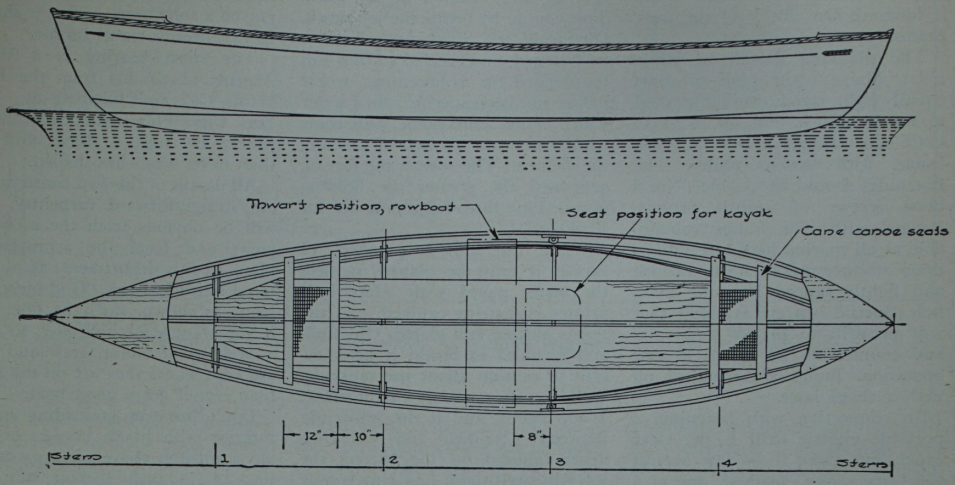


ROB ROY A COMBINATION CANOE-KAYAK

She's a combination boat with two sheer heights. You'll use her as a one- or two-man canoe, a one-man rowboat, or even as a large kayak

By ***WESTON FARMER***

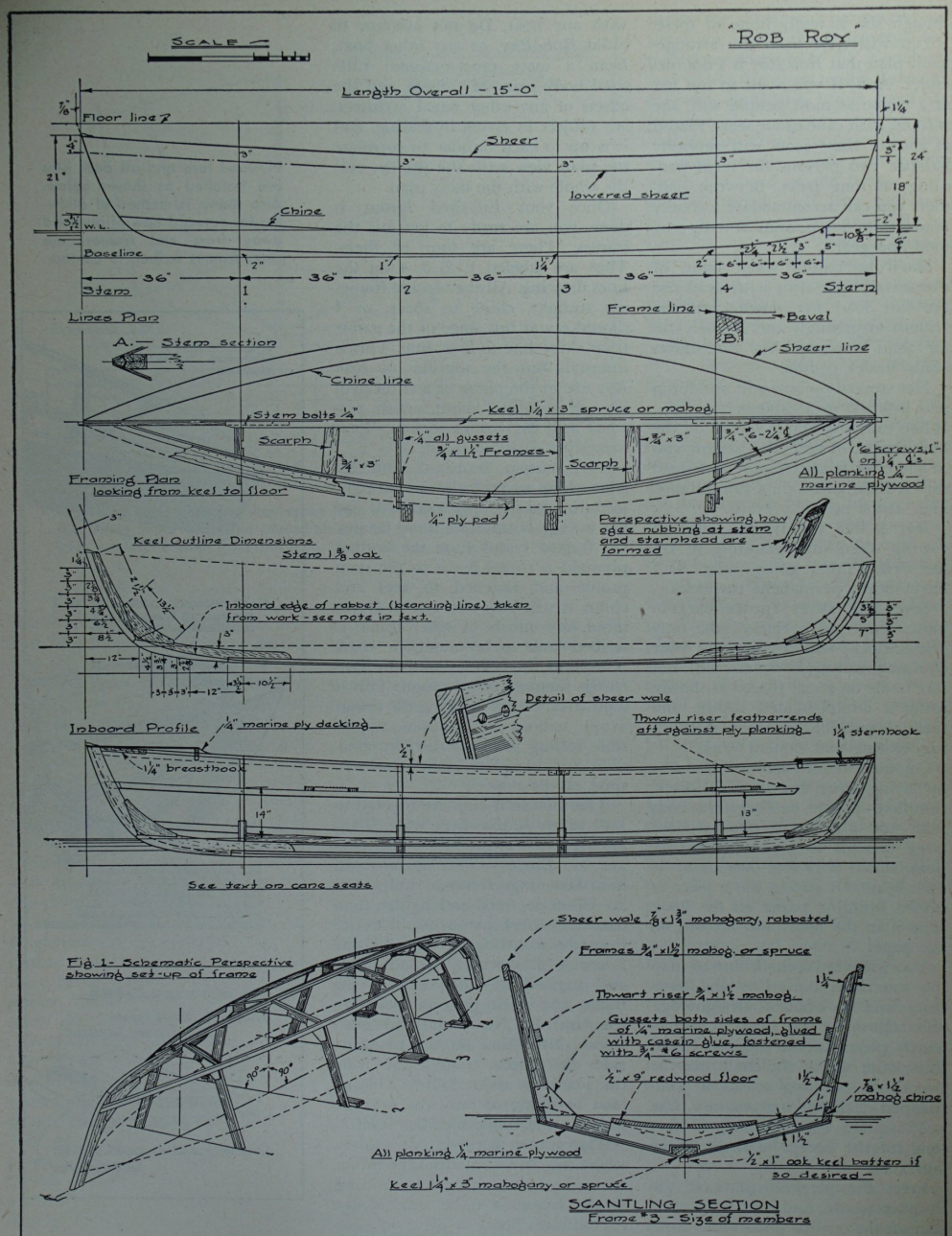
AN ARDENT canoeist and black fly devotee dropped into my Powder Island boat shop up on Nipigon Bay, Canada, last summer.

"I gotta have a boat that doesn't exist," sez he. "It's got to be as good as a canoe, but lighter. I may want to paddle her as a kayak, the better for shooting come fall. If I'm alone and toting a good camp load, rowing will cover more miles in a day than paddling. She'll have to be light because I may want to strap her to the pontoons of my Beaver and fly inland. I'll want her to be stiff, too."

He allowed as how he was going to hang around my boat and stoke at my galley stove until I designed him a special sort of craft for cartop and camp use. So it didn't take me long to galvanize the idea of *Rob Roy*.

She is named for the famed Scottish canoe of several generations ago in which Robert Louis Stevenson crossed Europe on its canals and lakes, and about which he wrote so charmingly in *The Adventures of Rob Roy*.

This *Rob Roy* in no way resembles Stevenson's boat, except that she is small, slim, and light. Our current *Rob Roy* fills my friend's variety of needs to a T, and is built of plywood, which Stevenson never heard of. Her main function will be as a canoe; she'll serve as a kayak; she'll row easier than a St. Lawrence skiff,



All of the dimensional and structural information to build Rob Roy is pretty well contained in the above drawing. The dimensions for stem and stern outlines are spread between lines and keel plan. Inboard profile ties in with scantling plan to locate all pieces.

though she is really none of these.

You will note from the arrangement plan that *Rob Roy* is a double-ender. And, if you want to use her as a canoe as most people will, she is fitted with cane canoe seats. Placed as shown, these seats will properly balance two persons for team paddling on long treks. Between paddlers you can accommodate a goodly load—up to 400 pounds of tent, gun, food and gear.

She'll be tender when light, of course—all light craft with dead rise are—but load her down, and she stiffens surprisingly and is much stiffer than a canoe. Yet she moves easily under paddle.

Her steeved-up bow will not dump seas inboard as a canoe's bow does. When camping alone, you sit on the bow thwart or seat, the narrow end of the craft is astern, and your load forward. Balanced thus, normal one-man canoe action prevails.

But I like my friend's idea of *rowing* when single-handing it. It's less tiring, faster going, safer. So I have shown permanent rowlocks.

Seven-foot silver spruce oars in loose, leathered oarlocks (the only safe oarlock) will complement your equipment. Kayak cranks will not fare badly on a seat placed as shown, using a double-bladed paddle and facing forward. Fine for marsh crawling, casting and camera work.

Commence construction of *Rob Roy* by laying down her lines full-sized, complete—profile, half breadths, body plan and all. Use a painted floor large enough to accommodate the boat, which is 15 feet over-all by 40 inch beam. Or stretch out a piece of brown building paper on the floor, tape it to the floor, and lay out on the paper.

You will need a chalk line to snap the waterline, centerline and baseline, and a wooden straightedge about 10 or 12 feet long, to permanently pencil in the snapped chalklines, after which the chalk may be swept off. Nothing excels a well-snapped chalkline for accuracy. Use a 1" square batten about 18 feet long for the sweeps of sheer, chine and keel.

Erect the perpendiculars at the frame stations, and you may then post off the outline dimensions from the lines plan, or, as may also be needed for the layout, from the keel outline dimensions drawing I have supplied.

This full-sized fairing is necessary with any boat. Do not attempt to build *Rob Roy*, or any other boat, from a mere cross-sectional full-sized body plan. My offsets, and the offsets of any other naval architect, are subject to errors in scaling, and it is up to each builder to correlate the plan view with the profile, and the whole with the body plan.

Once your full-sized layout is done, you are ready to get out the frames. There are four of them. They are labeled 1, 2, 3, 4 on the lines drawing. All the topside frames are straight, chine to sheer, or I should say at this stage of the game, from chine line to floor line. This is unusual. But the topsides of *Rob Roy* are in the plane of a truncated, warped cylinder about which plywood will lay flat in section. That makes her easier to build.

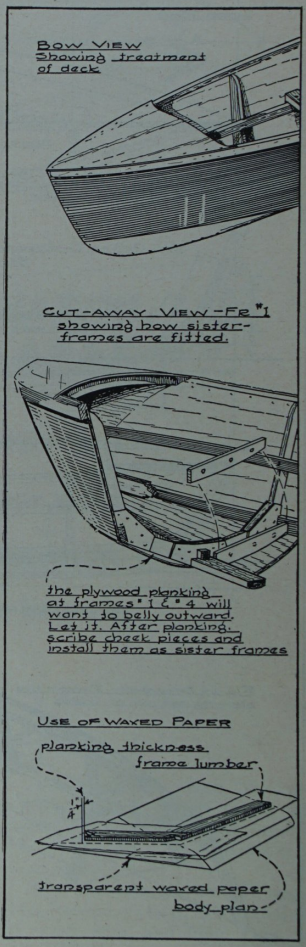
The bottom frames—2 and 3—from chine to keel also are straight section, and the plywood will lay flat on the bottom on those frames. On frames 1 and 4, as the bottom plywood is rolled home to the stem profile and fastened to keel and chine, it will bow out. Let it. Never mind how much. A sister frame is scribed later to lay alongside these frames on the bottom, and the fastenings then are put through. This is a practical way of working the thing: avoids tedious explanations, impossible lofting problems for the amateur, and like Tin Lizzie, works in spite of the dope.

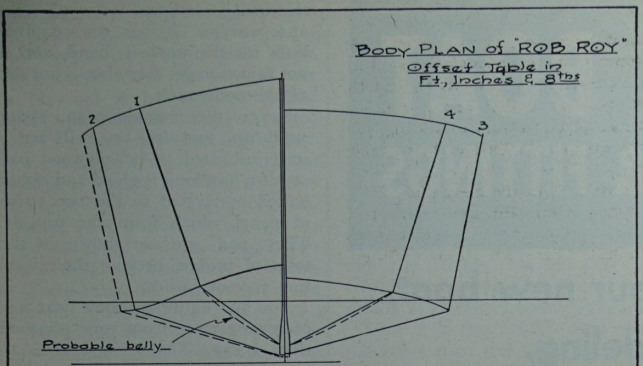
The topside frames are tapered to 1¼" width at the sheer wale. They are 1½" wide at the heel. All frames are of spruce or mahogany—both hold fastenings about as well, both are easier to work and lighter than oak. The cheek pieces, you'll notice from the scantling section of frame 3, are of ¼" marine plywood, glued and screwed to both sides of the frame. Use casein glue on these gussets, and ¾" No. 6 flathead brass screws. Note that on the planking side the gussets stand away from the planking about 3/16". This allows bevelling of only the toolable wood in the frame member itself.

The spaces between all gussets, where they run away from the frame, are to be filled with the same stock as the frame. This is true of the curved cross floors of plywood (gussets) which join the keel ends of the frame together.

An easy method of assembling the frame is as follows: After the body plan has been laid out and accu-

Plywood fore and aft deck bibs are installed as shown below. Also shown is method of allowing for outward bow of plywood away from end frames: use sister frames scribed to contour.





Heights above baseline	Station	1	2	3	4
	Sheer	2·0·4	1·10·4	1·9·4	1·10·0
	Chine	0·7·4	0·5·6	0·5·3	0·6·5
	Keel	0·2·0	0·1·0	0·1·2	0·2·0
½ Breadth from ℄	Sheer	1·0·5	1·6·5	1·7·7	1·3·6
	Chine	0·8·0	1·2·7	1·4·2	0·10·4
	Keel	0·0·4	——→		

This is the body plan you must make from the faired up lines drawing. The offset table gives the measurements in feet, inches and eighths from centerline and from baseline. See text for treatment of belly.

rately cross checked for heights and half breadths, scribe a heavy dotted line ¼" inboard from the frameline. This represents the face of the frame, because the lines are drawn to the outside of the ¼" planking. Now, place a piece of waxed kitchen paper over the body plan. This will permit the dotted frameline to show through. You can lay your frame members in the proper location over this waxed paper, and, mixing the casein glue with which the gussets and fillers are secured, proceed to tap these members together secured by brads. In 24 hours the upper set of gussets will be sufficiently set to enable you to screw fastenings in, these being ¾" No. 6 flathead brass screws. Then immediately glue and screw the opposite side.

You will note on the inboard profile that the frames in the forward end of the boat are *forward* of the frameline, and those aft of the midship section are *aft* of the frameline. The detail B in the half-breadth plans shows why—the frame is built to the frameline, and the bevel is taken *off* one side, leaving the other neat to the frameline.

You will also note from the scantling section that the gussets which form the floors over the keel are cupped. There is no objection to running them straight, except that a lower center of gravity for the load stowed results, also it is very conducive to handling and boarding steadiness to have cupped floor boards thus. Tends to center a live load.

The stem and stern timbers are next fashioned. These are of 1⅜" white oak, molded as per the keel dimension plan. They can be assembled in the same fashion as you assembled the frames. Bolts, preferably brass, ¼" diameter, are countersunk and plugged in the outboard face, and bolted over washers. Then the bevel between sheer and chine can be cut in, using the angle picked up from the half-breadth flow of lines to the stem. If you are a rattling good mechanic, you can guess the flow of bevel from chine around the forefoot to the keel. But since this bevel is a simple thing (the plank runs over the stem as per detail A—stem section) and is not rabbeted, it probably will be easier to plane the bevel in *after* you see how the bottom planking rolls on. More later about all this.

The keel is the next member you fabricate. It is a simple stick of clear 1¼"x3" mahogany or spruce. Either will do. This is not bevelled until set up in the frames.

Now you put a grid down on the shop floor as shown in Fig. 1, which shows the schematic perspective of the frame setup. The frame ends are tacked toe-wise along the frameline, and blocks are then nailed down to properly hold the frame head in position.

Rob Roy builds more easily then a pram, really, and cross-spalls, across the head of the frames, will not be needed until after the boat is all planked and you are ready to turn her over. Put them in then—*don't overlook this.* Your boat will change shape if cross-spalls are not provided until the riser and thwarts have eventually been installed.

All frames must be 90° to the floor, and at right angles to the frameline.

Next bend in the chine. Since the frames have been gained or notched out for the chine member, the chine will go in flat and unbevelled. It is easier to bevel it on the framing setup than on the bench, because the proper bevels will at once become evident. You may have to add an extra backing piece forward of frame 1 and aft of frame 4 to accommodate fastenings on the steep bevel. This is okay. Another way to fay the plank down to the chine, if it thins out and won't hold screws, is to use copper clout nails as rivets, over small burrs, on about 1¼" centers. Most mechanics will prefer an added backing piece glued to the chine

If I were designing this little boat for ordinary boat shop construction, I would specify a heavier clubbed end out of 1¼"x3" stock at bow and stern, which would mean to a professional boatbuilder that he should run his chine stock through the planer at 1¼"x3", and crank down the planer feed to ¾" after frame 1 was passed, and open it again to 1¼" from ¾" after frame 4 was passed. (Hint!)

One good screw, about 1½" No. 10 flathead brass, goes through the chine into each frame landing. One-inch ditto will do at the stem and stern, two per chine.

At this stage of the game, your frame looks exactly like Fig. 1. Mark the frames for the sheer height, and get out a pattern for the topside planking. This boat has been planned to work out of standard 4' x8' panels. Long enough sheets of plywood are available from the plywood makers, but seldom are available in builder supply stocks. Hence, on 8' panels there will be some waste. That's unavoidable, because

this boat is designed for wind, wave and weather. It has the required bulk for the work in hand, and is not drawn to get every last grunt out of plywood panels.

So on the framing plan, about amidship, topsides, you will see a scarf indicated. A ¼″ plywood pad about a foot long is glued and either bolted or riveted to the two strips of panel which form the topside. These pads are not shown in the inboard profile, because their location is your choice.

You may figure out some neat way of getting more from your plywood than I can. The main idea is to *stagger* the topside joints and bottom joint, because the bottom, too, on 8′ panels will have to be scarfed.

And here comes my previously promised word about the roll, or bow, in the bottom planking. The framing plan shows two scarf members on the bottom, of approximately ¾″ end thickness, by 3″ width, bellied out in the middle to the proper roll or bow which the fore and aft bib panels require. After the topside is planked, using ¾″ No. 6 flathead brass screws on 2¼″ centers, with the chine seam bedded in some sealing compound like Sealer 900 or Kuhl's Elastic Seam Composition, bevel the chine and topside.

Then tack on the middle panel of the bottom, using only a few screws at first to hold it in place. This would be the panels between the proposed scraf points. Bib ends are cut out. The stern bib will likely bend dry, but the forward bib should be persuaded by boiling in a washtub for about 15 minutes. In any event, it is merely a matter of using your noodle and ordinary mechanical horse sense to get the scarf battens of ¾″x3″ cut to the proper amount of belly. Don't, for the love of Mike, try to screw the plywood down flat at this point, because the rest of the planking will then festoon like pillows between frames. Invest the moderate sweat it takes: it will pay off.

With the bottom on, using ¾″ No. 6 flathead brass screws on 2½″ centers along the keel and 1″ on 1¼″ centers on the stem and stern posts, the edges of the bottom panel are planed flush. You may want to add a spray knocker out of ½″x1″ oak here, but I think its fastenings would weaken the already well-threaded chine. Perhaps fiberglas might pro-

vide a scuff-proof, watertight chine. It's your option, and easy to do.

Fiberglas is a spun glass cloth, very tough, which can be laid over a plywood or other wood surface after a plastic gunk has been brushed on. I'm no chemist, and don't know what this gunk consists of. But I am told it is a resin. Into this resin the fiberglas cloth sinks and becomes invisible. Over this you brush another coat of gunk, and the whole dries hard as glass, but quite resilient. Consequently the process has good bonding qualities.

For a *Rob Roy* intended for banging around in the rocky northern lakes, provided you could afford the extra portage grunts, fiberglasing the bottom would insure launchable-at-will tightness, and some strength. Costs vary considerably, colors may be added to the gunk; the whole development is sworn to by those who have used it. These are statements made to elucidate, not recommend, because this option is again yours. Painted or varnished only, *Rob Roy* will be very serviceable.

With the cross-spalls placed at the frame heads, pull up the floor nails and roll her over. The next things are the sister frames on the bottom at frame 1 and frame 4. These may be needed and may not be. Plywood rolls differently in each individual panel. But if the bottom bows away from the straight frame on which you lofted the boat, install a scribed cheek piece to the frame, cut and bevelled to accommodate the bow. Screw fasten this to the frame first, and then run in a few ¾" No. 6 screws from outboard—just a few. Don't pepper this part with fastenings, two or three will be ample. Moderation is best here, as in yodeling.

At this stage of the game, and with the cross-spalls left in (these are braces across the frame heads to hold the boat's shape) you can now fit the thwart riser and the sheer wale.

The sheer wale should come first, as it will not disturb the cross-spalls. This, as the sketch shows, is a piece of ⅞"x1¾" mahogany. I have specified mahogany because you can usually get it in one length any place that handles this wood. But birch, white oak, ash, or anything of that nature will be good. It must be in *one length* to give a fair hull. This wale is rabbeted on a circular saw up to within ½" of the top edge so that the plywood will nest in the rabbet. Screw fasten with very light screws on about 4" to 6" centers.

The thwart risers can next be installed. These are of ¾"x1½" mahogany, specified because of available length. There is no use trying to run the aft ends to hull shape and land on the stern post. The ends will want to bend up. So feather them to proper bevel so they lay against the hull planking and rivet the ends to the skin. Heights for this riser are critical, and are given in the inboard profile as distances above waterline.

Since *Rob Roy* is high-sided when light, but at correct paddling height with a normal camping load, I have specified that sheer height and thwart relationship which will give most comfortable two-man paddling under such conditions, using the standard chin-height paddle all experienced voyagers prefer. Long paddle, thwart at proper height to hold up your tail if you prefer to kneel—that's paddling perfection.

But should you plan to use the boat light as a one-man canoe, I would build it with the lowered sheer depicted in the lines plan. For a one-man canoe, the thwarts are placed exactly as shown, but you paddle from the bow thwart, the direction of the boat's travel being reversed. For such a craft, I believe the lowered sheer is best. Also for kayak purists who see nothing in *Rob Roy* but kayaking fun, I'd again prefer the lowered sheer. But as a load-carrying voyager, for either two-man paddling or one-man rowing, I'll take the higher sheer.

The lowered sheer, should you prefer it, is arrived at by lofting the boat to the lines and offsets shown for the normal sheer, then planking the topsides to the lower elevation. Simple?

A word on the thwarts: I believe the Old Town Canoe Company, Old Town, Maine, still supply cane seats for those who wish to buy them, though I have not checked this point. If you live in Canada, you might try the Chestnut Canoe Company, Fredericton, N.B., Canada. It seems to me they'd oblige the home builder. But any local upholsterer should be glad to make these frames for you and cane them. They are light, strong, and have mortised frames. These frames, bolted to the risers, will now let you remove the cross-spalls and install the redwood floor boards. Then you coat the boat with Firzite, which kills Douglas Fir grain in the plywood so you can paint and sand it. Either paint or varnish will go over Firzite.

The oarlocks are installed, the little ¾"x2" oak carlins for the fore and aft decks are secured from the sheer wale inwards with long screws; the fore and aft decks put on.

Then, just as you did when you first got down on your knees to loft her, you launch and get into her just as you have built her—like a porcupine makes love: *carefully*.

If you use Rob Roy as a double ended rowboat, get spruce oars seven feet long and put the leathers on about as shown. Don't use pinned oarlocks as they are both dangerous and hard to row with. See sketch.