

Boeing's

PB-1

By BILL ECKMEIER . . . An oldie-but-goodie . . . a simplified version of the famous Boeing PB-1 seaplane. It's a fun, easy to build project for free flight or three-channel radio.

• This design comes from *American Modeler*, a magazine which no longer exists, having gone out of business in the early 1970s. The most unfortunate part of the whole matter is that all of the many great model designs published in the magazine also disappeared. It is not known where the original drawings may be, if indeed they exist anywhere at all.

This very simplified version of the Boeing PB-1 is definitely an out-of-the-rut model, and with modern radios, becomes even more of an unusual and fun project than when it appeared back in January 1958. It was billed as either R/C or free flight, but we'd be willing to bet that the original was flown without radio. The drawing (but none of the photos) shows the biggest and heaviest single channel radio of the time, the Babcock CR-3, which, introduced at least three years earlier, was already outmoded by smaller, lighter radios. If designer Bill Eckmeier is available to make comment, we'd like to hear from him.

Modifying the design for three-channel radio should be fairly easy. Revise the fin and over-balanced rudder to put the hinge line just aft of the stab trailing edge. Add a stab spar just ahead of the one-inch trailing edge stock and use that stock piece as the elevator, splitting into two pieces each side of the rudder.

If you can find two Cox "Q-Z" engines with exhaust throttles linked to one push-rod, you can have the twin sound. Two G-Mark .03 engines, one G-Mark .06, or an O.S. or Enya .10 should provide ample power. At this point, we'll let designer Bill Eckmeier take over with the original text.

If you are weary of run-of-the-mill, box-type R/C and free-flight designs, this is the model for you. It not only looks like a real airplane, it sounds like one due to the realistic thrumming of the twin engines. The Boeing PB-1 was the granddaddy of modern patrol bombers, having been designed in the Twenties. Its compact configuration and inherent stability is readily adaptable to a model.

This is one of the rare jobs that can be flown on either engine or both. As a "twin" there is a minimum of torque problem, thanks to the counter-rotating propellers. As a free-flight she climbs rapidly at about a 30-degree angle with both engines running, around 15 degrees on

either engine. Even though one engine quits first, the transition from climb to glide is unusually smooth with no tendency to stall or porpoise.

Wing tip floats will be found unnecessary, due to the model's inherent stability on water. It is recommended, however, that spray rails along the chines be added from A to E for deflecting spray away from the props and engines.

A constant-chord wing makes construction a snap. Do not deviate from the wood sizes given; there is no interplane bracing and the wings must be strong. Panels for both the upper and lower wings are identical 18-inch sections. These join together to form a 36-inch lower wing—by inserting a 6-inch center section, you get a larger top wing. Gussets or 1/16 plywood reinforcements can be used to strengthen the dihedral breaks if these areas are not sheeted over as shown.

Conforming to the real PB-1, a two-step hull is employed. While it helps in breaking the surface tension of the water, you'll find it quite necessary to have both .049's running at peak rpm's for rise-off-water take-offs.

While that sheeted keel construction is durable, further covering with fiberglass makes for an almost indestructible fuselage. Repeated landings on hard ground have testified fully to the ability of this type of construction to really "take it"—however, a regular practice of landings on rocks or pebbly areas could eventually damage it.

Keel should be cut first, then formers A to J. Assemble formers on keel, add upper stringers working forward from rear end. Add lower, or chine stringers. With area from A to F propped inverted on 3/8" sheet, bottom and side sheeting is applied.

Engine nacelle struts of 3/32 plywood are added. Keep proper inward splay for struts so attaching nacelle will be easy later. The 3/8 sheet is cemented to top of fuselage at A to D; carve and sand to final shape. If access openings are desired, use stub sabre-saw to cut them.

Nacelle is mounted. It is basically an elongated "box," carved and sanded fairly round. Wing mount struts splay outwards at upper ends for firm support to sheet



PB-1 sweeps by on a lazy run to the clouds. Sheet-keel construction makes this two-wing seaplane a durable flyer.

wing platform. Two 1/8 dowels run length of platform and extend beyond ends to act as wing tie-downs. Lower ends of struts cement to inner faces of firewalls as shown in section N-N.

Since the nacelle-to-fuselage struts support both engines and the upper wing, add fairings of 1/8 sheet to them. Line both engines up zero-zero; no offsets are needed. Radiator under nacelle to heighten realism is carved from a small block.

The low cost, reliable Cox "Babe Bee" .049 engine allows most any modeler to undertake this project without a financial assist from Dad or the local "loan shark." As they will run in either direction either left-handed or right-handed pitch props will do in a pinch. It is best, however, to have each engine running counter-clockwise when viewed from its front. With a right-hand prop forward and a left-hand pusher aft, torque is neutralized—ideal for the R/C fan who wants to trim for straight-ahead flying under power.

There is adequate fuel capacity in the "Babe-Bee" tanks for average R/C flying. A short piece of fuel line from the overflow of one tank to the filler of the other will make single-point refueling possible; an added convenience: you can "top off" the tanks just prior to launching.

It is recommended that leads be soldered to the glo-plugs and routed to a common "ground" wire under the lower wing to facilitate starting; loose battery leads are a hazard with so many prop blades a-churning!

Your PB-1 can be operated off land by adding a simple 2 or 3-wheel landing gear, best held in place with rubber bands. The water-lovin' version should be well-doped for the inevitable dunkings that always occur.

Although the plans specify a Babcock BCR-3 receiver, any similarly reliable receiver can be used.

Prior to test flying, the model should balance at the point shown—just aft of the top spar. Additional weight may be necessary in the nose if R/C gear and batteries are not sufficient for proper balance. Our original required considerable nose weight when free-flighted.

Adjust for straight flights during glide tests, before attempting power hops. Front engine should be set with a rich mixture since it has a tendency to lean out during the climb. After a few hops, you get the "touch" more or less by instinct. You will find the PB-1 very easy to fly—it is a slow job easy to hand-launch.

For flying over large bodies of water, do not use green or blue colors on your seaplane. Orange is best for visibility. I trimmed my model in black.