

Building the Soling 1M without a jig.

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You DO NOT need a jig to accurately build a Soling 1M. You WILL need a stand when you are done, so build a simple and lightweight stand, first. A campstool type with slings is fine. With that out of the way... The boat is actually simple to put together, the instructions included with the kit make it difficult.

The two stumbling blocks for most builders are the hull to deck joint and the keel trunk. Neither should be that difficult.

The following is for a deck WITH a flange.

Locating the bulkheads --- The bulkheads do not accurately fit where indicated on the plans. Either you will have a gap between hull and bulkhead, or bulkhead and deck. One possible disaster is the deck will not fit over the edge of the hull. The following method ensures you will get accurately located bulkheads and a proper hull to deck fit.

Note: Do NOT glue anything in place until instructed to do so. Mark everything first.

First the hull, deck and bulkheads

1. Mark a center line on the inside of the DECK from bow to stern.

Note: Use pencil. Ball point and felt-tips will eventually bleed through styrene plastic.

2. Mark a center line on the inside of the HULL from just ahead of the keel spar cutout to the stern. Any flexible straight edge will do. Use the keel cutout and rudder post hole as a guide. Draw a line between them, then flip your ruler over and draw again from the opposite side. The lines will be slightly curved. Average the two lines to find the centerline.

3. Mark a vertical center line on both bulkheads and the transom by tracing around them on a piece of paper and cut out the paper with scissors. Fold the cutouts in half. Place the cutouts on the bulkheads and draw the centerlines along the fold.

4. Place the DECK upside down on the work surface. Starting with the forward bulkhead, hold the bulkhead upside down, place the upper flange of the bulkhead against the inside of the deck with the BULKHEAD FLANGE facing the HATCH OPENING. Sliding the bulkhead fore and aft, locate the position where the bulkhead has 1/16 INCH CLEARANCE between the outside corners of the bulkhead and the inside of the deck flange. The 1/16 inch clearance each side will allow for the hull thickness during assembly. Check with a small square to ensure the bulkhead is perpendicular to the center

line. Mark this location on the inside of the deck and extend the line to the deck flanges. Set the bulkhead aside. Do NOT glue.

5. Transfer the marks you just made on the inside of the deck flanges to the outside of the deck flanges.

6. Temporarily place the deck on the hull while holding the deck as far aft as it will go. Transfer the marks you put on the deck flanges to the hull. A short  $\frac{1}{4}$  inch line is sufficient.

7. Remove the deck and transfer the outside hull marks to the inside of the hull near the top edge (shear line). A short  $\frac{1}{4}$  inch line will do. You now have fore-aft position of the bulkhead for proper deck to hull fit.

8. Place the forward bulkhead inside the hull with the flange facing the deck opening, and line it up with the hull transfer marks you made in step 7. Press the bulkhead down into the bottom of the hull. Line up the centerline you drew on the bulkhead with the centerline of the boat. Do NOT glue.

9. While holding the bulkhead in place, check the top corners of the bulkhead for fit with the top edge of the hull (shear line). The EDGES of the HULL should be between  $\frac{1}{16}$  inch and  $\frac{1}{8}$  inch BELOW the top corners of the bulkhead. This will allow clearance for the inside curve of the deck flange.

Small adjustments to the height of the bulkhead may be made by tilting the BOTTOM of the bulkhead fore and aft. Keep the top flange of the bulkhead aligned with your deck transfer marks. When satisfied with the fit, mark the location for the bulkhead. Do NOT glue.

Notes: If the hull edges are more than  $\frac{1}{8}$  inch below the bulkhead corners, the deck flange will not have sufficient bonding surface. If the hull edges are higher than  $\frac{1}{16}$  below the bulkhead corners, the deck will not fit down on the bulkheads and the deck will flex or "oil can".

10. Repeat the process for locating the rear bulkhead. Be sure to reverse the flange on the aft bulkhead so the flange faces forward to the main hatch opening.

11. Mark and cut away  $\frac{3}{4}$  inch from the center of the forward bulkhead bottom flange to allow clearance for the keel trunk. Also, cut limber holes (drainage areas) from the bottom of the bulkhead for each side of the keel trunk. The rear bulkhead needs only one bottom hole for drainage. Many builders also increase the forward bulkhead opening on the right side to allow hand access to the inside of the boat.

Repeat: Before gluing in the bulkheads, make sure you cut out part of the flange for keel trunk clearance and limber holes.

12. Now glue in the bulkheads where you marked the locations. Use two small clamps for each bulkhead to hold them in place while the glue cures. Be sure to check the centerlines on the hull and the bulkheads. Yes, you will do this before the keel trunk is installed. This way you know the bulkheads will fit, and you have something solid to hold the keel trunk during its installation.

Note: The flanges on the bulkheads do not fit perfectly flat with the hull. As long as you have good contact all around with the hull-to-bulkhead joint, it will do fine. Filler and reinforcement may be added, if necessary.

Now the transom! Note: you will be cutting part of the hull off the boat at the transom. Also note: the aft end of the hull is NOT square as delivered from the factory.

13. Using the same method as the bulkheads, find the location on the inside of the deck where the transom has 1/16 INCH CLEARANCE with the deck flanges. This should be done while holding the transom at an angle of approximately 30 degrees aft tilt. Be sure the flange on the transom faces the hatch opening, (forward.)

14. Transfer the transom marks from the inside of the deck flange, to the inside of the hull as you did with the bulkheads. Measure from the bow to your hull marks on each side of the transom to ensure the measurement is the same and the transom is square with the centerline. Temporarily place the deck on the hull. Do NOT glue. Measure from the bow 39 3/8 inches and mark a STERN LIMIT location on the outside of the hull. This will be the very aft end of the boat. An easy way to do this is to hold the hull and deck together upside down with the bow against a wall and measure from the wall.

15. Remove the deck and test fit the transom to see if it will line up with the hull/deck marks and the stern limit mark when fully pressed down inside the hull. Just like the bulkheads, the shear line of the HULL needs to be between 1/16 and 1/8 inch BELOW the top corners of the transom. Small adjustments may be made by tilting the lower end of the transom fore or aft. The shear line may need to be sanded down on both sides if the transom sits too low.

CAUTION: After marking the transom location, re-measure the boat length with the deck in place to be sure the boat will be NO LONGER than 1 meter, (39 3/8 inches). You may be as much as 1/4 inch under. The important part of fitting the transom is to ensure it is fully pressed into the hull and the top of the transom will fit inside the DECK flanges. If the transom does not fit perfectly, you can fill the gaps later with Bondo.

16. Now glue the transom into the hull aligning it with your hull marks, the centerline of the hull and bulkhead centerline and the stern limit. Hold in place with small clamps while the glue sets. After the glue sets, trim the aft end of the hull slightly longer than the transom. This will provide a lip for body filler after the deck is installed. The excess length will be sanded off during final finish.

You are now ready to install the keel trunk and bracing.

17. Assemble the keel with the plywood keel spar per the plans. Do not fill the keel with shot or resin at this time.

18. Mark the bottom of the hull at 16 inches from the bow to locate the forward limit of the keel. Keel may not vary fore or aft of this point by more than  $\frac{1}{4}$  inch.

Note: The keel trunk may need to be modified on the forward end to fit it up against the forward bulkhead. Add a filler piece or mast compression post, as necessary.

19. Place the hull in your cradle. Place the keel up into the hull and slide the keel trunk on the keel spar from above and inside the hull. Loosely attach the keel wing nut to hold the assembly together. Level the boat laterally using a small level across the hull above the keel trunk. Suspend strings with weights from the bow and stern as guides.

20. Hold the keel in position by propping it up with books, bean bags, or old socks filled with uncooked beans or rice. Align the keel and trunk vertically and laterally with the boat centerline. Use the strings suspended from the bow and stern as sight guides.

21. Tack bond the TRUNK in place with super glue. Careful: DO NOT bond the keel spar to the trunk. Double check the boat is level, the strings line up with the keel vertically, and the keel is not twisted off to port or starboard.

22. With the keel trunk tacked in place, remove the keel from the hull. Add the trunk bracing. Now fully bond the keel trunk and bracing in place using plenty of reinforcement around the hull and forward bulkhead.

23. Now is a good time to add a mast compression post. Some builders add a doubler to the forward bulkhead just under the deck.

24. Install the rudder block and bracing. The kit does not have sufficient bracing at the rudder block. There is too much flex at the rudder post block. Add additional bracing to absorb lateral loads and stop hull flexing.

25. Install the deck sheet exits, underside deck bracing for chain plates, jib tack, and backstay.

26. Temporarily install the radio, servo tray and battery mounts. It is much easier to test fit the radio now than reaching through a small hole later. Bond the mounting rails in place when you are satisfied with the layout.

27. Install sheet attachment deadeyes.

28. Now remove all radio gear and servos to install the deck.

Installing the deck

29. Test fit the deck on the hull for all around fit. The deck should almost “snap” into place. Scribe a line across the deck underside at the transom. Remove the deck and trim the deck to final length. If you are installing a lazarette, now is a good time, however, one may be added later.

30. Deck installation is really quite simple using a small paintbrush and MEK. Slip the deck on the hull making sure the deck is as far aft as it will go. Rubber bands may help hold the deck when bonding it in place. Holding the deck and hull assembly in one hand, gently squeeze the hull and deck to coax the hull against the deck flange. Starting near the bow, paint on a small amount of MEK into the joint. The MEK will wick into the joint and bond almost instantly. Use MEK sparingly. You are just trying to tack the deck to the hull. Work your way down the hull deck joint from bow to stern. If there appears to be a gap, reach inside the hull through the hatch and add outward pressure to the hull to force it against the flange. For hard to reach areas use a small stick or dowel.

31. The deck flange does not lie flat against the hull at the first ½ inch of the bow. Using a hobby saw, cut four or five vertical kerfs, ¼ inch apart, into the deck flange, near the bow. Press the small tabs you create down against the hull and cement in place with MEK. Fill any gaps later with putty or body filler.

32. Holding the boat nearly inverted, pour a thimble full of MEK inside the hull and QUICKLY rotate the boat around so as to let the MEK run into the hull deck joint all the way around the inside of the deck flange. Pour out any excess MEK immediately. This will seal the hull to deck joint from the inside.

33. Paint a small amount of MEK on the inside of the deck at both bulkheads to bond them to the deck.

The rest of the boat is straight forward construction.