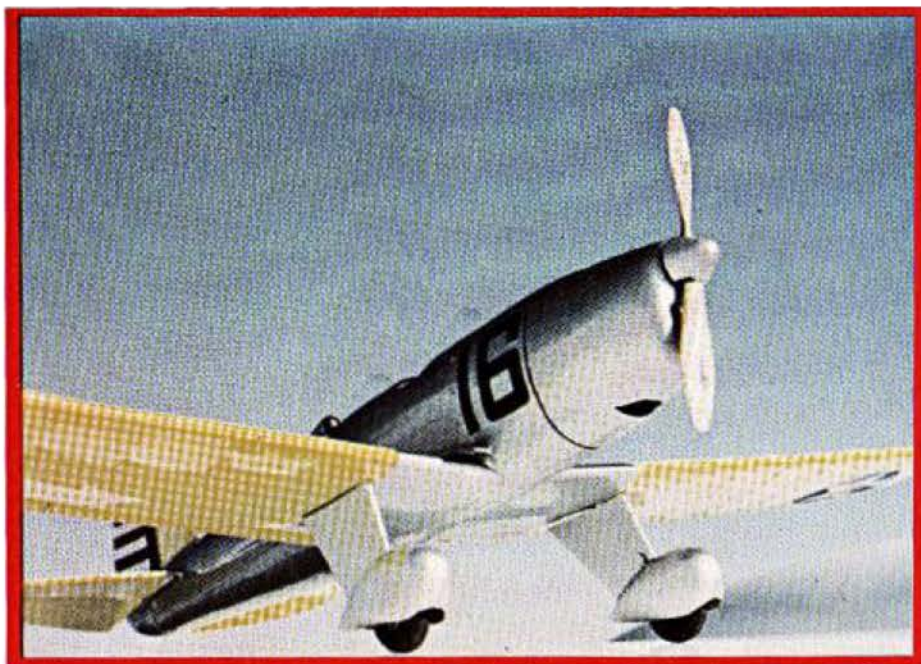


Story by
DICK FISCHER



RYAN ST

Perhaps the most exciting trend in Radio Control today is the scale or scale-like flying model. By Scale Flying Model I mean a realistic, good looking ship that the novice R/C'er can build and fly.

Most modelers have been avid aviation enthusiasts since youth. What could be more fulfilling, then, to see airborne that dream ship of years gone by? For me that dream ship is the Ryan ST.

When the Ryan ST first flew in 1934, it shared a sky filled for the most part by wood and cloth biplanes. Its appearance marked the end of the biplane era and signaled the beginning of the sleek, streamlined monoplanes. Wealthy sportsman pilots were quick to appreciate the racy good looks and flashing performance of the ST, and most of the 181 airplanes built found homes among private owners. A few Ryan ST's were purchased by the U.S. Army and dubbed YPT-16. These aircraft had the distinction of being the first low-wing

monoplane trainers used by the Air Corps.

Our scale Ryan ST seems to reflect many of the qualities of its full-sized counterpart. Not only does it have a great deal of eye appeal on a low flyby, but also turns in a good scale-like aerobatic performance. The one thing that has been bred out of our model is the tricky ground looping tendency of the full scale version.

If you have looked over the plans and photos and waded through the nostalgia portion of the text, you must be ready to cut wood. Some of the construction may look a bit light to those of you who are used to hanging a .60 on your creations. Fear not, however, all structure is plenty adequate for a .19 sized ship. Just be sure to use good glue and follow the wood densities suggested. That round fuselage looks pretty tough, let's start with it.

Begin by cutting two Basic Fuselage Sides from 3/16" soft sheet. Glue 3/16"

x 3/4" Basic Longerons to sides, being sure to have one left and one right side. Add the 3/16" soft sheet Forward Doublers, the 3/16" x 3/5" Forward Longerons, and the 3/16" square Corner Block. Next, glue on the 1/16" ply motor mount Webs and the 3/8" square hardwood Motor Mounts.

Set the two side assemblies aside to dry and cut out all of the Formers. Also cut out the 1/16" ply Servo Floor. The 1/16" ply may sound a bit thin, but is plenty good if you attach your servos with the foam tape made by Rocket City. If you prefer to use screws, add an additional 1/16" plywood lamination only in the area of the servos.

When the two sides are dry lay the right side over the plans and glue in F2, F5, and F6. Then set the left side down on top of the formers, being sure that all is square. Allow to dry thoroughly. Glue in the Servo Floor, and then the three F4's. Also glue in two F3's. Allow to dry thoroughly, once again checking

Photos by
JIM PHELPS



THE RYAN ST SIGNALLED THE BEGINNING OF THE SLEEK, STREAM-LINED MONOPLANE ERA. FIRST FLOWN IN 1934, 181 PRODUCTION MODELS WERE BUILT, OF WHICH THE YPT-16 WAS THE FIRST LOW-WING MONOPLANE TRAINER TO BE USED BY THE ARMY A.C.

the fuselage to be sure that it is square. A little care here avoids the embarrassment of having some kid ask, "Hey Mister, is that a banana on your wing or is it the fuselage?"

Next slide F1 on over the 3/8" square motor mounts and epoxy in place. Also epoxy the 3/32" motor mount plate. Proceed by adding F7, F8 and F9.

Curved sheeting is best pre-formed by steaming or soaking and then wrapping around an old paper towel tube to dry. (Come on Clyde, take the paper towels off the tube first.) A wrapping of waxed paper between tube and balsa helps preserve the cardboard tube.

While your curved sheets are drying, assemble the horizontal and vertical stabilizers. The leading edge of the stab is two 3/32" x 1/4" strips laminated together.

The first piece of curved sheet to be applied covers the cockpit area from F2 to F6. While this is drying, attach the horizontal stabilizer and F10 to the

fuselage. Next add the top skin from F6 to F10.

At this point you can add your fuel tank. I glued a Sullivan RST-4 tank between F1 and F2 using Dow Corning silicone rubber bathtub caulk. Position your tank as far to one side of the fuselage as possible so that the brass tubes sticking through F1 miss the engine. The tank should be on the same side as the fuel tube on your engine (with the engine inverted). Close out the tank area by adding the upper and lower blocks between F1 and F2. Be sure to hollow the blocks to about 3/16" thickness.

At this point you should set all your equipment in place for a trial fit. Route the throttle, elevator and rudder pushrods, cutting through bulkheads as required.

Add the 1/4" x 1/4" block to the face of F9. This block holds the bottom rudder hinge. Use a sturdy hinge, such as the DuBro, since it is the principal

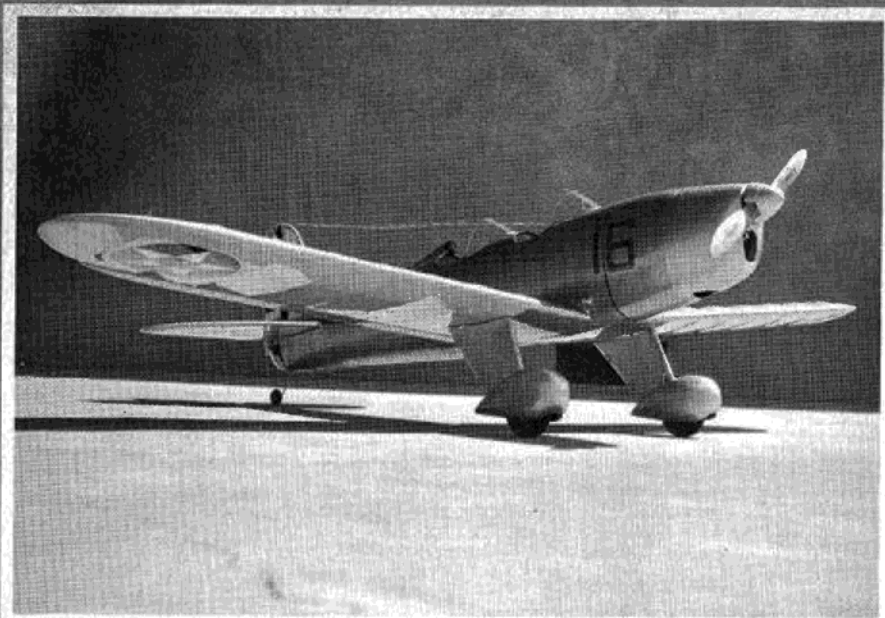
support for tailwheel loads.

Cover the bottom of the fuselage with two pieces of curved sheet just as you did the top. When the bottom sheeting is dry the fuselage may be sanded to shape.

The nose cowl for my ship was carved from a balsa block and held on with screws through the sides into the 3/8" square motor mounts. A cowl made of fiberglass would do very nicely. Whichever you use be sure to cut an opening in the bottom of the cowl to allow cooling air to exit.

The rudder is unique in that it holds the tailwheel. This has proven to be a simple and amply sturdy arrangement. The tailwheel wire is bent to shape and sewn to a piece of 1/32" plywood. This assembly is then glued to the rudder.

The wing is of very simple construction. The only unconventional setup here is the main landing gear attachment. Before assembling the wing, W5 and W6 Doublers are glued to the W2



ribs and $3/32$ " holes drilled as shown. The wing is built in one piece with top planking added in place. After unpinning the wing, slip the fore and aft landing gear wires into their appropriate holes and solder washers in place. This prevents the gear from moving spanwise. Bind the fore and aft gear struts together with fine wire and solder. Now you can plank the wing bottom. The strip ailerons aren't scale, but the inboard end can be made to look like flaps by painting on a "separation line" as shown in the photos.

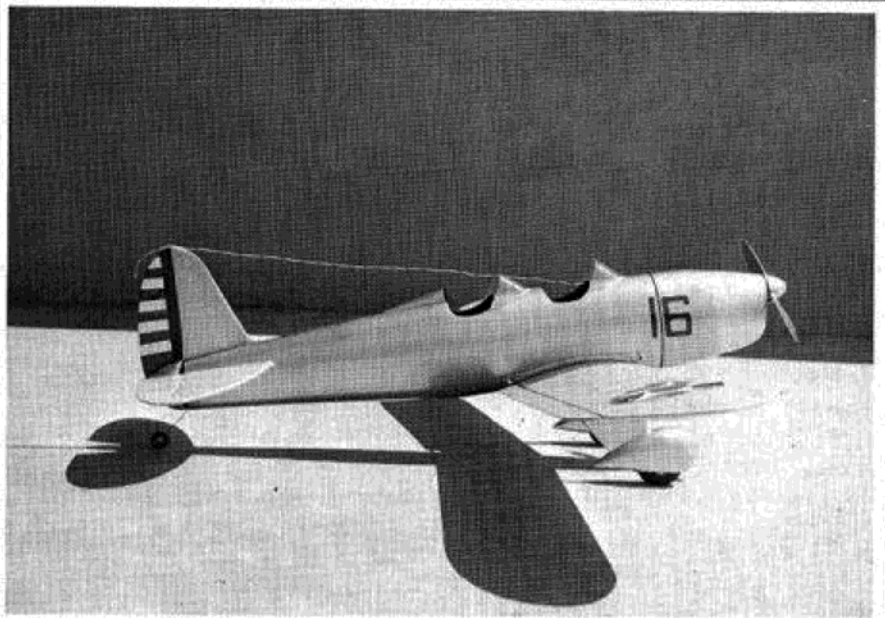
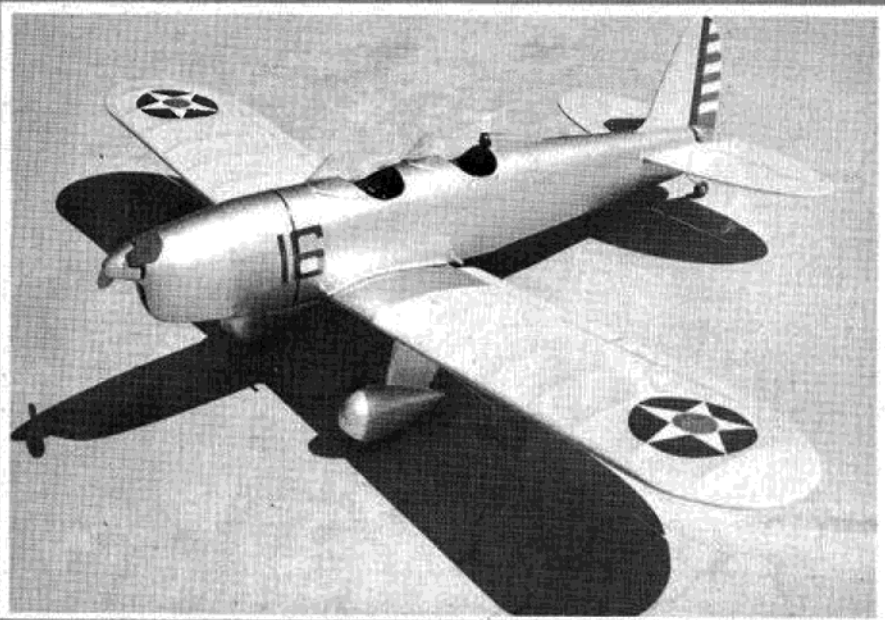
The aileron servo is mounted on top of the wing. This may seem a bit strange at first but works very well. I merely glued (bathtub seal) a $3/32$ " plywood plate to the top of the wing and mounted my servo to the plate. This preserves a great deal of the strength usually lost in making a servo cutout.

The fuselage-to-wing juncture is now completed by carving the fuselage bottom to fit the wing. Epoxolite wing fillets serve double duty. They add to overall appearance and beef up the wing saddle.

The wheel pants are made in halves. The periphery of one half has attached to it a $1/8$ " sheet spacer. This allows sufficient gap between the $3/32$ " sides for the passage of the $3/32$ " wire landing gear. The two halves sandwich the landing gear and are held together by a few spots of Ambroid glue so that they may be readily broken apart.

Finishing the Ryan is pretty straightforward. The most important thing to remember is that this model must be kept light. One extra ounce is like three ounces on a full sized multi. I chose Super MonoKote for my model and had pleasing results. The color scheme used was typical for the pre-WWII era trainers. The fuselage is all silver, as is the wing out to the landing gear. From the landing gear outboard the wing is yellow. The tail surfaces are all yellow with the exception of the rudder, which has the red, white and blue striping used on most Air Corps aircraft of that era. The wheel pants are all silver.

If you have managed to come in under the three pound target weight your Ryan should pose no flying problems. Should you build a lead sled (we call them Desert Penetrators), I suggest substituting a hotter .19 or a .23. Preface your first flight with some test gliding into alfalfa or tall grass if possible. Hand gliding is practically a lost art among R/C'ers today, but its rewards are as great as ever. Your ship can be trimmed to have a nice, straight, flat glide in just a few minutes. This practice



seems to take the edge off that first flight for me.

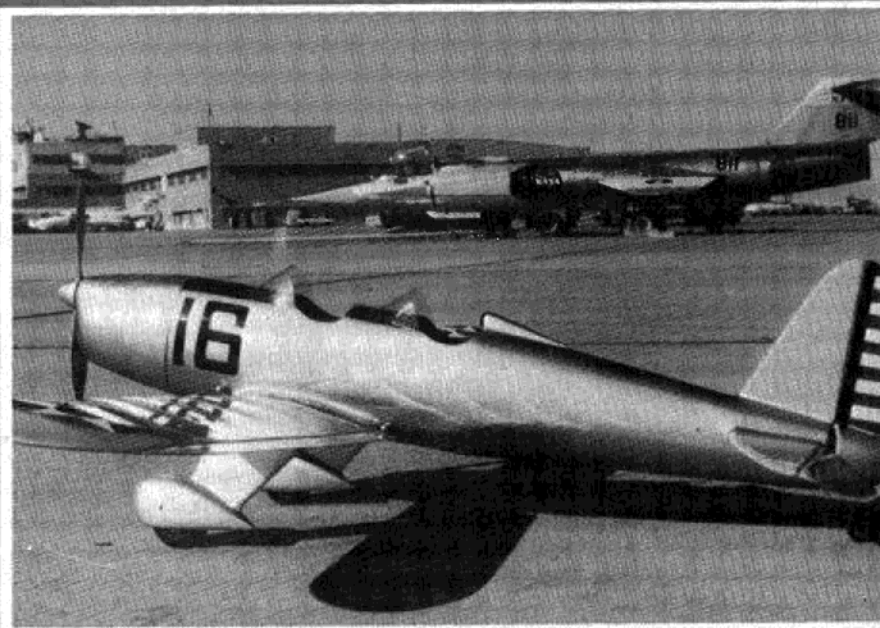
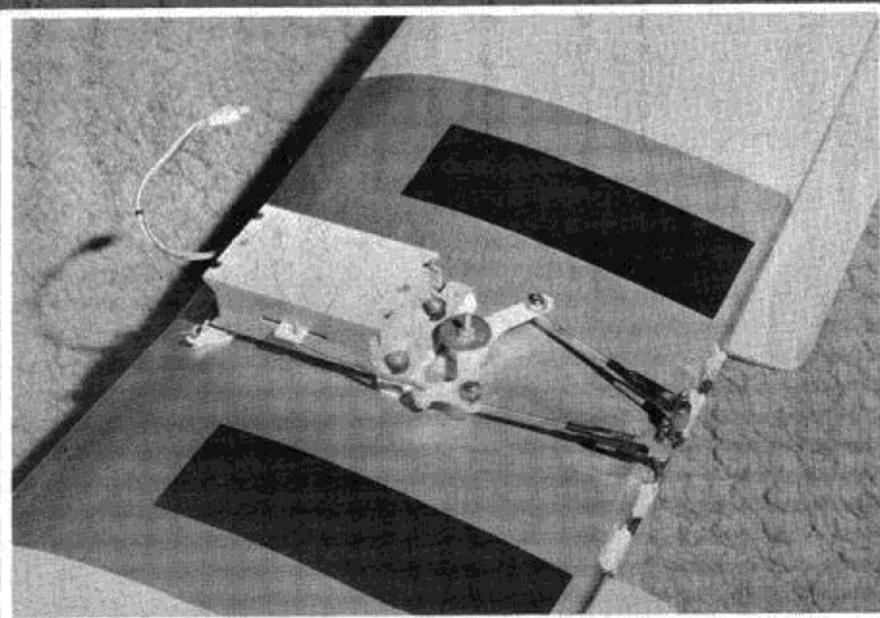
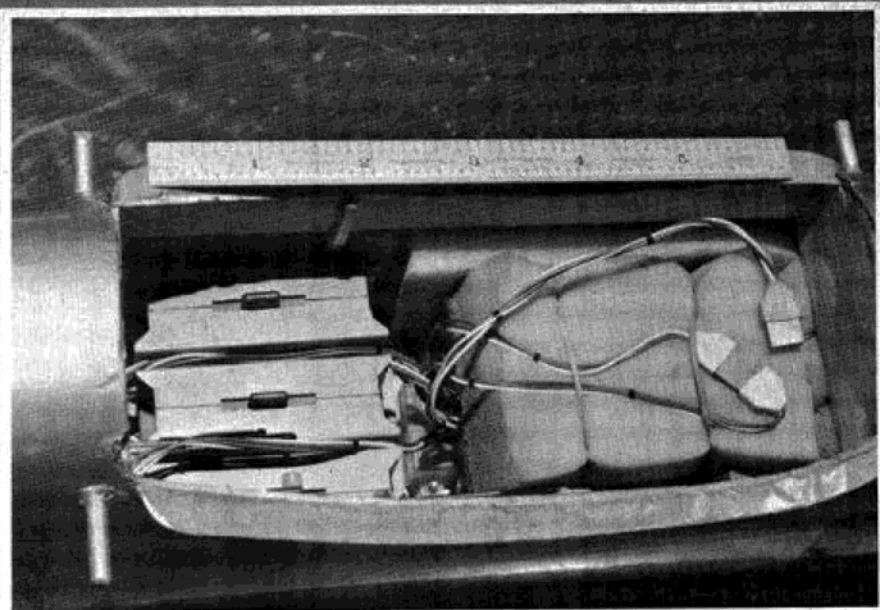
Once out to the flying field make a thorough check of radio and engine operation. Taxi around a bit to get the feel of tailwheel steering. Many people avoid tailwheel models because they have seen others have trouble, so here are some pointers based upon my experience both as pilot of the model and of full sized Ryans.

- a. Taxi very slowly.
- b. Watch your model closely, and apply corrective rudder as soon as it begins to deviate from the desired course.
- c. Apply short, pulse-like rudder corrections.
- d. When taxiing upwind, hold full up elevator to keep pressure on the tailwheel.
- e. When taxiing downwind, hold full down elevator to keep pressure on the tailwheel.
- f. Try to take-off into the wind whenever possible.
- g. Open the throttle slowly and make immediate corrections to all heading deviations on take-off.

These suggestions are not meant to imply that the model is a ground looper. On the contrary, it makes almost effortless take-offs and landings and taxis surprisingly well in the wind. If you follow the guidelines, though, you will do a more professional job than most people can manage with the aid of a trike gear.

Now that we've got you out on the runway, what next? Almost as soon as you ease the throttle open the tail will be up. The nose may wander a bit to the left, so be set to tap right rudder. A bit of back stick will get the ship airborne at about the same speed as a Senior Falcon. Flying is no more difficult than a Falcon, although the Ryan rolls much faster. Rudder control is not as positive as, say a Falcon, but an experienced galloping ghost pilot could do well with a .15 powered 2½ pound model. If in doubt, add another half inch of dihedral under each tip.

Good landings are the result of a well executed approach. Probably the easiest approach is the 360 degree overhead. Enter the pattern by flying upwind at half power directly over the runway. Altitude should be about one hundred feet. As the ship passes midfield (where the pilot should stand), throttle back to just above idle and begin a wide 180 degree descending turn to the left (or right, as conditions dictate). Ease in some back stick to slow down in the



turn. Roll out heading downwind, holding in enough back stick to visibly slow the model. Observe the descent angle on the downwind leg. If the Ryan appears to have a very flat glide, or does not come down at all, throttle back a bit more. Altitude should be fifty to seventy-five feet now. When the ship is approximately two hundred feet downwind, begin another 180 degree descending turn to the left. This turn will line you up on the runway. When it is obvious that the model will make it to the desired touchdown point, throttle back completely. At about five feet flatten the glide with an extra dab of up elevator. If the model is correctly slowed in the pattern, no ballooning will occur. An ideal touch down is made on all three wheels simultaneously. After touchdown, hold in the back stick and maintain a straight roll out with rudder. As your Ryan slows to a walk, turn off the runway and taxi back to the pits.

Hmmmmmm, I wonder how much brakes and flaps would weigh?

**From
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Mar. 1969**