

Simple Water-Tight Box – Part II

by Brian P. Koehler



In my Part I article I described my original dry box built out of a seamless 'uni-body' electrical

junction box. After battling with that first ship a while, I became enthralled with the dry boxes other captains made from dive boxes with the clear lids (I loved being able to see inside the box and watch for moisture). Most of the boxes I saw, however, still used a large amount of RTV 'goop' to seal the wires, which I have absolute zero luck with (a skill I just do not have). I decided to try to make a dry box from one of

these boxes but using the 'fool proof' electrical connectors used in my earlier box. My goals for this box were:

- easy to open
- easy to swap out interior components
- modular: very easy and quickly disconnect and move into another boat

The dry box I was able to order was the 'Pelican' brand with the clear lids. These have a rubber water-proof liner all along the bottom that wraps up and forms the seal between the lid and the base. I decide not to make any cuts in the rubber liner (to avoid leaks) and drill my connections

through the lid only.

Photo 1: The row of black connectors on the right are for the receiver battery (kept outside the box) and servo connectors. For these I bought a pack of 4" servo extensions. I used the drill bit in my Dremel tool to drill a hole and then dragged the bit downward to make a slot for each connector. I used epoxy to hold each in place and also on the inside around the wires to seal them water-tight. Inside, each connector was plugged into the appropriate channel on the receiver. I use the extra (white) wire on the battery extension slot to connect the antenna (except for the 2.4GHz receiver, whose antennas are small enough to fit inside).

The red and black electrical connectors on the top are the 6-volt lines for

Can a dry box be relatively easy to make, easy to get into, and still be reliable?

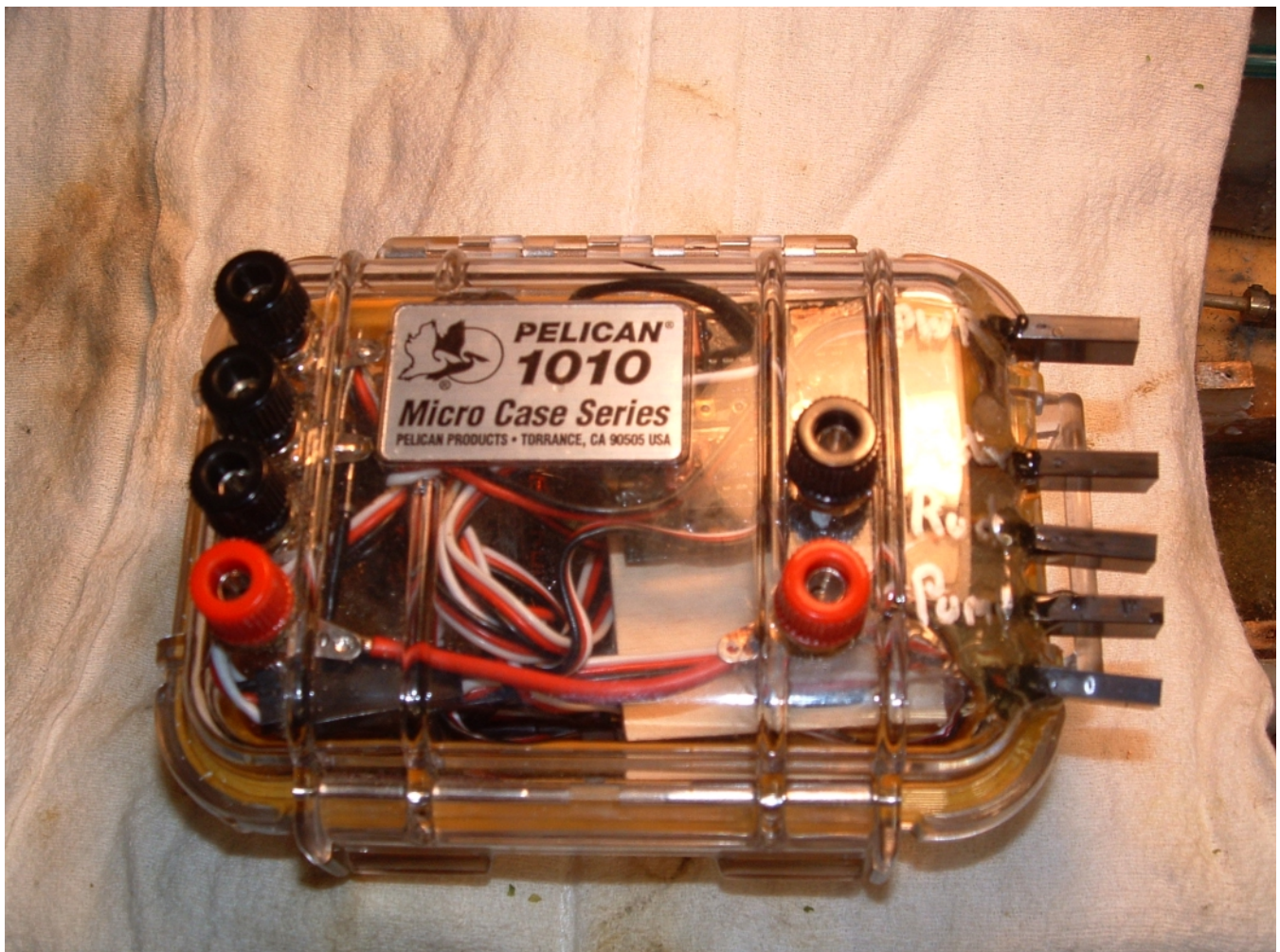


Photo 1

Photo by Brian Koehler

the Team Delta solenoid cards. I do really love these connectors. Just drill a tiny pilot hole and force-thread them in. They really CANNOT LEAK! The battery is connected on the outside to the two terminals in the right side of the lid. You can see that the red (+) just passes through under the lid and back to the red connector on the left (reason for that in a moment). The black (-) is connected to the Team Delta cards, and each card then routes back to a black connector on the left side of the lid. The wires from the solenoids are connected to the red connector at left (shared) and then to one of the black connectors. Under the left connectors (just visible in the Photo 2 inside the lid at left) a diode is permanently soldered in place between each black connector and the red connector. This is the diode that eliminates surges caused by the solenoids from damaging the Team Delta cards. *Note: Because they are permanently in place I do not have to change them when I remove a faulty solenoid (or pre-wire diodes to each back-up solenoid). I just disconnect the wires of the bad solenoid and push the wires of the new solenoid into place.*

Photo 3 is the inside of the box

just before closing the lid. It looks a little jumbled, but it all fits pretty well. The receiver sits under the extension cables in the space on the left of the box. I use a small drop of silicone to 'tack' down each Team Delta card to a small piece of wood (seen at right) to hold them all neatly together on the other side of the box. It is still very easy to 'pop' them off and swap should one fail. The main power (-) coming down from the lid to the cards are connected to a terminal block mounted upside down underneath the wood. This makes it very easy to quickly remove one card and screw-in a replacement if one ever fails, which has never happened yet. I also push most of the extra servo extension wires underneath the wood to tuck them out of the way as I close the lid. The clear lid also makes it very easy to see the blinking led's of the Team delta cards to check that they are working!

I should note my usual driving

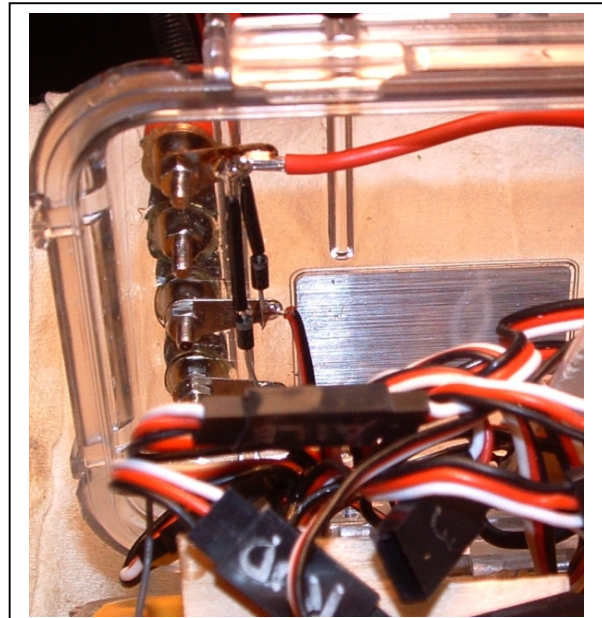


Photo 2

Photo by B. Koehler.

concern: Murphy's Law! As such, I like to have (at least one) extra layer of protection. So even though I use a dry box, I still cote my electronics with SkotchKote before mounting them inside the box. Also, using this design with the Clippard solenoids, where the tubing stays connected to the manifold (base), it is possible to quickly swap those out for repair: remove the two screws holding down the servo, disconnect the two wires from dry box lid, push leads of new solenoid in, and screw down to existing manifold... done in under 30 seconds!

I have used this box in my Vanguard and my son's HMS Lion. I enjoy the fact that, should a disaster happen to one, I can always quickly yank the whole box out of one boat and install it in the other in about a minute. Being the "big target" Vanguard, and also a novice when it comes to maneuvering a battleship, this box has been "tested" (i.e. sunk) quite a number of times by my Axis "friends". I really do not have any fears about using this box or having to leave it under the water for a period of time.

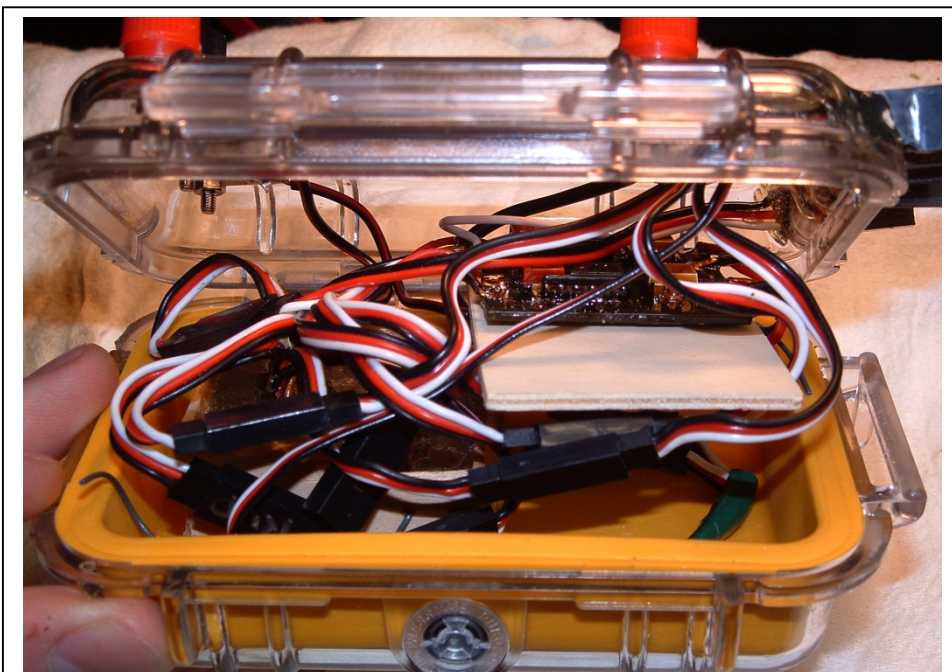


Photo 3

Photo by B. Koehler