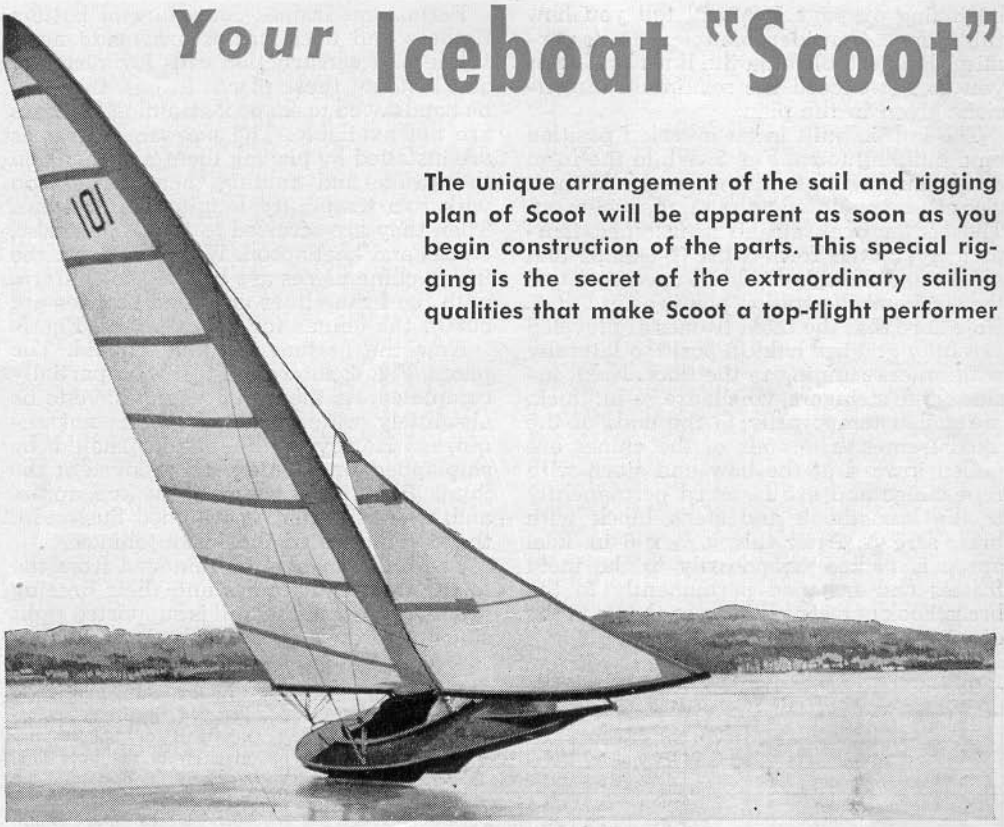
Your Iceboat "Scoot"



The unique arrangement of the sail and rigging plan of Scoot will be apparent as soon as you begin construction of the parts. This special rigging is the secret of the extraordinary sailing qualities that make Scoot a top-flight performer

FEATURING rudderless steering and a flat, shell-type hull, here's a unique 15-ft. racing iceboat, the original of which dates back historically to early days when it was used in lifesaving work on New Jersey's Great South Bay. Born of the necessity of being able to cross the bay even when it was only partly frozen, Scoot, in addition to its high speed and extraordinary maneuverability, is noted for its ability to take to open water, if necessary, in hurdling large patches of broken ice. Speeds greater than 80 m.p.h., achieved with as many as four passengers, put Scoot in the racing class. As a result of its four-point runner suspension, its maneuverability is extremely flexible, permitting sharp turns without danger of capsizing or skidding. Steered by manipulating a large-size jib sail, Scoot can be held on an arrow-straight course or turned almost literally on a dime.

As designed and built by Bill Harless, noted racing champion, this version of the scooter-type iceboat is the result of prolonged experimentation and development. The hook sail rig used is, in effect, a high-performance airfoil and, because of it, Scoot glides along effortlessly in the mildest breezes and really scoots past competition with a strong wind. The boat is moored by merely tipping it on edge with the sails flat on the ice. Except where modified to simplify construction, the plans presented here were taken directly from the actual boat. Original hardware, which was especially designed and cast in brass, has been replaced with less expensive fittings that can readily be improvised from common parts easily obtainable.

Building the Hull

The first step in building the hull is to draw the mold frames and the plan and profile views full size on heavy building paper, Fig. 3. The plan view is drawn by following the half-width dimensions given in Fig. 4, while the profile and mold frames are drawn by referring to the table of offsets in Fig. 1 and the body plan, Fig. 2. The body plan is an end view of the plan and profile. Note, in Fig. 4, that half-width dimensions are given to the inner face of the inside chine which is the line from which the mold frames are laid off. Offsets are given to the outside of the planking, so remember to deduct the thickness of the planking. In laying out the lines full size, use a long batten to fair out the curves. The text under the heading, "Laying Out Plans,"

beginning on page 162, will tell you how this is done. Considerable tolerance is permissible in establishing the lines as long as you do not exceed the maximum dimensions given in the plan.

The hull is built in an inverted position on a building form, Fig. 5. While the form can be supported in the manner shown, it also can be mounted on regular saw horses. The center deck strake is fastened temporarily to the form with C-clamps and screws and then the mold frames are set on the strake at the station points as in Fig. 7. Note here that the mold frames are leveled carefully and are held in position laterally with braces running to the floor. Next, inside chine stringers, which are ¾ in. thick, are nailed temporarily to the ends of the mold frames. The ends of the chines are pulled inward at the bow and stern with rope slings and are fastened permanently to the breasthook and stern block with brass screws. After this, a ½ x 6-in. keel apron is tacked temporarily to the mold frames and fastened permanently to the breasthook and stern block, as shown in the diagram, Fig. 7.

Permanent frames consisting of bottom timbers and deck beams are made next. While best construction calls for steaming and bending these pieces in jigs, they can be bandsawed to shape if steaming facilities are not available. The permanent frames are installed by placing them 9 in. apart on the strake and holding them in position with two temporary longitudinal battens. Then they are screwed to the deck strake, chines and keel apron. With this done, the inside chine pieces are beveled to conform with the frame lines and then notches are cut in the chines for chain plates, Fig. 8.

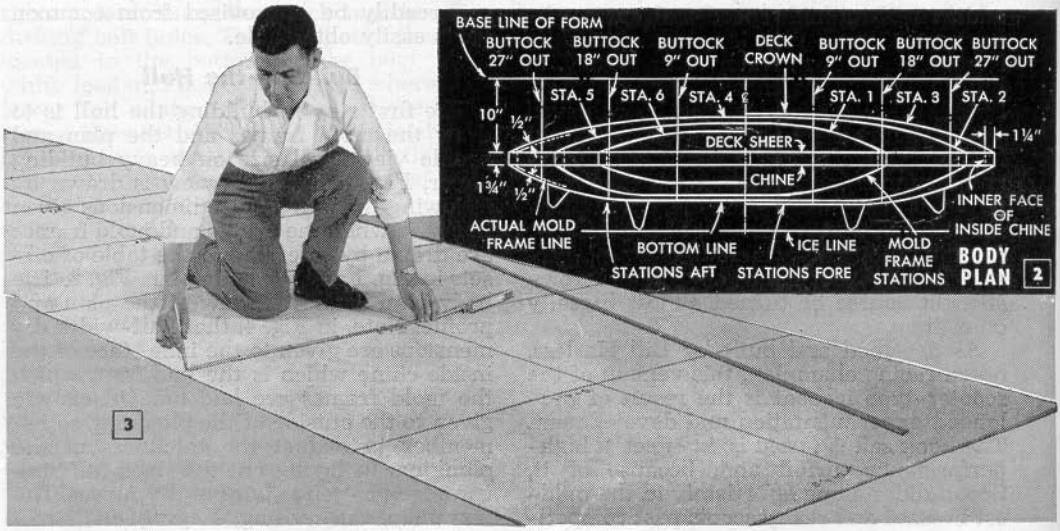
Now the bottom planking is laid. The photo, Fig. 6, shows the planking partially completed. As the hull does not have to be absolutely watertight, calking is not required. However, the planks should be shiplapped, or tongued and grooved at the joints. Planking is begun at the keel apron, and, when finished, is trimmed flush with the outer edge of the inside chines.

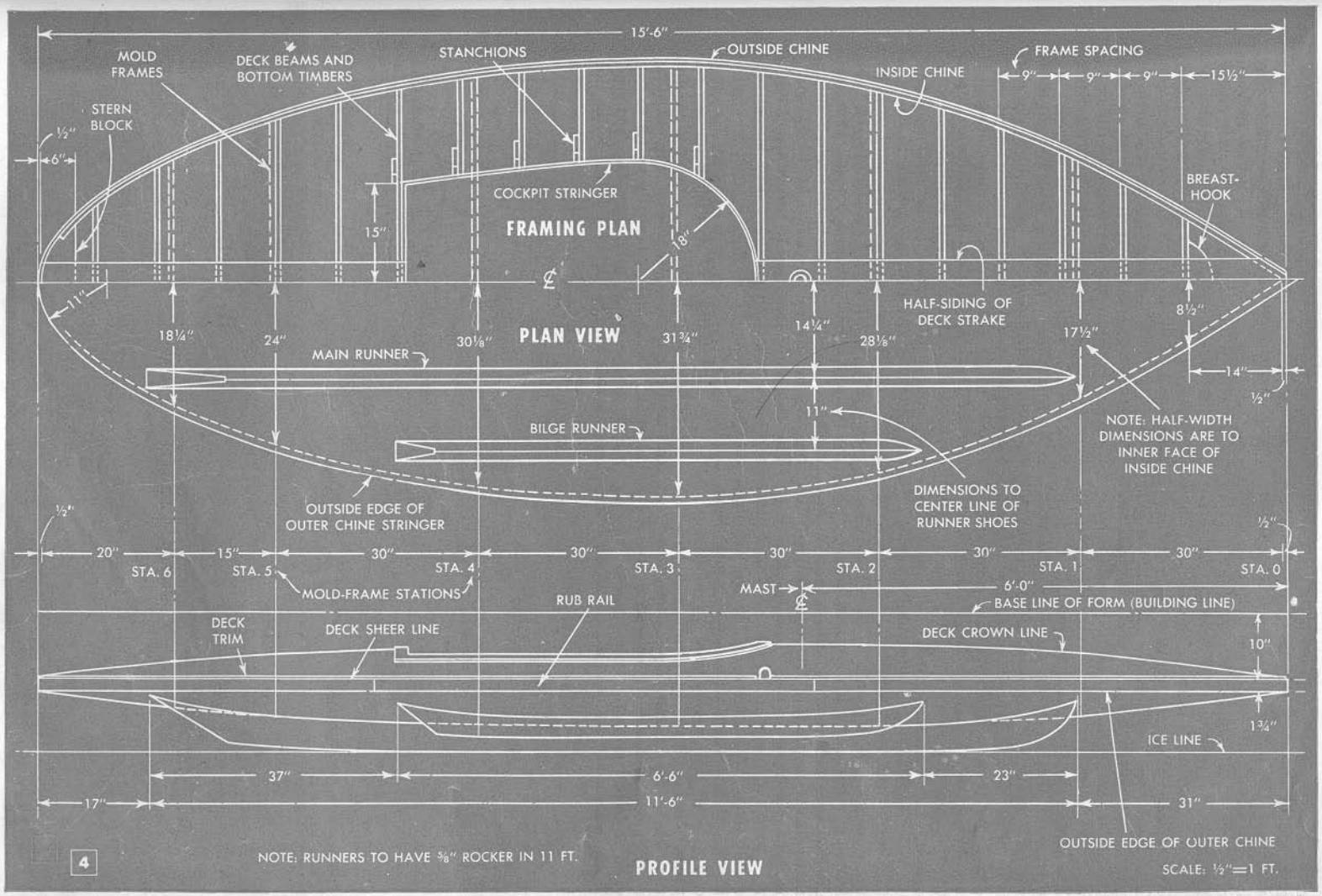
The hull can now be removed from the form. The mold frames and their bracing are removed and the hull is supported right side up on saw horses. The main and bilge-

1 TABLE OF OFFSETS—Measurements From Base Line to Bottom of Hull*

STATIONS	Bow	1	2	3	4	5	6	Stern
Deck crown line	0-10-0	0-6-0	0-5-2	0-5-0	0-5-2	0-6-0	0-7-2	0-10-0
" buttock 9" out	——	0-6-6	0-5-3	0-5-0	0-5-3	0-6-2	0-7-3	——
" buttock 18" out	——	0-9-6	0-6-2	0-5-5	0-6-1	0-7-4	0-9-3	——
" buttock 27" out	——	——	0-9-0	0-7-4	0-10-1	——	——	——
Deck sheer line	0-10-0	← STRAIGHT →						0-10-0
Chine line	0-11-6	← STRAIGHT →						0-11-6
Bottom buttock 27" out	——	——	1-0-7	1-2-4	1-1-7	——	——	——
" buttock 18" out	——	0-11-7	1-4-1	1-4-7	1-4-3	1-3-0	1-0-1	——
" buttock 9" out	——	1-3-2	1-4-5	1-5-0	1-4-5	1-3-6	1-2-2	——
" at center line of hull	0-11-6	1-3-6	1-4-5	1-5-0	1-4-5	1-3-6	1-2-2	0-11-6

*** As the hull is built in an inverted position, measurements or heights are given from the base line, Fig. 2, to the bottom of the hull. Dimensions are in feet, inches and eighth inches to the outside of the planking. All plus or minus dimensions are to be converted as required when laying out full-scale lines. Half-width dimensions for mold frames are to inner face of inside chine**




15'-6"
MOLD FRAMES
DECK BEAMS AND BOTTOM TIMBERS
STANCHIONS
OUTSIDE CHINE
INSIDE CHINE
FRAME SPACING
9"
9"
9"
15½"
STERN BLOCK
½"
6"
BREAST-HOOK
COCKPIT STRINGER
15"
18"
FRAMING PLAN
℄
11"
HALF-SIDING OF DECK STRAKE
8½"
18¼"
24"
30⅛"
PLAN VIEW
31¾"
14¼"
28⅛"
17½"
MAIN RUNNER
14"
½"
11"
BILGE RUNNER
NOTE: HALF-WIDTH DIMENSIONS ARE TO INNER FACE OF INSIDE CHINE
OUTSIDE EDGE OF OUTER CHINE STRINGER
DIMENSIONS TO CENTER LINE OF RUNNER SHOES
½"
½"
20"
15"
30"
30"
30"
30"
30"
STA. 6
STA. 5
STA. 4
STA. 3
STA. 2
STA. 1
STA. 0
MOLD-FRAME STATIONS
MAST
℄
6'-0"
BASE LINE OF FORM (BUILDING LINE)
RUB RAIL
DECK TRIM
DECK SHEER LINE
DECK CROWN LINE
10"
1¾"
ICE LINE
37"
6'-6"
23"
17"
11'-6"
31"
OUTSIDE EDGE OF OUTER CHINE
4
NOTE: RUNNERS TO HAVE ⅜" ROCKER IN 11 FT.
PROFILE VIEW
SCALE: ½"=1 FT.

runner clamping pieces come next. These are fastened to each frame and holes are drilled in them for the runner bolts. The holes are located either aft or forward of each bottom timber as indicated in Fig. 10. Do not pass bolts through bottom timbers.

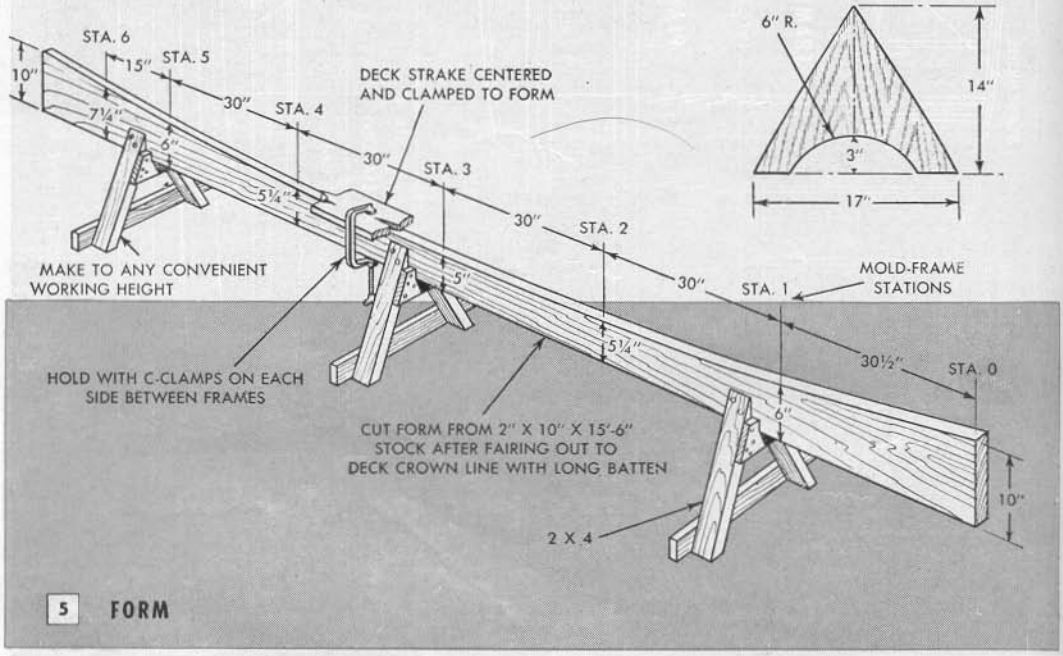
The mast step block is fastened to the bottom timbers as shown in Figs. 9 and 11. The mast step itself is a length of ¾-in. galvanized pipe. This is threaded into a standard pipe flange and the flange is screwed securely to the mast step block. The pipe should be just long enough to pass through the mast partner, which provides an upper step, and the deck strake, coming flush with a flange screwed to the strake.

Cockpit framing and the stanchions which support it are installed next. Note that stanchions also are installed at the center of the frames, fore and aft of the cockpit. The ends of the stanchions are cut to lap the face of the frames as shown in the detail above Fig. 12. With all interior framing completed up to this point, the decking is laid. Narrow planks, 1¼ in. wide, make this a simple job. The same procedure is followed here as was used in planking the bottom, working outward from the deck strake and trimming off the planks flush with the inner chines. For a neat job, countersink all screws and fill with wood putty. As will be noted in Figs. 8 and 11, the face of the inside chines and the edges of the deck and bottom planking are covered with an outside chine piece, ½ in. thick, which also is beveled off flush with the deck and bottom planking. Before fastening the outside chine, the rub rail should be flanged over and tacked to the inside face of the chine. The rub rail, of brass or copper, is applied to the chine from the mast station to the aft end of the cockpit and prevents scuffing when the hull is heeled over. After the outside chine has been fitted, the sheer trim is attached. This is set inward about ¼ in. and covers the joint between the decking and the outside chine. Completion of the hull involves fitting a coaming strip around the cockpit and installing the flooring, Fig. 9. Note that the screws in the floor boards are driven in countersunk holes and puttied over.

The bilge and main runners may be shaped from solid stock or built up of two or more laminations. All runners have a slight curve or rocker, ⅝ in. in 11 ft. They are bolted to the hull according to the dimensions given in the plan and profile views, Fig. 4. Note in Figs. 10 and 12 that the runner shoes, which are angle iron, toe inward. This is important and has a definite bearing on the performance of the iceboat. The shoes are fastened to the runners with screws, spaced 6 in. apart and staggered on each side.

Fitting the Rigging

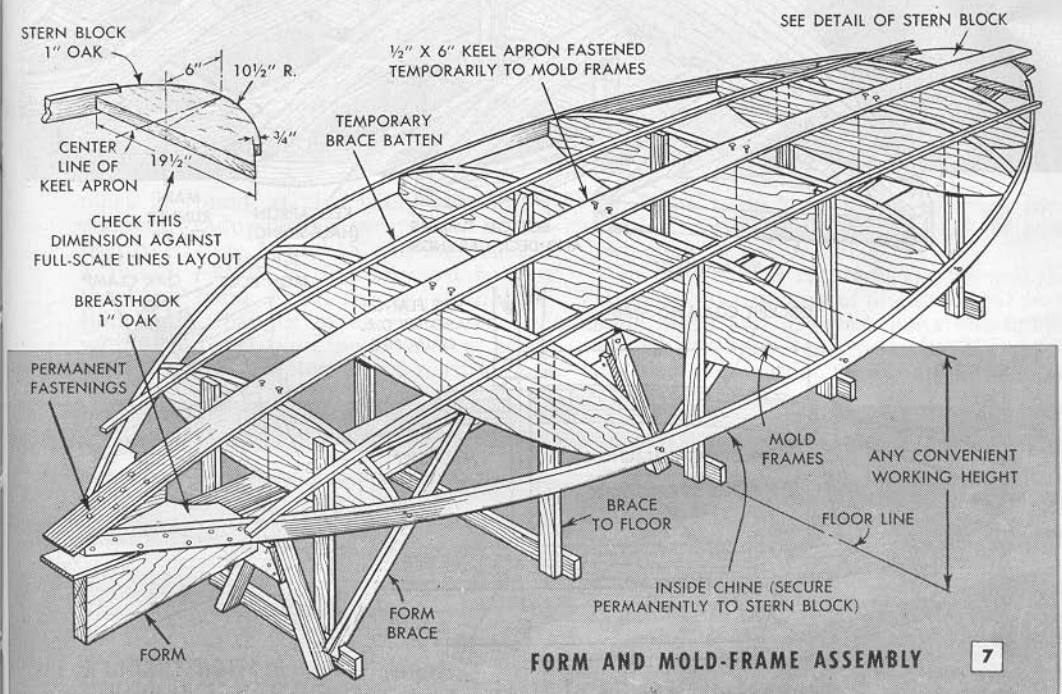
The first step in fitting rigging is laying out and bandsawing the horn, Fig. 13. The horn should be very carefully fitted to the curve of the deck, and then tapered and chamfered. The ⅝-in. bolt which holds the



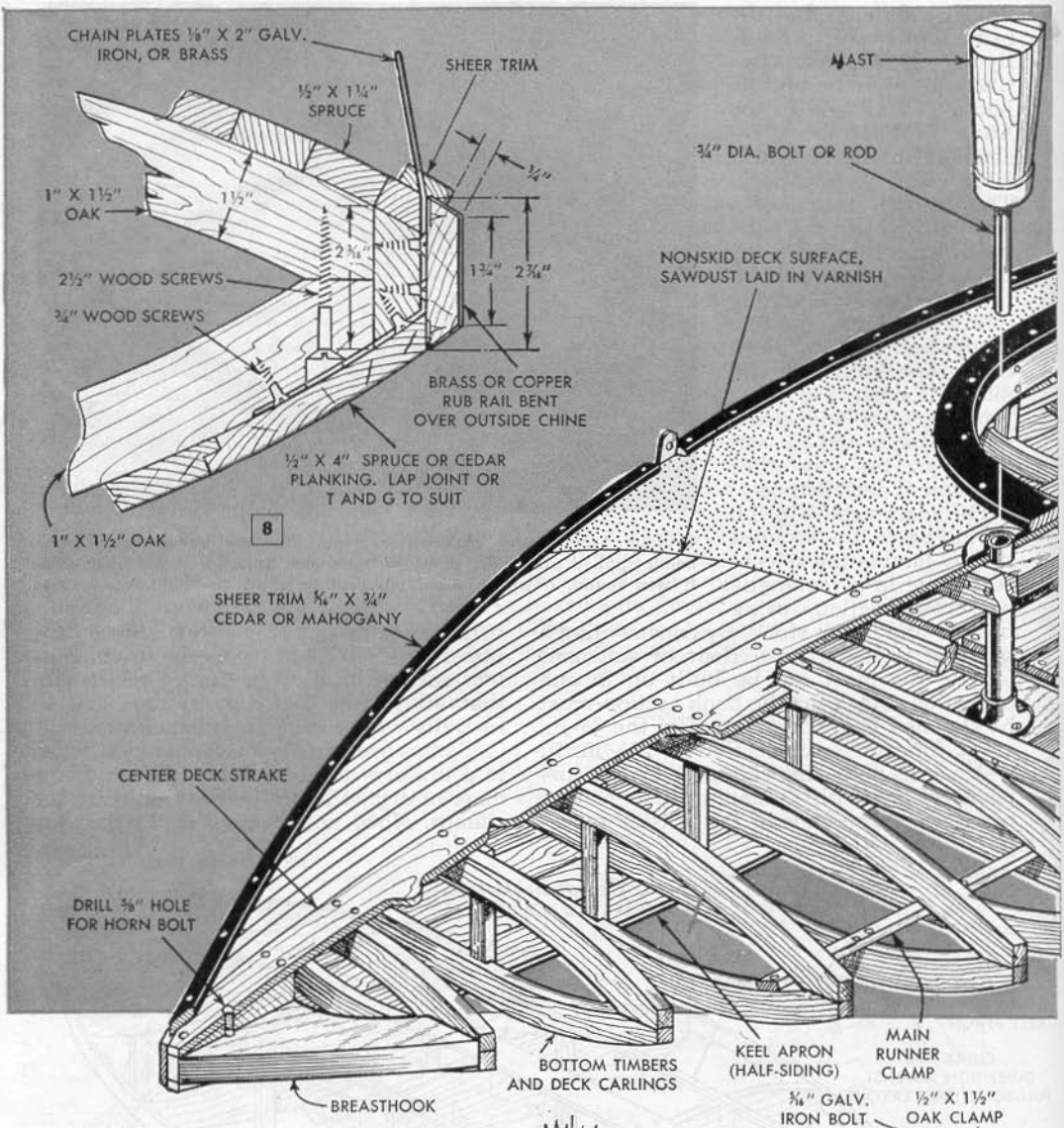
horn in place, and at the same time makes it readily detachable, passes entirely through the breasthook. The aft end of the horn is held in a U-shaped clip, Fig. 16, which is screwed to the deck. The smooth round-bottom notch for the jib-boom ring fitting, Fig. 16, is formed by sawing down the sides, and smoothing with a wood rasp and fine sandpaper. A standard tiller-rope guide for the mainsail sheet, Fig. 22, a 7-in. traveler and cleats for the main and jib-sail sheets are the only other permanent deck fittings.

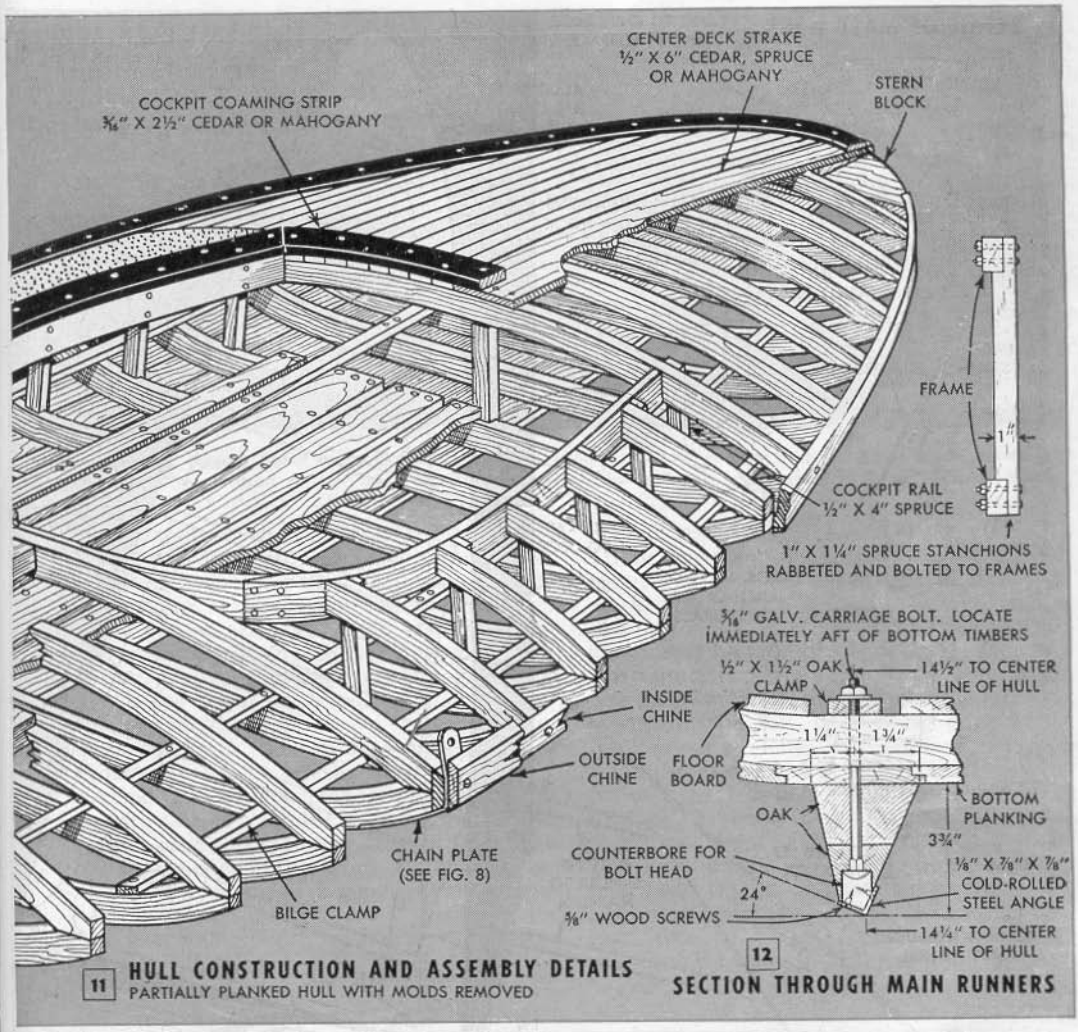
Original Scoot under construction. Note that the bottom planking is being applied after deck planking, a reverse procedure used by builder. It was found, however, more practical to plank the hull as described

The mainmast, Fig. 14, is built up to the required size by laminating selected spruce in a rectangular cross section, using both ¼ and ¾-in. stock. By constructing a bending jig on a level floor of sufficient length, the mast can be built up in one operation. Stock for the hook section must be steamed before bending. Rip the ¾-in. stock for the lower section to 3¼ in. in width and glue and clamp it in the improvised jig with C-clamps. Use waterproof glue. The ends of the outside members project about 32 in. (See note on the upper detail in Fig. 14.) As the ¼-in. laminations are built up in the jig, make sure that all joining flat surfaces are coated liberally with waterproof glue and that the C-clamps are equally spaced and tightened to a uniform tension. Allow the glued-up mast to dry 24 hours before removing the clamps. Now, note from Fig. 14 that the



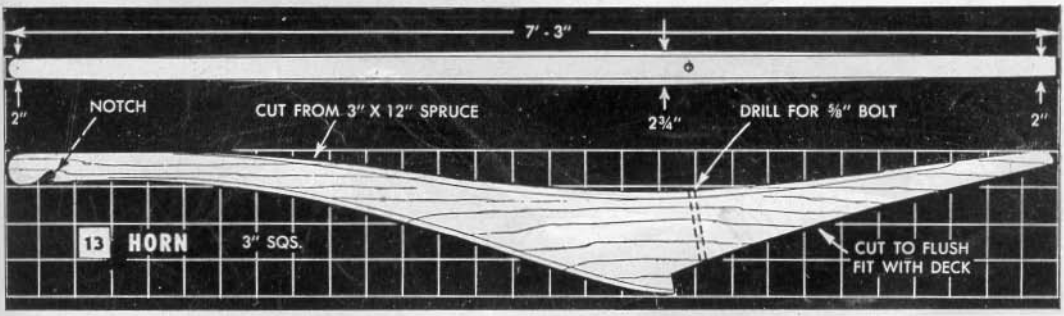
FORM AND MOLD-FRAME ASSEMBLY 7

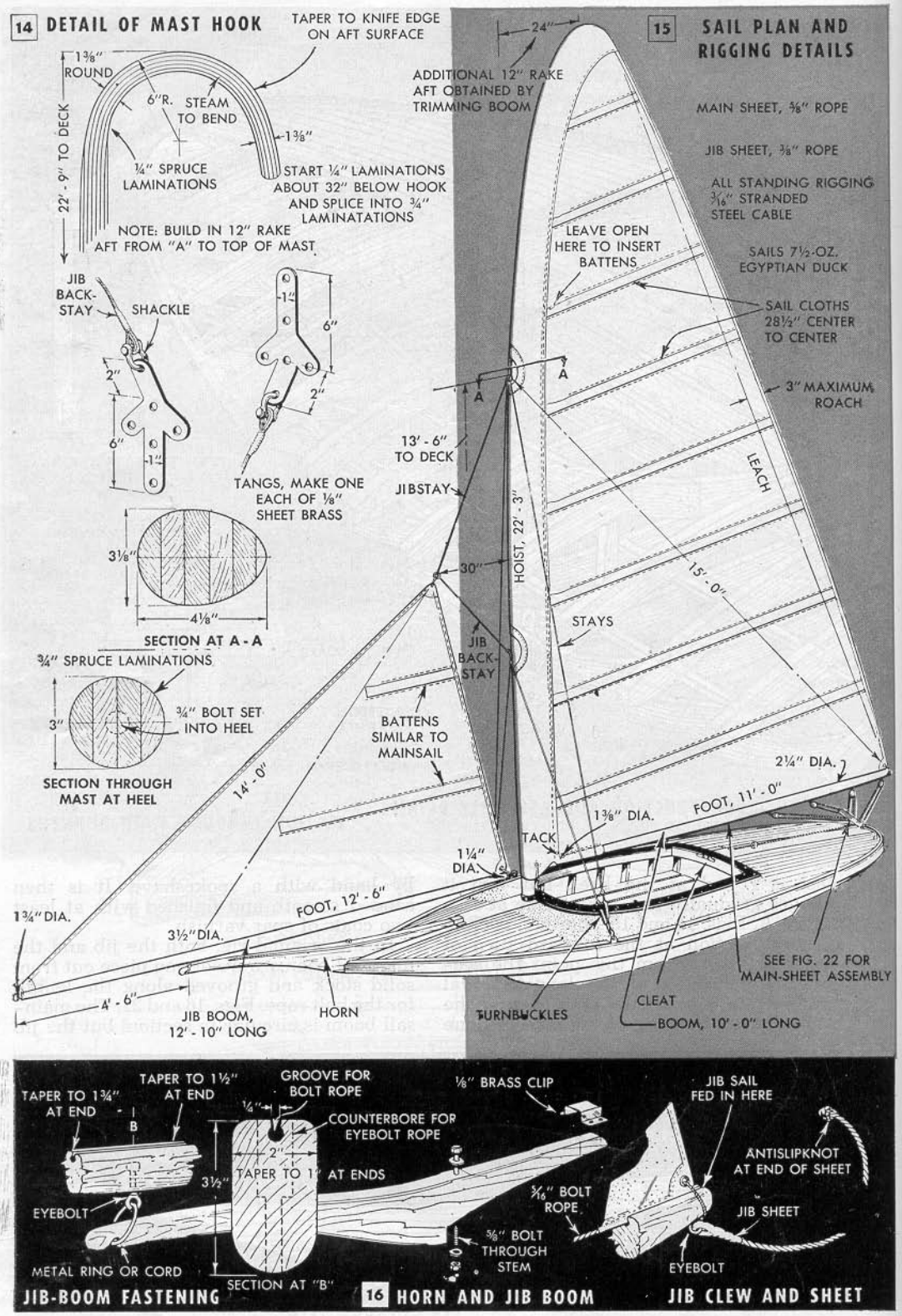

CHAIN PLATES ⅛" X 2" GALV. IRON, OR BRASS
SHEER TRIM
½" X 1¼" SPRUCE
¼"
1" X 1½" OAK
1½"
2⅜"
1¾"
2¾"
2½" WOOD SCREWS
¾" WOOD SCREWS
BRASS OR COPPER RUB RAIL BENT OVER OUTSIDE CHINE
½" X 4" SPRUCE OR CEDAR PLANKING. LAP JOINT OR T AND G TO SUIT
1" X 1½" OAK
8
MAST
¾" DIA. BOLT OR ROD
NONSKID DECK SURFACE, SAWDUST LAID IN VARNISH
SHEER TRIM ¾" X ¾" CEDAR OR MAHOGANY
CENTER DECK STRAKE
DRILL ⅜" HOLE FOR HORN BOLT
BREASTHOOK
BOTTOM TIMBERS AND DECK CARLINGS
KEEL APRON (HALF-SIDING)
MAIN RUNNER CLAMP
⅜" GALV. IRON BOLT
½" X 1½" OAK CLAMP
3"
3"
24"
OAK
ICE
10
SECTION THROUGH BILGE RUNNER
COCKPIT COAMING STRIP
18"
PIPE FLANGE AND ¾" DIA. GALV. PIPE
SEE FIG. 8
COCKPIT COAMING RAIL
FLOOR BOARDS ½" X 4"
MAST STEP BLOCK (1" OAK)
BILGE RUNNER
11"
MAIN RUNNER
14¼"
℄
ICE LINE
STANDARD ¾" PIPE FLANGE
9
PARTIAL SECTION AT MAST STEP LOOKING AFT

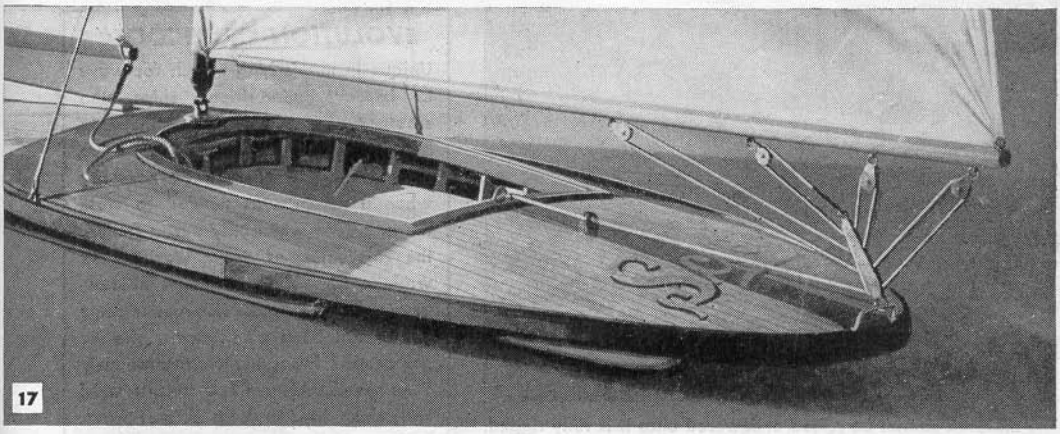


mast is round at the heel, but that it changes gradually to a pear shape at section A-A, Figs. 14 and 15, and then back to a round section at the forward turn of the hook bend. From this point the section again changes to an elongated oval with a knife edge on the after turn of the bend, Fig. 14. Shaping of the mast is done by hand with a spokeshave. It is then sanded smooth and finished with at least two coats of spar varnish.

In the original rig, both the jib and the mainsail booms were of one piece cut from solid stock and grooved along the length for the bolt rope, Figs. 16 and 21. The mainsail boom is circular in section, but the jib

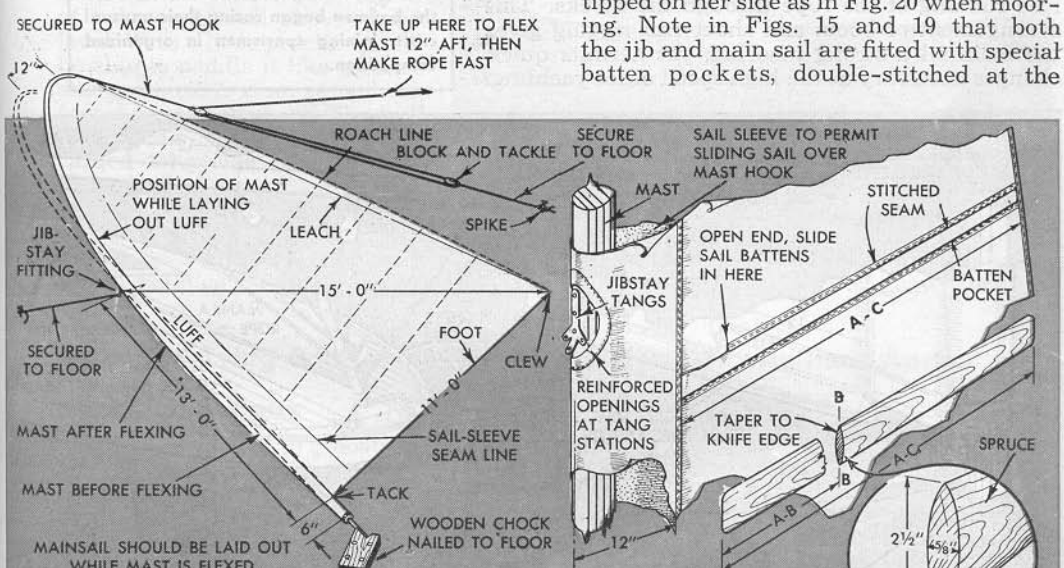



14 DETAIL OF MAST HOOK
TAPER TO KNIFE EDGE ON AFT SURFACE
1⅜" ROUND
6"R. STEAM TO BEND
1⅜"
¼" SPRUCE LAMINATIONS
22' - 9" TO DECK
START ¼" LAMINATIONS ABOUT 32" BELOW HOOK AND SPLICE INTO ¾" LAMINATATIONS
NOTE: BUILD IN 12" RAKE AFT FROM "A" TO TOP OF MAST
JIB BACK-STAY
SHACKLE
2"
6"
1½"
1½"
6"
2"
TANGS, MAKE ONE EACH OF ⅛" SHEET BRASS
3⅛"
4⅛"
SECTION AT A - A
¾" SPRUCE LAMINATIONS
3"
¾" BOLT SET INTO HEEL
SECTION THROUGH MAST AT HEEL
15 SAIL PLAN AND RIGGING DETAILS
24"
ADDITIONAL 12" RAKE AFT OBTAINED BY TRIMMING BOOM
MAIN SHEET, ⅜" ROPE
JIB SHEET, ⅜" ROPE
ALL STANDING RIGGING 3/16" STRANDED STEEL CABLE
LEAVE OPEN HERE TO INSERT BATTENS
SAILS 7½-OZ. EGYPTIAN DUCK
SAIL CLOTHS 28½" CENTER TO CENTER
3" MAXIMUM ROACH
A
A
13' - 6" TO DECK
JIBSTAY
HOIST, 22' - 3"
LEACH
30"
15' - 0"
STAYS
JIB BACK-STAY
BATTENS SIMILAR TO MAINSAIL
14' - 0"
2¼" DIA.
FOOT, 11' - 0"
1⅜" DIA.
TACK
1¼" DIA.
1¾" DIA.
FOOT, 12' - 6"
3½" DIA.
4' - 6"
JIB BOOM, 12' - 10" LONG
HORN
TURNBUCKLES
CLEAT
BOOM, 10' - 0" LONG
SEE FIG. 22 FOR MAIN-SHEET ASSEMBLY
TAPER TO 1¾" AT END
TAPER TO 1½" AT END
B
GROOVE FOR BOLT ROPE
¼"
COUNTERBORE FOR EYEBOLT ROPE
2"
3½"
TAPER TO 1" AT ENDS
EYEBOLT
METAL RING OR CORD
SECTION AT "B"
JIB-BOOM FASTENING
⅛" BRASS CLIP
⅜" BOLT ROPE
⅜" BOLT THROUGH STEM
JIB SAIL FED IN HERE
ANTISLIPKNOT AT END OF SHEET
JIB SHEET
EYEBOLT
16 HORN AND JIB BOOM
JIB CLEW AND SHEET



When fully rigged, Scoot looks like this. Note the roomy, shallow cockpit and the novel boom tackle for trimming the mainsail to suit wind conditions. Foot of the mainsail is attached to boom with bolt rope

boom tapers each way from the ring fastening and the section is rectangular with rounded corners, Fig. 16. However, it is easier to form the special undercut grooves if the booms are each made in two pieces and glued together after forming a round-bottom groove, or flute, in each piece. When the pieces are glued together, this will result in a single deep groove with a circular undercut as in the sectional view, Fig. 16. Finish the booms by sanding smooth and coating with spar varnish. Making the main and jib sails is a job for a professional sailmaker unless, of course, the builder has had experience in this work. Note from Fig. 21 that the mainsail boom is carried in a pocket sewed onto the foot of the mainsail. There is no gooseneck as in conventional rigging. Also, the builder will have to work closely with the sailmaker in establishing the luff of the mainsail, Fig. 18. The mast must be flexed with a tackle block in the manner shown, and it must be held in this position while laying out the luff of the mainsail. The luff, or leading edge, is in the form of a pocket, or boot, large enough to slip over the mast, Figs. 15, 18 and 19. No sail track is used, the luff being held taut by a short lashing made fast to a downhaul cleat, Figs. 17 and 21. Neither can the mainsail be raised or lowered once it is fully rigged. Instead, Scoot is simply tipped on her side as in Fig. 20 when mooring. Note in Figs. 15 and 19 that both the jib and main sail are fitted with special batten pockets, double-stitched at the



19 MAINSAIL AND SAIL-BATTEN DETAILS

18 METHOD USED TO ESTABLISH CORRECT LUFF BATTEN LENGTHS { A-B ⅓ TOTAL LENGTH; A-C TO SUIT CLOTH LENGTH