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Pilatus Turbo-Porter

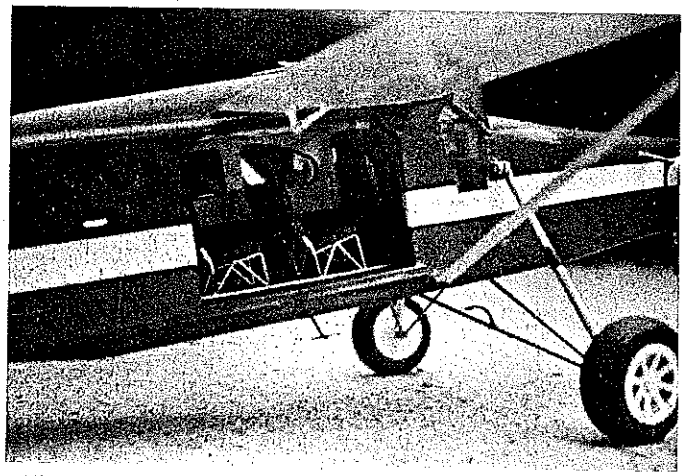
Even with the engine mostly uncowled, the Turbo-Porter's looks are not much hampered. The shock-absorbing landing gear works in conjunction with the oversized "bush" tires to make landings very smooth. The slab-sided fuselage makes it easier to build than many other Scale subjects.

MY FIRST Control Line Scale model was a Fokker Triplane. At the ripe old age of 12, I learned how important it was to have a model that balanced well. It was all I could do to keep that model at the end of the lines and in a level attitude. Such lessons are easily forgotten, though; all it takes is a neat radial-engined fighter and a set of plans, and it's all over. There's no balancing problem with the Turbo-Porter, however.

While looking for something distinctive to build for Control Line Scale, I came across this long-nosed beauty in my files. My workroom was already decorated with smaller Free Flight rubber-powered versions—from a vintage Peanut Scale model to one with 36-in.-span, so the idea was not really original. Then I began to think about how easy it would be to balance a CL version, and then the fresh lines and bright color schemes caught my imagination. The plans were drawn that day, and the balsa was attacked the next.

The Pilatus Turbo-Porter is a good design for modeling from many aspects. Besides being easy to balance, it has a good wing area, nice-sized tail surfaces, and an easily-detailed cockpit. If you are a military buff, the Turbo-Porter has seen military service in at least five different countries, including the United States. The aircraft has seen civilian service in all climates from tropic to arctic.

For flight options that were performed by the prototype, you can choose from several such as firing rockets and dropping parachutes and cargo. My Turbo-Porter is copied from the scale documentation listed on the plans. It features throttle control and cargo drop or parachutes. It wouldn't take much



The outboard hatch slides open for access to the cabin—from which many different competition options can take place. Just picture a parachutist seated while awaiting his turn to jump—or a load of cargo that will be dropped to a remote camp in Canada or Alaska. The seats fold down (or come out) to fit most any option than can be imagined. There are many variations, both military and civilian, that could be modeled.

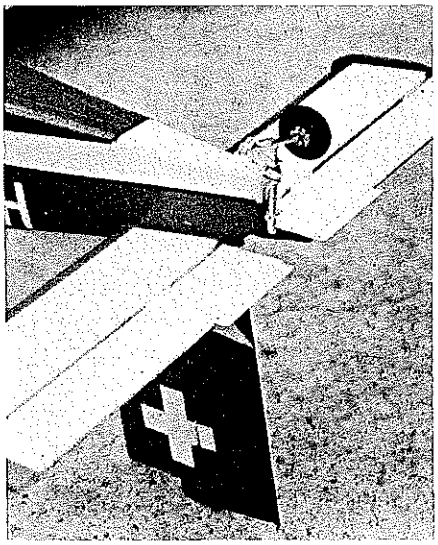
Proportions of the prototype are ideal for all modeling categories. This one is Control Line and sized for a .25 engine. Depending upon the builder's desires and capabilities, it can have simple detailing and be a great fun flier—or it can be given the full treatment for competitions.

■ Dave Haught

effort to add flaps, lights, and more. The airframe is readily adaptable to most any option you can dream of (and document, of course).

Construction. Did I mention that the Turbo-Porter is also fast and easy to build? Those flat fuselage sides and angular lines make construction a breeze. Nonetheless, Scale models require a bit more planning than conventional models. All the details you want to include should be planned in advance. Choose a particular version to build, select the options you desire, and plan accordingly. For instance, lights will require wires which need holes for routing them through, and so on. Think ahead, and you'll save yourself a lot of headaches later.

Tail assembly. This is a good place to start. Pin down the precut 1/16 sheet planking, and cement the spars and ribs in place. When dry, sand well with a sanding block to eliminate the high spots. Glue on the top sheeting, and set aside. The stabilizer, elevator, rudder, and fin all share the same type of construction, and if you use the cyanoacrylate (CyA) glues you can have them finished very quickly.



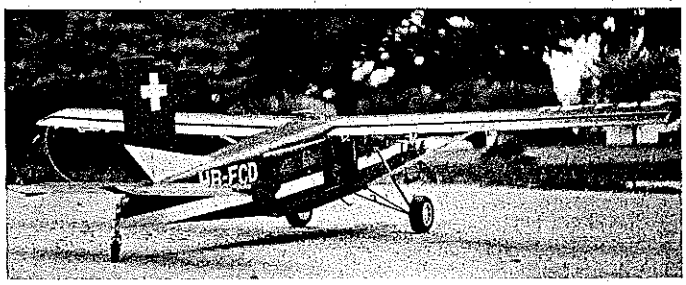
Built from brass tubing and sheet, the tail wheel works like the full-size one. Note scale trim tabs on elevator and rudder.

Join the elevators with a control horn assembly, making sure the halves are flat and properly spaced in the center. When dry, add the tip blocks; these should be of medium-hard stock, since they hang out in the breeze. Cut out the plywood stabilizer tip plates, and fit them to the stabilizer. Be sure there is proper clearance between the elevator balances and the tip plates. When you are satisfied with the fit, finish-sand the parts and connect them with nylon hinges.

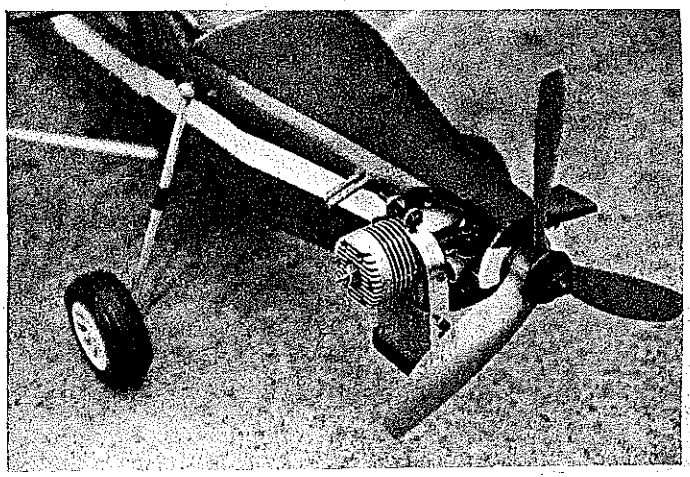
The rudder and fin are built in the same manner. Use tin or brass sheet for the hinges so the rudder can be set to help with line tension for flying. Give the tail assembly three coats of dope, lightly sanding between each, then cover with lightweight silkspan. Add the aluminum trim tabs by carefully slittiing the trailing edges with a small knife and slipping them into place. A coat of filleting CyA glue will keep them in place. Be sure to round off the corners slightly so they will not cut or snag on things.

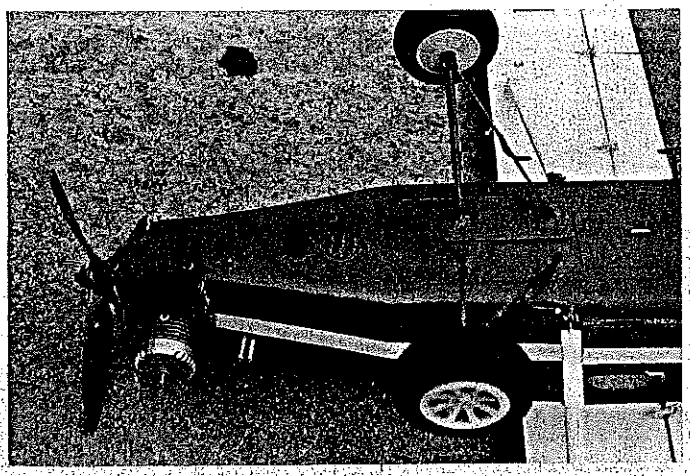
Wing. Begin by cutting out all the pieces. The key part to the assembly of the entire model is the wing root spar and bellcrank mount unit. These parts should be accurately cut to fit together tightly. Join the two spars and the bellcrank mount together on a flat surface using white glue. Let the assembly dry completely before moving it.

Pin the bottom sheeting to the building board, and add the bottom spars, ribs, top spars, tip weight, and wing strut mount. While the wing is still on the board, fit the root spars, and add the sheet webs to each side of the plywood spars. Do not glue in the

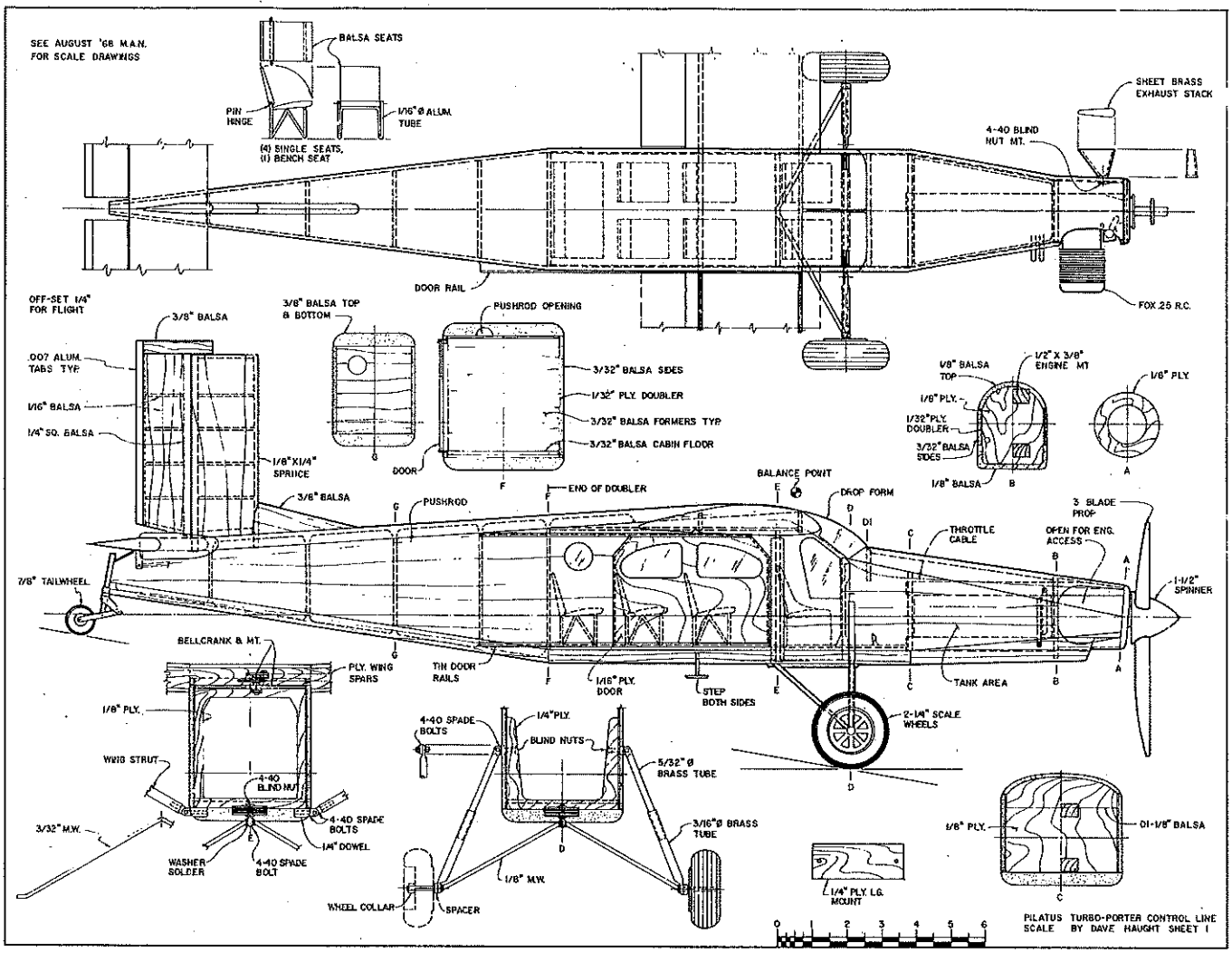


Left: Long and boxy, this is one model that won't need much added nose weight. Relatively clean, the model builds fast and performs well in the air. Right: Open and ready for business, the Turbo-Porter sits on the ramp. A bright color scheme makes the model really stand out.





Left: The engine is readily accessible for tuning and maintaining. A three-bladed prop is needed because of the long nose and short landing gear. Right: Civil aircraft has as much detailing as military planes, though it is more subtle. This one has many panels, hatches, scoops, etc.



plywood spars at this time. What we are doing is building a box for each of them to slide into later.

Run the lead-out wires through the inboard wing, and plank the top of the wing while it is still pinned down. After the wing is dry, lift it from the board, sand, and add the leading edge blocks and tip plates. Sand the entire wing carefully. Fill any holes and voids, sand, and give the wing three coats of clear dope.

The flaps and ailerons are built in the same manner as the tail assemblies. I found it easier to build them as one piece, and cut them to the right lengths after sanding. Sand them well, and apply three coats of clear dope.

Cover all the wing parts with lightweight silkspan, and set aside for the moment.

Mount the bellcrank assembly to the plywood wing spar unit. Fit the flexible pushrods as shown on the plan, but do not glue them in place yet.

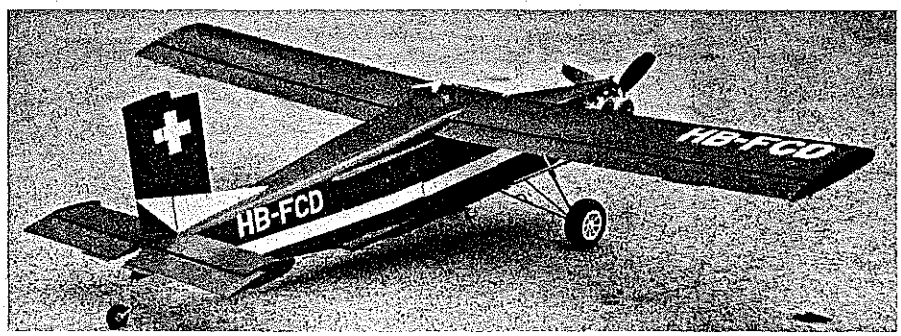
Fuselage. Cut out the sides from 3/32 sheet balsa, and cut out the doublers from 1/32 plywood. Glue the sides to the doublers with contact cement, and set aside under weights to cure. Next, cut out Formers A-F. Fit the hardwood engine mounts carefully into Formers B and C; line up the assembly, and join together with white glue.

Cut out the openings for the door and windows in the fuselage sides. Carefully notch the sides for the wing spar unit. Formers D and E should be a tight fit onto the plywood landing gear mount plate. Line them up together, and glue the wing spar unit and Formers D, E, and F on the building board. Check the parts to be sure they are in alignment before the glue sets.

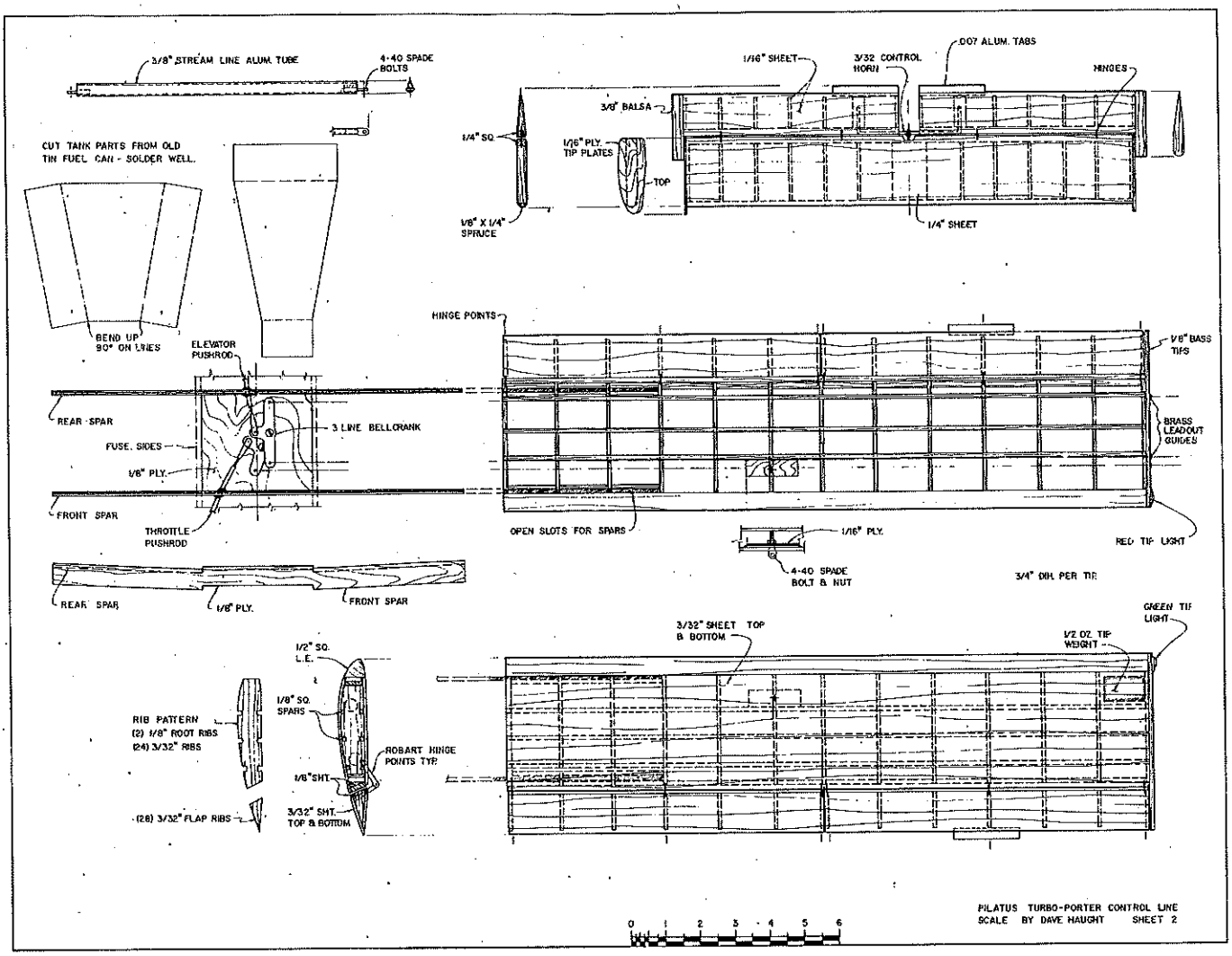
Build the fuel tank while the glued fuselage parts are drying. I attacked a used quart fuel can with a pair of tin snips for mine. Making the tank was an easier job than I had imagined. Get a good solder and soldering paste before starting, and take your time. An iron is preferred over a soldering gun, since it is always hot (ready to use). Clean off the paint from the areas to be soldered, and be sure to face the painted side of the can on the outside of the tank. Lightly sanding the surfaces to be soldered also helps.

Buy some 1/8-in. copper tube for the fuel tank vents and fuel pick-up. Copper is preferred to brass, as it is easier to bend to shape and will not crack from vibration as easily. Route the vents and pick-up tube to suit your particular engine. Solder all the joints well, and test the tank for leaks by plugging the vents and blowing air into the tank while it is submerged in a jar of water. If any bubbles show up, resolder the area and retest.

Fit the tank between the engine mounts as shown on the plan and secure it in place with silicone glue. Crack the fuselage sides as required to bring the nose section to the shape in the plan view. Glue the engine mount assembly and Former A into place;



A distinctive design, the Turbo-Porter is well respected among bush pilots—and it is even a popular forward air control military aircraft. The author's model has Swiss markings.



after the glue has dried, pull the tail post together, and add the sheet rear formers.

Purchase a quantity of spade bolts from your local hobby shop. Bend and install the main landing gear struts. Add the soldered washers to center and retain the wires as shown in the fuselage sections. Bind and solder the ends of the struts together, and add a drop of solder to the spade bolts and nuts that hold in the gear.

Install the shock strut mounting spade bolts and blind nuts to Former D. Fabricate the struts from the indicated sizes of brass tube by flattening the ends of each with pliers as shown. I installed small springs into the tubes to give the units a bit of shock-absorbing action. Attach the upper end of the struts with 4-40 bolts and nuts. The lower end slides onto the landing gear wire and is retained by a short tubing spacer that is soldered in place.

This is the time to build and install the cockpit interior. The floor and ceiling are cemented in place first. While these are drying, build the seats, instrument panel, rudder pedals, and stick. The scale source listed on the plan gives good interior details. Don't forget to detail your model to match the purpose you intend it to portray. My Turbo-Porter is fashioned after the Swiss version on the scale details. I finished the cabin interior with three colors of Contact paper, a very handy material, since it looks like the vinyl used in the full-size plane, and it is self-adhesive. The seats were made from balsa and glued to the aluminum tube frames. They look great and hinge down just like the prototype to make room for more cargo.

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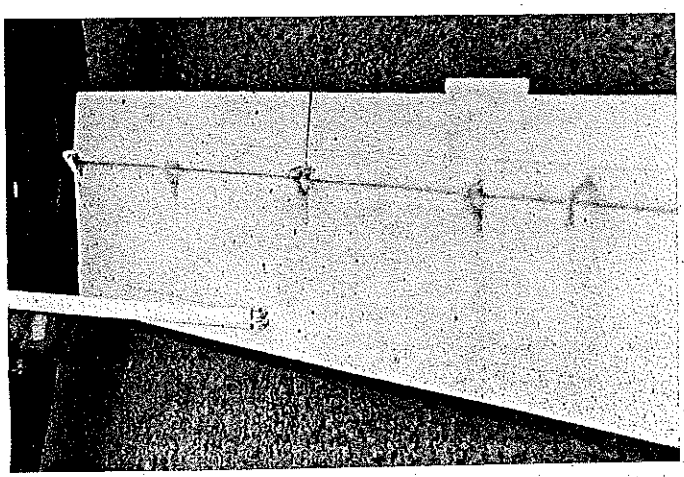

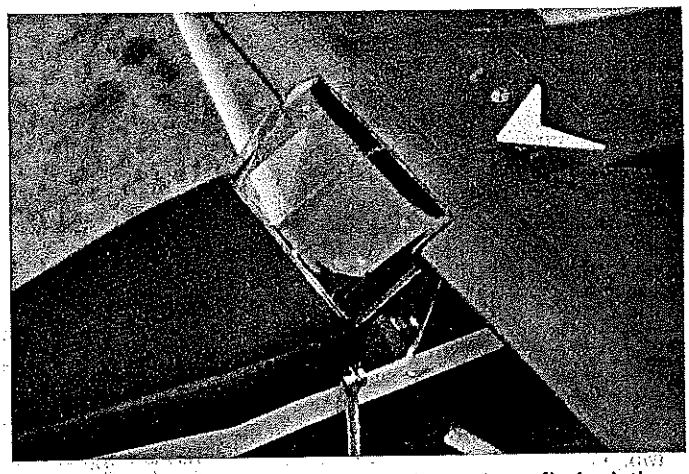

Left: Full slotted flaps and ailerons are reproduced by using hinge points. Panel lines were scored into the model's surfaces prior to final painting. Right: The clear molded canopy helps with the realistic appearance. Natch, the beacon and antenna help out, too. All photos by the author.

paper and dope! In a Combat world filled with Force clones and great white foamies, I suppose it's a rare chance to be different. I still have a supply of polka-dot silk left over from the 1971 Nationals. Any takers?

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CL Navy Carrier/Perry

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The March quiz didn't pose much of a challenge to anyone who read the "Competition News" section. A drawing of the Arado Ar-96 appeared on page 94, just before CN! I looked for a year-and-a-half for a good drawing of the Arado without success, and Carl Wheeley had one in his files all the time! A photo of the carrier version of the Ar-96 trainer appeared in the March 1976 issue of *Der Flieger*. The photo showed the aircraft, complete with tail hook, mounted on its catapult cradle.

Many fighter, dive bomber, and support aircraft were modified and tested for use on the German carrier *Graf Zeppelin*, which was never finished. A previous column contained a drawing of the Messerschmitt Bf-109T carrier fighter.

Kingfisher documentation. Robert Cory passed on some additional proof of the OS2U Kingfisher's eligibility for our event. *Combat Aircraft of WW II* by Weal and Barker states that, "It was also flown off AMC class carriers in the South Atlantic and Indian Oceans." The same book also documents use of the Piper HE-1 (AE-1) ambulance version of the civilian J-5C for carrying patients between carriers and hospitals on shore. Robert plans to build one.

Fox .36 for Profile. C. T. (Tom) Schaefer, the 1983 Nats Open Profile Carrier Champion, passed along some tips on using Fox .36 Mk IV and Mk V engines in Profile Carrier. The carb for the new Mk V (single-ball-bearing RC .36) fits the Mk IV (last two-ball-bearing Combat Special) after the intake is cut down. Tom filed down the spray bar to increase carburetor intake area; that was the only modification on either engine.

Tom set up both engines without the spacer ring under the sleeve. Head clearance was adjusted to provide .44 to .45 cc chamber volume (deck height .185 in.). The crankshaft on the Mk V was polished except for the part that fits within the ball bearing. The Mk IV was fit by hand; the Mk V was run in on a bench and in an airplane after a thorough cleaning. Both appear to be very good engines and have exceeded 90 mph high speed. The Mk V is within 200-300 rpm of the Mk IV and is still improving.

One problem has been encountered by a few fliers. The aluminum bearing for the crankshaft can wear excessively at the extreme front end of the bearing. Larry Driskill has prevented this problem and arrested deterioration on one engine on which it had already started by extending the oil groove forward. A small file can be used for this purpose. The extension of the oil groove need not be very deep and should stop just short of the forward end of the bearing area. Extending the groove through the front end of the bearing can cause some leakage around the crankshaft.

The Fox engines are light, powerful, cheap, and available—a combination that is hard to beat.

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Turbo-Porter/Haught

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Each seat was equipped with lap belts made from Contact paper and aluminum foil. Epoxy the seats in place when you are finished with the rest of the interior. The front seats are the bucket type; they are built similar to the cabin seats but with a sheet balsa base. The rudder bar and stick are made of 3/32-in. aluminum tube.

Everyone seems to have a favorite way to build instrument panels, so copy the panel on the scale drawings and use the instruments you prefer. Mount the panel to Former D1, and install it onto the nose of the model.

Assembly. Glue on the stabilizer and elevator assembly, and run the pushrods to the tail and nose. For the flexible pushrods, be sure to anchor them well and at short inter-

vals so they will not flex as they are actuated. Add the bottom blocks, hollowing them after they are fitted to save weight. Glue them in place, and sand them to the contours shown in the cross sections.

Cut away the nose area, and install the engine, throttle hookup, and blind nuts for the engine and scale exhaust. When the linkage works smoothly, anchor the pushrod guides, and plank the top and bottom of the nose. The wing panels can now be slid onto the plywood spars and fitted to the fuselage. Hook up the lead-outs and solder them as per the drawings in the AMA rule book. Slide off the wing panels, fill the wing spar holes with epoxy, and slide the panels back on. Align them carefully, and block the whole assembly in place while the glue sets. The top block can now be fitted, hollowed, and glued on.

Add the rudder assembly, along with the dorsal fin. Cut out the cabin door, and give it a few coats of clear dope to fill the grain. Finish the inside of the door to match the cabin interior. Bend the door rails from tin or brass, and install into grooves cut into the fuselage side. Make sure the door slides easily in its track, and glue the tracks in place with epoxy.

Build the wing struts as shown on the plan. Fasten the upper end to the spade bolt in the wing with a small 4-40 bolt and nut. On the fuselage end, drill a ¼-in.-dia. hole into the bottom block of the fuselage. Cut a short length of ¼-in. dowel, and drill it to hold the spade bolt anchor. Epoxy the spade bolt to the dowel, and when it has set, insert it into the hole in the fuselage; glue well, and when dry, bolt the bottom end of the strut in place.

Cut the windows from 1/32-in. clear plastic. Install them with silicone glue. Carve a mold for the windshield, and heat-form it from thick plastic. Do not install the windshield until after the model is finished.

Give the fuselage three coats of clear dope, and cover it with silkspan. Build the tail wheel assembly from brass tube and sheet, and install it with epoxy.

Attach the flaps and ailerons next. Note the use of nylon hinge points to mount them. Drill holes at the desired angle into the flaps and the wings. Tape the flaps and ailerons in place, spacing them out from the wing and fuselage as well as 1/32-in. from each other. With all the parts taped in place, the operation of gluing is easy. In each hole place a drop of epoxy and then the hinge. Stop to check that the angle is the same for all of the hinges by sighting down the wing from the tip. Adjust them as required. When the epoxy has set, remove the tape. Pin the controls in place, preferably 0-0 for the flaps and 1/32 in. down for the inboard aileron and 1/32 in. up on the outboard one. This will help keep the Turbo-Porter level in flight.

Give the model several coats of clear dope, sanding between coats, until the finish is smooth and ready for paint. Mask off the windows, and begin painting. After the paint has cured, go back and add the trim paint and any details you desire.

Balance the model—you may be surprised. Mine took ½ oz. of tail weight to bring it into balance. Bind and solder the lead-out ends, adjusting to fit your handle. Check for proper throttle and control movement.

Flying. This is the true test of a model. Pick a calm day, and proceed methodically. Tune the engine, adjust the throttle for smooth response, and time the length of engine run. Keep notes of the details for future use.

The Turbo-Porter is a smooth flier. Its distinctive lines in the air are impressive. I hope you will enjoy your Turbo-Porter as much as I have enjoyed mine. Just watch those landings in the grass; the long nose makes three-point landings mandatory!

Thinking of Sport Scale competition? Add rivets, more doors, cargo drops, brakes, lights, etc., and you should do very well.

FF Duration/Meuser

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curved to give undercamber, while the sheetwood is flat, stiff, C-grain material.) I don't know how a novice would do it. I took the easy route: dampened the sheetwood, strapped it to a tin can of about the right curvature, and let it sit for a couple of days. Then, it went together OK.

Flying instructions are better than you see