

Physical Oceanographic Mooring Time Series Protocol

Instrumentation Procedures: ADCP

Moorea Coral Reef LTER

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LTER 0, LTER 4 and LTER 5 15m ADCP protocol

There are ADCPs deployed at LTER 0, 4 and 5 in 15m of water. Each of these gets serviced and replaced every 6 months.

The locations are:

LTER 0: -17 28.52, -149 50.343

LTER 4: -17 32.614, -149 46.166

LTER 5: -17 34.91, -149 52.503

Pre-deployment/programming:

The ADCPs for these deployments need 3 battery packs. Two of these are housed in the external battery pack attached to the ADCP through a cable. The external battery pack needs to be opened at both ends and the old batteries removed. Check the voltage of these batteries; record the voltage on the battery and also in the battery log. They are then recycled or saved depending on the available voltage. New batteries need to be tested with the volt meter, recorded on the battery and in the log and installed. Make sure all connections are secure, insert a new desiccant pack and indicator card. To prevent debris from affecting the seal, clean o-ring and case lid with a Kimwipe. Reseal the external battery case using RDI supplied o-ring grease to lubricate the o-ring. Make sure to seal the case by slowly tightening around the case instead of tightening one bolt first. The ADCP itself has the end cap removed carefully and the connection to the ADCP head is removed. Then the battery pack is replaced as above. Make sure the connection to the ADCP head is secure and seal the ADCP end cap.

Use BBtalk to communicate with the ADCP. The time needs to be set with time.gov GMT as you base. A pre-deployment test should be run. The memory should be erased; the compass needs to be calibrated to a value less than 0.5 and the script file should be uploaded. Refer to "ADCP set-up commands" for specific information. The script file should look like this:

```
;Moorea LTER 5 15-m forereef, Dec-2009 -> Jun-2010 deployment
```

```
;08-Dec-2009
```

```
CR1
```

```
CF11101
```

```
EA0
```

```
EB0
```

```
ED150
```

```
ES36
```

```
EX11111
```

```
EZ1111111
```

```
WA255
```

```
WB0
```

```
WD111100000
```

```

WF88
WN25
WP15
WS100
WV175
HD111000000
HB5
HP2400
HR03:00:00.00
HT00:00:00.50
TE00:01:00.00
TF09/12/08 18:00:00
TP00:04.00
CK
CS
;
;Instrument      = Workhorse Sentinel
;Frequency       = 614400
;Water Profile   = YES
;Bottom Track    = NO
;High Res. Modes = NO
;High Rate Pinging = NO
;Shallow Bottom Mode= NO
;Wave Gauge      = YES
;Lowered ADCP    = NO
;Beam angle      = 20
;Temperature     = 28.00
;Deployment hours = 4320.00
;Battery packs   = 5
;Automatic TP    = YES
;Memory size [MB] = 2048
;Saved Screen    = 2
;
;Consequences generated by PlanADCP version 2.04:
;First cell range = 2.10 m
;Last cell range  = 26.10 m
;Max range        = 35.93 m
;Standard deviation = 1.81 cm/s
;Ensemble size    = 654 bytes
;Storage required = 418.85 MB (439200000 bytes)
;Power usage      = 1432.98 Wh
;Battery usage    = 3.2
;Samples / Wv Burst = 2400
;Min NonDir Wave Per= 2.04 s
;Min Dir Wave Period= 3.05 s
;Bytes / Wave Burst = 187280
;
; WARNINGS AND CAUTIONS:
; Waves Gauge feature has to be installed in Workhorse to use selected option.
; Advanced settings have been changed.

```

The “TF” line is the start date/time in yy/mm/dd hh:mm:ss It should be set to 8am of the deployment date before uploading the file. Once the file has been sent and you get the “CS” command back that everything is OK, unplug the ADCP before shutting down BBtalk.

Once programmed the ADCP needs to be attached to the external battery pack and taped. The heads are coated with a zinc paste to prevent fouling. Check to make sure that the copper screw at the center of the ADCP head does not have an obstruction in the vent hole. Cover the ADCP heads with the yellow cap to protect them.

Deployment:

Equipment needed for deployment:

2 Large game bags
cable-tie cutters
a minimum of 20 large cable-ties (blue)
yellow ADCP head cap

On the morning of deployment listen at 8am to make sure that the unit starts pinging. If you do not hear the pings between 8 and 8:10 there is a problem. Put the coupled ADCP and external battery pack each in their own game bag and in a protected place on the boat. At the site hang the ADCP and battery pack off the side of the boat in 15feet of water. When collecting these underwater be ready to take on a large amount of weight. Once at the ADCP rack set the new ADCP aside and cut off all the cable-ties holding the existing ADCP in the rack. The ADCP comes out first and then the external battery pack comes up through the middle of the rack as well. Take care to not pull or torque on the cable connections. Insert the new ADCP external battery pack through the rack and use cable-ties to attach it to one of the legs of the rack. Then the ADCP is secured to the rack with the head holder. Tighten those in a rotating fashion bit by bit so that the head is level. Once the battery pack and the ADCP are secure attach the cable to itself and to one of the rack legs so that it can not pull free or abrade on coral. Make sure the yellow protection cap is removed from the new ADCP and put on the collected ADCP for transport back to Gump Station.

Cleaning and Downloading:

On return to Gump Station wipe off any remaining zinc oxide with a cloth and rinse down the ADCP and external case. The heads of the ADCP need to be cleaned with a vinegar solution with nothing but a toothbrush. They are soft heads and must not be scratched. The tape around the body of both the ADCP and the external battery case does not need to be removed, but can be scrubbed with a bristle brush. The tape around the end caps needs to be removed and the end caps cleaned so that the batteries can be changed. Once the ADCP and case are dry the cable can be removed and dummy plugs installed on both the ADCP and the external case. Do not clean either with open plugs. The cable should be cleaned and re-taped.

Once cleaned the ADCP is connected to the computer. Use time.gov and BBtalk to get the amount of time the unit is off from correct and then use WinSC to recover the data. This will take approximately 30hours to download. The file will be called RDI000.000. Rename the file using the file called "file name structure.txt" Use a flash drive to back up the data file on another computer.

