



One of the finest trainers going, the PT 20 teaches you how to be a modeler as well as a pilot.

# PT-20

from Great Planes

Type: Trainer  
Wingspan: 52 inches  
Length: 42 inches  
Wing Area: 510 square inches  
Radio: 3 channel  
Engine: O.S. 20 FP  
Weight: 3<sup>3</sup>/<sub>4</sub> pounds

by **RANDY RANDOLPH**

**T**HE GREAT Planes\* PT-20 is the first model kit I've built in many years. In fact, in the last 35 years I've built no more than five kits! However, in that time-span I've built literally hundreds of airplanes and inspected that many more kits.

As a general rule I prefer my own methods of construction and design to those of others, partly because of my independent nature and partly because I think that kits are designed to accommodate techniques that reduce the cost of manufacture rather than improve the airplane. In many instances my second reason is valid, but *not in this case!*

It appears that the Great Planes people have added

touches to accommodate a wide variety of builder's desires, and equipment that could only add to the cost of manufacture, yet they've produced a kit that is designed to be built and flown at a very reasonable cost. For example, it can be built as a three- or four-channel airplane, and the parts for both are included in the kit.

The only criticism I have is that it could be as strong and as airworthy if it were half a pound lighter! In reality this is no criticism because the beefier the construction, the easier it is for the beginning builder to handle.

**THE KIT.** There is little reason to describe the quality of materials in these kits. The

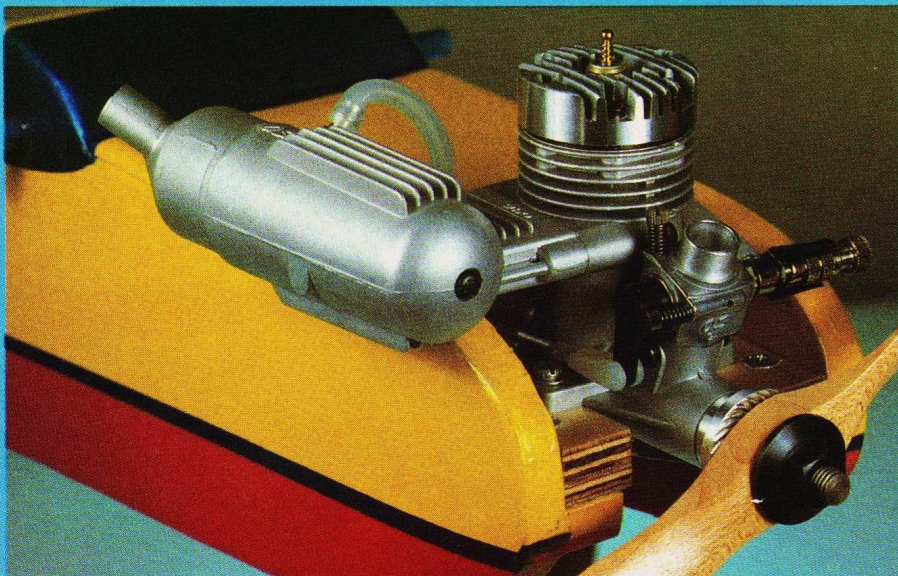
standard of quality in kits produced by major manufacturers today is such that an inferior piece of wood or defective part would be difficult to find. Instead, I'll describe the instruction manual that accompanied the kit—it is excellent.

Some 40 years ago the Heathkit people developed an instruction manual format that has become the standard of the world for electronic kits. They broke the construction procedure down into individual steps, illustrated each, and required you to check each one as it was completed. The PT-20 manual has 40 pages of instructions following just that format. If you can read and follow one-two-three

instructions, you can build this airplane and learn enough in the process to build other kits which provide much less help to the builder. I can't emphasize enough how pleased I am with the instructions that come with the PT-20.

As I describe the building of this bird you'll see just how complete the kit is and how instructive the manual. So, let's build!

**CONSTRUCTION.** The tail surfaces are built from pre-cut <sup>3</sup>/<sub>16</sub>-inch sheet balsa. The manual suggests using cyanoacrylate-type glue and these components are completed almost as fast as they can be placed in position over the plan. Provisions for the hinges are made at this point, but the surfaces are not hinged until after they're



*The O.S. 20 FP was ideal; well-suited for the PT-20.*

covered (11 photos describe these steps). Balsa has a mind of its own and regardless of the care taken in manufacturing, it will change shape and size, slightly, depending on temperature and humidity. For this reason, dress the edges to be glued together with a good sanding block and the edge of the bench, or some other guide, to assure nice square, true joints.

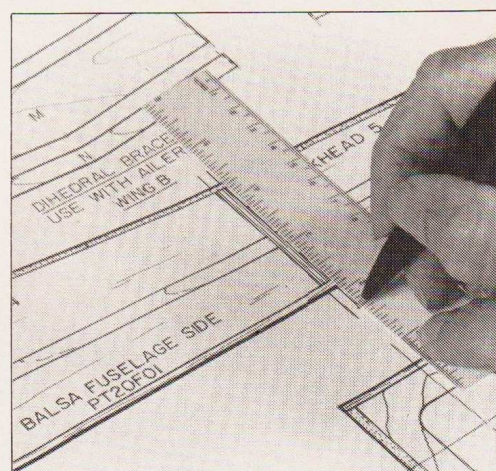
The fuselage sides are assembled and the sides joined with plywood formers—but watch it because epoxy glue is slippery. When gluing doublers in place, check their position often until the glue has cured (check the photos in the man-

ual). Provisions are shown on the plans for a number of engine installations and materials are provided for each. The mount is assembled as the fuselage is constructed and since I intended to use an O.S. 20 FP, also from Great Planes, I followed the instructions for that engine. The method of joining the sides and adding the bottom pieces almost guarantee a straight fuselage, but it's important to pay attention to what you're doing.

The landing gear is of the torsion type and it's necessary to mark and drill two holes in the gear mount before it's glued



*Application of trim is simple using Randy's method. See text.*

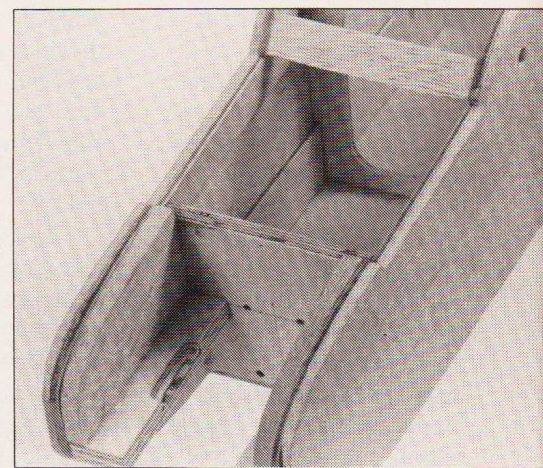


*Extension lines will help locate bulkheads when assembling parts on plans.*

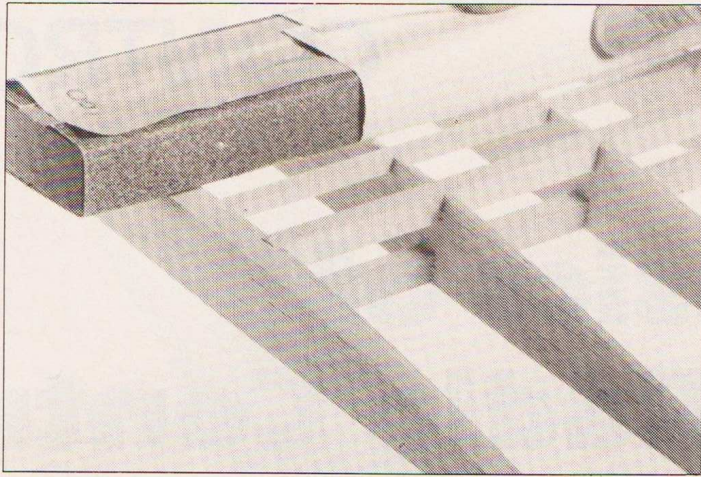
in place. Once again the instructions in the manual were clear and easily understood, with 16 photos illustrating these steps. Other than some trimming needed on the hatch cover to secure a good fit, the fuselage and tail are mostly assembled rather than built.

The manual calls for complete radio installation in the airplane (8 pictures) before the fuselage is finished. This one step eliminates many of the problems beginning builders have with routing pushrods. Once it's fitted and working, the radio is removed for final assembly and sanding, then it's time to build the wing.

Sometime in the past, the designer of the PT-20 must have had the experience of a wing folding in flight. Believe me, he's since made sure that it cannot happen again. The main spars are  $\frac{1}{4} \times \frac{3}{8}$  inch spruce and there are two more  $\frac{3}{16}$ -inch spruce turbulator spars at the leading edge. The leading edge itself is  $\frac{1}{2} \times \frac{7}{8}$ -inch, and the trailing edge is  $\frac{3}{8} \times 1 \frac{1}{2}$ -inch



*A ruggedly-built design, PT-20 is also lightweight.*



*Use of a sanding block enables uniformity of rib sections.*

balsa. The trailing edge is extra wide so ailerons can be cut into them if you want. When the three 1/8-inch plywood dihedral braces and center-section sheeting is applied, this wing would support foot traffic across a small river!

The notches in the leading and trailing edges don't exactly match the plan, but since there are lefts and rights to match the wing panels, there's no problem and everything comes out fine at the tips. The wing builds easily and the ribs and spars fit snugly at all joints, so the thin cyanoacrylate glues work well. I was able to build both wing halves in less than 20 minutes. In fact, assembly of the whole airplane, prior to covering, took less than seven hours, including the final sanding. The instruction manual has 21 pictures illustrating wing construction with an additional 17 outlining aileron installation.

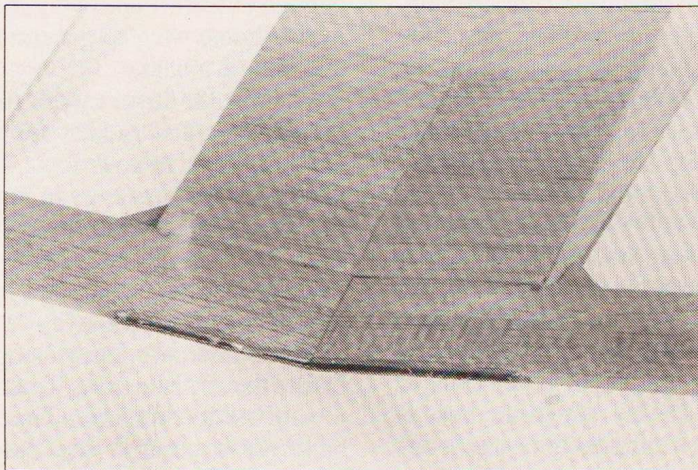
Before covering the wing, balance it along the centerline. Mine required almost 1/2 ounce of weight in the right tip to

bring it into balance. An airplane with a heavy wing can never be trimmed properly.

Top Flite's\* MonoKote is the preferred covering material and goes on with little difficulty. When covering sheeted surfaces, I use a travel iron covered by a piece of cotton cloth, which helps eliminate the bubbles that form between the MonoKote and the wood. The same arrangement works well for ironing on trim. The area inside the cowl should be painted with a matching fuel-proof paint to seal the edges of the MonoKote and protect the wood.

Since the radio, engine, and landing gear installations have already been done once, their reinstallation offers no problem. When everything is together and tested, it's time to go flying.

FLYING. The PT-20 and the O.S. 20 FP combine to form a matched pair. If they weren't designed to complement each other, they should have been! The new FP series of engines has power in



*Piano wire at base of wing prevents damage by rubber bands.*

reserve and the PT-20 maintains solid, stable flight on less than half-throttle, which is a good power setting for training. There's an abundance of power available for aerobatics when the student is ready.

Like most rudder-elevator airplanes, there's a little "tail wag" when rudder control is given at low speed, but the wash-out in the tips (outlined in the manual) keeps snapping problems well in hand. The combination of down-thrust and positive incidence in the wing causes a decided nose-up tendency when the throttle is rapidly retarded. That can be irritating to a seasoned pilot, but to a panicked student whose airplane is a spiraling silhouette, it could be salvation!

Once the trick of easing the throttle back is acquired, the landings become automatic and once on the ground steering is positive and smooth. This is a solid, gentle airplane in the air and on the ground.

I made every effort to build the airplane following the plans and instructions exactly, but there were a couple things I just had to change. First, I sheeted the top of the wing at the center section and added a 6-inch length of 1/16-inch wire, bent to the dihedral angle, to the trailing edge to protect it from the rubber bands that hold the wing to the fuselage. I trimmed 1/16-inch from the top of the center ribs so the sheet would lay flat with the airfoil. It would probably be fine without the sheet as shown, but I just couldn't expose bare MonoKote to vibrating rubber bands!

Second, the kit provides 1/4-inch hardwood dowels for pushrods to the elevator and rudder; I used 1/4-inch square balsa instead. I'm dead set against adding unnecessary weight to the tail of any airplane.

All and all the PT-20 is an inexpensive way to get your feet wet building and flying R/C airplanes. It offers excellent instructions that will start the new modeler on the right track.

*\*The following are the addresses of the companies mentioned in this article:*

*Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.*

*Top Flite Models, Inc., 2635 S. Wabash Ave., Chicago, IL 60616.* ■