed profiles should be stored in CTD/PRR notebook.
   1. Occasionally glance through profiles to check for anomalies – these might be real, or they could be representative of instrument problems.

B. After any cast, be sure to update logs with filenames and any problems encountered with the cast and/or data processing.
   1. As this file is filled, print full pages and file them in the logs section of the CTD/PRR notebook.

C. Check the summary file to make sure that what should be there is and that there aren't multiple copies of the same station. When save, say yes to save as a csv file, but then when you close the file, say no to saving the changes. I haven't a clue as to why it works this way.

D. Make backup copies of all files – raw data a plots.

E. The CTD can only hold about 12 casts (normal data size) at a time, so if you're getting close, you'll want to erase all of the old cast files and start over. After you're certain the data has been processed correctly, re-enter SeaTerm and Clear CTD memory.
   1. Start -> SeaTerm.exe
   2. Connect
   3. Init Log
      a. Yes to verify that you want to clear instrument log.
      b. A "y" will already be entered for the first question of whether or not you really mean to do this. Hit enter.
      c. Then IMMEDIATELY enter another y while holding down control for the second question. It only gives you like a second to do this. Holding down control is what the ^ before the Y stands for.
   4. Type "qs" to put instrument back to sleep.

F. Remove Data Transfer Cable and replace Dummy Plug

Appendix 1: Output Parameters for Data Conversion Software

1: scan: Scan Count
2: bat: Beam Attenuation, Chelsea/Seatech/Wetlab Cstar [1/m]
3: sal00: Salinity [PSU]
4: depSM: Depth [salt water, m] ** 64.46° for latitude**
5: dz/dtM: Descent Rate [m/s]
6: xmiss: Beam Transmission, Chelsea/Seatech/Wetlab CStar [%]
7: flECO-AFL: Fluorescence, Wetlab ECO-AFL [mg/m^3]
8: prSM: Pressure, Strain Gauge [db]
9: t068C: Temperature [ITS-68 deg C]
10: t090C: Temperature [ITS-90 deg C]
11: timeJ: Julian Days
12: v0: Voltage 0
13: v1: Voltage 1

NOTE: Between 0506 and 0607, the fluorometer and transmissometer got switched on the instrument, so that their order in the output parameters then needed to be switched as well. If you don't get a trace for these instruments in the matlab plot, try switching their order and rerunning the file in the data conversion.