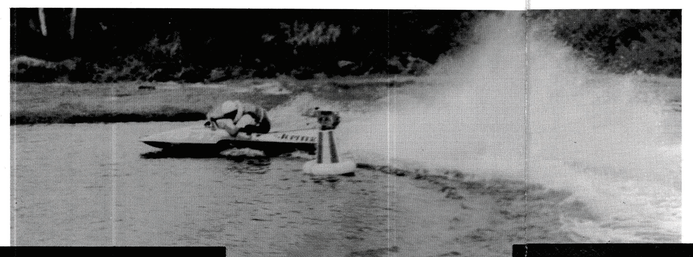
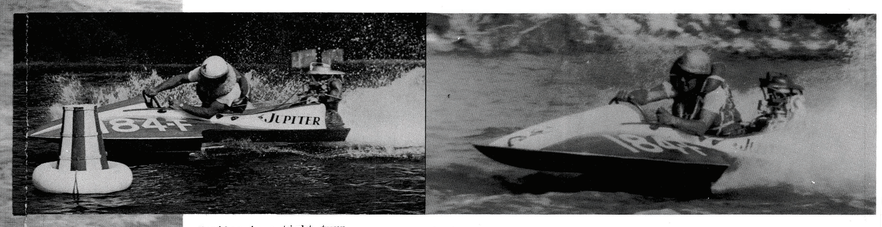


Jupiter wide open on a one buoy turn

Dub Parker way out in front with a 'home built' Jupiter

building *JUPITER*

9' 10" 3 point Semi-Cabover Hydro
Class 'B' Stock or 'A' 'B' 'C' Alky
by Hal Kelly



Jupiter in a tight turn

Jupiter can really eat up the rough water

BILL OF MATERIAL

BRONZE, MONEL, or EVERDURE FASTENINGS

1 gross of 7/8" #8 flathead wood screws
1/2 gross of 1/2" #7 flathead wood screws
1 gross of 1¼" #8 flathead wood screws
1 lb. of ⅜" #16 Anchorfast common nails..950 to lb.
1 lb. of 5/8" #16 Anchorfast common nails..1,400 to lb.

PAINT PRODUCTS

5 lbs. of Weldwood glue
½ lb. of Wood Dough or similar surface filler
1½ gal of spar varnish
½ pint of boat enamel (color to suit)

SITKA SPRUCE, or WHITE CEDAR

5 pieces.....½" x 10" x 12'
3 pieces.....⅝" x 10" x 12'

PLYWOOD MARINE GRADE

Decking; 2 sheets of 1/8" thick 3 ply Mahogany 4' by 8' if you can get it in 4' by 10' then one sheet will do.

Bottom; non-trip chines; sponsons; main girders; floor board; etc. 3 sheets of ¼" thick Mahogany plywood 4' by 8'. Transom one piece of fir plywood ½" x 16" x 14".

HARDWARE

1 Steering wheel
1 Piece of steering rope 24' long
1 Safety throttle
1 Bowden throttle cable 5' long
2 Rear snap pulleys, with snap swivel
2 Steering rope anchor straps
2 Forward steering coaming pulleys
2 Aluminum stern handles
1 Aluminum bow handle
1 12' length of ½" half round aluminum

For speed indicators, Automatic throttles, Race boat hardware. Write WILLIAMS MFG. CO.; 6450 Olympic Bremerton, Wa. zip 98310

For boat lumber, write MAURICE L. CONDON CO.; 250 Ferris Ave.; White Plains, New York 10603

JUPITER-- is designed for the Mercury Mark 20-H, Champion Hot Rod, and the 'A' 'B' 'C' Konig or Anzani, a semi-Cabover type that just about flies over the water, her sponsons hardly touching. Incorporating the best points of both Cabover and conventional 3 point design, she is great on rough water, going through the 'stuff' other drivers have to back off for. She has excellent turning characteristics in both rough and smooth water, and she's very quick at accelerating out of a turn.

Although Jupiter is an 'Out and out' racing hydro, she will take any pleasure motor from 7 HP up. The weight of the motor rather then the HP will determine how large a motor she will take; a 110 pound motor is about the limit. The transom height for motors without racing lower units should be 17½". Most important is getting the proper propeller for your outfit. This must be done before you try hopping up your motor. If you will give me the motor make, year and HP, I will tell you the make and kind of propeller you should have, it's cost and, if need be, can sell you same.

Before building Jupiter, read the instructions, study the step-by-step pictures and then go over the drawings. If you are new to boat building, I would suggest doing this several times. All rib drawings are full size, so take all measurements directly from the drawings for all rib dimensions. All framework is of Sitka Spruce or White Cedar, and has been kept to two thicknesses ½" and ⅜", with the exception of the 'built-up' stem which is made up of three pieces of ½" by ½" wood laminated together.

Since most Mahogany plywood comes in 4' by 8', I listed this size in the bill of material. This will have to be glued up to make the main girder, and the deck planking. See drawing for the best method to tackle this job. The girders are pieced up front, and the decking near the back. Most lumber yards don't want to do it or charge too much to rip the battens, etc. to size, so I have just listed the best plank size to order. All battens, etc. can be ripped to size with a small table saw. If you don't have one, I suggest you borrow a friend's for one evening; that's about all the time it will take to rip all battens, etc. to size. After accumulating the stock listed in the bill of materials and ripping all battens, etc. to size, you are ready to start on the ribs.

Due to space limitations only half of each rib is shown, but since the ribs are symmetrical, each side being the same shape, this will offer no problem. There are 8 ribs and a motor mount. The #8 rib is fastened in place last. Cut out all your rib components and place them on the full size rib drawings using ¼" #16 Anchorfast nails to secure the ½" plywood to the ribs. A piece of thin wax paper or cellophane under the ribs will keep the glue off your plans. Weldwood glue is used throughout. Rib #1 is made from ½" thick spruce with two ½" plywood pieces glued and nailed to it, to form the deck bracing. Since the main girders are spaced the same distance apart 16" the full length of the boat, all deck beams are exactly 16½" apart, as they straddle the main girders. Rib #2 is cut from ½" spruce with deck bracing fastened in place. Note the deck bracing has lightening holes drilled in them before being fastened to the rib. Rib #3 is also ½" spruce with lightening holes; this whole rib is backed with ½" plywood. The plywood is glued and nailed in place with 5/8" #16 Anchorfast nails.

Ribs 4,5,6, and 7 are made of ½" spruce. Note that rib #5 does not go beyond the bottom chine, and is notched for all battens, etc. It is to this beam that the bottom is pieced and nailed. The reason for piecing the bottom at this rib is that with the sharp bend in the bottom at this point, would be difficult to keep the last 30" of the bottom flat, using an unbroken span of wood over this hump. It is vital to keep the rear 30" of the bottom perfectly flat. The motor mount is made up of ½" thick plywood. The upper part is beefed up with a ½" thick piece of spruce. This mount is 16" wide and slips between the girders, and is notched for the battens.

Main Girders; this is the main trunk of your boat and all the ribs sprout from it like the branches of a tree. Both girders must be the same shape, and so are cut together with all the necessary notches for the ribs cut into them. Take two 2 by 3's stand on edge fastened to a suitable base (see step-by-step photos). Make sure they are parallel to each other and are 16" apart, outside measurement. The girders are clamped to the outside of the 2 by 3's, level and square. When the girders are level and true, it is best to temporarily screw them to the 2 by 3's. The screw holes can later be filled with wood dough or other suitable filler.

The motor mount is first on the agenda; the girders are screwed to it. The rest of the ribs are slipped in place with glue and 1¼" steel brads. All ribs are set ½" below the bottom of the girders, to make room for the two battens that run the length of the hydro. The girders are glued and fastened to these battens with ¼" #16 Anchorfast nails, and the battens in turn are fastened to the ribs with 7/8" #8 screws. In this type of construction the girders, battens and bottom are fastened to each other to form a strong, light and structurally sound unit. Rib #7 is glued and screwed to the motor mount with 1¼" #8 screws. Check by eye and double check with a level to make sure that all the ribs line up. After the ribs are in place the rest of the battens are screwed to the ribs with 1¼" #8 screws. Leave the battens at the bow a bit longer so they may be trimmed off for the bow piece at the proper angle. The main sponson beams are next and run the length of the hydro. Bending the batten as a guide (see photo 6) mark off the proper angle on the beams. Rough cut the sponson and carefully cut the part behind the sponsons to size, with the proper angle of the nontrip. Do this accurately so that only a little fairing will be needed later.

Built-up bow is next; bend one strip around the front and using this as a guide mark and cut the battens to their proper angle. All three strips are coated with glue on both sides, except the outside strip. They are grouped together while the glue is still wet, bent and screwed in place at the battens and ribs. The bow is clamped together every few inches with 'C' clamps until dry. The upper chine behind the sponson is next. Rough cut to the proper angle and then glue and screw with 1¼" #8 screws to the ribs.

Sponson chine is next, and running from rib #3 to bow, this is made up of two ½" by 1 1/8" pieces of spruce, bent and laminated together as a unit (see photo 9).

Fairing; taking your measurements off the scale drawing of the main girders, mark off the shape of the sponson beam from rib #3 to bow. Carefully fair the sponson and bow. Much careful fairing will be needed on the nontrips behind the sponsons. Keep this straight with no hooks or rockers in the nontrip. The angle of this nontrip will become steeper towards the transom. This takes more patience than skill and needs careful fairing so that the plywood planking will seat on all bearings evenly. Frequent checking with a straight edge will be a big help. On any curved surface, be sure that the curve is smooth. Check the bottom with a 34" long straight edge across the width of the bottom; the straight edge should rest on all battens. The last 30" of the bottom should be flat in all directions.

The plywood non-trip chines are fitted next, and run from rib #3 to transom and are fastened with glue and ¼" #16 Anchorfast nails. This piece of plywood must be carefully faired at the built-in airtrap, and again the last 30" of the bottom is checked for flatness. Now the back of the bottom is glued and fastened to all battens, rib #5 and the transom with glue and ¼" #16 Anchorfast nails about 2" apart. At this point you need a partner to hold a heavy weight against the bottoms from underneath while you nail the bottom in place. I predrill all my nail holes in the plywood before nailing in place, and coat both the plywood and battens, etc. with Weldwood glue. Since I fiberglassed the last 4' I did not countersink the nails. The ¼" plywood planking covering the bottom and sides of the sponsons is carefully fitted. Note the afterplane on the back of the sponsons; it runs from 1½" on the outside edge to nothing on the inside. The bottom planking extends over the sides except where they butt. After the sides and bottom are carefully fitted, the planking is glued and nailed in place with ⅜" #16 Anchorfast nail. Study the photos carefully for clarification. The rest of the bottom is carefully cut to fit between the sponsons, making a 45° cut to match the back section. This is carefully fitted and temporarily fastened in place. The bow shape is marked off on the bottom. Also mark off the battens, etc. so you will know just where to put the glue on the bottom. On the edge of the bottom between ribs #3 and #4 trim off 1/8" to receive the aluminum airtraps. Predrill all nailholes, coat bottom and all the battens etc. that come in contact with the bottom with glue. Get your small partner with the weight and nail the bottom in place.

The sponson afterplane is beefed up with a piece of ¼" plywood glued to the afterplane. A few 2" 'C' clamps will hold it in place until dry. The afterplane between the girders and behind rib #7 is also 'beefed' in the same manner. ¼" thick plywood is fastened likewise to the inside of the main girders and butted to the motor mount and rib #7 to give more support.

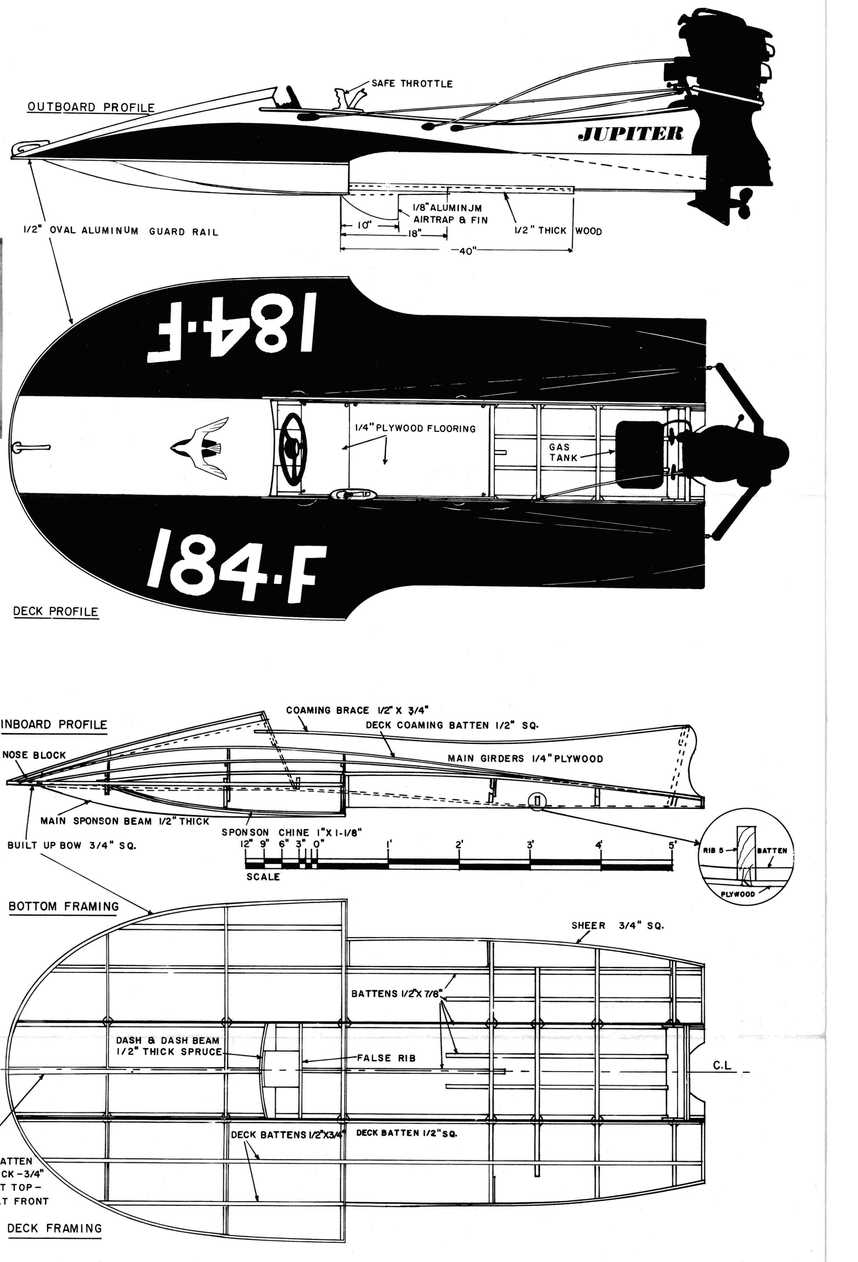
Before removing the hull from the jig, carefully sand down and give the bottom two coats of varnish for now. I used a new Epoxy clear racing finish called 'Tuff', sold by Glass Plastics Corp.,1605 West Elizabeth Ave., Linden N.J. The stuff is very good as well as expensive. I used it for my bottom and decks, and a cheaper varnish for the insides. It will take about 3 qts. to do the bottom and decks. Place the hull rightside up on level supports. Once again the hull is leveled and secured so it won't get out of shape.

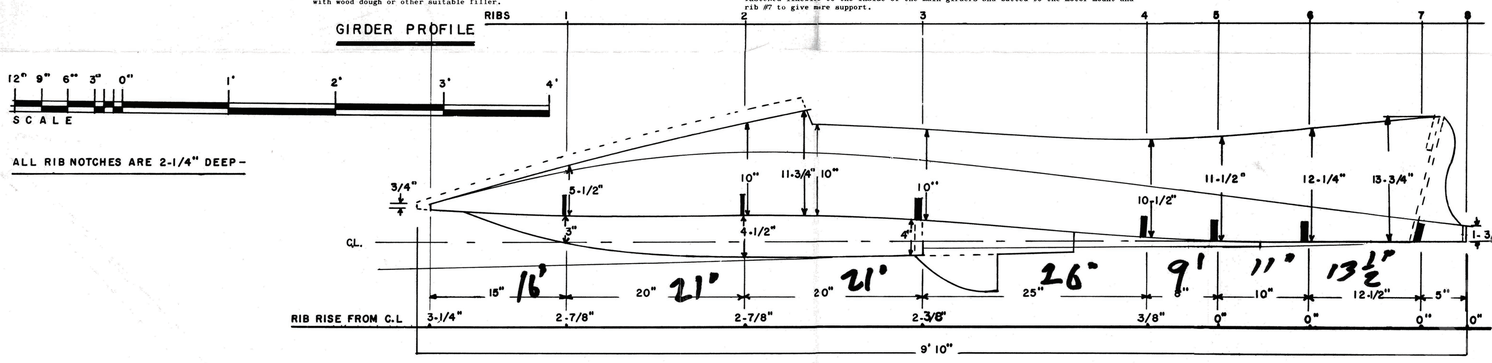
The dashboard of ½" spruce is next and fastened to a 'false' rib (see drawing and photo). Note that the drawings were changed from the photos, as in her test run the dashboard proved to be to far forward. The drawings are correct. The one front deck brace is next. Next all deck battens are fastened in place. The coaming is glued and nailed with 5/8" #16 Anchorfast nails to the deck batten next to it. The rest of the deck battens are fastened with glue and 7/8" #8 screws to all ribs and transom. The inside of the boat is given 3 coats of varnish.

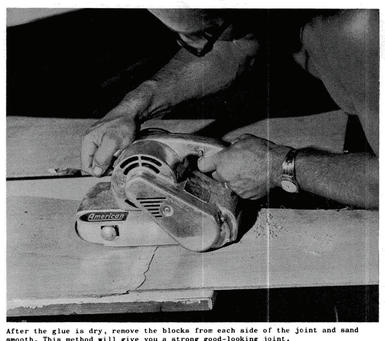
A large sheet of wrapping paper laid over the deck section and trimmed to size is a good guide, for size and shape. Lay this over the plywood for the decking and cut a bit oversize. The plywood is carefully fitted and trimmed to size. Hot water applied to the plywood with a rag will make the decking more pliable and easier to fasten in place. Again I would suggest predrilling all nail holes, and mark off on the outside just where the battens are, as a few small screws may be used to pull the plywood decking snugly to the battens. 5/8" #16 Anchorfast are used to fasten the 1/8" decking in place. Coat both the battens and decking with glue. When nailing this decking in place, work from all directions as the plywood can be stretched a bit, but don't work from one direction. If you do, you will find yourself stuck with a large bulge of plywood that you will not be able to work in place. All nailes should be on two inch centers for plywood decking. The front deck of 1/8" plywood is next and the proceedure is the same as for the side decks. The coaming strip is of ½" by ½" spruce, and the coaming glued and nailed to this strip from the inside with ¼" #16 Anchorfast nails. The floorboard is¼" Plywood and is screwed to the battens on the outside edge; 4 screws are enough. Emaolite is cemented (with contact cement) to the plywood flooring. Don't cover the screws so that you will be able to remove the floorboard for cleaning purposes.

The wooden part of the airtrap is a piece of ½" thick spruce 40" long (see rib drawing #4 for size and shape) fastened in place with glue and screws. The aluminum part of the airtrap is about 25" long 1/8" thick and is screwed to the wooden part of the airtrap and rib #3. Use a sponson fin on the back of lefthand sponson. The hardware is next. The placement of throttle and height of steering wheel should suit the driver. To get your racing numbers or rule book on outboard racing write: AMERICAN POWER BOAT ASSOCIATION; 22811 Greater Mack; St. Clair Shores, Mich. 48080

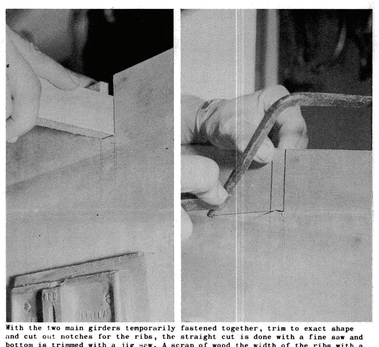
Motor angle and height are very important for racing and a motor 1/8" too high or low has lost many a race. The transom height should be 14" for the Merc 20-H or the Hot Rod. You will have to check the motor up to maybe 14½" high, depending on the prop and the type of water you are running on. This 14" transom will also be a good starting point for the Konig or Anzani. For a motor without a racing lower unit the transom should be 17½" high. A marine speedometer is a 'must' to tell you if there is any improvement in speed from one adjustment to another. Make one change at a time. It is a good idea to have a tach so you will know if you are getting peak RPM out of your motor and prevent winding the guts out of it. A Champ Hot Rod should peak out at 6,000 RPM, a Merc Mark 20-H at about 7,000, a 'B' Konig about 9,000. Check on this information from your motor manufacturer. For gosh sake always have a safety throttle, one that will close the butterfly of the motor in case you are thrown out. I always run with a 'full' butterfly. In case of a flip it's much safer for you and the other drivers, and will save you from a 'blown' motor. See you at the races!



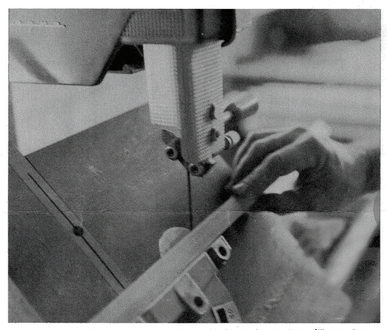




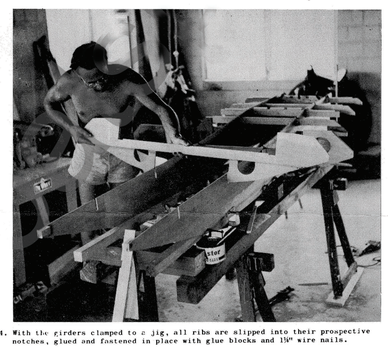
1. After the glue is dry, remove the blocks from each side of the joint and sand smooth. This method will give you a strong good-looking joint.



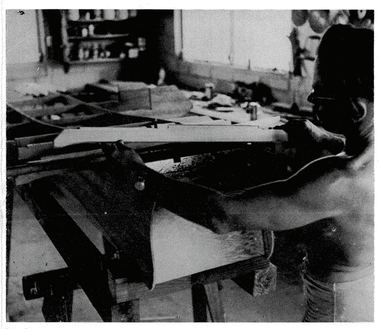
2. With the two main girders temporarily fastened together, trim to exact shape and cut out notches for the ribs, the straight cut is done with a fine saw and bottom is trimmed with a jig saw. A scrap of wood the width of the ribs with a piece of sandpaper tacked to the bottom, is great for squaring the bottom of the notch.



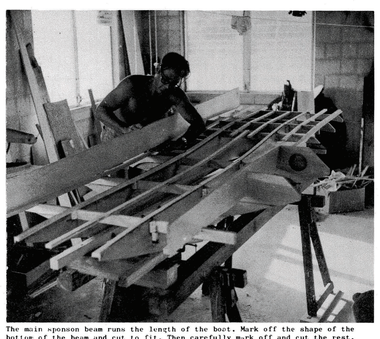
3. The triangle glue blocks are best made on a band saw, by cutting a ¾" sq. piece of wood at a 45° angle.



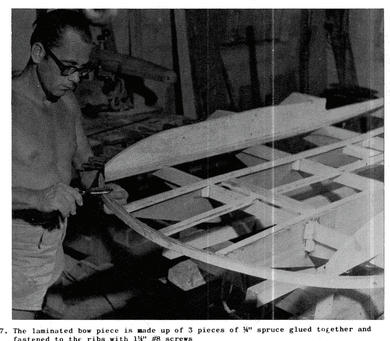
4. With the girders clamped to a jig, all ribs are slipped into their prospective notches, glued and fastened in place with glue blocks and 1¼" wire nails.



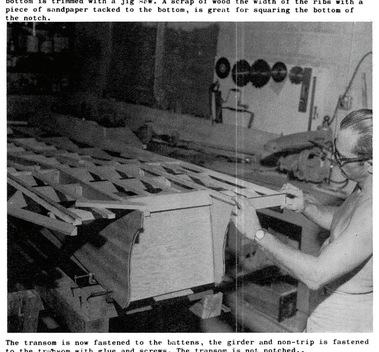
5. Rib #7 is fastened to the motor mount, make sure that all ribs are 90° to the main girders, check by sighting down the length of the framework, and double check with a level.



6. The main sponson beam runs the length of the boat. Mark off the shape of the bottom of the beam and cut to fit. Then carefully mark off and cut the rest. Sponson is rough cut to shape. The part that extends behind the sponson is cut more accurately with the proper angle, about 45°.



7. The laminated bow piece is made up of 3 pieces of ¼" spruce glued together and fastened to the ribs with 1¼" #8 screws

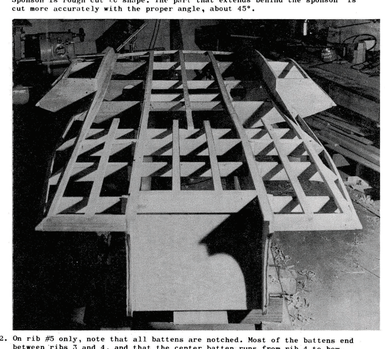


8. The transom is now fastened to the battens, the girder and non-trip is fastened to the transom with glue and screws. The transom is not notched..

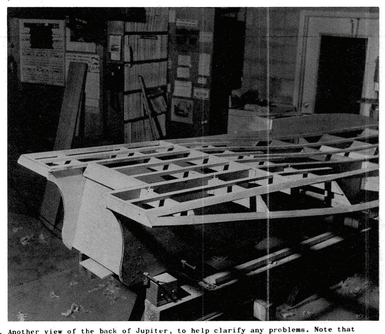
9. The sponson chine is made up of two ½" by 1 1/8" pieces of spruce laminated together. This method will give you a nicer curve and a stronger chine.

10. Bow piece and sponson chine are carefully faired with a file, plane, or a Stanley Surform prior to planking.

11. Here the whole boat has been faired and is ready for planking. The Non-trip behind the sponsons will require very carefully fairing. The angle of the non-trip becomes steeper near the transom.

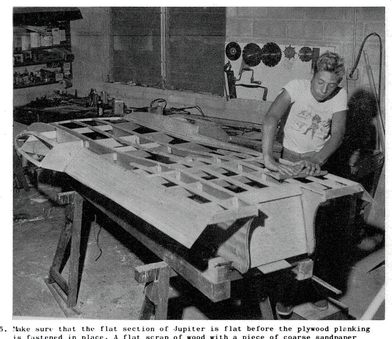


12. On rib #5 only, note that all battens are notched. Most of the battens end between ribs 3 and 4, and that the center batten runs from rib 4 to bow.

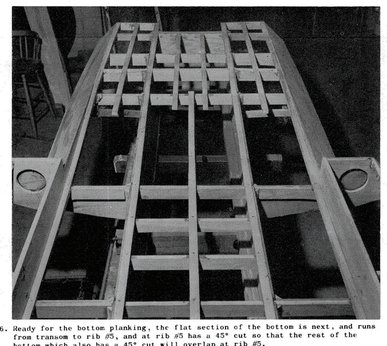


13. Another view of the back of Jupiter, to help clarify any problems. Note that rib #5 does not go to the top of non-trip. Angle of non-trip is best made with a Stanley Surform as this gadget will cover both the top and bottom of the chine at the same time and assures you of a true angle.

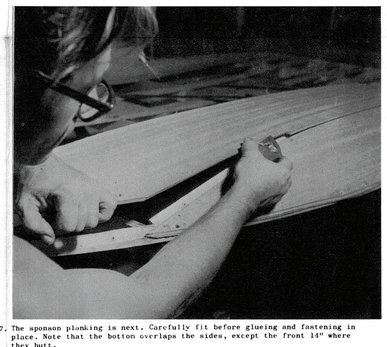
14. Plywood planking on the rear non-trip is in place and must be carefully trimmed. A rabbit plane is very handy for this operation.



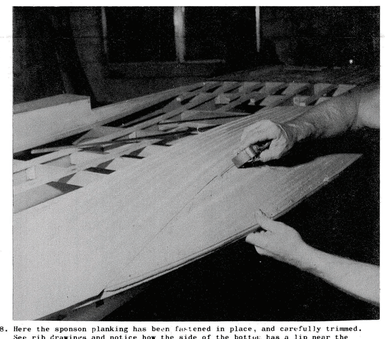
15. Make sure that the flat section of Jupiter is flat before the plywood planking is fastened in place. A flat scrap of wood with a piece of coarse sandpaper will be a big help..and remember, flat in all directions, no hooks or rockers.



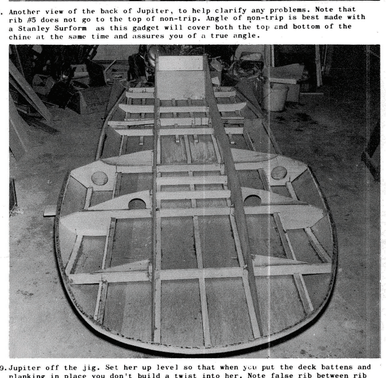
16. Ready for the bottom planking, the flat section of the bottom is next, and runs from transom to rib #5, and at rib #5 has a 45° cut so that the rest of the bottom which also has a 45° cut will overlap at rib #5.



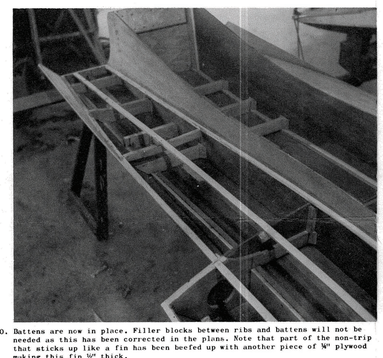
17. The sponson planking is next. Carefully fit before glueing and fastening in place. Note that the bottom overlaps the sides, except the front 14" where they butt.



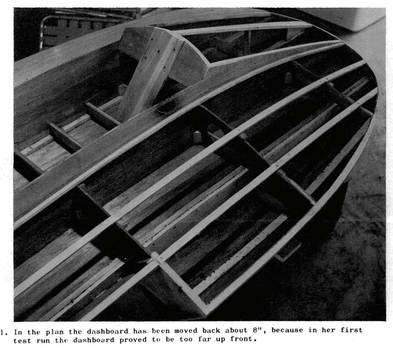
18. Here the sponson planking has been fastened in place, and carefully trimmed. See rib drawings and notice how the side of the bottom has a lip near the back of the sponson.



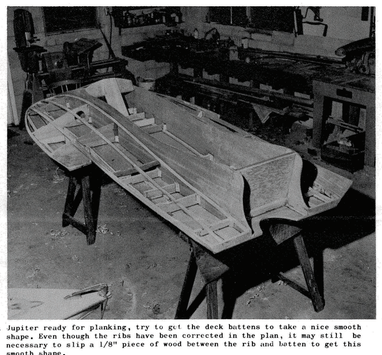
19. Jupiter off the jig. Set her up level so that when you put the deck battens and planking in place you don't build a twist into her. Note false rib between rib #2 and #3; this is to support the dashboard.



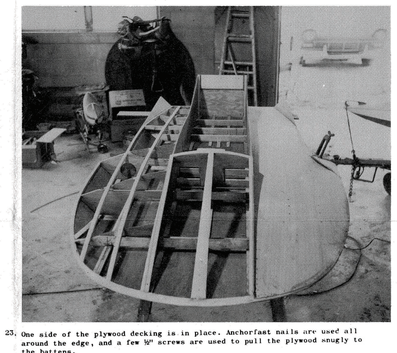
20. Battens are now in place. Filler blocks between ribs and battens will not be needed as this has been corrected in the plans. Note that part of the non-trip that sticks up like a fin has been beefed up with another piece of ¼" plywood making this fin ½" thick.



21. In the plan the dashboard has been moved back about 8", because in her first test run the dashboard proved to be too far up front.

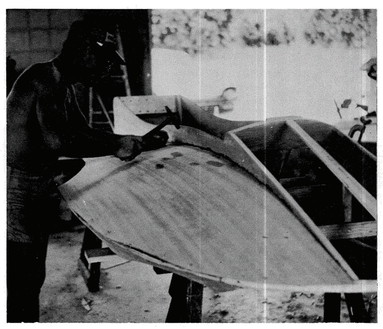


22. Jupiter ready for planking, try to get the deck battens to take a nice smooth shape. Even though the ribs have been corrected in the plan, it may still be necessary to slip a 1/8" piece of wood between the rib and batten to get this smooth shape.

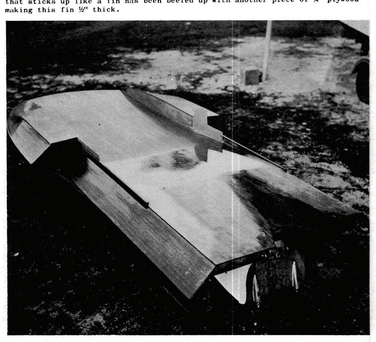


23. One side of the plywood decking is in place. Anchorfast nails are used all around the edge, and a few ½" screws are used to pull the plywood snugly to the battens.

24. The use of wrapping paper will give you a rough idea of the decking shape, and will save you time and expense.

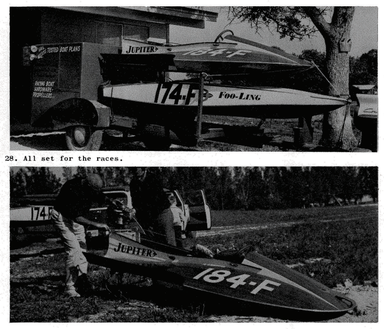


25. Here the decking is being glued and nailed in place. 5/8" #16 Anchorfast nails are used, spaced 2" apart. Soaking the plywood with hot water will be a big help in getting this slight compound shape.



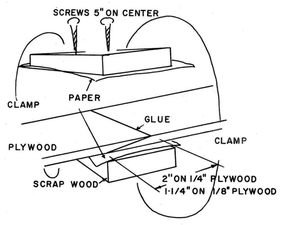
26. Finished bottom with airtraps in place. ½" oval aluminum was used on the outside edge

27. Ensolite was used for padding. It was cemented to ¼" plywood which in turn is screwed to the battens. Note that this pad drops down between the ribs for a lower center of gravity.



28. All set for the races.

29. Ted Koopman, top racing boat photographer is giving my set-up the once over before photographing Jupiter in action.



TYPICAL SCARF JOINT ON A PIECE OF PLYWOOD