

## UNAVCO POLAR GPS SYSTEM TEST PROCEDURE

### APPENDIX 2: HARDWARE QA TESTS

Appendix Version: **3.0**  
Date: **May 20 2013**

---

#### POWER COMPONENT QC CHECKS

1) Solar panels (after backing plates have been added)

- a) Test open circuit voltage and short circuit current with multimeter. On the circular connector, pin B is positive, pin A is negative.

The OC voltage should be >20 volts regardless of cloud cover, and the SC current should be within reasonable expected values given existing cloud cover.

Note: solar panel open circuit voltage and short circuit current specs are listed on the back of the solar panel, but only apply when panel is exposed to direct, full sun.

2) Batteries. If possible test at UNAVCO. If not, test at staging area as practical.

- a) Charge batteries prior to testing. After charging, allow the battery voltage to settle for a few hours to reach their quiescent voltage before testing.
- b) Look at physical appearance, test voltage (> 13V), and conductance (> 1000 mhos). Voltage and conductance values should be similar for all batteries.
- c) Write the date, voltage, and conductance values on each battery in permanent marker.

3) Battery wire harness. Assemble male/female pairs and perform following tests on each pair.

- a) Tug test on all connectors and ring terminals, on wiring harness and board (~ 10 lbs).
- b) Test continuity (< 0.2 ohms) from ring terminal to ring terminal on red line and black line. Test isolation between red and black lines.

4) Forgen wind turbines (after cable has been terminated with circular plug)

- a) Ensure mounting adapter is secure, inspect for mechanical damage, and verify rotor spins freely.
- b) Verify open circuit voltage with a spin test. On the circular connector pin B is positive, pin A is negative. For single-phase turbines, should be +15V to +20V when spun by hand. For 3-phase turbines, wired in a delta configuration, the voltage should be +7 to +10V when spun by hand.

5) Battery enclosure connector cables.

- a) For all external battery cables, and internal battery cables for auxiliary battery enclosures, verify continuity along positive (pin B) and negative (pin A) lines.