Frame building

The first step to assemble the frame consists in mount the ribs on the keel. Mark the exact middle point in the keel rib mounting plates that have the rib mounting slots. Put the stainless steel fittings (right angles) into the slots in the correct position and fix it in temporary manner with adhesive tape from lower side of mounting plates. Note the following tip: The ribs fittings corresponding to ribs 1- 2 – 3 – 4 and 5, have the short tongue, pointing to stern, and ribs 6 – 7 pointing to bow. Put rib # 1 in his position, doing that the marked rib center of symmetry coincide exactly with the center of keel rib mounting plate and mark the fitting holes on the rib. Drill the 4 holes and mount the ribs in the fittings with 1/8"x3/4" screws. Perform the same procedure with the remain 6 ribs. Note that when you take out the ribs from the keel, ribs 1 to 5 must tilt to stern and ribs 6 and 7 must tilt to bow.

Frame alignment

Place the entire keel over a very straight and horizontal floor (or better on a straight and strong beam, about 16' to 18' if you have one. Fix the keel on it with "C" fasteners). Mount all the ribs, and bow and stern plates in its sites and keep its temporary firmly by ties, cords or any adequate method. Place 2 tubes ¾" diameter





1.5 mm wall tick about 5 m long (16.5') one in right side and one in left side, following the future gunwales contour and position (these tubes will be part of the future gunwales), fasten its in each rib with cord or plastics "cable ties" The tubes tips in bow must agree with the position of the gunwale fitting in the bow. Check alignment of all ribs and check that its are in straight angle with keel. Check verticality of bow and stern plates. Mark with a marker only on one of the two tubes (left or right, not both) the exact position of the aft rib face of ribs # 1 to 5 and the forward face of ribs # 6 and 7. Also mark the exact position of the stern gunwale fitting and identify positively bow tip. Take out both tubes and put both together with the bow tip agreeing exactly. Copy all marks in the tube unmarked. Repeat this procedure with 2 plus tubes. Now you must have 4 tubes with the ribs, bow and stern position identified. Cut the excess in the stern tip of 4 tubes by the exact mark. Two of these tubes will be for the right gunwale and two for the left one.

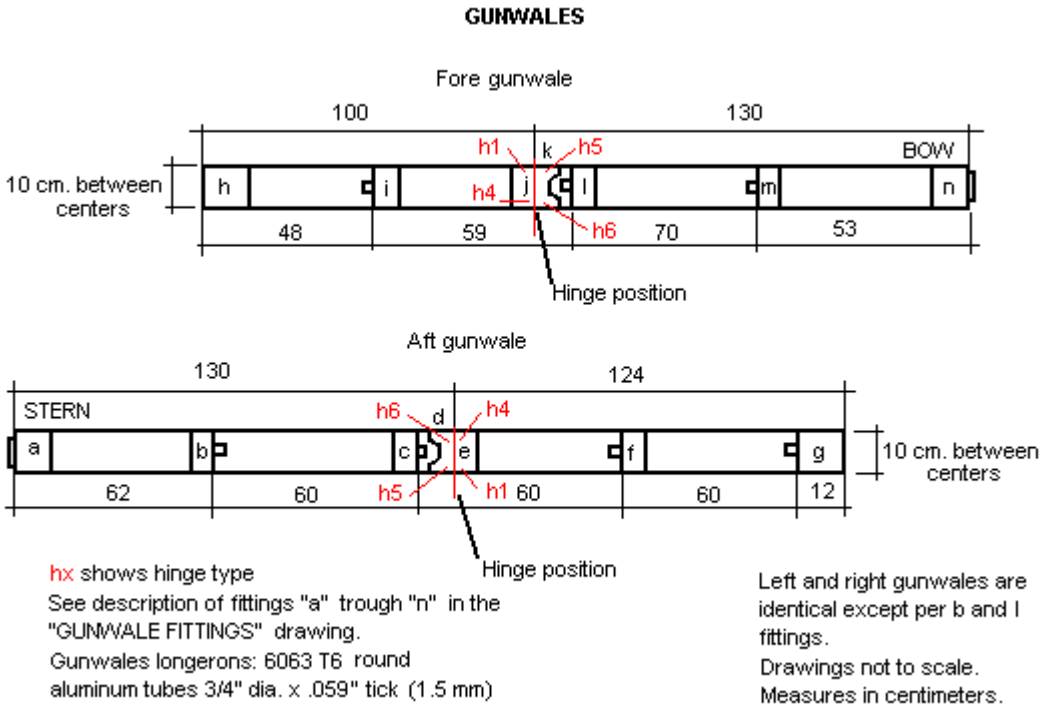
Gunwale assembly

Place two gunwale tubes on a very straight floor. Made a rig as the figure (use the same plywood of keel rig). Put this rig under the bow tip of the tubes doing its tips agree exactly with the transversal mark on rig and place the bow gunwale fitting (n) in his exact site. Drill one 1/8" hole in the tube and fix the plate with a pop rivet in place. Perform the remain holes and put all the rivets. Place the rig under the rib 1 mark. Put the gunwale rib # 1 plate (m) in the exact site, drill a 1/8" hole and fix it in place with one rivet, then drill remain holes and put all the rivets. Perform the same procedure with remain ribs and stern gunwale fittings (a, b, c f, g, i, l). Note that a edge of the gunwale rib plate must agree exactly with the gunwale tube rib mark, the riveted side must be oriented to bow side in plates corresponding to ribs # 1 to 5 and vice-versa in plates corresponding to ribs # 6 and 7. You have now one gunwale assembled but not finished yet as lack to mount some pieces and hinges.

When the two gunwales are assembled, mount its in the frame. To do this you must take out the stern gunwale fittings. To mount, hook both gunwales in the bow gunwale fittings, curve the gunwales following the boat contour, then hook stern gunwale fittings in the corresponding gunwale fittings and mount all in stern plate with screws.

Mount the 14 rib gunwale fittings in all the 7 ribs by hooking its in the tongues of the gunwale rib fittings and performing the corresponding holes in ribs and put the screws and nuts (1/8"x3/4"). Latter, identify positively all rib fittings as you must to dismount its later to varnish ribs. If you don't do it and change the fittings of the original places its will don't agree as there are little constructive differences between its.

IMPORTANT NOTICE: Don't put rivets where the hinges must be placed because these rivets will serve to fix the hinges and plates to the tubes.



Bow and stern deck stringers

Mount the bow and stern stringer fittings. Put a piece of ¾" tube long enough in the bow fitting and mark the tube exactly at point of aft face of rib # 2. Cut it by the mark and rivet on the tube the tongue which fit in the rib # 2 deck stringer fitting. Hook the rib # 2 fitting in the deck stringer tongue hook and accommodate the assembly in exact place. Drill the 3 holes corresponding to the rib fitting and fix it in place with 3 screws and nuts. Repeat similar procedure with bow deck stringer.

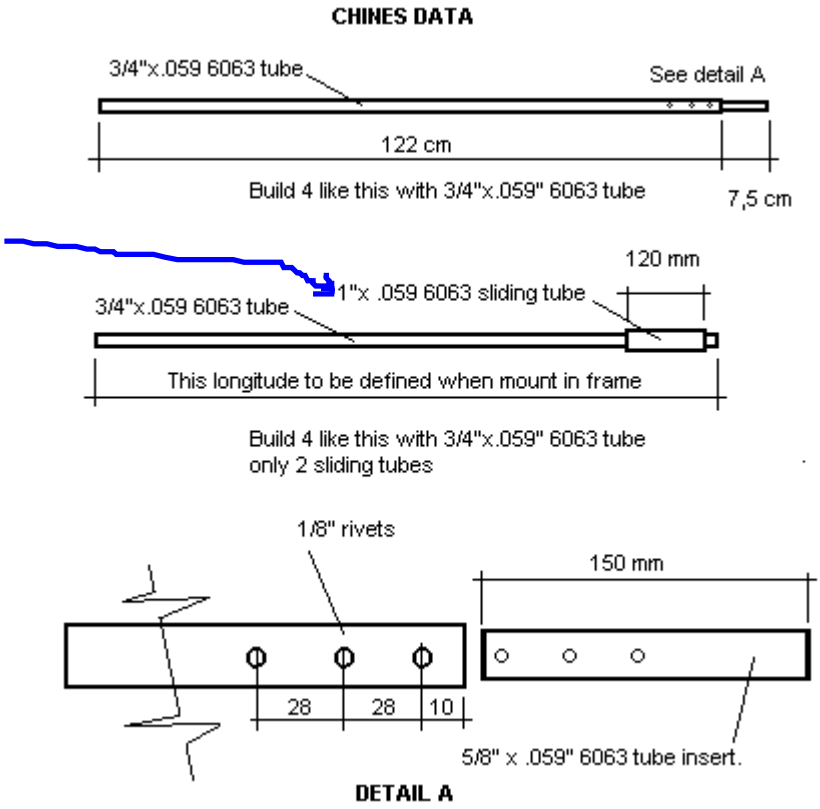
Chines

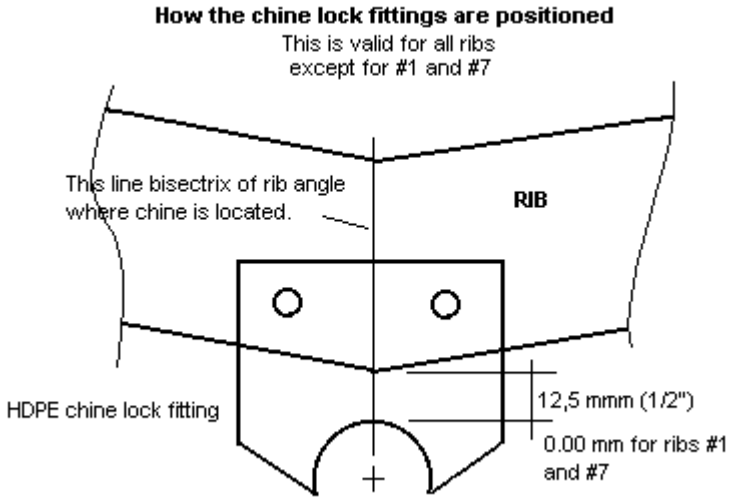
Put left and right chine tubes in place locking its in the ribs HDPE fittings and fix its in place helping with cord. Let the tubes to take its own form in bow and stern. Slide into left and right chine tubes the 5/8" bow chine fittings. Slide chines forward or afterward as necessary to obtain coincidence of fittings holes with bow plate hole. Put a screw and nut through assembly and nut. Go to stern and mark the chine tubes to cut at





adequate longitude for correct placing of stern chine fittings. Cut the excess of chine tube and place fittings in place, put the screw through and nut to fix all parts in stern plate.



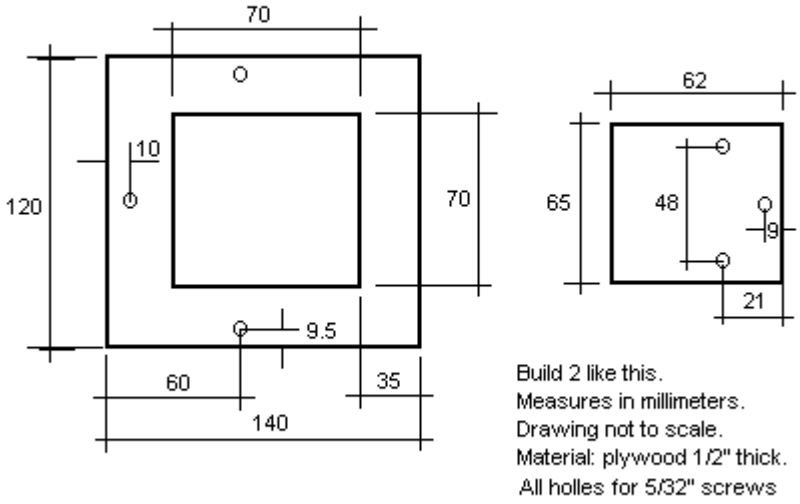


Finishing the frame

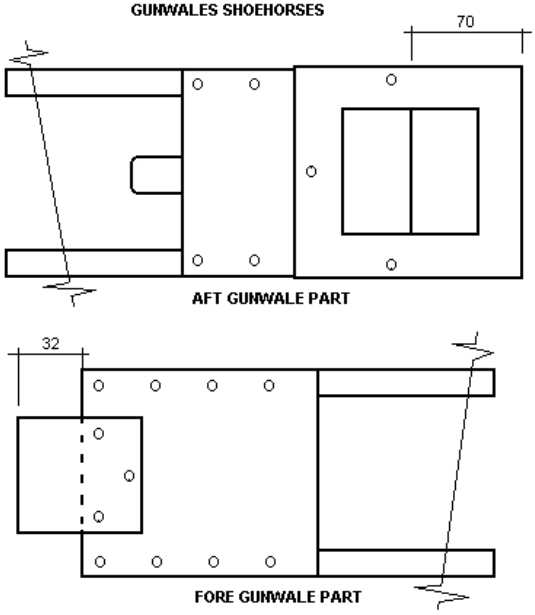
Put the remain plates in keel and both gunwales. Mark in all these parts the site where pivoting part of hinges must be. Place the hinges in place (12) and rivet its with 1/8" pop rivets.
Mark on gunwales the site where its will separate. This point is about the middle of the boat between plates (**g**) and (**h**) in both gunwales.
Mark the chines in the points to cut as the drawings show.

Mark the gunwales as **“left gunwale”** and **“right gunwale”** both in front and aft parts of each gunwale as it will be separated later. Mark also keel and chines same manner to know which position its belong.
Disassemble the frame. Cut the gunwale tubes in the hinges pivot marks and the mid point marked in the preceding step (between plates (**g**) and (**h**)).
Mount the gunwales “shoe horses” as the drawing shows in plate (**g**).Use screws 5/16"x 1". Place the aft and forward parts of gunwales together in the exact position, mount the wood tongue which fits in the shoe horse, drill and bolt with screws 5/16"x 1" and nuts on plate (**h**).
Cut the chines in the marked positions and put the 5/8” inserts as the chine drawing shows.
It's time to attempt the frame assemble again, but with the definitive method. Surely you will need to trim a little several fittings in order to permit a easy assembly because some parts don't fit properly or some others touch here and there. It happened with my boat, and it's possible that it happens with your own. Don't over trim parts. After several assembly procedures, you will note that the things come better and you will obtain more practice. The assembly is not matter of "brute force" if all parts fits well.

GUNWALES SHOEHORSES



GUNWALES SHOEHORSES



Assembling the frame by first time

1) Put both parts of the keel on the floor and engage the shoe horse with the tongue.
2) Put ribs # 1 and # 2 in place hooking its in the keel slots.
3) Engage front part of left and right gunwales in the respective bow plate fittings.
4) Engage the ribs 1 and 2 in the corresponding gunwales tongues.
5) Repeat same procedure with ribs 6 and 7 and the aft part of left and right gunwales, hooking its in the stern plate.
6) Engage the gunwales shoe horses, and expand gunwales outward
7) Insert the # 4 rib, hooking it in the keel first and then in the respective gunwales tongues.
8) With same procedure insert ribs # 3 and # 5 in this order.
9) Put the chines by inserting first bow part of tubes which have the insert, in the bow fitting, the insert pointing to center of boat, then insert the following tube which haven't inserts in the first one.
10) Do the same with stern part of chine. Engage the chine tubes in the HDPE fittings in all ribs.
11) Cut the excess of center chine tubes. Its convenient to cut the excess, spread it one part from each tube front and aft, in this manner both tubes has the same length and will be interchangeable.
12) Slide the 1" chine coupling tube until it engage and fix aft and fore parts of chines and engage it in the HDPE fitting of rib # 4. It will stop sliding when all is mounted.
13) Put the front deck stringer in the bow fitting and engage his tongue in the fitting of rib # 2. You will need to shift a little the rib, hook the stringer tongue and accommodate the rib again to original position.
14) Repeat similar procedure with rear deck stringer and rib # 6.

You have now the frame assembled. The next step is the washboard assembly.

Washboard assembly.

Put the right washboard aft hole in the 1/4" bolt of # 6 rib washboard fitting and fix in place with a butterfly nut. Be sure that ribs are correctly positioned and mark on washboard the exact position of bolts of washboard fittings of ribs # 2, # 3, # 4 and # 5. Perform the holes. Then disassemble and mark its on the left washboard coping from right washboard using it as template. This method is for to obtain more precision and symmetry. Proceed in similar manner with the skin support aluminum strips holes, but starting with the rib #4 hole because it is where both strips (aft and fore) must join.
Finally, mount both washboards, aluminum strips and boomerang in place and fix with butterfly nuts.
The frame is now finished. May be you need to trim some pieces in order to achieve easiness of assembly, but be careful and not over trim as it may cause too much loose in parts.
All wood parts must be varnished at least with 3 coats of marine type varnish. As to varnish is necessary to disassemble fittings, be sure to mark the original location of each part. If not, the different parts may not agree when reassemble. In the final assemble, I put a drip of "Loctite 290" in all threads before put the nuts in order to prevent loose of its. **NOTE:** "Loctite 290 " or alike is a nut /bushing locker.
There are some details that I didn't describe as it is much more evident in pics than words. This is the case of seats and back seats.
About the rudder pedals , you will see in Internet address one pic that shows rib # 4 with pedals mounted. This rib is specially designed to support the pedals and fore seat back. Incidentally, the distance between the aft seat and pedals agree with my legs length, but it may not be your case, then I prefer to leave this part of design to your own decision. May be more convenient to copy the Klepper rudder pedals and seat backs system in your case, or perhaps one adjustable position pedals.
Next step consist in the skinning.