

## **2006 MATE Center/MTS ROV Committee ROV Competition**

### **Building instructions – electronics module and trawl-resistant frame**

#### Electronics module:

The electronics module is constructed out of 1/8-inch acrylic (Plexiglass) sheets. The top acrylic sheet is 60cm x 44cm. The back and front sheets are 30cm x 35cm. The side sheets are 30cm x 40cm. The bottom sheet is 40cm x 35cm. These sheets are attached together in a rectangle to form the top piece and the body of the electronics module. A PVC elbow is used as an anchor in each corner of the electronics module body. The acrylic sheets are screwed into these anchors.

The body of the module hangs down below the top, flat surface. The body is set back from the front edge of the top surface by 2.5cm. The body is set in from each side by approximately 4.5cm. The body is set in from the back by 17cm. This overhang on the top, flat surface allows the module to sit within the guide rails on the trawl resistant frame while the body of the electronics module hangs down within the frame.

Note that each port will be appropriately labeled with the name of cable connector that needs to be inserted. RANGER class electronics modules will have one fully operational port on the left side for the power cable. EXPLORER class electronics modules will have two fully operational ports, one on the left side and one on the right side. The photographs of the electronics module show a RANGER class module, with only the left port operational.

The top, flat acrylic sheet has five U-bolts set into it for lifting. Four of these are set in each corner, approximately 5cm from each edge. The fifth is set in the center of gravity for the module. The center of gravity is approximately 27cm from the front edge of the top surface, and center-lined (22 cm from each side). Note that if you build your own electronics module, the center of gravity may be different depending on where you place ballast and flotation. The U-bolts are 2 inches in diameter and have a height of 2 inches above the top surface. The U-bolts are bolted in place.

The front of the electronics module body has two ports. These ports are openings 7.5cm (3 inches) in diameter and 7.5cm (3 inches deep). These ports are made from a 3-inch-to-1 1/2-inch ABS adapter. These adapters are screwed into the front panel of the electronics module. The left port will be labeled Power Cable. The right port will be labeled Instrument Cable.

Note that the electronics module is free-flooding. Flotation and/or ballast are added to achieve the appropriate submerged weight for each class.

Figure 1: Electronics module, top/side view and top view. Note PVC elbow anchors holding the corners together. Note the U-bolts.

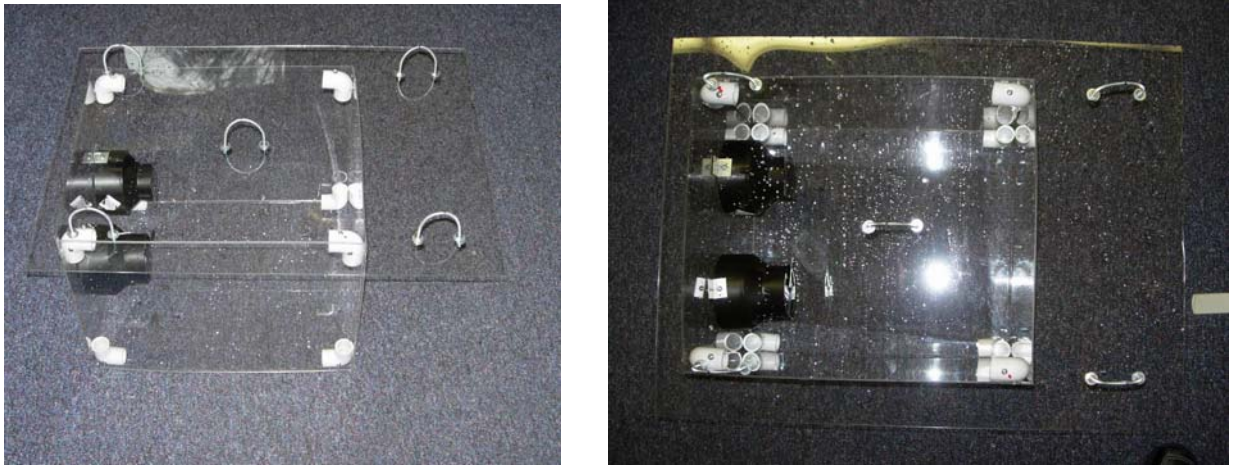


Figure 2: Electronics module, front view with ports and close-up view of ports. Note ABS adapters.



Figure 3: Electronics module, back view.



Trawl-resistant frame:

The trawl-resistant frame is constructed of ½-inch PVC. The frame is approximately 75cm long, 50cm wide, and 40cm tall. Built into the top side of the frame is a guide rail. This guide rail is designed to hold the top, flat surface of the electronics module, while the body of the module hangs down within the frame.

The guide rail is constructed of ¾ inch x ¾ inch x 1/16-inch angle aluminum. The angle aluminum is bent into a rectangle approximately 61.5cm x 45.5cm. The guide rail is screwed into the PVC frame. The top of the PVC frame that holds the guide rail in place needs to be built just big enough to hold the guide rail. The internal dimensions of this portion of the frame should also be 61.5cm x 45.5cm. When the mission is completed, the electronics module will fit within the guide rail. The sides and the back of the frame will be covered with black plastic sheeting. This sheeting is not shown in the pictures.

Once the electronics module is inserted into the frame, teams will need to open the door on the front to access the ports. The door is made from ½-inch PVC. The door is hinged on the left side (when facing the frame from the front) with the handle on the right side. The door is covered in ¾-inch hexagonal mesh. This mesh will help to decrease water resistance when the door is opened. If the electronics module is inserted properly, both ports should be accessible when the door is opened.

Figure 4: Trawl-resistant frame, front view of door and top view.



Figure 5: Trawl-resistant frame, view of angle aluminum guide rail.



Figure 6: Central node, front view with door closed and door open to reveal ports.



Figure 7: Central node, side view and top view.



Figure 8: Central node, back view.

