AIRABONITA

By CHARLES REEVES

Sleek machine making a slow speed run with flaps down and arresting hook extended. Steady as a rock out on the end of its control lines.

Author proudly poses with his well-finished and detailed little plane. Note third control-line.

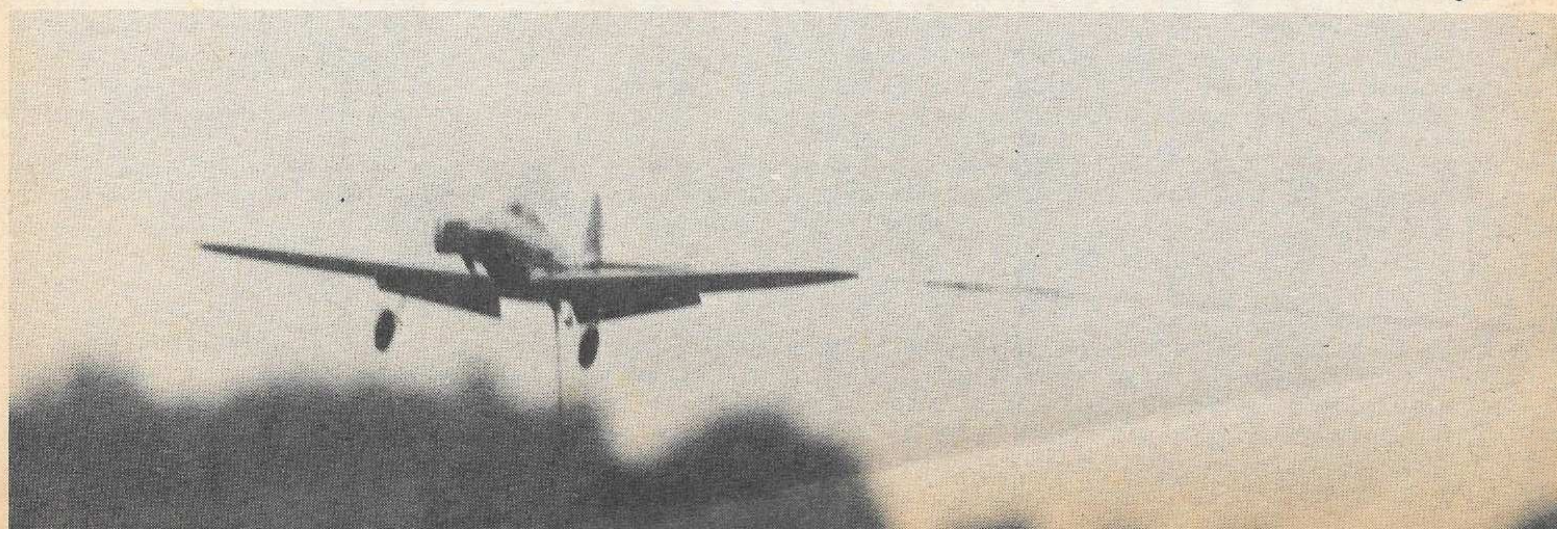
Contest winning Class One Carrier machine of little known prototype Navy fighter. Using Airacobra parts, it was maneuverable but obsolete before it had a chance to prove itself.

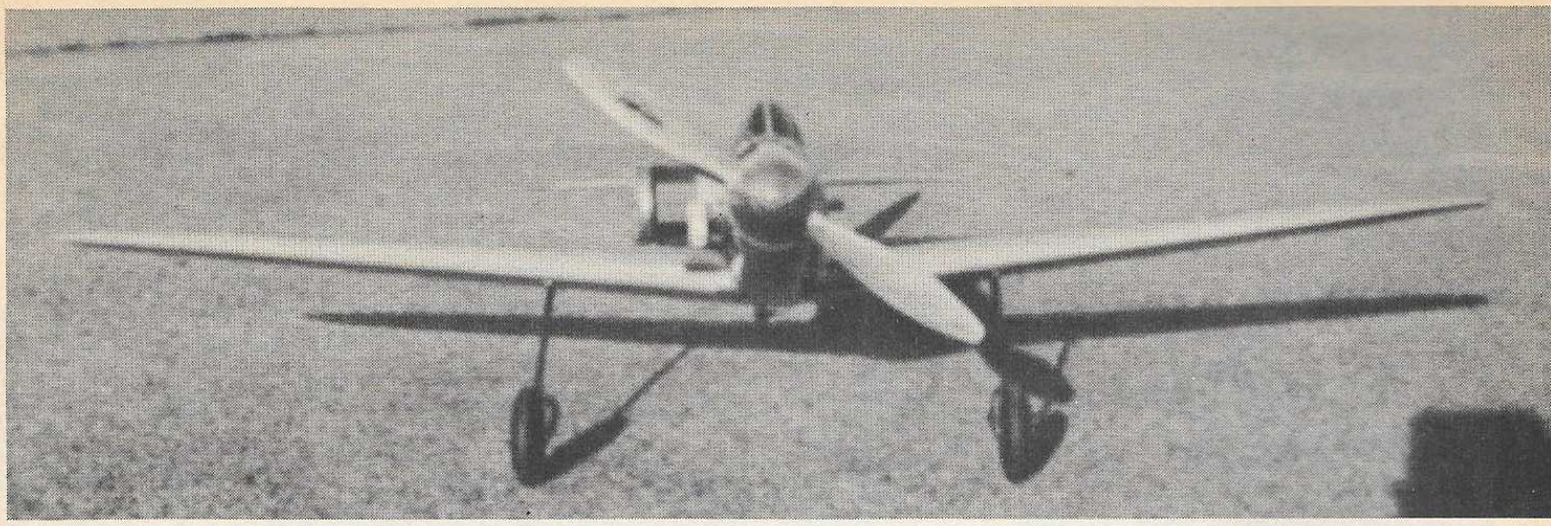
► In 1938, when the U.S. Navy placed a contract with the Bell Aircraft Corporation for an experimental shipboard fighter, it is doubtful that they even thought about the possibility of using it as a Class I Navy-carrier model. In fact, they apparently didn't think too much of the full-size airplane because they only ordered one, and they flunked it out during the carrier's qualification trials! After it flunked these trials, it was returned to the manufacturers in 1941 for modifications, but it was decided that it was unsuitable for further development and the aircraft was discarded.

"It looks like an Airacobra to me!" "I thought the Airacobra had a nose wheel." "Mister, is that a Mustang?" Really now — the questions some people will ask!

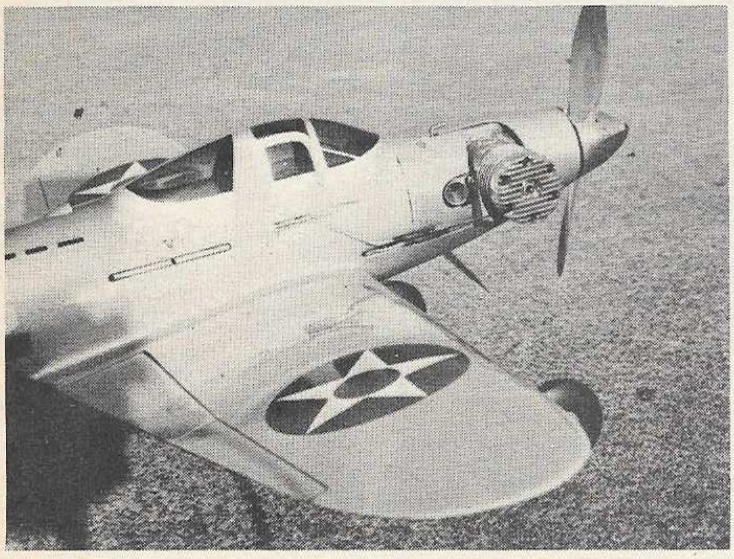
To begin with, it is not an Airacobra, but it is basically similar to it, and was developed in parallel with the land-based XP-39. Like the other two famous Bell fighters, the (*continued on next page*)

Another view of the Airabonita on a slow speed run. Flaps and arresting hook are clearly shown in this good shot. Note shallow or flat line angle.





Head-on view shows compact, smooth lines. Actually, the engine dwarfs the nose of the plane. Short but springy landing gear helps hard-deck landings.



View of nose section shows angular arrangement for throttle linkage.

Good clean release for take-off. Note angular deflection of landing gear.

AIRABONITA... Continued

Airacobra and Kingcobra, the Airabonita had the engine located behind the pilot, driving the propeller by means of an extension shaft. It differed, though, in that it had a tailwheel undercarriage with the main landing gear transferred to the front spar. An arresting hook was fitted, the vertical tail surfaces redesigned (from the XP-39) and the airframe was restressed for carrier operation. The Airabonita had provisions for two 0.3 inch machine guns in the nose and an 0.5 inch machine gun or a 37 mm. cannon firing through the propeller hub, although none of the armament was installed. This made it some kind of paper tiger then, didn't it?

If this glowing description hasn't already caused you to turn to the next page, see what you think of this model's qualifications as compared to the real plane's. If you look at all the current Class I carrier models, you will find that this one is by far the sleekest. It looks as if it is going a hundred miles an hour before it leaves the deck. In the three contests in which it was entered last summer, it took one first place and two second places. The slowest low speed recorded was 29 mph, and the fastest high speed was 103 mph. This low speed is expected to decrease (hopefully about 5 mph) with practice, and the high speed should increase with time as the motor loosens up and gains a few rpm's. If I can ever take some time off from my stunt flying to do a little experimenting with propellers, fuels, and glow plugs, this high speed will probably increase some more. Right now, I'll have to be content with a 9-8 Rev-up prop, Thimble Drome racing fuel (red can), and a standard long reach Fireball glow plug. Doesn't the model sound better than the real plane?

By looking very carefully at the plans and the pictures of the model, you will see that this plane is not intended to be a glider, so let's discuss the motor for a while. As soon as the first Super Tigre 40 R.V. came out, I bought one and set it back for the day when I would build a Class I carrier model. That is the engine that I have in this one, and the only complaint that I have about it is that it is about 3 ounces heavier than most other 40's. If I were buying a new engine right now, I'd be very hard put to decide between the new K&B 40 R.R. and the new lightweight Super Tigre 40 R.V. in the 29 crankcase. Regardless of the engine I chose, I'd send it to Bill Johnson, the "throttle specialist" in Berkley, Missouri,. and let him install one of his exhaust slides and fuel metering systems, which I consider a must for the really serious carrier flyer. If this sounds like a plug for Bill, it is! He's been a very big help to me in getting my motor and throttle system adjusted. His system allows one to run on crankcase pressure for the complete flight by reducing the fuel flow in the low speed run to minimize flooding. An added advantage of this is the ability to use a smaller tank and less fuel, thereby cutting down on the overall weight.

'Nuff bragging? Let's look at the construction. The wing can be completely finished before it is installed on the fuselage, so let's start there. Start by drawing the centerline on the leading and trailing edges and pinning them to the building board, setting them on the inside face of the 1/8" scraps so the ribs will clear *(Continued on page 48)*

Airabonita

(*Continued from page* 13)

the board when they are installed. Next draw the centerline on the ribs as shown on the plans and cement them to the leading and trailing edges, matching the centerline marks. This gives a perfectly true wing, and at speeds above 100 mph, you will need it. When dry, remove the wing halves from the board, plank the bottom with 1/16" medium balsa, and join at the center with 1¾" dihedral at each tip. At this point, cover the inside of the bottom planking between the two W1 ribs and the leading and trailing edges with fiberglass cloth and at least a couple of coats of resin. Install the bellcrank platform (with plently of glue) and mount the cut down Roberts bellcrank with leadouts installed. Make sure that the bellcrank is not binding in any way, and that it has plenty of room to operate before gluing on the 1/16" medium balsa top planking. Did you notice that no tip weight were included? In case you're worried, none was used on the original, since the motor was mounted out toward the outboard tip, and it has never torqued in on the take-off. Install the leadout guides with leadouts inserted, in the inboard tip and cement the tips to the wing. Shape the flap hinge line area, rough carve the flaps and install them with the tubing and wire hinges and horns expoxied flush with the bottom surface of the wing. Get a good fit on this hinge line, as it must close completey for the high speed run. Glue in the blocks at the outboard ends of the flaps, and glue in the filler block between the two flaps. Make this one solid piece, as it will be the trailing edge dihedral brace. Now the wing is finished except for shaping the blocks, so with razor plane and long sanding block, just cut and sand to your heart's content.

Build up the front end of the plane (motor mounts and formers A, A1, B, and C) with the motor bolted to the mounts. This insures that the mounts will be perfectly straight later on. Lay out the hard balsa crutch members (no doublers at the rear yet) over the plans, and tack glue

1/16" x ¼" strips between formers C and D, E and F, and at the rear to hold them in position while the formers are being glued in. Remove the motor from the front assembly, and after the formers have been glued to the rear crutch, glue the two assemblies together. Do not glue former D in solid yet, as it will have to be removed later to install the tank.

Make up the stabilizer-elevator assembly being sure to epoxy the elevator horn bushings to the trailing edge of the stabilizer. This will save your hinges later on. Cut away the center crutch member to clear the elevator horn, glue on the crutch doublers, and glue the stabilizer to the crutch assembly. Glue in the two 1/16" x ¼" tail posts between the upper and lower crutches at the rear. The planking will attach to these later. Now glue the whole flimsy crutch and elevator structure to the wing. Install the elevator push rod and run the rod from the throttle arm on the bellcrank to the vicinity of the auxiliary horn, running them low to clear the tank which will be installed next. My tank was made of .010" shim brass with a dome for the pressure line. Remove former D, which was only tack glued earlier, position the tank, gluing it in solidly, and reinstall former D. Make up and install the auxiliary horn and bracket along with the ⅛" plywood mount, and hook up the throttle wire from the bellcrank. The throw of this horn should be approximately 45° to the front for low speed. At this point run two strips of planking on each side of the fuselage, one below the centerline and one above the centerline. Now it's not quite so flimsy.

Make up the hook mount as shown from a piece of ½" square aluminum channel. Drill three holes in the back of this, one ⅛" for the mounting bolt and two 1/16" for the flap latch and hook latch wires, and drill and tap a 4-40 hole across the bottom for the 4-40 bolt hook pivot. Install this in the plane with the 4-40 mounting bolt and glue a ¼" x ¼" triangular block on either side of it to keep it from shifting from side to side. Make a tee on the end of the hook assembly and attach it with copper wire to a piece of 5/64" brass tubing cut to fit between the two ears of the aluminum channel. Silver solder this joint! If you don't, it might come unhooked on a hard landing. Make up the "Y"-shaped flap wire and run it through the aluminum channel. With the flaps in the up position, make a tee on the end of the wire about ½" behind former F. Wrap this with copper wire and solder. Run the hook latch wire from the auxiliary horn through the aluminum channel, and with the auxiliary horn in the high speed position, cut the wire off about 1" behind former F. Make up the 1/32" loop and plate to go onto the hook and position it so that the hook latch wire runs under the plate and holds the hook up for high speed. The flaps are also held up by the brass plate which presses against the tee on the end of the flap latch wire. This finishes the hook system except for the "mousetrap" type spring which pulls the hook down. It doesn't need to be very strong, and one end is soldered to the hook and the other rides free in a piece of tubing set into the bottom of the fuselage under the aluminum channel and former F. Spring load the flaps to pull them down for low speed with enough tension to pull them down solidly at 35 mph. airspeed. Solder a small washer on the flap wire so that it will hit the front of the aluminum channel with the flaps about 45-50° down. Bolt the motor in temporarily and run the throttle wires to the exhaust slide and the fuel control to complete the throttle and arresting gear hookup. To cock the system, pull the low

speed wire, pull the flaps up, pull the hook up, and then pull the high speed wires. Isn't that neat? Thanks go to Jerry Worth for this system.

Remove the motor, bind the tail wheel wire to former G with copper wire and glue well, and finish planking the fuselage with ⅛" x ¼" strips. Cut the rudder out of ¼" medium balsa, notching out to clear the control horn, glue the 3/16" fairings on either side of it and glue the rudder to the fuselage with no offset. Cut and sand to streamline shape. Cut out the planking to clear the motor. Mine is open from former B forward to the front of the motor all the way to the outside of the motor mounts so that I can check the motor mount bolts without taking off the cowl, which on my plane is an aluminum plate covering the area between the rear of the motor and former B. This plate is bolted to two brackets glued to the inside of the planking. Add the fillets now to the top of the wing, continuing around the leading edge, and to the top and bottom of the stabilizer. Large Du-Bro leather fillets were used at both places for strength and ease of application.

The landing gear brackets are from .04" dural, and are attached with #4 sheet metal screws. The landing gear can be bent directly over the plans, bending the wheel end as shown above the wheel. After making the recess for the landing gear, cut down and install a Taurus canopy and apply your favorite finish. For carrier planes, my favorite is Hobbypoxy which will resist the wildest fuels.

With a final weight of 27-30 oz. and the control movements shown, the Airbonita is as easy to fly as one could wish. Just make sure that the throttle and elevator are free and easy before you fly, and practice that low speed. You will find that your Airbonita will perform with the best, and usually will come out on top.

Now for the skeptic who still thinks this is an Airacobra, see "War Planes of The Second World War," Vol, IV, by William Green for photographs of the Airbonita.