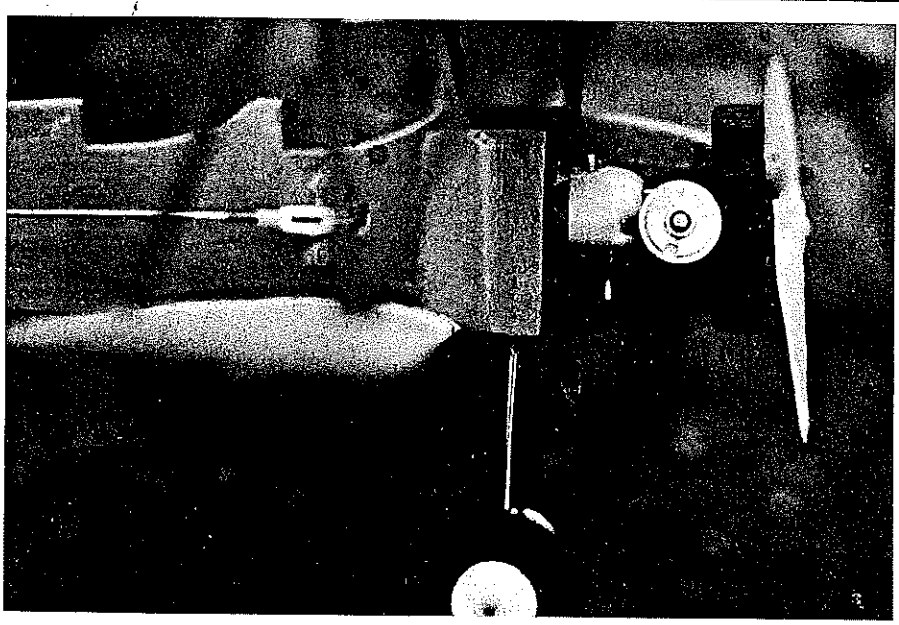

Top: It looks as if it is waiting for its next student. The PT-17 has trained countless pilots over its 38 years of continuous service. Above: The "business" end of the model. The mighty Cox .049 keeps the craft in the air doing what it has been designed to do best. Landing gear is sandwiched between the firewall and engine mounting block. The dummy radial engine is mostly cosmetic; it can be left off during early training flights when the risk is greatest.

ONCE I WAS TOLD that for an airplane to be a biplane it had to have two wings, a round engine, and be a Stearman. In fact the only biplanes I had ever seen for many of my younger years *were* Stearmans. I vividly remember trying to keep up with my dad as he worked the summer flight lines to keep a fleet of Stearman crop dusters in the air during the busy season. The big biplanes cast huge shadows to sit under while I handed dad the wrong wrenches or the safety wire that was so much fun to play with. In those days they were *big* yellow biplanes—very impressive and exciting. Of course, being six and sitting in a cockpit (from which I could not see out) made everything about the Stearmans exciting.

The PT-17 is a truly classic biplane. It was probably the most-produced biplane in aviation history, with several thousand of them built for the Army and Navy. After the war years, they found a lot of work as crop dusters, trainers, stunters, and even mail carriers. Stearmans found their way to China, South America, Africa, Italy, and nearly all points between. A strong and versatile aircraft, the PT-17 won the hearts

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of millions of pilots. Today it is one of the most popular and recognized biplanes still flying.

All those summers of climbing over the big yellow Stearmans when I was a kid helped me to find this subject as a basic biplane trainer for Control Line. Its good moments and sporty lines make the model a joy to build and fly. There is no mistaking it on the flight line: most everyone can recognize it.

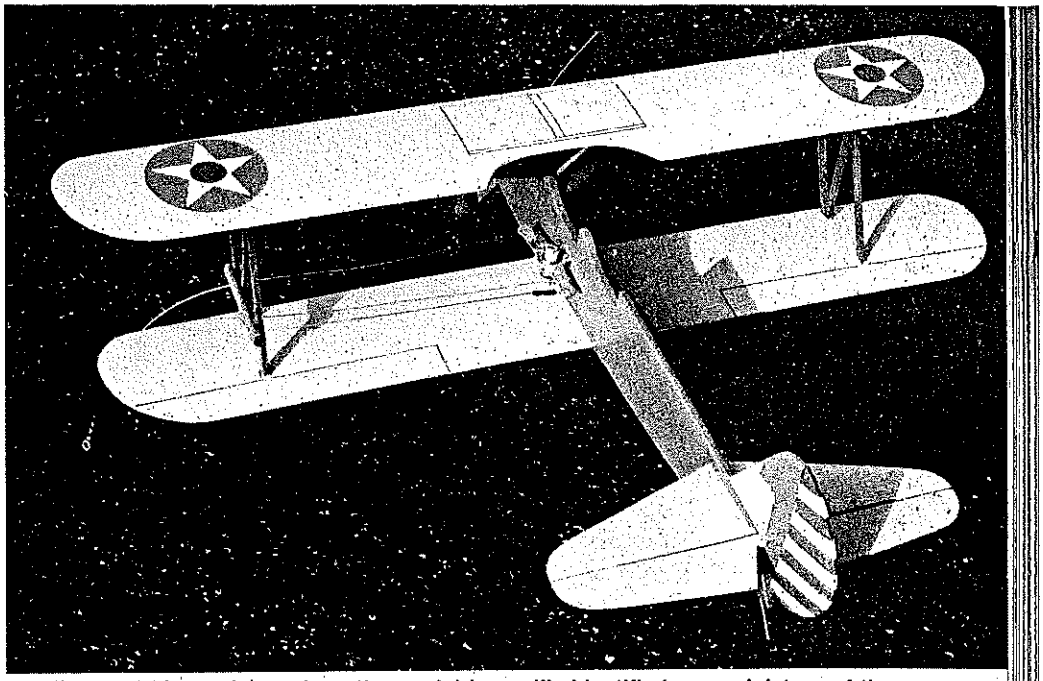
There are a number of neat trim schemes and things to do to modify the basic model into something spectacular. I even have toyed with the idea of rigging a dust bin and a third line so it could dust a few crops. If you're interested in building and flying a bit of aviation's lost glory, get out the balsa and follow along.

The model was designed with ruggedness and simplicity in mind. It can be built over a weekend or less if you use fast cyanoacrylate glue and have everything on hand.

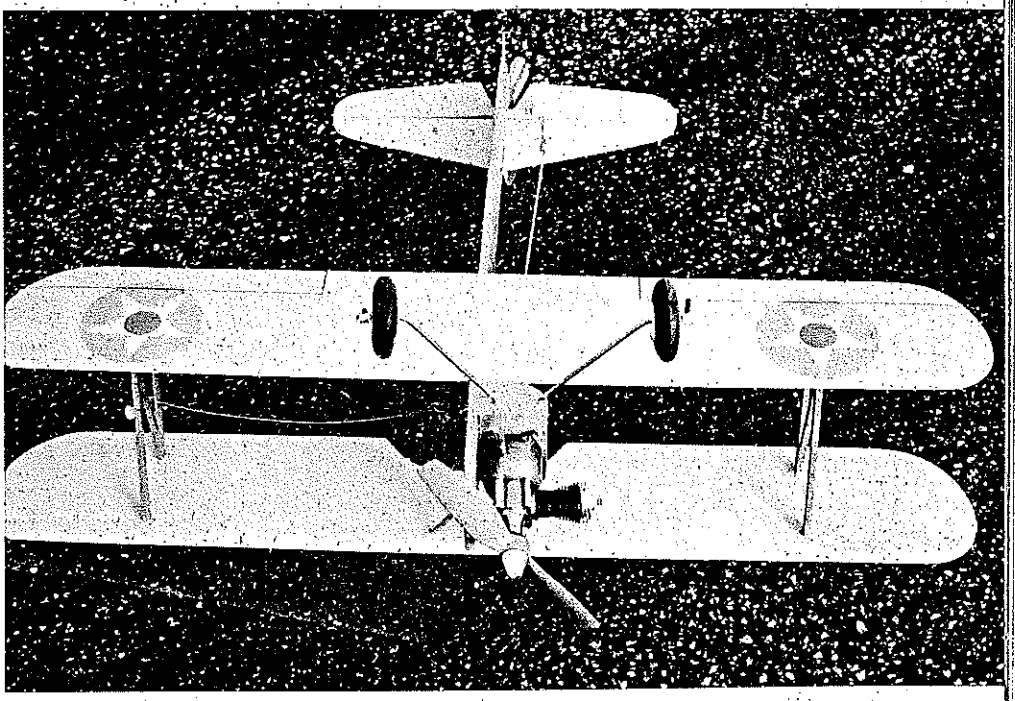
Begin by cutting out all parts from sheet balsa. Note the direction of the wood grain for each part. The wings are cut from Sig's 3-in.-wide pre-formed wing sheets. These are great and will only take a bit of sanding to finish off ready for assembly. Once all the parts are cut out and sanded in the appropriate areas, it is time to start gluing.

Lay down two wing struts on the plans and glue the center strut between them. Tack-glue the upper and lower wing jigs in place, making sure they line up with the jigs on the plan. Let this dry, then glue the rudder to the fin with the 3/16 rudder offset shown on the plan. Set this aside and glue the 1/32 plywood brace to the bottom of the elevator. Probably the wing strut assembly you started first will be dry and you can make another just like it, with the addition of the lead-out guide.

Start the fuselage by gluing the bellcrank mounts to both sides of the bellcrank opening. While this is drying, bend the landing gear wire and the tail skid. The tail skid wire can be glued in place and covered with a piece of lightweight cloth for reinforcement. Groove the balsa engine mount block for the landing gear wire, and glue it to the firewall and then to the fuselage, taking time to check for proper alignment and thrust angle.



In yellow and blue trainer colors, the model is readily identified as a miniature of the Stearman classic. The unusual bellcrank mount is strong and functional. Pushrod end goes through the fuselage. India ink panel lines and aileron markings give a finished, appearance. Insignias are cut from red, white, and blue Contact paper and simply stuck in place.

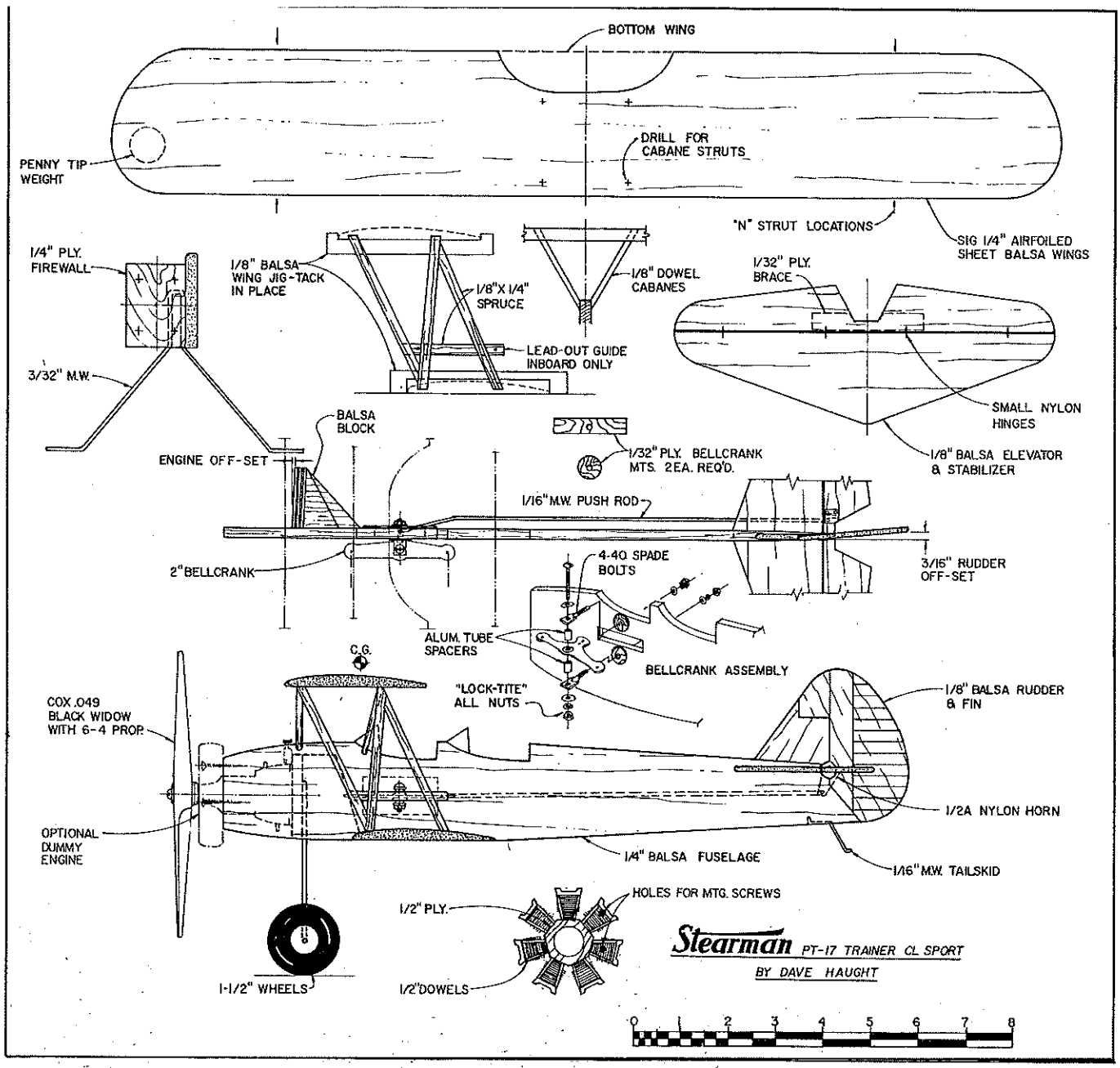


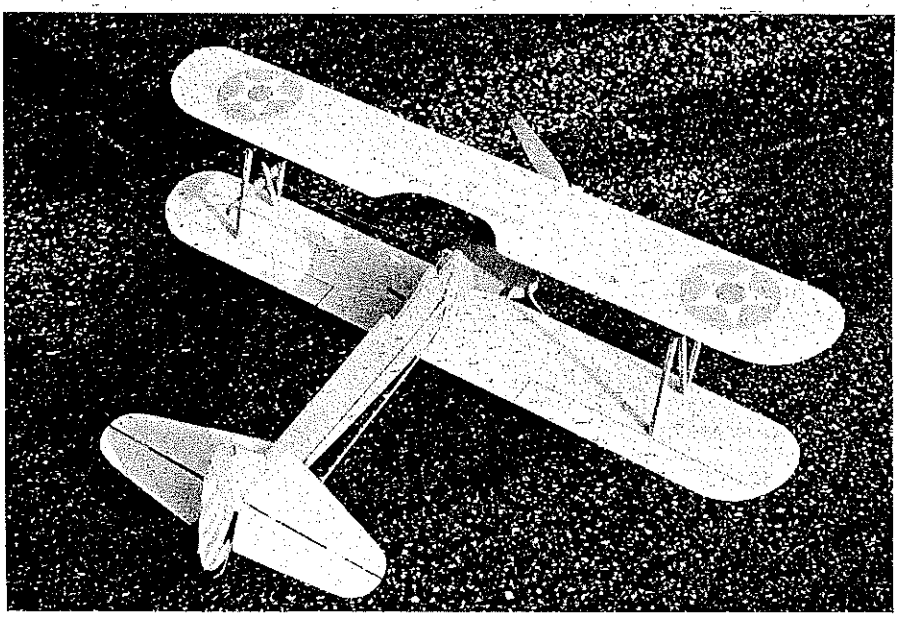
All the offsets are visible in this underside view. Inboard wings have more effective lift with the engine and landing gear mounted on the outside of the flight circle. Generous rudder angle also helps the model stay out tight at the end of the lines. All photos by the author.

Profile Stearman PT-17

How about a bipe Control Line trainer? This one for a 1/2A engine is an easy-to-build version of probably the most-produced biplane in aviation history. ■Dave Haught

Full-Size Plans Available . . . See Page 186





Biplanes have a unique appeal. The model Stearman captures the nostalgic lines of a day long past when "real airplanes" had two wings and round engines. From this side, the pushrod is clearly seen on its way from the through-fuselage bellcrank to the elevator.

While the fuselage is drying, add the wing tip weight to the upper wing, and mark and drill the cabane strut holes. Pin the lower wing to the building board, and mark the locations of the N struts on top of the lower wing and on the bottom of the upper wing. Using a sharp knife blade, cut the required notches in both wings to fit the N strut ends. Glue the N struts to the lower wing with slow-cure epoxy. Put some epoxy on the top ends of the struts, and glue the upper wing in place. While the epoxy is pliable, adjust the assembly to make sure it is square with your work surface and with both wings when viewed from the top, front, and both tips. The jigs should keep the whole thing in alignment without much fuss. Let all the glue harden before moving the assembly.

Work on the tail units next. Hinge the stabilizer and elevator with small nylon RC hinges. Install the control horn, and glue the stabilizer assembly in place. It should be square to the fuselage side and level with

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Stearman/Haught

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the wings. Next add the rudder and vertical fin assembly, also making sure it is true. While the glue is drying, begin the bellcrank assembly.

Cut two small aluminum tube spacers, and assemble the bellcrank unit as shown in the exploded view on the plans. Drill the two holes in the plywood mounts to fit the spade bolts, and slide the unit into place. Trim the fuselage slot to clear the bellcrank as it swings its full arc.

Slide out the bellcrank unit, and make up the lead-outs. Attach them only to the bellcrank at this time; the line ends can be formed after final assembly of the wings to the fuselage. Install the bellcrank assembly permanently, adding Loc-Tite or a drop of cyanoacrylate glue (CyA) to each nut to keep it from loosening.

The pushrod can now be bent to fit. I use two RC clevis rods, attaching one to the bellcrank and the other to the elevator horn. By cutting off each of them so they overlap one another by ¾ in., they can be wrapped with soft copper wire, adjusted to the proper length, and then be soldered in place. This eliminates all the "fun" of trying to bend a wire to exact length.

At this point the model consists of two completed subassemblies: wings and fuselage. Fit the lower wing to the fuselage, trimming the engine mount block to fit the wing leading edge. When satisfied with the fit, add the slow-set epoxy to glue the wing/fuselage assemblies together. Check the wing alignment and incidence one last time, then set it aside for the epoxy to cure.

While the model rests, plan out the color scheme and cut four ⅛-in. hardwood dowels 2 in. long for the cabane struts. When the epoxy on the wing joint has cured, carefully re-drill the holes in the top wing at the angle required for the cabane struts. Trim the dowel ends to the appropriate angle to fit the fuselage, and glue the struts in place with epoxy. Once the epoxy is dry, you can sand the entire model and apply two to three coats of thinned dope. Finish-sand the wood, and apply your colors.

Two of the three "requirements" for a biplane are now evident: it's a Stearman, and it has two wings. Are you going all the way and also giving it a round engine? The dummy engine adds a lot to the appearance of the finished model, but it takes a bit of extra time. I cut seven lengths of ½-in dowel for the cylinders, wrapped them with heavy thread, and secured them to a pine crankcase block that was drilled out to fit over the Cox .049 crankcase. This was then painted black and screwed to the nose of the model with long wood screws. With this mounting it is easy to remove the dummy engine for grass-field flying and engine maintenance.

A nice set of smooth-contour 1½-in. wheels that look right at home on the

Stearman are made by Williams Brothers. Add your wheels, engine, and propeller to check whether your Stearman balances as shown on the plan. If it needs nose weight to achieve the proper balance, add it; if it is a bit nose-heavy, don't worry at this point. Finish off the lead-outs; thread them through the holes in the N strut guide, and form the eyelet ends per drawings in the AMA rule book.

It's time to find a field to dust. I always fly ½A models on steel lines; they fly so much better and are more safe. Hook up a set of 30-ft. lines, fuel the tank, and start the engine. The Stearman is a spunky flier and a lot of fun.

If you haven't treated yourself to a Control Line biplane before, this one is sure to please. To tone it down a bit for training flights, try putting the prop on backwards and use 35-ft. lines. This will help slow it down without cutting the flight performance very much.

Just think how the guys at the club will react when you tell them you've just soloed your Stearman and are thinking about taking up aerobatics or crop dusting with it. Have fun, and keep 'em flying!

CO-2 Airfoiler/Lidberg

Continued from page 81

foiler should climb to the left (usually considered the kiss of death for a pylon model), and sure enough my replica Airfoiler climbs nicely in a wide left turn.

If your model exhibits tight turning tendencies under power, put shims between the motor and the mount to offset the thrust line for opposite turn. As you firm up the trim settings, switch to a liquid charge (charger pointing down), and experiment with the throttle settings. Most of my CO_2 replicas fly longer when the motor is operated at somewhat less than full power.

I don't mind telling you that I was really pleased with the way the replica Airfoiler flew the first day out. I am very cautious and use a DT fuse even for low-power test flights. With this model it was a wise precaution, as the first three flights dethermalized at about 200 ft. and rising after a 90-sec. flight. While it's not very common, there was a stationary thermal column at the field that day that seemed to stay in one place for over an hour. After a few more flights like that, we tried ROGs from the dirt. The Airfoiler lifted off nicely, although with CO_2-powered models, ROGs always seem to cost a lot of altitude.

Hope you've enjoyed this latest little trip into modelling's history. These replicas enable us to make examples of many neat models without filling up the workshop or going broke in the process. So—enjoy—fly CO_2.

Elec. Jr. Clipper/Morris

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With seven 800 mAh cells, it comes out at 35 oz. The climb is better at the lower weight, but the total flight time is less. Mostly I have been using a Kyosho prop.

At 40 oz. the wing loading is high, about 18 oz./sq. ft., and you need to keep the flight speed up. I have had some nice snaps when I tried to float into a turn too slow and too tight. With the 800 mAh cells, the reduced weight provides a less touchy flight.

The Astro 075 I have been using is the old-style type. The climb was much better with a Kyosho 360 PT motor. Nice performance was had with both the Kyosho prop and a reworked Top Flite 11-7.

If the pre-release reviews from both the manufacturer and the press are true, the ideal power package for this type of plane with this wing area sounds like the new Astro Cobalt 035 with a belt or gear reducer. This would bring the wing loading down to the range of a Sailplane while providing plenty of power to get upstairs. With the motor systems I have used, the power portion of the flight is fine, but the glide and thermaling ability suffer somewhat. Another option would be to stretch the wing an extra bay or two, but this would probably upset the purists whose delight is true scale.

There are many ½A Texaco designs that would make beautiful Electric conversions. I have enjoyed flying my Clipper on calm days and letting it fly as a Free Flight without touching the transmitter—except for an occasional nudge to bring it back upwind.