REPUBLIC SEABEE

BY TOM MOUNTJOY

Tom Mountjoy is a prime example of a pre-World War II free-flight scale buff (FFSB) who, several years ago, was bitten by the R/C bug. He designed and built his original Seabee in 1945, during which time the Republic Aviation Company was tooling up for the production aircraft with the dream of a Seabee in every hangar and/or boat dock. The fly-away price of the Seabee was first advertised at $4,500, although later the price was increased to a staggering $7,000. Republic built over one thousand Seabees before production was halted for good in 1947, due to a declining market.

The Seabee was a fine idea with a strong attraction to almost anyone interested in the ultimate airplane. The design has a certain amount of sex appeal not found in the average airplane. There was an old rumor that the Seabee was underpowered and it can now be told that, indeed, it was too much airplane for the size engine available at the time. Today, the original 210hp Franklin has, more than likely, been replaced with engines varying from 265hp up to 350hp. The Bee would true out at around 90mph low cruise, 115 at high; this, and patience, would get you anywhere!

It has been the author's experience that most model builders are constantly on the lookout for a challenge. Let me assure you, before going any further, that the Seabee R/C has all the basic requirements necessary to make it a prime candidate for anyone on a challenge search. It is a true marriage of the airplane and the boat, known as an amphibian. All of this pushed ahead with a power plant located behind the C.G. and therein lies the real challenge. The two problems most associated with an R/C configuration of the Seabee type are: (1) tail heaviness, and; (2) cooling the engine on a pusher installation.

Cooling is no problem in the air, but on the ground you will want to hold engine runs to a minimum (particularly on a hot day). This is not an unbearable situation; it's just one you must be aware of and exercise the necessary caution.

Fuselage Construction:

The fuselage construction is unique. As you can see by studying the plans, it is quite different from the normal. Remember that you are building an amphibian so there are some unusual curves involved. As in all boat construction, the keel is laid first. Make the forward section of the keel from 1/8" plywood sheet (no warp allowed) and the aft sections from 1/8" hard balsa. To keep the tail light, lightening holes are recommended as shown on the plans. I used an X-Acto hole cutter in my hand drill motor which does a neat job if the blade is sharp. Practice on a piece of scrap first.

Once the keel sections are secure, you are ready to add the bulkheads in the usual manner. The cabin floor and inside panels are added next in order to form a neat box construction. Be certain that all internal parts, stringers and even the control surface NyRods are glued in their proper places before covering the fuselage with 1/16" top grade balsa sheet. Note the 1/16" balsa "V" panel directly under the engine for catching fuel oil drippings.

Do not try to cover more fuselage with balsa sheet than you can conveniently

handle. Small sections accurately done give a much neater job than trying to cover too much area with one sheet. In building the Seabee, the fin is an intricate part of the fuselage and, therefore, should be assembled and covered right along with the rest of the fuselage.

You will note that the cabin floor has a rectangular hole for mounting the servo tray for the rudder and elevator only. Because of the engine location, the throttle servo is not a member of this group. Be certain to match the servo cut-out with your servos, using the drawing as a guide only. Control servos are mounted as low as practical in order to insure a direct route for the NyRod travel to the tail surfaces. Fill in the area under the servos with a solid amount of foam rubber for protection.

Follow the plans in constructing the top cabin structure. Use hardwood, or hard balsa, so that it will be strong in case of a flip-over landing. The skylight window is removable in order to gain access to the servos and radio gear. A little more weight for additional strength ahead of the C.G. is recommended with this particular design.

There are two fuselage window modifications I have made in the plans, not identifiable in the Seabee pictured in this article. The original, or first, Seabee did not have the racy slant to the forward window post and the windows were somewhat larger. In order to establish accuracy, I have corrected this situation on the plans. The smaller windows will make the addition of the Kavan window mounting channel more difficult to apply but not impossible. The problem will be in making the curves at each corner. It will probably be necessary to stop and start the channel in each corner, then trim the outside edge of the corner radius in order to give a curved appearance. Miter the opposing edges 45° at time of installation. The actual production Seabee as it left the factory did not have channel rubber window mounting. Therefore, if you decide to forego it, you will be that much more true to scale.

The landing gear is made in two separate sections, namely a right and left assembly. Using 3/32" wire, bend as shown on the plan and solder each of the two pieces after wrapping with fine brass or copper wire. Also, solder a small brass lug to each leg at the fuselage in order to secure the gear and yet make is easily removable. By turning the gear upside down and switching sides, it can be retracted for seaplane operation. The real Seabee carried the wheels in a similar manner on the outside when fully retracted.

Center Section:

As you can see on the plan, the wings are made in two panels and join at the center section which is a part of the fuselage. While I do not advocate this type of wing installation, it is a necessity because of the unconventional location of the engine and fuel tank. (By using the new pumper engine, the fuel tank might conceivably be located under the center section, thereby allowing for a one piece wing complete with aileron servo.)

In addition to the wing stubs, the center section contains the engine and mount, the fuel tank (Kraft 4 oz.), and the aileron servo. Locating and mounting the servo is a delicate situation because of the limited space. In order to facilitate a direct push-pull line to the ailerons, the servo is situated under the fuel tank. Since the tank is clearly accessible and easily removable, this is really not too bad a layout. A careful installation will insure against surplus fuel getting into the servo area.

The aileron push-pull rods are connected to the servo disc with the tank raised out of the way. I found that by drilling a Kwik Link hole on either side of the regular hole in the servo disc, adequate aileron travel could be obtained. Just enough clearance must be left between the opposing Kwik Links to allow freedom of movement.

The center section spars are made from 3/16" balsa, bonded to a slightly wider piece of 1/16" plywood. Note that the plywood extends down below the bottom edge of the balsa spar. This allows you to securely glue the spar assembly to the mating bulkhead. The 3/32 diameter wire pins for receiving the outer panels are thread wrapped and epoxied to each spar. The locknut arrangement for holding the outer panels must be installed before covering the entire center section with 1/16" sheet balsa. Blend the lower surface of the center section into the fuselage side with a good filler material.

Right here you have to say to yourself that mounting the wings and the aileron servo connection sounds like a lot of hookup work at the flying field. Actually, the Seabee is not a big model. It can be easily transported in most cars without disassembly. In other words, once you get it together, you can leave it together.

Tail Surface Construction:

The stabilizer is constructed in the normal manner and covered with 1/16" balsa sheet. Make the main spar from spruce or basswood as it must be strong. Insert the stabilizer through the fin so that the rear fin post is flush with the main spar of the stabilizer as shown on the plans.

The rudder and elevator are not covered with sheet balsa in order to preserve lightness. If you prefer to cover with sheet balsa, use 1/32" or sand the 1/16" to a maximum. Remember to keep the aft section as light as possible without sacrificing strength.

Engine Cowl:

The engine cowl can be carved from one hunk of balsa if you like to whittle. I made mine by framing with a front, center, and rear bulkhead, then filling in-between with 1/2" square soft balsa blocks. Use good quality balsa and you will have no problem carving to the desired shape.

The front grill is made from soft 1/16" wire, glued or soldered permanently in place. Paint the grill silver for a sharp appearance.

Wing Construction:

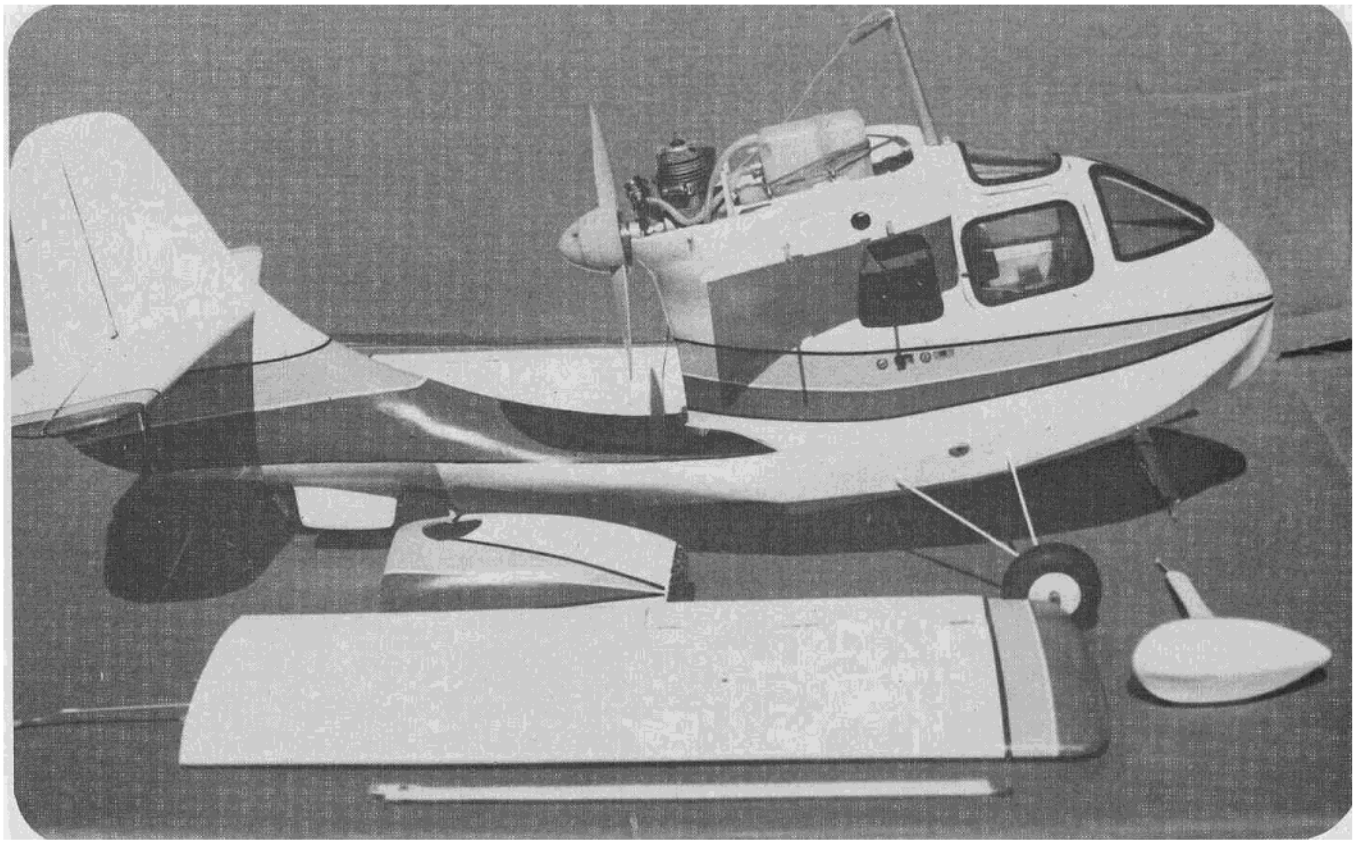
The wings of the Seabee are the only part that is not unusual. Believe it or not, the prototype Bee had a tapered wing which was attractive but too expensive to manufacture. I have stuck to standard wing construction for the right and left panels. If you have no objection to three controls, the ailerons can be deleted. Since my Bee has ailerons, I cannot vouch for the performance. However, it would save a lot of work including elimination of the servo installation in the

SEABEE AMPHIBIAN

Designed By: Tom Mountjoy

TYPE AIRCRAFT
Stand-Off Scale
WINGSPAN
51 Inches
WING CHORD
6.5 Inches
TOTAL WING AREA
331.5 Square Inches
WING LOCATION
High Wing
AIRFOIL
Flat Bottom
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
1 Inch
O.A. FUSELAGE LENGTH
34 Inches
RADIO COMPARTMENT AREA
(L) 7" X (W) 4" X (H) 3"
STABILIZER SPAN
18 Inches
STABILIZER CHORD (incl. elev.)
5.125" Average
STABILIZER AREA
92 Square Inches
STAB AIRFOIL SECTION
Symmetrical
STABILIZER LOCATION
Mid-Way on Fin
VERTICAL FIN HEIGHT
9 Inches
VERTICAL FIN WIDTH (incl. rudder)
5.125" Average
REC. ENGINE SIZE
.23—.35 Cu. In.
FUEL TANK SIZE
4 Ounce
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
Four
CONTROL FUNCTIONS
Rud., Elev., Throt., Ail.
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa and Ply
Wing	Balsa and Ply
Empennage	Balsa and Spruce
Weight Ready-To-Fly	56—72 oz.
Wing Loading	24—31 oz./sq. ft.



center section. Wing strut and pontoon fittings etc., are securely mounted and checked for alignment before final covering.

Pontoons & Wing Struts:

The pontoons are carved from lightweight balsa block and the strut is made from spruce. The mounting fitting is designed to hold the strut securely to the wing and yet be quickly removable. You will not wish to install the pontoons when flying off of land because of their vulnerability to damage. The wing struts are streamlined spruce with end fittings as shown on the plans.

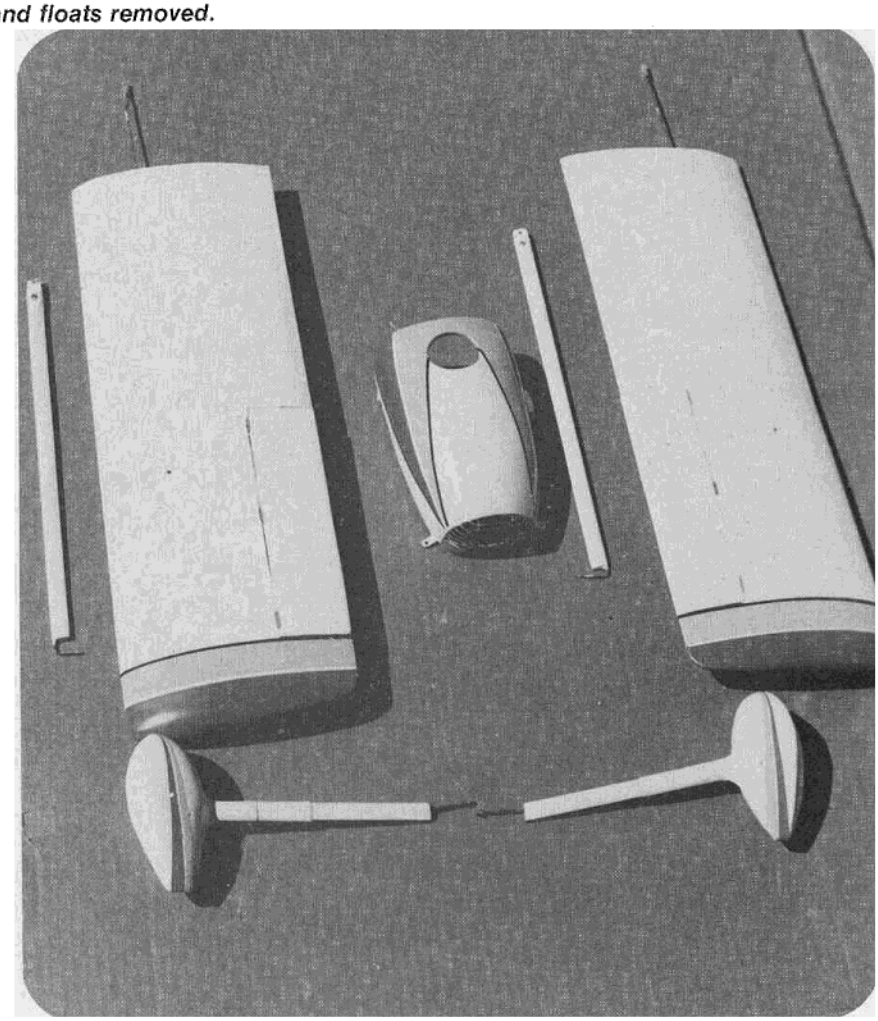
Covering & Finish:

Cover the entire model, including all balsa surfaces, with a material of your choice. The real Seabee is all metal with corrugated aluminum on the wings and tail surfaces. I used the new lightweight Coverite throughout and finished off with white K & B epoxy spray paint prior to adding the trim. The orange and bright yellow trim is accented with a thin black strip on the outer edges with a white strip between the orange and yellow. Because of the unusual shape of the Bee fuselage, the striping can be a point at the front and very wide at the rear. This would make a conventional airplane appear to be backing up, but with the Seabee, it gives a most attractive appearance.

Adjusting & Flying:

The first thing before flying is to balance your plane 1/3 back of the leading edge of the wing. If you have watched your tail weight from the beginning, this will be easy. A trap door in the nose is

Photos above and below show the Seabee with the wings, nacelle cover, struts, and floats removed.

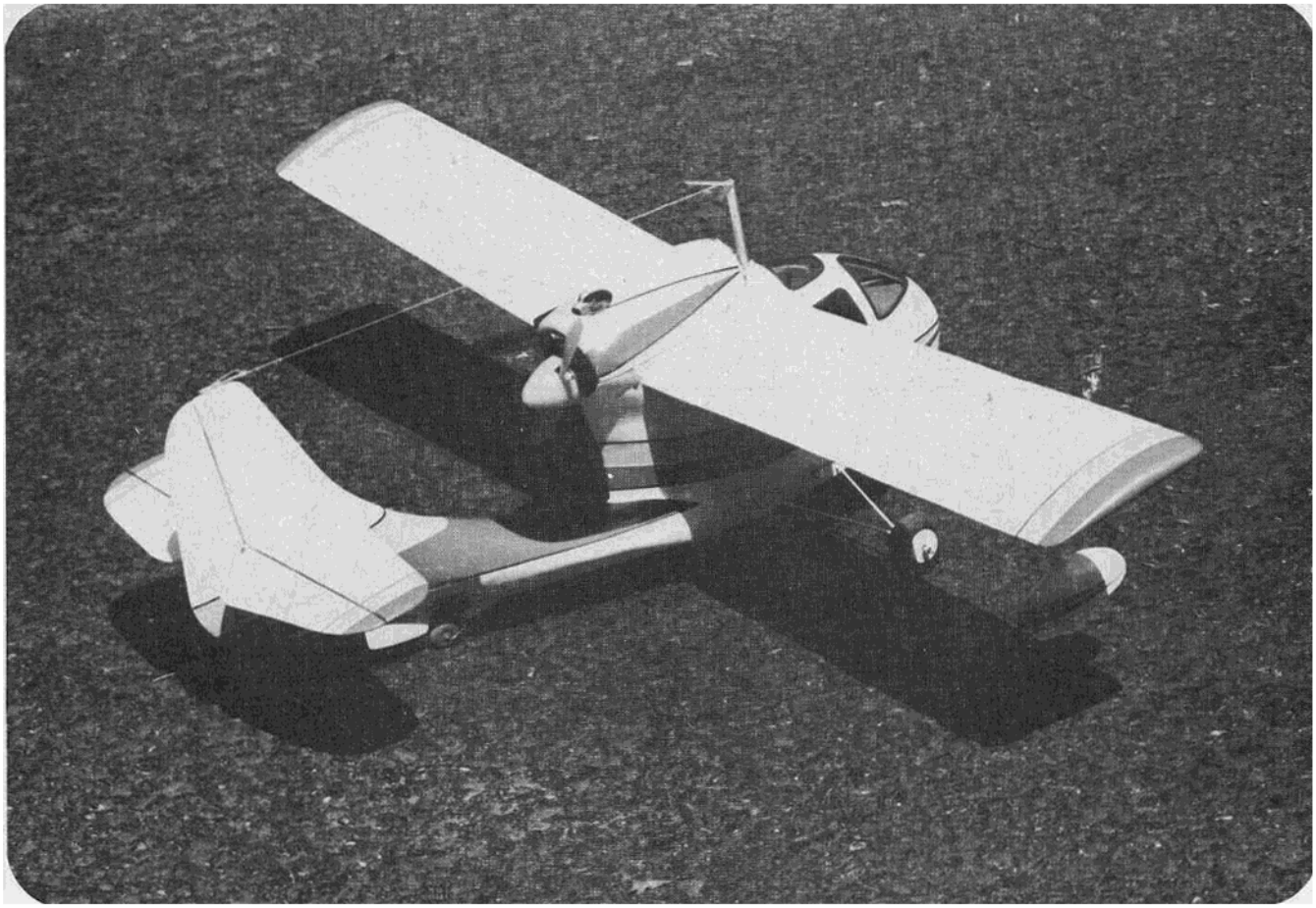


designed to hold any additional weight required. Since there is no propeller on the front end, weight can be added to a boom or probe extension made from a 3/16" dowel rod. This moves the weight well forward and cuts down on the amount needed and, therefore, the overall weight of the plane. Actually, the probe is rather attractive and gives the plane an experimental look found in most flight test aircraft.

In flying off the water, all adjustments remain the same except, don't forget to retract your landing gear and add you wing pontoons. If you plan to fly from the water, make certain from the beginning that your model is as watertight as possible. Drain holes are shown on the plans just in case.

Author's note: By now you have met the challenge on earth. Now see if you can meet it in the sky. Of the hundreds of models I have built, the Seabee has been the most rewarding. It's a cute little beast with a mind of its own which seems to say, "Fly me you devil; you ain't seen nothing yet!" □

The full size Republic Seabee which RCM's Technical Editor, Dick Kidd, piloted for Chelan Air Service in the late '40's and early '50's.



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