NEW HORIZON CALCOFI ADCP MANUAL

March 2006

ADCP computer, ADCP, Ashtech

This section gives instructions on how to power up the ADCP, Ashtech, and ADCP computer.

(1) In the computer room in the New Horizon upper lab (port side), check that the computer labeled ADCP (aft rack, middle) is on (green power light) and that the Ocean Surveyor ADCP deck unit is on (aft rack, bottom, white toggle: 1=ON). The Ashtech is in the same rack, above the computer. It should be on; green lights flashing. I believe the Astron unit (same shelf) is its power supply.

(2) In the upper lab, there is a monitor and keyboard that is used for all the upper lab computers via a KVM switch. On the keyboard, hit "CNTRL" twice to get the KVM menu to display on the monitor. Use the arrow keys/<return> to select the ADCP computer.

(3) Set the computer time [SIO CALCOFI setup person does this during the port call]: Prior to the cruise, check the computer date and time. Set the computer to GMT. The computer clock will drift a bit during the cruise. That is OK -- we will correct the clock drift in post-processing.

VmDas

Startup
This section gives instructions on how to run VmDas, assuming the usual files are in place. [The SIO CALCOFI setup person should verify the files during the port call]:

(1) Start VmDas (double click the icon on the desktop).

(2) File -> Collect Data

(3) Options -> Load -> Choose INI file (choose C:\CalCOFI\AutoADCP\Default_calcofi.ini, then click OPEN)

(4) Control -> Go (to start data collection)

A pair of text boxes display. The one on the left is the dialog between VMDAS and the ADCP. The one on the right is the dialog between VMDAS and the GPS and Ashtech. The dialogs should scroll by, then the windows disappear and there should be 2 small

green squares in the lower right. Green for ENS = ADCP acquisition and green for NAV = the navigation streams.

Shutdown

(5) Control -> Stop (to stop data collection)

(6) File -> Exit (to quit VMDAS)

Ashtech

Startup

This section describes how to run the Ashtech Checker:

(1) Start ASHCHECK (double click the icon on the desktop).

(2) Green is good: The time, heading value and an OK status will display on a green background if the program thinks the Ashtech is good

(3) Red is bad: The time and heading value display but may be incorrect, and a status message (RESET Ashtech) appears. Try rebooting the Ashtech: depress the red button on the Ashtech, and if good values don't appear in about 5 mins, power cycle the Ashtech.

NOTE: You do not have to exit ASHCHECK or stop VMDAS when you reboot the Ashtech.

Shutdown

(4) Click the 'Exit' button to quit.

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BASIC SETUP

This section gives instructions on how to setup the New Horizon Ocean Surveyor 75 kHz for CalCOFI ADCP data collection. We use a pair of files, "Default_calcofi.ini" and "OS75_NB16.txt", and the best way to confirm that the files have not been modified on the computer between cruises is to do a "diff" between the files on the computer and those archived on the USB drive.

CalCOFI ini and txt files are in the directory C:\CalCOFI\AutoADCP

We use files because the VMDAS manual is unclear on some critical points; the files save out configuration between cruises. Load the files (the ini file knows to load the txt file). The following tour of the VMDAS gui entries is meant to document how our ini file configures VMDAS. Each heading below describes the entries within a tab in the VMDAS setup screens. Documenting them here provides a checklist for normal operation.

TOUR OF VMDAS TABS:

(1) Start VMDAS (double click the icon).

(2) File -> Collect Data

(3) Options -> Load -> Choose INI file (choose Default_calcofi.ini for the default setting)

(4) Options -> Edit Data Options -> [see following sections ...]

Communications TAB

Options -> Edit Data Options -> Communications

Sets up com ports for ADCP, GPS, and Ashtech. ADCP is on COM1. I think GPS is on COM2 and Ashtech is on COM3.

Hardware setup:
(1) gyro is going into the deck unit as a synchro feed

(2) pcode or other reliable GPS as a serial feed

(3) GPS heading device, such as ADU, POSMV, or Seapath as a serial feed. (Presently, the New Horizon has an ADU5.)

- the GPS port gets written to the N1R files. It should have GGA and optionally VTG messages, but nothing else

- the GPS heading port gets written to the N2R files. It should also have a GGA message (if one is available), the attitude (heading and tilts) message, and any quality messages that are relevant. (For instance, a Seapath should have PSXN,20 for attitude, and PSXN,22 for quality.)

NOTES

(1): until a VmDAS bug is fixed, if you have a POSMV, you should output BOTH PRDID and PASHR messages. Then someone can use PRDID if they want, but the quality information is still there for later. (PRDID has no quality indicator)

(2) Keep the number of extra messages to a minimum. VmDAS can choke if it has too many serial messages. (The LOG files get really big and can stop data acquisition)

ADCP Setup TAB

Options -> Edit Data Options -> ADCP Setup

(1) Choose the text file to use under "ADCP setup from file".

os75_nb16.txt, DEEP OCEAN, (loaded via Default_calcofi.ini) lower precision mode. This is the preferred mode for CalCOFI. Since the cruise is in the open ocean and the scientists on board are interested in currents as deep as possible, use narrowband pings with 16-meter bins. Deepest profiles might be to 800m, but with lower vertical resolution.

(2) Set time between Ensembles. We recommend loading a new ini file when you change configs - the ini file loads the correct text file AND changes the time between ensembles automatically. Otherwise you have to do 2 things manually, in the gui.: load the text file and change the time between ensembles.

Change the gui "Ensemble Time" so it is consistent with your instrument's frequency (2 sec for NH OS75). This is done to maximize the number of pings that go in the water. The RDI default settings are conservative (i.e. they are designed so you won't have ruined data; but you do have fewer pings per average).

NOTE: "Ensemble Time" here refers specifically to the bottom of the "ADCP Setup" Tab, and it refers to the "seconds between ensemble" (where an ensemble is usually just one watertrack ping, or might be a pair of pings: one bottomtrack ping and one watertrack ping). This setting DOES NOT have anything to do with the averaging of the data later.** It is important to remember to change the "Ensemble Time" to match the ping pattern. The computer actually tells the instrument when to ping; the ADCP doesn't figure that out for itself. If it's too small, you may have interference. If it's too large, you waste the opportunity to ping.

Recording TAB

Options -> Edit Data Options -> Recording

Data should record to the directory

C:\ADCPDATA (primary)

C:\ (secondary)

It's probably easiest to have the data always end up in the same directory and choose a new deployment name to use; this name will be part of the VMDAS file names. Then after the cruise you can stop logging and use a file browser to move the data to a different directory. For CalCOFI data, we choose calcofi.

Max size 2-5Mb (We use 5Mb or they're too large to load easily)

You choose whether there is a dual output directory (but don't write to a networked disk -- it tends to cause problems)

Transform TAB

Heading Source: choose ADCP compass/gyro (better for reliability)

Tilt source: We choose to set the tilts manually to zero.

DO NOT ENABLE heading correction because we want the txt file to have precedence (see p. 56 in the VMDAS user manual).

EV (set to 0)

EA (fixed transducer misalignment)
There should be only one EA command in use, but it can be in one of two places.
- If you are using a text file, there is an EA command which we set to match
the NH alignment (EA045). In that case, the EA command in the gui should be zero AND heading correction should not be enabled. VmDAS
will use the value from the text file

- **DO NOT ENABLE tilt correction**
None of these things should change between cruises.

Averaging TAB

60 seconds for STA (short time averages)
The standard for ADCPs is 5 minutes or 300 seconds (for LTA)
ENABLE reference layer, bins 3-10 is fine.

Data Screening TAB

not needed

User Exits TAB

not needed

Simulated Inputs TAB

not needed

OS75_NB16.TXT

```
;----------------------------------------------------------------------\
; ADCP Command File for use with VmDas software.
;
; ADCP type:    75 Khz Ocean Surveyor
; Setup name:   default
; Setup type:   Low resolution, long range profile(narrowband)
;
; NOTE:  Any line beginning with a semicolon in the first
;        column is treated as a comment and is ignored by
;        the VmDas software.
;
; NOTE:  This file is best viewed with a fixed-point font (e.g. courier).
; Modified Last: 12August2003
;----------------------------------------------------------------------/

; Restore factory default settings in the ADCP
cr1

; set the data collection baud rate to 38400 bps,
; no parity, one stop bit, 8 data bits
; NOTE:  VmDas sends baud rate change command after all other commands in
; this file, so that it is not made permanent by a CK command.
cb611

; Set for narrowband single-ping profile mode (NP), fifty (NN) 16 meter bins (NS),
; 8 meter blanking distance (NF)
WP0
NN050
NP00001
NS1600
NF0800

; DISABLE single-ping bottom track (BP),
; Set maximum bottom search depth to 1200 meters (BX)
BP000
BX12000

; output velocity, correlation, echo intensity, percent good
ND111100000
```

```
; One and a half seconds between bottom and water pings
TP000150

; Three seconds between ensembles
; Since VmDas uses manual pinging, TE is ignored by the ADCP.
; You must set the time between ensemble in the VmDas Communication options
TE00000150

; Set to calculate speed-of-sound, no depth sensor, external synchro heading
; sensor, no pitch or roll being used, no salinity sensor, use internal transducer
; temperature sensor
EZ1020001

; Output beam data (rotations are done in software)
EX00000

; Set transducer misalignment (hundredths of degrees)  CHECK THIS
EA04500

; Set transducer depth (decimeters)  CHECK THIS:
ED00050

; Set Salinity (ppt)
ES35

; save this setup to non-volatile memory in the ADCP
CK
```