

CERBERUS SYSTEM#22

FieldTest 01/03/2014

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- **Weather conditions:**

Weather good, low wind, current in shore NW, 0.6knts, 0 wind waves, swell W 1-3ft at 16secs.

- **Sky state during data collection:** Hazy cloud

- **Boat Platform used:** Fish 3

- **Physical setup & Profile parameters:**

Pre-test battery voltage at terminals 26.88vdc, Voltage under thruster 26.17v
Free fall with no load 26.48v. End voltage measured at terminals 26.77vdc.

Surface Reference mounted on Stbd side of boat house.

4lb drop weight attached under boat.

Profile parameters:

Target depth: 15m,

Ascent depth: initially 0.1m then changed to 0.3m

Thruster Ascent power: 50%

Ascent ramp down depth: 0.5m

Ascent Ramp down speed: initially 1 then changed to 0.5

- **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.

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 tested in 'Auto schedule' mode and 'Manual schedule' mode

Schedule parameters altered via the schedule file on the Buoycomp system.

System tested in 'Manual Auto Profile mode' which runs one set of profiles at the prescribed parameters then stops.

- **Results observed:**

Batteries functioned well, now 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.

The system software failed to connect to the aggregator/deck box and then locked up on us. Took a few restarts. Would not restart Buoycomp software without us restarting the actual Buoycomp itself.

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.

To adjust the profile parameters you must restart software in manual mode and make changes, then SAVE them before starting acquisition to have them take effect.

Dragging package due to current conditions, tilt and roll first 3m very bad, approx 33 deg.

The System ran solidly for approx 45mins recording on schedule in manual mode.

- **Conclusions/Questions:**

We adjusted the depth at which the thrust motor started to ramp down as well as the ascent target depth. 0.3m was doable but getting to 0.1 was very difficult.

This will involve a lot of fine-tuning to get it right up to surface and different weather and deployment conditions could change this each time.

Q1) How do we lessen the acute angle at which the unit ascends and seems to cause a lot of 'wobble' at the surface as well as pushing the depth sensor deeper making it harder to get an acceptable depth reading recorded?

A: From Biospherical, physically adjust the mounted angle of the Thruster so it lies more horizontal and reduces the upward pitch of the package. Also ensure that the strain relief bridle is taking all the strain and that the cable isn't taking some load and pulling the unit also.

Q2) How do we slow the unit descent and allow more loitering at good Pitch and Roll angles?

Q3) What is start schedule vs auto profile while in manual mode?

A: Turns out that you can start the planned automated schedule in manual mode and watch the windows update, did this after we adjusted the schedule file so we could do 3 profiles, 1 Shadowband and then 1 short wait period of about 6 mins, then repeat indefinitely.

Q4) How can we improve the robustness of the Buoycomp software that appears to 'lock up' on us?