INTRODUCTION

CHAMELEON is intended as a multi-purpose nesting dinghy for amateur construction. She can be rowed, with two rowing positions for various loading conditions. Safe capacity is about 500 pounds, depending upon conditions. She can also be fit with outriggers and a rolling seat for “fitness rowing”. In addition she can be fit with a sprit sailing rig or a small (2hp to 4hp) outboard motor.

CHAMELEON can be assembled and disassembled in the water (it is easier to perform these operations in the water than on land), so it is possible to launch and retrieve her one piece at a time. Each piece weighs approximately 50 pounds.

CHAMELEON is built in the "stitch and glue" piywood/epoxy technique. The plywood panels are cut from dimensions provided in the plans and fastened together using copper wire and nylon monofilament fishing line. After the panels are assembled into the hull shape, a thickened epoxy fillet is applied to all the inside corners, followed by two layers of fiberglass cloth tape and epoxy resin. Then the outside corners are rounded and taped. Next the entire outside is sheathed in cloth and epoxy and the other construction details completed.

Though CHAMELEON is intended for the amateur builder, she is not an extremely easy boat to build. The number of details involved in making the two-piece nesting dinghy make it nearly as much work as building two dinghies. Some previous boatbuilding experience, or at least some previous experience working with epoxy resin, would certainly be an asset. Yet, I think that a very handy builder, with some assistance (in the form of an experienced friend or some reference material on "stitch-and-glue" construction) could successfully complete the boat.

Tools required to build the boat include a table saw, electric saber saw, electric disc grinder, drill, hand saw, wood rasp, wire cutters, hammer, screwdriver and at least six clamps (3" or 4"). Another vital tool is an “architects scale" for measuring dimensions from plans.

Costs and building time will certainly vary with the skills of the builder and the sources of materials. I would estimate the time and cost of building the rowing version at 80 to 100 hours and $800 to $1000. The sailing version would require an additional 30 to 40 hours and approximately $200 to $500.

PLYWOOD - Certainly the best choice for the plywood is a marine grade hardwood ply such as Bruynzeel(tm), Joubert or Hydrotek. Marine or exterior grade Douglas fir is less expensive, and will work, but will result in surfaces that are not sheathed in cloth and epoxy being more difficult to maintain.

EPOXY - System 3 epoxy is available from Duckworks Boat Builder's Supply - www.duckworks.com - they are also an excellent source for fillers, as well as other epoxying accessories (disposable latex gloves, disposable brushes, fiberglass, and hardware).

For fasteners, I recommend pan head stainless steel, self-tapping screws.

FRAMING AND SPARS - I have recommended construction grade spruce for its low cost, light weight and availability. Mahogany or fir would be nicer for the framing and gunwales if you prefer. Surely spar grade Sitka spruce could be used for the spars if you care to splurge.

SAIL - The sail can be professionally made by Duckworks. Alternatively, it is an easy sail to make yourself. It can be made absolutely fiat, to the dimensions given on the sailplan.

CAUTIONS

Any boat, whether owner or production built, can be poorly built, poorly handled or badly equipped. Every boat is suited to a limited range of sea and wind conditions. Any new boat, self-built or otherwise, requires testing trials and perhaps modifications to perform properly. in addition, it must be used with caution and good judgement.

Because I, as designer, have no control over the actual building of the boat, its outfitting or use, my responsibility ends with the providing of these plans. No other warrantees, expressed or implied, are made with respect to the suitability or safety of any boat constructed to the plans. The builder, by using thes plans, acknowledges and accepts sole responsibility for the ultimate suitability, safety and quality of the vessel, and for determining and meeting all applicable local, state or Federal requirements and standards.

The purchase of these plans entitles the builder to construct one boat. They may not be reproduced or transferred without written permission from the designer.

BUILDING CHAMELEON

1. Take the clearest (most knot-free) of the 12' "2 by 4's" and rip it as shown, on Fig. 1 of the “CONSTRUCTION DETAILS". First cut into two 1" by 1-1/2" and one 1-1/4" x 1-l/2" lengths, then into the nine thinner lengths. The 1" x 7/16" pieces will serve as the gunwale and outwales, but will first be used as battens to fair and draw the outlines of the plywood pieces. The 1-1/4" x 3/8" pieces will be used to laminate the beams along the top edges of the mating bulkheads.

2. Laminate the mating bulkhead beams by constructing a jig on any flat, rigid working surface. Using one of the 1-1/4" by 3/8" pieces on edge as a batten, draw a line between the three points as shown in Fig. 2. Then screw six strong blocks of wood along the line. Tape waxed paper or packing tape over the blocks and working surface to prevent epoxy from sticking to it. Cut the three lengths of 1-1/4" x 3/8" stock in half. Using epoxy slightly thickened with silica between the pieces, laminate three together by clamping them to the blocks. When it has cured, remove it and laminate the other. Grind any excess epoxy off of these two beams.

3. Mark a grid of lines on each of the three sheets of plywood as shown on the "Plywood Layout" drawings. Take great care to make the lines accurate and straight. If you do not have a long straightedge, mark many points,- drive small finish nails into the points, and use one of the 1" x 7/16" pieces held up against the nails to draw the lines. (If you are building the sailing version of CHAMELEON, mark the same grid on a fourth sheet of plywood.)

4. Lay out the plywood pieces as shown in "Plywood Layout #1". Fair and draw the curves by putting nails into the plotted points and bending one of the gunwale pieces around the nails. Use the laminated mating bulkhead beams to draw the lines across the top edge of the mating bulkheads. Next layout the panels as in "Plywood layout #2". Use the three large panels from layout #1 to trace their mirror images on layout #2. This is done by putting the "good face" of the pre-cut piece against the "good face" of the uncut plywood. Then lay out and cut the pieces as shown in "Plywood layout #3". (If you are building the sailing version, lay out and cut "Plywood layout #4".)

5. Epoxy the laminated mating bulkhead beams to the top edges of the mating bulkheads, using either temporary screws (I recommend 1" #10 pan head stainless steel self-tapping screws) or clamps to hold them in place while the epoxy cures. Then cut off the ends and notch them as shown in Fig. 3.

6. Fasten the two bottom panels and the two side panels together as shown in Fig. 4, using the butt blocks and 1/2" #10 pan head stainless steel self-tapping screws. The butt blocks go on the OUTSIDE of the hull. Since the outside of the hull will eventually be sheathed in cloth and epoxy, I think that it makes sense to put the "good face" of the plywood on the inside of the hull, Thus, put the butt blocks on the "poor faces" of the hull panels.

7. Lay the two bottom panels on top of each other, inside so that they coincide precisely. Drill 1/8" holes around circumference of the panels about 5/16" from the edge and 9" apart. Make sure that there are holes near the corner of each panel at the butt joint.

8. Cut four 4" lengths of 16 gauge copper wire. Use them to fasten the two bottom panels together at their centerline joint. Pass a piece of wire through the holes at the ends of each panel on this joint, bring the ends of the wire together, and twist them together tightly. Then lace the same seam with the nylon monofiliment fishing line, using the technique shown in Fig. 5. Work all the slack out of the line and tie it tightly.

NOTE-Where wire is used to fasten panels together, the two ends of the wire should be brought together and twisted on what will be the outside of the hull. In this way they will not interfere with the filleting, and can be cut off or removed later.

9. Open up the two bottom panels and hold them open in the approximate position shown in Fig. 6 by passing a piece of rope through the gap between them, just aft of the butt blocks, tying a knot on the bottom end, and tying the other end to the middle of a 36" piece of scrap wood. Draw the rope tight enough to make the "V" in the panels about 6" deep amidships. Do not worry about gaps between these, or any of the plywood panels, of up to 3/16", as these can easily be filled later.

10. With a helper to hold the panel in position while you drill holes and insert the copper wires and fishing line, attach one of the side panels. Start in the middle by carefully aligning the butt joint in the side panel with the butt joint in the bottom panel. Drill holes in the panel to precisely align with the holes in the bottom panel. Wire the pairs of holes on each side of the butt joint, then with the fishing line work from that point aft. Get the line tight, and tie it. You can use a piece of wire, or even a doubled piece if necessary, to draw together the aftmost pair of holes. Then start at the butt joint again and work forward in,the same manner. When one side panel is tightly attached, do the same with the other side. Jam a piece of scrap wood, cut to a length of 48", between the top edges of the side panels amidships to hold them open.

11. Drill a couple of 1/16" holes through each butt block, from the inside, exactly through the butt joint in the plywood panels. Insert a nail or screw through each hole from the outside. These will serve to position the mating bulkheads. Place the mating bulkheads into the hull, one on each side of the positioning nails, with their flush sides against each other and their laminated beams facing away from each other. Make sure that the bulkheads are precisely aligned with each other and then drill and screw or bolt them together, making sure that the positioning screws are between them. Then, with a helper, force the mating bulkheads down tightly against the hull panels, bottom and side. It may be necessary to adjust the rope holding the bottom panels open to get the mating bulkheads to fit well. Do not worry about gaps of about 3/16" or less. When you are satisfied with the fit of the mating bulkheads, fix them

there with strategically placed nails or screws driven through the butt blocks and into the end grain of the bulkheads and/or their laminated beams. Remove the rope and piece of wood that were holding the bottom panels open.

12. Hold the stern transom in position inside the bottom and side panels at their aft edges. Mark where holes should be drilled in the stern transom to match up with the holes in the bottom panel, and mark matching pairs of holes between the transom and side panels. Drill all holes. Fasten the stern transom in place using fishing line and wire where necessary.

13. Drill a 1/4" hole near the upper, forward corners of the two forward bottom panels. . Pass a piece of rope through the holes and use it to draw the corners together until they are about a foot apart.

14. Temporarily fit the bow transom in position. Adjust the rope, which should be 4" or 5" aft of this bulkhead, to get a good fit. Check that the bow transom is square athwartship by taking measurements from each top corner to the corners of the mating bulkheads. When you are satisfied with the position and fit. Mark the edge of the transom on the hull panels and mark the points to drill holes in the transom and matching pairs in the hull panels. Drill the holes, wire the transom in position.

15. You are now nearly ready to fillet and tape the inside joints of the hull. First, however, you must make a few simple tools. Take three plastic "spreaders" (they are normally used for spreading body putty in autobody work, and are usually bright yellow or brown), and mark out "fillet tools" as shown in Fig. 7. Make them in diameters of 1-1/2", 2", and 2 1/2". A fourth spreader, left uncut, is useful for cleaning up the fillets afterward.

16. If you have little or no experience filletting, it is definitely wise to practice before going to work on the hull. Building the two aft quarter buoyancy tanks is an excellent practice exercise. Drill and wire them together. Mix up a small batch of epoxy and brush some along the mating edges, a couple of inches on each panel. Then thicken the resin mixture with filletting blend to the consistency of peanut butter. With a paint stirrer or other narrow stick, apply copious amounts of the blend to the three inside joints. Use the 1-1/2" filleting tool to smooth out the mixture in the joint. The object is to achieve a smooth, rounded corner with the excess mixture forced well away where it can easily be cleaned up. The amount of working time you have is a function of the temperature of the resin, the temperature in the working area, the amount of mixture and the speed of the hardener used.

NOTE-It is in the filletting operation that previous experience, some experienced assistance, or a detailed reference text is crucial. As I point out in the initial description of design, I do not think that this is a project for those totally inexperienced in epoxy work, nor do I think that these procedures can be taught adequately within these building plans. Also, care must be taken to avoid the toxic effects of the resin and fillers. A vapor respirator and protective gloves should be worn whenever working with the resin, fillers or grinding dust.

Work the filletting blend into the joints until you are satisfied that they are relatively even, without gaps or lumps. Then clean up all excess filletting mixture with the intact spreader tool. Go on to the other buoyancy tank.

There are three ways to handle the taping operation. You can wait until the filletting mixture is fully cured, eliminate any lumps with a grinder, file or sandpaper, and then start applying fiberglass tape and resin. One alternative is to wait until the fillet is partly cured (somewhat firm but not hard), smooth out any lumps with the fingers, and proceed with the taping. The third option is to tape immediately after

filletting. This must be done with finesse so as not to deform the fillet, and does not allow the builder to work as much resin out of the saturated cloth as the other two methods, but it does speed up the building process, eliminate the sanding or grinding operation, and achieve an excellent bond between fillet and tape. My ideal choice is the first alternative, working on the partially cured fillet, but this is often difficult to time correct!y in varying conditions.

Whatever method is chosen, the object is to apply two layers of fiberglass cloth, first 3" wide and then 4" wide, over the fillet, evenly spaced on either side of the joint. Once you have achieved this on the two stern quarter buoyancy tanks, and are satisfied with your ability and technique, you can move back to the hull.

17. Before filletting all the inside joints of the hull, check that there is no twisting in the boat. From astern, sight down the top of the stern transom toward the tops of the mating bulkheads and the bow transom. It may help to lay a piece of wood along the top of the mating bulkheads. This piece of wood and the top edges of the two transoms should be parallel. If they are not, it is necessary to twist the hull, perhaps by tying it down to the sawhorses, to make them parallel. Also, any gaps between the panels greater than l/8" should be covered with tape on the outside to prevent the filletting mixture from running out.

With the hull secured in a twist-free position, it is time to fillet all the inside joints. The width of the fillet required is a function of the angle between the panels to be joined. I find that the 1-1/2" fillet tool is fine where the angle is 90 degrees or less. The 2" tool is good for joints between about 90 degrees and 120 degrees. The 2-1/2" tool is good for joints between about 120 degrees and 150 degrees. Where the angle is greater than 150 degrees, such as between the two bottom panels in the aft section, the uncut spreader can be used to achieve a fillet by forcing it down just enough to curve it slightly. I would like to emphasize that the time to clean up any excess mixture is now, before it hardens. This eliminates the need to chisel, file or grind it away later.

Using one of the three methods discussed previously, tape the inside joints with a layer of 3" tape followed by a layer of 4" tape overlapping it evenly. With a little practice you will find that you are able to trim the ends of the tape in such a way that where they intersect another taped joint, the taping is relatively neat and smooth. By applying resin with a brush to the area to be taped, before the cloth is applied, saturation of the wood and the cloth is enhanced.

18. It is not necessary to remove the copper wires from the joints, but it does ease the later joint-rounding process somewhat. If, before the fillet is fully cured, the wire ends are untwisted and one end is pulled with pliers, the wire will usually slip out of the joint. If the fillet is fully cured, the wire may or may not pull free. If a little bit of heat from a propane torch is applied to the wire, it will usually pull free. If it does not pull free, simply cut off the two end as close to the wood as possible with a pair of angled snips. The exposed ends can be ground flush and smooth along with the rest of the joint. With a knife or a scissors, cut away the exposed portions of fishing line on the outside of the hull.

19. With a saw, cut off any excess part of the side and bottom panels that extend forward beyond the bow or stern transoms. With an electric grinder or wood rasp, round off all the outside corners of the hull to a radius of 3/4" to 1". Do not be concerned if you expose some of the fillet between the panels as you grind the joints. If there are any voids in the joints after they are ground smooth, fill these voids with some filletting mixture. Sand the radiused joints smooth with coarse (50 or 60 grit) sandpaper.

Then tape all the outside joints with 3" and 4" tape. Let the tape on the longitudinal joints run right across the joint between the mating bulkheads, as it is easy to cut through this with a razor knife or saw later.

20. When the taped areas have fully cured, grind the edges of the taping lightly to remove bumps. If any bumps or voids persist, fair them with some resin thickened with phenolic microballoons (with a dash of silica) and applied with a spreader. Allow this to cure and sand smooth.

21. Now you can sheath the entire outside of the hull in a layer of cloth and epoxy. Here, again, some previous experience or some experienced assistance is very valuable. The hull can be sheathed right across the mating bulkhead joint, as this can be cut later. Do not worry about air bubbles at the joint, and try not to get too much resin into the joint. The taping and cloth within a few inches of the bulkhead joint will be completely ground away later anyway.. Overlap the bottom and side sheathing onto the transoms by a few inches, and the transom sheathing onto the bottom and sides by a few inches. However, try to avoid bunching or lumping in the cloth.

22. It is now time to fit the gunwale along the inside top edge of the hull. The beams on the mating bulkhead have already been notched for them, so it is just a matter of cutting two of the 1" x 7/16" pieces of spruce to fit. It will be a little tricky to get the gunwales into position and a second pair of hands will be useful. These gunwales will be epoxied in place, using resin thickened slightly with silica. If you have enough clamps, ten or so per side, they can be clamped in place while the resin cures. Otherwise, use temporary screws drilled and driven from the outside. You can remove the l/2" #10 pan head stainless self-tapping screws from the butt blocks in the bottom panels and use them for the gunwales. A small number of clamps can be used to hold the gunwale in position, and a single clamp can be used to squeeze the panel and gunwale together just where each screw is driven. Drill and drive the screws first, before the epoxy is applied. Then remove the screws and gunwale, apply the epoxy mixture, and re-attach the gunwale.

23. When the epoxy on the gunwales has cured, remove the screws holding them in place. These screws will be easier to remove before the resin is fully hardened, but should still be removable even when the resin is fully cured. A little heat from a torch might help. Even if the screw head should snap off, the remaining piece of screw can simply be ground smooth and ignored. Now apply the outwales on the outside of the hull. Just make sure that they run an inch or so beyond the transoms at either end. As with the gunwales, fit, drill and screw them first. Then coat them with the thickened epoxy mixture (and coat the area on the hull where they will be attached with the same mixture) and clamp and screw them in place.

24. Cut off the outwales flush with the outside faces of the bow and stern transoms. Fit the gunwales and outwales to the two transoms as shown in the construction plan. Epoxy these in place using clamps or temporary screws.

25. There are eight “knees" required, made out of 1/2" plywood, or two thicknesses of 1/4" plywood. There are only 10 knees shown on the "plywood layouts"; the remaining six pieces are cut from the butt blocks. There are four different knee shapes shown in Fig. 8. Make a pair of each. Then, place each knee in its appropriate place on the hull and mark check its shape precisely. Also mark where the knee falls on the hull, and saw, file or grind away the necessary gunwale material so that the knee fits flush with the top of the gunwale as shown in the construction drawings.

Next screw each knee in place, using the 1“ #10 pan head stainless steel self-tapping screws, with their heads counter sunk into the knees to allow for parts of the top surface of the knees to be ground away later to be flush with the gunwales. Finally, remove the screws, coat the mating surfaces with epoxy thickened with silica, and refasten them in place to cure.

26. Mark the locations for two 1/2“ holes to be drilled through the mating bulkheads as in the construction plan, and drill the holes. Now, it is time to separate the two hull sections. First, remove the butt blocks on the hull panels. Then with a razor knife or saw, cut through all the epoxied cloth and tape that crosses the joint. Then saw through the gunwale and outwale on each side. Finally, remove the fastenings through the mating bulkheads. Voila! You have the two hull sections of CHAMELEON.

27. From one of the 2 by 4's, cut a piece 1" x 1" x 39" and plane one edge as shown in the construction profile to fasten together the bow locker top and the bow locker bulkhead. Fasten the bulkhead and top to the beam with epoxy and temporary screws.

28. When the epoxy has cured, remove the screws and round off the outside corner. Mark a line on the inside of the forward side panels and bow transom, 3" down from the top of the gunwale. This is the line on which the top of the bow locker should fall. It will be necessary to trim the edges of the bow locker top and bulkhead to get the assembly to fit properly. Trim slowly and carefully with saber saw, grinder or rasp until the locker assembly fits as desired.

29. Center and mark the 9"x13" opening in the top of the bow locker as shown in the construction plan. Cut out the locker opening and save the piece of plywood to serve as a doubler on the inside of the stern transom. Frame the opening with 11/16" x 1-1/2" spruce, half-1apping the corners. Epoxy the frame in place and screw with 1" #10 screws from the underside. If you are building the sailing version, epoxy a 5" square plywood doubler on the underside of the locker top where the mast hole will be, and then cut the 2-7/l6" diameter hole for the PVC pipe.

30. Tab the bow locker in place with a few pieces of cloth and epoxy, and when they are cured, proceed to fillet and tape the locker in place.

31. As with the bow locker, mark and fit the two stern buoyancy tanks. Then fillet and tape them in place.

32. If you are not constructing CHAMELEON as a sailing dinghy, and so will not be constructing a daggerboard trunk, proceed to step 34.

If you are building the sailing version, it is now time to construct the daggerboard trunk, as shown in the construction plan. The two trunk walls should be sheathed in epoxy and cloth on their inside surfaces prior to assembly, and the trunk-end beam given two coats of epoxy. Then assemble the walls and the trunk-end beam by coating the mating surfaces and clamping them together to cure.

33. The daggerboard trunk is open on both its bottom and aft faces. So, mark a 1" wide opening on the forward mating bulkhead up to the bottom of the bulkhead beam (DO NOT CUT THE BEAM!), and for 13-1/4" forward on the bottom centerline. Trim the daggerboard assembly so that it fits snugly against the bottom and bulkhead, and so that the top edge extends up slightly beyond the top of the bulkhead beam. Use nails, driven from,the outside of the hull into the end grain of the daggerboard trunk assembly to fix it in position, with its inside edges flush with the cutouts in the hull and bulkhead. Fillet and tape the trunk along the bottom and the bulkhead on the inside of the hull.

Round off the corners between the trunk and hull and bulkhead on the outside of the hull. Fill any voids in the joint, and tape with two layers on the bottom and one layer on the bulkhead. Use a small brush tied to a stick to smooth out the tape inside the trunk.

34. Round off the corners where the mating bulkheads meet the hull. Fill any voids. Put one layer of 8" tape on this joint. Then sheath both bulkheads in cloth, allowing the cloth to extend an inch or two beyond the edge of the taping on the hull. If you have a daggerboard trunk, allow the sheathing to extend into the trunk by three or four inches.

Bring the two hull halves together and make sure that there are no lumps in the bulkheads that prevent them from fitting closely together. If bumps exist, grind them off and check the fit again.

35. Cut and fit the doubler piece to the inside of the stern transom. Epoxy in place using temporary nails or screws to hold in place. Cut, fit, and install the aft seat bracket.

36. Cut (from butt blocks) the doubler pieces to fit in the upper, outboard corners of the mating bulkheads. Epoxy them in place. Then drill through them, using the 1/2" holes previously drilled in the mating bulkheads as guides.

If you are not building the sailing version, proceed to step 41.

37. Cut a piece of mahogany or other fairly hard wood to the 7/8" x 1-1/4" x 3/4" dimension to make the two daggerboard trunk blocks. Saw or grind this piece if necessary so that it can slide into the aft face of the daggerboard trunk. Then cut it into a 4-3/4" piece and a 3" piece. Drill two holes on centerline of the aft mating bulkhead to attach the 4-3/4" dagerboard block.

38. Assemble the two hull halves together upside down by bolting through the two holes in the bulkheads. Slip the 4-3/4" block into position, resting against the underside of the forward bulkhead beam. Holding the block in place, drill through the previously drilled holes in the aft bulkhead, and using 2" #10 screws, secure the block in place. Then, carefully roll the hull over, supporting it so that the mating bulkheads remain together. Insert the 3" piece of daggerboard trunk blocking up into the daggerboard trunk and, holding it firmly against the other block and the aft mating bulkhead, drill through the daggerboard trunk from each side into this block and insert a screw from each side.

Also drill the 1/2 hole, just off centerline, as shown in the construction plan.

39. Separate the hulls and remove the screws holding the blocks. Then epoxy both blocks in place and replace the screws. The screws into the lower block are just temporary and are removed later, with their holes filled.

40. Construct and install the forward seat for the sailing version as shown in the construction plan. Also shape a piece of 2 by 4 to fit snugly in the forefoot to be the mast step. Epoxy it in place with a thickened mixture.

Proceed to step 43.

41. From "2 by 4" stock, cut the seat bracket for the aft mating bulkhead, and the doubler piece for the forward mating bulkhead. Epoxy and temporarily screw them in place. When the epoxy has cured, remove the screws. Then bring the two hull halves together, bolt through the holes at the upper,

outboard corners, and drill the 1/2" hole on centerline.

42. Construct and install the-forward seat for the rowing version as shown in the construction plan.

43. Now construct the aft rowing seat by epoxying 1“ x 2" x 60" pieces of spruce to the edges of the 10" x 60" plywood seat. Secure with screws at the ends. If you are building the sliding seat version, modify the spruce cleats as in the construction drawings. Then trim the seat to length to fit. Install barrel bolts at the
four corners if desired. For foot braces, drill 13/16" holes through the cleats & insert 15" x 3/4" dowell in appropriate spots.

44. Cut, shape, and install the twin skegs, fastening them from the inside, through inner longitudinals, with countersunk screws. A helper is a definite asset for this operation.

45. Build the hatch cover, making it fit snugly.

46. Install bow towing eye and/or bow cleat.

47. Install oarlocks.

48. For the sliding seat/outrigger arrangement, construct the seat, foot braces and outriggers from the construction plan. The outriggers are buiit of 1/2" plywood (or two layers of 1/4" laminated together). The pieces are nailed together from the outside, then filletted and taped on the inside. After removing the nails and rounding off the outside corners, they are sheathed on the outside. Build and install the outrigger brackets as shown in the construction plan. Drill 13/16" holes through foot brace & seat cleats so it can be dowelled in place.

49. Fair the entire hull by applying a mixture of epoxy, phenolic microballoons and a bit of silica with a spreader or a long batten. Sand smooth. Any degree of fairness and smoothness can be achieved, depending upon how much time you want to spend at it.

You may also wish to sheath the inside of the bottom panels with a layer of cloth and resin. This area gets fairly hard wear and a layer of cloth is an asset.

50. Prime the hull inside and out with two coats of epoxy primer, followed by finish coats of any high quality paint. Polyurethane and epoxy paints are the hardest wearing, but are expensive. Single-part marine enamels are next in durability and price, followed by exterior house paints.

If you wish to paint a waterline or boot stripe, set up the dinghy on a flat surface (like a floor or paved driveway) and block it so that it rests as shown in Fig. 9. Cut a block of wood to a 6" length, and move’ it around the hull with a pencil held tightly against the top of the block, marking a line on the hull. This should be the top edge of the bottom paint. If you want a boot stripe, cut another piece of wood to a 7-1/2" width and go around the hull again to mark the top of the boot stripe.

INSTRUCTIONS FOR SAILING VERSION

51. Construct the mast and sprit from 2 by 4 spruce. The mast must be made by laminating pieces together, while the sprit can be one-piece if the wood is clear. The mast should be clamped while the epoxy cures, but if you do not have enough clamps, you can take an old car tire innertube and cut it

spirally to get very long strips of rubber about 2" wide. These can be used to wrap around the spars as the epoxy is curing.

52. After the epoxy has cured, grind off the excess epoxy, plane them eight sided, then sixteen sided, then round with a rasp or file. Check the fit of the base of the mast into the PVC pipe during the shaping process. It should slide in easily with just a little bit of play. Sand smooth and drill appropriate holes and slot.

53. Cut out the plywood pieces for the daggerboard, rudder and daggerboard trunk filler piece. Laminate the pieces together with epoxy, using weights, nails or temporary screws to hold them in place. Then grind them to the desired shape, and sheath in epoxy and cloth.

54. Laminate the tiller

55. Screw and epoxy the end caps onto the daggerboard and daggerboard trunk filler.

56. Fit the tiller to the rudder. Drill and bolt.

57. Install the pintles onto the rudder and the gudgeons on the transom.

58. Insert the mast into the pvc pipe, and both through the hole in the bow locker top. With a helper holding it in place, make sure that it is vertical athwartships, and just slightly raked aft. Mark where the foot of the PVC pipe falls on the mast step. Cut a piece of spruce 1" thick and 2-7/16" in diameter. Screw it in position on the mast step.

Insert the PVC pipe into position. Trim the bottom so that it rests evenly on the mast step. Trim off the top 1" above the deck. Drill a 1/2 hole through the side of the pipe, 1-1/2” above the bottom to act as a drain.

Apply a bead of silicone sealant around the inside of the bottom of the pipe, and put it in its position. Apply a bead of silicone from the top where the pipe passes through the deck, Allow the sealant to cure.

59, Lace the sail to the mast and rig the rest of the sailing lines.

60. Wait until you can sail the boat to check the best position for the sheet leads before installing them on the inside of the gunwale aft.

MATERIALS REQUIRED

3 sheets 1/4" plywood
2 12' spruce 2 by 4's
2 pieces mahogany 1" x 6" x 36"
3 gallons System 3 epoxy resin with hardener
1 50 yd. roll 3" fiberglass cloth tape
1 50 yd. roll 4" fiberglass cloth tape
10 yd. 38" wide 8.8oz. fiberglass cloth
1 2 lb. package Duckworks Fillet Blend
1 gallon silica thickener
1 8 oz. container phenolic microballoons
25 ft. 16 guage bare copper wire
100 ft. 50 lb. test nylon monofilament fishing line
55 1/2" #10 pan head, stainless steel, self-tapping screws
25 1" #10 pan head, stainless steel, self-tapping screws
10 2" #10 pan head, stainless steel, self-tapping screws
8 1" #8 flat head, silicon bronze screws (for oar lock sockets)
4 10/24 x 1-1/2" flat head, stainless steel machine screws, with nuts and washers (4 more are required for rowing outriggers)
2 7/16" X 2 1/2" hex head stainless steel cap screws
1 7/16" x 5" hex head stainless steel cap screws
3 7/16" stainless steel wing nuts
6 7/16" stainless steel flat washers
3 7/16" stainless steel lock washers
1 box (100) disposable Nitrile gloves
1 box (24) disposable 2" chip brushes
1 bundle of plastic spreaders
1 pr. Buck Algonquin angle mount oarlock sockets (a second pair will be necessary if the rowing outriggers are built)
1 pr. Buck Algonquin oarlocks
1 8mm x 3 5/16" stainless steel U-bolt
1 bow cleat

FOR SAILING VERSION (additional)

1 sheet 1/4" plywood
2 12' spruce 2 by 4's
mahogany or other wood for tiller (see plans)
1.5 gallon System 3 epoxy resin with hardener
1 set Racelite Medium Duty Pintles & Gudgeons (3/4" width)
1 Duckworks 10-24 Pintle and Gudgeon Fastener Kit
1 sail
25 ft. 1/8" nylon line for lacing sail to mast
25 ft. 3/8" rope for sheet and snotter
2 fairleads
1 small cleat
16 inches of 2" ID PVC Pipe

All of the above supplies, with the exception of the lumber, some screws, and fishing line is available at very reasonable prices from Duckworks Boat Builder's Supply - 826 East Park Avenue, Port Townsend, Washington - 98368 - 888-683-1930 - www.duckworks.com