

1/16th Scale Round Nose Hydroplane Instructions Rev:B

Preparation

Four sheets of good quality 3/32" X 6" X 36" firm balsa, a little 1/32" birch ply and a few other odds and ends will build one boat with a little left over. Fix the templates to the wood with a glue stick. Cut out each piece with the grain running the long direction of the part and sand to the final profile. To help with assembly, copy the lines from the plans onto the wood. Make a 3/4" X 24" X 5" flat building board.

Basic Hull Assembly

Cover the building board with wax paper. Lay the bottom sheet on it and assemble the bulkheads, transom, and stringers without glue at the marked locations. Be sure these are square with the bottom sheet. The tops of the bulkheads must match the top of the stringers and the stringers must be level with each other. Trim any edge that needs adjusting before gluing.

With the bulkheads in place, start by gluing the transom to the bottom and main stringers, then glue bulkhead C to the stringers only, not the bottom. Work your way from front to back, gluing bulkheads A and B to the stringers only, then bulkheads E and D to the bottom and stringers. Use medium or thin CyanoAcrylate glue (CA) to fill each joint, but not so much as to make a fillet outside the corners, this just adds weight. The open framework is very delicate until the deck is on, handle it with care.

While this is still on the building board, block the transom up and press the nose down so the front tips of the stringers line up evenly with the bottom sheet. The bottom sheet should just touch the base of bulkheads A, B, and C. With everything in place add CA to the base of bulkhead A and to the joint between the bottom sheet and stringers, but not to the base of bulkheads B, and C, which will be cut away later. Bevel the front of the 3/32" X 3/8" X 23" full length deck stringers to fit flush against the front of the bottom sheet and CA in place all the way back to the transom, being careful to keep the curve smooth. The hull structure should now weigh 2 or 3oz.

Check the hull for warps by setting it on a flat surface to see if the base of the transom is level with the bottom edges of bulkhead C. If there is much more than a 1/16" gap, gently twist the hull in the opposite direction while heating it with a hair dryer. In the next few steps check the hull frequently and correct by counter twisting when needed.

Bottom sheeting

Bevel and trim the edges of the rear non-trip panels to fit between the stringers and the bottom sheet then CA in place. Curve the sponson bottoms (one right, one left) by dipping in water then bend them while heating with an iron. Do this until the sheets lay over the bulkheads smoothly. The closer these are to the curve of the bulkheads, the easier it will be to keep the boat straight. Glue these in place and bevel the edges flush with the bulkhead profiles. Add the outside sponson panels using the same process. It may be necessary to add small balsa filler blocks to the inside of the front of the sponsons

to get a smooth curve in the nose. Add an extra fillet of glue on the inside of the bottom of the sponson to the stringer joint. This will add strength to the non-trip bevel.

Decking

Bevel the front of the bottom sheet where the deck will join with it. Carefully sand the tops of the bulkheads, stringers, transom, and side panels, if needed, to get a smooth profile for the deck to sit on. Test this by lightly pressing the deck in place, checking for gaps or bulges. Pay close attention to the seam between the sponson sides and the deck. Trim the inside edges of the deck to be 2.5" apart which leaves half the deck stringer exposed.

Put wing skin contact cement on the tops of the bulkheads, stringers and side panels. Add contact cement to the inside of the deck (one right, one left). Let this set up per manufactures instructions.

This is the hard part. When using contact cement, once you touch the parts together, they are STUCK. Be sure you have it right before putting them together. With the boat on the building board, line up the deck to the center of the deck strip and carefully touch the deck down at bulkhead C. Lay the deck down evenly along bulkhead C to the outside of the hull. Then pull it down to meet the rest of the open structure. Add CA to all the outside seams of the deck. Check for warps and counter twist if needed. Trim the center deck section to fit and glue this in place. This locks the hull (it will now be hard to twist).

Trim the deck outside edges flush. Put a 45° downward bevel on the front seam of the deck to the bottom sheet. Plane or sand the non-trip bevels on the inside of the sponsons and taper this to a point at the front. Use a drum sander to shape the curve of the deck overhang aft of the sponsons. Cut out the centers of bulkheads B and C where marked. Add a 3/32" X 1/2" X 5" cross brace to the bottom sheet where bulkhead C was. Test fit the 1/32" birch plywood doublers to the back of the transom and rear face of the right sponson, and CA in place. Fill any gaps inside the hull in the seams of the deck, bulkheads, bottom, and main stringers with thick CA so water won't find it's way past the exposed areas into the sealed off sections. Add 1/32" X 7/8" X 4" birch ply over the ride pads with the front beveled to blend into the sponsons without leaving an edge.

Sand with 180, then 320 grit using small sanding blocks being careful not to gouge the edges. I use 1" or 2" X 1/8" balsa squares with sandpaper glued on for this. Add thin CA to the outside corners to harden the edges and touch up with sandpaper. The basic hull is done, it should weigh 4 or 5oz.

Hatch Cover, Cowling, Cockpit, & V-12 Engine

Make a removable hatch cover by either soaking 3/32" balsa in water then heat and bend until it fits, or section, plane and sand 1/8" balsa. Trim the edges to fit into the opening without gaps or binding. Sand the top so the curve matches the deck.

Mark the side and top profiles of the cockpit cowling on a block of foam. Use a band saw, large scroll saw, or very sharp knife to rough cut to shape. Get the final shape by sanding until the piece is round and smooth. If using a power sander, hold the piece so it pulls the foam away from your hand, otherwise it may grab and damage the part and your hand. You can hand sand starting with 180 then 240 and finally 400 grit paper. Foam will gouge easily so be careful towards the end. Spackling past, thinned with water makes a good filler for foam. This will be finished like the rest of the hull. Don't use regular CA or nitrate dope, test other materials and paint on a piece of scrap before endangering good parts.

Cut the tail fin to shape from 3/32" balsa. Sand the edges smooth and shape the base to fit the rear cowling. Add iron-on mylar or paint the correct color and pattern of the boat you are building. Epoxy this to the foam cowling after painting. A 1/12th scale sport pilot can be dressed up in a life jacket, and painted to make a believable driver. Cut a section of airplane canopy to the shape of a windscreen. You can add stick-on instruments and a steering wheel too.

If you are building a boat that ran with an exposed engine, make one of foam or balsa by cutting the basic shapes. Sand to the final profile and glue the pieces together. Cut the bottom off to fit on the deck cover. Exhaust stacks can be cut from drinking straws or 1/4" dowels. Study photos of the real boat and add detail as needed. Paint the deck cover flat black or dark gray around the engine.

Drive Assembly

Good power and driveline options for this hull are: 6 or 8 cells, brushed, or brushless motor, 1/16" wire drive and an X430 or X432 propeller. It is important to locate the propeller .58" below, and 1.50" – 1.75" behind the bottom of the transom. The propeller thrust angle should be 4° to start with. The motor and driveline are offset 3/8" to the right to counter prop walk. Shown is the new RRH Pro-Series hardware. Use what works best for you. The setup shown is a well proven combination.

Turn Fin & Rudder

The turn fin shown is cut from 1/16" aluminum angle. Anchor this to the back face of the right sponson with a #4 sheet metal screw. Add a little glue or paint to the threads to seal this area. If the turn fin is knocked off, it should separate at the break-a-way notch, or pull the threads out. It shouldn't rip the back of the sponson off.

Install the rudder on the transom with the hinge 1.25" to the left of the centerline. As with the turn fin, don't mount it so strongly that hitting something will result in the back of the boat coming off. Drill holes through the transom and bulkhead E for the push rod sleeve to line up with the rudder and servo arm locations.

Radio and ESC

Use Velcro to hold the receiver to the right side between bulkheads D & E. A Hayes whip antenna can be installed in the right rear corner of the deck. Reinforce the inside of the

deck where the base is attached by gluing a 3/32" balsa doubler inside the corner. Run the antenna wire for the receiver connector through a small hole in bulkhead E and seal it with tape. Install the rudder servo with servo tape (or glue) on the left, across from the receiver. Once the antenna and rudder pushrod sleeve are installed, the open area between bulkhead E and the transom can be sealed over with a piece of balsa.

Add a silicon seal to the radio compartment lid face (the top, between bulkheads D and E). Put saran wrap around the hatch cover, and lay masking tape on the deck edges to keep the glue off. Run a bead of silicone around the top of the bulkheads and deck stringers. Press the hatch cover in place, leave until the glue is set, then trim off the excess. Let this air-out for a week before installing the electronics.

The electronic speed controller can be Velcroed to the left side main stringer just behind the location of bulkhead C. This will put it beside the motor and behind the battery. Check to see that all those heavy wires and power connectors have a place to go, and you can get to them.

Water Pickup

Run a 1/8" OD brass tube along the back of the right sponson, through to the inside, for a water pickup. Beveled the end so it extends just below the sponson bottom, but not past the ride pad. It will just bounce in and out of the water. Route water from the pickup to the speed controller, to the motor (if it is equipped with water cooling) and out an overboard tube on the left.

Finish:

There are many ways to cover wood for use in the water. Epoxy mixed 50:50 with alcohol works well. I have seen a very light weight application of 1/2 oz. glass cloth and resin used. Or prime and seal then sand smooth with 320 grit before painting. Brush paint underneath the deck and in the corners inside the hull where the outside paint won't reach. This will water proof the inside wood.

Krylon or Rustolium spray can acrylic are a popular electric model boat paints. Spray this on top of sanding sealer. Finish with a coat of clear after the trim is on. Some paints attack unprotected foam. Don't mix paint types without first testing on scrap parts.

The boat logo, U-number, and decorative trim can be painted or "stuck" on, depending on your skill or preference. Bill Fulmer at: www.rcplanet.com/grafix can cut adhesive backed vinyl lettering or patterns to your specifications charging only for materials and shipping. If you are good with paint and masking tape try that, or cut adhesive backed trim sheet with a very sharp blade and a steady hand on a glass surface.

Motor combinations:

A 14 to 16 turn hand wound brushed motor will handle an 8 cell battery pack. For 6 cells, use a 10 to 13 turn motor. The Octura X430 and 432 propellers are the best wheels for this boat with any power plant. Try each, modify as described blow.

This boat is really fun on 6 cells. I use economical CP2400 batteries, a DuraTrax Streak speed controller with BEC, a 12 turn Speed Gem motor and unmodified X430 propeller. This combination gives about 3 minutes of run time and great top speed. A boat set up this way should weigh about 2¼ lb. It's about the best "bang for your buck" anywhere.

The new small 4400 KV class brushless motors are at the other end of the performance scale. For 8 cells an X430 will be plenty of propeller. On 6 cells an X432 would be very fast. Both of these combinations will be more than fast enough to challenge you and this boat to stay on course.

Propeller:

This boat loves an Octura X432 propeller with the blade area reduced by about 20%. Mark a curve on the front of the blades, as shown on the plans, .15" from the leading edge and trim to this. Chuck the prop in a variable speed drill and spin it slowly against a file until both blade profiles are equal. Smooth, sharpen and blend the leading edges into the outside profile then balance and polish. Use a dust mask when working with a beryllium alloy prop. A stock (sharpened and balanced) X430 will provide more run-time with a little less top speed.

Running

Move the battery for or aft to get the hull to balance 1" – 1½" behind the sponson back face. Lube the shaft with light oil. Run the system with no load, be sure you have full control with minimum vibration and about ±30° rudder throw.

If all looks good, head out, point the nose in an uncluttered direction and pull the trigger hard. The tail will pop up in a few feet and the tunnel will fill with air. The rooster-tail will thin out and it will accelerate to top speed very smoothly. It should ride level with the sponsons "patting" the water every two to four feet. There should be very little, if any spray, off the sides. A 30' radius, power-on right turn should be with the bow high, the tail just touching the water, and with spray off both the outside sponson and the turn fin. A left turn will produce a wide bouncy skid.

This boat is fun and fast, but it can't do everything at full speed. Rough water and hard turns limit the hull's ultimate speed. With 9.5" of width, the hull can be rolled in a turn, if the skid fin is not carefully sized and mounted with the right amount of angle. This will be different for each hull depending on power, weight, propeller and balance. Part of the fun is tuning the hull for a good compromise of speed and stability.

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