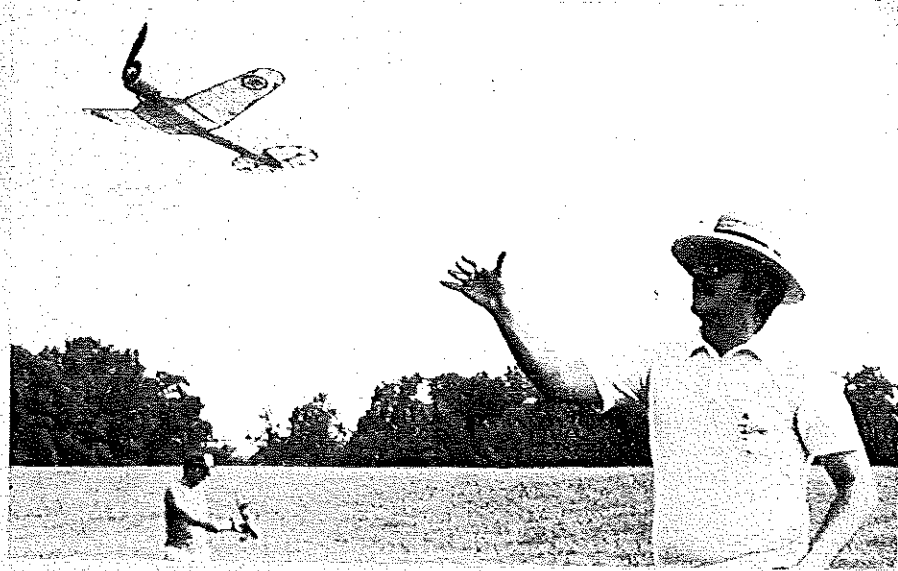


# Italian Gem the



Pat Daily and Mike Midkiff (Hellcat) prepare to launch models in final heat of WW II Combat at Flying Aces meet. Last man down, Pat shaded the Hellcat by a whisker. (Bill Noonan photo.) Insert: At "Shangri La," Pat releases the little fighter on a touch-up adjustment flight.



You would have to see Srull's Heinkel 100 and Pat's Fiat in head-to-head combat to appreciate this rubber-powered Italian fighter of WW II. It has won a raft of meets. ■ Pat Daily

THREE years ago our club, the D.C. Maxcutters, decided to hold a World War II Combat event for rubber-powered scale models at our annual summer contest. We decided to use an adaptation of the very popular Flying Aces Club (F.A.C.) rules for the Thompson Trophy Races, which involve mass launches with the first plane down dropping out of the competition until only one plane remains.

In looking around for a WW II subject that would pique my interest enough to keep me building until it was completed, I stumbled across Profile Publication No. 188 on the Fiat G-50. Since I am partial to Italian airplanes (and food!), I immediately fell in love with the Fiat's fat little fuselage. I located some old plans of the Fiat by Bill Winter from the June 1940 issue of *Model Airplane News*. I really didn't expect

much in the way of performance from the Fiat, but with some modifications to Bill's plans, I built it anyway.

Apparently, these old timers (sorry Bill) knew a lot about designing fine flying scale planes because my Fiat, to my utter surprise, has a very impressive contest record. So far she has won the following: 1st in the D.C. Maxcutters WW II Combat in 1977, beating out Don Srull's '77 Nats winning Heinkel; 3rd in the F.A.C. G.H.Q. WW II Combat in 1978; 1st in the F.A.C. Nats WW II Combat at Johnsville in July 1978; 2nd in the D.C. Maxcutters WW II Combat in August 1978; 3rd in F.A.C. Scale at the F.A.C.-G.H.Q. contest in June '78; and 4th in F.A.C. Scale at the F.A.C. Nats. My Fiat is now on the "retired" list and is flown only for fun.

Before we start construction of the Fiat, a few

words about the full-scale Fiat are in order. The G-50 was designed by Guiseppe Gabrielli and made its first flight in early 1937. Its fat fuselage was due to a Regia Aeronautica air ministry specification calling for an internal bomb bay. The G-50, christened "Freccia" (Italian for arrow, although it hardly resembles one), was the first low-wing all-metal monoplane with retractable gear developed for the Regia Aeronautica. Although it was a contemporary of the Hurricane and Spitfire, it lacked the performance, firepower and development potential of these types. It was an extremely maneuverable, slow and underarmed fighter. The Fiat G-50 saw action in the latter part of the Spanish Civil War, the Battle of Britain, and in Greece and the rest of the Mediterranean theater during the early years of WW II. At the time of the Italian Armistice on





**Fuselage:** The fuselage is built using the keel, or master stringer, and half-shell former method. Laminate the upper and lower and two side master stringers over the plans by using two pieces of hard 1/16 sq. so that the final dimension is 1/8 x 1/16. I use thinned Elmer's glue for laminating the balsa stringers. Construct the left half of the fuselage over the plans. Add the left master stringer. I used 1/16 C-grain 6-lb. balsa for the formers in front of the motor peg, and 1/32 C-grain harder balsa for the formers aft of the peg. Remove the shell and add the right-side formers and master stringer. Add the rest of the stringers in a symmetrical manner, i.e., one on the left side, one on the right side and so on. I used 1/16-sq. stringers for the most part, with

some hard 1/20-sq. stringers in the headrest and other non-structural areas.

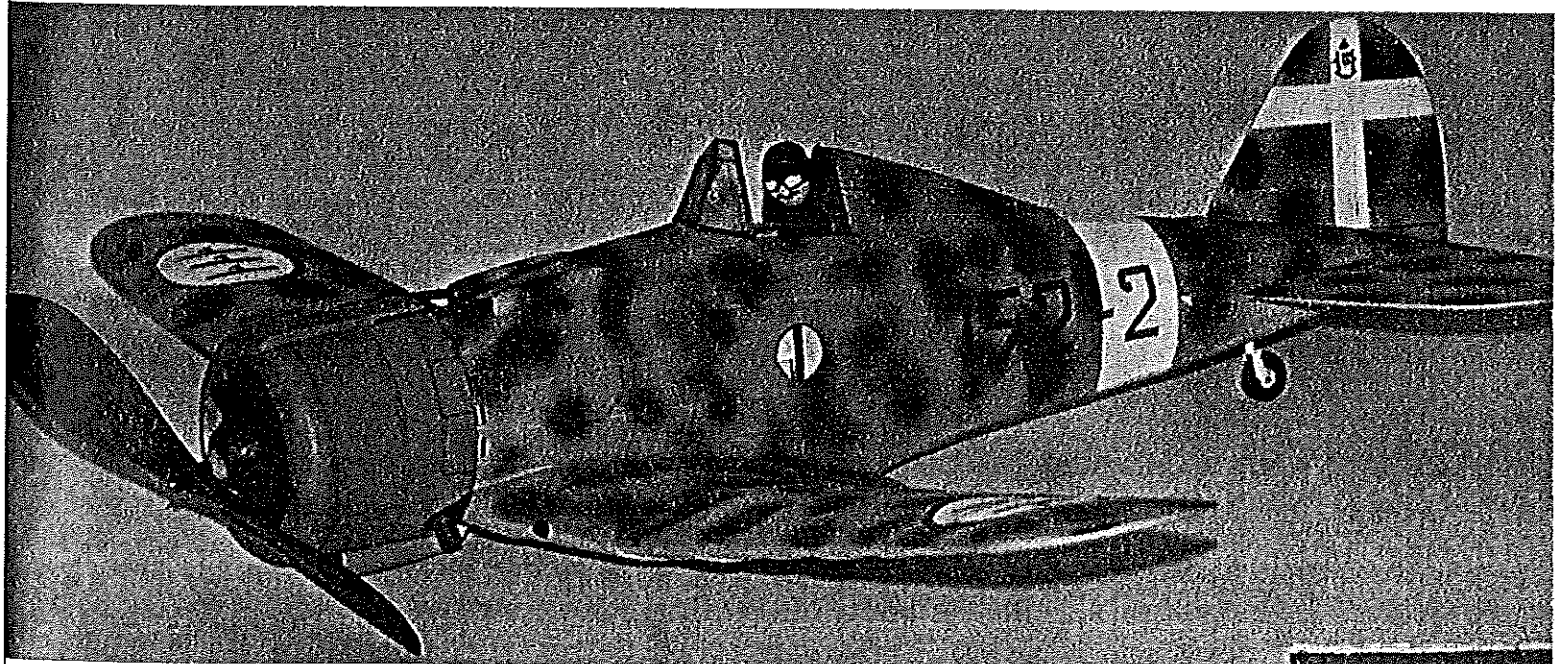
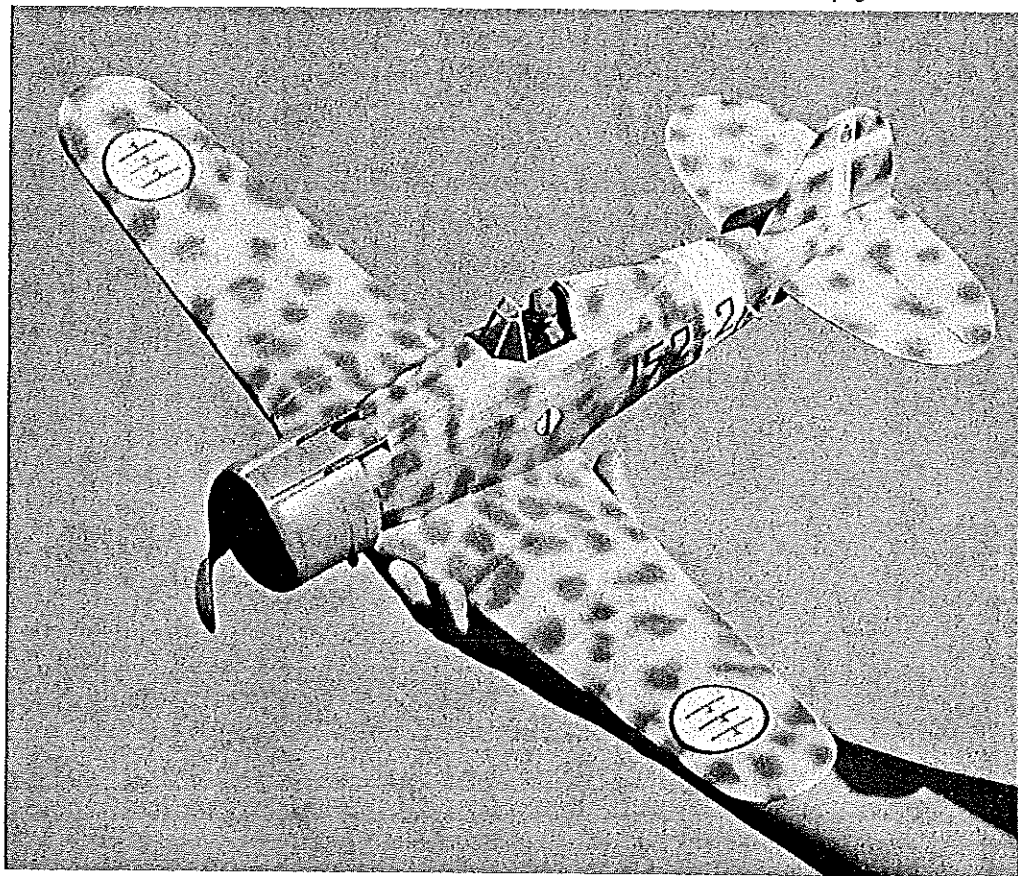
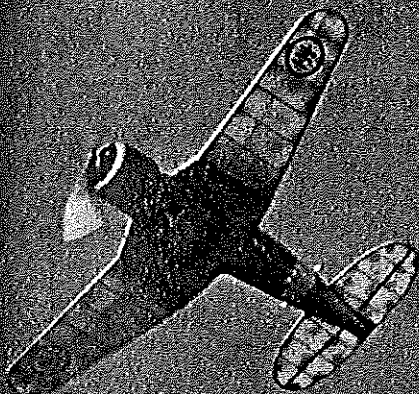
The inboard wing sections are actually assembled as part of the fuselage. Rib B is glued to the sides of formers 2, 3, and 4 on both sides. By carefully lining up the fuselage over the top view on the plans, the stub spars can be located and glued in place. The stub spars are made from hard 1/16 x 3/8 balsa. I arranged for the stub spars to butt against the lower master stringer. Rib A can now be located on the two stub spars and glued in place on both sides. The leading edge for the inboard wing sections is hand tapered to fit from Rib B to Rib A on both sides. Construct this leading edge from two pieces of hard 1/16 sheet laminated together. A trailing edge, laminated

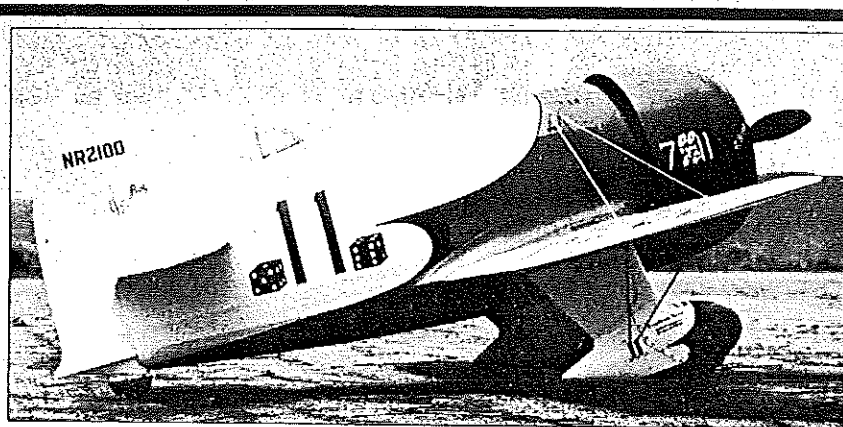
from two pieces of 1/16 x 1/8 balsa, is shaped or tapered and glued in place from Rib A to the stringers paralleling the bottom master stringer. Use gussets, made of 1/16 sheet, at all rib and trailing or leading edge joints. Now add the top spars between Ribs B and A. These are constructed of hard 1/16 x 1/18.

The cowling is built up separately and attached to the front of the fuselage at former #1. Cut the circle shapes needed with a compass fitted with a sharp blade. Softer balsa will do here. Use 1/8-sq. spacers to hold the front and rear sections apart at the proper distance. Now cover the cowling structure with damp soft 1/32 A-grain balsa. Be sure to cut a "key" in the front bulkhead of the

Continued on page 124

In flight, the FIAT reveals the generous stab which helps it stay on the step. Right: Careful wood selection and light construction are vital—and there are ways to minimize finishing weight (see text). Below: Even when weight control is a life-and-death matter, your true-scale flier feels lost without a dummy pilot.





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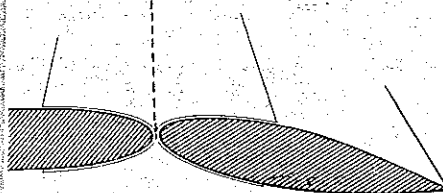
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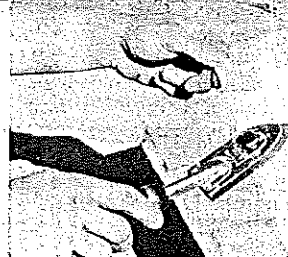
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**Survival Kit:** I guess you could call it a "rump pack" or a "belly pack," depending on whether you are facing north or south when you put it on. It is great for carrying odds and ends: camera, binoculars, liquid refreshments, compass, DT fuse, extra rubber bands, perhaps a spare pastrami sandwich, snake-bite kit, etc. Stuff you would like to have close at hand, but which is too bulky to fit in your pockets. Flip it around in front to get stuff in or out of it; then flip it behind you where it will be out of the way. I've been using one for decades; got it at a ski shoppe years ago. Shops specializing in rock-climbing and back-packing sometimes have them too.

But now there is one on the market designed especially for you! Not only does it enclose the required cubic footage; in addition there is a soft, light-weight, insulated pouch that precisely fits a

pair of cans of Gatorade, or beverage of your choice. The fabric is coated on the inside with something like vinyl; the same sort of stuff used to make the finest back-pack bags. The zipper is a husky plastic-toothed affair of the sort that has been proved to be relatively grit-proof. Web tabs are sewn to the pack near the ends of the zipper to make it easier to zip and unzip. The quick-attach/release buckle, apparently made of injection-molded fiberglass-reinforced Nylon, or a similar light, tough material does its job in a self-assured manner.

The introductory price is \$19.95, plus \$2.00 for shipping, plus 6% tax if you live in California. The source is Jim Crocket Replicas, 1442 N. Fruit Ave., Fresno, CA 93728. Tell him Bob sent you...

Bob Meuser, 4200 Gregory St., Oakland, CA 94619.

## Fiat/Daily

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cowling for the removable noseblock to fit into. Make the round noseblock from medium 1/8 sheet and add the engine crankcase, also made from two thicknesses of 1/8 sheet, to the front of the block. Add 7 Williams Brothers 3/4" scale cylinders, cut in half lengthwise, to the noseblock. Fashion the key on the backside of the block. Carve the front radius of the cowling very carefully. Fashion the gun troughs from wet 1/32 soft balsa and slip them into slots cut into the top of the cowling. Sand until smooth. Fill in the grain with several applications of talcum powder and dope and sand well.

Carve a block of very soft balsa, or fabricate a sheet balsa fairing, to fit between the wing root and the fuselage at the leading edge. Fashion the oil cooler scoop from medium-weight balsa. The scoop functions as a very effective belly skid if you build your Fiat with the gear up. Add a tailwheel at the proper location. This was not retractable. Add a dashboard and the windshield structure.

**Wings:** The inboard sections were dealt with in the fuselage section. The outboard wing sections are built separately and later attached to rib B. First, laminate the wing-tips from three thicknesses of 1/32 x 3/32 balsa. Laminate the leading edge from two pieces of hard 1/16 sheet, 8.5 inches long by 5/16" deep. Taper the leading edge from 5/16 x 1/8 at Rib A, to 1/8 in. sq. at the last outboard rib. The trailing edge is laminated from two pieces of 1/16 by 1/8 and sanded to a triangular section. Assemble the wings by laying down the tips, the leading edge and trailing edge, and a duplicate of Rib A. Glue all these together and then add the tapered main spar from Rib A to the wing tip. Now add the upper and lower wing ribs at the indicated locations. Be sure to use hard balsa for all wing ribs. Slice the ribs according to the patterns for the upper and lower ribs and hand fit to each location. Add a 1/16-sq. upright brace in front of and behind the main spar for each rib. These help keep these large lightweight ribs from collapsing when stressed. When each wing is completed, glue it to Rib A on the inboard wing sections. Be very careful to line up the wings with the same incidence angles and dihedral angles. I used 1/4 inch of dihedral at each tip.

**Tailplanes:** Construction of the rudder and elevator surfaces is straightforward. I hinged these surfaces with wire, thereby making it necessary to use double spars in each structure. However, I did not cut the laminated outlines at the tips. This helps keep the hinged surfaces stiff, but still allows plenty of movement for adjustments. Sand all tail surfaces to a symmetrical section before attaching them with pin joints to the fuselage. I use pin joints, that is pins embedded in the structure for the attachment points with the fuselage, because in the event of a crash the structure will break loose easily with little or no damage to the fuselage or the structure.

**Covering and Finishing:** I covered my Fiat with light-weight Japanese tissue. Before you actually begin covering the model, be sure to "scallop" all of the fuselage formers between the stringers with a Dremel or a piece of fine sandpaper wrapped around a 1/4-in. dowel. This eliminates all of the former bumps and will make for a much more attractive covering job. I used thinned Elmer's glue (1 to 3 parts water) to attach the tissue. The wings and tail surfaces should probably be covered before final assembly. The fuselage is covered in long strips of tissue spanning the distance between two parallel stringers. This is



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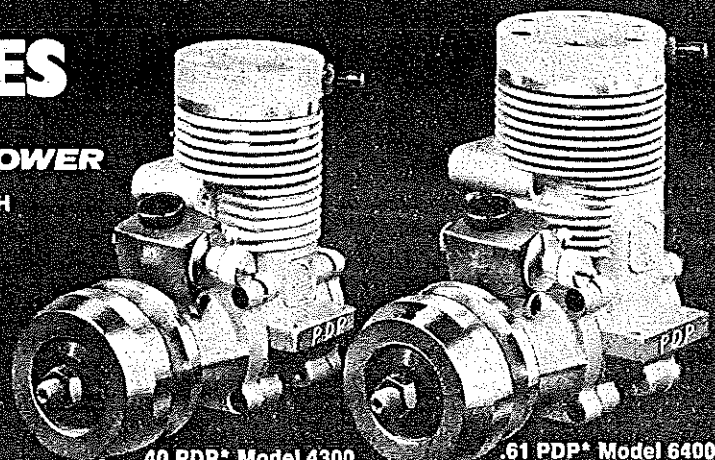
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the time consuming way to do it, but it sure looks the best. Add the balsa gun fairings and then water shrink the entire covered plane. I like to "shrink in" my wing washout rather than build it in. I used about 1/8 inch of washout at each wing tip.

Dope the plane with two coats of thinned dope, preferably nitrate, to which you have added an appropriate amount of plasticizer. The cowl section, as mentioned before, is not covered, but is filled in with several coats of dope and talcum powder followed by sanding. Take your time here because the cowl must look like metal rather than "grainy" balsa, if you really want a nifty-looking Fiat. After clear doping, select your favorite Fiat color scheme. I chose the sand and spinach effect with a yellow cowling and light grey undersurfaces.

I used Floquil Model Railroad paints thinned with very thin nitrate dope and sprayed on with an airbrush. After adding all the colors, details such as panel lines can be added with a soft grey pencil and "fixed" with a coat of clear nitrate sprayed on. My Fiat was built with the gear "up." I simulated the gear doors and wheels with bond paper glued in place with rubber cement. The numbers were cut from either black or red tissue and doped on. Next, add a pilot carved from foam and machine guns made from balsa or aluminum tube stack.

**Trimming and Flying:** I used a 9/16-in. Peck-Polymers plastic prop and a large Peck-Polymers bearing with 5° of down thrust. The finished weight of my Fiat without rubber was about 70 grams (slightly over 2 oz.) and about 95 grams with rubber. I used 4 strands (2 loops) of FAI 3/16" rubber. The total length of rubber was about 15-17 feet! Tie the rubber with a good knot, lube it with Dow 33 or Sig Rubber Lube and proceed to "braid" the motor. Do this by having your buddy hold the knotted end of the motor while you put in about 17 winder turns with a 16:1 winder. Now, grab the knotted end from your buddy, while still holding onto the other end, and place both ends over your index finger. Pull out the now 4-stranded motor several times until it looks nicely "braided."

Install the motor in the plane and test glide over tall grass. When the glide is reasonable, try a few winds and launch the plane slightly nose down. If everything is still OK, try about 30 winder turns. My Fiat flies in a large left circle with a left glide.

When properly trimmed, it will fly in a slightly nose-up attitude and glide very well with the braided motor. I fly for fun with about 100 winder turns (1600 total turns) and get 45 seconds or more duration. I go for broke with 130-plus turns—except you can't get that many turns in with a 16:1 winder. The motor is too strong. My plane flew for 1:53 to beat Mike Midkiff's super Helicat at the F.A.C. Nats and I needed to use a 5:1 winder to get over 2000 total turns in it. Good luck with yours! Now I think I'll try one of Bill Winter's Grumman biplanes!

*(Editor: The "old timer" thinks his Curtiss SOC-3 biplane has the most potential for a biplane—also from MAN, gosh knows when.)*

## Manito/Hutchinson

*continued from page 45*

quickly, with a short useful lifetime. Use about three coats of nitrate dope with a clear epoxy final coat. Give a couple of extra coats to the front portion of the stab, since most of the exhaust residue seems to collect there.

**Fuselage:** Use a metal straightedge to cut out the sides, then add nose and tail doublers. Draw the top view out on a piece of 3/32 sheet, but don't cut it out yet. Pin this bottom to your building board, and glue in formers. (Hot Stuff works well for fuselage construction.) Add the sides, checking carefully for alignment. Sand fuselage assembly, then add the top.

Build the pylon by gluing pylon core to bottom ribs. Add formers, checking that core is truly vertical. Add the tip ribs, then sand and cover with 1/20 sheet.

The fin is built in the same way, but no central core is needed. Cut out two sides to the outline shown, then glue the fin ribs to one side with Hot Stuff. Sand so no rib edges stick out, then glue on other side.

I recommend an epoxy finish like Hobbyepoxy on the fuselage. High-nitro fuels will destroy any other finish in a very short time. Cover the fuselage with tissue, using nitrate dope for better epoxy adhesion. Apply a couple of coats of nitrate (lacquer) sanding sealer, then two coats of colored epoxy (add an additional coat of epoxy at front end). Wet sand the first coat with #400 wet-or-dry sandpaper, and the final coat with #600. Rub out with Dupont white polish-

ing compound.

Assemble the complete model and move the pylon until the ship balances where indicated, or very slightly forward, then epoxy in place.

**Flying:** Don't be in too much of a hurry to get out to the flying field. Assemble the model and check thoroughly for proper balance and the correct warps. The CG should be where shown on plans. If it balances tail-heavy, move the engine forward by inserting additional plywood spacers between the firewall and the engine mount. The engine should point straight ahead, or slightly left.

Hand glide the model to be sure there's no stalling or diving tendency. Correct by shimming the front or back of stab with pieces of thin ply. There should be a definite glide circle to right. Run the engine a few times to familiarize yourself with the pacifier fuel system and to make sure the engine cutoff works.

For the first flight, try a 5-second run with the prop on backwards and the engine running full bore. This probably won't tell you much, but it should get rid of first flight jitters. If the model does anything but climb straight out at a shallow angle, you may have problems. A sharp turn may mean that you have a misaligned rudder or bent fuselage. A steep climb at this stage means you have too much incidence.

From now on, all flights will be made at full power with the prop in the proper direction. Reason for this is that a hot free-flight pattern depends on being trimmed for one certain speed. The various adjustments you make are all delicately balanced to work against each other properly at your maximum climb speed. If you try to work your way up gradually in power, you'll find yourself undoing the low speed adjustments as you go along.

So bite the bullet, and try a full-power test flight with about a 3-second engine run. The model should climb straight out at a steep angle. Adjust thrust offset to correct any turning tendencies right at launch. Remove incidence if the model shows any looping tendency on this short a run. If it has a shallow climb angle, or the nose begins to tuck under, add incidence by shimming rear of stab. When you get it going straight out with no looping tendencies on this 3-second run, increase the engine run in 2-second increments.

If the model tends to go left on longer engine runs, add right rudder tab. Use pieces of 1/16 x 1/4 balsa cut to a trailing edge section and glued to