

## MATERIALS LIST

Plywood, (A-C Exterior Grade, or Marine Grade):  
5 - 4 ft. x 8 ft. x 1/4" Panels

Clear Fir: (or Spruce or other medium hardwood)

1" x 10" - 6 ft.  
1" x 6" - 8 ft.  
1" x 3" - 14 ft., 14 ft., 7 ft.  
1" x 2" - 4 ft., 4 ft., 18 ft.  
2" x 6" - 6 ft., 6 ft.  
2" x 3" - 6 ft.  
2" x 2" - 18 ft.

#2 Pine

1" x 10" - 12 ft., 14 ft., 14 ft.  
1/4" x 1" Pine Battens - five 6 footers  
3/4" Dowel - 3 ft.

Hardware:

800 - 1", #8 plated flathead woodscrews  
200 - 1-1/2", #8 plated flathead wood screws  
PVC Schedule 40 Plastic Pipe: 1-1/2" i.d., 10 ft.,  
1-1/2" i.d., 20 ft.

Eyebolts; 1, 1/2" x 5"; 2, 1/4" x 2"; 3, 5/16" x 3";  
2, 5/16" x 2"

Screw-Eyes: 22, 1/4" x 3"

Lag-Screws: 2, 1/4" x 4"

Threaded Rod: 4, 1/2" x 24"

Bolts: 10, 1/4" x 1-1/2"; 1, 1/2" x 6" (Round-head)  
8, 1/8" x 1-1/4"; 5, 1/4" x 3"

U-Bolts: 12, 3/8" x 2"

Nuts: 10, 1/4"; 12, 1/2"

Pulleys: 2, double for 3/8" line; 2, single, 3/8"

Cable Clamps: 13, 3/16"

Cable Thimbles: 13, 3/16"

7/8" o.d. Aluminum Tubes: 1, 3 ft.; 2, 6 ft.

1/2" i.d. Galv. Iron Pipe: 1, 2 ft.

1 Grommet Kit

3 "Quik-Link" Chain Splicers

4 Spring Clips

2 Galv. Iron Straps: 1" x 9-3/4" x 1/8" x

85 ft. Steel Cable, 1/8" Plastic Covered or 3/16"

2 Galv. Tie-Down Cleats

4 Sliding Barrel-Bolt Locks

2 Turnbuckles, 5/16" Threads

70 ft. 5/16" braided Nylon Rope

3 Tubes Immersible Seameroller

1 Gal. Catalysed Polyester-Auto Body Putty

2 Gals. Oil Base Enamel Paint

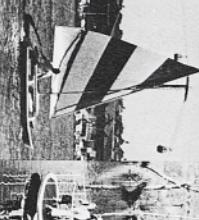
1 Roll, 2" grey fabric-backed Duct Tape

15"-6" x 19"-8" Tarpaulin "Flextuf" Rip-Stop

Polyethylene (with grommets and rope inside hem,) or "Super-Tuff" rip resistant Tarpaulin

If you're interested in more low-cost recreation projects you can build, fill out this coupon and mail it to: Stevenson Projects, Box 584, Del Mar, Calif., 92014 to receive our illustrated brochure including: a 14' Catamaran, a Redwood Hot-Tub; a 22' Pontoon Boat; a miniature Indy Race Car; a simple Beginner's Sailboat; Hydrofoil; a family-size Catamaran; a 12', three-way Prism for motoring, rowing, or sailing; a lightweight Land-Sailer; a 14' Bass-Boat; a modular Greenhouse; and an extra-complete Sewing Center.

Name	_____
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# P.S. MINI-CAT

 Stevenson Projects

MINI-CAT was designed to bring some of the newer speed features of the larger, second generation racing catamarans down to a size that can be conveniently car-towed to the water. With lightweight, 65-pound hulls, two position rudders for easy beaching, and one-man set-up ability, the MINI-CAT is one of the simplest boats for the beginner to learn to sail. Finally, you will be found the MINI-CAT to be a delightfully faithful performer, dependable to take if you do things right, and in a gust she's fast enough to throw water off her bow. She's both docile and exciting—and a good boat for beginners and veteran sailors alike.

Hull racing is simple, using 9/4" plywood sides and solid lumber for the hulls and the bottoms, so you don't need stringers and the number of screws

needed is cut in half.

Figure #1 shows the general building steps for the hulls. First the pair of plywood side panels is joined together and then attached to one edge of the hull top. Then the sole lumber bulkheads and transoms are attached to the hull top and bottom. The hull bottom is built up in layers, then attached. Finally, the opposite hull side plywood panels are attached, after sealing steps are completed.

If experienced builders will be with us, we'll go into the basic techniques we've found well for hulls, cutting and assembling wood components. Then we'll get construction under way in the step-by-step building guide.

### BOAT BUILDING TECHNIQUES

The first step is to mark down the shape of the parts on the wood. With large panels we mark straight lines with a straight edge and a chalk board, spacing the lines 1/4" apart. We use a carpenter's square to mark these lines (called "station" lines) across lumber pieces and we use another, uncarved piece of wood to mark these lines squarely across the 1/4" panels. To mark curves accurately, we mark the lengthwise ("reference line") to the panel, then we measure out each station line to the curve. Then we mark the curve to the station line and mark the "offset." It's a good idea to number the station lines as shown and recheck each offset mark before marking and cutting to keep things straight.

Next, small nails are driven down into the offset marks on the station lines and then a batten (a stick about 6" - 8" long and about 1 1/4" thick) is pushed up against the batten eye to the curve end to make so the batten rests against as many nail at one time as possible. The curve is marked along the OUTSIDE of the batten and the smoothness of the bend is checked by placing the eye near the hull surface and sighting down to the curve from the eye to make sure the curve has no unwanted S-bends in it.

The uncut edge of a plywood panel makes a good straight edge for marking right angles and intricate shapes like the bulkhead commers can be done by sketching the 2" squares along the lumber, then transferring key dimensions onto the wood by compass or from squares from the grid work in the plan.

We use a hand-held electric circular saw to cut the larger curves and straight cuts, setting the blade cut depth to 1/2" of the bottom surface of the wood. Cut with a shallow set circular blade, never use a heavy, regular circular. You can use a hand saw or saber saw to cut the tighter radius curves.

You can check the panels out with a pencil for both hulls at one corner and make sure faces up on one set and down on the other so you end up with a finished surface on the outside of both hulls. Be sure to keep a few extra sets and cuts notched in the plan and check to make sure you end up with an opposing angles cut to form an opposite pair to fit the right and left hulls. The hull sides are straight down the outside (outboard) side and curved on the inside (inboard) side.

To attach the plywood panels to the edges of the lumber parts we first mark placements for screws 3" apart and 5/8" from the edges of the panel (so the screws will be in the bulkheads and not the lumber). Next, we drill pilot holes for the screws at these marks as we progress along (with the joining

parts in position) using a combination drill bit/countriers called a "scrivematic." These are either made of wood or metal and are used to make the screws used, as they'll save a lot of time by drilling with a 3/8" bit, then going back to countersink the tops of the holes. All screw holes are drilled with the parts held in position together. If you're using straight straight edges, you can drill and use the screws, then fill in between once the parts are held in position. If you're attaching a curved edge, however, you'll probably want from one end, spreading the screw holes out and then drilling the rest of the screws. We use 1/8" flathead plated wood screws when attaching 9/4" plywood to the lumber and 1 1/8" #8 plated flathead wood screws for attaching 1" plywood to the lumber.

The kind of screwdriver you use will determine more than anything else how fast the project goes. A regular screwdriver will take a long time and wear out quickly. Yankee Phillips (Philips' head screw) will speed things up a lot.

A screwdriver attachment for the power drill or simply a screwdriver bit for a Yankee (square) screwdriver in a variable speed power drill will do the job fastest. You can drive a long line of screws in a few minutes with a drill and screwdriver, and we found that thin slot head screws work best when set up.

Before joining parts, we paint all joining surfaces with waterproof plastic resin glue which is a water mix that's cheaper and much easier to work with than wood-resorcinol type, and it holds up just as well.

We'll go into sealing, finishing and painting techniques later. Right now, we can get boatbuilding.

### STEP ONE:

#### LOFTING AND CUTTING HULL PARTS

Use the methods discussed to mark the four plywood panels in Fig. #2, being careful to end up with opposing sides all the same (outboard edge to outboard edge). Cut from plywood edge to mark the curve on the hull top edge down to the bottom edge. Then from this top down to bottom mark the upward curve on the hull bottom as marked. Save the scraps from the hull panels for the front crossbar, assembled later.

Next, we'll mark and cut the hulls.

First, mark and cut a pair of forward bulkheads, after bulkheads and transoms are cut, as shown in Fig. #3. The bulkheads are cut to the inside of the heads are notched to allow water to drain within the hull.

### STEP TWO: HULL ASSEMBLY

Fig. #2 shows the sizes of the plywood panel parts. Cut a pair of hulls from a 3 x 3' stock. To make the forward panel, cut the end of the panel from one hull down on a flat surface, butted end to end in position with their finished sides up. Spread the parts apart a few inches, place an outside bulkhead on the forward edge of the hulls, then fill in between once the parts are held in position. If you're attaching a curved edge, however, you'll probably want from one end, spreading the screw holes out and then drilling the rest of the screws. Use 1/8" flathead plated wood screws when attaching 9/4" plywood to the lumber and 1 1/8" #8 plated flathead wood screws for attaching 1" plywood to the lumber.

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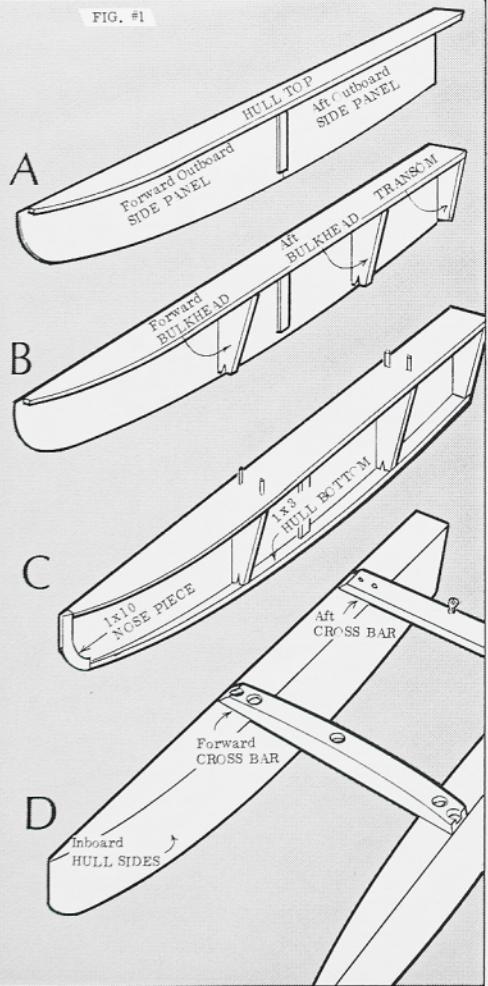
To complete Step "A" in Fig. #1, drill and drive screws to attach the straight side of the hull top edge to the hull side, or the unmarked surface of the outside bulkhead. Then glue the hull side flush to the top. However, use a Lurex G.L.E. to do this.

Next, use a square to measure and mark the positions of the 2" sides of the two bulkheads, as shown in Fig. #5, placing the square on the aft side of the hulls and marking the 2" sides on the curve at the bow. Position the forward bulkhead in position against the hull top and outside board and draw around its position on the hull top and bow (you can use a pencil to mark its position). Drill 1/8" pilot holes through the side panel and up through the top, placing the holes between the bulkhead position and the hull top edge. Drill 1/8" pilot holes in the side of the hull and side panel and drive in 1 1/8" #8 plated screws with 1" screws on the side and 1 1/8" #8 plated screws on the top. You can use the same mark, drill and then drill from the other side, or any part that has to be mounted "blind" this way. Attach the other bulkheads and transoms this way, remembering NOT TO GLUE the tops to the hulls at this point. This completes Step "B" in Fig. #1.

Next, place the hulls on their tops and attach the straight sides of the hull bottoms to the insides of the bulk sides and to the bottoms of the bulkheads and

heads in Fig. #6. The hulls are cut to the inside of the heads are notched to allow water to drain within the hull.

FIG. #1



transoms, using plenty of glue. Drive  $1\frac{1}{2}$ " screws into the bulkhead bottoms on each side of the notch cutouts.

With the hull on its outboard side, place a  $1" \times 10"$  under the bow so the curve can be traced onto it, then mark the rear side of this bow nose piece so it butts back against the front edges of the hull top and bottom, as shown in Fig. #2, bottom left. The rear curve of the nose piece can be free handed, maintaining at least a  $3"$  width of the part. Attach this nose piece to the inside of the outboard hull side with glue and screws placed  $2"$  apart.

Mark and drive  $\frac{1}{2}$ " holes down through the hall top so they'll be tangent against the rear side of both bulkheads, and  $2\frac{1}{2}$ " from the forward inboard bulkhead. Drill these holes, then countersink as shown in Fig. 2, Fig. #3, and Fig. #5. Next bend  $2\frac{1}{2}$ " x  $\frac{1}{8}$ " galvanized threaded rods as shown in Fig. #2, bottom right. Slip the rods through the holes, as shown, then drill at the bottom bend to attach a  $\frac{1}{4}$ " U-bolt (tap the U-bolt onto the wood with a hammer to mark its place placement). Mount a U-bolt near the top of the bulkhead (about  $\frac{1}{2}$ " down from the top piece) to secure the tops of the rods and tighten all nuts on the U-bolts firmly. Slip a pipe down over the rod ends to adjust so all ends are perpendicular to the hull tops. This completes Step "C" in Fig. #1.

The angled edges of the hull tops and bottoms are an important part of the hull. The first step is to use a hand saw to cut the hull from stem to stern. The next step is to use a belt sander and/or Surfboard wood shaper to plane off the exposed edges of the hull framing so the in-board panels will lie down evenly against them to make a good, watertight joint with all parts, especially at the nosepiece, hull bottom, and transom. Lay a straight edge across the frame pieces to make sure they are straight. Then use a hand saw to shave off to allow a good, even joint with the side panels. The nose piece should be shaped down to about  $\frac{1}{4}$  " thick at the bow, fairing back into the bottom piece. You may have to hack off the nose piece mounting screws to do this, redriving them after the in-board panel is mounted.

Mount the barrel bolt rudder "pintles" to the all side of the transom with the hardware shown in Fig. 2. Use a screw instead of the screw provided on the top pintles and  $\frac{1}{4} \times 1\frac{1}{4}$  bolts to mount the bottom pintles. Raise the bottom bolts (only) to the "up" position, then drive in a screw just below the bolt so the screw head is  $\frac{1}{8}$  " out from the transom, so the bolt cannot return to the "down" position.

When you're satisfied that the inboard edges of the framing have been fairled off, attach the inboard panels to the edges using plenty of glue on all surfaces.

faces EXCEPT those touching the hull top. Align the side panel flush at the top and at the rear of the transom, driving in positioning screws at the corners, then working fast to attach the entire inboard side to the bottom, the transom, the bow, up the bulkheads (marking their position with a straightedge aligned with the screws at the hull top and bottom), then across the top. Note: Place the hull down on a flat, stable surface, and use a straight edge on the hull bottom to align the inboard side panel.

you can align the bow from parallel to the outboard side at the transom, when driving the first placement screws. Allow the hull to cure overnight, then remove the screws holding the hull top and cut the hull top to remove.

We used a cartridge gun to apply immersible seam sealer to all joints, cracks and knot holes inside the hulls, pushing the sealer down into the seams by running a finger along the bead after it has been laid down. When this was cured according to the directions on the label, we painted the hull inside with two coats of Thompson's Water Seal, so you could

two coats of Thompson's Water Seal (you could use oil base enamel). If you want positive flotation (for over 750 pounds) more than the natural buoyancy of the wood hulls, crossbars and mast, you can fill the compartments of the hulls with Expanded Polystyrene foam chips available at packing and shipping supply companies. Ask for "EPS Stars" or "Peanuts" foam cushioning.

### STEP THREE: BRIDGEDECK ASSEMBLY

The first step to making the bridgedeck (crossbars and trampoline) is to mark two lines across the bottom of the hull. The first line is 2" from the deck & 6 $\frac{1}{2}$ " apart, using a square. Set the tilt blade 1" from the deck and cut across so both ends angle in at the top when the finished side is up.

Prop one end up and set one crossbar on its top edge. Set the cut against the aft threaded rod "mounting hole," and with its end flush with the outboard side of the hull top. Use a square to mark lines across the 2" x 6" at the centerpoints of the bolt holes. These are the sole positions at the center of the crossbar. You'll end up with bolt holes through the center of the crossbar, exactly the right distance from the crossbar end.

and back of the bar to remove the thin end of the 6' bar between the end and the hole, (as shown in the diagram) and then the ends of the 1' x 6' bar with the ends of the 2' x 6' bar, and then ground down the edge corner of the 1' x 6' and plywood. We were at it, we drilled a  $\frac{1}{4}$ " hole down to the centerpoint of the top 1' x 6' for a mast drilled with the  $\frac{3}{8}$ " holesaw attachment, made the trampoline from plastic tarpaulin, doubled over three times, grommeted and the hulls. The mainsail, jib and both halves trampoline are all cut from the same - it's best to look over the sail cutting instructions before cutting the trampoline sheets, to make you will be able to use the right parts of the tarpaulin.

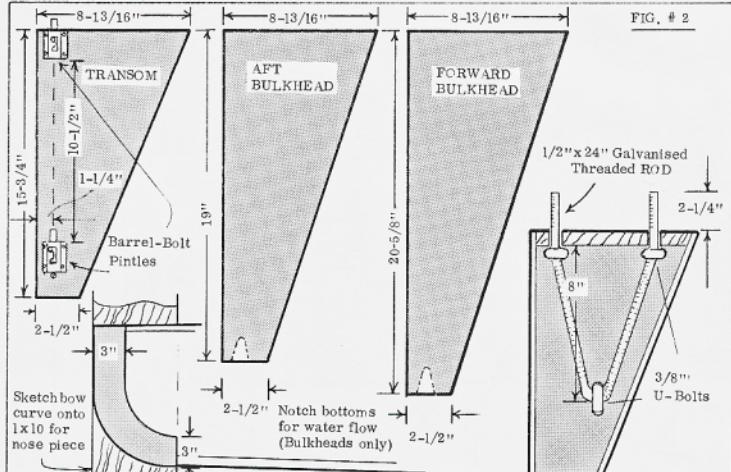
The kind of tarps we've used come in orange and are widely used for covering machinery and for covering roofs, as well as for covering the ground. The tarp material is a reinforced plastic coated with a woven fabric. A 10' x 20' piece can retail around \$10, and had seemed every bit as good as a \$200 piece when we were doing a rope. The material has proved to be extremely good, tear-resistant, and it stands up well to exposure. It has been used for many years in the package because of the original quality of the material.

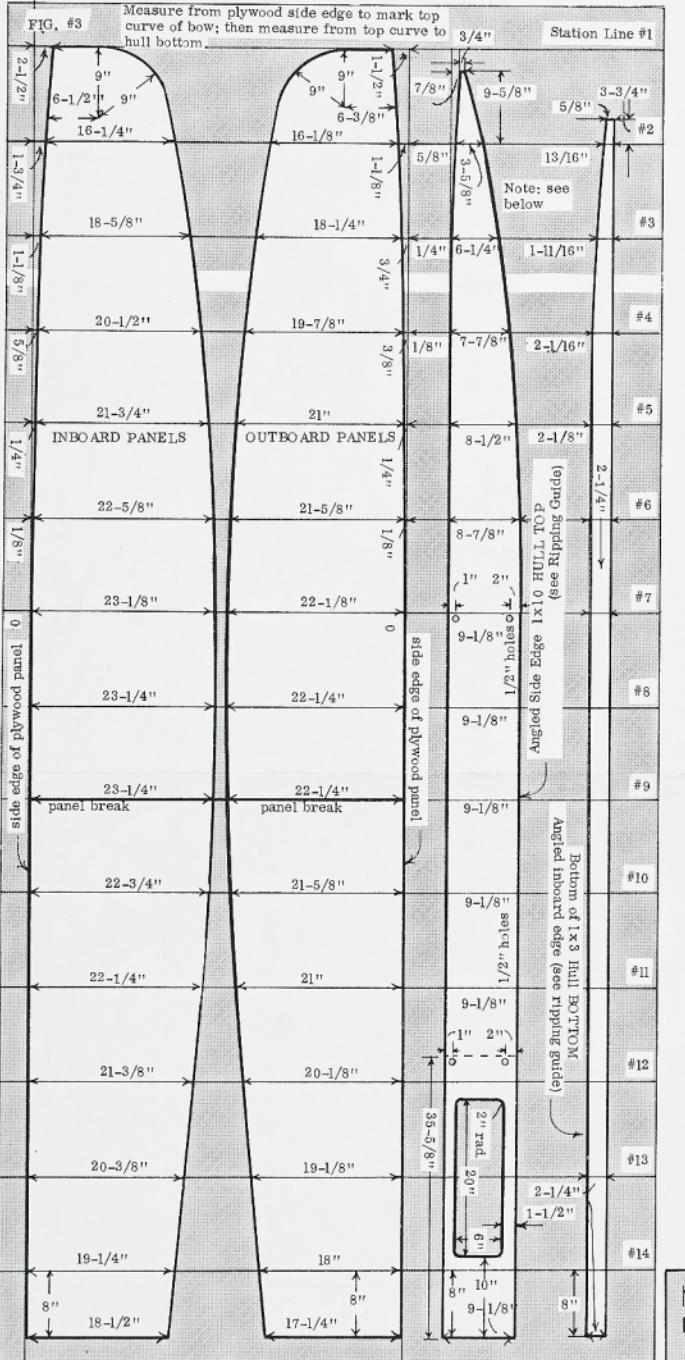
If you want to complete the trampoline right now, you should skip to the sail layout and note that the sail layout is the same as the tarp layout. The sail makes use of the hem that runs at right angles to the seams of the material, and also uses the hem that runs along the top point of the sail.

The jib made use of another hem, and for its form, rear corner (or clew) using two adjoining canvas edges for the sail and reef edges (or foot edges) for the sail. If you have a trampoline like this, you can lay a lot less sail over the trampoline bunks, which lengthwise will parallel to the seam.

We cut it into 10 1/2" x 6" pieces, running a seamed edge along the top of each piece. Then we cut it back over again, as shown in Fig. 66 at (a), leaving up with a 20° or so triple-ridge piece, 6" x 6". This is a seamed edge along the bottom of one of the 10 1/2" pieces. Then we cut the 10 1/2" pieces into 10 1/2" x 1" strips, and these are joined end-to-end to make the hewed material as shown. Then both hewed halves were laid out side by side with the 1" x 1" strips in the center. The hewed grain is faced up front and both the hewed and the seamed was stashed to the back side of the 1" x 2". The 1" x 2" was then rolled back under the material one revolution, and then mounted to the underside of forward crossbar (centered) by drilling and driving a 1/2" x 1 1/2" lag screw into the 1" x 2" and into the seamed, spacing the screws 6" apart. With the crossbars mounted on the hulls, we then freed the front of the trampoline under the crossbar, then rolled the trampoline over on its revolution, then freed 10 1/2" screws up through the 1" x 2" and into the rear crossbar with the trampoline material pulled as tightly as possible (again, the 1" x 2" is the only part of the trampoline that is not hewed).

FIG. 42





To pull the transom tight across the bear, we drilled  $\frac{1}{4}$ " holes through the inboard side panels and into the side edges of the hull top pieces, spacing the holes across from the adjacent trussing grommets. Then  $\frac{1}{4}$ " x 3" screw-eyes were twisted into the holes and the center of each grommet with  $\frac{1}{4}$ " nylon line permanently, as shown in Fig. 6 at the bottom. Then the side grommets can be faced to the screw eyes as shown, and pulled tight before sailing.

#### STEP FOUR: BUILDING THE MAST

This section is the widest part of all wood, sandwiching a  $2 \times 2$  and a  $1 \times 2$  to form a symmetrical air foil-type cross section for a leading edge to the sail. The mast pivots automatically to cut into the wind and is fully stayed for rigidity (and all parts can be bought at the lumberyard).

The first step is to cut five 6"-wide strips of  $\frac{1}{4}$ " ACX plywood (try to use a good panel with no large knots) to the width of the hull on the back side. Next a straight-grained clear fir (or spruce)  $2 \times 2$  and  $1 \times 2$  were trimmed to 18". Fig. 7 shows the mast frame layout from the side. The  $2 \times 2$  and  $1 \times 2$  are joined together and are butted together end to end and a third length, cut to 24", is butted against these to form the mast bottom.

Four tapering strip joiners were cut from scrap  $2 \times 4$  (as shown at top left of Fig. 7). These joiners were cut with a slight S-curve as shown to fit between the  $2 \times 2$  and  $1 \times 2$  providing a solid back-up for the end joints of the plywood strips (these strips will assume a slight S-bend after all screws are driven).

To complete Step "A" as shown, we glued and screwed the panels spacing 6" apart so they

**Note:**  
When inboard panel is bent into position, front edge will be a little aft of the outboard panel from on the nosepiece. Rounding off bow will fair both panels off.

sink into the centers of the  $2 \times 2$  and  $1 \times 2$  to the  $2 \times 2$  so that one edge of the  $2 \times 2$  extends out beyond the edge of the strip  $\frac{1}{4}$ ". The flat side of the  $1 \times 2$  was mounted to the same (unfinished) side of the strips with the narrow edge of the  $1 \times 2$  parallel to the other edge of the strip and  $\frac{1}{4}$ " in from the edge.

Next, two strip joiners were mounted in place with the  $2 \times 2$  on the inside of the mast bottom, as shown. These screws were used to position the  $\frac{1}{4}$ " plywood strips, rear end butts joints and into the strip joiners to help pull the strips down into the general shape. Then the assembly was held in place with a  $5 \times 6$  in.  $1 \frac{1}{2}$ " diameter hole was drilled in through the center of the front (the front edge of the  $2 \times 2$  is 63" down from the mast top and a plated or galvanized  $\frac{1}{2}$ " x  $\frac{1}{8}$ " eyebolt was bolted in place with lock washers and lock nuts on both sides (see Fig. 7, lower left).

Then the opposite side plywood strips were screwed into place, attaching them first to the  $2 \times 2$  then to the  $1 \times 2$  and then the position was checked and slipped down into the top end of the mast and then screwed in place. The remaining strip joiner was then mounted and secured with a  $5 \times 6$  in.  $1 \frac{1}{2}$ " back from its front  $\frac{1}{16}$ " with other holes in "C". A  $\frac{1}{2}$ " x  $\frac{1}{8}$ " roundhead threaded all the way was bolted through the  $1 \times 2$  with wide washers and lock nuts on both sides of the wood block following the head of the bolt to extend down  $\frac{1}{2}$ " below the mast bottom to form a pivot pin for the mast as in Fig. 7, lower left.

The next step was to make sure the sail is run inside the leading edge of the mast, so the next step was to

mount the halvards pulleys to the mast head. We cut

open the ends of two single pulleys (as shown in Fig.

7) and then cut a slot in the top edge of the pulley

90° instead of 180°. Then the pulleys were

mounted to the top edge of the mast, back enough so

that the halvard line can come up the front of the  $2 \times 2$  and then down the  $1 \times 2$  and then down the mast, about  $\frac{1}{2}$ " beyond the rear edge of

the plywood strips. We mounted the pulleys by drilling

the top joint block through the pulley mounting

eye and then drilling a hole down the  $1 \frac{1}{2}$ " lag

screws with wide washers to clamp the pulleys firmly

down into the front of the mast member.

To cover the front of the mast, we cut a length of  $1 \frac{1}{2}$ " inside diameter schedule 40 plastic pipe down the center (use a Skilaw with rippled tube or band saw), so that each half of the pipe could be down over the  $2 \times 2$  and  $1 \times 2$  when the pipe is cut beyond the top edge of the mast. With the hole saw attachment we drilled  $\frac{1}{4}$ " holes through the pipe halves 63" down from the top and 36" up from the bottom to clear the eye bolt of the top eye and provide an undercut for the front of the mast top cap at the bottom. (If the hole doesn't quite clear your eyebolt, you can slice through one side of the pipe at the eyebolt hole and slot it through the base of the eyebolt.) We then cut the pipe in half and then, with the pipe to the  $2 \times 2$  (spacing the screws 12" intervals), laid the halvard line down on the  $2 \times 2$  forward side (facings up this step) and screwed the pipe halves to the  $2 \times 2$  and  $1 \times 2$  and the halvard line to the pipe.

To hold the hole bore of the sail is a track made from  $\frac{1}{2}$ " inside diameter schedule 40 plastic pipe. We cut a slot in the  $2 \times 2$  with the rip guide on the Skilaw and then cut the pipe to size (we sliced a cut along only one side of the pipe (a table saw would work better, but try to use a blade that will cut a narrow kerf)).

By holding the sail hard against the front edge and running the rip guide of the Skilaw (circular electric hand saw) along the outside surface of the plywood edge (not far from the front edge), we cut the slot to trim and the inside surface of the pipe close to you, if needed, to allow the  $\frac{1}{2}$ " inside diameter pipe to be slipped in the slot in between the plywood at the rear and to be pushed up against the rear of the  $1 \times 2$ .

We anchored the  $\frac{1}{2}$ " pipe "sail track" in the slot by laying two heads of waterproof adhesive caulking down the slot and then pushing the pipe firmly down into the slot and smoothing the squished-out caulking into the joint between the pipe and the plywood on both sides (making sure the slot in the pipe does not catch any of the wood away from the thinner edge of the mast) (see "D", Fig. 7). To cover the top of the mast we cut a rounded shape (Fig. 7, top right) from light aluminum flashing, then bent it to the top of the mast and the cable back on itself with a  $\frac{1}{4}$ " cable clamp. When finally setting the rigging up for sailing (after tuning), grasp the cable clamp with a pair of channel locks and then turn the cable clamp to tighten the nuts on the clamp as tightly as possible (recheck tightness after the first sail).

If you're using extra heavy cables in your rigging, you may want to  $\frac{1}{4}$ " cable trimmers to protect the plastic coating on the cable clamps. We snugged our clamps right down onto the plastic covered cable and had no problems with slipping. However, it's a good idea to use a pair of channel locks and pulling hard out to all sides with the halvard and then checking all cable clamps to see if the plastic coating is held under the clamps.

To mount the spreader bars, we drilled a  $\frac{1}{4}$ " hole

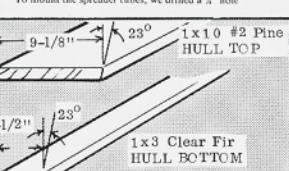


FIG. #4 RIPPING GUIDE



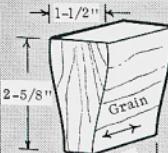
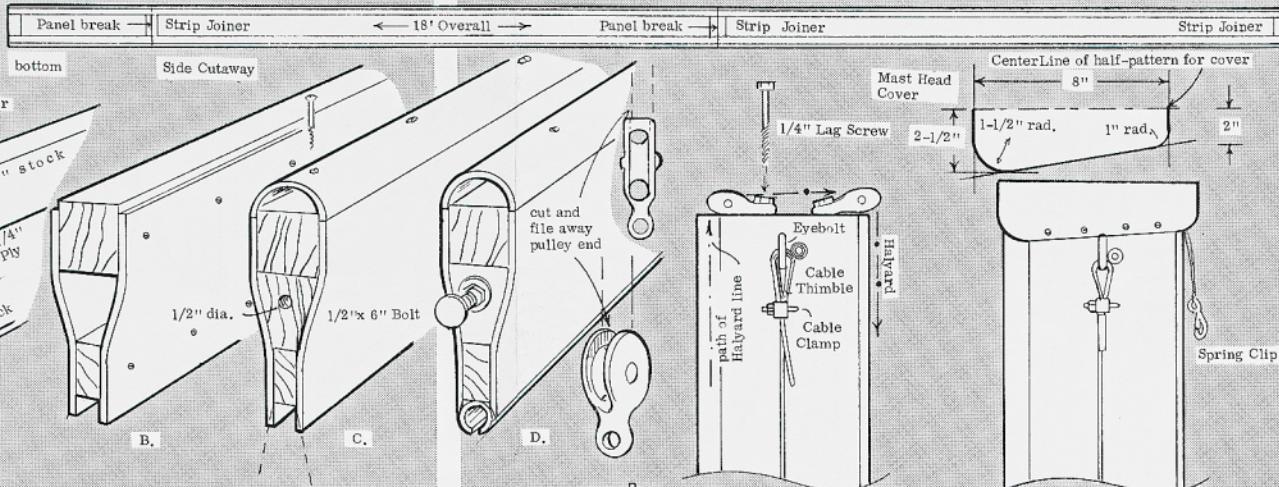
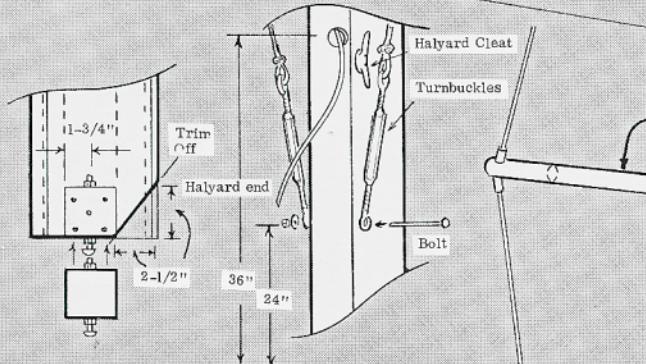


FIG. #7



Side View of Mast

Front View of Mast

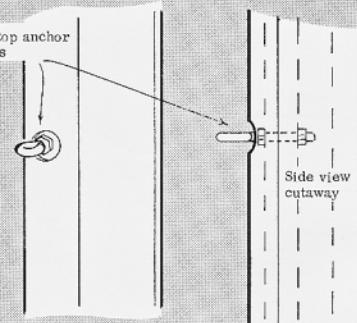


Spreader Bars

1/2" x 24" pipe inside tubes  
(see text)

Wrap Mast Stays with  
tape to locate Spreaders  
perpendicular to Mast

1/2" Eyebolt top anchor  
for Mast stays



not overlapping). A 6½" aluminum strap was mounted to each side of the mast (as shown in Fig. #10, at center). The straps are mounted with 2½" x 16-gauge sheet metal screws. The strap is bent so the straps 1¾" apart at the rear of the mast plywood strips. The straps were drilled parallel at the aft end and ¼" holes were drilled through the strips, 5½" apart. The strips were then bent at the aft ends and rounded off all sharp corners with a file.

Joined to the boom to the mast were inserted a ¼" bolt and a 1" lock washer, and then passed through the circular holes in the ¾" pipe, and through the hole in the bottom boom strap. Next, a 4" x ¾" eyebolt was inserted through the hole in one of the ¾" pipe sections, and then passed through the ¾" pipe, and through the hole in the other mast strap. The vertical bolt was secured with a wing nut for a quick and easy mast removal.

The boom is controlled by a 25' x  $\frac{1}{4}$ " braided nylon line (the "mainsheet") running through a double pulley block mounted to the centerpoint of the rear crossbar with a  $\frac{1}{4}$ " eyebolt that opens the eyelet. The boom is sheeted in with the mainsheet. A second double pulley was mounted to another  $\frac{1}{4}$ " eyebolt and inserted up through the hole in the boom, as shown. A knot was tied at the end of the sheet, then the other end was inserted back through the rear block, up through the upper block, and so on, coming out forward through the upper block to sheet out.

The line coming from the "jb sheet" passes back through a  $3 \times \frac{1}{4}$ " screw eye and then up to the top of the rear crossbar 13" out from the center on each side. From there it passes back through a home-built quick-release cleat made from  $\frac{1}{2}$ " inside diameter plastic tubing cut from a  $\frac{1}{2}$ " diameter PVC pipe. The ends are trimmed off the ends at an angle (as shown), cut a  $1 \frac{1}{2} \times \frac{1}{4}$ " wedge cut out of the top of the pipe, and then the top of the pipe is cut off, leaving the remaining pipe at the ends. These "jam cleats" were mounted directly behind the screen and the rear of the cleats pointing toward the center of the rear crossbar. The ends of the jb sheet pass back through these jam cleats and a knot is tied in both ends.

## STEP SEVEN: SAILMAKING

As we are in the trampoline building instructions, the front edge of the sail (the "lift") is secured to the rear corner grommets of the taro to form the top corner of the sail. The seamed edge with the cord sown in is inserted into the  $\frac{1}{2}$ " plastic pipe at the rear of the mast. The pipe is then inserted into the rear of the top ring. It is cast onto the pipe and the sail material is extended back through the slot. The sail shape is improved by use of six full-length battens made of  $\frac{1}{2}$ " diameter wood, and six  $\frac{1}{2}$ " diameter wood number yards. To batten the sail to the sail we used grey, fabric-backed duct tape on both sides of the sail material so that the adhesive on the two layers of tape would grip the wood. We then applied the tarp material with a  $\frac{1}{8}$ " hole punched, spaced every  $\frac{1}{2}$ ". After cutting the mainsail shape, we laid out the six battens as shown with the forward end of each batten pointing toward the top corner grommets on the leading edge so that even though the tape is wrapped around the front edge of the sail for strength, the total thickness of the sail is not too wide for the hole punch.

## STEP EIGHT: RUDDERS

that the tape/tail's grabbed onto each other permanently (the adhesive is pressure-sensitive and is extra strong if hammered). A small length of tape is wrapped around the aft end of the batten, as seen in Step "Z". The rest of the battens were attached in the same manner. At the bottom batten only one

A hole is punched along the top of the batten, the overlapped layers of tape wrapped around the bottom of the batten and extending up the opposite side of the "gull" and through the holes from her side.

The sail is then doubled over the tape at the bottom  $\frac{1}{4}$  in., wrapping around the ends to about 6 in. in length, and the hole in the tape through the sail is then drilled. A hole is made in the top of the sail (about 1 in. from the foot of the sail). A 2 $\frac{1}{2}$  in. length of the aft corner of the sail which was then cut through the hole at the end of the boom is then folded back over the sail and is then glued to the bottom of the boom, about  $\frac{3}{4}$  in. from the end of the boom. A small spring clip is used to hold the sail in the forward end of the bottom of the sail as shown in Fig. 10, right. The sail is then glued to the boom in the gooseneck when raising the sail, able to be freed the sail into the sail track at the end of the mast, we used a  $\frac{1}{4}$  in. drill bit to drill two holes in the sail track, one on each side of the sail track, to allow the sail to be freed, track and connecting the sail to the boom. The sail is then glued to the wide, as shown in Fig. 10, top right.

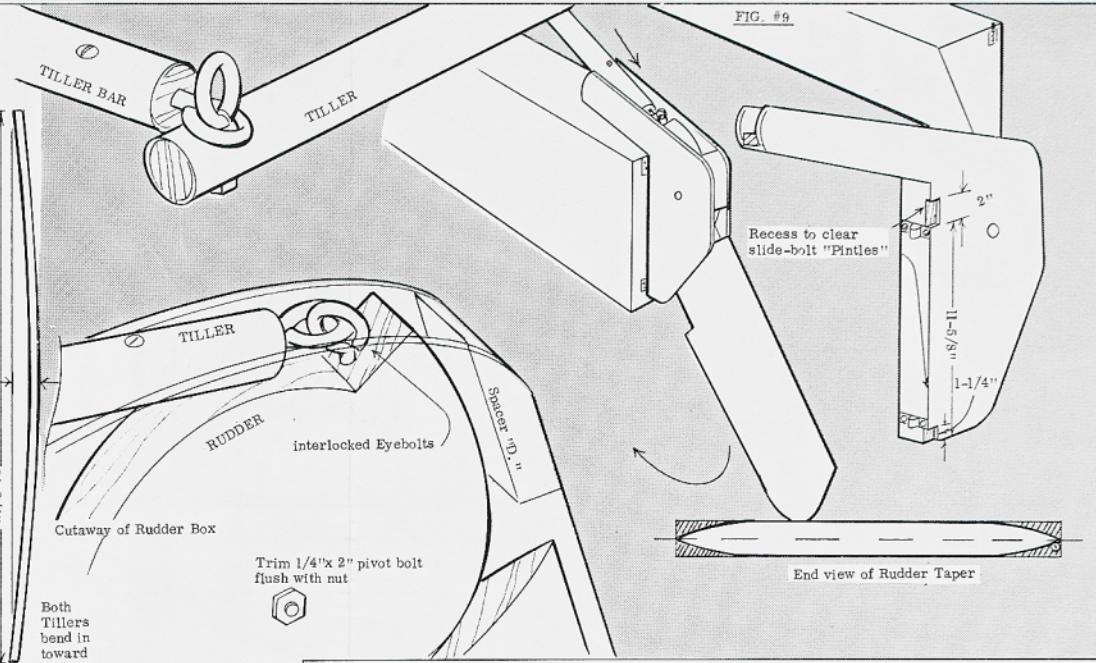
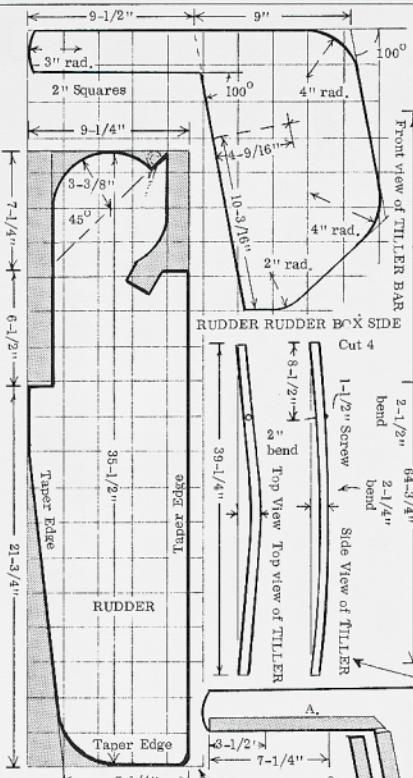
il on both sides, just behind the hemmed rope, all may be hard to pull up at first because of spots at the top or at the battens. We fed the sail to the track with the mast down flat so the sail would not catch on the battens. We then track it in and loosen up the passage in the track. If a tick is a little too wide, you may be able to pull it out of it. However, the pressure of the wind will uniform pull on the sail and we've found the will hold the sail well in actual sailing even if an pull it out from behind with your hand. make the jib (which adds a great deal to speed performance), we first cut one corner of the tarp material (as shown in Fig. 10, left of the The rear and bottom edges are formed by

rope edges of the tarp. The corner grommets had a tapered pocket 3" wide, so we lengthened the grommet and sail rear, and a light line connecting the front and top edges. The sail was then folded and the front edge was folded back and the material was trimmed where it extends out the triangle at top and bottom. The edge of the sail was then folded in the sail by passing the sail wet through the pocket. The sail was then folded back, then layered (overlapping the pocket) and stepped "B" at upper left, then, with the holes aligned, a strip of 2" wide tape or bias-tape was laid along the seam and the holes, the sail was carefully flipped over and a second strip of tape was laid along the same path opposite side (Step "D") and then hammered to

is laid down in the holes. The fore-  
end is laid down in the post before taping, or  
be threaded through afterward.  
fastened a grommet secured in the lower front  
of the job (check similar detail in Fig. #10  
the lower front corner of the mem-  
brane grommet is placed in the center of the  
snap hook and to this grommet (as in the  
job in Fig. #10). When attaching the job for a sail,  
at the top of the job is attached to the  
"link" at the top of the forestay (before  
it is raised). The bottom of the job is attached by  
the snap on the "quick-link" (the cross  
through the grommet at the bottom front of the

To mount the rudder boxes onto the pintles on the transoms, we screwed the "receiver" part of the bolt-lock rudder pivots to the front side of the 1 1/4" wide cap strip attached earlier, centered them in positions shown in the front view of the rudder boxes. Then we "glued" the rudder boxes onto the cap strip using "goof-joint" 25% from the outer corner of the cap strip and the rudder box, and with the top of the lower gudgeon 10 1/2% below the joint.

As the right in Fig. 98 the sketch shows how the inboard, outerboard corner of the cap strip is chiseled away to provide clearance for the slide on the rudder arms, to allow full swing of the rudder and control of the upper pintle so the pin can be raised to remove the rudders.



#### **FINISHING AND PAINTING**

We rounded off all edges and corners with a 5/8" foam wood shaper. The hulls, crossbars and masts were then sanded with #80, then #150 sand paper. A belt sander will save a lot of hours and provide a smooth base for painting.

All gaps, cracks and holes were filled with carefully polyester auto body putty, scraping off excess when it's first hard enough to scratch and leave with finger nail mark. Then, if you work fast with sharp Surfsoam shaper, you can remove a lot of excess lumps before it really hardens. A second going-over with filler putty can fill all shallow places below the surface just smoothed down with Surfsoam.

Use a gloss, oil base enamel, let dry well between coats and sand and wipe clean just before the next coat (to prevent "fishbones"). The first coat will be just a tinted base. The second coat will have to fill in the grain pattern. By the third coat you'll start to see a nice surface forming. At the fourth coat you'll start thinking about quitting while you're ahead. But if you can persevere through the fifth and sixth coats, you'll have a really glossy, plastic-like coated boat that can stand up to years of weathering with only small surface problems to touch up at sniping fitting out time.

## SAILING CAT

Catamarans are excitement in sailing and they are definitely a special breed of boat that takes a slightly different approach. On a broad reach, sailing away

from the wind at an angle, you may start out with the sails way out to catch the force of the wind. However, as speed builds up, the "apparent wind" will swing around, bringing the feel of the wind from the bows, and you'll pull in on the sails to run with

Tacking can be tricky if you're not careful. We've found the sure-fire way to coax this cat around is to

swing her around and not too tight (when rudders can drag you to a stop). Pull up on the mainsheet to keep the sail pulling as far as you can through the loose luff. Once you get to the end of the luff, completely loose, so it can "weather vane" as the hulls pivot up without any drag. Don't touch the jib sheet. Let her coast through the wind and catch the jib from the "wrong" side (with the jib still pulled tight as it was in the previous tack). Once the jib is set, ease the jib sheet to get the jib to the nose well around into the next tack, then quickly loosen the jib and pull up on the leward jib sheet to set the jib for the next tack. Once you get onto it, it's very dependable. Don't be afraid to try experiments with the jib sheet tension and the tension of the mainsail backstay from time to time. It's key to high speed, *net performance*, and it'll *help* you keep your crew happy.

cially if there are some seas running. It's possible to stuff the bow of any cat into a wave and "pitchpole", which can be a suddenly wet and embarrassing situation that you can prevent.

brings the windward hull down and the downwind hull up in a hurry, so you can control the depth of the leeward hull with the mainsheet.

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Before heading out for a sail, make sure you have a paddle aboard in case the wind quits, plus a sponge to dry things off, and a Coast Guard approved life-jacket for each crew member.

Because the construction of a P.S. MINI-CAT is dependent on factors of materials used and craftsmanship that are beyond the control of the designer and the magazine publisher, neither the designer nor other contributors can accept responsibility for the performance of the boat as actually constructed.

#### 4-Step Sail Pocket Construction

A. Fold pocket and cut holes through both layers

B. Align Holes

C. Run Duct tape over seam, covering holes

D. Run Duct Tape along other side of sail so adhesive of both tape layers touch through holes

FIG. #10

#### 3-Step Batten Attachment

X. Position Batten and cut holes on both sides

Y. Overlap 2 layers of tape to cover Batten and both sides of sail

Z.

Tape over ends

15'-10"

33"

70"

33" Cut Battens 1" short of Sail Dimensions

70"

33"

MAINSAIL

20-1/2"

70"

1-1/2"

4"

3" wide pocket  
After taping pocket, attach grommet to top and bottom corners of Jib. Tie Spring Clip Snap Hook to top grommet.

JIB

3"

11'-9"

11'-9"

11'-4"

16-1/2"

148" Tip to Tip (after clamping)

Tie Snap-Hook to Grommet in corner, -clip to Eyebolt on Boom

If using 6 mil clear polyethylene sheet for sails, reinforce corners with tape on both sides (grabbing through holes as with pocket)

Widen Sail Track to allow feeding of sail into track

Eyebolt to attach Boom

MAST

Drill through bottom Batten and sail, -Tie on Cuthaul rope (attached to aft end of Boom) and Snap-Hook

Screw-Eye

Quick-Release Cleat

Screw-Eyes

3/16"

1/2" Plastic Pipe