Troubleshooting Wind

This paper describes how to troubleshoot your wind sensor, mast cable and interface. Because the wind sensor is way up top of the mast, and the cable travels down the mast right next to halyards and must go thru the mast at two points, this instrument subsystem is one of the more vulnerable subsystems of the instrument package.

You should be reading this because there's a problem with your apparent wind readouts. If you have issues with true wind, you should first check the Windspeed Apparent, Windangle Apparent and Heading readouts as described in the System Troubleshooting article; (http://www.ockam.com/TroubleshootingSystem.pdf).

Reference will be made to the system manual at: http://www.ockam.com/pdfman.pdf. Page numbers are shown as [##]. Skill with a multimeter will be helpful.

In this paper we'll concentrate on Windspeed Apparent (**Ba** which stands for beta apparent – beta being the naval architect symbol for bow-relative angles) and Windangle Apparent (**Va** which stands for velocity apparent – no comments about 'velocity' please).

Accurate **Ba** (along with Heading) is crucial for Wind Direction. In the System Troubleshooting article, you compared the vane against the readout all the way around.

No apparent readouts

If your apparent wind readouts are blank or '----', the CPU isn't communicating with the Masthead Interface. Perform Open and Shorted Bus troubleshooting [41]. If you get readouts, proceed to the next step. Otherwise;

- Check the bus connection (the cable or socket the interface is plugged into). It should measure 9 volts between the center and shell. If there is no voltage, check the network cabling [41].
- Disconnect the interface, open it up and ohm the fuses. They should read as a short. If you can, replace them, reassemble and check the apparent readouts again. Otherwise, return the interface for service.

Look-see

If you have apparent wind troubles, the mast cable should be your first suspect. Inspect it carefully.

- Look for a chafed, cut or pinched jacket. Especially inspect the points where it enters and leaves the mast.
- Check the terminal block at the mast step.
- Take the connectors apart and look for grunge. Also check that the pins and sockets extend the same distance (sometimes they get pushed back and fail to make contact).

Electrical checks;

- With the interface attached, measure the supply voltage on the mast cable (+V to Gnd) which should be 5.2 volts. If none, check the fuses in the interface.
- Disconnect the interface from the mast cable and check the mast cable wires with a multimeter.

Pot-type mastheads (Signet)

Reading	Result
Resistance: S1 -> S2, S2 -> S3, S3 -> S1	Approximately 1100 ohms, all the same. Opens or shorts are bad news.
Resistance: Gnd -> +V	About 1250 ohms.
Resistance: Gnd -> Anem. AC voltage: Gnd -> Anem.	Approximately 3600 ohms. If the cups are turning, .2 volts RMS or greater.
All wires -> Mast (6 readings)	Open circuit. Any reading less than 100,000 ohms indicates a short to the mast or waterlogging.

B&G-213 type mastheads

Reading	Result
Resistance: S1 -> S2, S2 -> S3, S3 -> S1	Approximately 20,000 ohms, all the same. Opens or shorts are bad news.
Resistance: Gnd -> +V	About 6800 ohms.
Resistance: Gnd -> Anem. AC voltage: Gnd -> Anem.	Open. Nil. Masthead must be powered up for Anem. to work.
Resistance: All wires -> Mast (6 readings)	Open circuit. Any reading less than 100,000 ohms indicates a short to the mast or waterlogged cable or masthead.

Eliminate the mast cable if possible

Most extended mastheads and Signet units are compatible with the connector on the interface. If they are compatible, take the masthead down and connect it directly to the interface. Check **Ba** and **Va** readouts by manipulating the vane and cups. If it works attached to the interface, then the mast cable is the culprit.

Windangle Apparent (Ba)

Here we'll describe some possible results you may have observed, along with some possible corrections.

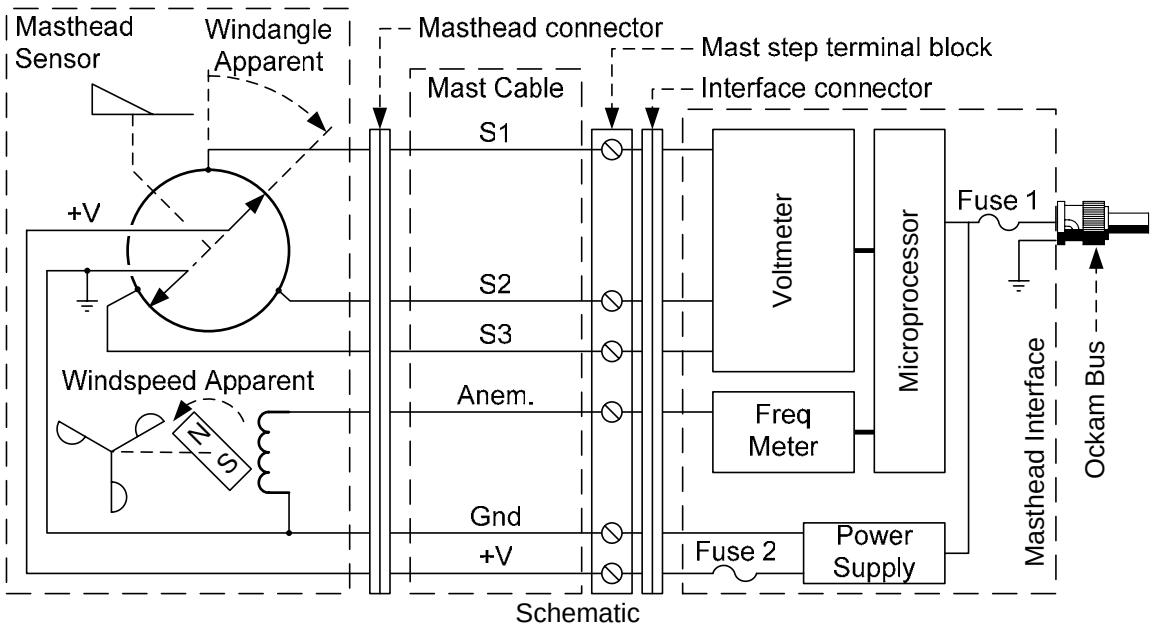
Issue	Possible cause
Ba doesn't move or wanders aimlessly.	No power to the masthead. See Electrical Checks above. Total failure of sensor. Try directly connected to interface.
Ba is noisy.	Probably due to roll rate compensation (see pdfman [58]). Temporarily disconnect the Heading interface and rotate the Masthead interface 90 to disable roll rate. Also spin the cups so there is some Va.
Ba is good some places and way of other places.	Open or shorted S-line. Perform Electrical Checks. Bad sensor. Repeat checks with masthead directly connected to interface. If still bad, sensor needs replacement.
Ba is off by a constant amount everywhere.	If >16º, vane is misaligned, or wrong signature switch setting (see pdfman [86]). If <16 º, adjust Cal Windangle Zero.

Windspeed Apparent (Va)

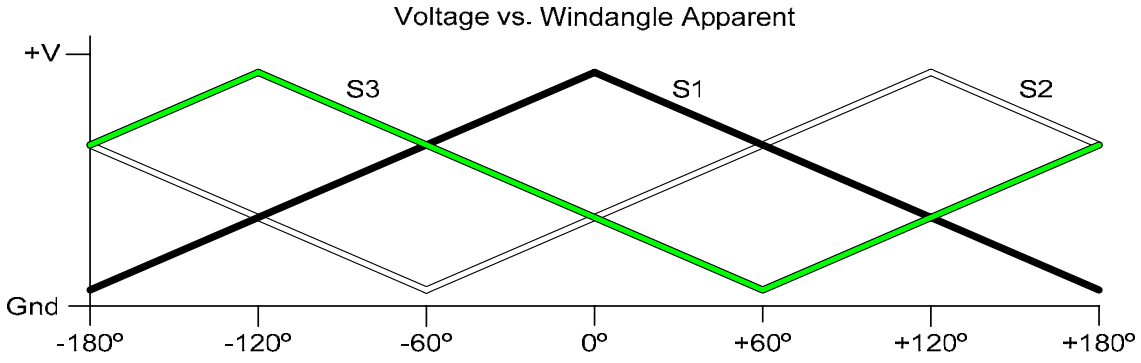
Issue	Possible cause
Va reads zero when cups are turning.	B&G-213 types: No power to the masthead. See Electrical Checks above. Try directly connected to interface.

Va reads >0 with cups still.	AC coupling to mast cable from shore power or radio transmitter. Vibration of mast due to wind jiggling wind generator.
Va is 'way off' e.g. twice or half.	Wrong signature switch setting (see pdfman [86]).
Va is off e.g. 12 vs 10.	Judgment of Va is problematic due to wind blowing faster aloft than on deck. Calibration of Va is covered in pdfman [46].

Pot-type mastheads (e.g. Signet)



Schematic



B &G-213 type mastheads