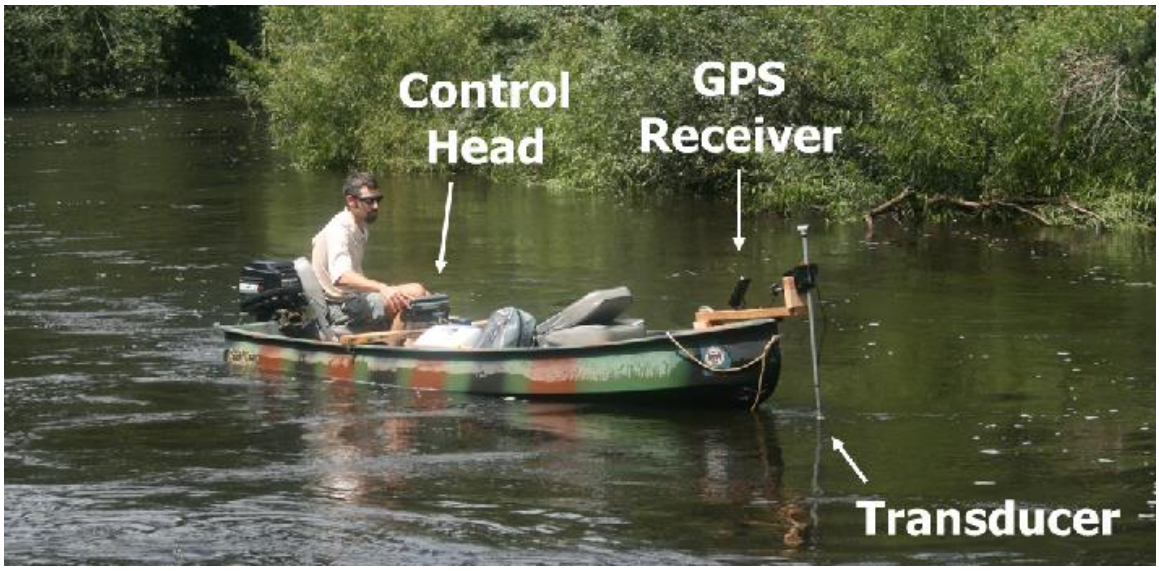
Materials List and Assembly Instructions for the Humminbird® 1197c SI Combo and the Humminbird® 1198c SI Combo control head, transducer, and external Garmin GPSMap 76 series

An illustrated manual for configuring Humminbird® side imaging units for benthic sonar habitat mapping projects



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Introduction:

Side imaging sonar uses sound to produce two-dimensional digital imagery of submerged aquatic features. This imagery can be geo-referenced to provide spatially accurate information on the location and extent of substrates and other features (i.e., large woody debris) found in aquatic systems. In turbid or non-wadeable systems side imaging provides an efficient method to collect *seamless* habitat data across large (or small) extents. Recent technological advancements, and the low cost of "off-the-shelf" side imaging units (e.g. Humminbird®), have put quality side imaging sonar within the budgets of natural resource managers and researchers ($1700 (Humminbird® 998c SI) – $2500 (Humminbird® 1198c SI). This illustrated manual details how to configure an "off-the-shelf" Humminbird® 1197c SI or 1198c SI side imaging system for benthic habitat mapping applications, including constructing a bow-mounted transducer attachment and wiring a Garmin GPS to the Humminbird® control head.

Materials list:

Item	Make	Model	Source	Approx. cost
Side imaging unit	Humminbird	1198c SI	Humminbird.com	2799.00
GPS unit	Garmin	GPSMAP 76Cx	Amazon.com	185.00
GPS/NMEA Connection cable	Humminbird	70000301 AS HHGPS Bare wire	Humminbird.com	34.99
GPS marine mount	Garmin	GPS MAP76	Amazon.com	25.00
GPS Power & data cable	Garmin	010-10082-00	Amazon.com	20.00
Pelican case (for controller head)	Pelican	1450	Amazon.com	80.00
4 GB SDHC Memory card (3x)	SanDisk Ultra	SDSDRH-004G-A11	Amazon.com	15.00
Trolling motor mount assembly	Mercury	MCK30007S	Huggins Outboard	60.00
3-4' of 1/2" galvanized water pipe	N/A	N/A	Home Depot	5.00
1 - 1/2" galvanized threaded "T" pipe fitting	N/A	N/A	Home Depot	3.00
1 - 1/2" PVC threaded "T" pipe fitting	N/A	N/A	Home Depot	3.00
2 - 3/4" galvanized conduit straps	N/A	N/A	Home Depot	2.00
1 - 3" x 3" x 1" water/rot resistant wood	Cedar, larch, Cyprus, etc.	N/A	Home Depot	5.00
1 - 3" x 1/4" SS bolt	N/A	N/A	Home Depot	0.50
2 - lock washers (match above bolt)	N/A	N/A	Home Depot	0.50
1 - nut (match above bolt)	N/A	N/A	Home Depot	0.50
2 - small/medium alligator clamps	N/A	N/A	Home Depot	5.00
20 feet of 4 strand trailer wire	N/A	N/A	Ace Hardware	15.00
15 feet 14 gage red wire	N/A	N/A	Home Depot	5.00
15 feet 14 gage black wire	N/A	N/A	Home Depot	5.00
1 - inline fuse holder - 20 A	N/A	N/A	Home Depot	1.00
1 - roll electrical tape	N/A	N/A	Home Depot	2.00
7 – ½" screws	N/A	N/A	Home Depot	0.50
12 - small wire nuts	N/A	N/A	Home Depot	5.00
Total (approx.)				$3300.00

Tool list:

Drill press
Pipe wrench (2x)
Jigsaw
Pipe threading set
Wrench set
Phillips head screwdriver
Wire stripper
Wire cutter
Hand drill + bit set

Assembly instructions:

1) Cut the ½" galvanized pipe to the length required for a minimum 6 inch transducer submersion when the completed unit is mounted off the bow of your surveying vessel. In GDNR applications a 16-foot, flat-bottom Jon boat is used, and a pipe length of ~3 feet is sufficient for our needs.

2) Thread both ends of the galvanized pipe. Most hardware stores can perform this service for a nominal fee, if you lack pipe threading tools.

3) Thread the ½" galvanized "T" on one end of the pipe. Use two pipe wrenches to securely tighten it down.

4) Using a drill press (Note: a drill press is not absolutely necessary, but it will decrease the risk of crooked drilling) bore a hole through the center of the galvanized "T" perpendicular to the openings on both ends of the "T". This hole will be used to bolt the transducer to the end of the galvanized pipe (Fig. 1-2).

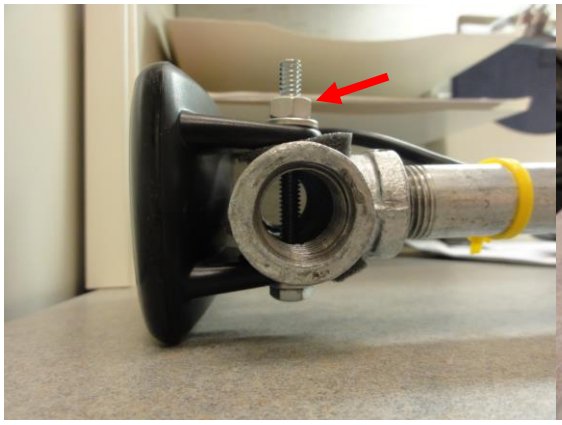

Figure 1: Transducer mount (front view). Note the bolt placement (red arrow) in the galvanized "T".

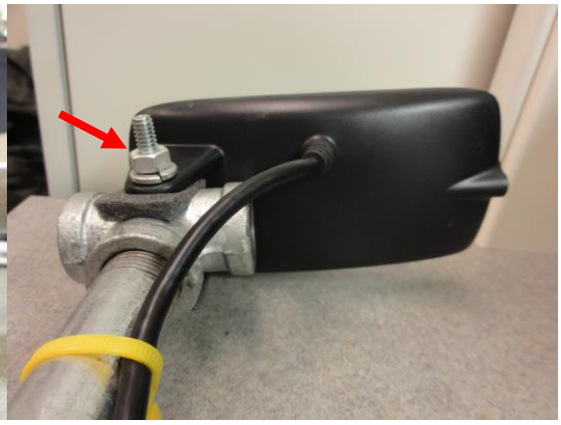

Figure 2: Transducer mount (top view). Note the bolt placement (red arrow) in the galvanized "T".

5) Bolt the transducer to the galvanized "T" using the two lock washers and the 3" x 1/4" SS bolt (Fig 1-2). If there is too much "slop" in the transducer bolt attachment, then rubber (or similar material) sleeves can be positioned on the inside of the bolt.

6) Slide the trolling motor assemble onto the galvanized pipe such that the red tipped angle locking pin is facing AWAY from the transducer. Lock the trolling motor assembly into place about halfway down the galvanized pipe using the thumb screw (Fig. 3).

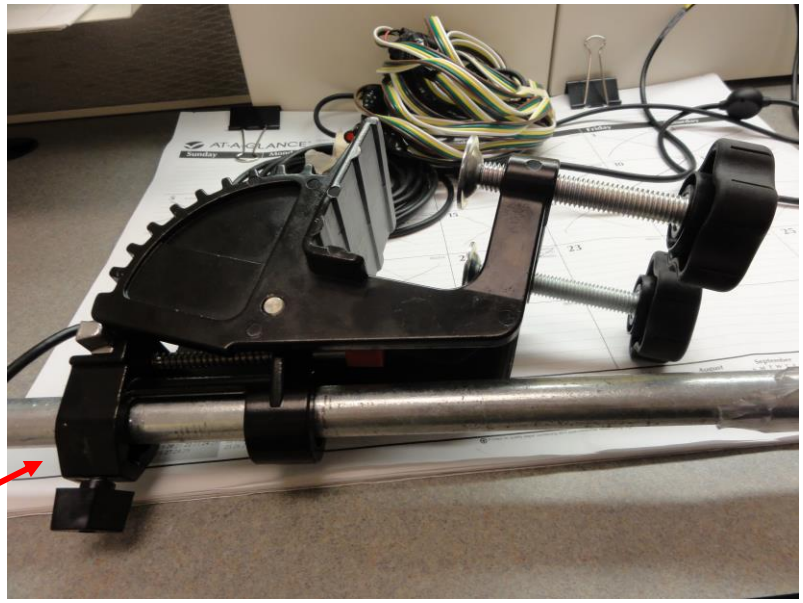

Fig. 3: Trolling motor assembly positioned on the ½" galvanized pipe.

7) Thread the PVC "T" on the other end (the top) of the galvanized pipe. Hand tighten securely, aligning the open ends of the PVC "T" perpendicular to the open ends of the galvanized "T".
8) Cut a 3" x 3" x ½" block of wood. This will form the platform for the GPS unit mount.
9) Pre-drill tap holes and then secure the wood block to the PVC "T" using the galvanized conduit straps and four of the 1/2" screws (Fig. 4).

Fig. 4: GPS mount block (side view). Note the conduit straps used to attach the mount block to the PVC "T".

10) Attach the GPS marine mount to the mounting block using the remaining three ½" screws (Fig. 4-5).

Fig. 5: GPS marine mount and wood mount block complete assembly, rear view (left) and front view (right). (Note the conduit straps used to attach the mount block to the PVC "T".)

11) Wire the transducer, GPS and power supply to the controller head via the control head plug (Fig 6) using the wiring diagram in Fig. 8.

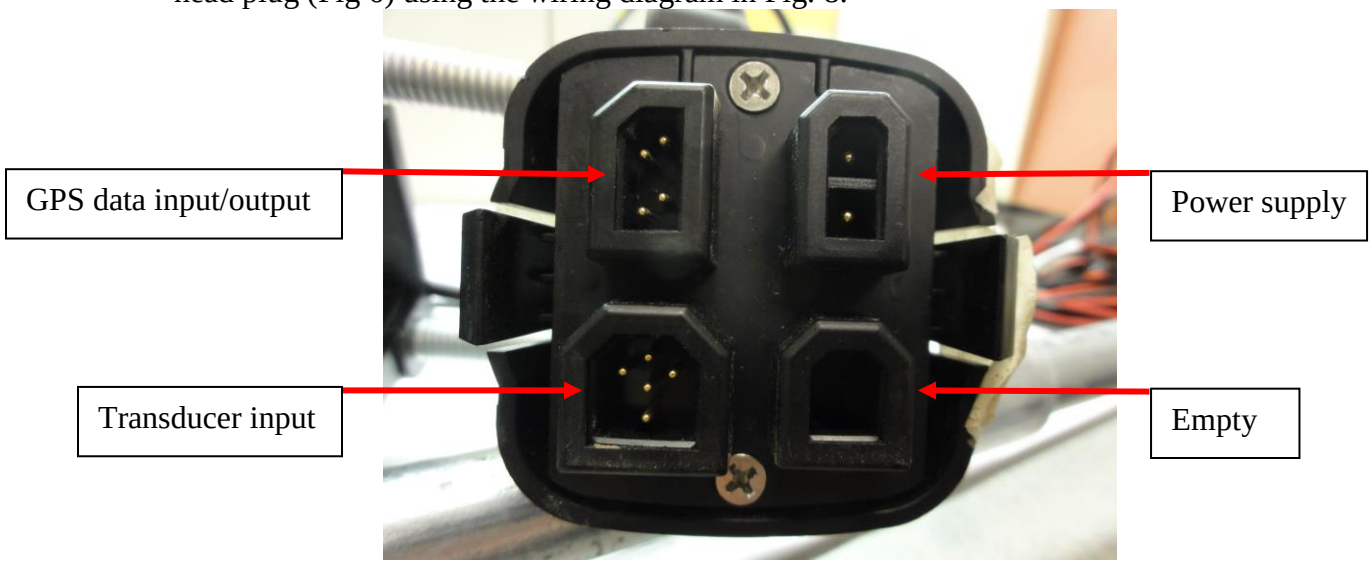

Fig. 6: Control head plug.

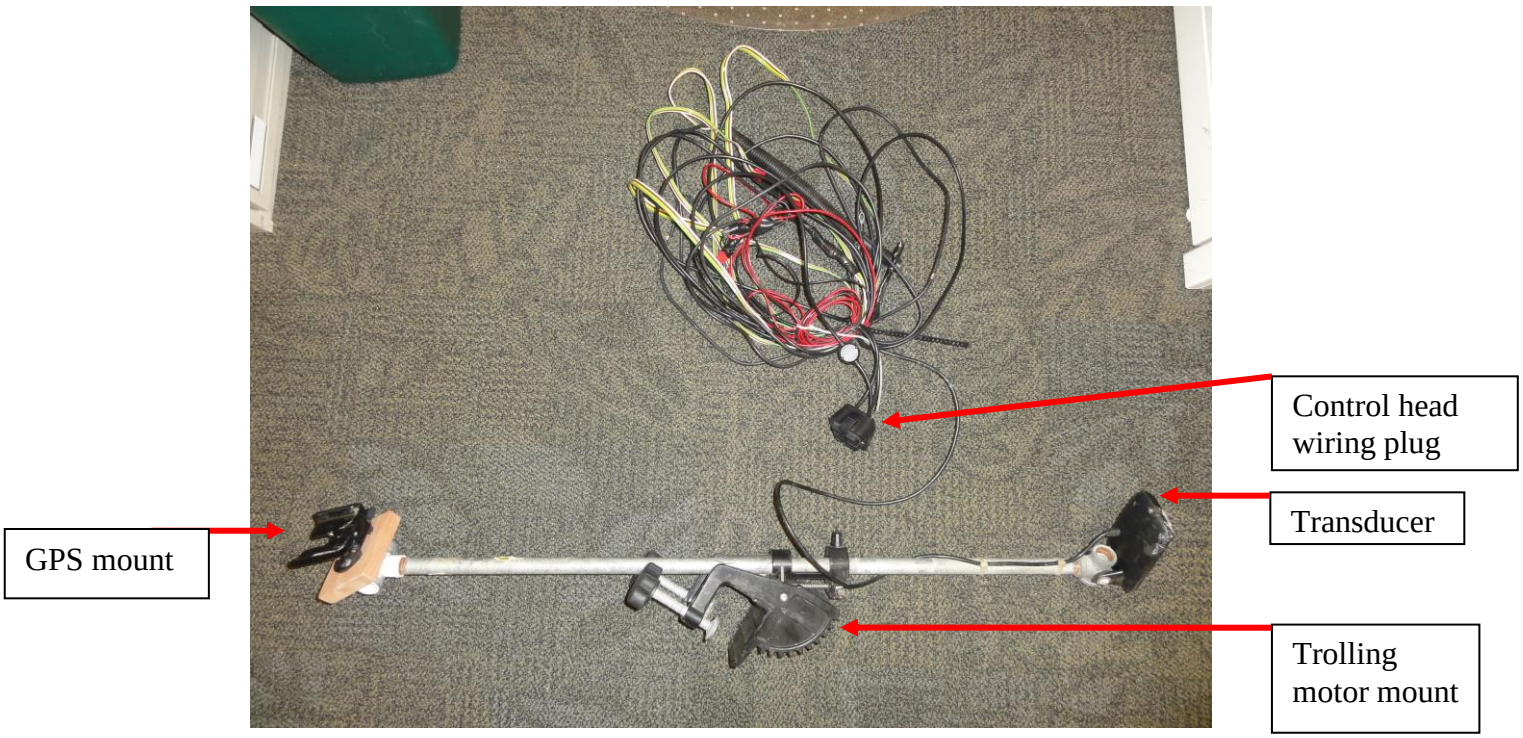

Fig. 7: Completed transducer mount assembly.

Fig. 8: Wiring diagram for a Humminbird® 1197c SI Combo, and Humminbird® 1198c SI Combo controller head and transducer.