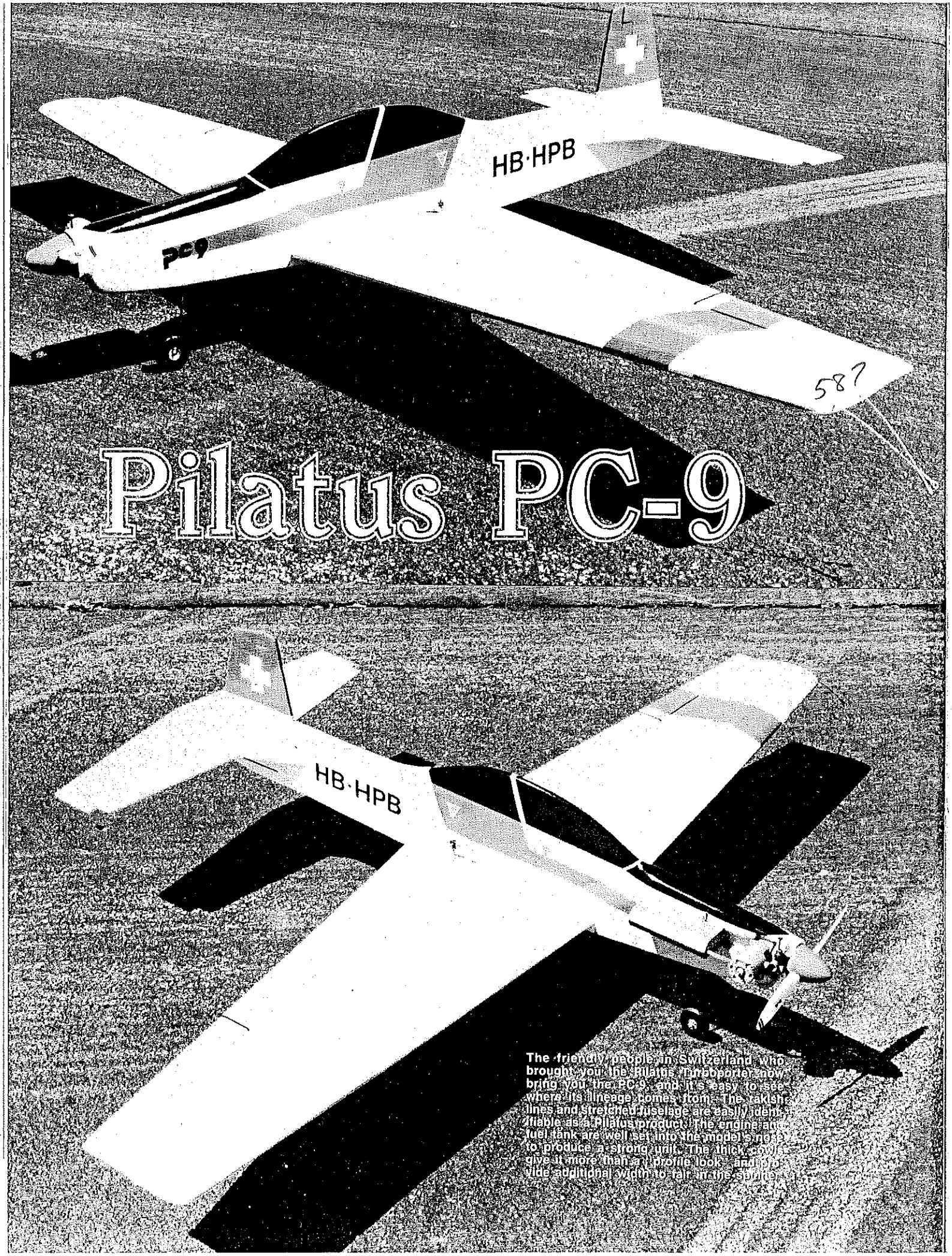
Pilatus PC-9



The friendly people in Switzerland who brought you the Pilatus Porter now bring you the PC-9, and it's easy to see where its lineage comes from. The rakish lines and stretched fuselage are easily identifiable as a Pilatus product. The engine and fuel tank are well set into the model's nose to produce a strong unit. The thick cowl gives it more than an profile look and the wide additional width to tail in the spirit

AS ONE OF THE new generation of small fighter trainers, the PC-9 is making its mark on the aviation market. It was designed to fill the need for a trainer that would teach the transition from a basic airplane to a fighter airplane.

The PC-9 was not the first plane intended for such a role. The Pt-19, the Pt-22, and even the De Havilland Chipmunk were intermediate fighter trainers too. All have been low-wing, two-place aircraft that were very nimble. Each was designed to teach the pilot the mechanics of what it would take to fly his fighter plane, and what it felt like when a plane went through combat maneuvers. As a group, these airplanes have set a standard for military training aircraft, and the PC-9 has the added advantage of modern technology to help fill in some of the missing pieces of its predecessors.

The sharp, modern lines of the PC-9 with its long, thin nose and tricycle landing gear make it an excellent design for Control Line Stunt. I've always tried to keep the lines

If you'd like a nifty sport model that is capable of flying the AMA Control Line Stunt pattern, why not try this profile version of the airplane the Europeans are using to train their next generation of fighter pilots.

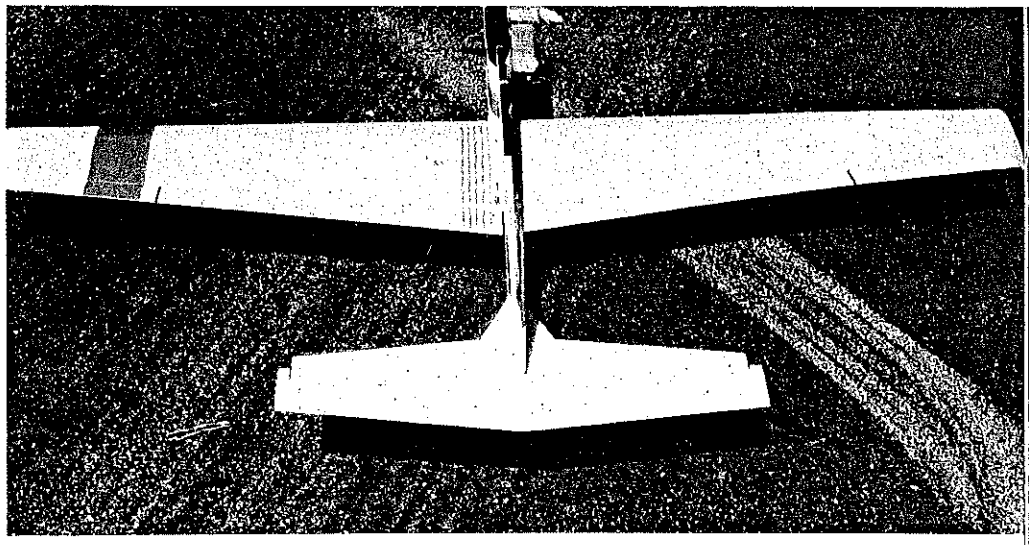
■Dave Haught

and layout as realistic as possible with my Stunters, and this design lends itself to Stunt with only a few modifications.

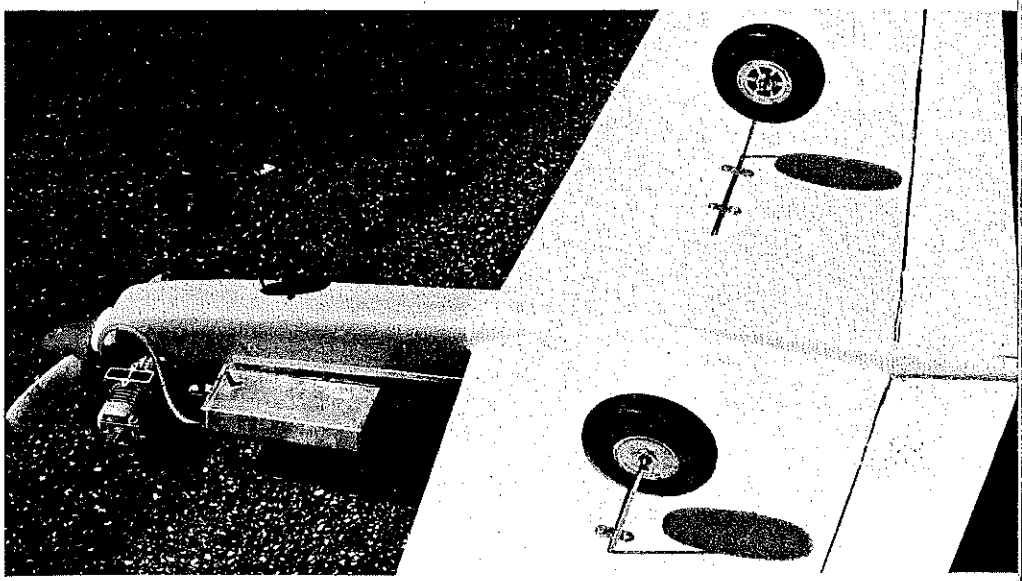
The profile of the fuselage is to scale, with the wing and stabilizer modified to suit Stunt parameters. The full-size PC-9 has a flat center section, and the tapering tips provide the dihedral. For simplicity's sake I've eliminated the flat and straight section of the wing, but retained the dihedral. The effect on its appearance and flight performance is nil.

The PC-9 is a good, stable platform capable of the full Stunt pattern. Give it a try and see. With its thick, airfoil it carries weight well, but do try to keep it as lightweitgh as possible to retain the designed-in nimbleness.

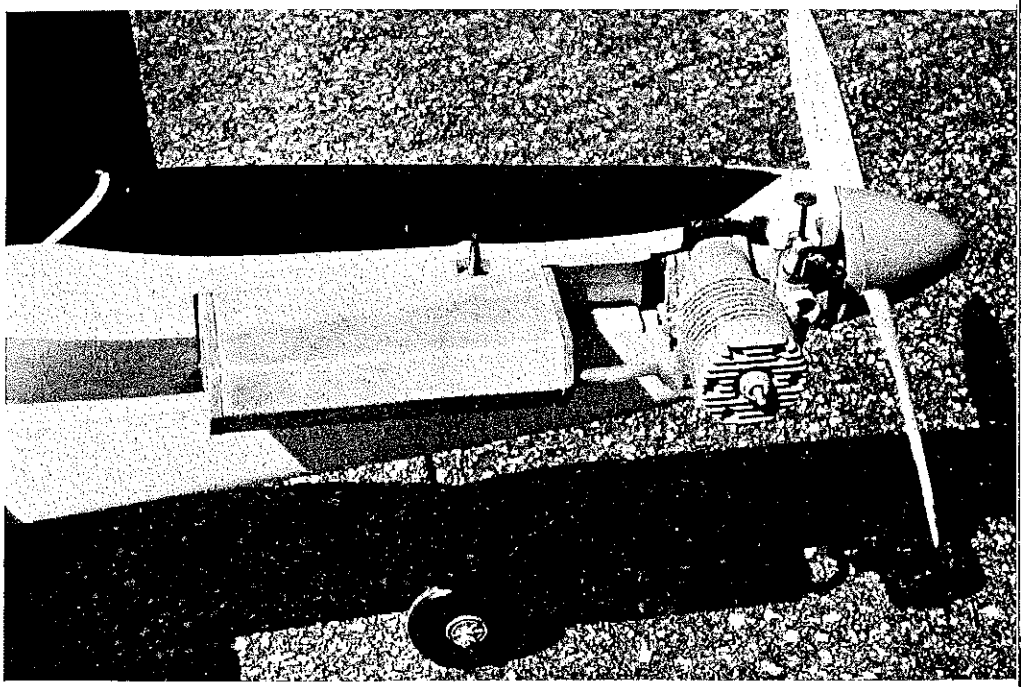
Construction is quite straightforward. As is generally best when scratch-building, cut out all parts first. The balsa fuselage plank will need to be firm, but still light and straight. The canopy area has to be spliced on, and can be cut from very light balsa. You will notice that construction of the en-



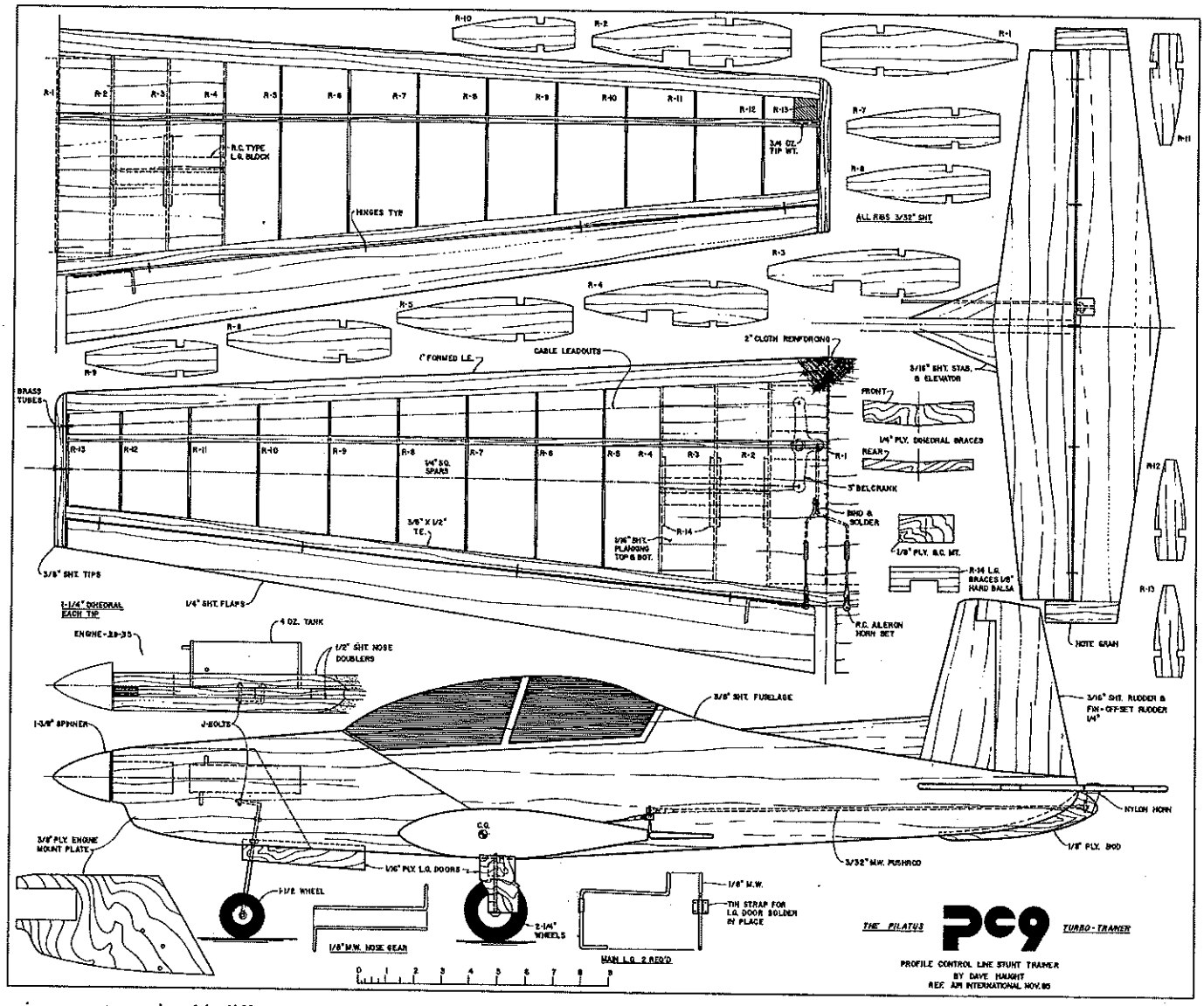
Clean in all views, the PC-9 design lends itself well to the Stunt circle. The leading edge fairings on the stab are for support, not anti-spin stakes like those on the De Havilland trainers.



RC-style landing gear mounting blocks hold the main gear in place. Replacement and rebending (should it be necessary) is a painless effort. Notice how well the nose cheek doublers fair into the wing and give the wing/fuselage joint an extra measure of structural integrity.



The business side of the Turbo-Trainer shows the tank installation and the engine snuggled into its fuselage cheeks. There's lots of room for adding a muffler and fuel tank pressurizing.



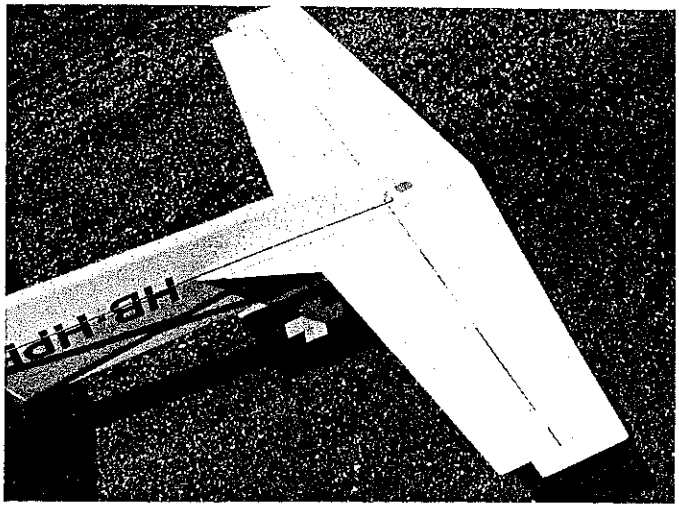
gine mount area is a bit different from standard procedure. I use a ⅜-in. plywood engine mount plate for the engine as well as the nose gear wire. (Any good-quality five-ply will do.)

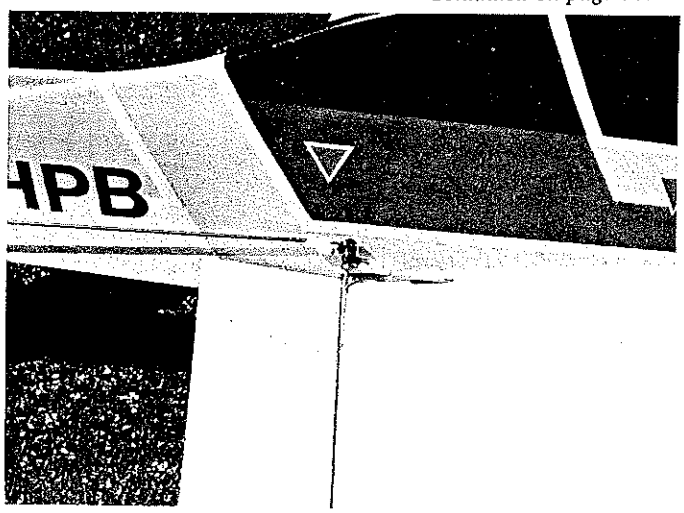
Attach the nose gear wire to the plate with J-bolts, and lock them with a drop of cyanoacrylate (CyA). Fit the plywood to the fuselage sheet, and glue them together with white glue. When dry, locate and drill the engine mount holes and install the blind nuts.

Carve the nose cheeks to shape, and tack glue in place. Carve the blocks to contour into the spinner and then back into the fuselage plank. These cheeks act as doublers and add a lot of strength to the model.

Sand all the stabilizer and elevator edges to shape. Add the balances to the elevator, and install the hinges. Cut a slot into the fuselage, and carefully align and glue the stab in place. Before the glue sets, make sure the stab is aligned properly from front, top, and

Continued on page 171





Left: The far end of the control system is stark simplicity. The pushrod end has a Z bend which is slid into place before the clevis on the other end is secured. The hinges need to be free of paint and glue for easy-working controls. Note the balanced elevators, a Pilatus trademark. Right: Flap hookup only looks complicated. RC aileron hardware is used to accommodate the dihedral and swept-forward wing trailing edge.

do a satisfactory job of getting this material out of the pores of the metal, and repairs are virtually impossible. I myself must have at least 25 Harter's proto pans which have been rendered useless by small cracks around various tapped mounting holes.

Nelson "Funny Plug" evaluations. I have just finished a rather extensive evaluation of the Nelson "Funny Plug" 4L and 1L models plus the Nelson one-piece plug. My first observation is that the 10%-nitro fuel is much less taxing on the element in all three plugs than was the 50%-75%-nitro fuel used in the past. Depending upon head clearance in both .15 and .40 cu. in. engines, the 1L Funny Plug is off 100-600 rpm from the 4L at the same head clearance. Apparently this 4L plug runs just a shade hotter than the 1L.

General head clearance on both .15 Scale Racing engines was .008 to .012 in. The head clearance on the Rat Race .40 with constant-diameter pipe was .010 to .015 in. The K&B .40 engines require approximately .005-.008 additional head clearance as compared to the Supertigre .40.

The one-piece Nelson Funny Plug seems to run about 200 rpm better than the 4L, making it the best performer of the three candidates. Unfortunately, its element is somewhat thin, and I find the biggest distortion factor is the setting of the rheostat on the GloBee battery. If the battery's amperage-level rheostat is moved any farther than half the distance of its travel, the plug glows extremely bright and distorts quickly as the engine starts and compression hits the wire. Of course, the "peephole" effect of this plug minimizes element distortion, but with the element glowing bright under battery power, distortion is imminent. By carefully adjusting the rheostat, the plug can be caused to give a very faint glow with very little, if any, distortion of the element after running.

Each pitting situation will, of course, be different. The battery type used is important, as are the gauge of the connecting wire and its length. Each battery setup will have to be attached to the aircraft and the glow plug's heat observed to make sure that the rheostat is adjusted properly. Longer or heavier-gauge wire will require higher setting of the rheostat. Heavier (lower-gauge) and/or shorter wires will result in the opposite condition. This phenomenon is also evident with the 1L and 4L plugs. If a faint glow is not distinguishable in these plugs with the battery connected, reliable starting is impossible.

Cox .049 Mouse Racing engines have been the object of another rather extensive study, and I will share the results with you in the next (July) column. It is my honest opinion that these are the most temperamental of the Racing engines.

As always, I solicit your comments and photos.

Pilatus PC-9/Haught

Continued from page 66

side. When dry, add the leading edge fairings, which not only look neat but add considerable strength as well.

While the fairings are drying, sand the the fin and rudder, and glue them together with the offset shown on the plans. Glue the assembled fin and rudder to the fuselage top. Use a drafting triangle to make sure everything is square. Add the dorsal fin.

The wing is built in two halves, joined with

plywood dihedral braces, and then sheeted.

Begin by laying all the ribs and the wing parts out where they will be handy. Mark the rib locations on the spars, and then slip the ribs into place on the bottom spar. Once all ribs are in place, insert the top spar. Mark the locations of all the ribs on the leading and trailing edges. Pin the leading and trailing edges in place.

Cover the plans with wax paper, set the completed wing assembly on the plans, and align all parts. With everything pinned in place over the plans, put glue on all joints. I suggest using white glue for this job because it allows a final chance to adjust and bend out any warps or misalignments before it sets. Repeat the procedure on the other panel.

While the wings are setting, cut out a bellcrank mount, and install a good 3-in. metal or nylon bellcrank. Install the lead-outs. Attach the landing gear braces and the hardwood mounts using ample bracing.

Fit the two wing panels together, and sand as required for the dihedral angle. Pin one panel to the bench, and block the other up. Add the plywood braces, the center rib, bellcrank mount, and any extra bracing you feel is necessary.

Once the wing panel is dry, remove it from the board, and drill the holes for the lead-outs and the lead-out guides. Bend the flap pushrods to shape, and install the flap horns. I used RC aileron linkages, and they worked very well. Connect the pushrods, and adjust them to give neutral flap when the bellcrank is in the center position. Finish off the lead-out ends, and sheet the center section.

Add a wrap of reinforcing tape around the center break, and a wrap around both of the flap bushings. To complete the wing construction, cut the flaps out of sheet balsa. One 3-in. sheet will make both flaps if you stagger them just right. Sand them to an airfoil shape, and hinge them to the wing trailing edge.

Covering and assembly. If you plan to use a plastic covering, you should go ahead and assemble the model now. If you're using tissue on the wing, seal the wood with a couple coats of thinned dope, and sand it smooth. Apply the tissue, shrink it, and apply five coats of clear dope.

The fuselage-to-wing joint is important. It needs to be fitted carefully to ensure adequate strength. Once you have a good fit, epoxy the wing in place.

While that is setting, bend the main landing gear struts, and cut out and install the wheel covers. Bend and install the main pushrod, and install the elevator control horn. Give the wood a few coats of thinned dope, and then sand and fill in any rough spots.

Choosing a color scheme is the hard part. The Pilatus PC-9 has been featured in several aviation magazines in various bright colors. My original model was trimmed to match the second prototype PC-9 as shown in the November 1985 issue of *Air International*. Of course, military colors are also appropriate; so have fun figuring out yours. Apply the color, and trim to suit. I used automotive trim tape to add aileron lines and cockpit details. All of this fuss just makes the model look better. It will fly the same with or without all the bother.

Now is the time to add the engine, wheels, tank, fuel lines, and all the other little details. Check the PC-9 for proper balance and wing warps, and correct as necessary. Test run the engine to make sure the tank feeds as it should, and then head for the flying field. Get ready for the inevitable comments: "Yes, it does look like a souped-up Ringmaster . . . No, it's not a Platypus, it's a Pilatus." So it goes when you build something not quite ordinary!

In the air the PC-9 does fly well. The high aspect ratio wing makes up for the apparent lack of wing area and gives the ship an interesting look. The dihedral will attract a lot of questions, but it has never been a problem on any of my Stunters. Both upright and inverted, this ship grooves and flies level. Enjoy your PC-9. It's more than just a high-tech trainer; it's fun to fly—and that's what it's all about.

FF Old-Timers/Baker

Continued from page 67

out picking very small nits, the only difference I can see is in the wing mount. The OMS version does have somewhat more information on the plan and gives more than one propeller choice. It