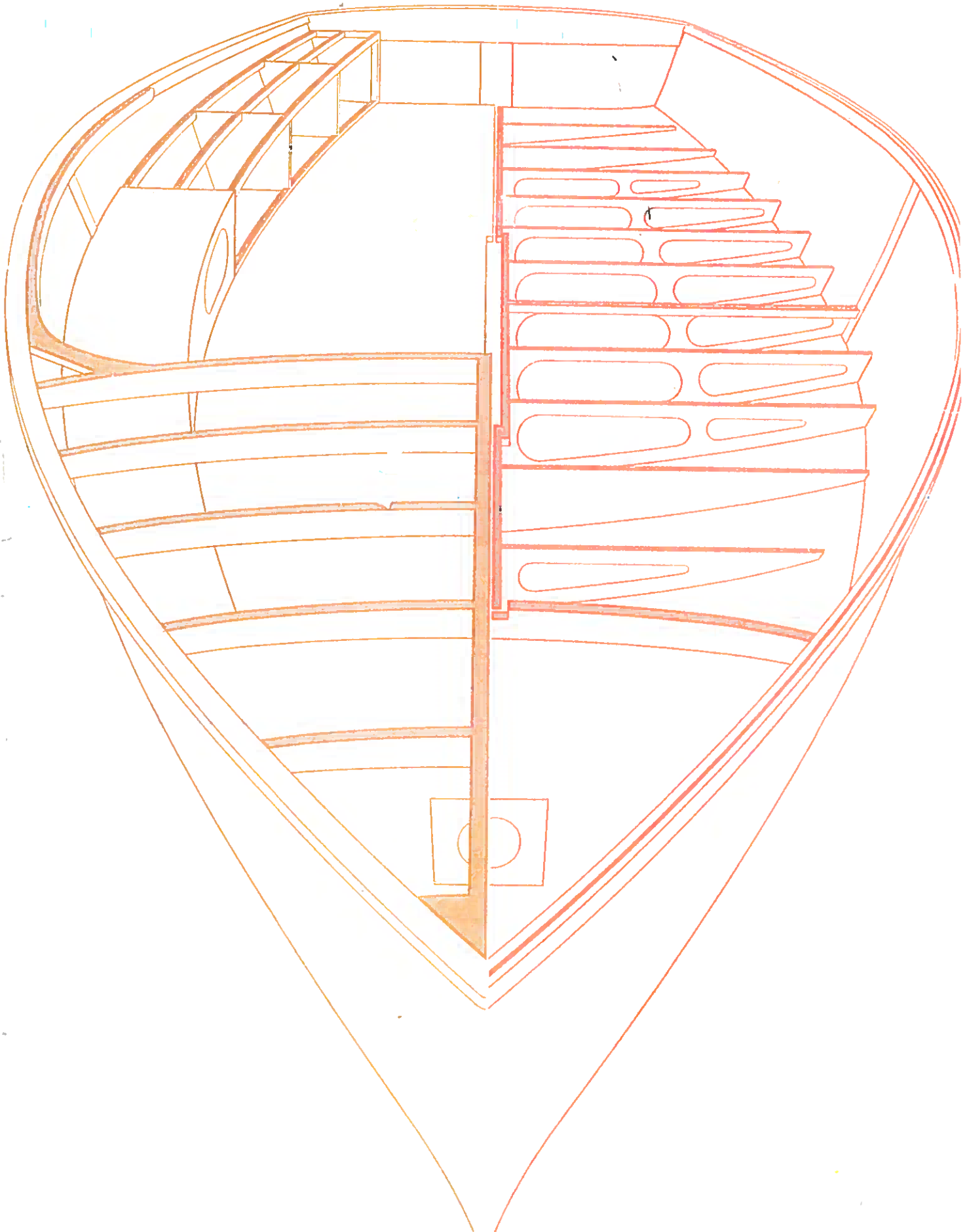


Mirror 16

Building Instructions

3



AMENDMENTS AND ADDITIONS TO M.16.
BUILDING INSTRUCTIONS.

Painting.

Danbolin is not supplied in the paint kit. For Danbolin read one coat of metallic pink primer; this is equally suitable and by reducing the number of different materials, makes the painting easier.

Page 9 Para. 2.

Check that the stirrup fits correctly before assembly.

Page 12 Para. 4 & 5.

It has been the experience of several members that there is a simpler method of fixing the bottom panels to the centre web.

Having drawn the centre line along the web you should start by offering up one of the panels to its respective side of the web. After drilling lead holes for the screws and applying glue and hardener you should commence fixing this panel by screwing about 2' of its length immediately aft of the centre board slot. Repeat this over a similar area, forward of the centre board slot and drill off the foreward centre webb lacing holes.

Now offer up the other panel and butt its edge to that already fixed - then screw and glue similarly. After this you should screw both panels along the centre board case edge so that you finish this stage with both panels glued and screwed over the complete centre section..

By screwing a section at a time you will find that it is easier to achieve a really good butt joint right down to both ends of the boat.

One word of warning! If your hardener dries before you actually screw down the panels, especially at the extreme ends, remember to renew it otherwise the joint will be useless!

Page 13 Para. 3.

Ensure you are positioning part no. 24 correctly. If it does not fit one way, try it the other, remembering that the draining holes must line up with those in the transom.

Page 20 Para 1.

The top of the stem trailer block is fitted 1'5" from the top of the stem post NOT FOURTEEN INCHES.

Page 30 & 31.

H.A. 76 should be fitted at right angles to and in line with the jib sheet which runs from the fairlead to where the crew will be sitting on the opposite side of the boat.

H.A. 3 kicking strap anchorage plate is fitted on to the floor immediately behind the king post step.

The transom has no cut out in its top edges.

Page 33 Para 1.

FOREWORD

At one time it would have been considered impossible to build a 16' sailing dinghy without complicated jigs and formers. Using completely new principles of construction the Mirror Class Dinghy achieved a break-through in the field of home boat building. For the first time, a complete novice could assemble his boat, with the simplest of tools, in any spare space he had. What is more he knew, at the end of his labours, that his boat was bound to measure correctly and qualify for a measurement certificate.

Basically, the designers achieved that in two ways. First of all, most of the component parts were cut exactly to shape and size - a few of the pieces were supplied a little larger than necessary to allow for a margin of error. Secondly, instead of fixing panels to a heavy wooden frame-work the whole job was simplified by welding each marine plywood panel to the next with polyester resin held in place by glass fibre tape making a seam which was many times stronger than wood itself.

An indication of the success this design achieved is the fact that of all the thousands of Mirror dinghies sold throughout the world 80% of them were in kit form and were built at home.

It was natural that many of these owners, after several years sailing in an 11 foot dinghy, would aspire to a somewhat larger craft and, because of their requests, the Mirror 16 was born.

Using the knowledge gained from the Mirror dinghy we could produce an even more sophisticated boat but incorporating the simplicity of construction. Some of the lessons learned have been used in the actual boat and some used in these instructions which follow.

I, as the writer of this book, have already learned the hard way that it is impossible to produce a set of instructions which satisfies everybody. The absolute tyros ask for more detailed notes and less diagrams whereas the highly technical and experienced bodies would like a set of very accurate blueprints with no notes. Most people, however, seem to prefer the type of booklet which eventually evolved with the Mirror Dinghy so, with a few refinements, this is the format I will adopt.

I am writing this for one person - he is a family man of average intelligence, no experience of boat-building and little of carpentry, he has no elaborate tool kit and any assistance he gets is decidedly unskilled. If you are not he, forgive me because I am sure you will still be able to build a good boat using these instructions - it might just take a little longer.

If you have already built a Mirror dinghy, you will find some of this book rather familiar but, even so, I ask you to read it through before you actually start to build in order to give you a rough idea of the sequence used.

One final plea! Everyone has a well-meaning friend or relative who always knows a better and easier way of doing a job - don't listen to them! If they knew so much they would not be wasting their time offering advice to you, the boat-builder.

INTRODUCTION

The kit you have contains all the pieces you will need to build a Mirror 16, and each piece has been numbered so that it is instantly recognizable. As each component appears in these notes, it will be referred to by its name and number - subsequently, it will merely be named.

Although most of the actual construction can be done by one man, it will sometimes be quite impossible to cope unless you have a willing assistant to hold ends of panels and pass you tools etc. Another aid is some rough trestles on which to build the dinghy - they need to be fairly low to the ground to enable you to reach inside the boat. Three long flat boxes about 18 inches high, with some wedges to steady the hull, would be ideal.

While you are arranging this you had better check your tool kit. These are the items you will need:-

1 pin hammer	1 top-cutter (wire cutting pincers)
1 tenon saw	1 smoothing tool
1 set square	1 pair broad nosed pliers
1 drill (preferably electric)	1 carpenters rule
1 screw driver	Glass paper (coarse and fine)
1 chisel ($\frac{1}{2}$ " or 1")	2 "G" Clamps.

A word about the screw driver - it must be the same width as the screw heads and have a square blade.

I admit that "G" clamps are not found in every home but, although they are not vital to the operation, they will make life easier so see if you can borrow a couple.

In addition to the above you will require a couple of old 1" paint brushes (for putting on the resin) and plenty of old rag for wiping the resin off tools, fingers and anything else it gets on.

FILOBOND is a resin which is used for bonding and sealing ALL the seams of the boat and making it strong and completely water-tight. The bonding provides the main strength of the boat. This resin consists of two separate compounds which, like a seidlitz powder, only work when they are mixed together. The resin itself is inactive until the liquid catalyst is added to it. It is vital that they should be mixed STRICTLY ACCORDING TO THE MANUFACTURERS INSTRUCTIONS which are as follows:

Large amounts of Resin should not be mixed with Catalyst because the mixture will solidify in about sixty minutes and become useless.

One pint of Resin requires four cubic centimetres of Catalyst, which is approximately equal to two teaspoonfuls. We recommend that half a pint of Resin be mixed with one teaspoonful of Catalyst K or one pint of Resin with two teaspoonfuls of Catalyst. Handle the Catalyst with care as specified on the label. I have only given you an indication of the proportions NOT the amount you have to mix.

The resin mixture should not be used in a temperature below 60°F or

(15°C). At 68° the mixture will set in about an hour - 80°F in 30 minutes.

If you get the proportions wrong, the resin will be useless. When you are working in the right temperature and your resin remains tacky for a long time, you probably need a tiny drop more catalyst. On the other hand, if the resin sets off too quickly, you need less catalyst. It must be mentioned that the resin and catalyst, unmixed, have a life of six months after which time a slight deterioration develops. The resin should not be prepared until just before you are ready to use it. Later on, when we reach that stage, I will tell you how to apply it.

It would be as well if, now that I have dealt with the resin, I give a brief description of the glue you will be using.

AEROLITE consists of a glue and liquid hardening solution; it is used to join all the various pieces of wood together, in the same way as carpenters glue. The method of use is to spread the glue evenly over one of the surfaces to be fixed, using a flat stick. The hardening liquid is spread onto the other surface to be fixed. When the two compounds come together they react and form a fast setting adhesive. To spread the hardener, use a flat stick with a bandage of cloth wrapped and fastened round one end. It should be pointed out that if the hardening liquid dries before the join is sealed it becomes ineffective. **REMEMBER! GLUE FOR JOINING THE WOODEN PIECES TOGETHER: RESIN FOR BONDING AND SEALING THE SEAMS OF THE BOAT.**

And now I shall list the same general hints on woodwork which were in the Mirror dinghy booklet. If you have read them before, read them again - you might have forgotten one or two.

- (1) When driving in nails or pins make sure that the head of the hammer is clean.
- (2) All nails etc. should be driven in using a flat, firm surface as a backing; something like an iron weight or the side of an old hammer head will do admirably.
- (3) The usual practice for screwing two pieces of wood together is to drill a hole the same size as the screw shank in the first piece of wood to be fixed and then a smaller lead hole in the other piece of wood. A screw should never have to be really forced into position. It is commonsense that, in soft wood, lead holes need to be somewhat smaller than ones in hardwood.
- (4) On the subject of screws, remember that brass screws are easily twisted and broken if hard pressure is brought to bear.
- (5) Do not try to glue wet, greasy or painted wood.
- (6) If you are working in an outbuilding in frosty weather, do not let the glue or resin freeze before setting. This particularly applies to joints left to set overnight.

(7) Going to the other extreme, remember that the hotter the atmosphere, the quicker glue and resin sets so, if you are working during a heat wave or in a heated room, you will have to apply your glue or resin much more speedily but with the same care as normal.

(8) You will see, eventually, that the fibre glass webbing strip fits tightly to the angles formed by the seams. I must stress, even at this early stage that the strip must be absolutely bonded to the wood at all points with no air bubbles beneath it. Secondly that when it is sanded down this must only be done to the edges of the strip - the bonded corners must be as strong as possible.

(9) Talking of sanding I must mention a technique which I will remind you of later at the appropriate time. Use a softwood block for your glasspaper and sand ACROSS the grain for PAINTED surfaces and WITH the grain for VARNISHED surfaces, remembering that the finished interior of the boat will all be varnished and the exterior will be painted.

(10) Every wood upon wood joint must be glued as well as pinned or screwed.

(11) Having mixed up a batch of resin and used it on the seams, you might find that you have some left over. Don't throw it away - go over all existing seams once again.

(12) When you finish with the resin wash the brush out in solvent.

(13) Before using resin apply a good barrier cream to your hands or else you will have a terrible job to remove the dried resin from your skin. The barrier cream supplied with the kit can be used for removing resin from either your hands or the brush. The method used is to rub the cream well in and then remove with a dry cloth.

(14) A lot of people use far more glue than is necessary, thinking that the more adhesive one uses the stronger joint one achieves. This is not true - a thin film of glue is quite sufficient to make the strongest joint.

(15) It would be just as well to memorise the previous fourteen notes because they apply to every stage of construction and to forget any one of them might prove to be a costly blunder.

Some of the photographs illustrate more than one aspect of construction so it is no cause for concern if you spot some detail to which I have not referred. It is likely that further on I will mention the same picture again regarding that particular point.

Finally I give you two DON'TS.

DON'T try to build your boat to a thousandth of an inch - it is not necessary. Try, by all means, to achieve accurate work but don't get worried if there is a tiny gap between seams (the resin will fill it) or if a piece of wood doesn't quite fit (trim it off slightly).

DON'T listen to know-alls who are better at giving advice than building boats! There is an old Danish proverb which says "He who builds according to every man's advice will have a crooked house". The same applies to boats.

BUILDING THE MIRROR 16

Before you start on the actual construction, it might be of some help to you to have an overall picture of the early stages - in this way, you can relate the individual task to the integrated whole.

The skin of the boat is made from four long shaped panels of marine plywood - one pair forms the bottom of the boat and are curved upwards and inwards to become the complete bow whereas the other pair are laced more or less vertically to the outside edges of the bottom panels to form the sides of the dinghy. This structure would be very wobbly to work on so it is stiffened by building the whole of the bottom section on to a backbone along the full length of the boat - this is called the centre plate case and web. The centre seam of the bottom panels is glued and screwed to this spine which terminates at the aft end of the dinghy in a short cross member at the bottom of the aft transom. Again the bottom panels are glued and screwed to this.

Elsewhere, when two plywood panels meet edge to edge they are laced together through matching holes with short individual pieces of copper wire. Later on a completely bonded seam will be made with the use of glassfibre tape and resin.

In the early stages to provide extra stiffening you will be fitting gunwales along the top edges of the topsides.

The initial building programme described above is certainly less simple than any of the later stages so pay particular care and you will not be sorry.

Now we will start on the actual detailed work - each section will have a sub-heading and I advise you to read the particular section through before you commence work.

ASSEMBLING THE BOTTOM PANELS

Pieces 11 and 12 have to be joined together to make one side of the bottom section. You will notice on one of the longer edges of each of these pieces there is a long cutaway portion which, when the two complete bottom panels are placed edge to edge, forms the centreboard slot. It should now be evident that the two parts (11 & 12) of each panel join along the resultant matching straight edges.

The method of joining is to butt the two edges together and place along this join one of the butt straps (15) so that it lies centrally. It should also lie short of the edge with the centreboard cutaway by 1" - this is to allow for the centre case assembly to be fitted direct to the ply (Plate 1). The butt strap is now glued and nailed (using short copper nails) to the two sections. It is easier to have a line drawn straight down the centre of the butt strap so that you can fix first one section and then butt the other to it. In each case, use a zigzag pattern of nails and where the points protrude they should be neatly bent over flat into the buttstrap. Remember the nails must go from the ply to the buttstraps so that only the heads are visible on the outside of the join. (Plate 2 shows a completely assembled panel).

Each buttstrap finishes up on the inside of your boat so it is important that when you assemble the other bottom panel it is done the reverse way to the first one. A simple check on this is to lay the four pieces together as two matching panels with the centreboard slot formed between them - the buttstraps then lie on top as you look at the assembly.

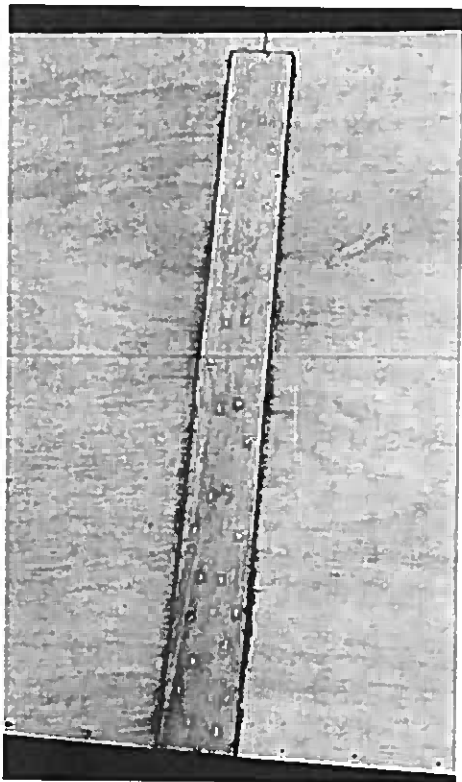


Plate 1

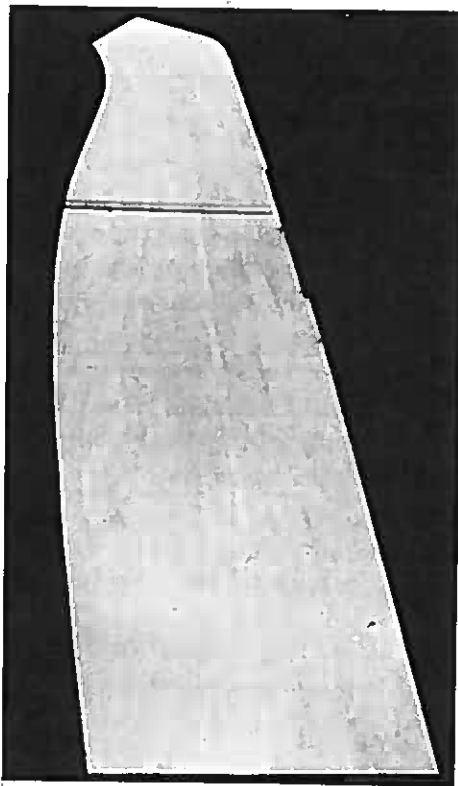


Plate 2

ASSEMBLING THE TOPSIDE PANELS (13 & 14)

The method of joining the four pieces to form two separate lengths is exactly the same as that used for the bottom panels but you must be watchful when you butt the short straight edges together. As originally designed, it was possible, unwittingly, to reverse one panel against the other. To guarantee that you have these pieces joining correctly the short edges have been cut so that each has a fraction of its length curved - on one panel it is a convex curve and the other a concave to enable one curve to fit inside the other. By using this jigsaw puzzle technique it should be impossible to join the panels the wrong way round.

Be very careful that, again, the buttstraps (15A) are placed so that they finish up on the inside of the boat. The simplest way to achieve this is to join two sections together to form one panel and then lay the other two sections on top, chines together, so that the two complete panels coincide exactly. If the buttstrap on the joined panel below is uppermost then one only has to open the upper sections like a page in a book and its respective buttstrap will also be placed uppermost. I am sorry to be so wordy here but this is the one part of the construction where a mistake will easily occur and will be one that cannot be remedied.

Finally, I must tell you that when gluing and nailing these buttstraps you must leave a gap of $1\frac{5}{8}$ " at the gunwale edge and $\frac{3}{16}$ inches at the chine edge (the edge which, at the forward end, curves up to the point) (Plate 3). A finished pair looks like those in Plate 2A.

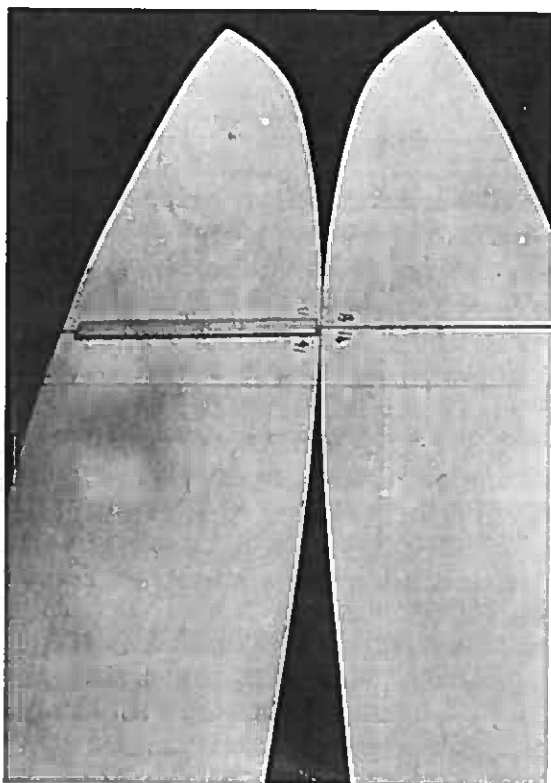


Plate 2a

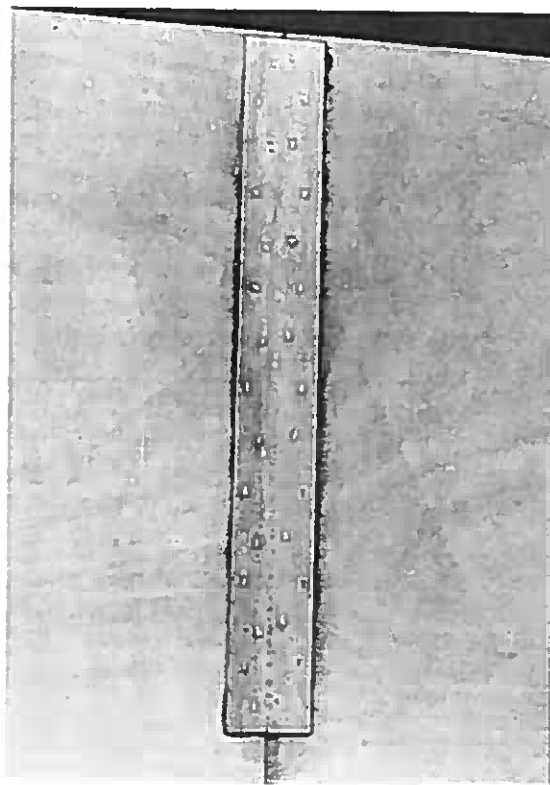


Plate 3

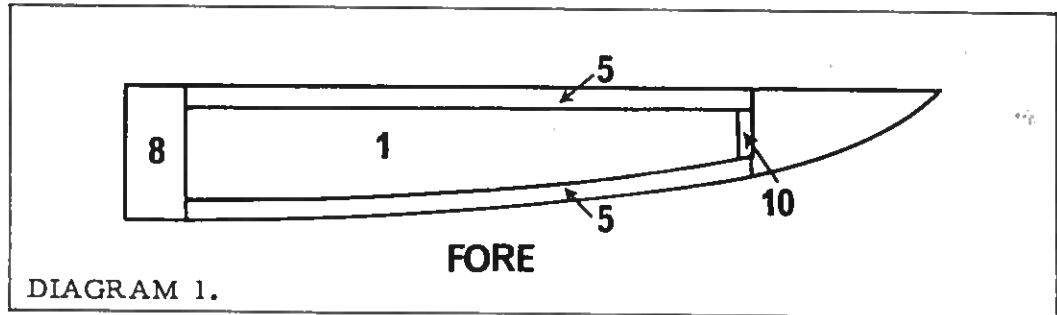
FIXING GUNWALES (64) TO TOPSIDES

Each gunwale is a long batten of wood, much longer than the gunwale edge of the topside. It should be glued and nailed, with its flat edge flush with the gunwale edge and its bevelled edge opposite, on the outside of the side panels (opposite side to buttstraps) starting at the aft end, which is square, and leaving 1 inch of the gunwale overlapping this end. Continue curving and nailing the gunwale to the side (one nail every 5 inches) until you reach the forward (pointed) end of the topside. You should now have about 2 feet of gunwale left over but this will eventually be fixed to the bow portion of the bottom panels.

ASSEMBLY OF CENTREBOARD CASE AND WEB

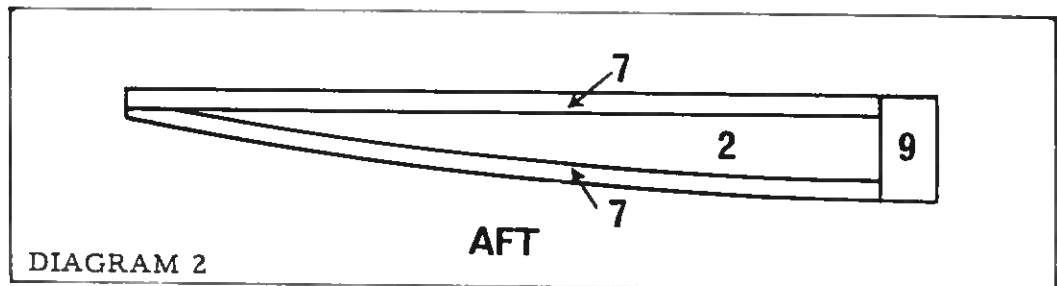
This now is the backbone of the boat and although it looks a bit complicated (Plate 3a shows an end-on view) it is really quite simple. It can divide into three sections and this is virtually how it is made - the fore and aft sections are assembled first and then they are joined together by the centre section - the plate case itself.

In the following diagram (not to scale) you can see the manner in which the numbered parts go together to form the forward section. All parts are glued and copper nailed.



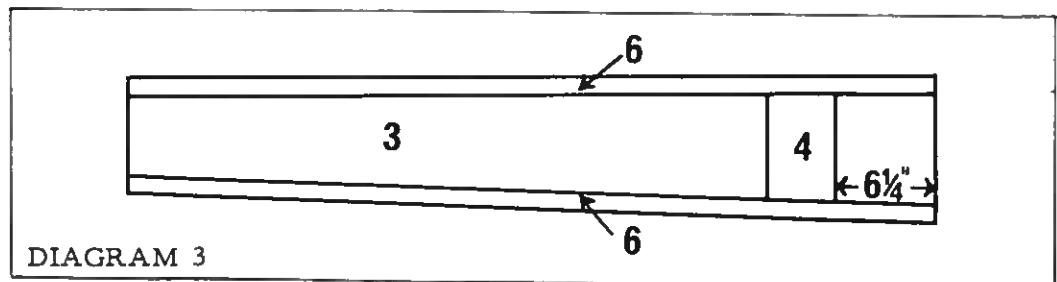
The wide end of piece 1 is sandwiched between the two blocks of wood (8) - butted up to these and running flush with the top and bottom edges on both sides of the web are the bow web edges (5). These do not go right to the pointed end (Plate 4) and the lower one, because it is slightly curved, does not finish quite in line with the top edge. This is apparent when the last pieces (10) are fixed in position. These short uprights joining the forward ends of the top edges should be vertical because this is where the forward bulkhead will sit. When fixing the bulkhead blocks you will obviously encounter a small gap between it and the lower edge - ignore it for it will eventually be filled with resin.

This next diagram shows the aft web assembly and you will notice that it is put together in a similar manner.



The web (7) is sandwiched at the wide end between blocks (9) - the top and bottom edges running flush with the edges of the web meet at the narrow (aft) end (Plate 5) - if necessary shape them slightly to fit against each other.

The centreboard case itself is made in two separate sections which eventually sandwich the fore and aft webs between either end (Plate 6).



The diagram above shows the starboard side of the case formed with piece No. 3 with a top and bottom edge (6) on one side only - the outside. The inside of the box (in other words, pieces No. 3) has a slot

to take the metal fitting which holds the centre plate, the stirrup. These vertical slots must be opposite to each other at the forward end of the case whilst on the outside of the case are fixed the stirrup pads to act as strengtheners to the ply where the slots are.

One word about these slots - the machine which fashions the groove is incapable of cutting a slot of even depth. It will be necessary for you to deepen this groove for its complete length consistent with that at the edge.

To return to the assembly, the stirrup pad has its forward edge $6\frac{1}{4}$ " away from the forward end of the case - in other words it is fitted on the other side of the ply to the stirrup groove. This pad is fitted after the top and bottom edge.

Plate 6 shows how the three pieces are fastened together.

It is best to fasten the fore and aft ends to one of the sides - each butts up to the end of the plate case side. **IMPORTANT** - It is vital that the top of the whole assembly is absolutely straight so take no chances when joining the sections together - keep checking.

When one side has joined the end sections together, the inside face of the case (where the vertical slot is) must be painted because it will be in contact with the water - use a coat of metallic pink primer followed by one of Danbolin.

After this, paint the other case side before fixing it in position but **DON'T** paint the surface to which you have to apply glue.

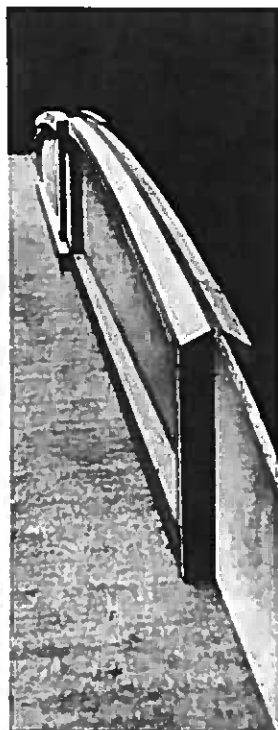


Plate 3a

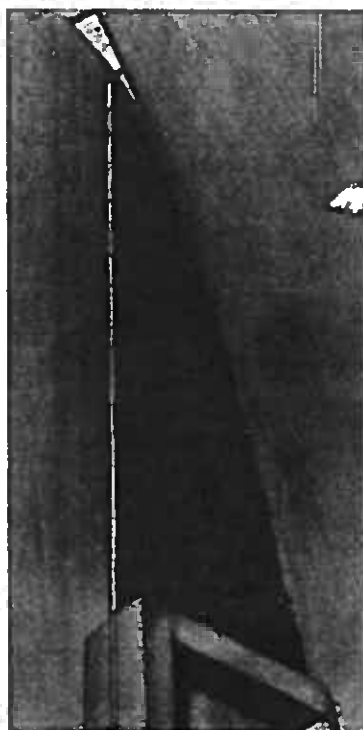


Plate 4



Plate 5

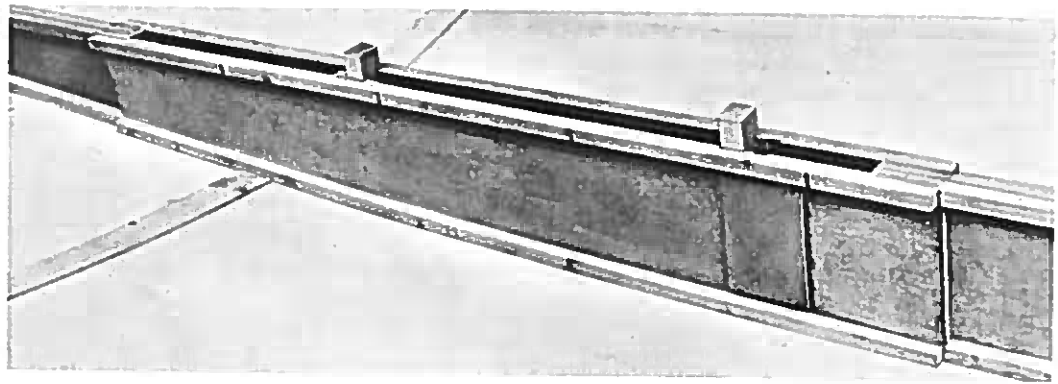


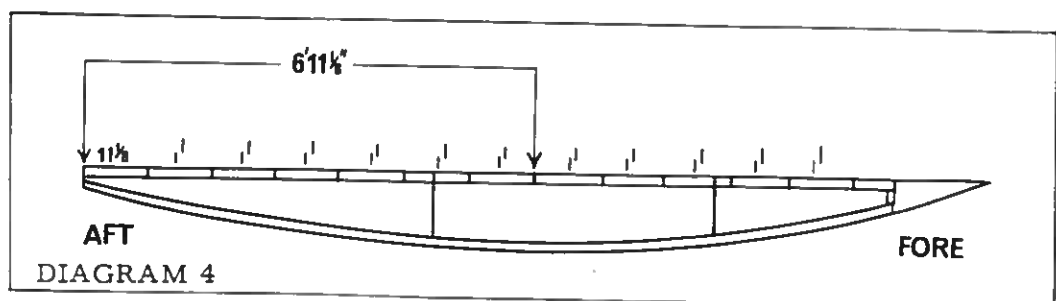
Plate 6

FIXING THE CENTREBOARD CASE & WEB

The top of this assembly is the long straight edge to which the floor will subsequently fit but, at the moment, you are concerned with the bottom edge so turn the whole thing upside down and, if possible, clamp it to your trestles - in any case, you need it to be quite firmly held.

First of all, you will need to shape the forward end of the bow web bottom edges (Plate 3a). A bevel must run from the front end where it is about half the thickness of the batten, (this is to say, the batten must be reduced to $\frac{3}{8}$ " deep), DECREASING to nothing at a point 1 foot aft of the start of the centreboard case itself after which you will leave a completely flat surface along the bottom of the web. The easiest way to do this is to mark the limit of the bevel with a pencil line along the bow web edges and plane down to this.

One other task which is simpler to tackle while the centreboard case and web are still out of the boat is the cutting of the slots which will eventually take the floor webs. In Plate 7 you will see a shot of the dinghy as it will appear at some stage in the near future. From the backbone, sticking out like ribs, are the floor webs each notched at right angles to the centreboard case and web. Plate 8 shows you a close-up of one of these webs in position - the floor web batten has been left off to give a clearer picture of the way in which the ply clips into the slot. This plate also shows a number of neighbouring slots. The slots ($\frac{1}{4}$ inch deep) are cut in both sides of the plate-case web top edges at intervals of 1 foot for the whole length but, for reasons we won't go into, you must start at an odd distance so I am giving you another diagram to illustrate this - again, this diagram is not to scale.



Finally, before you fit the plate case assembly to the bottom panels, it is advisable to insert two blocks into the top of the centreboard slot (Plate 6) - any two pieces of spare wood will do as long as they are the correct width to hold the case to shape.



Plate 7

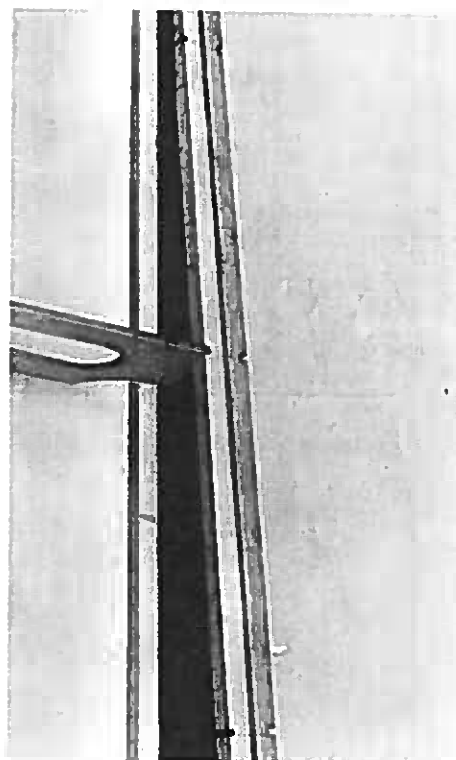


Plate 8

DRILLING OF LACE HOLES IN BOTTOM PANELS

Another short cut to make life easier is to pre-drill both the holes for the copper lacing and also the lead holes for the screws. Because the panels need to have matching holes it is quicker to put both panels together with edges corresponding exactly and then drill through both at the same time. With the panels in this position, scribe a line all round the top one, half an inch from the edge and running parallel to it.

Lace holes are drilled $2\frac{1}{2}$ " inches apart using a $\frac{3}{32}$ " bit the entire length of the chine i. e. the side opposite that with the centreboard slot. These lace holes continue around the forward end of the panels until a point is reached $4'3\frac{1}{2}"$ from the forward end of the centreboard slot - this is where the first of the screw holes is drilled. Plate 9 shows the lace holes followed by the positions of the screws marked as crosses.

When the position of the first screw hole is reached change to a $\frac{5}{32}$ " bit and continue drilling holes along the guide line, this time at 3 inch intervals. The pattern of holes around the centreboard slot is shown in Plate 10. The screw holes continue right up to the aft end of the panels and around the corner along the actual end for about 1 foot (these holes will be for the bottom edge of the transom Plate 5) - for the rest of the aft end drill lace holes as previously.

All the screw holes you have drilled should be slightly countersunk - but only slightly!



Plate 9

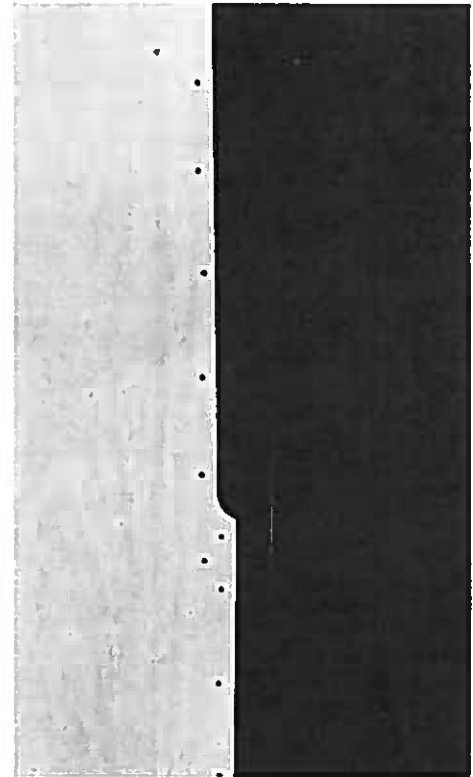


Plate 10

FIXING BOTTOM PANELS TO CENTREBOARD CASE WEB

With the centreboard assembly upside down and firmly screwed the bottom panels can be glued and screwed into position. The final result should be that the two bottom panels butt together, edge to edge, with the centreboard slot complete and matching that in the plate case assembly.

You will find that the aft end of the panels overlap the centre plate case web by $1 \frac{1}{8}$ " inches - this is to allow room for the transom bottom edge to be fixed (Plate 5).

The panels are glued and screwed to the web with $\frac{3}{4}$ inch "6" screws being fixed at 3 inch intervals set $\frac{1}{2}$ inch in from the edge of the ply. It is best to fix one panel first (using the ply of the web as the centre line guide) and then butt the other to it. Plate 10 shows how the line of screws alters at centreboard slot.

Before the second panel goes on, however, you should drill lace holes along the curved edge of forward part of the plate case web - these holes should match the positions of those in the first panel. You will observe that it is not possible to screw down the panels for their complete length - the section forward of the fore plate web battens is all connected with copper wire and brings the bow up to shape. This last little job you can do later with the rest of the lacing.

I must also mention that the aft end of the centre case assembly falls short of the panel ends - this is where the aft transom bottom edge will fit.

Now the spine of the boat is firmly fixed I think it is better to leave the bottom of the boat upside down because this way it will be easier to fit in the transom.

ASSEMBLY OF TRANSOM (22)

The bottom edge (24) of the transom is a crescent-shaped piece of wood in which there are two drainage holes - these match those in the transom itself. The bottom edge is glued and copper nailed to the transom flush with its lower edge and situated centrally.

Copper nail and glue top edge (23) flush with the upper edge of transom - the shapes coincide so there is no difficulty here. Finally fix the transom pad (29) in an upright position on a vertical line which is central to the transom - the upper end of the pad fits tight to the underside of the transom top edge but there is a gap of $3/16$ " at lower end to allow for the ply of the floor to slide in (Plate 5).

FIXING OF TRANSOM

Plate 5 gives you a right-way-up picture of the transom in position. You can see how the bottom edge butts up to the aft end of the centre plate web.

The aft face of the transom is, of course, flush with the aft end of the bottom panels.

As the whole thing is at present upside-down, it is a simple matter to screw ($5/8$ inch "6" screws) and glue it in place using the screw holes in the ply already drilled. The rest of the lower edge should be copper laced to the bottom panels but this can be left until the topsides are laced on.

The assembly should now be turned over and, from now until the very latter stages, it will stay this way up.

DRILLING LACE HOLES FOR FIXING SIDES

With each side in turn mark along the chine edge positions of lace holes matching those already in bottom panel. Your assistant will have to hold one end of the side while you match the two panels edge to edge. You can then drill the holes.

Remember also that the aft ends of the topsides have to be laced to the side of the transom so again you will have to drill out a series of corresponding holes on topside and transom - three will be enough because the upper end is screwed to the transom.

While you are drilling both topsides, your helper can be cutting the

coil of copper wire into lengths of approximately $2\frac{1}{2}$ inches - accuracy is not necessary here as long as the pieces are not too short. It will be helpful if each of these pieces is bent to form a U-shape.

PREPARATION FOR FIXING SIDES

The bow of the dinghy tends to be a bit floppy so I advise that you, temporarily, tie the two top corners nearly together using a piece of thin string through the top lace holes. Plate 11 will give you an idea of the way to do it - the "G" clamps in the picture are referred to in the next section.

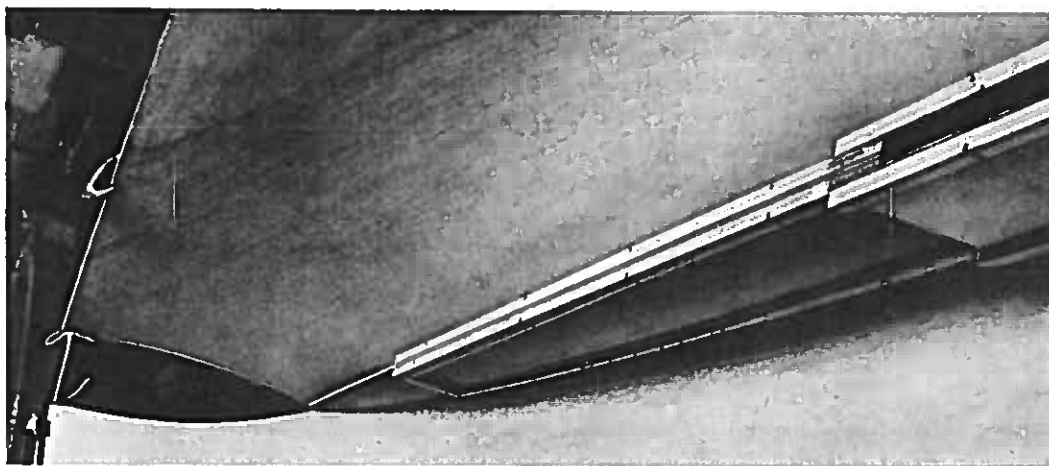


Plate 11.

FIXING TOP SIDES

Starting at the bow and working aft, lace each topside to its bottom panel. Slipping each copper staple through two matching holes on the inside, you finish off by twisting the ends together on the outside of the hull - to do this tightly you will need the blunt-nosed pliers.

The curved forward section of the side should fit edge to edge with the corresponding shape of the bottom panel. The gunwale already on the topside should lie along the straight top edge of the bottom panel. It will facilitate your work if the forward end of the gunwale can be clamped to the side of the bow. The butt strap on each side sits on top of the bottom panel edge.

When you reach the aft end of the top side it is laced to the transom through the holes already drilled and the upper portion is glued and screwed ($1\frac{1}{2}$ " - 8) to the side of the transom top edge - one screw through the gunwale and another about $1\frac{1}{2}$ inches below it will do the trick.

The principle thing to remember is that the join between panels must be a good one and not with one panel overhanging the other. The main advantage to the copper lacing method is that this can be achieved in the simplest manner possible.

Having fixed one topside repeat the performance with the other.

LACING UNDERSIDE OF BOW

Plate 4 shows how the underside of the bow is laced together and to the forward portion of the plate case web. The pieces of copper wire need to be a little longer than before and each link passes through both the bottom panels AND the web, to be twisted tightly on the outside.

Before lacing together the actual sides of the bow itself it will simplify the job if you slightly bevel the inside edges so that the two sheets of ply join comfortably. Also you will need to glue and copper nail the remaining length of gunwale to the top edge of the bow. The gunwale ends can be trimmed off square to the bow.

PLACING THE SPREADERS

These long pieces of wood have a cut-out shape at each end which clips over the gunwale at each side of the boat. They serve to tension the sides of the boat to the correct shape.

The positions of the spreaders are as follows:- "A" 3 feet from aft transom, "B" 6 feet from aft transom, "C" 9 feet from aft transom - in other words, they are at intervals of 3 feet.

It might help you later on if you place some weight in the centre of each bottom panel because eventually the underside of the boat will curve outwards - this is not absolutely necessary but it aids the process of fitting the floor webs. Also a pair of vertical struts (any rough piece of wood can be used) screwed to the topside and resting on the floor as centre props which can be adjusted at the foot to prevent a twist developing in the dinghy.

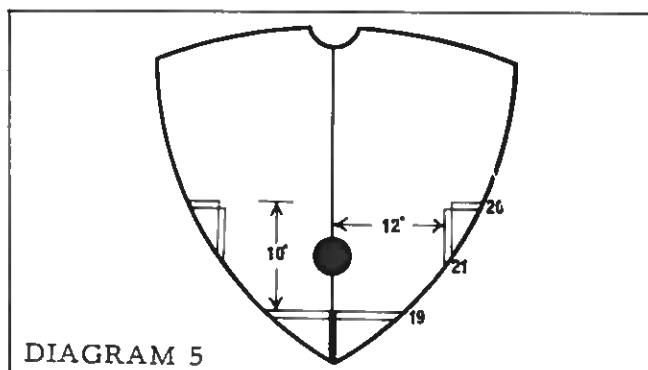
The skin of your boat is virtually complete and the most difficult part of the construction is over. From now onwards it is merely a matter of fitting pieces inside the hull you have created.

GENERAL NOTES ON SHAPING THE BOAT

The next section of construction deals with the fitting of the bulkheads and floor webs all of which go in under tension and press the skin out to shape. This is accomplished more easily by fitting all these pieces before the resin sealing the seams has really had time to bond off completely. This will take several hours but to avoid undue haste on your part I have planned a sequence to achieve a successful job without too much trouble.

It will first be necessary to sub-assemble the bulkhead and floor webs so we will start with this.

ASSEMBLY OF BULKHEAD (16)



The bulkhead is shield shaped and, at its lower point, has a vertical slot - a horizontal line should be drawn across the bulkhead level with and at right angles to the top of the slot. This is the setting line for the upper edge of the floor battens (19)

From this line measure up a further 10 inches and draw another line parallel to it. Now draw a vertical centre line starting from the top centre of the slot. From where this centre line crosses the upper horizontal line measure out to either side a distance of 1 foot and draw a short vertical line running down from the horizontal. From Plate 12 you will see that you now have the setting lines for the seat top battens (20) and the seat front battens (21). With glue and copper nails, fix all these pieces as in the illustration.

On the other side of the bulkhead fit the top edge flush with the upper edge of ply and notches coinciding. Also fit on this side the bulkhead hatch frame (18) - Plate 13 shows both these pieces in position.

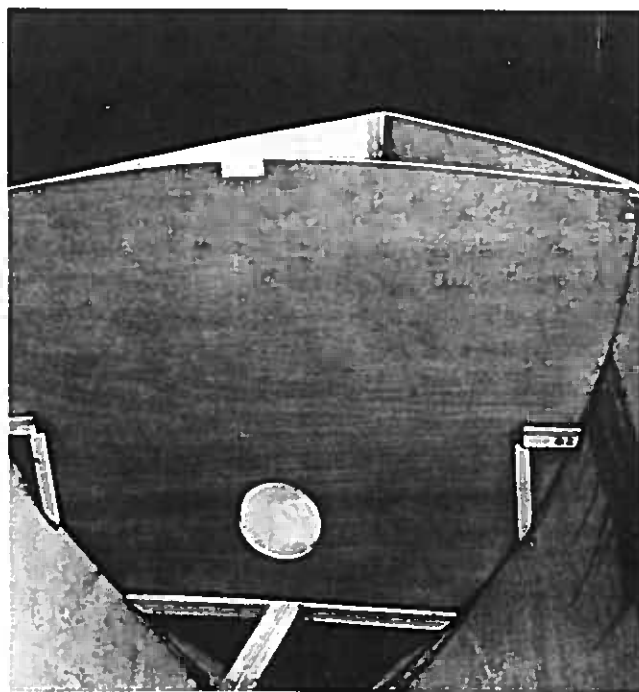


Plate 12



Plate 13

ASSEMBLING FLOOR WEBS

Plate 7 shows all the floor webs in position - it can be seen that each web has a batten along the aft face of its top edge with the exception of one web which has battens on both sides. The flooring will be fastened to these battens and because it is laid in two separate halves, the web where these meet is double sided in order to take the join.

Apart from web 36 which has a batten (36A) on either side of its top edge, all the rest of the floor webs (30, 31, 32, 33, 34, 35, 37, 38, 39, 40 and 41) can be fitted with their single battens (30A, 31A, 32A, 33A, 34A, 35A, 37A, 38A, 39A, 40A and 41A respectively). Each batten must be fitted to leave a $\frac{1}{4}$ inch gap at the wider end - this is the part which clips into the plate-case slots.

One other piece of preparation is that you can drill a copper-lacing hole in the lower corner at the narrow end of each web. Web No. 30 does not need a hole because it is fastened as shown in Plate 14; also shown is web 31 laced, like all the rest, through the holes you are now drilling.

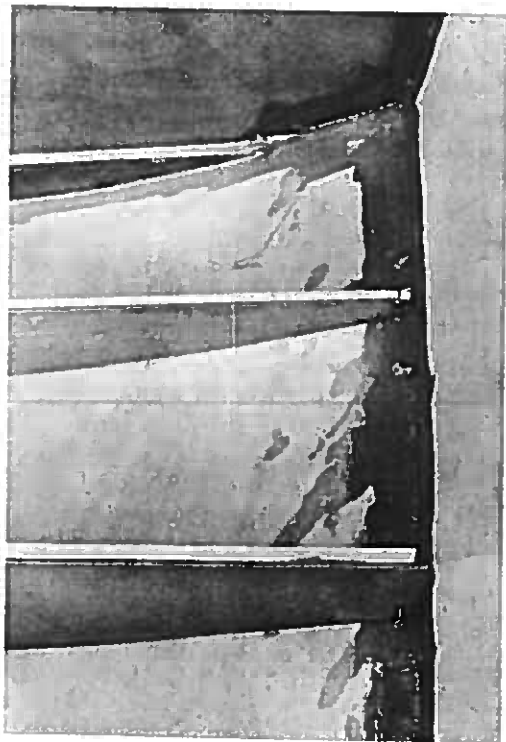


Plate 14

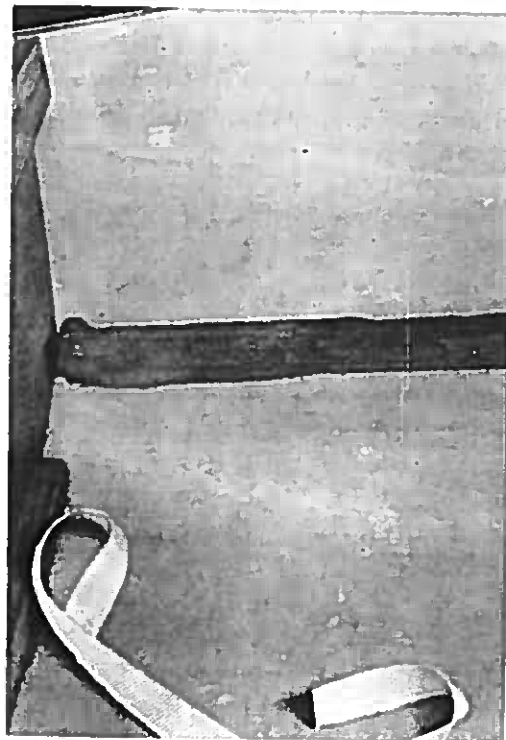


Plate 15

APPLICATION OF GLASS FIBRE RIBBON & RESIN

The inside of each seam, where plywood meets plywood only, has to be bonded with glass-fibre tape and resin. First of all cut off two strips of tape sufficient to cover the seams between the topsides and bottom panels with about $\frac{1}{2}$ inch overlap at each end. A better seal is made if the copper loops are flattened into the corner with something like the butt end of a hammer before the initial application of resin is done.

The method of applying is to paint resin along the seam first, lay the ribbon on top and then brush resin down through the weave of the tape so that it becomes impregnated.

So, after cutting your tape, mix the resin carefully according to instructions and proceed with this job. Plate 15 shows the tape as it looks before and after this process.

Here is where we use a short cut. Get your assistant to do the resinning and instruct him to do the seams at the bow on both sides of the boat first. This will mean that, after he has passed the point at which the forward bulkhead is fixed, you can actually fit the bulkhead into place while the resin is still wet. He then continues down the length of the hull carefully laying the resin and glass-fibre so that it is tight to the seams with no air bubbles.

Do not tape along the centre board assembly where it meets the bottom panels - part of this will be resinned but not until after the bulkhead is fitted.

Although, at this stage, a few runs of resin down the ply surfaces is somewhat immaterial, it would be as well to insist that these be avoided where possible because when you come to resin the portions of the boat which will be visible when the structure is complete it is imperative that the finish is not marred by ugly trickles of the compound.

FITTING THE BULKHEAD

Plate 12 shows how the slot at the bottom of the bulkhead clips down over the forward end of the plate case web butting tight up against the upright battens (10). The bulkhead floor battens line up with the top of the web casing and face aft. You must ensure that the whole assembly is vertical or everything else will be thrown out of position. A set square placed on the centre case web will show any discrepancies immediately. Once you have decided the correct placing for the bulkhead mark the gunwale to indicate the line of its location.

As your principle assistant is busy, I suggest you co-opt someone else to push down on the bulkhead in its correct position while you first hammer in a couple of copper nails from the forward side into the upright battens of the centre case web - these will act as retainers. Then put a long screw ($1\frac{3}{4}$ " x 8) through the gunwale at each side so that it comes through into the side of the bulkhead top edge. These screws are temporary and will be removed later. Ensure that the line of the bulkhead top comes down correctly to the gunwales.

By the way, a bit of glue at the joint between the bulkhead and plate case web might be advisable but don't worry if you forget it.

From a point roughly halfway along the centre board slot to the forward bulkhead, you should tape and resin the bottom edges of the centre board assembly to the hull. This taping is on both sides of the assembly.

FIXING FLOOR WEBS

By this time your resinning should be complete so start fixing in the floor webs. Each pair must be put in at right angles to the plate case web and clipped in the slot at its inner corner. The part numbers are in order going forward.

HERE ARE TWO MOST IMPORTANT POINTS! First you must start at the aft end of the boat with webs 30 and proceed pair by pair until you reach the bulkhead.

Second, each web must be pressed down tightly to the hull in order to force the underside of the skin to shape - the top edges of the webs should lie on the same flat plane as the centre case web and each web should be upright with its top edge facing aft (except, of course, web 36).

To hold them in position lace them at their outer ends to the hull as previously described (Plate 14).

This job is nowhere as difficult as it sounds because all the pieces are shaped for you but it is vital that care is taken in their fitting because the ultimate form of your boat depends on it.

By the way, if necessary, you will have to temporarily remove a spreader so that you can reach your work but don't forget to replace it!

FITTING THE STEM POST (27)

The first step is to finish glass-fibring the rest of the inner seams i. e. around the corners of the aft transom and the bow.

In the case of this latter you have to resin and tape the forward face of the bulkhead where it meets the hull.

Then cut two pieces of tape long enough to run from the bulkhead, along the bottom of the boat where it meets the forward end of the plate case assembly (the piece of shaped ply which you have laced right through to the hull) and then up the inside of the bow to the top. This means that when these tapes are resinned in place there will be a double thickness right down the inside of the bow. While the resin is still wet, screw ($\frac{3}{4}$ inch "6") into place the stem post - this can only fit in one way and the top of it should, of course, be level with the gunwales. (Plate 16). You will need three screws either side but stagger them slightly so that they do not impinge on one another. Plate 17 shows the positions of these screws on one side of the bow and also those for the stem trailer block (28) which we will deal with in the next paragraph.

Meanwhile the stem post should also be resinned into place with tape down either side for its full length.

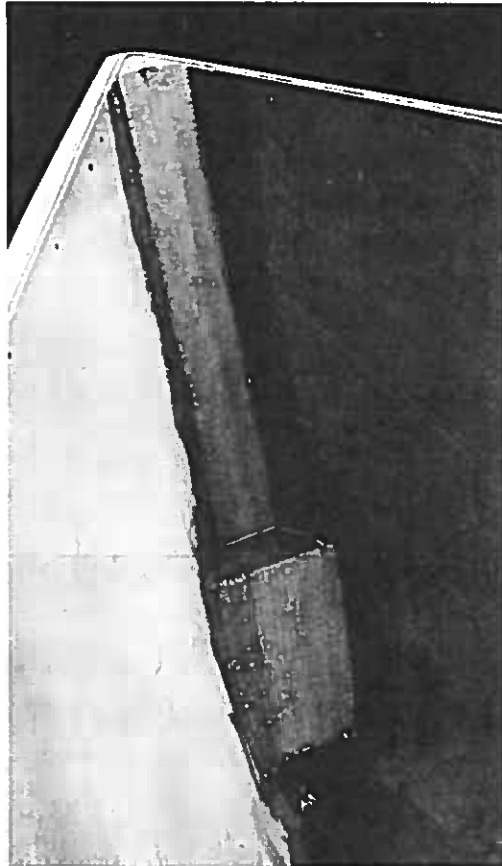


Plate 16

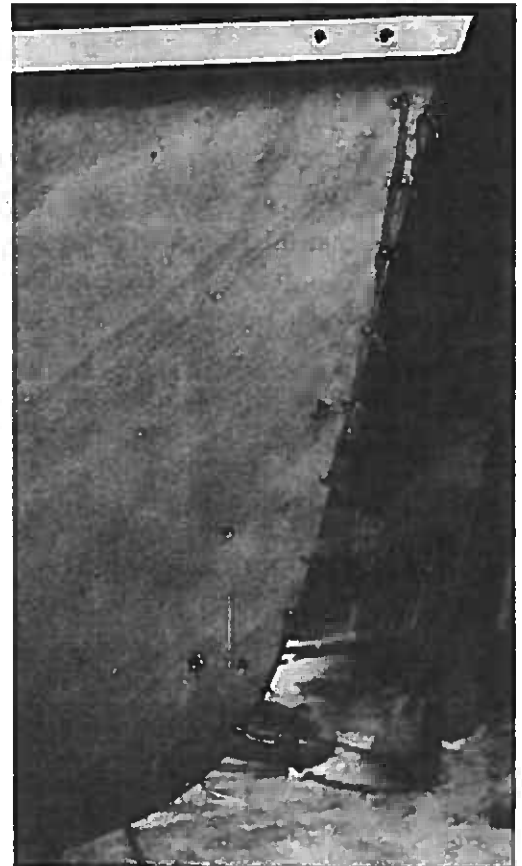


Plate 17

FIXING STEM TRAILER BLOCK (28)

This, again, will only fit in one way round but the top surface of the block should be 14 inches from the top of the stem post. Screw it into place while the resin on the stem is still tacky - the pattern of screws ($\frac{3}{4}$ inch "6") either side is indicated in Plate 17. In a similar manner to the stem post fixing tape and resin are applied to bond the block to the hull.

RESINNING FLOOR WEBS

Strips of glass fibre tape and resin should now be applied to the edges of each floor web where it meets the hull and centre plate assembly (Plate 18). This needs to be done only on the forward face and NOT on the aft face of each web.

There are small cutaway sections at the inside lower corner of each web which will allow any water to drain right through the boat - these must, on no account, be blocked with glass fibre and resin.

When you have finished all your taping don't throw away any left-over resin - brush it along the full length of the centre case assembly where it meets the bottom panels. This will ensure that it is completely watertight because, if there are slight gaps due to bad gluing, the resin will fill them.

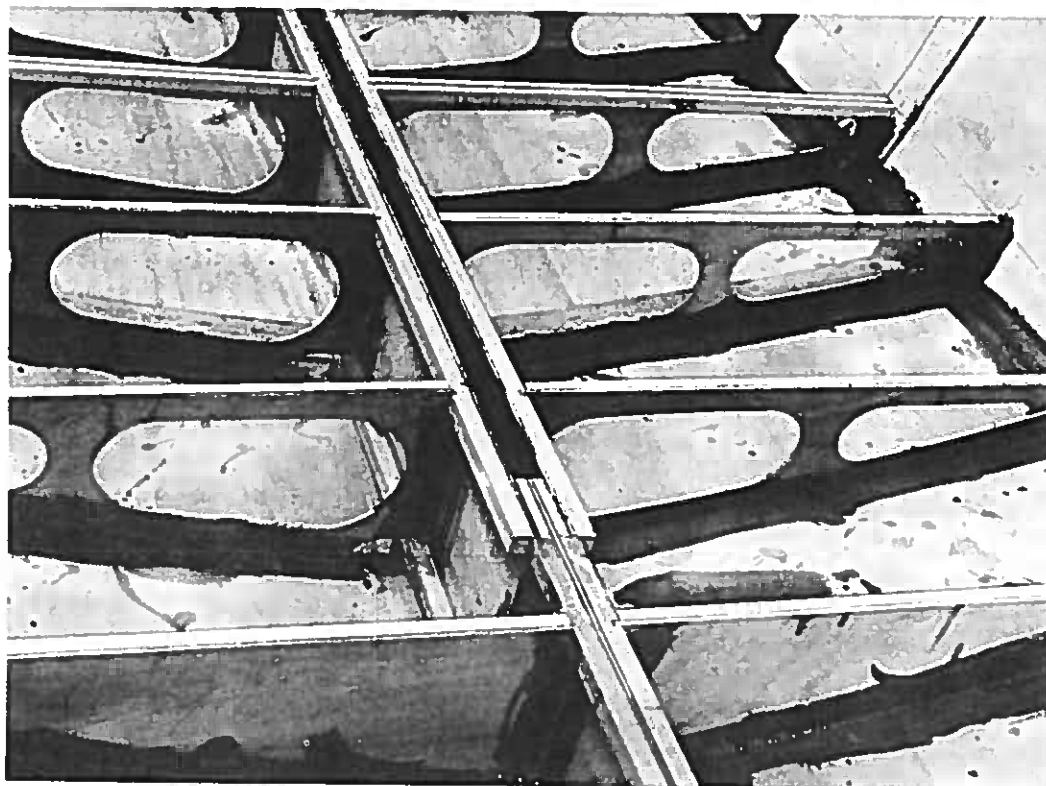


Plate 18

PREPARATIONS FOR FIXING FLOOR PANELS

Along the inside of the hull above each end of the floor webs make a rough mark with a pencil to indicate the position of the webs so that you can locate them when they are covered by the decks.

Now lay the two aft portions of the floor in position to make sure that they fit - the centre aft corner of each slips under the transom pad. (Plate 19). Using the pencil lines on the hull as a guide, mark each piece of flooring to give you some guidance when you come to apply hardener on the panels to match the upper surfaces of the floor webs. Now clean out all the sawdust and woodshavings from your boat.

There are one or two important jobs to do before you can fix the floor in position. One is that you have to fix strengthening pads (43A) to the undersides of the floor ventilation hatches. Plate 20 shows the floor in position with the two pads on top and the cutaway corners adjacent to the centreboard slot. The picture was taken like this to demonstrate the correct relative position of the pads to the slot BUT, as I have said previously the pads go UNDER the floor. You, therefore, have to glue these in place before the flooring goes down - a pin at each corner, from the floor side and clenched over where it protrudes from the pad, is sufficient to hold this piece while the glue hardens.

Because the lower part of your boat will be a sealed compartment, it has to be waterproofed to prevent rot being caused by damp. This is

done with a special paint made for use in the bilges of a boat. There are several types on the market but the one recommended is DANBOLIN by International Paints, with initially a first coat of metallic pink primer.

When the primer is dry put a good coat of Danbolin onto all surfaces which are to be enclosed but NOT on any surface which is subsequently to be glued e. g. the top surfaces of the floor webs and centre case assembly. Also remember that the two aft corners on the inside of the hull are not covered by flooring and therefore not painted (Plate 21).

Don't forget to paint the underside of the floor but NOT along the lines to which glue will adhere i. e. the guide lines for the floor webs.

The last job to complete is the installation of the nylon drain hole sockets in the floor web which is next to the floor ventilation hatches. This floor web (No. 39) is the only one with a solid surface but with two small drainholes at the well of the boat - it is into the aft side of these holes you will have to fix the sockets using Aerolite glue to seal.

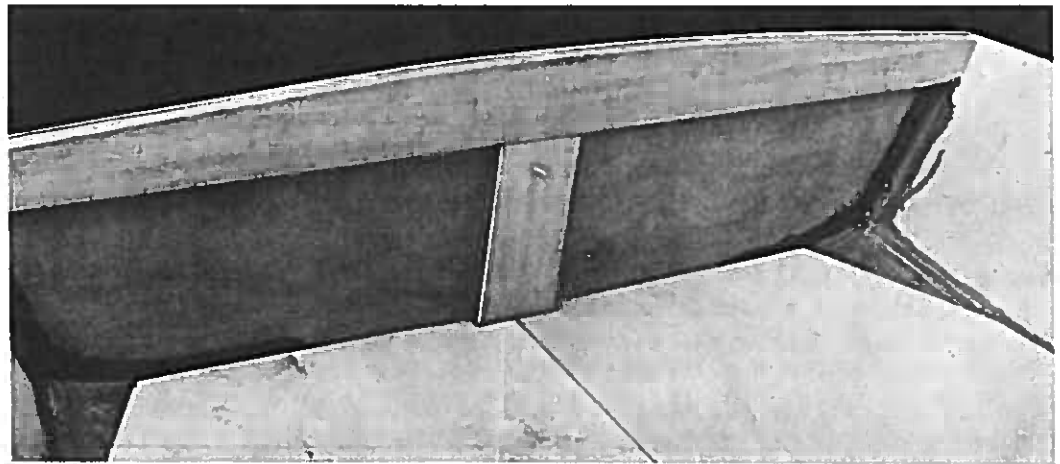


Plate 19

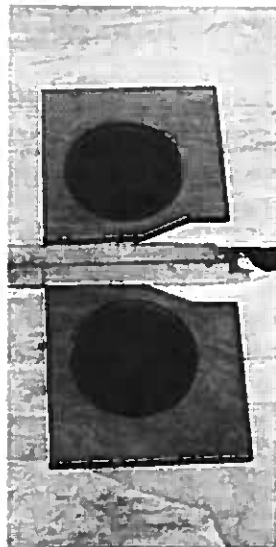


Plate 20

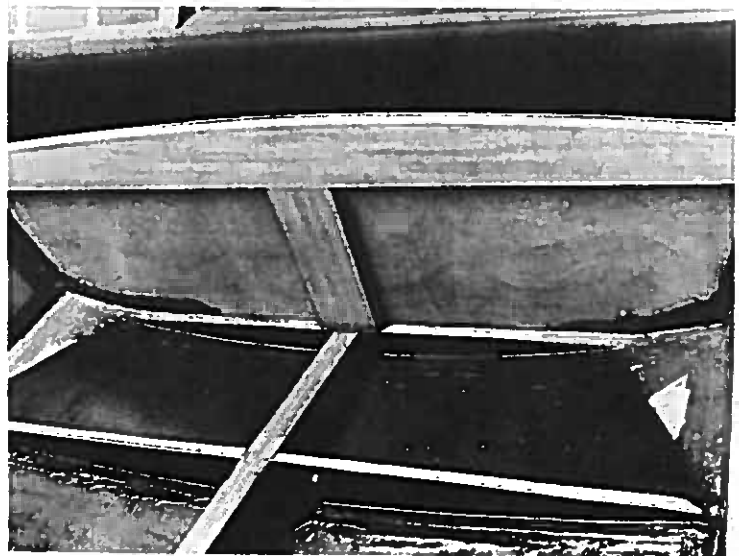


Plate 21

FIXING THE FLOOR

Each section of floor, starting with the two at the aft, has hardening solution applied to all the relevant parts and is then pinned to the centre board assembly and floor webs which have previously had glue applied. The joint along the centre of the boat should be as exact as you can make it - the outer edges of the floor will be covered eventually so there is less need for accuracy there.

When the two aft panels are on, repeat the process with the two forward sections. The front ends are, of course, pinned and glued to the battens on the bulkhead.

Plate 22 shows roughly what the boat looks like with flooring in position.

The final stage of this operation is to tape and resin all the outer edges of the floor to the boat. Do not apply tape to the centre seams of the flooring but a neat application of resin alone across the seam where the forward floor sections meet the aft is permissible because this will ultimately be covered by a batten.

If you have some resin left over it will be needed for the next job.

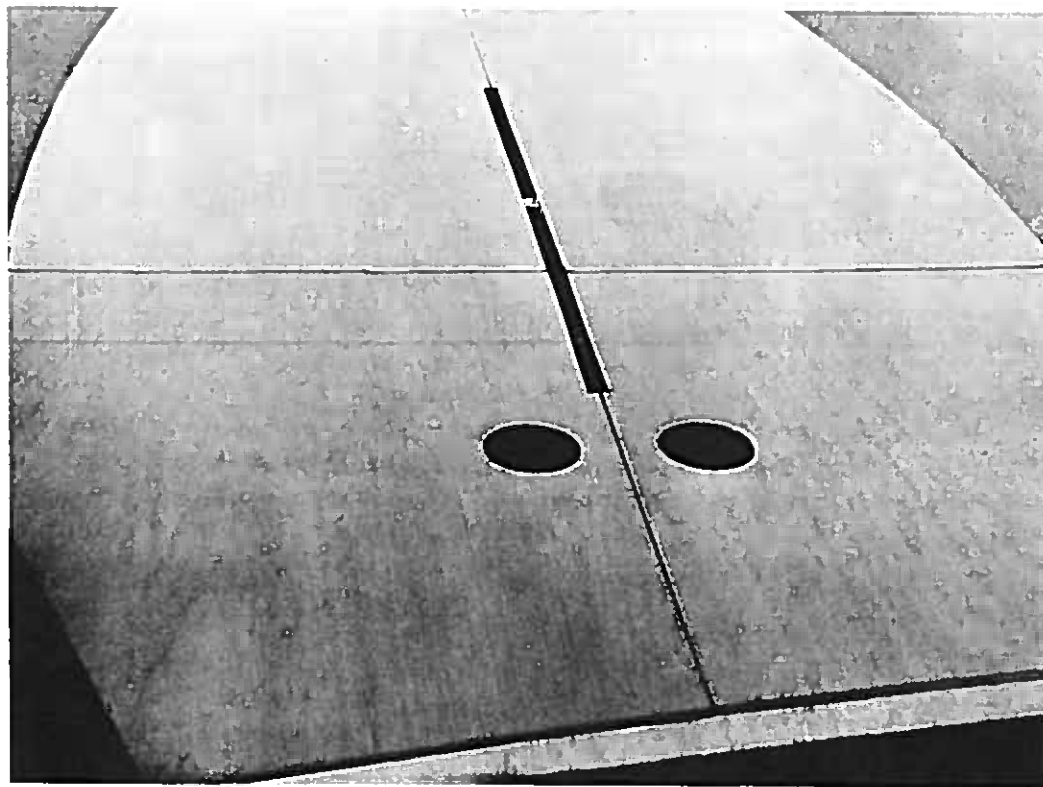


Plate 22

FITTING OF VENTILATION HATCHES

It is a good idea to fit these black screw type hatches now because they prevent any sawdust and shavings dropping under the flooring and messing up the under-floor compartment.

The installation is almost self-evident - the outer ring is screwed down to encircle the ventilation hole but first it is necessary to seal the plywood, particularly the end-grain, to prevent absorption of water. With the resin left over from taping the floor, go over the edges of the apertures and the surface which will lie beneath the black outer ring of the hatch. It is best if the resin is beginning to solidify when you do this because then the outer ring will screw down tight to a firmer seal. Use $\frac{1}{2}$ inch "4" screws (roundheaded) as fastenings.

The actual hatch cover merely screws into place. Plate 23 shows a view of the fitting.

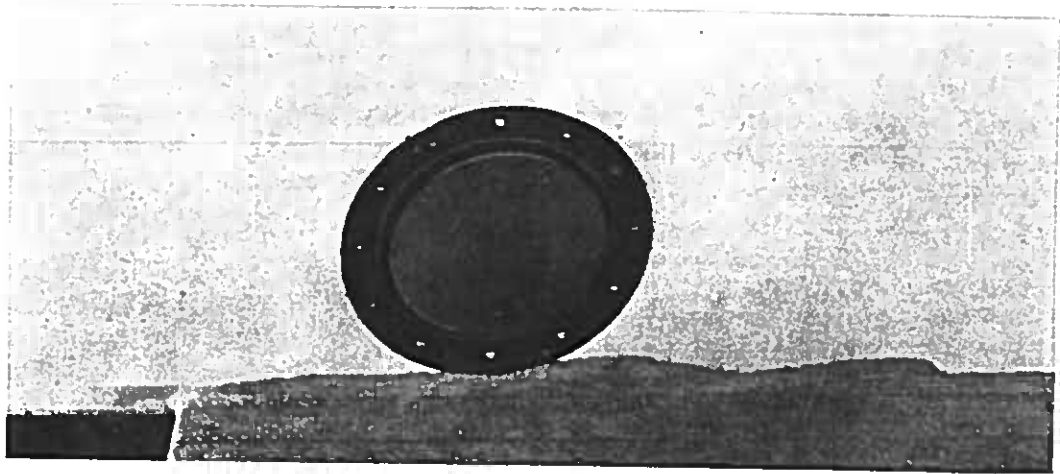


Plate 23

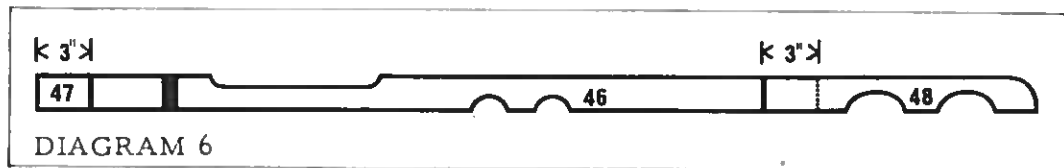
TWO IMPORTANT NOTES

1. From about this time onwards several of the illustrations show the dinghy with no spreaders in place. These have been removed deliberately in order to produce a clear uncluttered illustration BUT the spreaders in your boat should be there all the time. Also the two upright props screwed to the gunwales at one end and resting on the floor at the other should be checked periodically to ensure your dinghy is without a twist.
2. Once your resin has set off around the flooring, and assuming that your dinghy is on a firm base, you will be able to climb into the boat, if you wish, to carry out certain processes. Two in particular, when we come to them, will be the fitting of the floor boards and also the upper sections of the centreboard case.

ASSEMBLY OF CENTREBOARD CASE

This is put together in a similar manner to that of the centre case assembly which is now beneath the floor.

The two sides of the plate case top (46) sandwich the foot rest (48) at the aft end and the forward packing at the forward end. The diagram shows one side screwed and glued to the foot rest and forward packing with the appropriate measurements - the packing you will notice fits flush with the ends of the sides.



The inside of the slot is painted and the other side of the plate case is glued and screwed in place to complete the assembly.

Plate 24 also pictures the whole assembly.

One small point - use $1\frac{1}{4}$ " "8" screws and place them in the corners of each section - two diagonally opposite from one side and the other two from the reverse side and opposite corners.

The whole lower edge of the assembly must fit perfectly flat to the floor so ensure that this edge is absolutely right.

N. B. The centre plate case forms a slot slightly narrower than that in the boat.

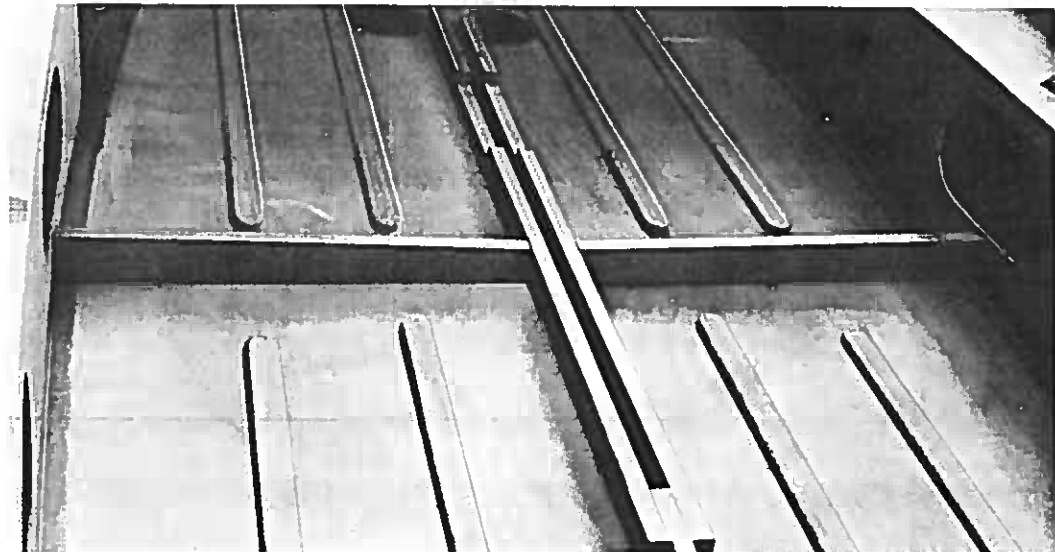


Plate 24

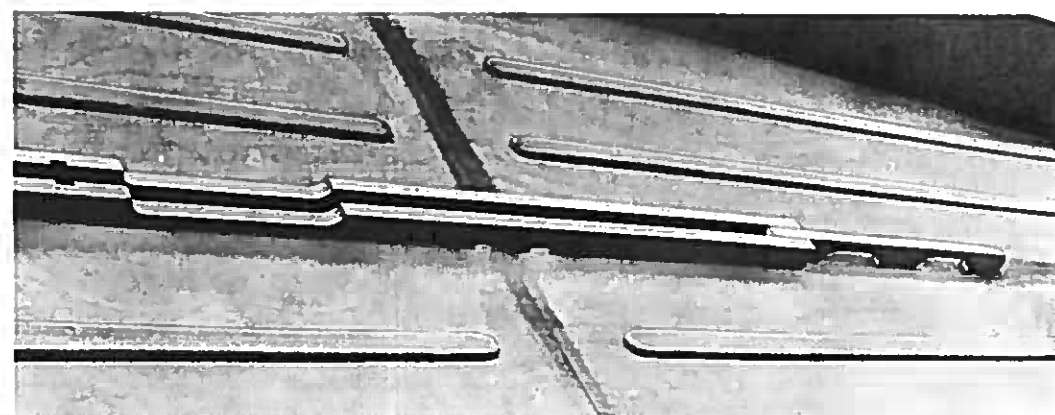


Plate 25

FIXING CENTRE PLATE CASE

Fair out the slot in the flooring to match the case assembly slot beneath it. Screw and glue the plate case assembly down to its partner under the floor matching up the two slots and with the foot rest aft. (Plate 25). Because of the depth use $2\frac{1}{2}$ inch "10" screws down through the plate case from the top. Make sure that the countersunk lead holes are straight and centrally situated. Space screws at about 4 inch intervals.

GUIDE LINES FOR SIDE TANKS

It is always extremely difficult to give measurements for irregularly curving lines which are inconstant to a curved surface. The guide lines to fit in the side tanks are exactly this.

The stringer guide line around the inside of the hull has to be on a level plane 10 inches above and parallel with the floor of the dinghy. This sounds impossible to achieve but you can make the gadget shown in Plate 26 and mark the line out accurately in half a minute. Using any old off cuts of timber, nail on to the horizontal bar (4'6" in length approx.) two pieces of wood exactly 10 inches long and at right angles to the horizontal - set each in about 1 foot from each end of the bar. (See diagram).

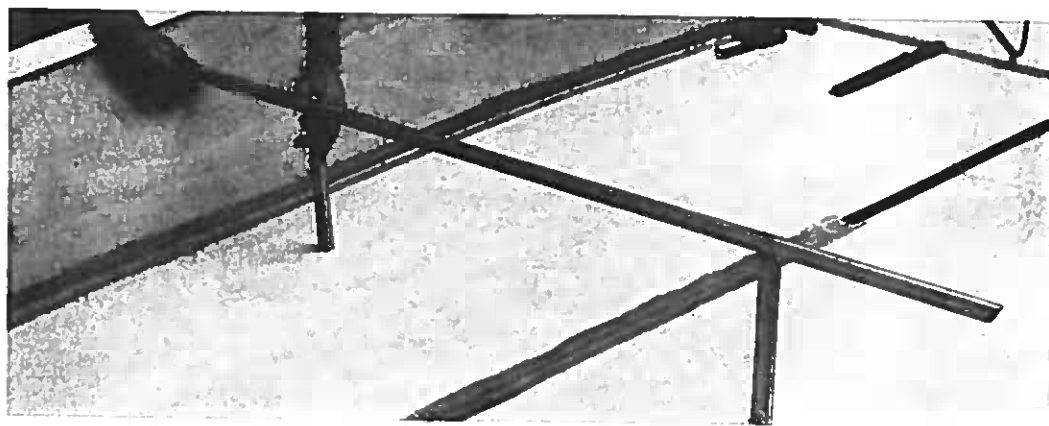
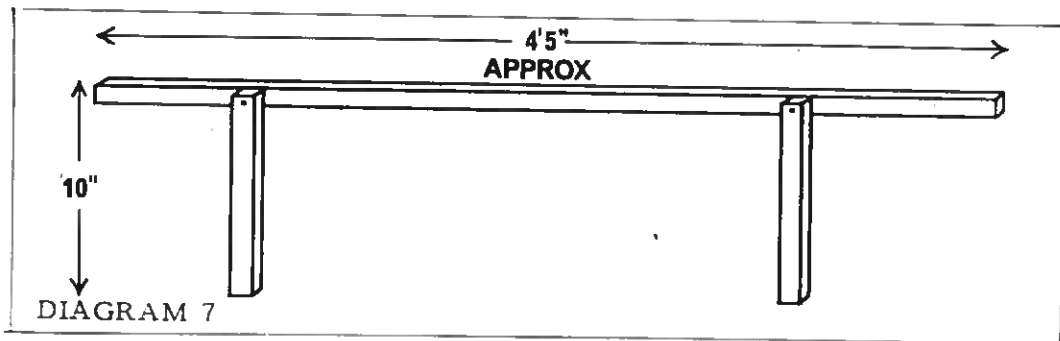


Plate 26

Now, keeping the thing upright with the two legs touching the floor, as in the picture, you can with a pencil, at one end of the horizontal and level with it, go around the inside of the hull inscribing a line. This line will exactly fulfil the requirements and will represent the top edge of the stringers.

The side tanks are merely a number of boxes in a row. It is a modern civil engineering technique, to achieve lightness and strength at the same time, to build a succession of small box sections doing away with girders altogether. Already you have constructed 27 boxes to bring your dinghy to its present state and now you will be adding a few more either side to give added rigidity. I have dealt with this in detail to give a simple general picture of what is required. As you know, a wooden box has to have battens on which to fasten the sides and ends etc.

To get the top batten (25) at the aft end in, first, measure in along the transom, on a level with the stringer guide line, a distance of $9\frac{1}{2}$ inches. It is along this line that the transom seat top batten is fixed BUT the piece will be a little longer than necessary allowing you to shape its ends slightly to fit the curve of the hull and the slope of the side tank side. Glue and nail this along its setting line with its outer end flush to the hull and the square notch uppermost (Plate 27.)

The stringer (50) represents another of these battens and must be fixed along the guide line. $\frac{3}{8}$ ths of an inch beneath this line drill out a series of lead holes using a $\frac{3}{32}$ " bit - this makes it easier to locate the position of the stringer from the outside.

The stringer can now be copper-nailed and glued along its line with the BEVELLED face uppermost - this ensures that there is a flat setting for the side tank top. The aft end is tight up to the transom seat top batten and, of course, on the same level. Carefully curve the stringer around the inside of the hull fixing as you go. Trim away the portion which goes over the hull butt strap. The copper nails should be at roughly 3 inch intervals.

When you are about halfway round you will be able to judge the exact length which will fit flush to the forward bulkhead. Trim off to this point and conclude fixing. Repeat operation on other side of boat. Plates 28 and 29 show various aspects of this operation and I have purposely included later stages in these pictures which permits you to relate one section with another.



Plate 27

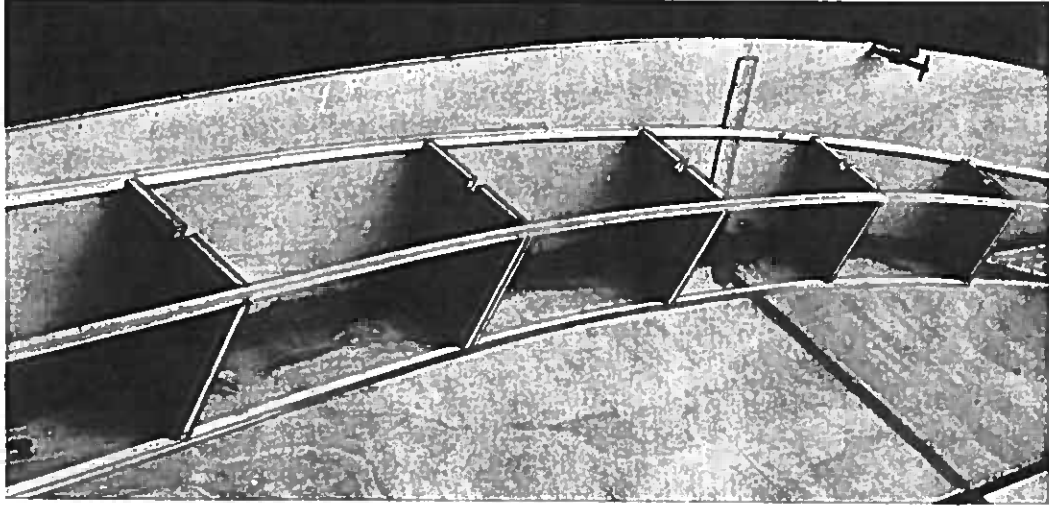


Plate 28

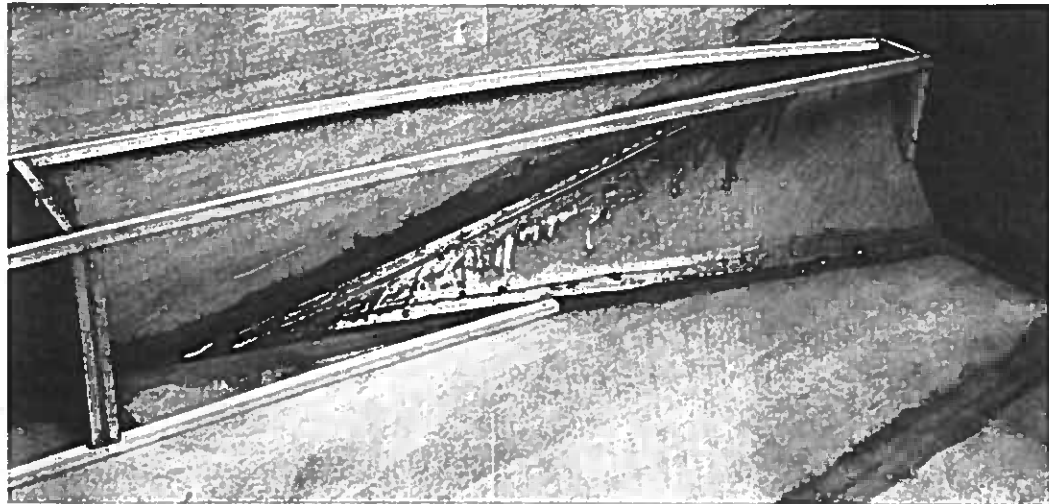


Plate 29

SETTING LINE FOR SIDE TANK FILLET (49)

The fillet is the batten which runs along the floor and to which the lower edge of the side tank side is pinned and glued.

You will see from Plate 28 that the bottom corners of the side tank webs meet this fillet. You will also perceive that (Plate 29) the forward end of the fillet finishes short of the bulkhead.

The simplest method of ascertaining the fillet setting line is to place each side tank web in place and mark where its lower corner meets the deck. Joining these marks gives the guide line, all but the forward section.

The side tank webs (56, 57, 58, 59 & 60) are fitted along the stringers in that order starting at the aft end. They are spaced out at 2 feet intervals so mark these spots along the stringer and lay each web down by its respective setting mark - this way you can tackle them systematically and not get them mixed up.

Each web must be held upright, when marking the fillet guideline, and at right angles to its respective portion of the hull. Because of the curve of the sides, this means that the webs will not be parallel to each other. Plate 30 illustrates this better than words so you had better study that. At this stage, by the way, the webs are just sheets of ply - the fixing of their battens will come later.

Having checked that your fillet setting line is accurate, you may now glue and copper nail the fillet down to the floor remembering that the lower notch of the seat web will have to clip over it (some of the nails should go down into the floor webs). Your assistant can check this at each stage with the web to make sure of no error.

Although Plate 29 shows the forward end of the fillet fixed down, it is just to give you an idea of how it will subsequently be. For the present, leave this loose because it is simpler and more accurate for you to fix this when you put the side tank sides on.

The last part of the outer framework of the side tanks is the transom seat front batten (26) which is fixed vertically on the inside of the transom with its lower end on the end of the floor fillet (Plate 27) and its top end underneath the transom top edge.

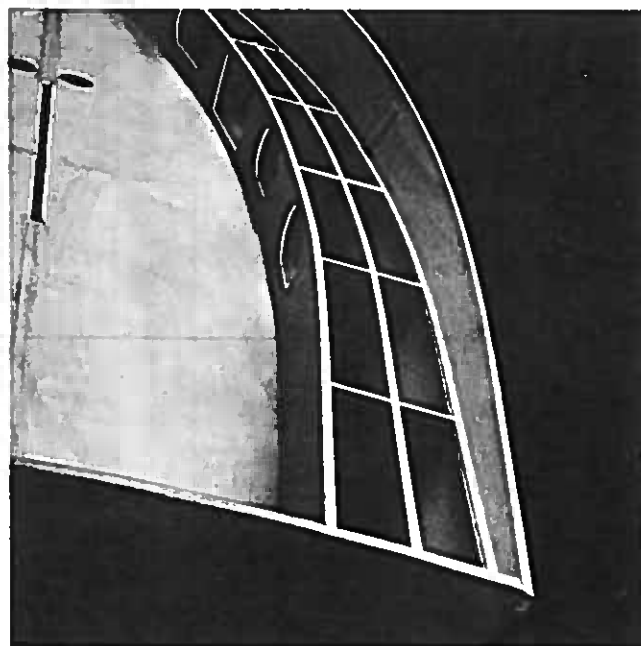


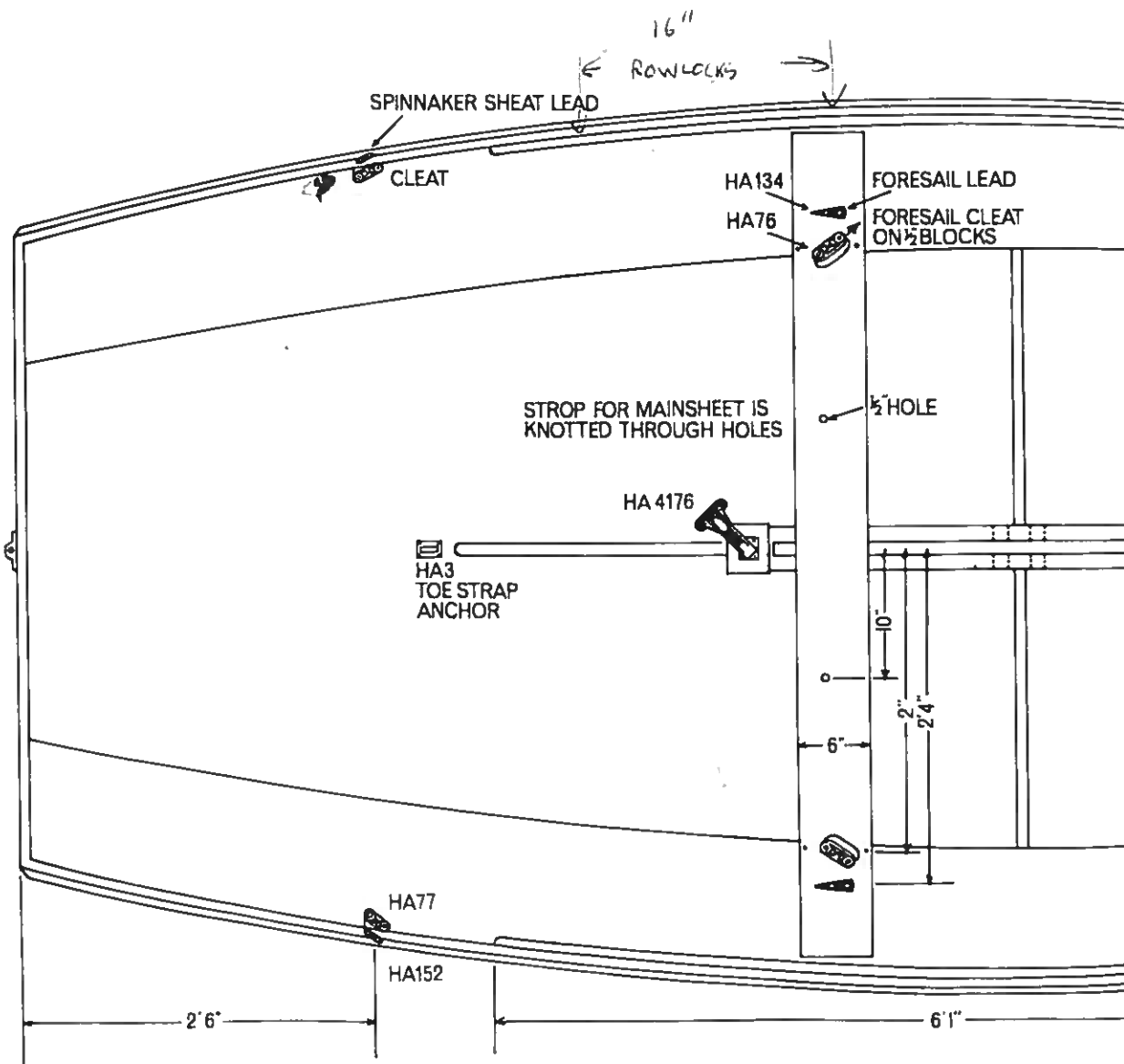
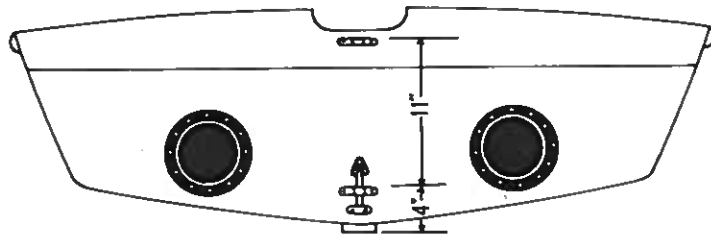
Plate 30

ASSEMBLING THE SEAT WEBS

Plate 28 shows clearly that each seat web has its front and top edge fitted with battens - these are to provide surfaces on to which the side tank tops (53 & 54) and side tank sides (52A, B, C) can be pinned and glued. Where any two of these panels join at a web, there has to be a batten on both sides to take the ends of the panels.

The webs which have single battens have these on the aft side only.

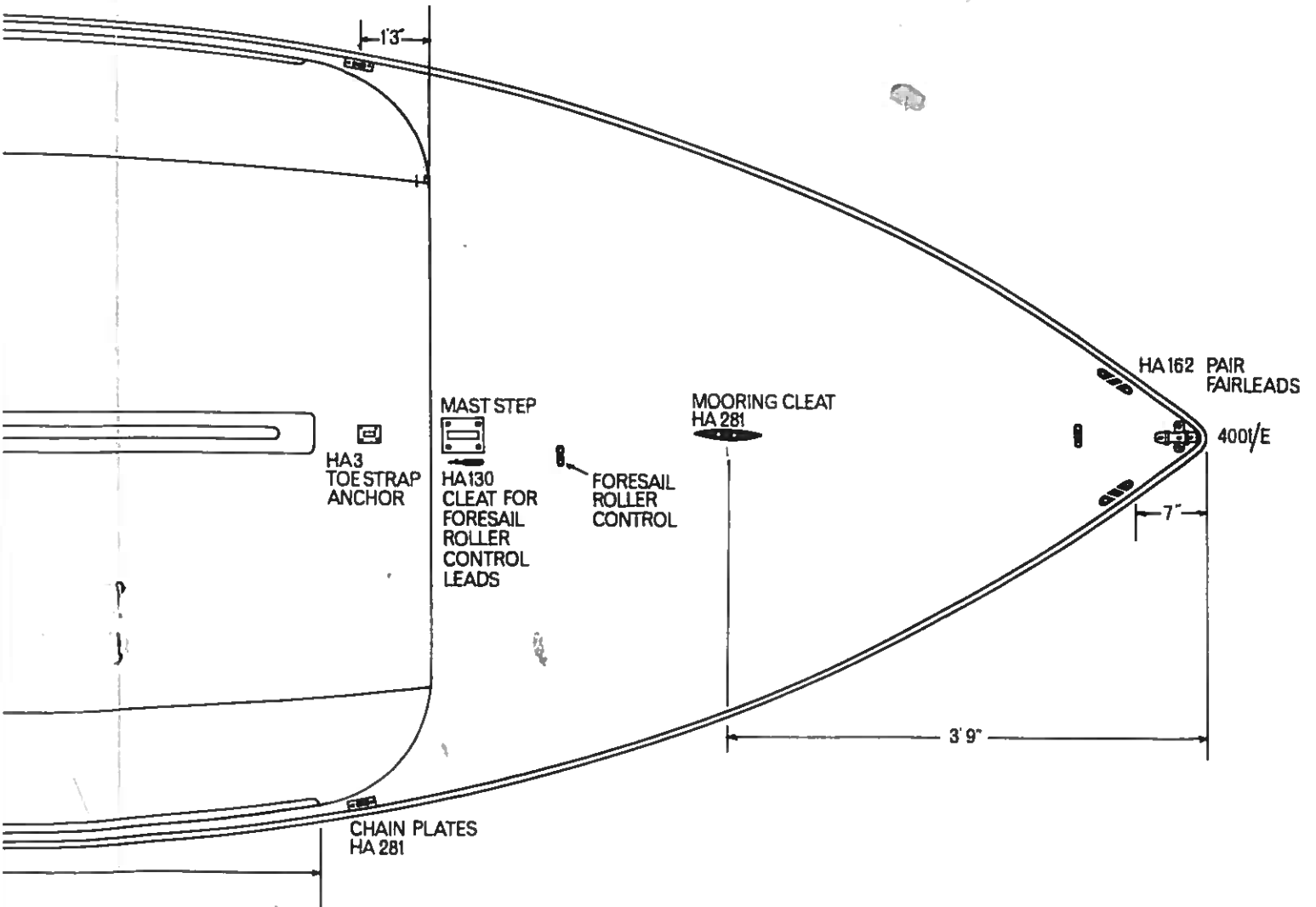
DIAGRAM OF FITTINGS



CONVERSION TABLE: FEET AND INCHES TO METRIC

inches	mm.	inches	mm.	inches	mm.	feet	mm.	feet	mm.
1/4	3	3/4	22	6	152	1	305	7	2134
1/4	6	1	25	7	178	2	609	8	2439
3/8	9	2	51	8	203	3	914	9	2744
1/2	12	3	76	9	229	4	1219	10	3048
5/8	16	4	102	10	254	5	1524	11	3353
3/4	19	5	127	11	279	6	1829	12	3658

MAY HEIGHT OF GOOSENECK
32" ABOVE DECK



You will understand now why I told you to lay the webs in the boat in their respective positions - taking each one in turn copper nail the battens (numbered the same as the webs with an "A" added i. e. 56A are the battens for 56).

Incidentally, the top batten goes on in one piece flush with the web's top edge and afterwards the section over the square notch is cut away - this is quicker than fiddling about with very short lengths of batten.

With a reminder that web 56 is the aft one and the rest work up the boat in order, this is how the battens are allocated to each web:-

<u>56</u>	<u>57</u>	<u>58</u>	<u>59</u>
(1 top, 1 front)	(1 top, 2 front)	(2 top, 1 front)	(1 top, 1 front)
<u>60</u>			
(1 top, 2 front)			

FITTING SEAT WEBS

These are merely taped and resinned into place. One corner notch clips under the stringer, the lower corner notch over the floor fillet and a pin at each of these places to hold the web in position while you tape it. The web is taped along the two edges which meet the floor and the hull, on the forward side only. Do make certain that the webs are correctly sited before you tape them - if you are in any doubt, a quick mock up with the side tank sides will settle the problem. Also your set square will show you whether the upright edge of the web is at right angles to the deck.

FITTING SIDE TANK TOP BATTEN (51)

Each batten runs from the inner end of the transom seat top batten to the corner of the short battens on the forward bulkhead, passing through the exposed corner notches of the seat webs and completing the framework of the tanks (Plate 28). It must NOT be fixed until the resin on the seat webs is set off hard otherwise they will be pulled out of position.

You might have to trim a little of the forward end to make the batten fit neatly.

Assuming your resin has set, start from the aft and glue and copper nail the batten in place.

FITTING THE SIDE TANK TOP STRINGERS (55)

These again run from the aft transom but they finish just beyond the forward seat web (60) - each stringer clips down into the centre notches of the webs and also that in the transom seat top batten (Plate 30). Copper nails and glue complete the operation.

FITTING SIDE TANK FRONTS

Now the side tank fronts can go on. Each of these is in three sections. The aft 52A is a plain piece of ply, the centre 52B has three shaped holes and the fore (52C) has one hole. The two panels with cut-outs are fitted so that the holes are nearer the top of the tank sides - they are cut off-centre and one can tell visually which way up they go. Plate 31 will also help in this matter. The aft panel notches under the transom top edge.

Try them for size first and then pin and glue them to the upright battens of the seat webs. When you come to the forward section, you also have to make a final fixing of the floor fillet which has been left loose. The line of this can be determined by putting the side tank front in place with its forward end up to the seat front batten and then setting the fillet just behind the underside of the panel. Fix the fillet - then the tank front.

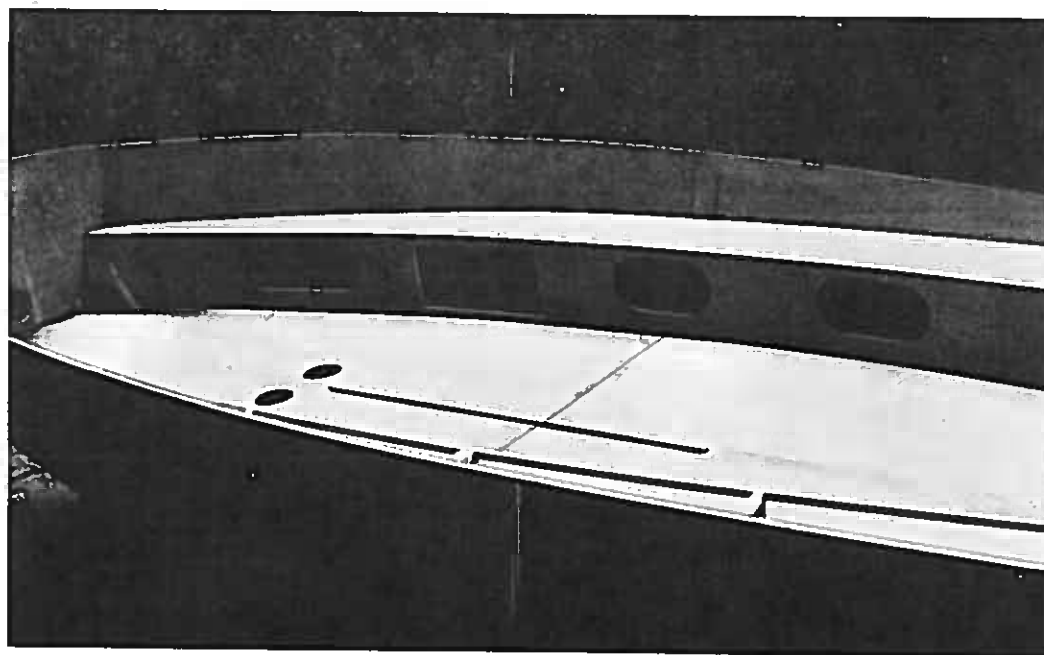


Plate 31

PAINTING THE SIDE TANKS

Once more you have to use the special bilge paint to waterproof the inside of the side tanks and this must be done before you put the tops on. Paint all inner surfaces including the undersides of battens but avoiding the faces which have to be glued i. e. all the top edges.

While the paint is drying, try the side tank tops for size. The two aft panels (53) first, followed by the two fore (54). If they need trimming slightly, do this and then pin and glue them to the tops of the tanks. Pins every three inches are sufficient.

REMEMBER that the undersides of these tops must also be painted, leaving bare all the parts that coincide with the stringers, seat web top edges and the side tank top batten for all these areas will be in contact with glue.

FIXING THE SIDE TANK TOPS

These should now be firmly fixed so complete the sequence by taping and resinning around both ends of the side tanks and along the complete length at the two edges where they meet the hull and the floor.

With any resin left over brush neatly over the join between the fore and aft sections of flooring and also the joins between the side tank panels. Tape is not needed on these places but merely enough resin to filter into the cracks - this is to stop water seeping into the end grain of ply and causing eventual discolouration of the wood.

FITTING THE FIDDLES (75)

Using glass-paper round off the edges of the side seats - it is on the forward parts of these that the fiddles go (Plate 32). The picture shows their position - suffice it to say that the forward ends of the fiddles are 3 inches from the bulkhead and they are set along the edges of the seats about 1/8 inch away. Use glue and 2 inch "8" screws.

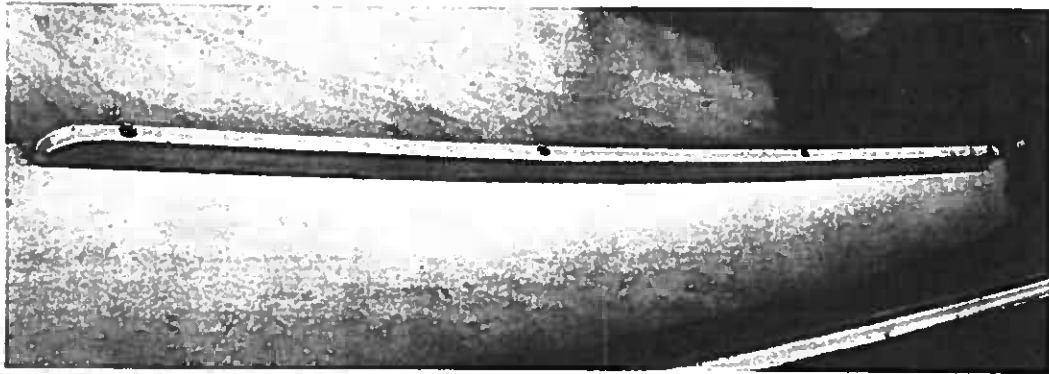


Plate 32

FITTING FLOOR BATTENS

You have two sets of battens the aft 44 (two long, two shorter) and the fore 45 (four all the same length). The diagram shows how these are placed and includes the edge to edge measurements in each case.

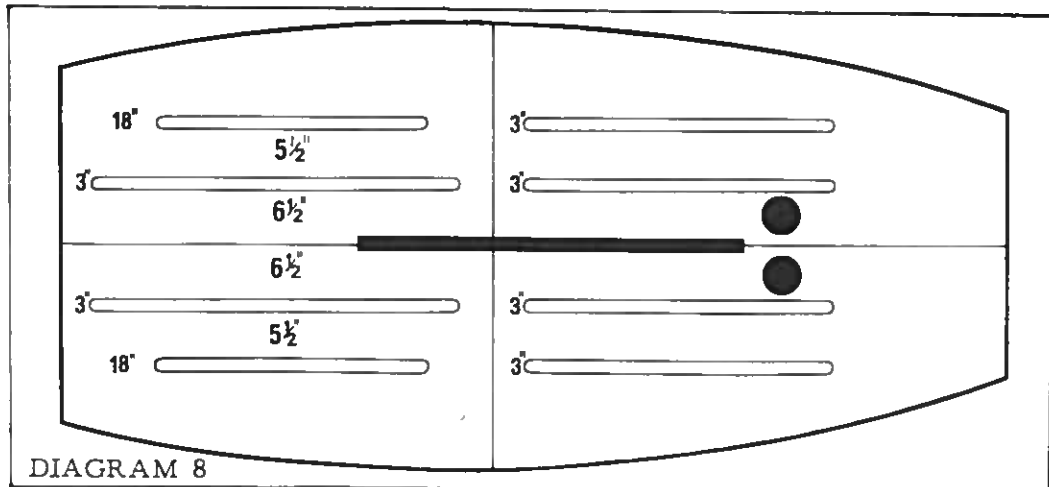


DIAGRAM 8

Round off the ends and top edges of battens.

Lay them in position first and lightly pencil the floor around each one - check the marks with a straight edge before you fix. Put hardener on the floors within the outlines and glue the battens. Fix them with a zig-zag pattern of screws (5/8 inch "6"), every alternate screw going down into the top edge of a floor web with one screw fairly close to each end of the battens.

FITTING INWALES (63)

These go along the inside of the hull's top edge, opposite the gunwales.

You should first shape the aft end of the inwale so that it will fit neatly into the aft corner of the boat. Then you should check that the whole thing will go into place, especially in the notches at the sides of the forward bulkhead. When these are fixed in position, they will not be flush with the gunwales. Specifically, from about halfway along the boat to the bows, they will rise above the edge of the hull until, towards the bows, they will be sitting up by about half an inch - there is a reason for this which will emerge later. The correct placing is obvious because the inwale sits on top of the butt strap which joins the side panels together.

Also, the forward end of the inwale does not reach the actual point of the bow (Plate 33) despite the fact that the piece you have is slightly longer than necessary. Plate 34 will show you why this is - a breast hook (70) will fill this gap.

All that remains is for the inwale to be glued and screwed into place. The screws (1 inch "8") are driven through the gunwales from the outside at approximately 7 inch intervals. Start at the aft end and continue forwards BUT leave this front end loose because you will subsequently have to trim this to fit the breast hook.

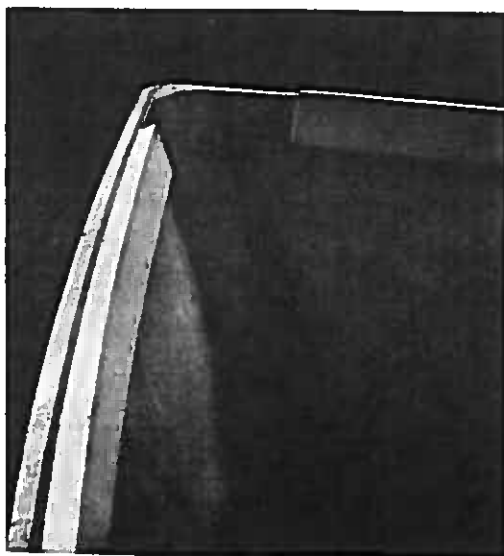


Plate 33

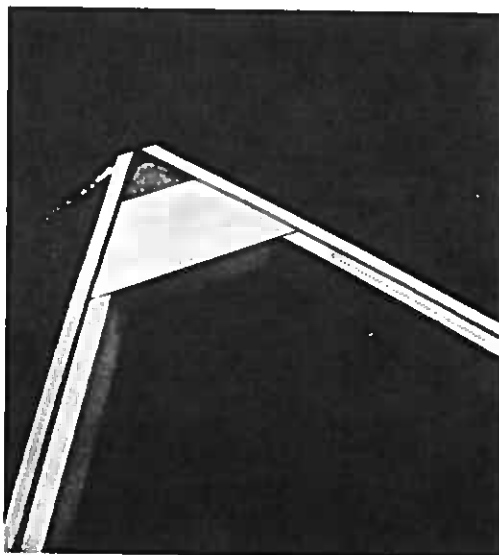


Plate 34

SHAPING TOPSIDES

The top surface of the inwales/gunwales should not be horizontal but should slope downwards and outwards: this applies particularly at the front half of the boat because the curve of the fore deck should be followed on to the topsides.

As a guide for the correct angle use the slope of the forward bulkhead: Plate 36 demonstrates how a straight edge along the top of the bulkhead continues its line over the topsides.



Plate 35

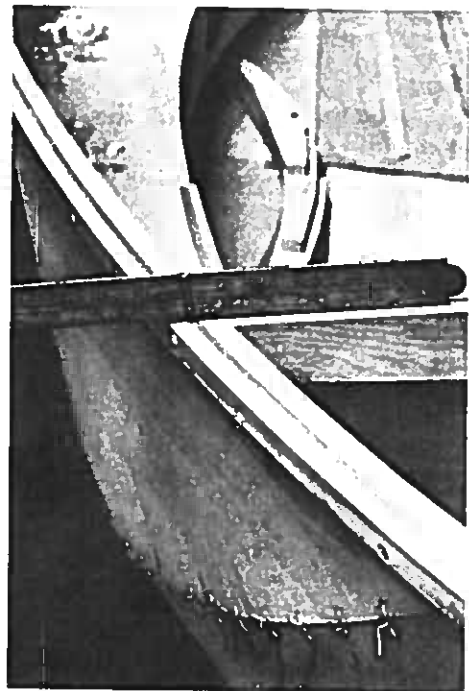


Plate 36

FITTING THE BREAST HOOK (70)

This shaped block fits into the angle of the bow - it may be necessary to cut back the inwales to make room for it. Plate 35 shows how this goes in place and notice that the top of the block, away from the bow, sits up by about quarter of an inch. Before the deck is fitted you have to achieve a slightly rounded surface to the block and the corners will be planed away.

Glue and screw using $1\frac{1}{2}$ inch "10" screws.

BENDING THE COAMINGS (84)

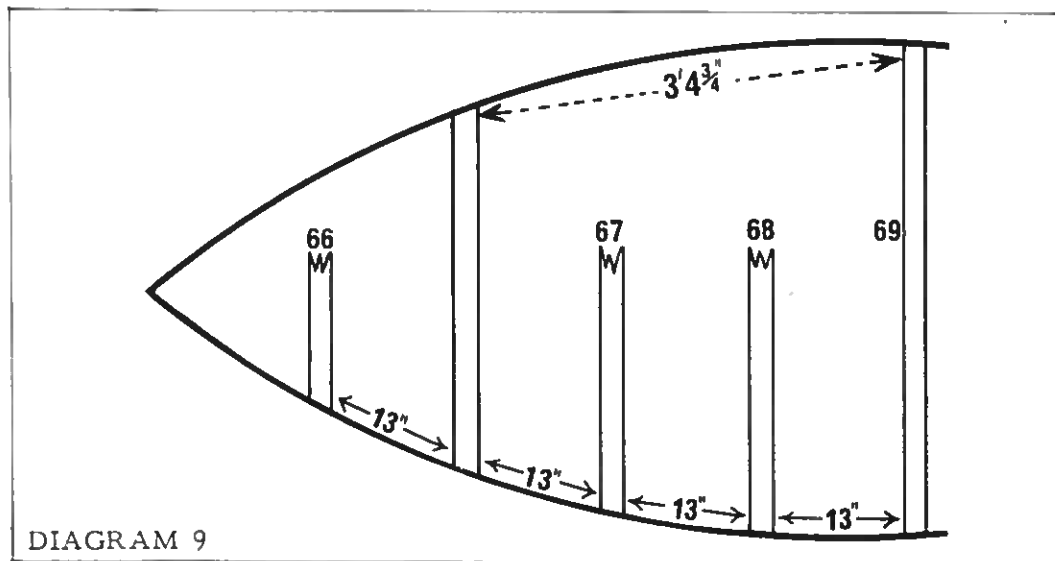
Plate 46 shows you one of these coamings in position, the curve it takes up is somewhat pronounced and makes the fixing very difficult. To remove some of the elasticity from the wood, you can, at this stage, bend it to nearly a right angled curve and keep it under pressure with weights or some similar device. Soak the coamings in clean water, bend and allow to dry in the bent position. Be very careful not to break the wood.

When the weight is removed, the wood will almost resume its former shape but, despite this, a lot of its spring will have gone.

FITTING THE DECK BEAMS

Each of these beams is slightly longer than is necessary and has to be trimmed to length at both ends equally. Also the ends have to be angled in two directions so that they fit into slanting notches cut into the inwales.

First you must mark the positions of the beams and the vital measurement is that of the largest beam - technically, this should be taken from the aft transom but, assuming you have set your bulkhead in absolutely square, it is easier to measure from there.



The dotted line in the diagram shows the position of the main beam and I have exaggerated the curve of the hull to stress that the measurement is a straight one from the aft face of the bulkhead to the forward face of the beam. Lay the beam across the gunwales to coincide with these marked points and pencil lines on the inwale to locate the notches into which the beam will fit.

The other beams are laid across the boat at equal distances from each other (as indicated in the diagram this distance is roughly 13 inches but it might be slightly different in your case).

Now the inwales must be notched to take the ends of the beams - Plate 37 illustrates how these notches start $\frac{3}{8}$ inches deep and slope away to nothing - this is so that the beams are tensioned between the sides of the boat.

All the beams should be trimmed to size and shape until they fit down into the inwales. The curve of each beam is carried on across the gunwales where you planed earlier.

Glue and screw beams using a $1\frac{1}{2}$ inch "8" screw through the beam ends from the outside.

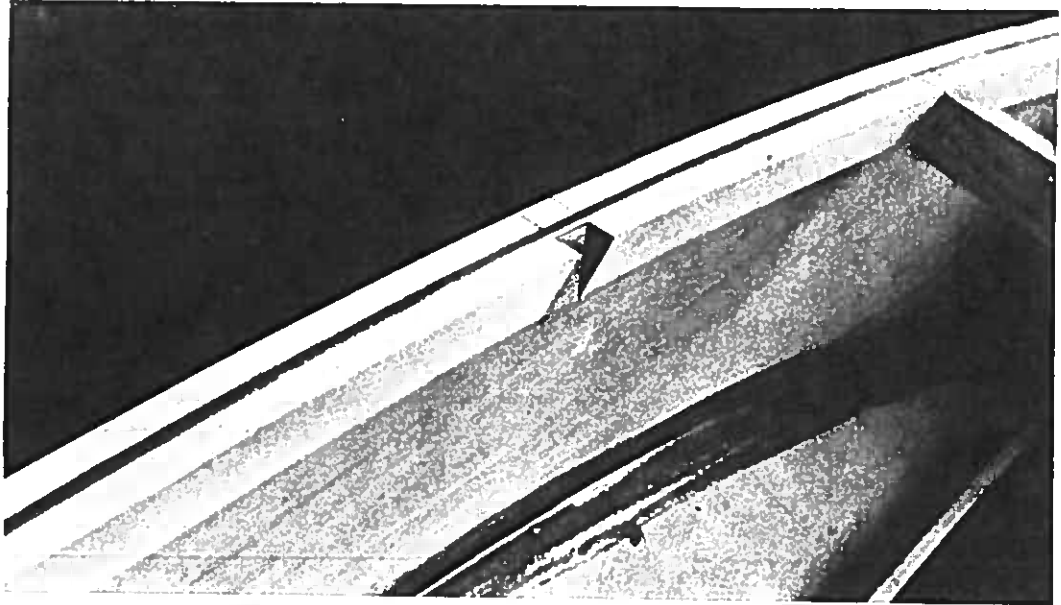


Plate 37

SHAPING FRAME FOR DECK

The framework you have now constructed should have a gentle even curve in both directions so check its shape, especially at the joins, and plane away any unevenness.

FITTING THE KING PLANK (71)

Establish a centre line from the centre of the main deck beam (69) to the point of the bow - mark where this passes through each beam.

The notches in each beam, except beam 68, have to be squared off to the same size as the plank (Plate 39) - you can use one of the king plank edges (72) to test the size of the notches: it is the same measurement as the king plank itself but, being shorter, is easier to handle.

Fit king plank support (70A) centrally on the forward face of the main deck beam - it is set down a distance equivalent to the thickness of the plank. Three screws ($1\frac{1}{4}$ inch "8") and glue fix this in place (Plate 38).

The forward end of the king plank fits into the breast hook so cut out a square notch to accommodate 1 inch of plank (Plate 39) - now the king plank itself can be trimmed to the correct length to fit between the breast hook at one end and the forward face of the main beam at the other.

When the king plank is notched down in place it should sit up a fraction (Plate 40) so that its outer edges can be sloped off to take up the general configuration of the deck - this is not terribly important but can be regarded as a technical refinement.

Now fix the plank in position using glue and two screws ($1\frac{1}{4}$ inch "8") through countersunk holes down into each beam (Plate 38).



Plate 38



Plate 39

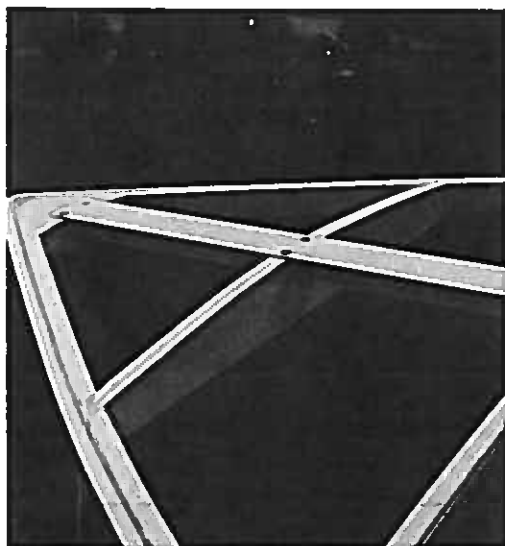


Plate 40

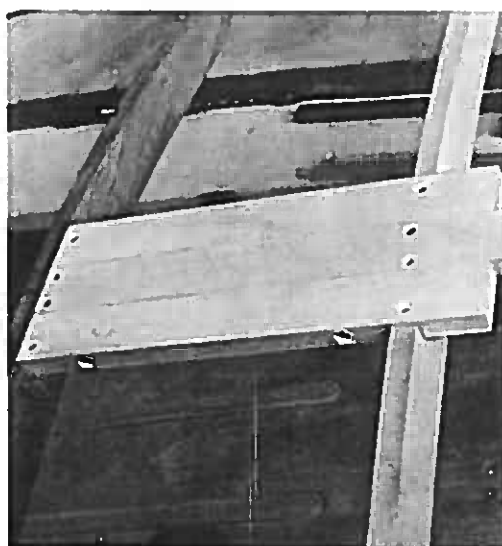


Plate 41

FITTING KING PLANK EDGES (72)

Plate 41 illustrates how these are fixed. The large notch in beam 68 can now be squared to take the edges. These can be glued and screwed down in the same manner as the king plank. You will see in the photograph that two screws ($2\frac{1}{2}$ inch "8") are put through each side to fix the glued edges to the plank.

FITTING THE KING POST (74) AND KING POST STEP (73)

These two pieces go into the boat together so do a dry mock-up in order to position the step and also to determine the correct length of post. The lower end of the post slots into the step and stands vertically (parallel to forward bulkhead) with its upper end tight under the king plank and against the king plank support on the main deck beam (Plate 42).

When you are satisfied that the siting is correct draw a line around the step to record its position on the floor of the boat.

Take out the pieces, glue the lower end of the post into the step, glue and screw (4, $1\frac{1}{2}$ inch "8") to the floor down into the centre case assembly and finally put a single screw ($1\frac{3}{4}$ inch "8") down through the king plank into the top of the post with some glue and hardener in between.

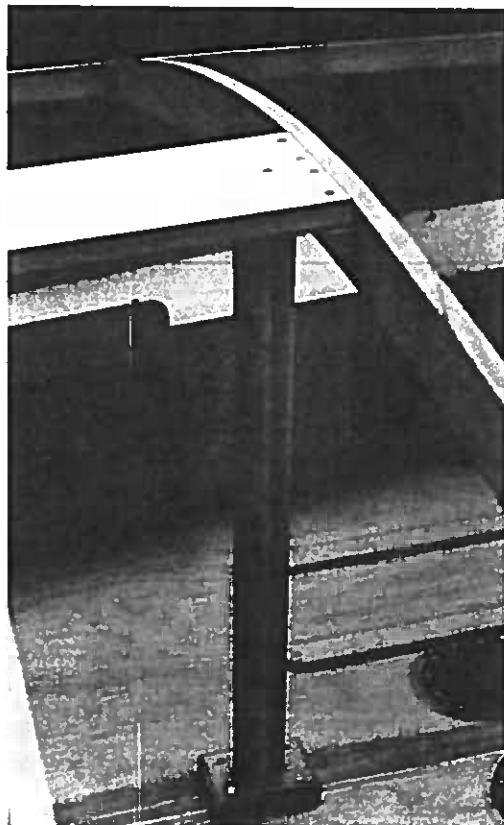


Plate 42

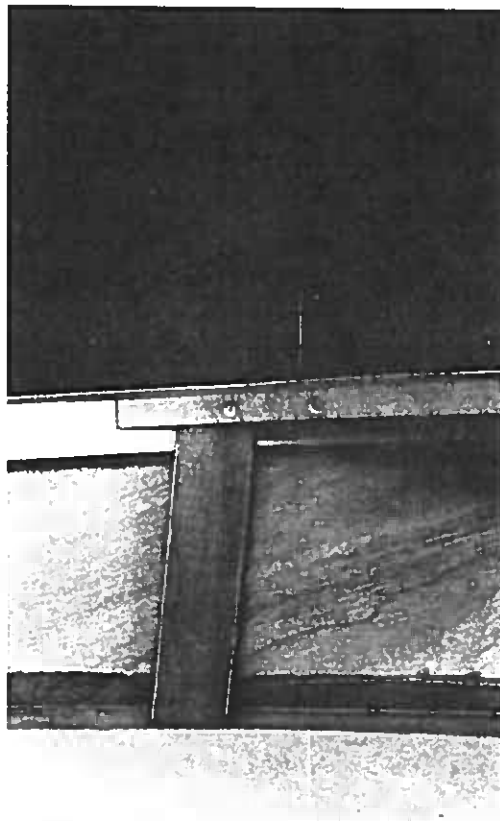


Plate 43

FITTING THE CHAIN PLATE BLOCKS (77)

The rebated ends of these blocks clip under the inwales and they slope forward to take up the ultimate line of the shrouds (Plate 43). A matching pair is supplied so it is impossible to install the blocks the wrong way round. The vertical centre line of each block at the inwales is $1' 2\frac{1}{4}"$ from the aft face of the main deck beam measured along the inwales themselves.

Screw and glue in place using, for each block, six screws ($\frac{3}{4}$ inch "8") set evenly in two vertical parallel lines of three from the outside of the hull.

FITTING CARLINS (76)

Because these pieces, as used, are so fragile at the tapered ends, the pieces supplied in the kit are very much larger than needed - a considerable amount of trimming is necessary.

Plate 44 shows a piece which has been laid on the corner between the main deck beam and the inwales and marked to shape and size. The actual carlin is illustrated in Plate 45 which depicts how the ends are tapered really finely - the better this is done, the better will be the fit of the coamings.

When the carlins are glued and screwed into place, the outer ends sit up slightly to be faired off later.

Glue and screw as indicated in diagram.

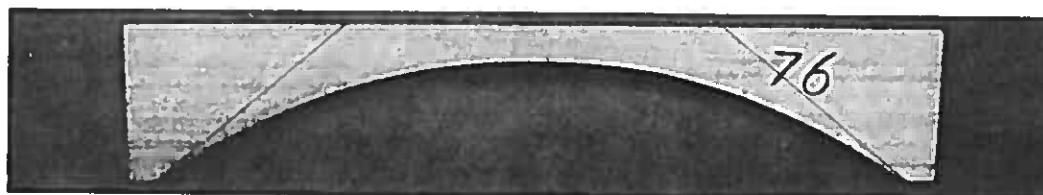
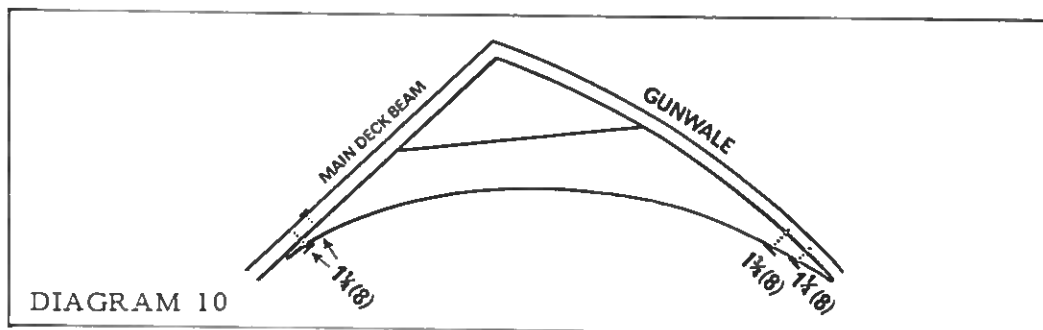


Plate 44

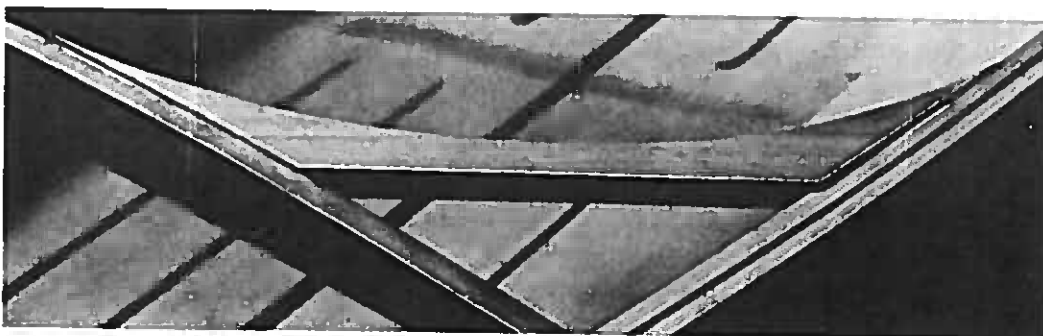


Plate 45

PREPARING FOR DECKS

Fair off all the deck beams, king plank and carlins sufficiently to achieve a smooth rounded surface overall so that the decks will fit evenly.

Fit two drain sockets in the bottom of the forward bulkhead using glue and hardener to seal them - these go in from the forward face of the bulkhead.

Paint forward compartment with DANBOLIN covering every surface except those to be glued.

FITTING DECKS (78)

It is apparent how the two deck panels fit together over the framework you have built. A little extra wood is allowed around the edges to guarantee a perfect fit. The centre seam should not be trimmed but just smoothed slightly to effect a neat joint.

Draw a centre line along the king plank and fit each panel up to that. The ply is pinned and glued around the edges and also across the deck beams but before this is done remember to paint all the undersurfaces which will be enclosed in the forward buoyancy compartment - don't paint the areas where the deck beams lie.

After fitting, fair off all the outer edges flush with the boat.

FITTING THE DECK CAPPING (79)

These pieces merely continue the line of the deck along the tops of the gunwales. The joints between the deck and the capping should be neat so mock fit the latter and square off the forward ends to match the aft ends of the foredeck. Each piece should be fitted flush with the inwales so that there will be a slight overhang on the outside of the boat.

Glue and pin in a zig-zag pattern, again every 2 inches.

Extra wood has been allowed not only on the width but also on the length so the aft end of the capping will have to be trimmed up to the forward face of the transom top edge.

If you are able to procure a fine nail punch you should knock down each pin slightly below the surface of the deck ply so that you can put wood filler over each hole, concealing the pins and assuring a perfect finish to your boat. The whole job of punching and filling takes less than 30 minutes but is well worth the extra trouble.

FITTING THE TRANSOM CAPPING (98)

In a similar manner, the transom capping is glued and pinned to the top of the transom edge.

The front edge should be flush with the forward face of the top transom edge and the ends lining up with the gunwales. Once more, extra timber is allowed for trimming and shaping so there will be an overhang on the aft side and at each end which has to be faired off.

FITTING THE RUBBING BEAD (65)

The rubbing bead goes right along the side of the boat covering the side of the decks and the gunwales. The whole of each side should be faired off flat to take the flat side of the rubbing bead.

The bead is put in place with the longer curve below and the shorter, flatter curve above flush with the deck.

Starting from the bow and level with it, the bead is glued and copper nailed every 4 inches. In the interests of appearance, you could, before you use the nails, elongate the heads by hammering them on the sides. This long narrow head is placed running with the grain of the wood and the nail can be driven right in to be ultimately covered with wood stopping.

If you half fix the nails in the bead itself first, then glue, then put hardener along the sides of the boat, you will find that the operation is easier.

At the aft end, the bead should be trimmed off flush with the transom.

FITTING THE COAMINGS (84)

Earlier you have soaked these pieces and bent them under pressure so they should now be quite dry and reasonably pliable to handle.

Plate 46 shows one of the two coaming pieces in position. The top edge, for its entire length, is $1\frac{1}{2}$ inches above the deck and is screwed (1 inch "8" every 4 inches) and glued to the main deck beam, carlin and inwale. The two halves join at the centre line of the deck.

Before actually fitting the coaming, sand off the aft end of the deck itself - the reason for this is that once the coaming is in place that part of the deck is difficult to reach. The direction of sanding should be with the grain of the wood all the time.

A guide line $1\frac{1}{2}$ inches from and parallel to the top edge of the coaming will help your assistant, who should be bending the piece on while you are fixing, to keep its correct position to the deck. Work from the centre line outwards to the inwales. The use of clamps greatly assists the fixing of these pieces.

ASSEMBLING & FITTING SHEET SWIVEL

The swivel block (99) is sandwiched between the top ends of the two side pieces (100) to form an inverted U-shape. This assembly should clip over the aft end of the centre plate assembly where it meets the foot rest (Plate 47) - it is screwed and glued firmly in place. The diagram illustrates this.

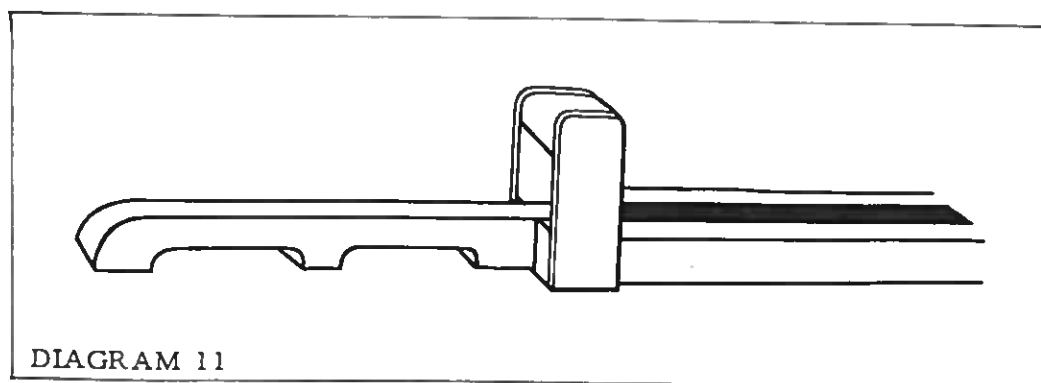


DIAGRAM 11

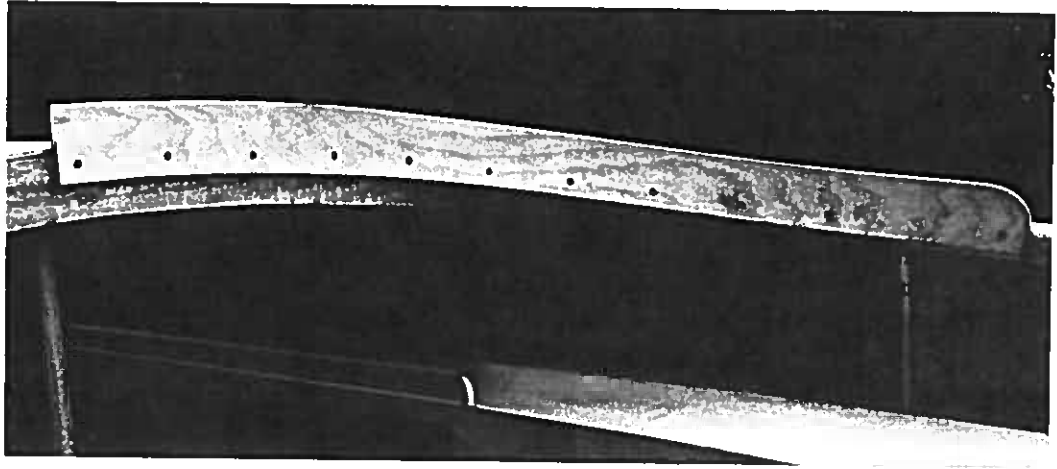


Plate 46

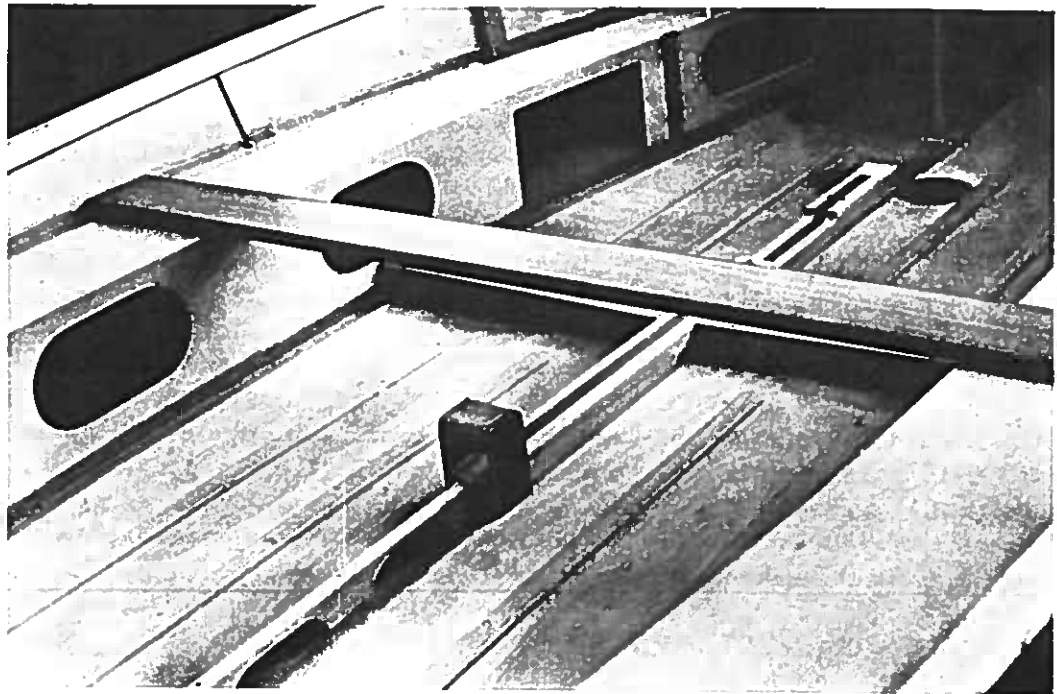


Plate 47

FITTING THE INWALE THICKENER (103)

The function of this piece is to thicken up the gunwales to make it more comfortable when you sit the boat out.

These fit on the inside of the inwales with the forward end butting up to the coaming. The section of the end touching the coaming should be squared to make a good joint, otherwise both ends of the thickener should be rounded.

The long shallow curve of the piece is the top surface and the shorter, rounder curve is underneath.

The whole thing is glued flush with the topsides using screws ($1\frac{1}{2}$ inch "8") every five inches.

FITTING THE BAFFLES (92)

These two lengths of timber fit across the centre seam between the fore and aft sections of flooring, one piece on either side of the centre-board case.

They should fit tightly between the centre case and the side tanks with the wider ends adjacent to the latter (Plate 24). They are taped and resinned to the floor, centre case and side tanks on both the fore and aft faces.

FITTING THE THWART (85)

This lies across the full width of the boat with each end on a side tank and fitting up to the topsides. Trim the thwart to size and shape (this shaping applies to the ends where they meet the slanting sides) and fix each end to the appropriate side tank top using six screws ($1\frac{1}{2}$ inch 10") in two parallel rows of three. (Plate 47 shows the thwart lying in place).

The aft edge of the thwart should be 5'8" from the outside face of the transom measured in a straight line. Fibre glass and resin the ends to follow the line of tape along the side tank tops.

FITTING THE MAST STEP (80)

The mast step is screwed and glued centrally over the centre line of the fore deck with its aft edge (the shallowest edge) $2\frac{1}{4}$ inches from the aft edge of the fore deck. A screw ($1\frac{1}{2}$ inch "8") down through each corner into the king plank assembly holds the step in place.

FITTING HATCH COVER SLIDES

Each hatch cover is held in place, top and bottom, by the hatch cover slides. The top slides (82) are fixed above the rectangular openings so that the rebated ends are equidistant from the sides of the apertures: the bottom of each slide should be level with the top of the hatch.

The best way to determine the line of the lower slide is to push the hatch cover itself (81) up into the top slide (82A) as far as it will go and mark the line of its lower edge on the side tank - this is the setting line for the lower slide. (Plate 48).

The screws to be used on the slides are as follows:-

Top Slides - Four 1 inch "6" on each

Bottom Slides - Four $\frac{3}{4}$ inch "6" on each.

ASSEMBLING HATCH COVER (81)

The hatch cover handle (83) is screwed and glued to the centre of the hatch cover. (Plate 48).

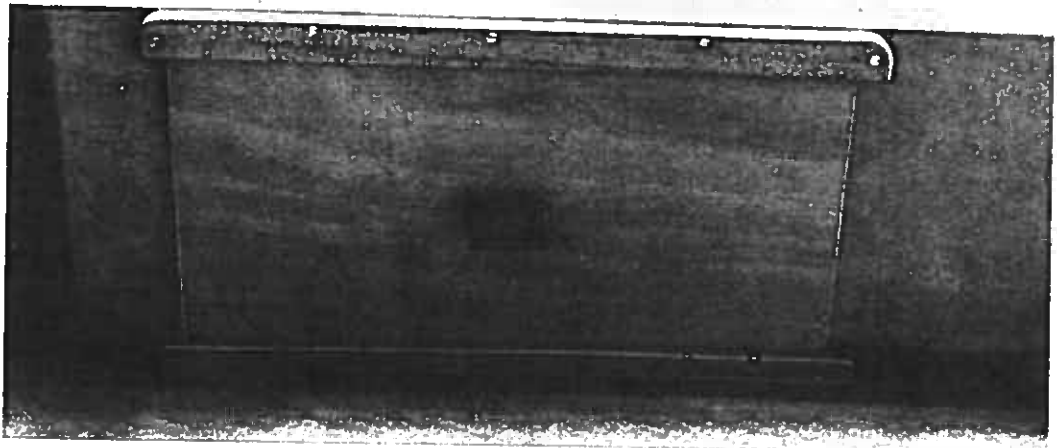


Plate 48

RESINNING THE UNDERSIDE

Turn your boat upside down on the trestles so that it is firm to work on.

Cut off all the twists of wire from the outside. To do this use an old chisel and a mallet and cut the wire off flush with the plywood.

Smooth down these seams with a plane rounding them slightly. Resin and glass fibre tape each seam in the same way you did the inside.

Do NOT tape any of the centre seam.

PREPARING TO FIX THE KEEL (62)

Lay the keel in place, its aft end level with the transom. The narrow end will eventually bend round the lower curve of the bow. The centre-board slots should match exactly.

Mark the outline of the keel on the boat and then take the keel away.

Your assistant can mark out and drill the screw lead holes. To do this one needs a centre line drawn down the top surface of the keel and, where the centre board slot comes, a centre line down the top surface at each side.

The main portion of the keel will be fixed by screws at either side of the main centre line but at the narrow forward end there is just a single line of screws. At both sides of the centre slot the screws are fixed centrally in a straight line. Plate 51 shows the pattern of screws at the forward end. All lead holes should be countersunk.

SHAPING THE BOAT FOR THE KEEL

While your helper is preparing the keel, you will be flattening the bottom of your boat to create an even surface on which the keel can sit.

First of all, remove all the screws which were put in to hold the centre assembly in place. Don't think that your dinghy will fall apart - it won't.

Now plane off the whole area contained within the pencil outline of the keel. You must achieve a quite flat surface and, at the forward end, this entails cutting right down through the ply to the centreboard assembly.

To restore your nerve, take a glance at Plate 49 which shows roughly what your boat should look like after this treatment.

SHAPING KEEL

The forward end of the keel needs to be shaped down in a similar manner to that shown in Plate 50. To help you bend this end into place; with a tenon saw, score the underside every quarter of an inch over the area between the third and fifth screw holes shown in the illustration. This series of shallow parallel crosscuts enables the wood to be pressed down in a curve.

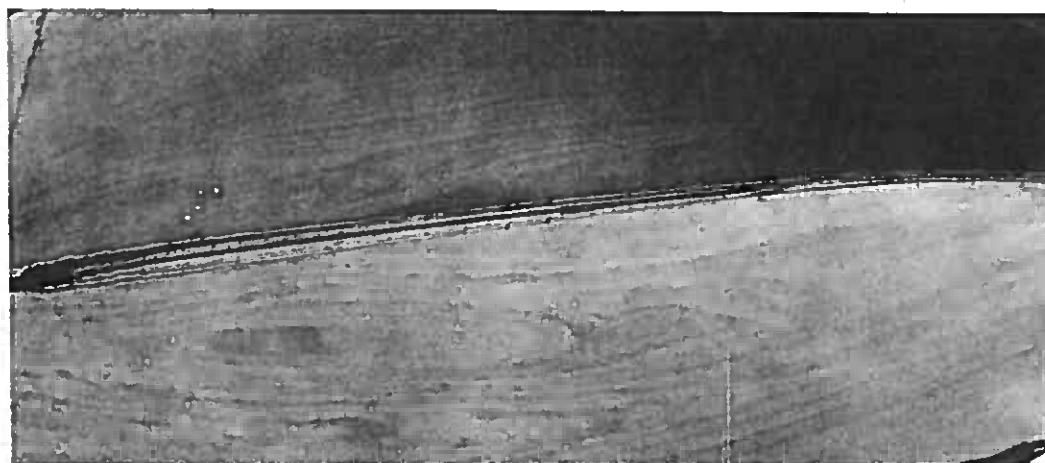


Plate 49

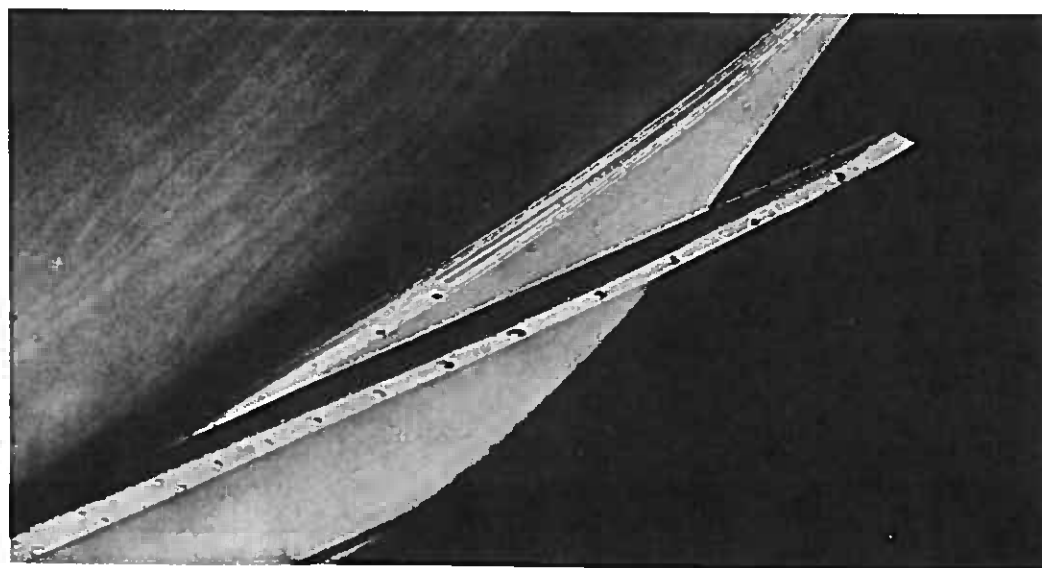


Plate 50

FIXING THE KEEL

Glue and screw the keel into place. Use 1 inch "8" screws five inches apart in the pattern already described. At the forward end, for the first 12 inches, screws should be 3 inches apart. Plate 51.

The thin forward tip of the keel can have one carefully placed copper nail to hold it down - avoid splitting the wood.

TAPING THE BOW

You can now resin and glass fibre the bow. One piece of tape should be sufficient to run down the centre seam from the gunwales to the forward end of the keel where it will run along one side for a further nine inches. A short piece of tape is then run from just forward of the keel along its other side for nine inches. Plate 52.

The result should be that the first nine inches of keel is resinned on both sides down to the boat itself.

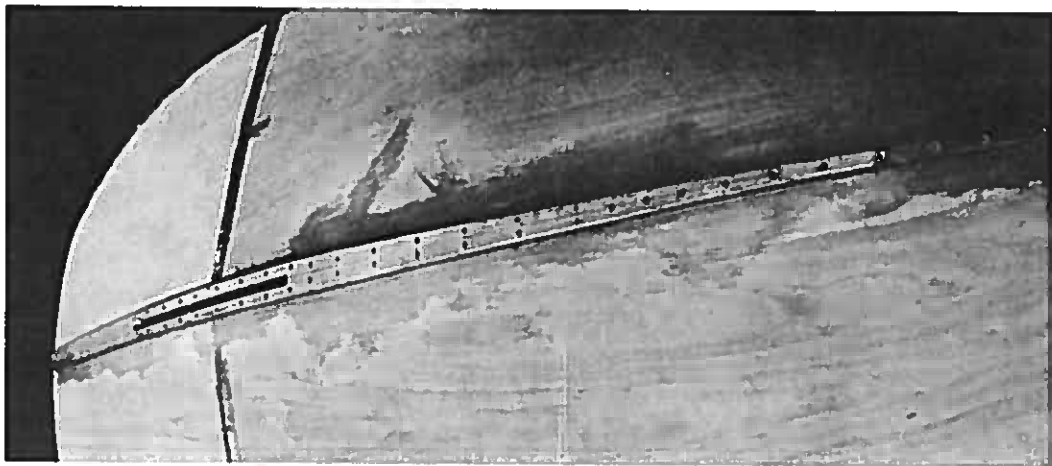


Plate 51

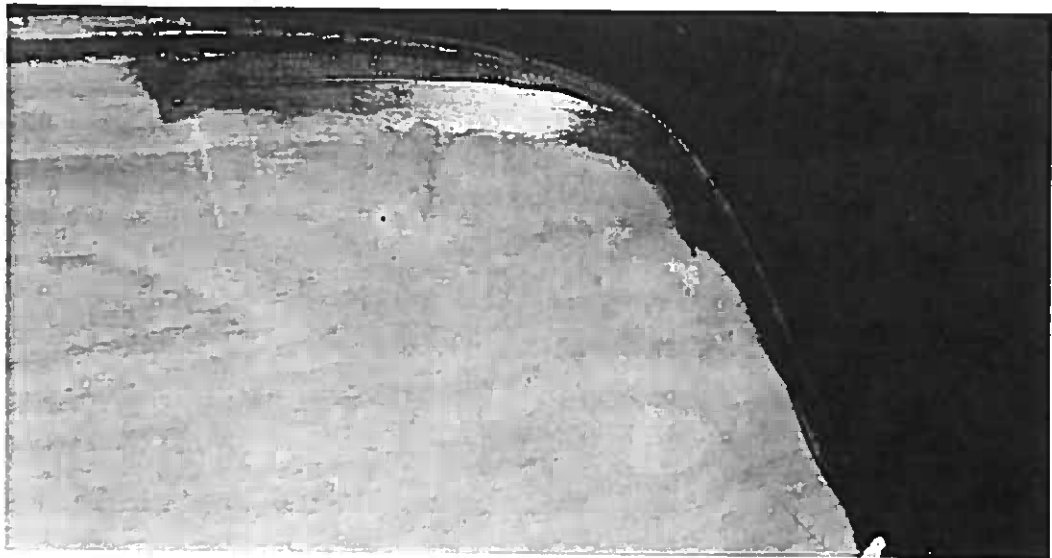


Plate 52

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 1" it down - avoid splitting the wood.

tape should be

Page 48 Para. 3.

Before applying the tape and resin plane back the bow to a $\frac{1}{2}$ " wide flat surface from the top of the bow to the front of the keel. The fibreglass tape is then more easily fitted leaving a flat base for the stem band.

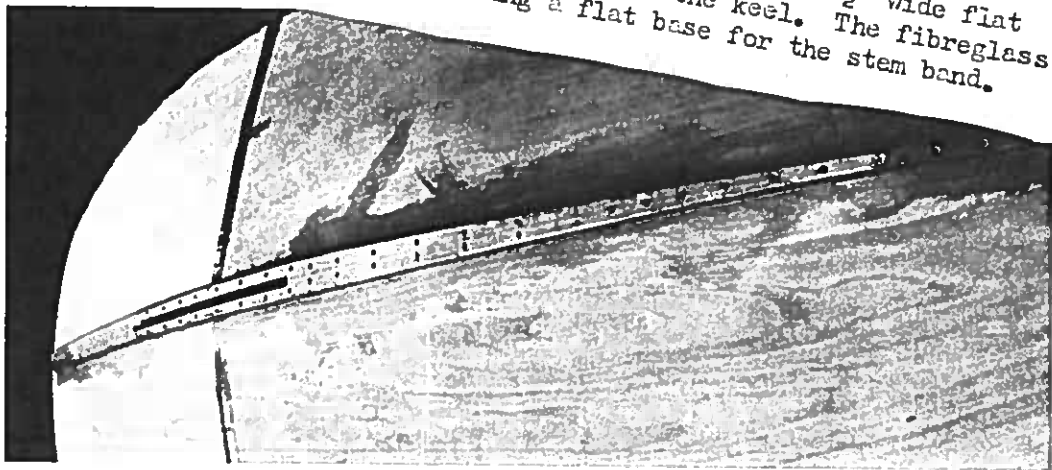


Plate 51

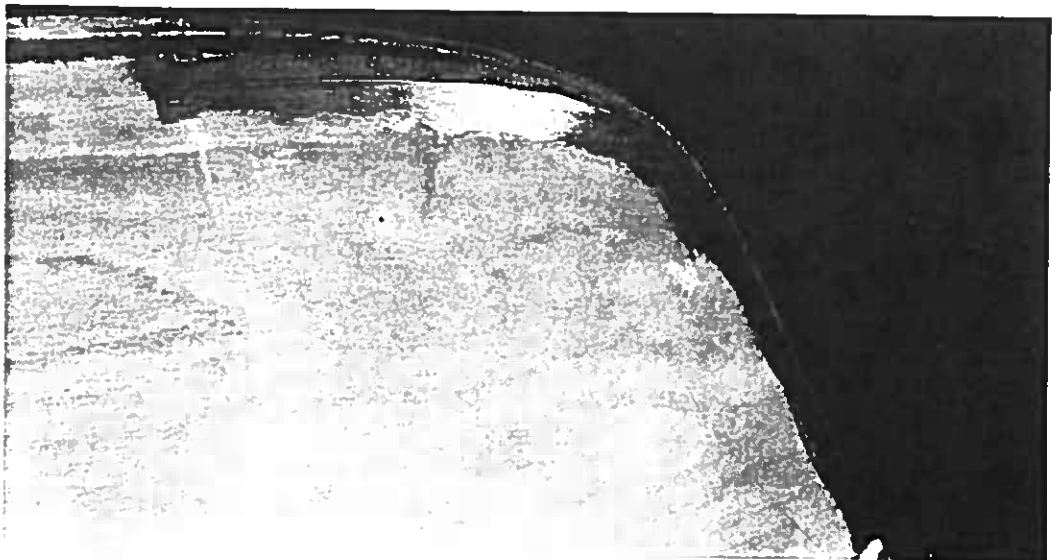


Plate 52

BITS AND PIECES

You have now virtually completed your boat and little remains as far as the construction is concerned. There are a few small jobs left and these concern mainly the fittings. Also there are two pieces of construction which, if you intend using the boat purely as a sailing dinghy, you might consider unnecessary.

TRAILER EYE

The bolt at the end of the trailer passes completely through the bow of the boat to achieve a positive fixing. To take this bolt, a hole has to be drilled across the bows where the trailer block is located. The positioning of this hole must be exact or you will have trouble matching it with the corresponding fitment on the trailer. You need to measure down the line of the bow a distance of 1'7" measured from the deck - the hole is set in from this point a distance of $1\frac{1}{4}$ inches, measured at right angles to the line of the bow.

Secondly the hole needs to be $5/8$ inch diameter and this can be made in one of two ways. Either you will have to procure a $5/8$ drill to fashion the hole in one go or, and I think this a better method, use a smaller drill and enlarge the hole to the correct size with a round file. With this latter method you can correct the alignment of the hole if it is not quite straight.

A tubular lining for the trailer eye is supplied; this should be firmly glued into the hole and the ends trimmed off flush to the hull.

RUDDER AND TILLER ASSEMBLY

Plate 53 shows how the rudder packing piece (89) is screwed and glued to one of the side pieces (88). The other side piece is fixed on top to sandwich the packing piece. The diagram shows how the fittings hold the tiller in place and also how the tensioned shock cord holds the rudder blade in place: this cord is fixed with screw and washer on the aft face of packing piece opposite the pintle bracket and follows the curve of the dotted lines to be fastened with four copper nails on the upper face of the small shoulder of the rudder blade near the gudgeon bracket. The elastic should be slightly tensioned.

The hempen cord for the uphaul is tied through the hole in the large shoulder of the rudder blade, then runs up under the tiller and on to the trumpet jamb cleat on the tiller shaft.

Remember that the exposed inner faces of the rudder side pieces should be painted or varnished to protect them from rot.

TILLER EXTENSION

Screw and glue packing piece to underside of tiller extension end. Then fix upper bracket of universal joint to this after which you can screw the other part of the fitting to the end of the tiller, giving a hinged extension.

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 curve of the ...
Page 49 Para. 5.

The word 'slightly' has been misinterpreted in the past. Particularly in strong winds the Mirror Sixteen travels at very high speeds. This puts tremendous strain on the rudder blade which tends to rise; the elastic holding the blade down must be very strongly tensioned to overcome this. ... under the tiller and on to ...
 ... great on the tiller shaft.

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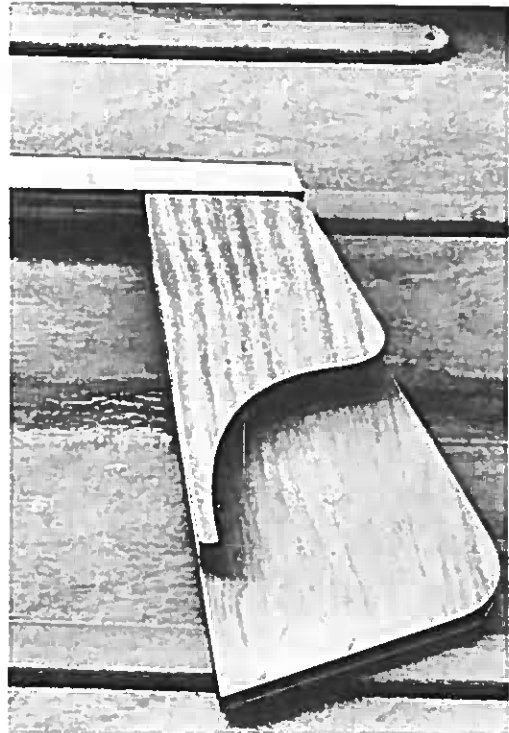
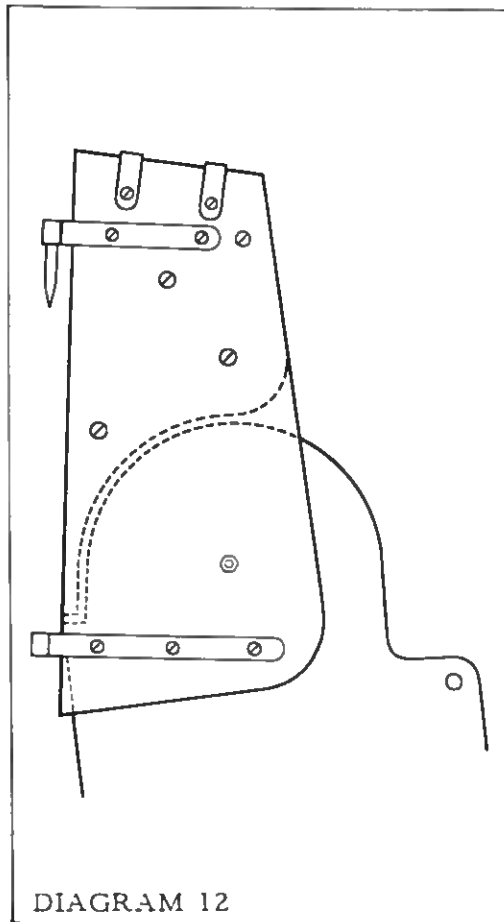


Plate 53

FITTINGS

All the fittings are supplied with their appropriate screws and the positions are shown in the enclosed plan drawing of the dinghy. Usually the fittings are fixed before finishing and then removed while the paint and varnish is applied - when the finish is dry the fittings are replaced.

KEEL STRIP

Before turning the boat the right way up you should preliminarily fix the keel strip together with the rubber edging for the centreboard slot. Plate 54 shows how this is positioned and you use $\frac{3}{4}$ inch "6" screws for fastening. The keel band starts at the aft end of the keel and, at its forward end, curves right up the bow to a point four inches from the deck. This leaves space for the deck stem fitting.

HATCHES AND BUNGS

You still have to fit the ventilation hatches in the transom - these are done the same as before but remember that the black ring must be fixed on the outside.

Also there are small bung fittings to be put into the side tanks - these are also fixed as before.

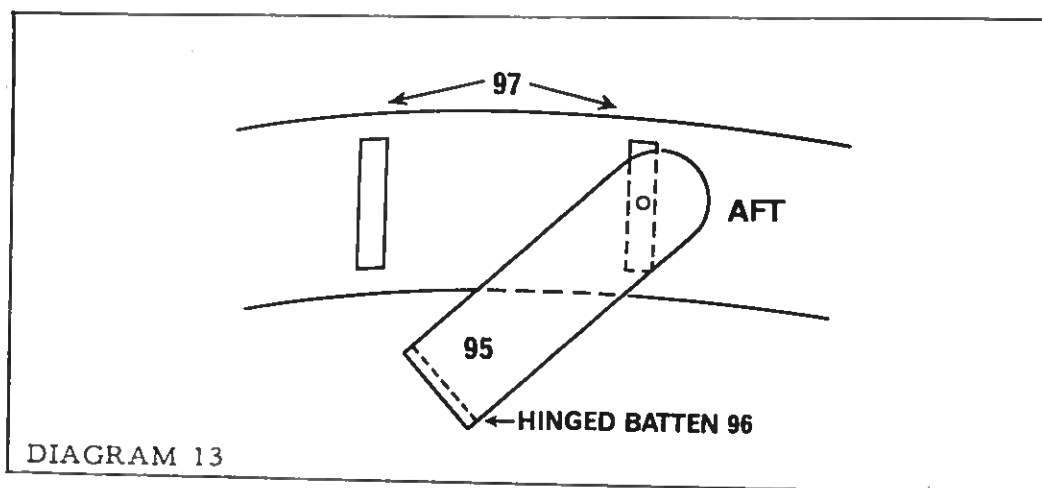
COOKER ASSEMBLY

This is a pivoted platform which swings out from the square fronted hatch on the starboard side. On the lower side of the square end, the nylon hinge is fitted with a batten the width of the platform. When in the closed position the batten lies on top but, when the platform swings out, it is turned underneath to act as support.

The two battens (97) are fixed into the floor of the tank and the platform (95) is pivoted from the aft one.

This assembly need not be fitted at all if you do not wish to store a gas cooker.

See diagram for general layout.



BOTTLE RACK

This is another piece which is optional - its purpose is to fit into the aft starboard hatch and hold in place oil or water bottles.

Two supporting battens (94) are placed underneath the rack (93) towards each end - the assembly will then clip down into the tank so that the battens are on the floor.

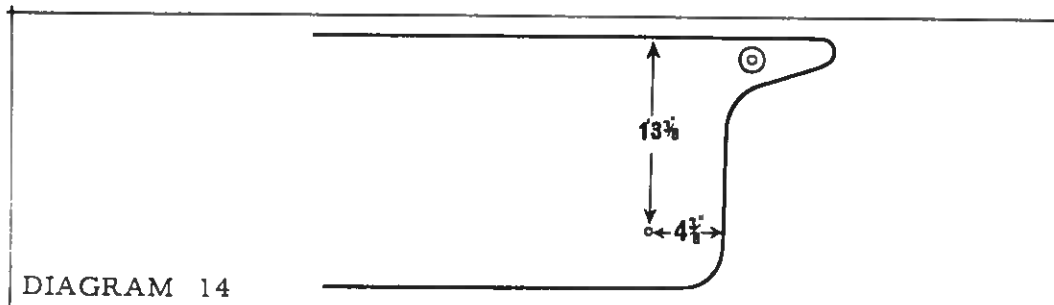
CENTREBOARD

The centreboard needs cleaning up and the round rubber stops (like door stops) fitted either side of the handle. The position is central $3\frac{1}{2}$ inches from the pointed end.

On the centre case assembly there are two cutaway portions towards the forward end which accommodate the two short pieces of rubber hose which act as grips to hold either side of the plate itself.

The pieces are held into the cutouts by metal plates the same length and four retaining screws in each.

Finally, in the centreboard itself you have to drill a hole to take the pivot of the stirrup - the diagram shows where this should be. After drilling glue in the short brown nylon sleeve as you did for the trailer eye. The stirrup connects through this hole and you can lower the plate into the case, the sides of the stirrup fitting into the upright slots.



TOE STRAPS

You will see from the main fittings diagram where you position the fore and aft anchor plates but the centre of the straps fit up underneath the thwart with screws and washers. The lateral place of these is largely a matter of personal choice but the recommended points are $\frac{8}{12}$ inches either side of the thwart's centre line.

There are two holes ($\frac{7}{16}$ ") to be drilled through the thwart to take the ends of the mainsheet strap. These should be 10 inches from the centre line and $3\frac{1}{2}$ inches from the forward edge.

CHAIN PLATES

These are fastened to the outside of the boat to coincide with the chain plate blocks. The top end of the plate protrudes upwards through the rubbing bead for 1 inch so a slot has to be cut to accommodate this. Seal the bare wood before installing the fitting. Finally, the plate fits over the top of the chainplate and is screwed to the rubbing bead.

MAST ASSEMBLY

The mast comes to you in two pieces (to prevent damage in transit) and you need to assemble them.

One piece has a wood block fitted in the end - all you have to do is to screw the other section tight up to the first using a similar lay out of screws. The screws must be very tightly in place so ensure that the lead holes are a good bit smaller than normal. Also it is vital that the whole mast is absolutely straight when assembled.

The grooves of each section coincide of course but check that the cords run through both halves otherwise it will be almost impossible to use the halliard which tracks through the full length of the mast.

If you like, before assembly, you can apply a thin coat of sealing varnish to the wooden block.

FINISHING YOUR BOAT

The tow strap thwart fixing line of the thwart but this on length of legs etc.

The following instructions have been extracted from a booklet published by International Paints Ltd. and called "Hints on Boat Painting".

1. To ensure a satisfactory job it is essential that the work, brushes, clothing and workroom are all as clean as possible. Tools should all be free from grease and dirt so that the woodwork is not contaminated. Shavings, sawdust and debris from the sanding should be carefully removed, not only from the work, but also from the surrounding floor. Brushes should be of good quality and clean, for the bristles of poor quality and dirty brushes will either break or come adrift to cause disfiguration of the paintwork. Keep brushes scrupulously clean to avoid the risk of old dry paint in the brush stock transferring itself on to the job being painted. Wear non-woolly clothing and, if possible, a nylon shirt or blouse. This will help prevent minute portions of hair or wool from your clothing sticking to the wet paint and causing small but noticeable blemishes.

2. When the surface has been sandpapered smooth, the question of removing the sanding-down dust must be tackled. The best way to do this is with a vacuum cleaner, which extracts the dust from the grain and leaves the surface dust-free. If a vacuum cleaner is not available, a vigorous brushing along the grain will remove much of the dust which is lodged there. When cleaning is complete, wipe over the area with a rag lightly damped with white spirit or thinners to ensure the removal of the last traces of dust.. WE WOULD EMPHASISE THAT THE REMOVAL OF ALL DUST IS EXTREMELY IMPORTANT. If any dust becomes mixed with the priming it will lead to poor adhesion of the paint to the wood, and dry as a "bitty" surface.

3. The abrasives most commonly used for preparing paintwork on boats are composition blocks and wet-and-dry "sandpaper". The composition blocks are used almost exclusively for rubbing down existing paintwork and are excellent for this purpose. They contain a lubricant and it is only necessary to keep them wet to get a good cutting effect. It is usual to purchase these in either a medium or fine grade.

Wet-and-dry paper is made in a large variety of grade sizes, and can be used in either a wet or dry state. If using wet, put a little soap on to the paper to prevent clogging of the paper. Keep the paper or the paint surface properly wetted at all times. The same type of wet-and-dry paper is used for dry rubbing down. When the abrasive paper is used wet its cutting efficiency is increased but it leaves the surface with a slightly polished and smoother finish. This is not suitable for the application of further paint. A surface which has been rubbed down with wet paper should be finished off by rubbing down with the same or a finer grade of dry paper. The paper used for a particular job will give varying results according to the way in which it is used. Its tendency to scratch will depend on the amount of pressure applied by the operator. Finger pressure will apply comparatively concentrated pressure in a small area; if the paper is used with a block the

pressure is more evenly spread and the risk of scratching reduced. The use of a lubricant on the wet-and-dry paper reduces the probability of a mass of rubbing down debris sticking to the sandpaper. If this should happen it very much increases the risk of the surface being scratched and reduces the cutting efficiency of the paper.

It is most important that surfaces to be varnished should be sanded WITH the grain of the wood, and those to be painted should be sanded ACROSS the grain.

4. Paint is most likely to be thick during cold weather. Thick paint can be reduced to normal consistency by either adding a little thinners or warming. Before warming, the tin should be inspected to see whether it has a petroleum mixture label on it. If so, there may be a considerable danger in warming it. Therefore exercise caution. The best way to avoid thickening is to store the paint in a warm room or boiler house overnight (away from any open fire, of course). If thinners are to be added, be quite sure the correct thinners are used. Most conventional paints can be thinned with white spirit, but NOT with paraffin or what is sometimes sold as "paint thinners", which may be a mixture of white spirit and paraffin. Most special paints, including two-pot Epoxides, Polyurethanes and some Antifoulings have their own special thinners. In windy conditions (as on an exposed beach) paints dry extremely quickly, so it is often necessary to add the special thinners to ensure easy and smooth application.

5. The paint should be well stirred until any sediment is thoroughly incorporated. Very occasionally, a tin of paint is found to have a heavy sediment and the easiest way to thoroughly incorporate this is to pour off most of the liquid contents into a separate container and break up the sediment into a thick paste. When this paste is uniform in texture, add back the liquid paint, slowly stirring all the time. After the brush has been dipped into the paint and "loaded", to a depth of $\frac{1}{2}$ " to 1", it should be held over the tin and tilted upwards to prevent the paint dripping. The paint should then be transferred to the surface and spread as evenly as possible, using both vertical and horizontal strokes to achieve this. When it has been evenly spread, it should be "laid off" in a series of brush strokes all in one direction. To ensure the best adhesion, and to obtain even spreading, the brush should be held at approximately right angles to the surface being painted. If it is held at an angle, there is a tendency to slide the paint over the surface, leaving it unwetted. Finally, if convenient, lay off the painting in a vertical direction, as this is less liable to cause runs than laying off horizontally. During the actual operation of laying off, the brush should be held at an angle of 45° so that it leaves less marks than would be the case if held vertically. If the brush has been over-loaded with paint and it is desired to remove it, this is best done by scraping the brush against a clean palette knife or similar object held over the paint tin. The habit of wiping the brush against the side of the tin is not a good one, as this tends to collect thickened paint on the side of the tin, which will skin and transfer itself to the brush.

Most paints are quick drying in nature and after the brush has been

used for twenty minutes or so, a certain amount of paint collects and dries in the heel of the brush. This tends to skin and work its way down the bristles to the surface being painted. If the surface to be painted is large, it is advisable to stop as soon as the paint starts accumulating at the stock of the brush and either change to a brush which has already been cleaned or stop and clean the brush which is being used. The first coat of primer should be liberally applied and well brushed into the surface to ensure good adhesion. The second and subsequent coats of primer should be of normal thickness.

Undercoats should be applied as medium coats taking special care to spread these evenly to avoid brush marks and the necessity for excessive rubbing down.

6. It is most important to buy good brushes. Apart from other considerations they last longer. To obtain a good paint or varnish surface free from bits, one essential is to have clean brushes.

After use, the brush should be thoroughly washed with Turpentine Substitute or thinners using one or more changes of solvent to ensure that the brush hairs are as free as possible from paint or varnish. The brush should then be washed with soap or preferably a good detergent and warm water until a good froth is obtained by working the brush vigorously on the palm of the hand. This is an indication that all the paint or varnish and solvent has been removed from the hairs and the brush should then be rinsed in warm fresh water. As much as possible of the water should be shaken from the hairs. The brushes should then be wrapped in clean greaseproof paper. When wrapping, care should be taken to imitate as nearly as possible the maker's original wrapping. If an elastic band is used to secure the paper it should be put round the metal part of the brush and not the hairs. Care should be taken to see that in wrapping the brush the hairs are not twisted for, if they are, they will be permanently twisted when the brush is unwrapped. When wrapping the brush, the paper wrapping should be gently stroked from the metal to the tip of the hairs to try if possible to lay the hairs in a flat, even chisel shape.

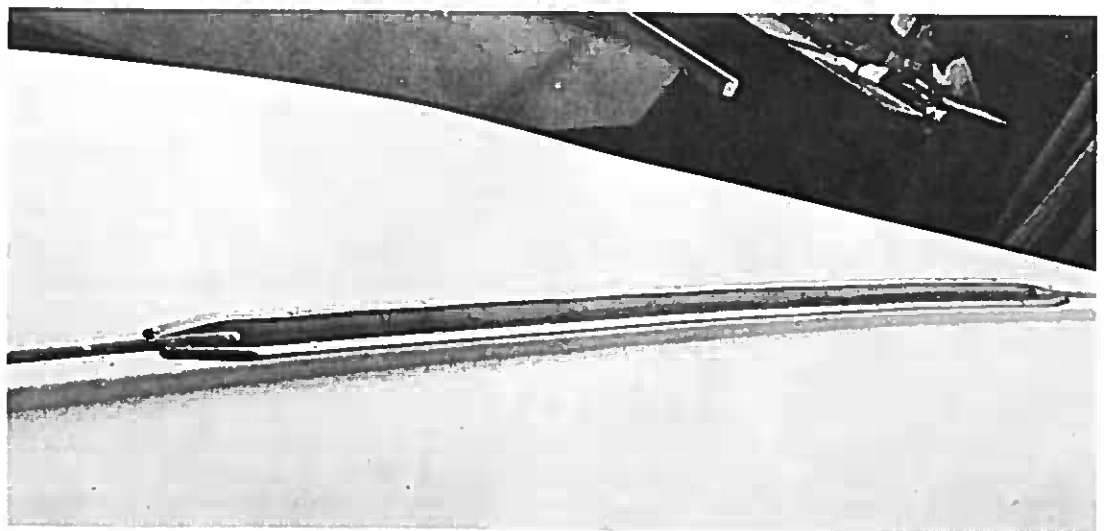


Plate 54

ASSEMBLY OF MIRROR 16 TRAILER

The three photographs show all the relevant angles of the trailer and will make the following notes much simpler to understand.

1. Bolt Stub Axles to underside of flat end of springs using inner two holes only.
2. Bolt rubber spring snubbers to underside of main cross member.
3. Bolt springs to underside main cross member.
4. Bolt the two main fore and aft members below stub axles using remaining outer hole.
5. Bolt tow bracket to front of fore and aft members.
6. Fit wheels to stub axles, tighten nut until split pin is inserted, bend out split pin and slacken nut.
7. Snap grease retaining hub caps on after smearing bearings with grease.
8. Bolt on mudguards to inside of main member bracket.
9. Bolt long white rubbers to top of main cross member and mudguards.
Bolt short white rubber to lower half of front tow bracket.
10. Bolt on ball fitting to front of tow bracket.
11. Secure "V" shaped fitting to hole in top of tow bracket, using large wing nut.

General Notes

Always use shake proof washers under all nuts.

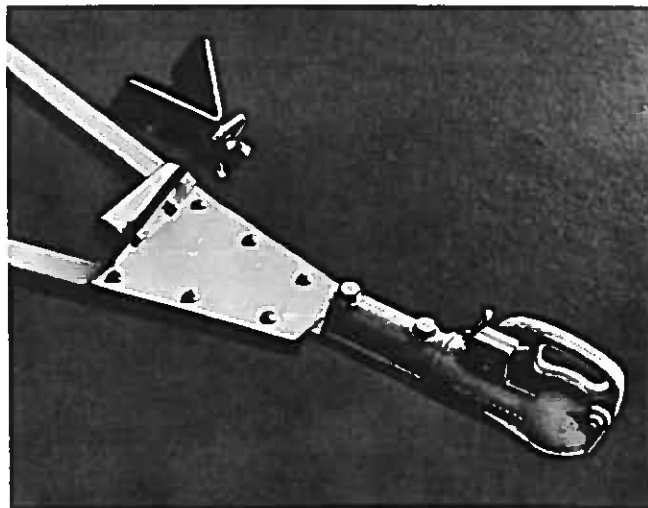
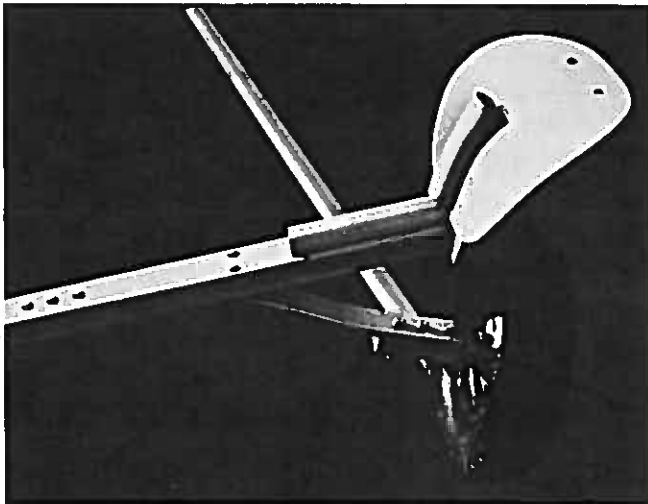
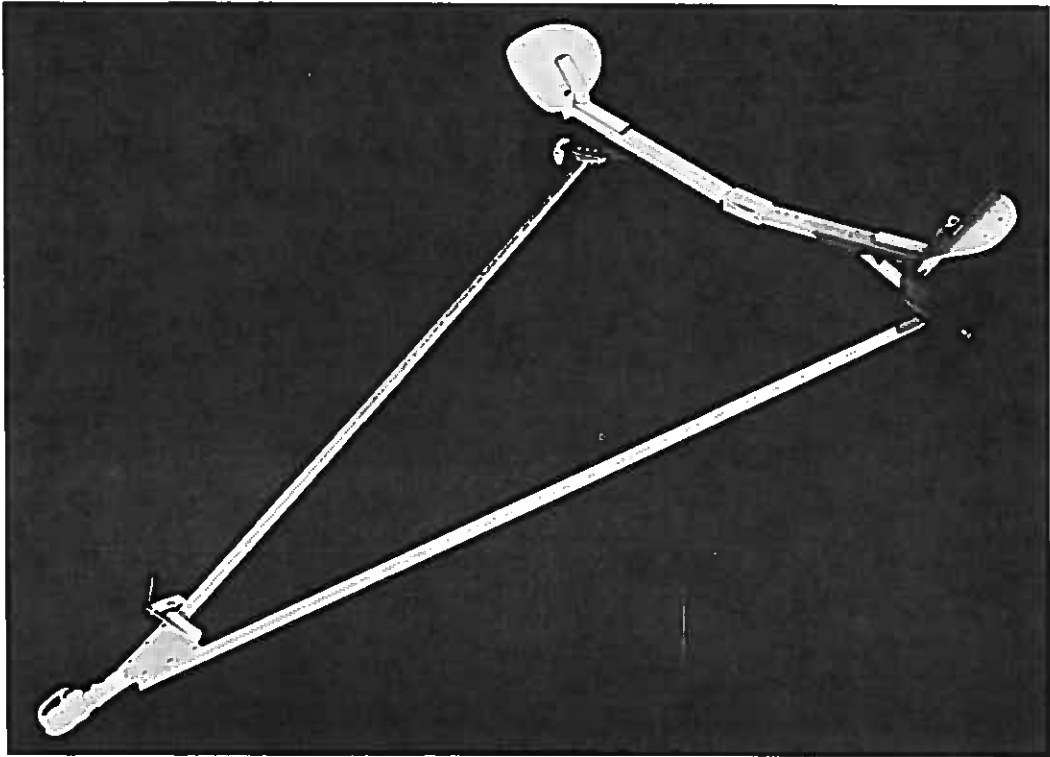
Make sure all nuts are tight; it is advisable to check all nuts for tightness after first 100 miles, and when used on rough and bumpy roads.

Tyre pressure 30 lbs.

Grease all nipples after trailer has been used for launching.

MAINTENANCE INSTRUCTIONS

1. Periodically grease the hubs through the nipples provided. This is particularly important before and after immersion in water.
2. Maintain tyre pressures at 80 lbs p. s. i.
3. Periodically inspect for tightness the nuts and bolts holding towing attachment to trailer frame and those holding springs and axles to trailer cross members.
4. Touch up paintwork as and when scratches occur.
5. Hose down trailer with fresh water after immersion in salt water, particularly wheels.



RIGGING INSTRUCTIONS

It is assumed that anyone who buys a Mirror 16' Dinghy has already some experience of sailing and is fully conversant with basic techniques and terms. I am, therefore, giving a quick rundown on the rigging sequence for your general guidance. You may find that a different sequence will suit you - well, so much the better for it is always more effective to use a drill which is familiar.

Here then are the notes in order:-

1. Lay the mast on the boat, at an angle, with the mainsail groove downwards and the foot of the mast a short distance aft of the king post.
2. Connect the shroud eyes to the two lugs at the side of the mast. The other end of the shrouds (with the bottle screws loosened) can be shackled to the respective chain-plates.
3. Connect the loose end of the forestay to the lug between the shroud lugs.
4. Standing in the boat you can lift the mast so that the foot clips into the mast step whilst your crew is steadying the forestay.
5. The forestay, just below the reefing roller, can be connected to the forward hole in the stem fitting.
6. The bottle screws on the shrouds can now be tensioned correctly and the pins covered with waterproof tape to prevent snagging. Also ensure that the mast is upright.

The sort of tension one needs in the shrouds is one that will allow 3 inches play at a point 3 feet from the deck.

7. Rig the jib by shackling on the wire halliard from the top of the tube to the head of the foresail. Feeding the luff of the sail into the tube, hoist the sail until the locking pin at the bottom end of the tube slot can secure the tack of the sail. The halliard should now be tied (tight enough to take the wrinkles out of the sail) to the plastic hook by the drum. The end of the halliard is now fed through 1. the slot in the typhol drum, 2. the guide onto the drum from the inside, 3. the plastic eye in the deck and pulled through until all the slack rope is taken up.

Holding the roller still, wrap the sail around the tube until it is completely furled. Now attach the jib sheets.

You will find that pulling on the jib sheet unrolls the sail while pulling on the halliard furls it up.

8. Rig the mainsail by threading the bolt rope at the foot of the sail into the front end of the boom and pulling the clew lacing along to the outhaul cleat at the aft end.

Put in the sail battens.

Shackle the head of the mainsail to the main wire halliard and pull the roped luff up the groove in the mast until the peak reaches the black band. Secure the halliard and fix the boom into the gooseneck fitting. When you pull down on the boom and achieve the correct tension, you then tighten the nylon locking nut.

Addition to rigging instructions.

Main Halliard.

Wire approx. 19' long spliced to rope tail approx. 26' long. Attach end of rope tail to the thin line running through top sheave and pull through mast, tie stopper knot in end of tail to prevent being accidentally pulled back through mast.

Spinnaker Halliard.

Rope approx. 35' long, attach plain end to thin line running through sheave on front of mast just above forestay lug, pull through and tie stopper knot.

Jib Halliard.

Having assembled luffspar, thread the halliard (approx 12' wire and 14' rope) through the pulley at the top of the spar. The rope tail is used as the furling line when the jib is hoisted.

Instruction 6.

Having adjusted the bottle screws correctly they should be locked with thin wire, to prevent them slackening off while sailing. Finally, the bottle screws and pins should be well covered with waterproof tape or a one foot length of suitable plastic (waterhose) tubing; this prevents the jib sheet catching in, and possibly removing, either the split ring or locking wire.

Instruction 7 (12).

With the jib unfurled tie a stopper knot in the furling line at the plastic fairlead. This is to ensure that the line is kept taught and does not drop off the drum.

7. Rig the jib by shackling on the wire halliard from the top of the tube to the head of the foresail. Feeding the luff of the sail into the tube, hoist the sail until the locking pin at the bottom end of the tube slot can secure the tack of the sail. The halliard should now be tied (tight enough to take the wrinkles out of the sail) to the plastic hook by the drum. The end of the halliard is now fed through 1. the slot in the typhol drum, 2. the guide onto the drum from the inside, 3. the plastic eye in the deck and pulled through until all the slack rope is taken up.

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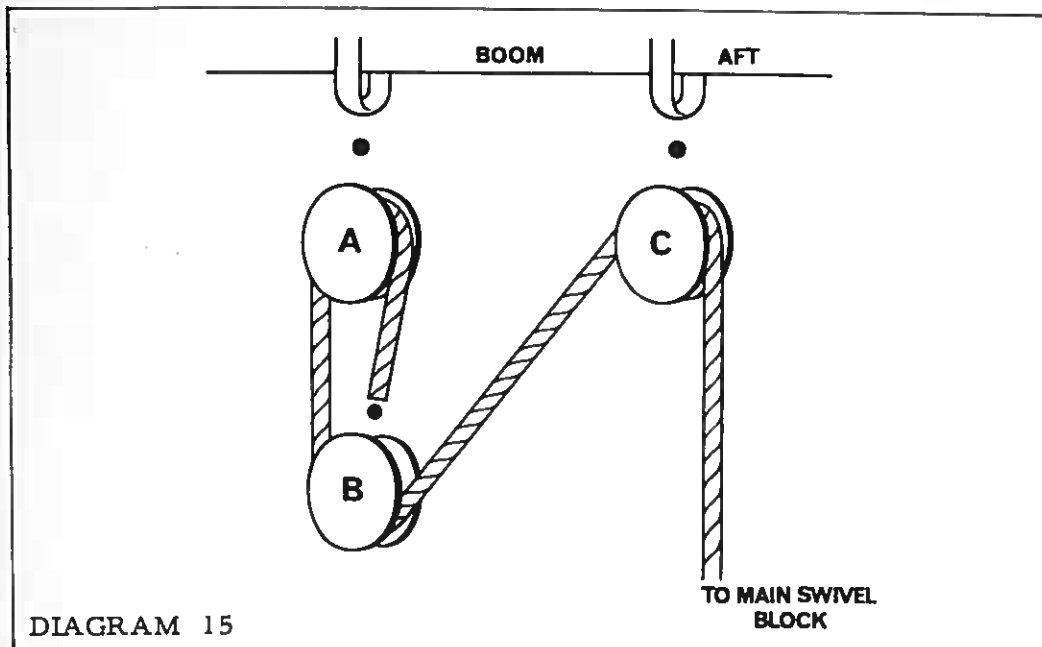


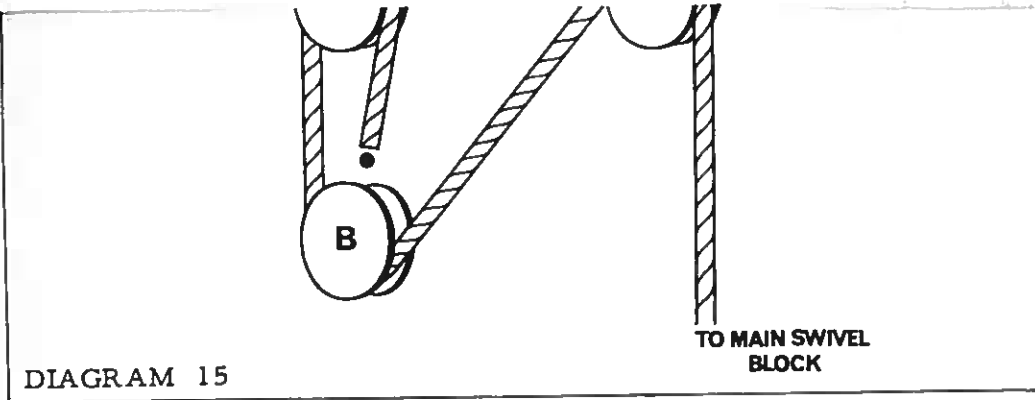
DIAGRAM 15

9. Finally you can rig the mainsheet. The fixed end on the sheet is made fast to the top of Block B which is on the mainsheet strap fastened across the two holes in the thwart. The diagram shows how the ropes run from one block to another.

As you can see the sheet runs from B to A which it circles from aft to forward - then back to B forward to aft - on to C forward to aft - finally to the main swivel block above the foot rest which it passes through from forward to aft.

10. Put in all drainage bungs and ventilation hatches.

Having reeved the mainsheet and hoisted the mainsail the final stage is to fasten Block B. First locate the mainsheet strop which is $1\frac{1}{2}$ " circumference terylene rope approx 4' in length. Tie the centre of the strop to the bottom of Block B, this rope is secured to the thwart by passing each end through its respective hole and tying a stopper knot underneath. Adjust the position of the knots along the rope so that when Block B is pulled up to tension the rope into two equal sides of a triangle, the block itself is 3" below Block A when full pressure is exerted on the mainsheet.



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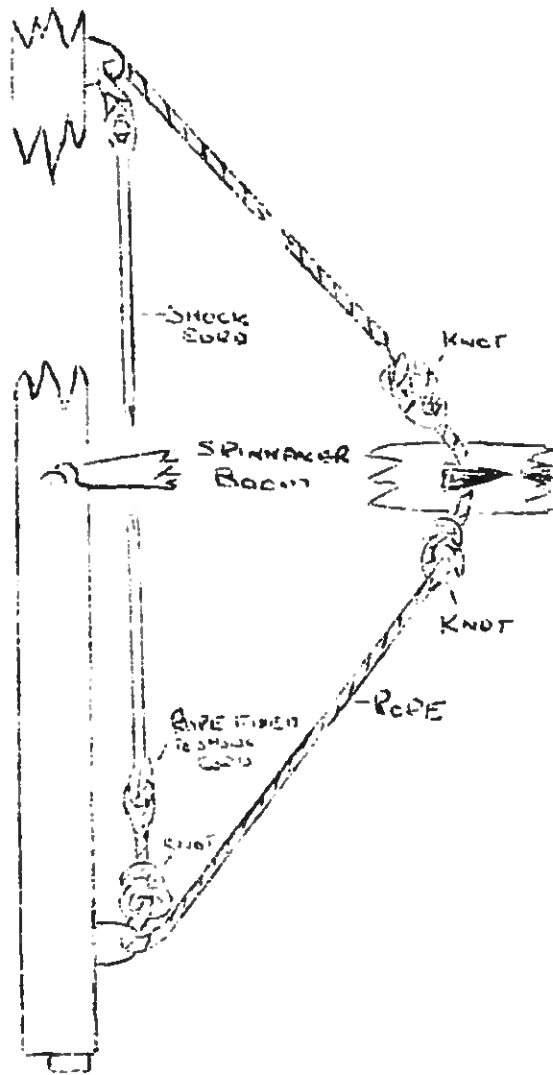
As you can see the sheet runs from B to A which it circles from aft to forward - then back to B forward to aft - on to C forward to aft - finally from forward to aft.

10. Put in all drainage bungs and ventilation hatches.

ASSEMBLY OF LUFF SPAR UNIT (ROLLER REEFING)

1. Remove nylong bearing block at upper end of luff spar.
2. Slip bearing block over forestay before the soft Tularit eye is made in forestay.
3. Insert forestay through luff spar from upper end.
4. Locate and secure nylong bearing block to luff spar tube by means of two $7/8$ x No. 6 self-tapping screws through HA 186 assembly.
5. Slide two unattached halves of HA 270 on to lower end of luff spar tube.
6. Fit soft eye of Tularit loop into upper end of stainless steel axle and attach by means of $3/16$ dia. cross pin.
7. Insert axle/Fairlead/bearing assembly in lower end of luff spar tube lining the $1/8$ " dia. holes in the bearing bush with the $3/16$ " dia. holes in the tube.
8. Gently slide the lower half of HA 270 down to the extreme bottom limit of the tube, ease it past the belled stainless steel fairlead at the points of the 'ears' formed by the slot.
9. Align the lower half of HA 270 to allow the insertion of the stepped pins through the luff tube and into the bearing bush.
10. Gently bring the lower half of HA 270 into contact with the location pins, making sure the $3/16$ dia. portion of the pin is located in the slots provided.
11. Bring the upper half of HA 270 into contact with the lower half ensuring the slots in the rims of the drum halves are opposed i.e. 6 oc; 12 oc.
12. Complete the assembly by fitting the eight brass screws into the drum halves.

FITTING SPINNAKER BOOM TOPPING LIFT DOWNHAUL



Lay the mast on its side on the ground. Find the 6' length of shock cord spliced onto 12' of $\frac{3}{8}$ " terylene rope. Thread the plain end of the rope through the plastic fairlead 9' above the mast heel. Now clip on the spinnaker pole and hold at just above right angles to the mast. The rope pulled tight, so that the shock cord is pulled up to the upper fairlead, is now placed in the jamb cleat in the centre of the spinnaker pole. A figure of eight knot should now be tied in the rope approximately 1" each side of the cleat. The rope is now lead through the fairlead three inches above the heel, pulled tight and a figure of eight knot is tied in the rope two inches above the fairlead. The shock cord is now stretched down the mast and secured to the rope just above the figure of eight knot. Now slip the rope out of the central cleat on the spinnaker boom. The shock cord should pull the rope neatly against the mast. Check that the pole can be easily and quickly rigged before trimming off the loose ends.

Following the change in the Class Rules passed at the A.G.M. 1971 and the subsequent approval from the designer and copyright holders, the Class Association Committee have been investigating suitable spinnaker chutes. For a trial Barrie Skelcher has fitted one to his Mirror '16 and he now reports as follows.

"The chute was fitted by Cyril Stetens, Esplanade, Maylandsea, Essex. It is the smaller of the two sizes and is fitted flush with the deck. It consists of a special moulded fibreglass funnel-shaped device which is fitted flush with the deck and penetrates into the forward bouancy tank. It is sealed into the tank in such a way that the integrity of the tank is not lost. The tail end of this device extends a few inches through the forward bulkhead and provides for the attachment of a nylon sock which then extends abaft of the centre case. A new spinnaker haliard is required, which has to be long enough to start at the head of the spinnaker, reach up and down the mast, along the floor of the boat and into the nylong sock, where it is attached to the centre of the spi. A set of instructions is provided by Mr. Stevens when the chute is purchased. The arrangement used in the case of Puff is shown in the sketch, though of course there is room for personal choice.

The system is now working well 'though there were one or two snags and some technique of operation to be learned. The big advantage is that the spi can be hoisted and taken down much quicker. This not only has the obvious advantage for racing but also makes the hoisting and striking of the spi a much safer operation.

Although the smaller size is fitted to Puff it is tight and it may be better to use the next size up. Although the nylon sock may be bent it must join the plastic tube concentrically and in line, otherwise the spi tends to gather at this point and is difficult to launch.

A device fitted to the front of the bow to prevent the spi sheets falling under the bow had to be removed, as it tangled with the tail of the haliard attached to the belly of the spi.

The top block on the forestay spar tends to catch up with the spi haliard. This was overcome by making a plastic cone out of the top of a "squeazy" bottle and fixing this as a shroud over the block with sticky tape.

One other problem to be overcome is the leading of the haliard out of the mast. It tends to rub and bind on the deck wash board. On Puff this has been overcome by fixing a small brass plate for the haliard to run on. A block would be better but requires some ingenuity to fit.

This chute was used on Puff during "Deben Week" with considerable success. For those who wish to use their M16 for camping the nylon sock can be unfastened at its tail and folded out of the way."

THE MIRROR 16 CLASS
(inaugurated by the DAILY MIRROR)

MEASUREMENT FORM

Authority: Mirror 16 Class Association
Daily Mirror
Holborn Circus
London E.C.1.

To qualify for a Class Certificate, a boat must be measured by a measurer of a club recognised by a National Yachting Authority, a Royal Yachting Association measurer or a measurer officially recognised by the Class Association. This form must be completed and certified by the measurer who should forward it to the Class Secretary.

BEFORE POSTING PLEASE MAKE SURE THIS FORM HAS BEEN COMPLETED

NAME OF BOAT 1st choice 2nd choice
3rd choice OWNER'S NAME
OWNER'S ADDRESS
OWNER'S CLUB
BUILDER DATE BUILT
DATE MEASUREMENT COMPLETED CLASS NO. OF BOAT

RULE	MEASUREMENTS TO BE TAKEN	MINIMUM	ACTUAL	MAXIMUM
	Hull			
1.	Base line below K. at T.) To fix datum	-	8"	-
2.	' ' ' ' ' B.) line. In all	-	0.203 m	-
3.	' ' ' ' ' ") measurements	-	5 $\frac{1}{2}$ "	-
			0.139 m	
4.	' ' ' ' ' F.) ignore keelband	2. $\frac{3}{8}$ "		3. $\frac{3}{8}$ "
		0.054 m		0.079m
5.	Length of base line	1. $\frac{3}{8}$ "		2. $\frac{3}{8}$ "
		0.028m		0.054m
6.	Projection of K. below skin	14' 10 $\frac{1}{2}$ "		15' 0 $\frac{1}{2}$ "
		4.497m		4.543m
7.	Width of K.	$\frac{5}{8}$ "		$\frac{7}{8}$ "
		0.016m		0.022m
8.	Base line to chine at T.	3. $\frac{1}{8}$ "		3. $\frac{1}{8}$ "
		10. $\frac{3}{4}$ "		11. $\frac{3}{4}$ "
9.	' ' ' G ' T.	0.273 m		0.298m
		1' 9. $\frac{3}{8}$ "		1' 10. $\frac{3}{8}$ "
10.	Chine girth at T.	0.550m		0.575m
		3' 6 $\frac{1}{4}$ "		3' 7. $\frac{3}{4}$ "
11.	Beam at T. (Where top of G. meets topside if extended).	1.072m		1.111m
		4' 2"		4' 3"
12.	Base line to chine at A.	1.270m		1.295m
		6"		7"
13.	' ' ' G ' A.	0.152m		0.178m
		2' 2 $\frac{1}{4}$ "		2' 3 $\frac{1}{4}$ "
		0.666m		0.691m

RULE	MEASUREMENTS TO BE TAKEN	MINIMUM	ACTUAL	MAXIMUM
14.	Chine girth at A.	4'8 $\frac{1}{4}$ "		4'9 $\frac{3}{4}$ "
15.	Base line to chine at F.	1.228m		1.467m
16.	' ' ' G ' F.	8. $\frac{7}{8}$ "		9. $\frac{7}{8}$ "
17.	Chine girth at F.	0.225m		0.251m
18.	Base line to chine at B.	2'4. $\frac{1}{8}$ "		2'5. $\frac{7}{8}$ "
19.	Base line to G at B	0.733m		0.758m
20.	G. girth at B. to underside of beads	4'8"		4'9"
21.	Base line to top of deck at stem.	1.422m		1.448m
22.	Straight line of stem cuts base line.	1'11"		2'
23.	Extensions of C.P. below h.	0.584m		0.609m
24.	Width of C.P. at K. when fully down.	2'7 $\frac{1}{2}$ "		2'8 $\frac{1}{2}$ "
25.	" " " " 2' below K. at 90° to fore edge.	0.789m		0.824m
26.	Length from extension of T. face and stem fore edge	5'7 $\frac{1}{4}$ "		5'8 $\frac{3}{4}$ "
27.	T. face where it meets the gunwale to eye on chain plate	1.708m		1.733m
28.	Length from extension of T. face to aft side of mast at step.	2'.10. $\frac{5}{8}$ "		2'.11. $\frac{1}{8}$ "
29.	Beam at A (where top of G. meets face of topside if extended).	0.879m		0.910m
30.	Depth G. to side seat top at A.			3'.0. $\frac{3}{4}$ "
31.	Width between side seat tops at A.			0.933m
32.	Depth G. to floor at A.			1'7"
33.	Beam at F.			0.483m
34.	Depth G. to side near top at F.			1'6. $\frac{1}{4}$ "
35.	Width between side seat tops at F.			0.463m
36.	Beam at B. Over deck			16'3"
37.	Height of mast stop step above G.			4.903m
38.	Top of deck to underside of bead (depth of bead)			4.954m
39.	Weight of stripped hull			9'2 $\frac{1}{2}$ "
40.	Weight of correctors if any			9'3 $\frac{1}{2}$ "
41.	Rudder. Pivot of blade to bottom edge			2.807m
42.	Width of blade measured 90° to fore edge			10' 5 $\frac{1}{4}$ "

RULE	MEASUREMENTS TO BE TAKEN	MINIMUM	ACTUAL	MAXIMUM
43.	Foresail roller $\frac{1}{2}$ circumference (roller must be fitted and used)	1 $\frac{1}{2}$ " 0.037m		1.8" 0.034m
44.	Foresail roller. Length top of drum to top of tube.	13'4" 4.065m		13'6" 4.115m
45.	Mast section as specified by Assoc. HA. mm 89.		2 $\frac{3}{8}$ "x2 $\frac{1}{2}$ " 0.073mx0.063m	
46.	Mast C.G. above step	10' 3.048m		
47.	Lower edge of the B.B. to step. Above which the sail may not be set			20'4" 6.198m
48.	Upper edge of lower B.B. to step. Below which the sail may not be set.			1'4" 0.407m
49.	Height forestay eye on mast above step.			14'0" 4.208m
50.	Height spinnaker halliard block			14'6 $\frac{1}{2}$ " 4.372m
51.	Boom section Ha.MB. 7 ex fitting		3 $\frac{1}{2}$ "x1 $\frac{1}{4}$ " 0.088m.x0.031m	
52.	Inner edge of B.B. to aft side of mast			10'0" 3.048m
53.	Spinnaker boom or jib stick overall length			6'7" 2.007m
54.	Mainsail battens, 4. The centreline of which not more than 2" from the points dividing the leech into 5 equal parts.	3'5" 1.041m		3'6" 1.066m
55.	Mainsail leech from highest point of headboard to lower aft corner of foot.			21'3" 6.477m
56.	Horizontal width of headboard.			4" 0.102m
57.	Mainsail $\frac{3}{4}$ luff to $\frac{1}{4}$ leech) See I.Y.R.U. measurement instructions for method of obtaining position.		4'0" 1.219m
58.	Mainsail $\frac{1}{2}$ luff to $\frac{1}{2}$ leech		6'11" 2.108m	
59.	Mainsail $\frac{1}{4}$ luff to $\frac{1}{4}$ leech		8'10" 2.693m	
60.	Foresail luff corner to corner.			13'0" 3.963m
61.	Foresail leech corner to corner.			12'8" 3.861m
62.	Foresail foot corner to corner.			8'5" 2.566m
63.	Foresail. Top of sail to centre of foot.			12'3" 3.734m
64.	Foresail. Maximum width of head over all roping.			1 $\frac{3}{4}$ " 0.044m
65.	Foresail. Window length.			4'1 $\frac{1}{2}$ " 1.256m
	Window height.			1'3" 0.381m
66.	Foresail. Window distances from luff and foot. (The following measurements are taken with the sail folded in half (clew to clew) and flat on the floor, with just sufficient tension to remove wrinkles).	6" 0.152m		9" 0.229m
67.	Spinnaker leeches corner to corner.			15'0" 4.513m

RULE	MEASUREMENTS TO BE TAKEN	MINIMUM	ACTUAL	MAXIMUM
68.	Spinnaker clews to centre seam, corner to corner.			5'0"
69.	Spinnaker head to foot at centre seam in straight line.			1.524m
70.	Spinnaker $\frac{3}{4}$ height at right angles to leech.			16'6"
71.	Spinnaker $\frac{1}{2}$ height at right angles to leech.			5.029m
72.	Spinnaker $\frac{1}{4}$ height at right angles to leech.			3.6"
73.	Class number to be cut on inside of transom in 1" figures.			1.066m

- Measurements 1 - 40 Hull and centreboard 73
- do 43 - 44 Foresail roller
 - do 41 - 42 Rudder
 - do 45 - 50 Mast
 - do 51 - 52 Boom
 - do 53 Spinnaker boom and jib stick
 - do 54 - 59 Mainsail
 - do 60 - 66 Foresail
 - do 67 - 77 Spinnaker

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'K' equals keel. 'G' is gunwale, where the topside if extended would cut the top of deck.

'A' section is aft end of centre plate slot. 'F' is fore end of slot.

'B' is bulkhead, as defined on sketch. 'C.P' centre plate.

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I certify that all the above measurements are correct.

Signed

(measurer)

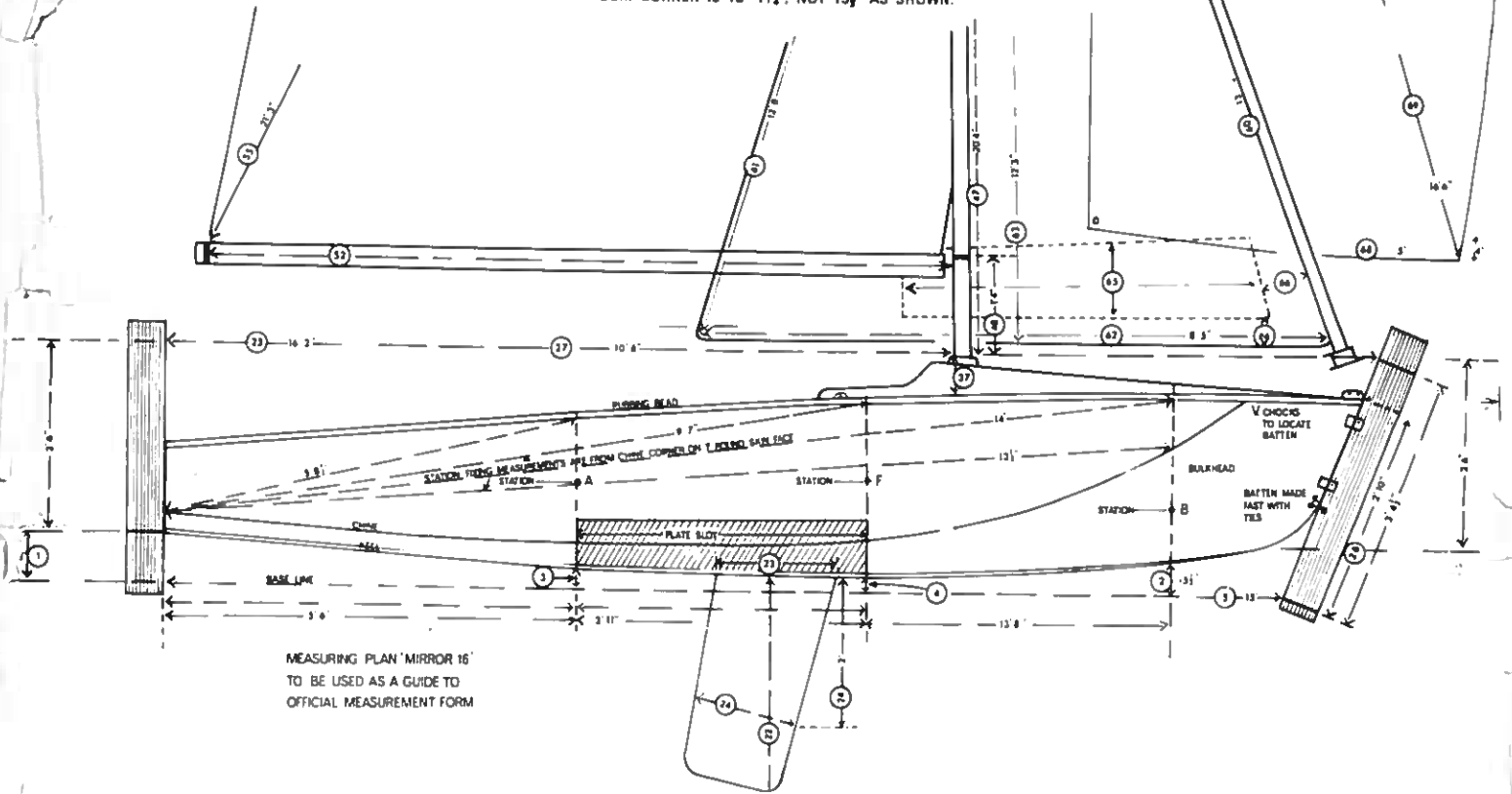
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CORRECTIONS

BULKHEAD B TO TRANSOM IS 13' 8" ALONG TO BASE LINE.

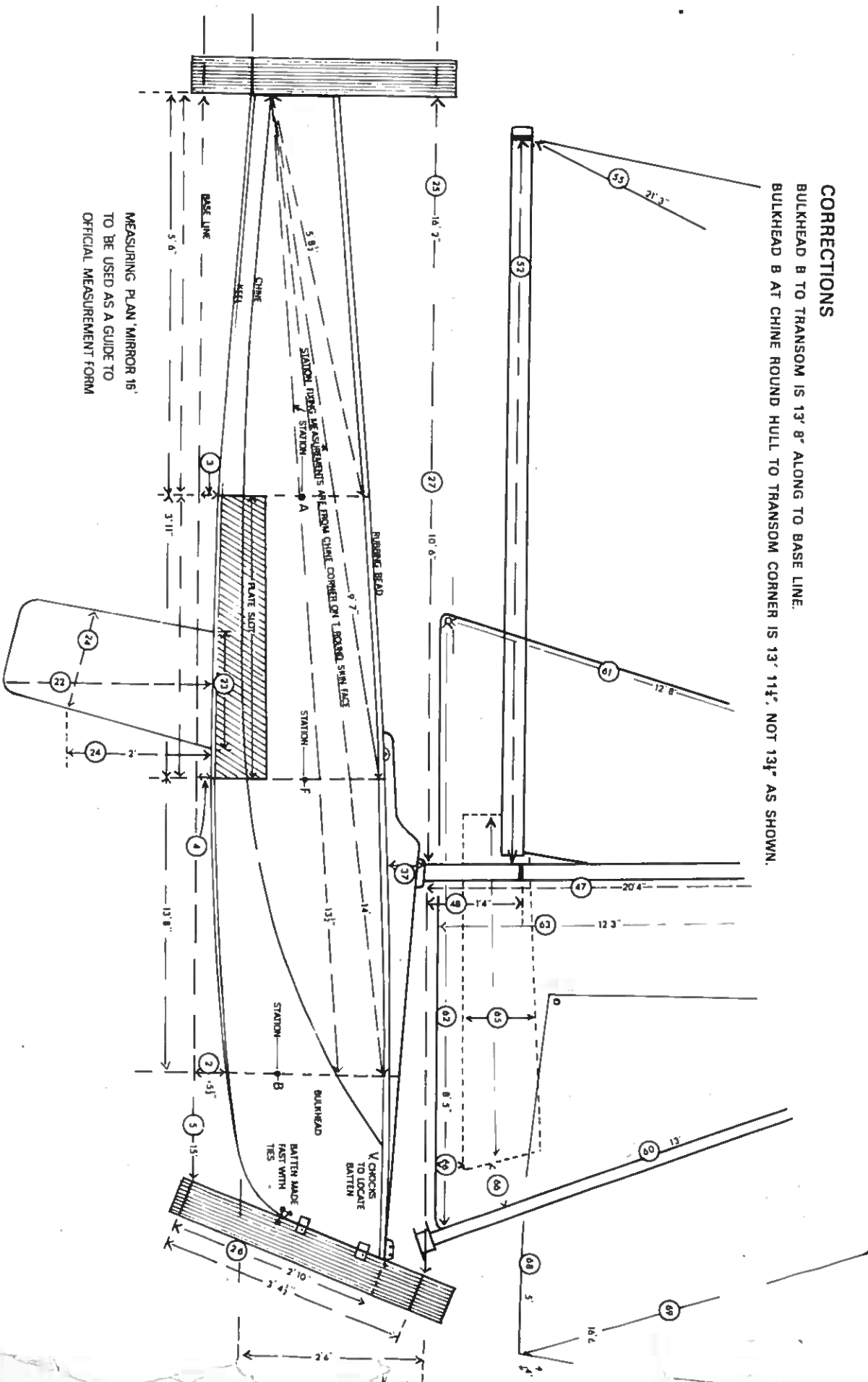
BULKHEAD B AT CHINE ROUND HULL TO TRANSOM CORNER IS 13' 11 1/2" NOT 13 1/2" AS SHOWN.



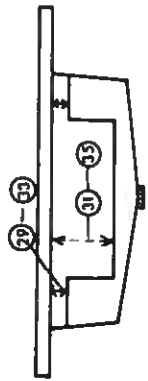
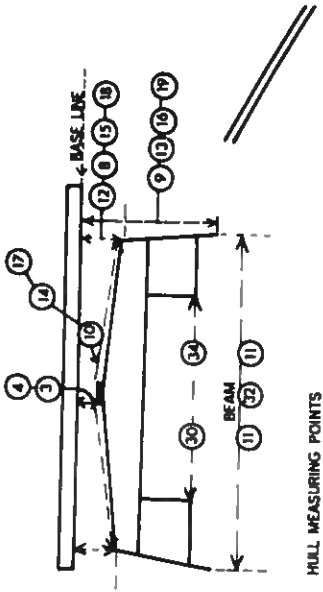
MEASURING PLAN MIRROR 16
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MEASURING PLAN MIRROR IS
 TO BE USED AS A GUIDE TO
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HULL MEASURING POINTS

