HONKER BIPE

● Almost everyone turns on to a biplane. The sight of one sitting on the tarmac brings a wave of nostalgia to even the youngest modeler, because you don't have to remember the good old days to appreciate them. Two wings bring back the 1930's, the golden age of American aviation -- the era of grace and rigging, before the war warped the airplane forever into a machine of speed and efficiency and blind rivets and steel.

The very names of these early planes have magic: Eaglerock, Great Lakes, Travelaire, Knight Twister, Honker Bipe . . . er, Honker Bipe?

Well, it never hurts to associate your product with the respected names of the industry -- after all, Phil Kraft made it by setting his gear on the hood of a Continental, didn't he? Besides, you can create any one of those famous bipes from a standard Honker biplane, using just a touch of imagination and a roll or two of Solarfilm.

The big drawback to building most model biplanes is, of course, those very two wings that look so neat. Not everyone enjoys gluing great mounds of identical ribs in place, especially when you put in the very last one with a sigh, only to realize that you're only half finished -- you still have another whole wing to go. The Honker Bipe is designed to streamline this operation. No ribs, no spars, no dihedral braces -- just two pieces of sheet balsa laminated at a 6 degree angle and razor-planed to airfoil shape. Too crude, you say -- looks like a hand launch glider. But how long since you've seen a well-designed hand launch fly? The fact is, we've thermalled the number two prototype here in Albuquerque, and slope-soared the same plane (dead stick) out at Torrey Pines.

Wing loadings with a three-channel Kraft brick hover around 10 ounces per square foot, and the biggest complaint the experienced pattern flier has of the bipe is that he can't get it down! If you suffer from this same complaint, you can always leave the bottom wing at home. She flies fast but rock-stable on top-wing only, and looks like a WW I observation plane in the air. The increase in relative stab area seems to more than compensate for the rearward Center of Gravity you get when you fly parasol. But, two words of warning. First, be sure your receiver is tied down securely, and not likely to come tumbling out of the hole left by the missing wing! Second, don't stress that lone top wing too far unless you've glassed the center joint, something that isn't necessary if you plan to fly it only as a biplane. I still fly the number two proto parasol-style once in awhile, just to show off, but I never forget that the wing on it was designed and built for an .049 (it was pirated from an ancient, decrepit Honker) and it presently has a very young and virile O.S. .25 on it!

Which brings us to engines. The number one prototype, built by Dick Roberts here in Albuquerque, flew beautifully with a Max .15. This is also the engine Don chose for the RCM prototype. Gentle, realistic performance at sea level can be had with a good .09 sized mill such as the Enya or Max .10, but these engines become marginal at altitudes above three or four thousand feet. If you decide on a .09, however, you needn't worry about the tip stalls and unexpected snap rolls that plague most marginally-powered models -- the great virtue of the Honker wing is that, properly built, it is extremely tip stable at low airspeeds. Don't ask me why -- just build one and see.

On the other hand, I recognize that there are power-mad individuals among us . . . people so warped and perverted by the modern obsession for speed that they will not rest until they have the fastest airplane on the field. People who are driven by a relentless mania into building machines that will perform vertically every maneuver that their more sensible comrades are content to do horizontally. People who claim they only keep all that excess power on hand "for emergencies" - - - but just watch them on take-offs.

These people are fools, and ought to be ostracized by rational men everywhere. I, myself, treated them so, until I tried flying one of their planes once. Gad! They're right -- it's the only way to fly! So, I never put less than a .25 on my Honker Bipes. After all, the excess engine weight assures a nice forward Center of Gravity. And realistic third-throttle take-offs. And true vertical climbs at sea level (O.S. Max .25, Top Flite 8/4 prop, 35% nitro fuel). Besides, I only use the extra power in emergencies.

Before we begin construction, a word of reassurance to fliers who have cut their teeth on tricycle-geared aircraft. In spite of what your local field prejudices may say, taildraggers need not be tricky to handle on the ground. Half the battle is the correct type and

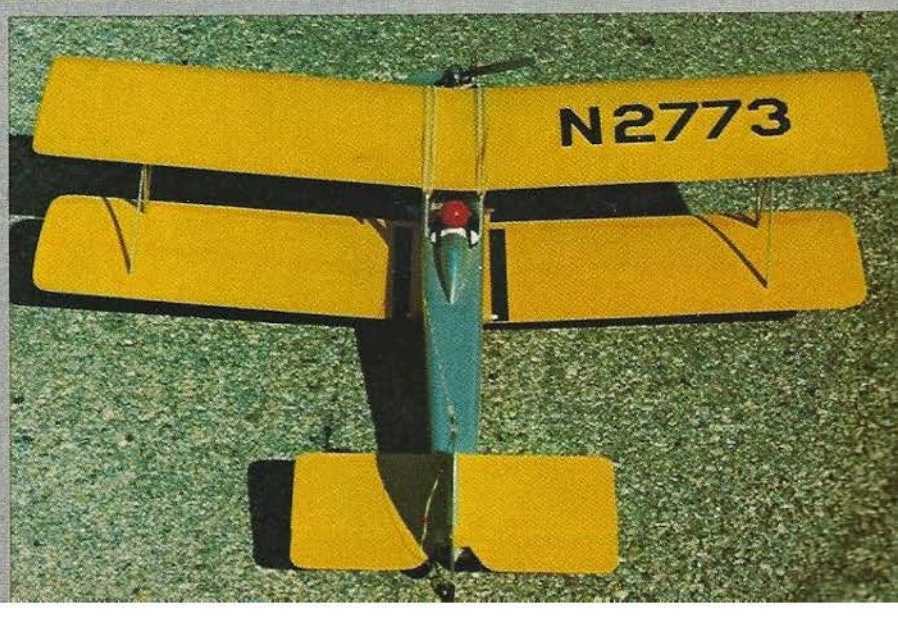
text to page 72

The Honker Bipe will do some of the wildest maneuvers you've ever seen with a .15, yet is light enough to thermal. And, why not? It was designed by a sailplane manufacturer.

BY DAVE THORNBURG & DICK ROBERTS

For people driven by a relentless mania to build machines that will perform every maneuver vertically.....

.....or for realistic performance at trainer-like speeds and a floating glide that almost never quits.



placement of landing gear. If you plan to do most of your flying over a man-made surface such as concrete or tarmac (grass is considered man-made here in New Mexico) you **must** have a steerable tailwheel. A wooden skid may give the plane that Curtis-Jenny look your heart so ardently desires, but I guarantee that it won't get off the tarmac any more often than about every third try – and then not in the direction you expected it to go. A wooden skid simply hasn't enough purchase on a hard surface – it leaves your aircraft's tail at the mercy of every upsetting force imaginable, including torque, crosswind gusts, and small pebbles under the wheels. The real WW I birds had the same problem with ground looping, and pilots learned quickly that the trick was to slam in full power from a standstill and get that tail off the ground and flying as quick as possible. And to land and take-off only on dirt – a runway material most early aerodromes had in excess.

But the addition of a steerable tailwheel cures this problem. It allows tricycle-type ground handling, and takes off arrow straight, with seldom a rudder correction needed. A fixed wheel would do almost as well, although you'd sacrifice the ability to taxi out to the end of the runway and turn into the wind, a maneuver that is absolutely imperative if you wish to keep the respect of the frowning pattern experts in your audience – especially the poorer ones.

The only other aspect of flying a taildragger that deserves mention is the landing approach. You **will** learn to flare out like the real ones do – or buy a lot of props. But this, too, is realistic, and looks almost as good as the classic taildragger take-off: rollout, tail liftoff, long smooth run before that imperceptible second – who knows just when? – that the spinning wheels clear ground and your bird wings off into Ted Strader's "turbulent, signal-jammed, vile grey yonder." Looks like you have about thirty feet of altitude; turn her crosswind. Good; now another ninety for the downwind leg . . . okay, you're cleared to leave the pattern. You're on your own.

CONSTRUCTION

Start your Honker Bipe by cutting a piece of 3/8" x 3" x 36" to the top keel outline shown on the plans. Don't mutilate the 7" end scrap; you'll need it later for the bottom nose sheeting. Lay this top keel flat on the bench and glue two pieces of 1/4" x 1/4" triangle stock down each edge, indented in 1/8" for the fuselage sides. (See cross-section on plans.) If you don't trust your eye to judge the 1/8" consistently, then first mark it off with a ball point pen. Now cut the 1/8" fuselage sides from hard balsa and glue them in place.

At this point you may wish to glue the firewall in place to help align the fuselage sides; personally, I prefer to add the 3/8" bottom sheeting and its corner stringers instead, installing the firewall-engine-tank as a single unit after final sanding and MonoKoting is completed. This allows me to assemble and connect these critical items and to check their viability out in the open air instead of down inside a dark nose shell.

The next step is the bottom rear sheeting – draw its outline on 1/8" balsa using the rear portion of the top keel for a pattern. Glue the two corner stringers to the fuselage sides before adding the sheeting. (If you worry about strength, you may prefer to put this sheeting on with the grain crosswise.)

Now, cut the two cabane struts to exact shape and epoxy them to the outsides of the fuselage. (Our Editor put the cabanes and doublers inside – said it made it look nicer. Yech!) Consult the plan frequently during this operation and you can be almost certain of a trouble-free first flight. Here's why: the top wing is in front of the bottom one, right? So their combined Center of Gravity ought to be about halfway between the normal CG's of each of the wings – in other words, a bit in front of the normal CG location of the bottom wing, and a bit behind the normal location for the top wing. Now, picture the plane going into a stall, and pretend that for some reason the top wing stalls first. When it stalls, it quits flying, and the plane is suddenly relying solely on the bottom wing for support. It's as though the top wing no longer existed, and the plane was a low-wing monoplane. And where is the Center of Gravity on this monoplane? "A bit in front of the normal CG location of the bottom wing."

And we all know what happens to airplanes that suddenly find themselves with a too-far-forward Center of Gravity – they drop their nose and go into a dive, right? At which time the top wing begins to fly again and the plane resumes reasonably level flight. Because, by good fortune, the top wing stalled first, the bottom wing never had a chance to stall, so the airplane continued flying. And all you have to do to build in this automatic stall dampener is to set the top wing at a slightly more positive angle of attack than the bottom one. That's why the strut position shown on the plans is so important.

Now cut the 1/8" balsa fillers that go in front, between and behind the struts, and glue them in place with epoxy or contact cement (water-base glues will warp the wood and make a tight bond difficult.) You may omit these pieces entirely if you wish, but be advised that they do more than make your MonoKoting easier – they act as nose doublers for strengthening the fuselage sides. Incidentally, sanding the taper into the rearmost doublers (see top view) is much more easily done **before** gluing it in place.

At this point your fuselage is structurally complete – not much over an hour's work, using a bandsaw and 5-minute type epoxy. All that's left is to shape it to your heart's desire (some have been left perfectly square – ugh!) and finish it as you prefer.

Add the 1/8" sheet empennage, wing dowels, landing gear and tail wheel or skid according to the options shown on the plans. Feel free to reshape the rudder and stab to suit any particular plane you wish to duplicate (Fokker D-VII, Thomas Morse, Sperry Messenger) with only this stipulation: don't **decrease** any areas. You can safely add a bit of area to either the vertical or horizontal, if necessary, but the surfaces shown don't allow for much trimming down. (This is due to the necessities of kit production: with balsa getting more scarce and expensive every month, waste has to be cut to a minimum.)

The wheels you choose will also depend upon the effect you want. Williams Brothers "antique" wheels give that delicate, WW I effect, while the more robust scale types such as the standard Du-Bro's smack of the thirties.

The last step is the wings. If you or your friends have any retired Honkers (June 1973 RCM) lying about, you're in business. Here in Albuquerque we pylon-race our Honkers around football goal posts, and believe me, that

retires them fast! Almost as fast as it retires far-pylon flagmen!

In any event, construction of the biplane's wings is identical to that of the half-A Honker. Using a sanding block or jointer, bevel a sheet of 1/4" x 4" x 36" Sig tapered balsa to about 6 degrees and join it to a piece of 3/8" x 3" with about 3/16" undercamber, as per the accompanying plan.

When the glue has set thoroughly, razor-plane and sand the panel to the cross-section shown. At this point I like to apply my film covering, saving the cutting of the dihedral break for later. That way, the film goes on in just two sheets, a top and a bottom. But, of course, the quality of the dihedral break is hard to hide, unless you put a trim patch over it.

Either way, the dihedral break ought to be made with care. Be sure it is exactly centered and exactly perpendicular to the wing - - - these points are obvious. Less obvious is the inside of the joint. Use only epoxy glue for this joint (five-minute types are fine). And, take advantage of an old hand launch glider technique: after the two panels are beveled (with a sanding block) for a tight fit at the proper dihedral angle, punch a couple of dozen holes into each root with a straight pin so the glue can soak back into the wood. About 1/8" deep is plenty. Then rub the glue well into these holes before joining the panels. Voila – dozens of miniature dihedral braces built into your wing. Strong!

If you decide to use ailerons, cut them into the bottom wing as shown, before covering. Then use the film covering for a hinge, per this time-tested method: First, bevel the joint for a top-surface hinge. Cover the top surface first, leaving a bit of a crack (maybe 1/32") between the wood pieces. Then cut the inner end of the aileron free and hinge it up and forward until it is resting flat against the top surface of the wing. Now apply the bottom film so that it covers the aileron, both the inner surfaces of the joint, and the bottom of the wing, in one continuous piece. When you flip the aileron back into position, you'll have a neat, full-length hinge composed of two layers of film. This same method works well on the empennage.

Don't be put off by the undercamber. It's really just two flat surfaces, that must be covered one at a time. Tack down the center joint firmly, then iron on the surface you've just tacked (makes no difference whether you do the leading or trailing half first). Then move across the joint and do the other half. Just be careful not to stretch the film across the joint itself, and you should have no problem.

The radio installation will depend upon your equipment. Honker Bipes have been flown on two-channel bricks, using rudder and elevator control and a Tee Dee .09 up front running full bore. (If you're a beginner, forget advice that tells you to fly rudder and throttle - - - it takes much more expertise to make a throttle function as an elevator than it does to make an elevator function as an elevator.) They have been flown three-channel on Kraft bricks and discrete systems with KPS-15 servos, and full house (four channel) using RS and Orbit radio with miniature servos. There is no reason why it shouldn't fly well on rudder-only; just keep in mind that this is the most difficult and challenging way to fly an airplane this large. But they're tough and forgiving and gentle, so no matter what control set up you choose, you're in for some long, pleasant afternoons.

Editor's Note: Please don't call or write Southwestern Sailplanes about supplying wing panels only – they just can't do it during the present balsa crisis. Four-inch-wide wood is incredibly hard to come by, and it's taking all they can get to maintain Honker kit production. If this situation eases, we'll spread the word – but at this writing there's no relief in sight. □

From RCModeler Mar. 1974