

Recommend that only epoxy resins and glues be used.

## BACKBONE

The complete backbone is a box like structure made up separately from the shell and is only glued into the shell when it is complete. It consists of two parallel pieces of plywood 1" apart, running vertically from bow to stern. (about 10' 6" long) This plywood also forms the sides of the fin case which is thus 1" wide. All struts to go inside the ~~X~~ backbone box are spruce, 1" X 3/8" and are glued first, on edge to the inside of the full length backbone ply.

Before gluing any wood to the backbone ply it is advisable to cut the appropriate lightening holes. (do not cut away ply closer than 1/2" from any strut) If using a power jig saw cut out holes when backbone is complete.

Order of gluing spruce internal backbone struts:-

1. Struts to close off front and back of fin case.
2. Aft and forward keels - butt up against fin case struts not vice versa.
3. Foredeck and cockpit king planks.
4. Mast step struts and other bow web struts - butt to keel and king plank.
5. Other vertical struts.

N.B. At all times make certain that backbone is ~~xxxx~~ kept straight.

Take the other piece of ply that forms backbone and fin case and glue the two halves together to complete the backbone box. Staple guiding lines may need to be drawn on the outside of the second sheet showing positions of internal struts. Again care must be taken to see that backbone does not curve or twist. Finally, glue the external fin case struts (keel and deck king plank) to the outside of the ~~x~~ backbone (clamps may be needed together with blocks to hold sides of fin case 1" apart).

Before gluing the backbone assembly into the shell the keel of the backbone must be faired up, excess ply planed off. - ensure keel has a smooth curve from bow to tuck. Use a square to ensure ~~xxx~~ that sides of backbone are exactly 90 degrees to the flat of the keel otherwise the fin case would not be vertical.

## FITTING THE BACKBONE

Fit backbone into shell after ensuring correct length, using plenty of glue and checking that backbone is straight and in centre of boat. Use a clamp at either end to hold bow and tuck into (OR STABLE) position and turn shell upside down and screw and/or nail shell down onto the backbone keel. Around the fin case screws should be every 4" and 1 3/4" apart (no centre keel at fin case). Remove screws and clamps when glue is dry.

Diagram of Backbone  
on  
Separate sheet

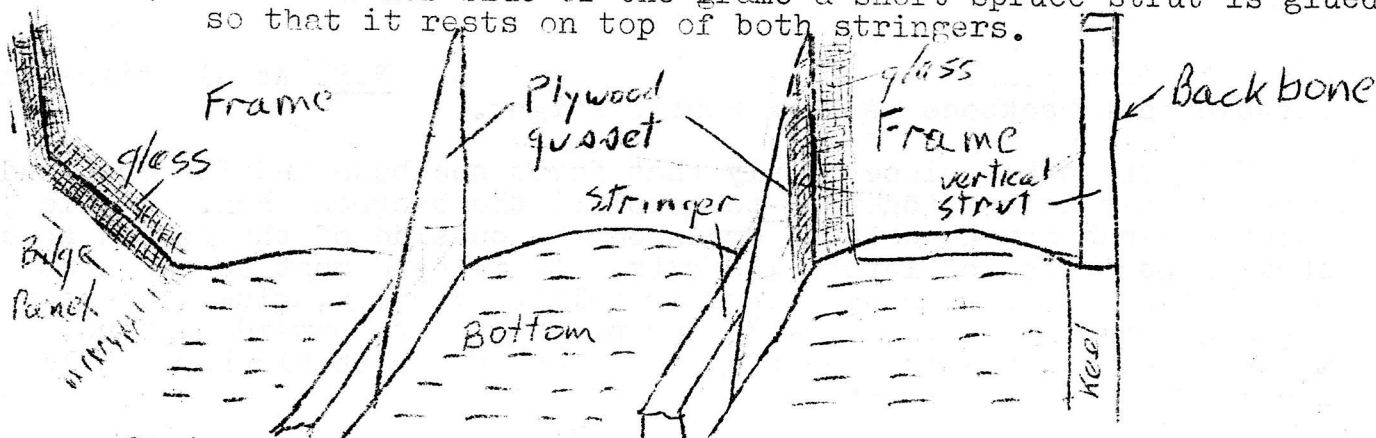
## FRAMES

All frames are to be set up as follows:-

1. Scallop out between stringers, stringers and keel and stringers and bottom chine to allow drainage.
2. Carve chine corners away slightly to allow for glass on inside of shell chine. if necessary.
3. Glue all deck beams, ~~X~~ vertical struts and horizontal struts onto frames before fitting into boat.
4. Cut out lightening holes

All frames are to be fitted to shell in ~~XXXXX~~ following way:-

1. Butt join deck beams to gunwhale and backbone - top of deck beams should be flush with tops of gunwhales and backbone.
2. Frames are attached to backbone by a vertical piece of pencil cedar glued to both backbone and frame and glassed on reverse side.
3. Frames are ~~also~~ glassed carefully on both sides to the shell sides and bilge panels and shell chines - most important.
4. There are a number of ways of attaching stringers to frames. It is advisable to use both methods described here - if stringers come away it is the beginning of the end.
  - a) On one side of frame glue ply wood gussets to stringers (triangular) with vertical side flush against frame and glass both sides of gusset to the frame. If wished, another gusset can be glued to the other side of the stringer.
  - b) On the other side of the frame a short spruce strut is glued so that it rests on top of both stringers.

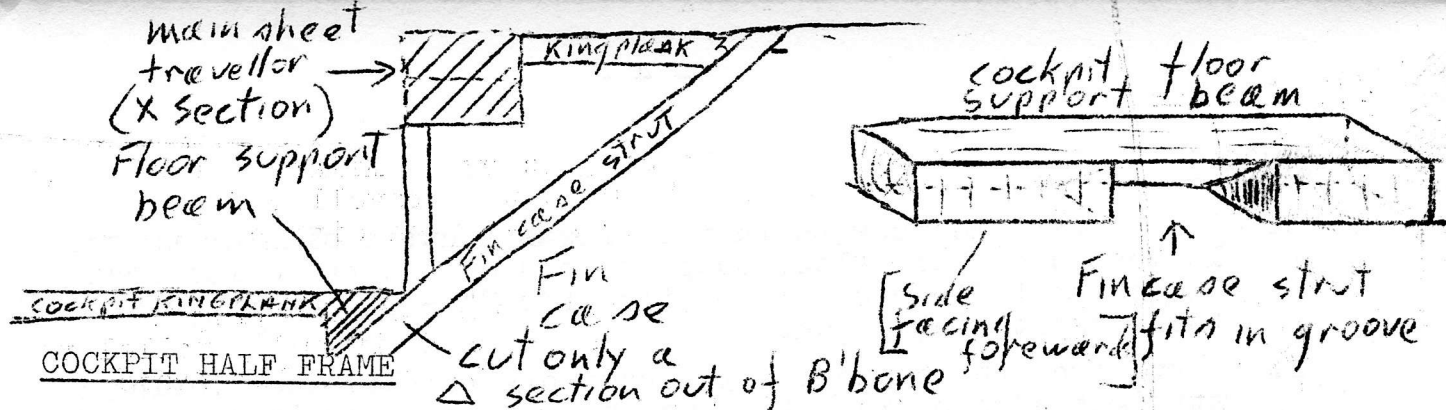


Stringer slots in frames should be exact height and frames should fit exactly when top of slot is just resting on top of stringer.

## MAINSHEET TRAVELLOR FRAME

Along the top of the traveller frame a full width deck beam is added. The foredeck will rest on this beam.

On the reverse side of the frame, side facing aft a laminated beam must also be glued upon which the cockpit floor ply will rest. This curve should be flat for 2" - 4" on either side of the centre line). Do not cut either beams in half at the backbone but cut out backbone to allow these beams to fit in. When cutting out backbone to allow the fitting of the laminated cockpit floor support beam do NOT cut into the back of the fincase strut - in this case some of the laminated beam will have to be cut away and a triangular piece cut out of the cockpit king plank. (See diagram) The rest of the traveller frame is to be fitted in the usual way.



#### COCKPIT HALF FRAME

Fit this frame into the shell in the usual way but do not attach the cockpit floor support beam until later.

#### CHAIN PLATE BLOCKS

Use layers of scrap ply to build up a block underneath the gunwhales between the mast-step and fin case frames in the position indicated on the shell. Use plenty of glue and clamps and build up until  $3/4$ " thick. Layers of plywood are used because side is curved and a solid wooden block would not fit. When the boat is finished chain plates are attached to the hull on the outside with three heavy gauge self-taper screws. The chain plates are usually placed 10" aft of the mast step.

#### WING SUPPORT BLOCKS

Wings can be attached in a variety of ways, some require internal blocks appropriately placed if using aluminium strips bent around the tube and then screwed to the side of the boat, or if using U-bolts extra external gunwhales may be required. The spruce struts  $3/4 \times 1/2 \times$  approx 18" must be glued directly under the wing where the wing will pass. Perhaps the simplest method is with lashing - but this requires bolts to be placed through the side of the boat before fitting the

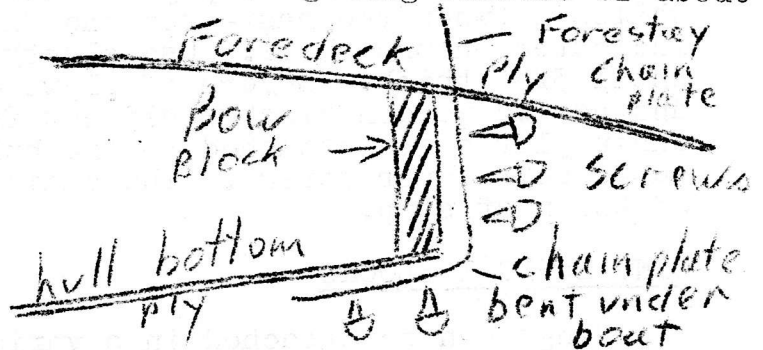
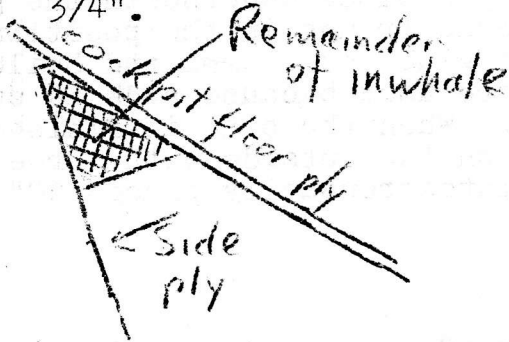
*Perhaps best method is with lashing - requires bolts thru side of hull before decking*

#### PREPARING FOR DECKING

1. Glue timber to the hull at the tuck, between tuck and  $4" \times 6"$  will be screwed.
2. Glass front of backbone to bow block.
3. Varnish of boat and under blocks should be given 1 or 2 coats of
4. Fair up deck beams, gunwhales, foredeck king plank and carve top of bow block to desired curve. Check that strips of ply, when laid across the boat, lie flat on all beams. Mark frame and chain plate positions on outside of shell.
5. Compound curves in the foredeck can make decking difficult - try a dry run first. Draw staple guiding lines on top of ply wood deck at frame positions. N.B. Foredeck to be continued 6" past bow block.
6. **MOST IMPORTANT!!!** Ensure that the boat is not twisted. Once even one quarter of the decking is in place the shell becomes rigid. To check for twist lay two straight edges 7' apart at equal distances from the bow and tuck at 90 degs. to the backbone across, and resting upon the gunwhales. From a position well aft of the boat sight to check that these straight edges are parallel.
7. After varnishing the underneath of the first half of the foredeck (not over glue lines) glue and staple the foredeck into position. Foredeck ply should extend beyond bow frame by 55%
8. The second half of the foredeck will have to be shaped along the centre line, the centre line no longer being straight.

## COCKPIT FLOOR

1. Carve away the tuck so that it forms a curve similar to the laminated cockpit floor support beam on the traveller frame. The cockpit floor should be flat for 2" - 3" on either side of the cockpit king plank.
2. Carve away the cockpit half frame ply so that when laying a straight edge between the two ends of the cockpit and parallel to the king plank the straight edge rests on the traveller frame floor support, the cockpit half frame and the tuck.
3. Carve the internal gunwhale away so that the cockpit floor ply will lie flat on it. This requires careful planing and testing. When completed the inwhale should have a gluing surface of about 3/4".



4. Before gluing cockpit floor ply in position varnish inside of boat and underneath the floor ply where not being glued and again check boat for twist.
5. Following the new curve in the cockpit half frame ply, glue a supporting beam.

## FINISHING

Trim all decking but leave foredeck extending over bow block. Glue and screw chain plate, forestay, to bow block bending chain plate so that it goes underneath the hull and along the keel. Silver ash can be used if wished (veneer 1/32"), to cover foredeck centre line ply join and end grain ~~at~~ at gunwhales.

## TUCK

Fit a tuck beam to which the top rudder gudgeon will be bolted - cut the correct angle in the ends of the tuck beam so that it will sit with the top just flush with the gunwhales - if left up 1/4" it can be curved. Glue into position and using a sharp plane fair the back of the tuck so that the tuck ply lies flush across the tuck. Glue ply on and cut a hole between the tuck beam and cockpit floor.

## COCKPIT FLOOR REINFORCEMENT

Fibreglass can be used in the working area but plywood strips glued from gunwhale to gunwhale are lighter and stronger. To prevent the cockpit floor from splitting down the centre line these plywood strips must not be butt jointed at the centre line.

## BOW BLOCK

After tuck ply has been glued on measure the hull's straight line length and cut off the excess foredeck ply at exactly 11'. If foredeck



## VARNISHING

Varnish decks before dealing with the bottom.

1. Thoroughly sand decks all over with an orbital sander. Remove dust and debris before commencing varnishing. Do not sand without sanding.
2. Rub back with about 260 grade wet and dry paper - if water is used sparingly a paste will be produced which fills the staple holes.
3. Apply another coat of varnish and rub back with about 320 grade wet and dry.
4. Repeat step 3 if desired.

## PAINTING

When varnishing of decks is complete turn boat over, cut out fin case slot and glue fin case fubbers or sail cloth in place. Roughly feather the edges of the chine fibreglass with a disc sander preferably with foam between disc and sand paper. Ignore remaining roughness of fibreglass and apply a thin coat of Everdure. Follow with a coat of International Marine Sandcoat - a very good filling undercoat which sands easily. Wet sand hull thoroughly using 180 grade on chines. Apply a second coat of Sandcoat and again rub back with about 320 grade wet. The hull should then be ready for gloss coats.

N.B. The centreboard case is 1" wide. Milled 1" maple finishes at about 7/8" and when glassed will be about the right thickness, for a centreboard.

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