



PHOTOGRAPHY: BOB HUNT

There's a whole new crop of R/C trainer planes that have come out in recent years and among the best of them is Midwest's *Aerostar* family, begun with the *Aerostar 40*, a conventional, easy to build, wood kit.

An FM Product Review: Midwest Products' Aero-Star

By Les Hoffman

Looking for "that" complete trainer package? This all-wood kit qualifies from the bench to the sky.

Finally, a trainer is available for the beginner which has most of its parts pre-cut and sanded. You won't find any plastic, foam, or shelf-paper covering in this *Aero-Star* kit, only top quality wood which is mostly machine cut, or die-cut to the highest standard. The parts fit proved to be excellent which can help a beginner really enjoy building as well as flying his plane.

The *Aero-Star 40* is one of a new generation of kits available from Midwest Products (PO Box 564, Hobart, IN 46342). The kit's high quality is evident right from the point you open the box. All parts are neatly packaged into five bags of related parts: stab and elevator are bag #1; fin and rudder, #2; fuselage parts, #3; wing parts, #4; and, machine-cut ribs, #5.

There's also a hardware bag with pre-bent landing gear, pushrods, clevis and horns, and even a motor mount. At the bottom of the box are two perfectly matched light poplar ply fuselage sides and a beautiful set of fuel-proof decals to save you time when finishing your *Aero-Star*. But hold on, I'm not finished bragging about this plane yet!

One of the least considered, but probably most important parts of any trainer kit are the plans and building instructions. Well, let me tell you that after 31 years of model building, I've never seen a more complete, easy-to-understand instruction book, with 100 pages and over 200 photos of step-by-step building sequences.

As one example of its thoroughness, the manual is constantly bringing your attention to the importance of proper alignment. For instance the wing/stab relationship is mentioned several times, as well as several pictures showing the proper and improper way of aligning these parts. Pay close attention to the photos and you'll be guaranteed a straight airplane.

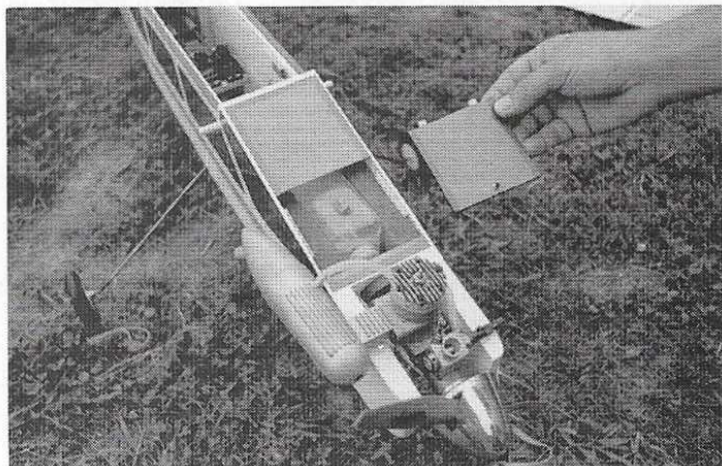
I'm glad to see a manufacturer spend so much time telling the beginner to build a straight airplane! Straight planes are easier to trim, easier to learn to fly, have better flight characteristics, and last a lot longer.

A quick tour

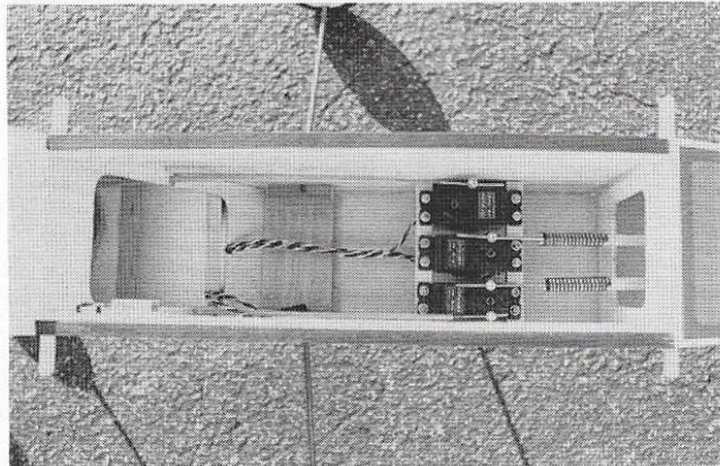
Just to acquaint you with construction here's a quick look at some of the major component groups. Before we begin, though, a little philosophy. If this is your first plane, I do not suggest using the quick cyanoacrylate adhesives exclusively. White glue, though it does take longer, is better in some instances because it allows you to double check critical alignment before it's "cast in stone". From time to time I'll mention the places I used white glue to afford me some time to "eyeball" things a second time.

Bag 1 contains the first item to be assembled, the horizontal stab and elevator. The bag contains one pre-shaped $\frac{1}{4}$ inch leading edge, trailing edge, and two $\frac{1}{4} \times \frac{1}{2}$ inch balsa tips. Even the elevator leading edge is rounded. Even though the stab is simple to build, the manual shows 10 very clear photos of the building sequence. Nothing is left to the imagination.

Parts bag #2 is next. It includes a pre-shaped dorsal fin, leading edge, and trailing edge, and rudder. When assembling the fin and stab, I found white glue helpful. It sands easily and so the glue joints won't show up as



One of the most vexing beginner problems is fuel draw so easy access to the fuel tank and plumbing is desirable. So the author added this simple access hatch (above left) to quickly get at the root of any potential problem. No prob-



lem installing the radio (above right). The receiver and the battery can be packed in foam and tucked neatly in the forward fuselage under the fuel tank. Clean pushrod runs, fore and aft, with no binding or kinking.

unsightly lumps under your covering. Just wipe off any excess with a damp cloth after putting the pieces together. The last part to glue onto the fin is a pre-cut $\frac{1}{8} \times \frac{1}{4}$ inch fin alignment guide, which gets glued to the bottom of the fin.

The fuselage is the third item for assembly. The instruction manual will tell you to hold your fuselage in alignment with tape or rubber bands after insuring that it is straight. I used white glue on the top parts, #7 and #9, and then reinstalled them. After letting them dry thoroughly overnight, I glued the bottom fuselage pieces in, once again using white glue, and double checking alignment before allowing the assembly to dry overnight.

Lastly, I used white glue on the formers, using a small piece of wood to apply a thin film to both sides of each former. Remember, excess glue doesn't make your plane stronger; it makes the overall weight a little heavier.

Let's talk about some necessary things before starting to talk about building the wing, and a few small things to look out for. First of all, the board you build on: make sure it's a flat, smooth surface. You have to build two wing halves, not two 30 inch twisted pretzels.

Be sure to use wax paper between the plans and the wood framework. Use a small right angle piece of wood or plastic as a square to ensure that your ribs are vertical. Also, use care lining up the two inside ribs for the proper dihedral joint. These items might seem basic, but sometimes they're overlooked too frequently by the beginner.

Building the wing requires the most attention. The *Aerostar* wing has most of the pieces cut to shape for you. And the neatly cut and sanded ribs take the guesswork out — "Is this rib too short, or are the rest of the ribs too long?!"

The construction begins by pinning down your $\frac{1}{16}$ leading edge and trailing edge sheeting to the plans and gluing in place the lower wing center section sheeting. Now you add your lower spruce spar and cap strips. Ribs are next: be sure to use that small right angle "square" on both sides of the ribs to make sure they're upright.

The upper spruce spar and pre-shaped leading edge go on next. The shear webs are added to the front of the spars, before the top wing sheeting is glued on. The wing tips are last, and the kit includes a gauge to help get the proper angle. For a little extra strength I added some $\frac{1}{16}$ balsa sheet fill on top of the tips, with the grain running span wise.

I omitted the end cap strip and used the top of the last rib for a ledge and anchored a "center" tip sheet filler to it. For the rest of the $\frac{1}{16}$ inch sheet fill I butt joined a "front" and a "back" tip sheet filler to this "center" piece. Without the wing tip sheeting, I felt the angled wing tips would be quite fragile.

Tuning it up

There are a few minor changes that can make your *Aero-Star* an even better trainer than it already is. First, an easy access fuel tank will help greatly. I've found time and time again that most beginners' engine problems are really just fuel tank problems! Simply cut part 12 in half, which makes this a removable hatch. You could use some rubber bands or some small sheet metal screws to hold it in place. Now you can check your fuel tubing for kinked, cut, or loose lines.

The pushrods in the kit for the nosegear



The author holds the *Aerostar* aloft (above) for the camera. Almost any covering can be used for the model (below) which lends itself to some nice schemes. The self-adhesive "windows" come with the kit.



The *Aerostar* begins to rotate after a short ground run. The wide stance of the $\frac{5}{32}$ music wire landing gear keeps the ground track very straight with no tendency to "squirrel" all over the runway.

Midwest Products' Aero-Star

steering and throttle are metal. I chose Sullivan's #508 cable for this instead. It's easier to install, with less chance to bind and - when that inevitable(?) crash comes - it might save the servo it's attached to.

The tiller arm set screw, supplied with the kit and used on the nose gear, tended to strip out easily. Replacing it with a C.G. #281 solved the problem.

The main gear tends to get mushy after a couple dozen landings. A "V" shaped .062 spreader wire between the gear legs would help solve the problem, using copper wrapping wire soldered to each end where it is attached to each gear leg. The top part of the spreader bar has a #64 rubber band attached to the wire and to the fuselage bottom. Benefit is better ground tracking, and quicker take-offs.

I also found the use of 1/4 inch triangular stock tremendously increased the strength of the vertical fin and horizontal stab. It was used in the angle formed by the fin to fuselage joint and the horizontal stab to fuselage joint.

Gracing the gear legs of my *Aero-Star* were Williams Brothers smooth contour wheels. On the mains I used 2 3/4 inch diameter wheels while on the nose I used a 2 1/4 inch diameter wheel. I would have used 2 1/2 inch wheels on all three but Williams doesn't make them. The benefit I observed were quicker take-offs and more responsive steering.

Down the runway

After teaching several dozen beginners the past two summers, I can honestly say there wasn't anyone disappointed with their *Aero-Stars*. The ailerons have a positive feel, whether flying fast or slow. Some trainers are not that way. On breezy days, the plane handles well and has excellent wind penetration.

A good reliable engine is also a necessity. It doesn't leave a beginner scratching his head,



Easily tucked in the nose, the World Engine's A.S.P. .40 (above) provides plenty of power for the model. Climbing out after another takeoff (bottom), the model has very stable response and "grooves" in flight.

wondering what to do. World Engines' A.S.P. .40 ABC went in the front of my *Aero-Star* and got the usual 2-3 tankfuls of fuel (SIG 5% nitro) run though it on the ground, at a rich needle valve setting. With that little bit of common sense care, it showed that it was a quite reliable and powerful engine. It started easily and idle mixture adjustments to this

date have not been required.

Learning to fly on the *Aero-Star* has been a pleasure for many of my students. With all the information supplied in the instruction manual, building also seems to be a pleasure - and a success. For ease of assembly and flying characteristics, this plane deserves an A+ in my book. CE

