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APPLICATION NOTE NO. 57 **Revised January 2014**

Connector Care and Cable Installation

This Application Note describes the proper care of connectors and installation of cables for Sea-Bird instruments. The Application Note is divided into three sections:

- Connector Cleaning and Inspection, and Cable / Dummy Plug Installation
- Locking Sleeve Installation
- Cold Weather Tips

Note: All photos in this Application Note show standard Impulse XSG/AG connectors. Except as noted, all procedures apply to standard XSG/AG connectors as well as to optional *wet-pluggable* MCBH connectors.

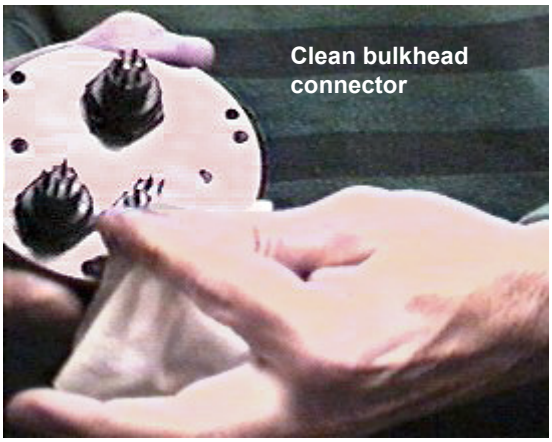
Connector Cleaning and Inspection, and Cable / Dummy Plug Installation

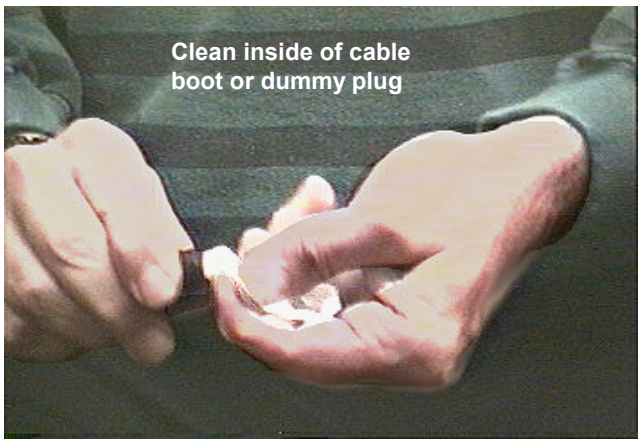
Clean and inspect connectors, cables, and dummy plugs:

- Before every cruise.
- During the cruise – This is a good practice if you have a few days of down time between casts.
- After every cruise – This is the best way to find and remove any corrosion on connector pins before severe corrosion develops.
- As part of your yearly equipment maintenance.

Follow this procedure:

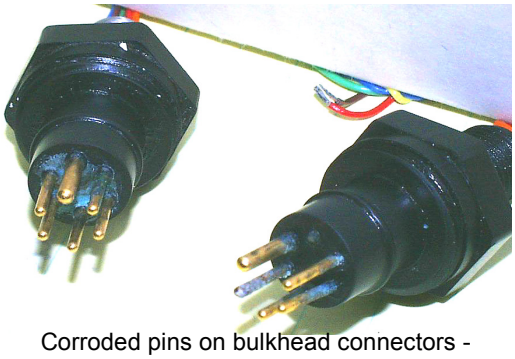
1. Carefully clean the bulkhead connector and the inside of the mating cable's boot or the dummy plug with a Kim wipe. Remove all grease, hair, dirt, and other contamination. **See Cautions in Step 3 regarding lubricants.**





2. Inspect the connector and cable boot or dummy plug:
   A. Inspect the pins on the bulkhead connector for signs of corrosion. The pins should be bright and shiny, with no discoloration. If the pins are discolored or corroded, clean with alcohol and a Q-tip.
   B. Inspect the bulkhead connector for chips, cracks, or other flaws that may compromise the seal.
   C. Inspect the cable boot or dummy plug for cuts, nicks, breaks, or other problems that may compromise the seal.

   Replace severely corroded or otherwise damaged connectors, cables, and dummy plugs - contact Sea-Bird for instructions and a Return Material Authorization (RMA) number.



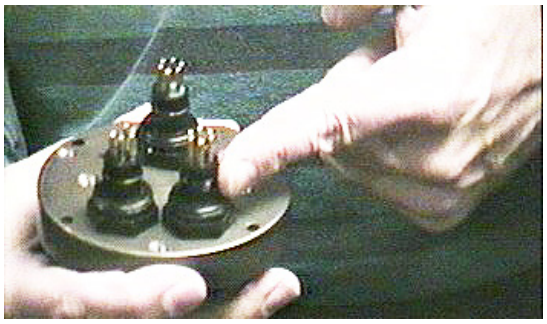
Corroded pins on bulkhead connectors - Connector on right has a missing pin

3. Using a tube of 100% silicone grease (Dow DC-4 or equivalent), grease the bulkhead connector and the cable boot or dummy plug.

CAUTIONS:

- **For all connectors: Do not use WD-40 or other petroleum-based lubricants, as they will damage the connectors.**
- **For optional wet-pluggable MCBH connectors: Silicone lubricants in a spray can may contain ketones, esters, ethers, alcohols, or glycols in their propellant. Do not use these sprays, as they will damage the connectors.** Teledyne Impulse sells a silicone lubricant in a pump spray bottle that may be used with these connectors.

A. Squeeze the silicone grease -- approximately half the size of a pea -- onto the end of your finger. Apply a light, even coating of grease to the molded ridge around the base of the bulkhead connector. The ridge looks like an O-ring molded into the bulkhead connector base and fits into the groove of the mating cable boot or dummy plug.



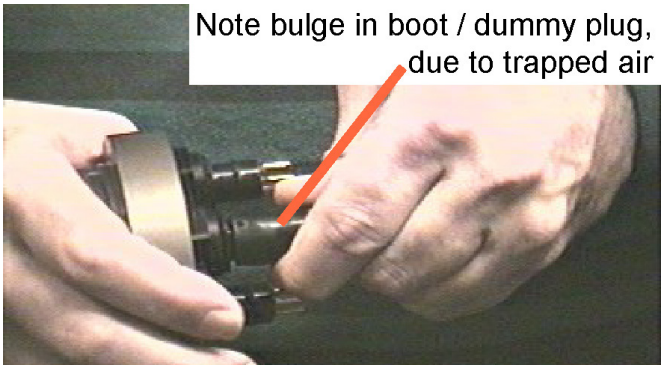
B. Squeeze approximately half the size of a pea of the silicone grease onto the end of your finger. Apply a light, even coating of grease to the inside of the cable boot or dummy plug.

4. *Standard XSG/AG connectors only:* Align the *bump* on the cable boot or dummy plug with the large pin on the bulkhead connector, and align the sockets with the pins.

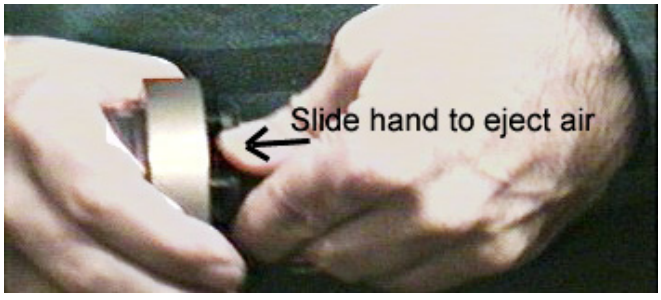
   Optional wet-pluggable MCBH connectors only: Align the non-conducting guide pin and the conducting pins with the mating sockets.

   - Do not twist the cable boot or dummy plug on the bulkhead connector; twisting can lead to bent pins, which will soon break.

5. Push the cable boot or dummy plug all the way onto the bulkhead connector.
   - *Standard XSG/AG connectors only:* You may note a bulge in the boot or dummy plug, which is due to trapped air. There may be an audible pop, which is good. With some newer cables or dummy plugs, or in cold weather, there may not be an initial audible pop.



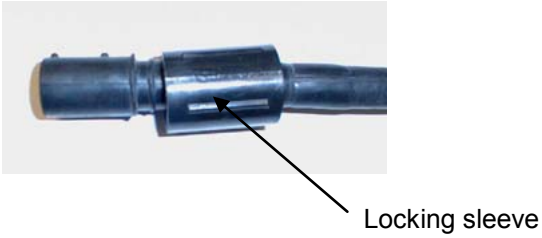
6. *Standard XSG/AG connectors only:* After the cable or dummy plug is mated, run your fingers along the cable boot or dummy plug toward the bulkhead connector, *milking* any trapped air out of the boot or plug. You should hear the air being ejected.
   CAUTION:
   Failure to eject the trapped air will result in the connector leaking.



Locking Sleeve Installation

After the cable boot or dummy plug is mated to the bulkhead connector, install the locking sleeve. The locking sleeve secures the cable or dummy plug to the bulkhead connector and prevents them it being inadvertently removed. Important points regarding locking sleeves:

- Tighten the locking sleeve by hand. **Do not** use a wrench or pliers to tighten the locking sleeve. Over-tightening will gall the threads, which can bind the locking sleeve to the bulkhead connector. Attempting to remove a tightly bound locking sleeve may instead result in the bulkhead connector actually unthreading from the end cap. A loose bulkhead connector will lead to a flooded instrument. **Pay particular attention when removing a locking sleeve to ensure the bulkhead connector is not loosened**.
- It is a common misconception that the locking sleeve provides watertight integrity. **It does not, and continued re-tightening of the locking sleeve will not *fix* a leaking connector**.
- As part of routine maintenance at the end of a day's casts, remove the locking sleeve, slide it up the cable, and rinse the connection (still mated) with fresh water. This will prevent premature cable failure.



Cold Weather Tips

In cold weather, the cable or dummy plug may be hard to install and remove.

Removing a *Frozen* Cable Boot or Dummy Plug:

1. Wrap the cable boot or dummy plug with a washrag or other cloth.
2. Pour hot water on the cloth and let it sit for a minute or two. The cable boot or dummy plug should thaw and become flexible enough to be removed.

Installing a Standard XSG/AG Cable or Dummy Plug:

When possible, install cables and dummy plugs in warm environments. If not, warm the cable boot or dummy plug sufficiently so it is flexible. A flexible cable boot or dummy plug will install properly.

Note about Wet-Pluggable (MCBH) Connectors:

As an option, Sea-Bird offers *wet-pluggable* (MCBH) connectors in place of the standard Impulse XSG/AG connectors. Wet-pluggable connectors have a non-conducting guide pin to assist pin alignment and require less force to mate, making them **easier to mate reliably under dark or cold conditions**, compared to our standard connectors. Wet-pluggable connectors may be mated in wet conditions; their pins do not need to be dried before mating. By design, water on the connector pins is forced out as the connector is mated. However, they must not be mated or un-mated while submerged. Like standard connectors, wet-pluggables need proper lubrication and require care during use to avoid trapping water in sockets.

If desired, Sea-Bird can retrofit your existing instruments with wet-pluggable connectors; contact Sea-Bird for pricing information.

Application Note Revision History

Date	Description
September 1999	Initial release
May 2003	Add caution to not use WD-40 or other petroleum-based lubricants.
August 2007	• Revise recommendations on how frequently to unmate and check connectors. • Add recommendation to lube inside of cable boot. • Make more general – cover all cables and/or dummy plugs. • Add description of wet-pluggable connectors in section dealing with cold weather installation.
February 2010	• Update to include more information about MCBH connectors. • Update address.
January 2014	Update to include caution about using silicone spray that contains propellants incompatible with MCBH connectors.