

Sea Mite: a 10-Ft. Sail

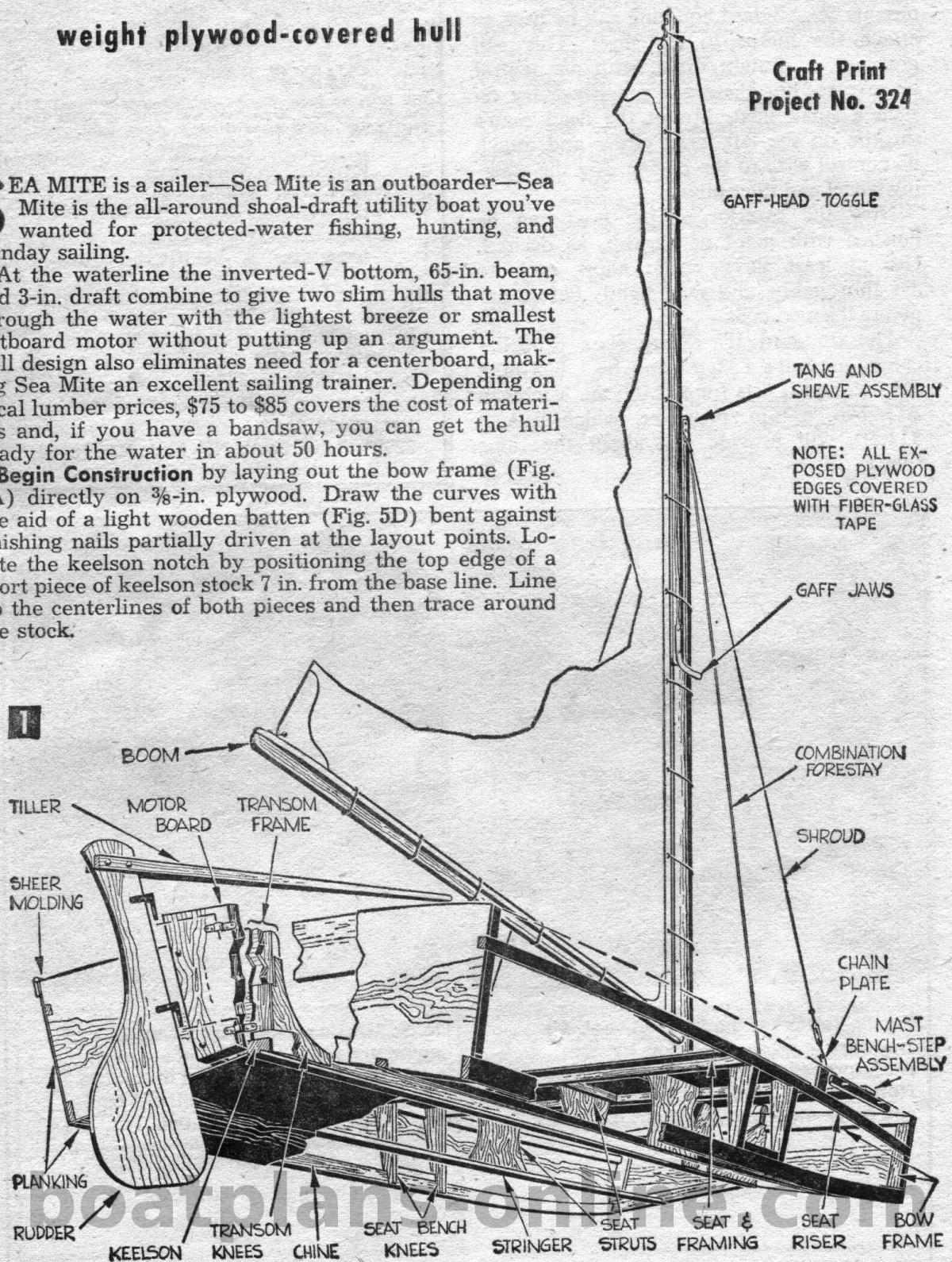
Part 1: how to construct the light-weight plywood-covered hull

SEA MITE is a sailer—Sea Mite is an outboarder—Sea Mite is the all-around shoal-draft utility boat you've wanted for protected-water fishing, hunting, and Sunday sailing.

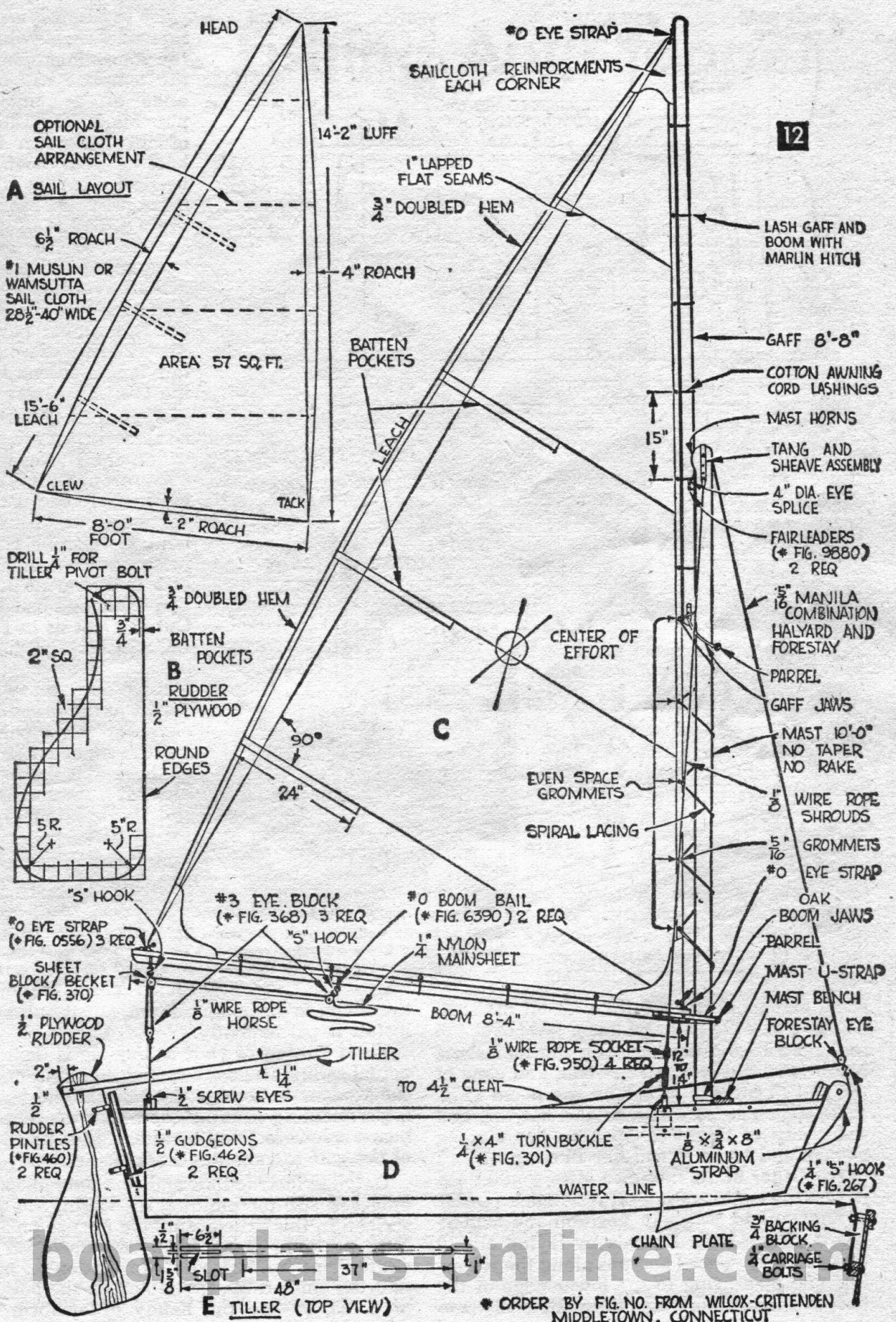
At the waterline the inverted-V bottom, 65-in. beam, and 3-in. draft combine to give two slim hulls that move through the water with the lightest breeze or smallest outboard motor without putting up an argument. The hull design also eliminates need for a centerboard, making Sea Mite an excellent sailing trainer. Depending on local lumber prices, \$75 to \$85 covers the cost of materials and, if you have a bandsaw, you can get the hull ready for the water in about 50 hours.

Begin Construction by laying out the bow frame (Fig. 4A) directly on $\frac{3}{8}$ -in. plywood. Draw the curves with the aid of a light wooden batten (Fig. 5D) bent against finishing nails partially driven at the layout points. Locate the keelson notch by positioning the top edge of a short piece of keelson stock 7 in. from the base line. Line up the centerlines of both pieces and then trace around the stock.

I



Craft Print
Project No. 324



A SAIL LAYOUT

OPTIONAL SAIL CLOTH ARRANGEMENT

6 1/2" ROACH

#1 MUSLIN OR WAMSUTTA SAIL CLOTH 28 1/2"-40" WIDE

AREA: 57 SQ. FT.

15'-6" LEACH

CLEW

8'-0" FOOT

2" ROACH

TACK

DRILL 1/4" FOR TILLER PIVOT BOLT

2" SQ

3/4" DOUBLED HEM

BATTEN POCKETS

B RUDDER

1/2" PLYWOOD

ROUND EDGES

90°

24"

5" HOOK

#0 EYE STRAP (# FIG. 0556) 3 REQ

SHEET BLOCK / BECKET (# FIG. 370)

1/2" PLYWOOD RUDDER

2" x 1/2"

1/2" RUDDER PINTLES (# FIG. 460) 2 REQ

#3 EYE BLOCK (# FIG. 368) 3 REQ

#0 BOOM BAIL (# FIG. 6390) 2 REQ

1/4" NYLON MAINSHEET

1/8" WIRE ROPE HORSE

BOOM 8'-4"

1/8" WIRE ROPE SOCKET (# FIG. 950) 4 REQ

TO 4 1/2" CLEAT

1/2" SCREW EYES

1/2" GUDGEONS (# FIG. 462) 2 REQ

1/4 x 4" TURNBUCKLE (# FIG. 301)

1/8 x 3/4 x 8" ALUMINUM STRAP

1/4" x 5" HOOK (# FIG. 267)

#0 EYE STRAP

SAILCLOTH REINFORCEMENTS EACH CORNER

1" LAPPED FLAT SEAMS

3/4" DOUBLED HEM

4" ROACH

BATTEN POCKETS

LEACH

CENTER OF EFFORT

90°

24"

EVEN SPACE GROMMETS

SPIRAL LACING

GAFF 8'-8"

COTTON AWNING CORD LASHINGS

MAST HORNS

TANG AND SHEAVE ASSEMBLY

4" DIA. EYE SPLICE

FAIRLEADERS (# FIG. 9880) 2 REQ

5/16" MANILA COMBINATION HALYARD AND FORESTAY

PARREL

GAFF JAWS

MAST 10'-0" NO TAPER NO RAKE

1" WIRE ROPE SHROUDS

5/16" GROMMETS

#0 EYE STRAP

OAK BOOM JAWS

PARREL

MAST U-STRAP

MAST BENCH

FORESTAY EYE BLOCK

E TILLER (TOP VIEW)

37"

48"

SLOT

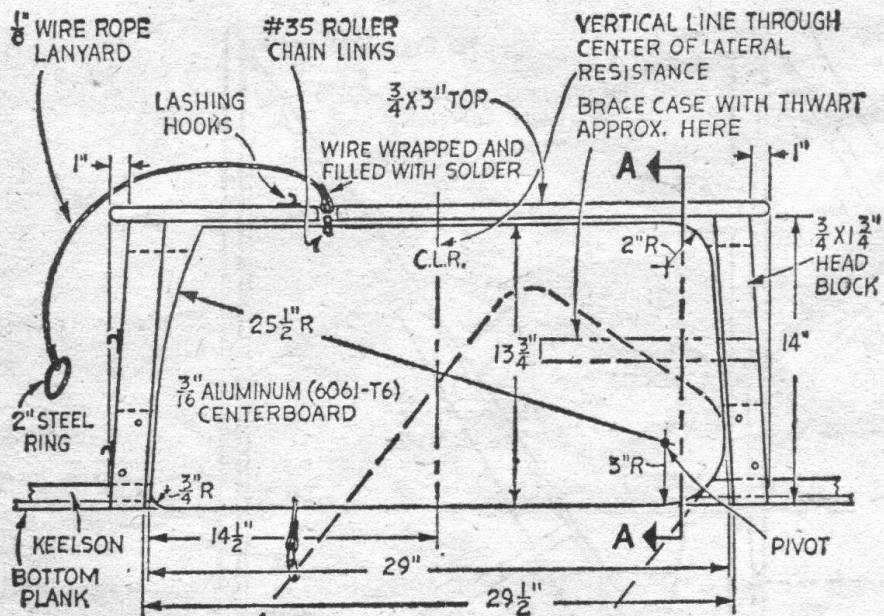
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6 1/2"

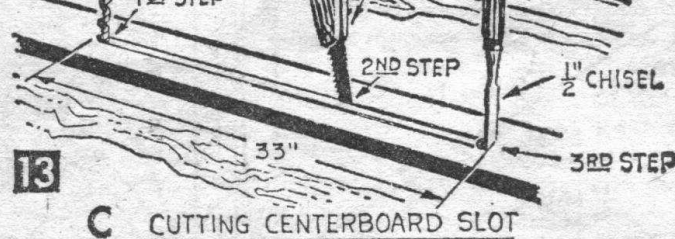
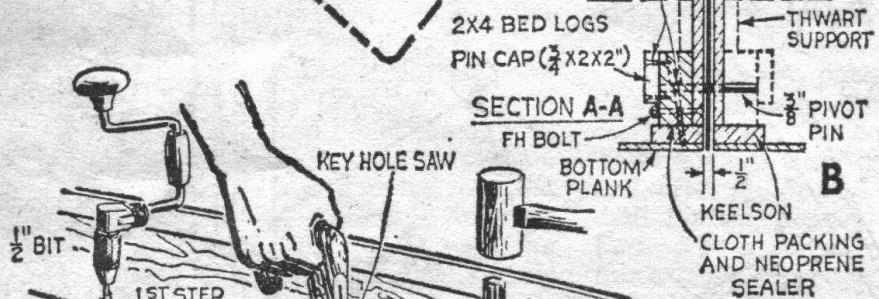
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1/2"

ORDER BY FIG. NO. FROM WILCOX-CRITTENDEN MIDDLETOWN, CONNECTICUT



A
CENTERBOARD
AND
CENTERBOARD CASE



13

C CUTTING CENTERBOARD SLOT

stem, and then to a 4 1/2-in. cleat on the seat.

Now place the gaff and boom jaws over the mast and fit the parrels. Rig the mainsheet horse (Fig. 12F). Lash the tack and clew of the sail to the eye straps on the boom (Fig. 12C). Then hoist away on the halyard and are ready to take Sea Mite on her maiden voyage and learn to sail her like a pro.

For Other Boats than Sea Mite, you'll need to find the center of lateral resistance (CLR) of the hull to properly position the centerboard (Fig. 13A). Do this by laying out 10 or 12 equally spaced stations along the waterline and measuring to the lower edge of the keel at each station. Use these dimensions to make a scaled-down cardboard template of

the underwater profile

By trial and error, find the point where the long dimension of the template will balance on a common pin. Mark the location of this point on the keel of your boat. A vertical line at this mark will go through the CLR. Install the centerboard case so it is equally divided fore and aft over this point. The center of effort of the sail should be located 2 to 4% of waterline length forward of the CLR.

If your boat has a keel 5 in. wide or wider, the slot can be cut through it, but with narrower keels (or none at all) the bottom must be reinforced with a section of 5- to 6-in.-wide lumber, to act as a bed log. Cut the slot as in Fig. 13C. Insert the head blocks, coating the mating surfaces with glue. Cut the case sides next, and, after painting the inner surfaces of these and the head blocks, attach them and the bed log (Fig. 13B).

Make a cardboard template of the centerboard (Fig. 13B) and install it on the 3/8-in. pivot pin to be sure it will swing clear. Then transfer

the shape to 3/16-in. aluminum, cut it out, and install it permanently.

Final Tuning of your sailing rig is done in actual sailing trials by shifting the position of the wedges to change the rake of the mast, experimenting with the depth that the centerboard is lowered, and by altering the position of the gaff to vary the draft of the sail.

Detailed instructions and complete plans in enlarged size for building the sailing rig described in this article, suitable for use on Sea Mite or other small boats, are included in Craft Print No. 324. For information on how to order this print, see the box on the bottom of p. 43, or use the handy order form on page 112.

or Power Catamaran

After cutting the plywood, lay the framing on it and mark the stock for cutting. Begin with the top framepiece and follow with the bottom and sides in that order. Rip the stock for the side and bottom framepieces from 1x6 lumber. When all pieces are cut, set them in position to check their fit and trace their outlines on the plywood. Then coat the contacting surfaces with glue and permanently attach the framing with a double row of 1 1/4-in. ringed nails spaced 2 in. apart.

When finished, position the 2x4 stock for the center framepiece on the assembly so the centerlines and top edges coincide. Then mark the stock for cutting, being sure to allow 1/2 in. to extend over the notch for fitting the frame to the keelson (Fig. 3C). Attach the center framepiece with glue and nails.

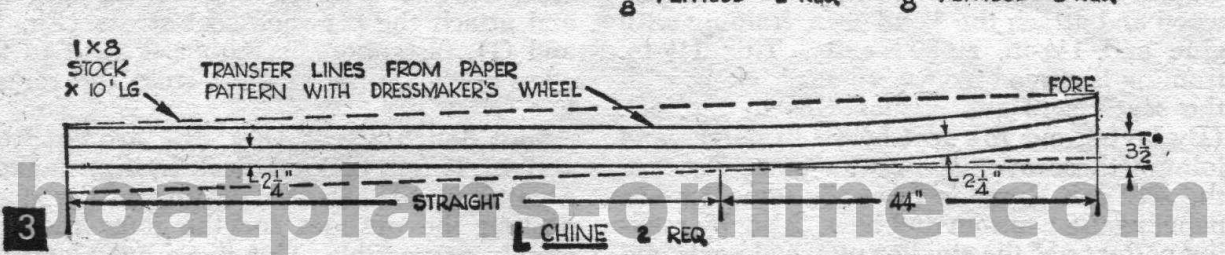
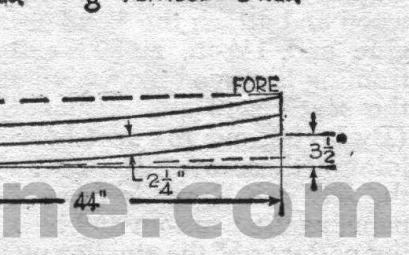
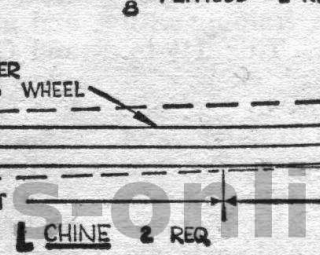
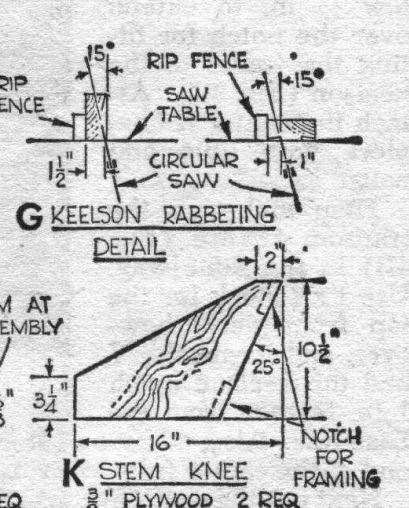
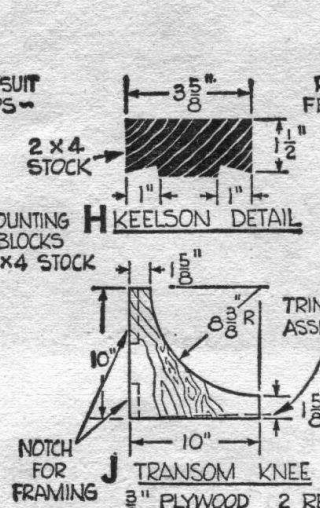
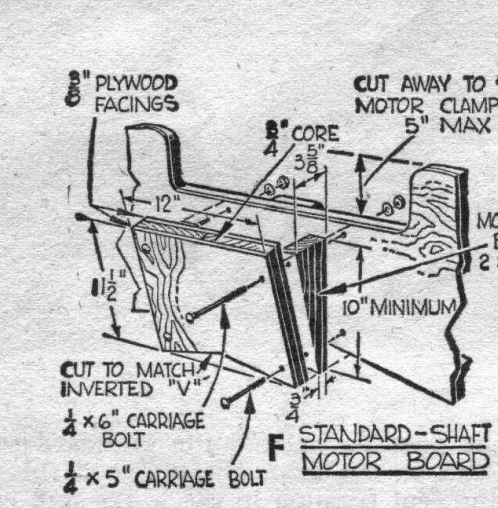
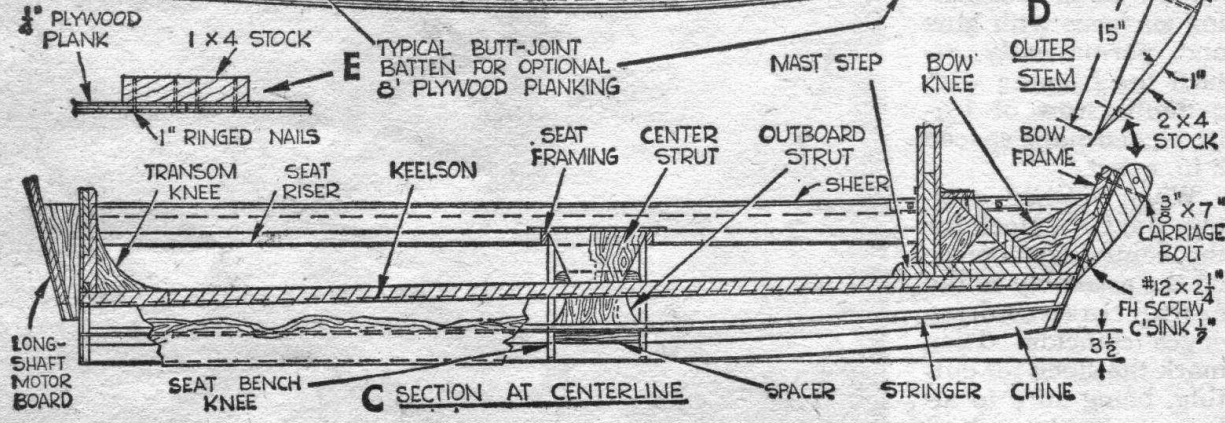
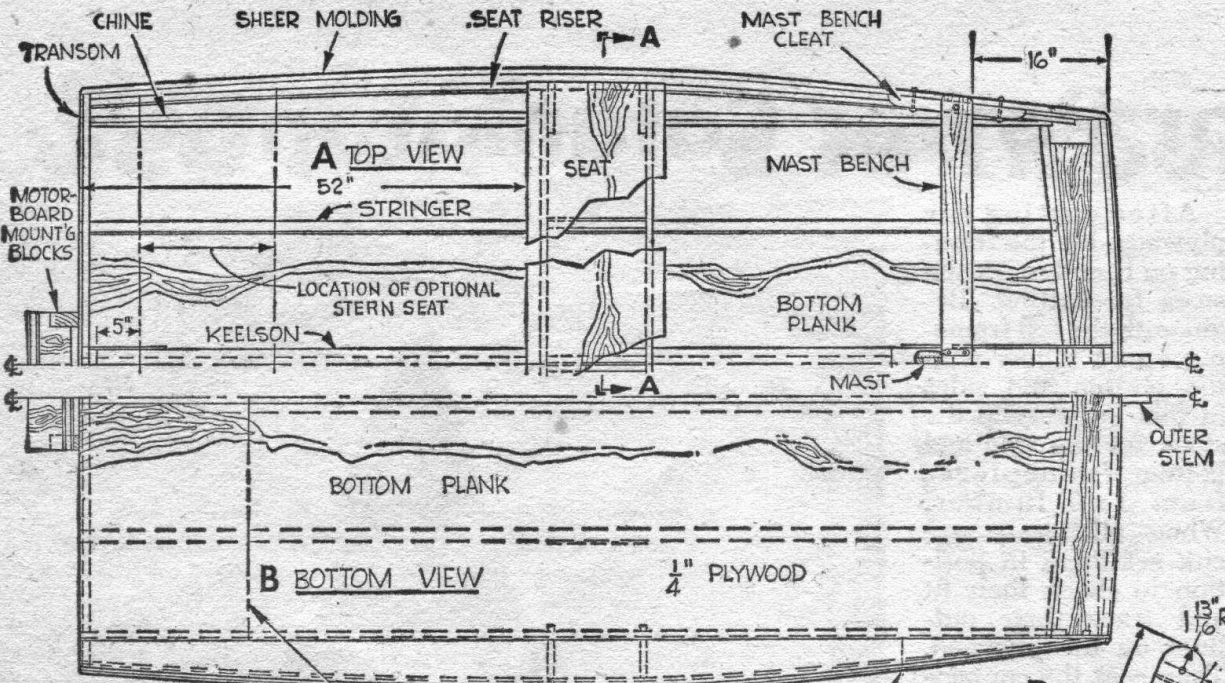
Then make up the transom frame (Fig. 4B) in the same way. Use 1x4 stock for the top framepiece, however, and locate the V and the keelson notch 1 in. farther from the base line. Also, additional stock on the lower end of the center framepiece is not necessary.

Next cut the seat (Fig. 5A) from 3/8-in. plywood and attach the 3/4 x 1 1/2-in. framing with glue and 1 1/4-in. ringed nails. This 1 1/2-in. framing is ripped from 1x6 stock along with the seat risers and stringers as in Fig. 5D. (By laying out the seat board in halves and joining these over the center strut Fig. 5A, the seat can be made from the same 4x8-ft. panel as the transom and bow. Also, by making patterns of the smaller plywood parts and locating them on the panel to leave as little



scrap as possible, all but the outboard seat struts can be cut from one plywood sheet.) With the seat framing in place, lay out, cut, and attach the plywood seat struts (Fig. 5F and G), fastening the outboard strut to the edge of the frame farthest from the centerline.

Seat Bench Knees (Fig. 5B) are cut from a 40-in. length of 1x6 stock by first making a pattern and then tracing this on the stock, nesting the outlines for the four knees as closely as possible. Cut these out along the outlines and then, before cutting the notches,



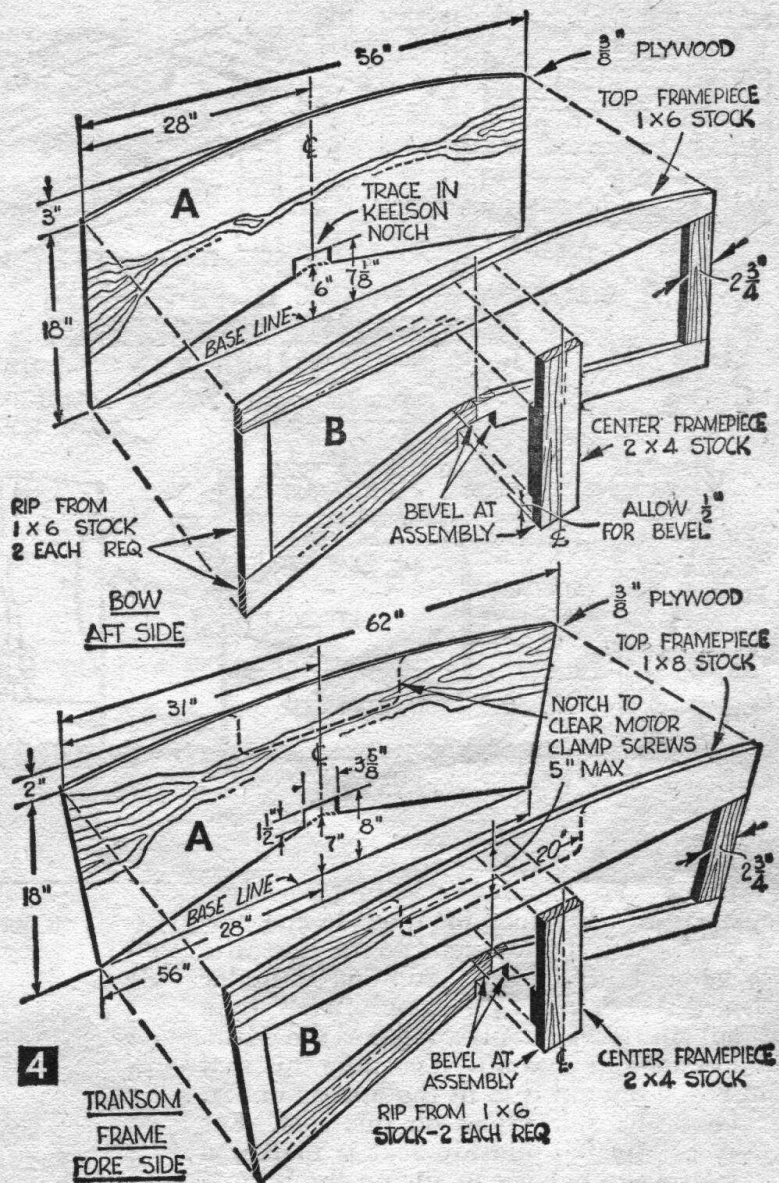
set the knees in position $\frac{1}{16}$ in. from the ends of the seat panel and trace their ends on the plywood. Then remove the knees and bevel each end of the seat as in Fig. 5E.

Lay out and cut the seat riser notches, using a short piece of the beveled stock (Fig. 5D) as a template. Also lay out the chine notch as in Fig. 5E and cut these. When finished, coat the mating surfaces of the seat, seat frame, and chine knees with glue and assemble them, driving three #8 x $1\frac{1}{4}$ -in. fh (flat-head) woodscrews through the plywood seat and two #12 x $1\frac{1}{4}$ -in. fh screws into the knees. Then cut and attach 10-in. spacers (Fig. 1) between the knees on each side.

Keelson. Next select a knot-free 10-ft. length of 2 x 4 stock for the keelson and rabbet it on your circular saw as in Figs. 3G and H. After this place the keelson, rabbeted side down, over three sawhorses and locate the cleats for the center seat strut as in Fig. 3C so the aft edge of the seat panel will be 52 in. from the end of the keelson. Then attach the seat assembly with glue and nails and fasten a temporary scrap-lumber prop from each end of the seat to the floor.

Cut the transom knees (Fig. 3J) from $\frac{3}{8}$ -in. plywood and fasten these to the center frame-piece with glue and $1\frac{1}{4}$ -in. ringed nails so the lower edges of the knees are at the bottom of the keelson notch. Then bevel the forward edge of the transom notch slightly to match the 2° rise of the keelson. Align the lower edges of the keelson and knees and assemble with glue and nails. Coat the surface of the notch with neoprene sealer and secure this joint with two #12 x $2\frac{1}{4}$ -in. fh screws.

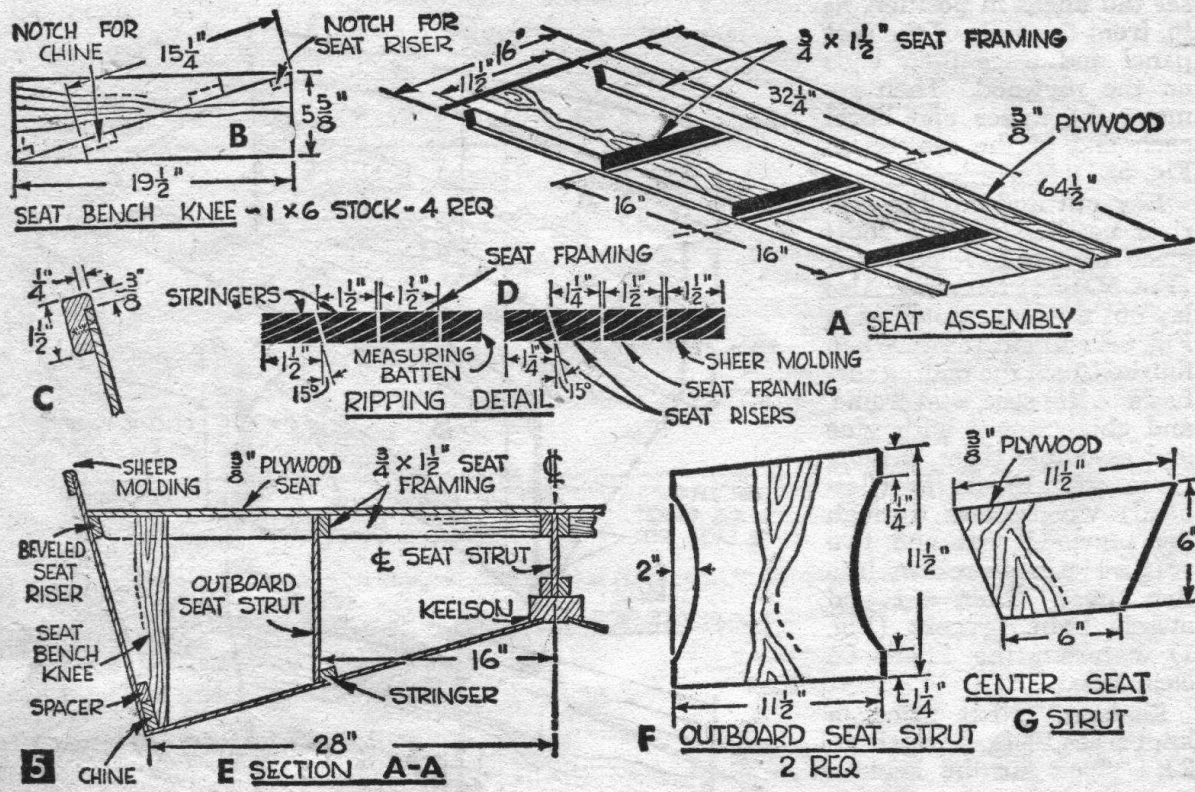
Now cut the bow-frame knees (Fig. 3K) and attach them, locating their lower edges flush with the bottom of the frame on each side of the keelson notch. Bevel the notch to get the 25° bow angle (Fig. 3C) and then clamp the knees to the keelson. When this is done, use the 10-ft. length of scrap stock (Fig. 5D) to check the distance from the aft edge of the transom, through the seat riser notches, to the fore edge of the bow frame. This should



be at the most 9 ft. 8 in., to insure that a 10-ft. length of plywood will cover a side. Relocate the bow frame as necessary and mark this location on the keelson. Then assemble the frame permanently in the same way as you did the transom.

After sawing the chines to shape as in Fig. 3L, cut the chine notches in the bow and transom frames. Clamp the chines in the seat knees and then, starting at the bow and working aft, bevel the notches as you go along to get a fair curve on the chines.

As the plywood joints along the chines and frames will be covered with fiber-glass tape, notch the chines, stringers, and seat risers (Fig. 3C) completely through the plywood, and attach them with glue and two #8 x $1\frac{1}{4}$ -in. fh screws to each joint. The seat risers are installed parallel to the floor or base line of the framework.



Planking. For maximum sailing performance, use 1/4-in. plywood for the side and bottom planks. Or, if you intend to use Sea Mite as a general utility boat, running it under outboard power as often as or oftener than sail, substitute 3/8-in. plywood for the 1/4-in. and add another seat aft. Assemble this seat as in Fig. 5 but cut it to fit the hull as in Fig. 3A. Omit the side knees on this seat. For strictly sailing the midship seat is merely a thwart and the helmsman sits on the bottom plank.

The original Sea Mite used 10-ft. lengths of A-C exterior plywood, enabling an entire side to be covered with a single plank. If this 10-ft. plywood should be too expensive in your locality, substitute standard 4 x 8-ft. sheets of the same material and use butt-joint battens (Fig. 3E) where the planks joint are indicated as in Fig. 3B.

Before starting to plank the framework, lay the 3/4-in. batten (Fig. 5D) along the surface to be planked to locate points such as the lower edges of the frames, seat panel ends, and seat-bench knees that need fairing. Trim these points with a wood rasp or jack plane so you will have a flat surface where the plywood fastens. Also sight along the stringers and chines to check for waviness and trim this out with the plane.

Begin planking by cutting a 19-in. side plank from each plywood panel. Clamp this to the side of the framework, lining it up with the aft edge and bottom of the transom frame.

MATERIALS LIST—SEA MITE HULL

PLYWOOD		
Amt. Req.	Size and Description	Use
2	1/4" x 4 x 10' fir A-C Ext. plywood	side and bottom planks
1	3/8" x 4 x 8' A-C fir Ext. plywood	bow, transom, seat, knees, frames
1	3/8 x 12 x 24" A-C fir Ext. plywood	outboard seat struts
LUMBER		
(Parentheses indicate nominal size to be used when ordering lumber)		
1	(2x4) x 8' fir or pine	frames, stem, mast step
2	(1x8) x 10' fir or pine	chines, motorboard core, framing
4	(1x6) x 10' fir or pine	frames, seat framing, stringers, seat risers
2	(1x4) x 10' fir or pine	mast bench, transom frame, sheer moldings
FASTENINGS AND MISC.		
40	1" wire nails	
1 lb.	1" ringed nails (Maze or Stronghold)	
2 lb.	1 1/2" ringed nails	
5	#12 x 2 1/4" fh woodscrews	
3	1/4 x 6" carriage bolts, nuts and flat washers	
2	1/4 x 4" carriage bolts, nuts and flat washers	
13 yd.	fiber glass tape (Sear's Elgin Tape Kit)	
2 lb.	glue powder (Weldwood)	
1 pt.	neoprene sealer (Stay-Tite)	
2 qt.	porch-and-deck enamel	
1 gal.	pentachlorophenol sealer (Sear's Penta)	
1 qt.	spar varnish	

Then mark the outlines of the chines, frames, and seat-bench knees on it and remove it to coat the contacting surfaces with glue. Secure the plank with 1-in. ringed nails and then trim the plank along the chines and frames (Fig. 3C) but leave the sheer edges as they are.

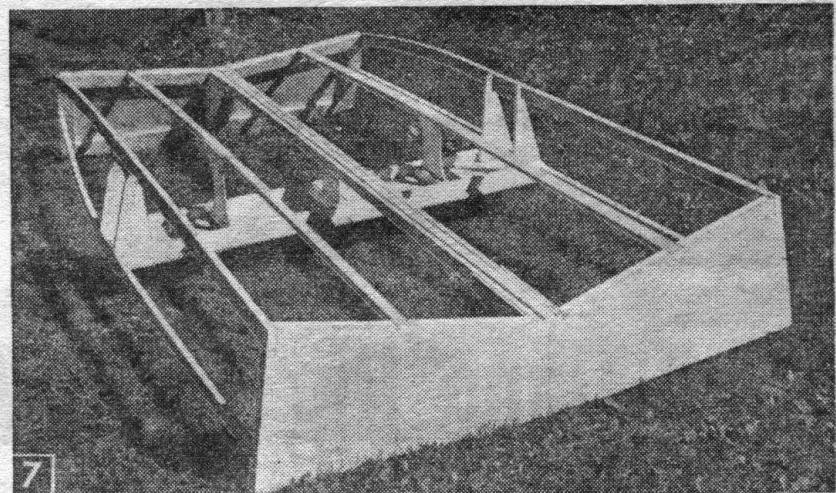
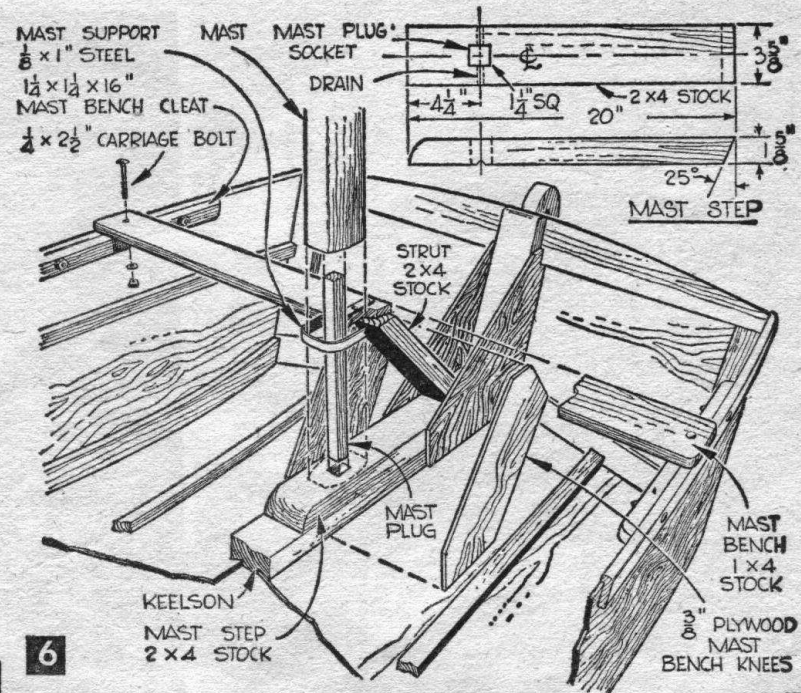
Place the remaining 27-in. widths of plywood in place on the bottom of the framework. Trim the shaped keelson and plank to make a tight joint here, using the jack plane to make the rabbet shallower near the ends of the keelson. Then coat the joining surfacing with neoprene sealer and nail the plank in place. Trim the plywood along the chines and frames, and then cover the exposed edges with 3-in. fiber-glass tape, using the fiber glass and resin according to the manufacturer's instructions.

Turn the hull right side up and install the sheer moldings. Cut both of these from a 10-ft. length of 1 x 4 stock and rabbet them on your circular saw. Attach the moldings with glue and 1-in. wire nails driven through the plywood and clinched on the outside of the molding. Back up the heads of the nails with an iron block when clinching them and set the clinched ends of the nails deep enough to allow them to be covered with *Plastic Wood* when finishing. Use a wood rasp to fair the ends of the moldings into the plank joints fore and aft, and to round off the top edges.

Next cut the outer stem piece as in Fig. 3D from 2 x 4 stock and fasten it at the center of the bow frame with glue and one carriage bolt at the top and one countersunk #12 x 2½-in. fh screw at the bottom.

Alternate motor boards (Figs. 1 and 3E) are shown for use with long- and standard-shaft motors. Make up the motorboard core from 12-in. lengths of ¾-in.-thick lumber and attach ⅜-in. plywood facings to it with glue and 1-in. ringed nails. Cut and bevel the assembly as in Fig. 3C.

Cut away the transom, if necessary, to clear the motor clamp screws, making the cut no more than 5 in. deep (Fig. 4B). Then cut two 15° mounting blocks to extend from the lower edge of the motor board to the transom cut-out. Glue these flush with each edge of the board and clamp the assembly in place. When the glue is dry, drill and countersink the motor board and secure it with two pairs of carriage bolts (Fig. 3E).

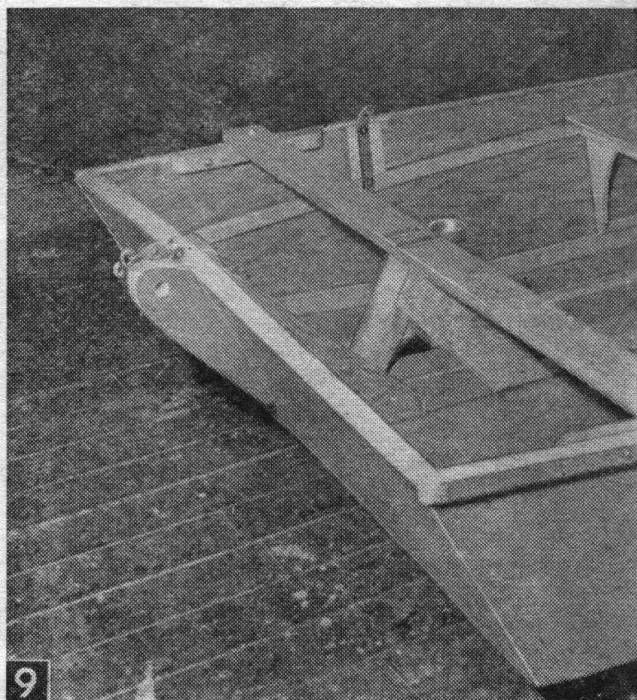


Seat bench assembly eliminates building mold and acts as midship frame. Second seat may be added aft if sail is not used.

Now give the hull two coats of sanding sealer inside and out. When dry, apply one coat of porch-and-deck enamel and, finally, one coat of spar varnish. Sea Mite is now ready to use with outboard motors up to 5 hp.

To build and install a sailing rig for Sea Mite or any other small boat, see complete instructions beginning on the next page.

● Craft Print No. 324 in enlarged size for building Sea Mite is available at \$3.00. Order by print number. For your convenience, there is a handy order form on page 112. To avoid possible loss of coin or currency in the mails, we suggest you remit by check or money order (no stamps or C.O.D.'s) to Craft Print Division, Science and Mechanics, 229 Park Avenue South, New York, N.Y. 10003. Please allow three to four weeks for delivery.



Greatly increased draft for high performance while running or reaching with Sea Mite's colorful fore-and-aft-cut sail is obtained by dropping the guntered gaff slightly from its normally vertical position.

A Sailing Rig for SEA-MITE— or Other Small Boats

Part 2: Here's how to rig the inverted-V hull—or any other 8- to 12-ft. open boat

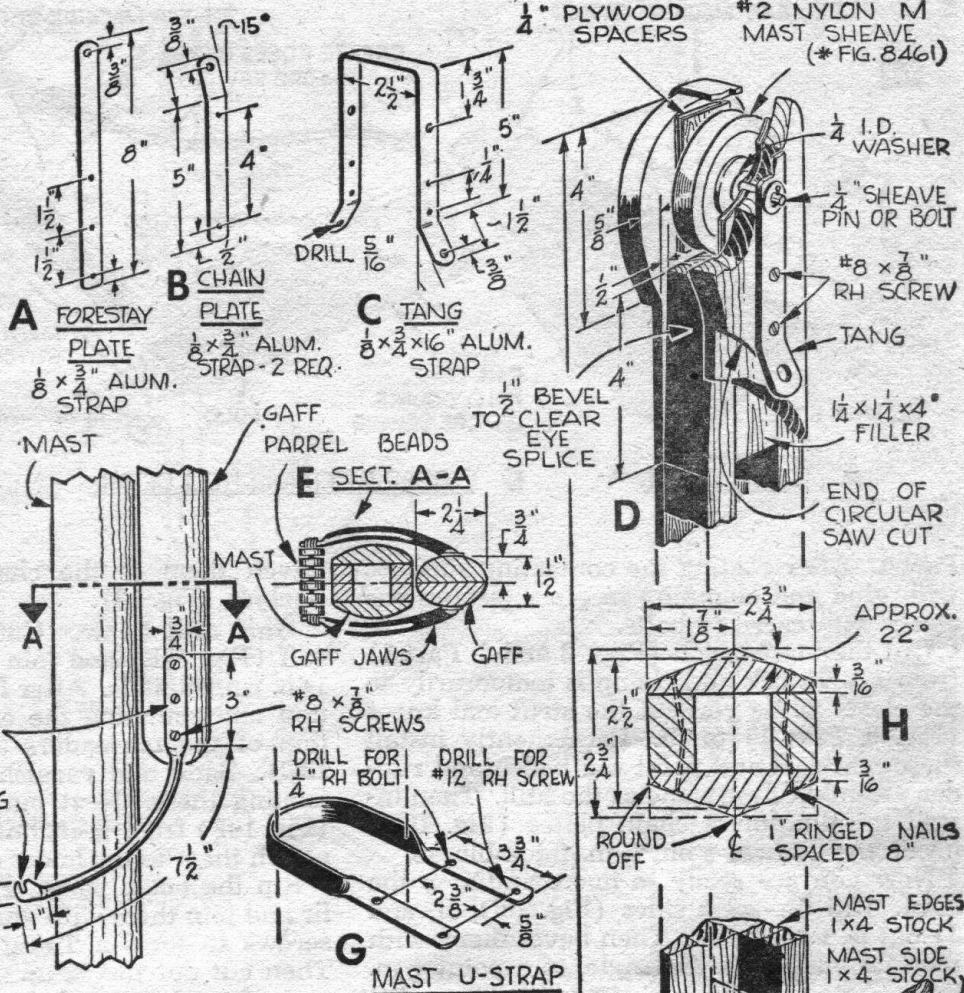
AFTER completing the hull for Sea Mite (see Part 1 preceding section) and making a few outboard-powered cruises, you're ready to build this modified gunter rig that can be completely stowed within the

hull and is especially designed for skippers who want to get the most out of small boats.

Sea Mite's sailing rig can be adapted to other open boats, too, the only additional work being to add a centerboard which Sea Mite's inverted-V hull does not require.

Begin by Cutting and Shaping the rudder and tiller as in Figs. 12B and E and attaching them to the centerline of the motorboard with two sets of pintles and gudgeons.

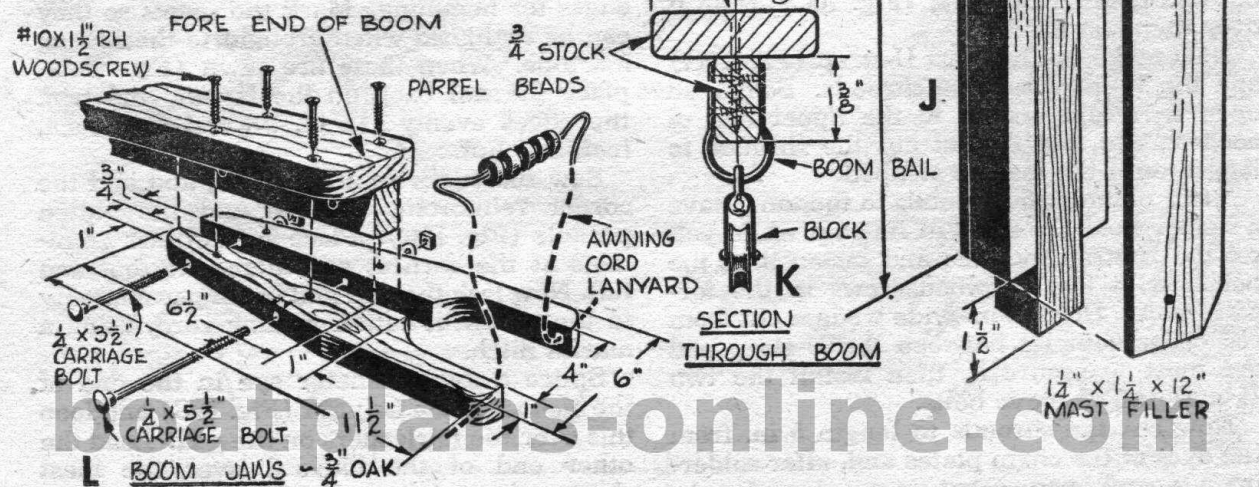
Next lay out and cut the 1¼-in.-sq. mortise in the mast step (Fig. 6, Part 1) and after cutting the drain groove across its underside, attach the step to the keelson with ¼ x 3-in. lag screws. Also shape the 1¼-in.-square mast bench cleats to fit the sheer as in Fig. 6,

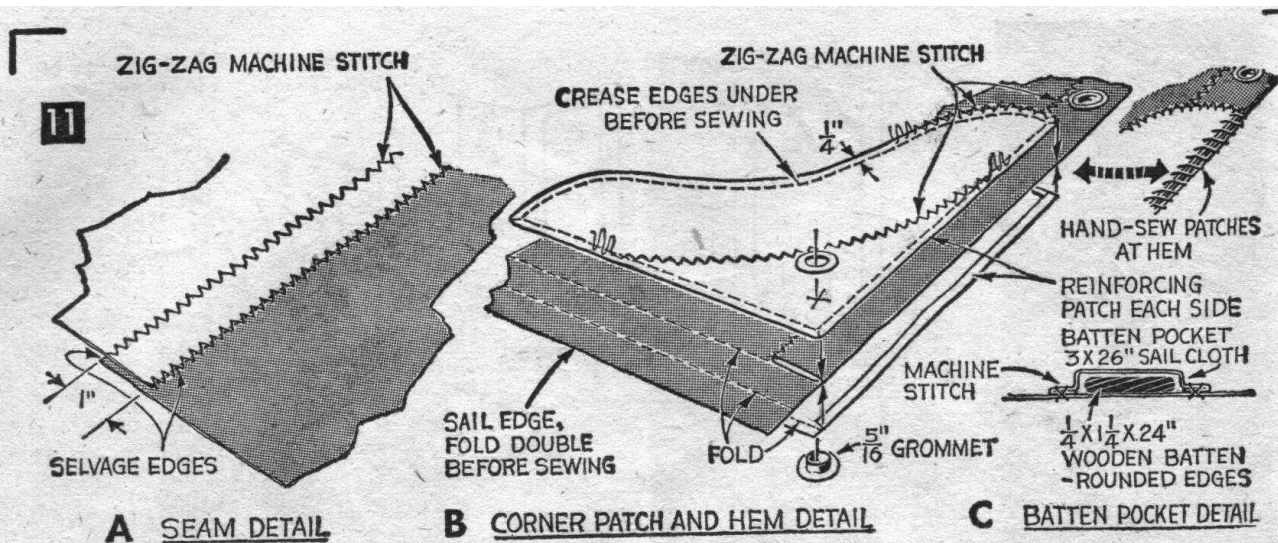


MATERIALS LIST—SEA MITE RIGGING

Amt. Req.	Size and Description	Use
1	1/2 x 18 x 40' fir EXT plywood	rudder
1	3/4 x 5 x 11 1/2 oak	boom jaws
5	3/4 x 3 3/8 x 10' clear fir	spars
1	1/8 x 1 x 15" steel strap	mast support
1	1/8 x 3/4 x 40" alum. strap	tang, chain plates
20 ft.	1/8" wire rope	shrouds, bridle
25 ft.	3/16" manila line	halyard, mainsheet
30 ft.	cotton awning cord	lashings

For sail materials, see Fig. 12.
For centerboard materials, see Fig. 13.





Part 1. After coating the contacting surfaces with glue and clamping in place, secure the cleats with carriage bolts.

Cut the mast bench (Figs. 3 and 6, Part 1) from 1 x 4 stock and clamp it temporarily to the cleats while you cut the strut and knees (Fig. 6, Part 1) to fit. Permanently install these and seal and paint the bench and rudder assemblies the same as the hull. Then install the aluminum chain plates (Fig. 10B) inside the gunwales on $\frac{3}{4}$ -in.-thick blocks.

Now you are ready to make and step the mast. Rip the mast sides (Fig. 10D, H, and J) out of 1 x 4 stock. Then bevel them, with the saw blade at a 22° angle, to a point 4 in. from one end. Finish cutting these rounded ends with a compass saw. Assemble the mast edges and fillers (Figs. 10D and J) with the mast sides, using glue and 1-in. ringed nails spaced 8 in. When the glue has dried, smooth the bevels and horns (upper ends) with a wood rasp, jack plane, or power sander. Finish up with fine sandpaper followed by two coats of spar varnish.

Standing Rigging. Next glue in the $\frac{1}{4}$ -in. plywood spacers (Fig. 10D) and, after laying out and drilling the tang (Fig. 10C), form it over the mast head.

Now make up the mast U-strap (Fig. 10G) and the $\frac{1}{8}$ -in. wire rope shrouds. Solder an open wire-rope socket to the upper end of each shroud, but do not cut the shrouds to length until the mast is stepped.

After pinning the shrouds to the tang, have a helper hold the mast in its step while you set the U-strap in place and fasten it to the bench with two *rh* woodscrews in the forward holes. Drive 1-in.-wide wedges cut from red cedar shingles between the U-strap and the mast to secure it, then install the two $\frac{1}{4} \times 1\frac{1}{4}$ -in. *rh* stove bolts.

Now cut the shrouds to length 5 in. from the eyes of the chain plates and, after soldering a second open socket on the shroud ends,

attach them to the chainplates with turnbuckles (Fig. 12).

Gaff and Boom. Cut the halves for the gaff (Fig. 10E) and join them with glue and 1-in. ringed nails. After forming the oval section and rounding the ends, mark the location of the fairleaders and eye strap (Fig. 12C). Sand and varnish the gaff before attaching these. Next make up the gaff jaws (Fig. 10F) from $\frac{3}{8}$ -in. hot-rolled steel rod and attach them to the lower end of the gaff.

Rip the boom parts (Fig. 12) out of 1 x 4 fir and join them with glue and #10 x 2-in. *fh* screws to form a T-section as in Fig. 10K. Then cut out the $\frac{3}{4}$ -in. oak jaws (Fig. 10L) and, after gluing and clamping them in place, drill for and install the two carriage bolts. Four #10 x $1\frac{1}{2}$ -in. *rh* woodscrews complete this assembly. When the boom is finished, attach the eye straps, bails, S-hooks, and blocks (Fig. 12).

Making the Sail. Make a full-size layout of the sail as in Fig. 12A, drawing the curved lines with the aid of a wooden batten. Lay the sail cloth on it, lapping the material 1 in. for the seams and allowing at least 2 in. at the edges for hemming. Mark the seams so they can be realigned when brought to the sewing machine. When these are sewn (Fig. 11A), place the sail back on the layout, and trim the edges evenly $1\frac{1}{2}$ in. beyond the leach, foot, and luff.

Sew the edges as in Fig. 11B, and add the corner reinforcing patches and the batten pockets (Fig. 11C). Place $\frac{5}{16}$ -in. brass grommets at the corners and along the foot and luff. Now lash the gaff and boom permanently to the sail with cotton awning cord, using a marlin hitch.

Splice a 4-in.-diameter eye in the end of the $\frac{5}{16}$ -in. manila halyard (Fig. 12C) and loop this over the fairleaders on the gaff. Lead the other end of the halyard over the mast sheave, down to a bullet block at the outer