

## **CERBERUS SYSTEM#22**

### **FieldTest#4 04/24/2014**

**Stuart Halewood/Erik Stassinis**

- **Weather conditions:**

Weather Okay, wind 10-15knts at beginning of deployment then dropped but picked up again towards the end, current in shore NW, 0.4knts, wind waves 1ft, swell W 3ft at 7 secs. Southerly swell 1ft at 16 secs.

- **Sky state during data collection:** Coastal haze, 2/8

- **Boat Platform used:** Fish 2

- Starting position: 34 22.560N, 119 41.739W

- Bottom depth: 62m

- **Physical setup & Profile parameters:**

Pre-test battery voltage at terminals 28.73vdc, Voltage under thruster 26.65v  
End voltage measured at terminals 26.61vdc.

Surface Reference mounted on Stbd side of boat house.

Removed one small float from package to increase negative buoyancy

4lb drop weight attached under boat. Same position as Fieldtest#2 initially then moved (5ft deeper) @ 11:20am as we were dragging the profiler and needed to get down to target depth of 15m.

Profile parameters:

Target depth: 15m, (changed to 12m when we had dragging issues, file: 14024\_102217)

Ascent depth: initially 0.4m

Thruster Ascent power: 50%

Ascent ramp down depth: 0.5m

Ascent Ramp down speed: 0.5

Descend time: 400secs at file: 04242014\_100423, after initial 300secs.

- **Schedule & # of profiles recorded:**

3 profiles, 1 Shadowband and then 1 short wait period of approx 6 mins.  
12 profiles recorded continuously. Other small numbers of profiles recorded as tests were made.

- **Tests Performed:**

Lithium batteries for complete system power supply tested. Fully charged before Field test #4, trying to log hours of use to monitor overall Voltage drain.

New Panasonic Toughbook 'Leviathan' tested.

All tests completed over Buoy wireless system.

Darks and Pressure Tare performed on boat and then pressure Tare performed again on surface in water.

System on-deck ambient light test performed, unit rotated so all sensors exposed to sun.

System tested in 'Auto schedule' mode and 'Manual schedule' mode. Attempting to keep parameters as much the same as previous field test for comparison.

Adjusted Thruster to be as Horizontal to the backplane as possible.

Removed one small float from package to increase negative buoyancy

Adjusted 'Time to target depth to 400secs to allow for slower descent while being pulled by current, started at file 04242014\_100423.

- **Results observed:**

Batteries functioned well, no significant load issues with thruster powered or off.

Panasonic Toughbook worked well, battery life excellent.

Wireless takes 5 complete mins to come up properly but works fine under Windows 7.

Due to low medium current and strengthening winds we were dragged NE and made the adjustments, dropping a float and lowering the 4lb drop weight down the umbilical to allow us to fall more rapidly and lessen the dragging of the unit. This allowed us to achieve the 15m target depth.

At this point the system was running in ok but appeared to still be tilting due to our dragging of the unit. Will have to check during processing.

Software also froze up on us when we were changing schedule parameters and moving from Manual to Auto mode. Needed a hard restart on the Buoycomp again.

Restarted Buoycomp again and Buoycomp froze up another time. We waited to observe any lag from wireless etc but no response. This necessitated yet another hard restart.

**\*Note: send logs to VI\***

After restart the system ran in Auto mode for the rest of the deployment with a freefall time of average 140secs to reach 15m versus a 75 sec average time to climb to surface.

- **Conclusions/Questions:**

We adjusted the ascent depth target to target depth of 0.4m based on swell and weather conditions and had no problem achieving this.

Also the freefall pitch and roll angle seemed a lot better after the removal of this weight. Need to confirm in the data though.

Overall we recorded a good amount of data between 10:00am and 14:00 local time. Not quite as much as fieldtest #3. The hardware appears to be functioning well.

The Buoycomp software issues appeared to be less of an issue now that we have the updated Buoycomp software on both systems. We did see the software 'lock up' one time. Will be sending VI logs of this deployment..

Q1) The Buoycomp software really slowed us down and we had multiple differing episodes of failure and freezing. How can we analyze and narrow down the software issues?

A: This appears to be better but we still need to be confident of having no freezing failures..

Q2) will the system turn on after being 'asleep'? can we adjust the schedule to simulate a night time break and observe the system 'wake up'?

Q3) On a higher current and wind day like this test. What did removing a float and adjusting the drop weight do to the Pitch, Roll and tilt?