

Ryan ST

A low-wing, "panted" classic. By Tom Sandor



"rascals" that caused me a lot of home to give the model that realistic, winning look. Templates to make the bulkhead laminations are not as difficult as some might think. If you have never tried this, do it now. It makes a great looking model a lot lighter.

Carefully cut these ovals out of thick poster board or $\frac{3}{32}$ inch plywood, if you have a good jig-saw machine. Draw the cross-lines on them accurately according to the plan.

Next, select a sheet of $\frac{3}{32}$ soft, very light contest-grade balsa. Using a good metal straight edge, or balsa stripper, cut about 12 to 16 strips, $\frac{1}{8}$ inch wide for the laminations.

Now place all these strips in a large flat pan of warm water, and allow to soak for about ten minutes.

While waiting for this, using an old candle, wax all the ovals' edges by rubbing firmly with the candle. Next place a sheet of waxed paper on your work board. Now pin each oval firmly to your work board. When the $\frac{1}{32}$ inch strips are ready, lift one at a time from the water, and do the following: squeegee the ex-

The beautiful Ryan S-T is one of those "special looks" aircraft which caught my fancy as a kid. At the risk of dating myself, I shall never forget the scene in a Joe E. Brown movie in which this airplane appeared.

The comedian was flying a mailplane and was mistaken for a bandit pilot. Above and behind him appeared that silvery bird with those great "pair of pants", or landing gear. It was the flying policeman.

The pilot in the open cockpit, signalling the comedian to land, made this a memorable scene indeed.

Sleek and shining like a model turned from solid silver, the first Ryan S-T caught the attention and affection of the flying world in 1934 and has held it ever since.

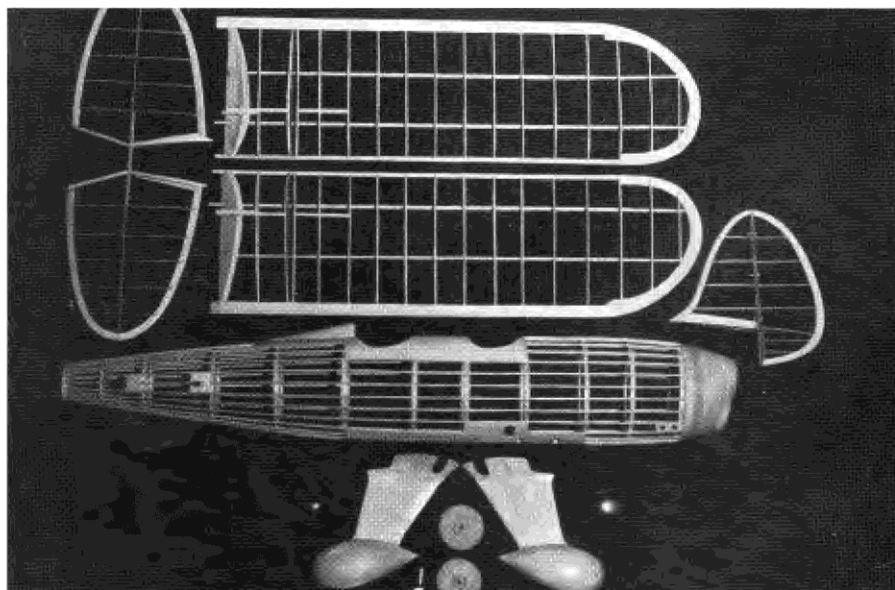
Even the *Gee Bees* and all the others with similar type landing gear lacked the classic lines and charm of this superb beauty, the Ryan S-T. The S-T (for sport trainer) was an open, two place, tandem cockpit plane powered by a Menasco B-4 Pirate engine of 95 HP.

Construction

Study the plan drawing carefully. Note the order of construction by number. This is important so as to understand the lamination type fuselage of this model. Select four strips of $\frac{1}{16}$ inch firm balsa strips for the start. Laminate these over the side view of fuse-

lage, shown as black and white on the plan.

Next check the plan for making the fuselage lamination templates. Those are the



There's much more than a hint of the elegant beauty of the finished Ryan in this shot of the graceful framework parts. The wings and tail are standard construction while the fuselage uses laminated rings as formers.

cess water from each strip between your fingers and coat carefully with white glue.

Next, starting at about the 7 o'clock position on each oval template, carefully and firmly press the glued lamination around the template. Be certain the glue side is always outward from the ovals. Continue to wrap the $\frac{1}{32}$ inch strip around the oval until there is a thickness of at least $\frac{3}{16}$ inch on each finished lamination. Trim off the excess strip and place a pin at this location to hold until glue dries. Keep going until all the other ovals have produced their proper sized laminations. Allow at least three or four hours—preferably overnight—to dry.

Remove the profile of the fuselage from the plan. Be certain that you have marked the locations for each laminated ring former first.

Check to be certain the laminated rings are firm and dry. Now coat each with clear dope. I use nitrate dope for all the work. It does not shrink the tissue on a finished model too tightly thus preventing warps. However, any type clear is OK for this stage.

Following this, return to the fuselage profile, and where the marks are placed, carefully notch $\frac{1}{8}$ inch (see fuselage laminated detail) cutouts from the inside $\frac{1}{16}$ fuselage strip, on the top and on the bottom, at every point where the ring laminations will go. This will then leave you with a $\frac{1}{16}$ inch finished outside stringer on the top and the bottom of the fuselage when all the rings are in place.

Now begin putting the rings in place carefully, beginning with locations No. A through I. J, K, L, and M are solid pieces. Next cut out all temporary cross braces.

Next begin the side stringers by placing and gluing left and right opposites at the same time. Space them about $\frac{3}{8}$ inch apart. Continue this throughout the assembly to be certain the oval fuselage will be nicely aligned. Check it now and then to be certain. You may have to shave off a bit of the rings here and there. Also a shim of balsa at low points, but you will get the knack of the thing as you go along. Just stay with it, as the finished product is a beauty to behold!

From formers No. D to No. G use $\frac{1}{16}$ inch thick soft sheet wood to form the open cockpits. The headrest is formed from soft balsa



The solid silver finish of the first Ryan ST helped make it one of those memorable aircraft for the author, who poses with the finished model (above). Assembly of the model (bottom) comes before the tissue covering so the gear wire and the wheel pants assemblies can be installed.

block, hollowed out. The noseblock is hollowed out also from soft balsa.

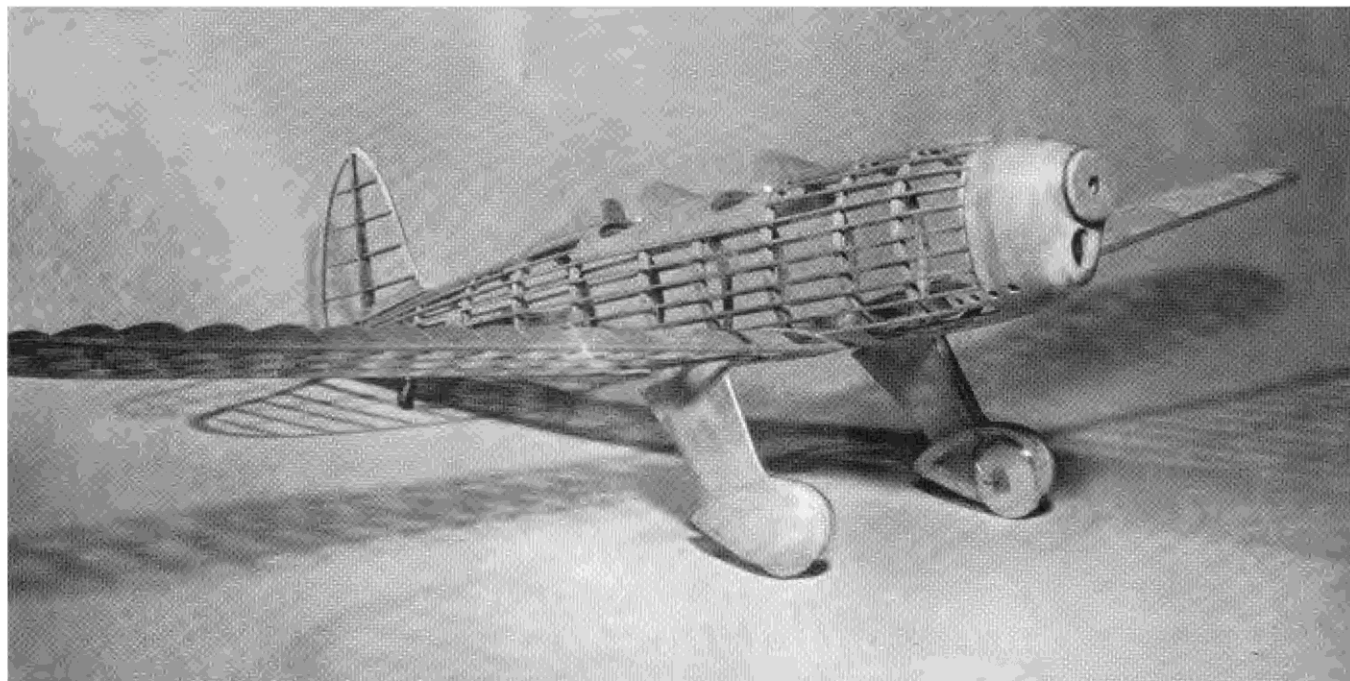
Wing construction is fairly straight forward. Cut the ribs from contest grade, light balsa, $\frac{1}{16}$ inch thick. Laminate with $\frac{1}{64}$ ply, the two sets of angled ribs where the landing gear slides through.

Complete the main wings, right and left, in the usual manner, being careful to note the following: the inside ribs, which line up with the fuselage sides for dihedral, should be made of soft light balsa, because of its $\frac{3}{32}$

inch thickness. Also note the angled, doubled rib section (detail #4) which takes the main load of the shock absorbing landing gear wire and wheel gear itself.

Next complete the tail sections, stabilizer and rudder, as shown.

When the fuselage, wings and tail sections are all completed, carefully light sand all the balsa stringers, wing tips, spars and undersides of all ribs. Using thinned-down nitrate dope, coat the entire fuselage inside and out to prepare for tissue paper application.



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Tom inserts the $\frac{3}{16}$ braided motor into the Ryan (above left) and starts to pack in the winds for a flight (above right). The motor is 27 inches long with only four strands for the first test flights. First test winds, Tom says, should be

limited to 150 turns. An "S" hook at the end of the .045 prop wire attaches the rubber motor (below left). Bring your "runway" to your flying field and let your Ryan gracefully R.O.G. (below right).



However when tissue covering the model, do only the wings and tail section at this stage. Leave the fuselage uncovered until the landing gear is first installed.

Before making the landing gear, please observe the following. Make certain the wings are completed and fastened to the fuselage. Next check the exact distance between right and left wing ribs as indicated on the plan (detail #5). At this point, on your model, (not the plan) is exactly where your 90 degree angle bends will be to form the gear. Use .045 music wire and be sure to include the "V" sections in their right locations. The "V"s should center between ribs #1 and #2. Make two small balsa blocks (detail #6) $\frac{1}{16}$ inch thick. Glue and bind with thread to the "V" sections, which should then fit perfectly between ribs #1 and #2 on both wings.

Complete the wheel pants (detail #6) using the lightest balsa possible. These must be kept very light so as to keep the finished model about 2 ounces or less without prop and rubber motor.

Use the outline of wheel cover pants and solid upper sections on the side view of the plan. The entire outline is cut out of $\frac{1}{64}$ inch thick plywood. The rest is laminated from soft balsa. The two outside sections may be formed of balsa, then used to vacuform the inside portions of the wheel pants.

This was my own method of forming the

gear. I would like to make an offer to vacuform anyone's set of wheel pants if you will form the two outside halves. Send these and include two dollars for postage, and I'll do the rest. Just make certain you get a good smooth finish on those wood surfaces.

To accomplish this, try some Dap putty. This sands very easily and leaves a velvety smooth finish. Special note: these wheel pants, of course, must be also coated with thinned down dope, before the final silver coat is applied. However, if you plan on the vacuformed pants, do not coat with dope as yet. This would create a problem in the vacuforming process.

Next try dry fitting all the wheel pant sections, as shown. Start with the outside wood sections, making certain to get those wheels on first. The thin plywood tops should fit up into the double ribs so as to freely "ride" through the wings as shock absorbers (detail #7).

Carefully slip the whole wood and wire landing gear arrangement through the fuselage area where the wings have butted up against it. There should be pre-cut holes there to receive it. The $\frac{1}{32}$ inch ply section of the gear should slide through the double "V" ribs giving it a back and forward shock feature. This should also spring sideways in both directions, thus saving those precious wings during hard landings. This is a special

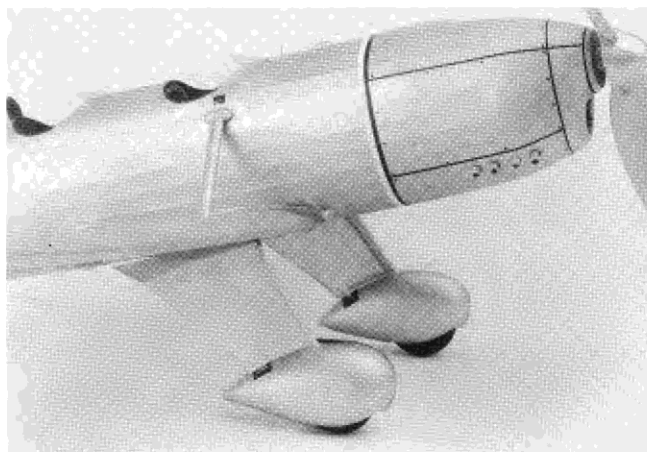
feature of the model, and it really works. On one of my initial test flights, the model hit some tufts of high grass in a landing. The only damage was a slight tear on the lower wing behind the one gear. For this reason you must use elasticized thread on the model throughout.

Assemble the wheel pant inside half sections onto the outside portions and glue into place. At this stage the model should begin to have that Ryan ST charm in appearance. It was great to see that distinctive classic undercarriage making the airplane take shape. Temporarily slip the whole tail section on the model and you'll see what I mean. Great nostalgia as the look of the 30s is sitting right there on your table. Better yet, it flies even as great as it looks, as we'll see later on.

Before securing the tail sections, however, make certain to tissue cover the fuselage first. When this is done, note the area in the rear where the horizontal stabilizer's leading edge must pass through (detail #8). Cut out the tissue there on both sides. Now slip the stabilizer into position until the dowel section fits into the slot on the last bulkhead doubler "M" on the fuselage.

Apply glue carefully to the dowel only and secure it to the slot. Follow the instructions on the plan for securing the leading edge through the small openings provided. The stabilizer should fit snugly onto the fuse-

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Those lovely large wheel pants are as characteristic of the plane (above left) as its silver finish. But, they must be kept as light as possible by making them from the softest, lightest balsa possible. The gear strut is actually a 1/32 ply



profile plate. The entire gear assembly has been designed to take some abuse (above right) and each gear "rides" a slot in the wing so there is some flex. Elastic thread forms the flying wires.

lage, and also be able to swivel up and down at the leading edge. Now you may glue the rudder onto the fuselage. Secure the tail wheel as shown on the plan. Using 1/8 inch diameter aluminum dowel cut out the small exhaust stacks and secure them onto the nose cowl left side only. The model should look about ready for the color at this point.

There are a number of options for painting the model. I used the simplest one in a choice of Aero Gloss Silvaire Aluminum spray by Pactra. This worked very fine with no notable weight added. With paper, carefully mask off the inside cockpit area and black wheels. Lightly spray on one coat. Let dry and hold it up to the light to check for thin spots. Lightly spray coat again, being careful not to get any thick, flowing build-up of the paint.

When completely dry remove the masking and paper. Add windshields by making little slots in the balsa sheeting and fit these into place. You may want to add all the black detailing such as lettering on the tail and main wings. Please note, (and I apologize here). You must add another #2 (NC-14223) to the

license on the wings. Just a bit of oversight on my part. With all the inking in of the drawing detail I felt you would not mind my not erasing and doing it over again, since it is not vital to the overall construction specifications. Thanks!

The large wing letters were cut from black tissue. I outlined the letters first on white writing paper, and then placed this over the black tissue, taping both together.

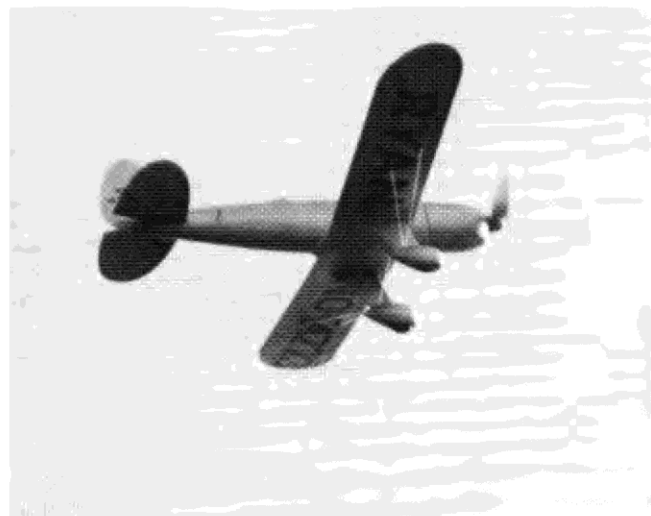
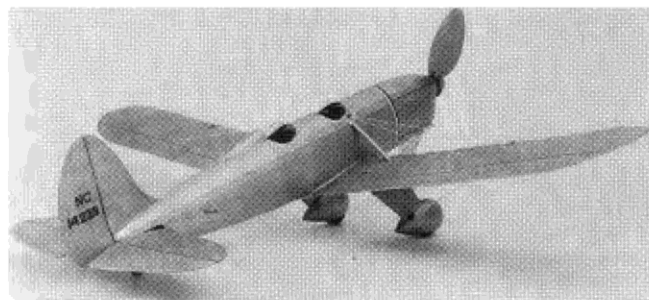
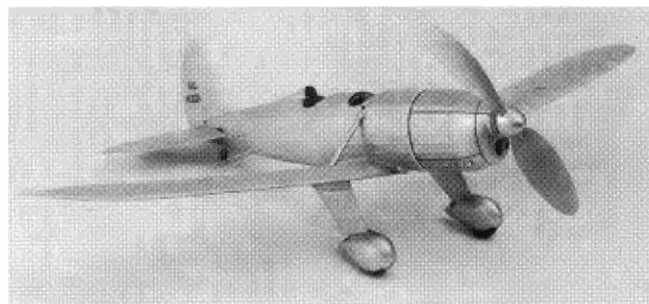
I then proceeded to carefully cut the letters out using the top white sheet outline as a guide. This produced beautiful clean edged letters. These are applied to the surfaces with thinned down dope, being careful not to brush too heavily into the sprayed silver coat.

Complete the model by using elasticized thread for all the rigging as shown on the plan. I started all the rigging first through the small streamlined blocks above and below the wings, see (detail #9). Be sure to thread these blocks with elastic rigging before applying to the wings. The prop is a 10-inch medium pitch made from balsa and thin

plywood construction with a free wheeling device. A carved balsa prop will also do.

Check the model now for any detail you may have overlooked. With the prop in place and no rubber motor, check for proper balance and the test glide. Keep the rudder straight. If needed, adjust the stabilizer to attain a nice long flat glide. Next install the rubber motor. The test rubber used was 3/16 inch F.A.I. braided motor. Test your model first with four strands of 3/16 inch rubber, 27 inches in length. Finally try longer, braided-rubber motors. Test wind only 150 turns. If the flight is good, next wind it up to 600 turns. If the model tends to stall, add more downthrust.

If the model flies well to either right or left, keep adding turns into the rubber motor for longer flights. Keep experimenting. If you have built the model light, the Ryan S-T, like the PT-22 of another article, should give you beautiful and realistic performances. I truly hope you will enjoy this one also. For further information write: Tom Sandor, 47 Lorrie Lane, Clifton, NJ 07012.



Pactra's Aero Gloss Silvaire Aluminum dope worked well as the color coat of the model (top left) while lettering on the bottom of the wing and the tail (bottom left) was done with black tissue carefully doped in place. With the adjustable stab long graceful flights (above) become easy with trimming.