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THE ULTIMATE R/C SUNDAY FUN FLYING MODEL:

The SE-5, in itself, should need no introduction to modelers of any age. The airplane was a favorite mount of numerous WWI flyers and claimed its share of aerial victories. Acclaimed as an easy flying airplane, the SE-5 soon became one of the most famous aircraft in the 1914-18 period.

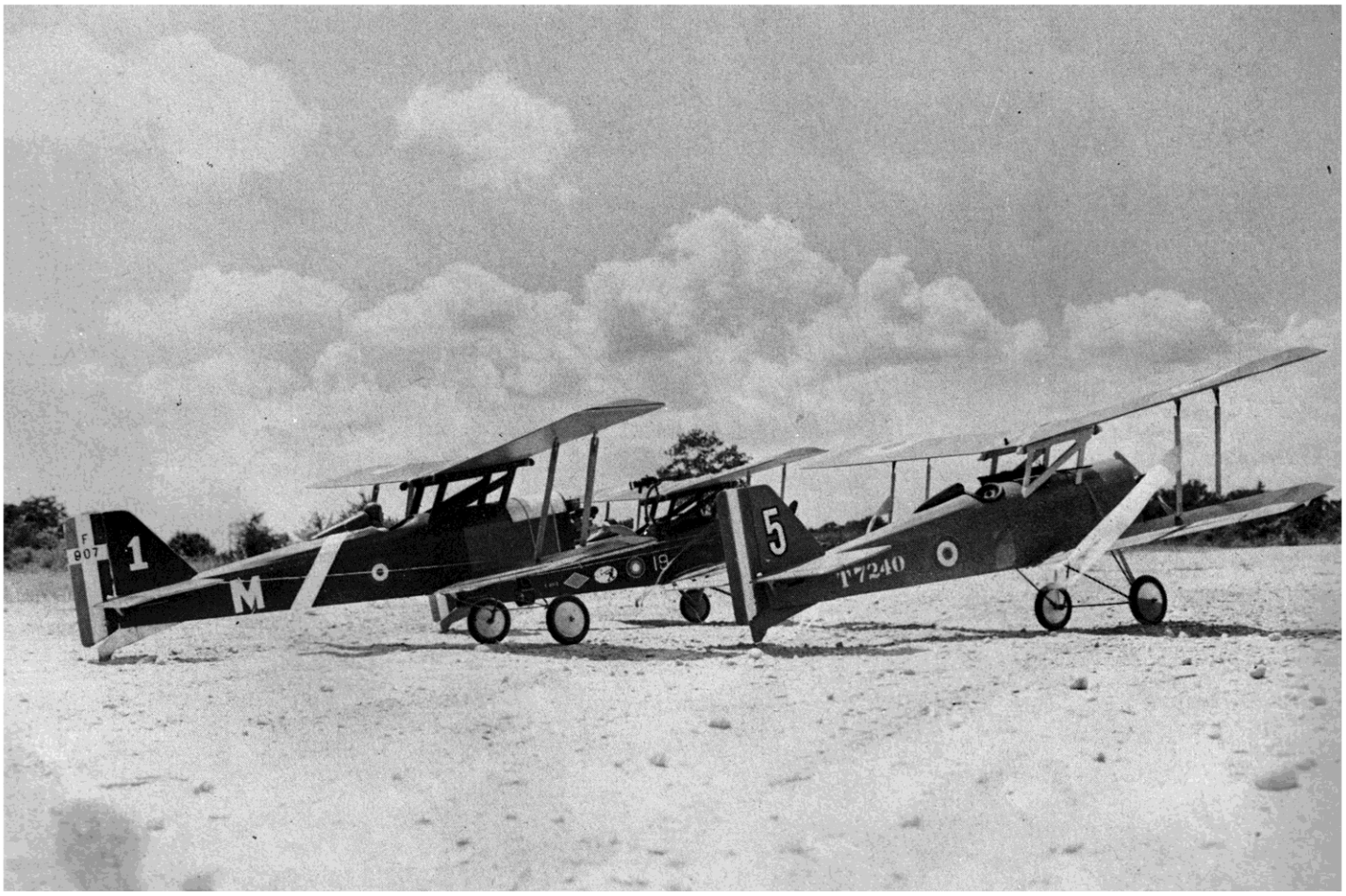
The model presented here captures the flavor of the SE-5 and will give many fun hours for the sport flyer while still providing the builder with a "sport scale" airplane which, properly "dressed up," can be competitive for contest work.

Although designed for 4 channel operation, the model has been flown very successfully on 3 channels by eliminating the ailerons. This was brought to light, quite accidentally, during prototype testing when the aileron servo became inoperative during flight. The flight was continued and the airplane flown on three channels with no appreciable change in characteristics. Quite naturally, the rolling maneuvers were limited to rudder rolls, but the airplane remained extremely docile and never seemed to miss the ailerons.

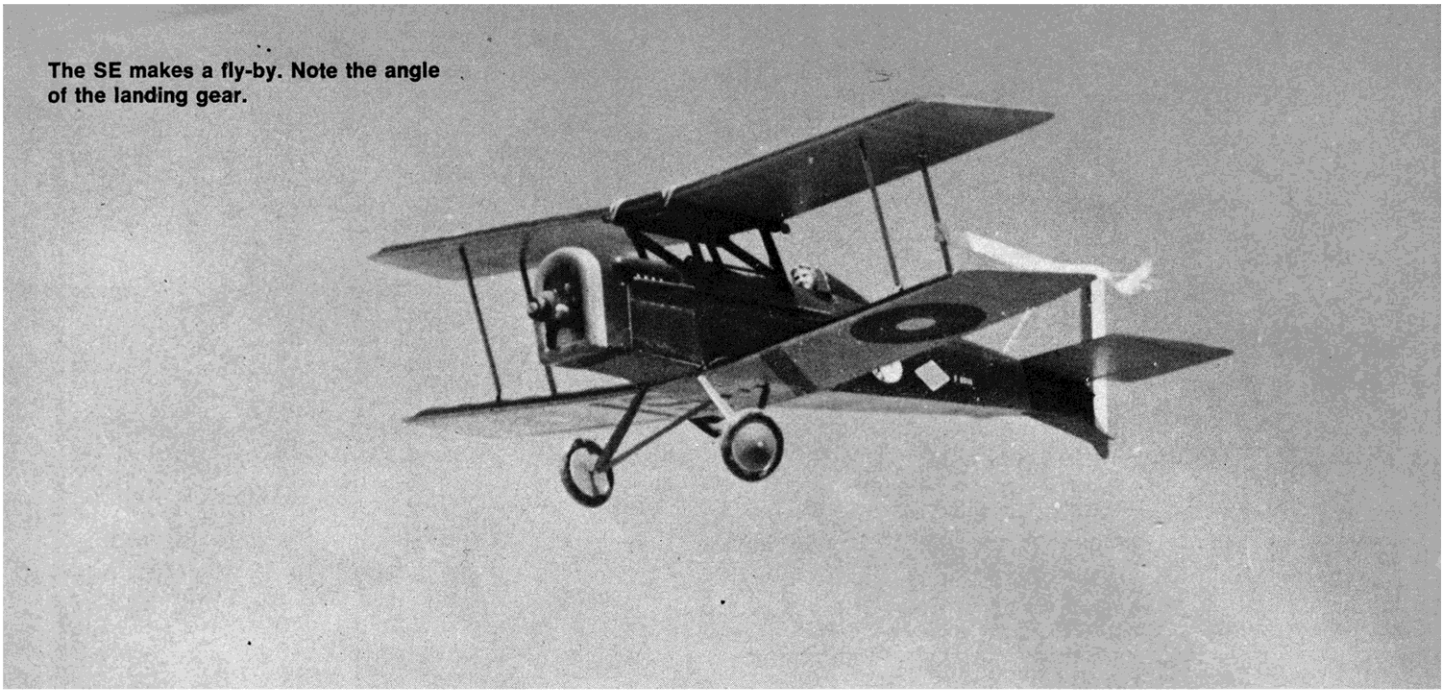
In fact, what we have here for your enjoyment is a "grass roots" basic airplane that is simple to build, easy to fly, and since it's "mid-range" powered, won't cause you to take a second mortgage on your home to fly. Construction materials shouldn't cost you more than $15 or so, with your scrap box yielding some of the wood. Add to this the fact that it's a biplane, and a WWI type to boot, and you'll end up with a popular, eye-catching sport scale SE-5 whose stability and flyability will amaze you. To quote the Southern Bridegroom—"without further 'Ah Do!!' " let's start cuttin' sticks.

FUSELAGE

The fuselage is built "old stick model" style by constructing the basic side directly over the plans. The shaded areas indicate basic frame. When both sides are complete, epoxy the 1/16 ply doubler in position. Note the doubler covers *both* the 1/4" balsa side and upper 1/4 x 1/4 longeron. Make certain you build a RIGHT and a LEFT side. After the assemblies dry, cut 3/16" off the front of the *RIGHT* side from top to bottom. This will insure the built-in right thrust. Our next step, and this is one of *paramount importance,* is marking the position of the cabane assemblies directly on the ply fuselage doublers. Using the



A gaggle of the fun flying SE-5s is gathered at a local Long Island flying site for a little combat. Author Richard Uravitch distributed plans for his design to various members of his local club and there are now several of the models flying. Club members are delighted with the performance as well as the ease of construction and virtually scale appearance.



The SE makes a fly-by. Note the angle of the landing gear.

template on the plans, position accurately and mark locations. Accuracy *is essential* to insure proper upper wing incidence. Having completed this step, install bulkheads #3 and #4, taper edges of the rear longerons and join at the tail.

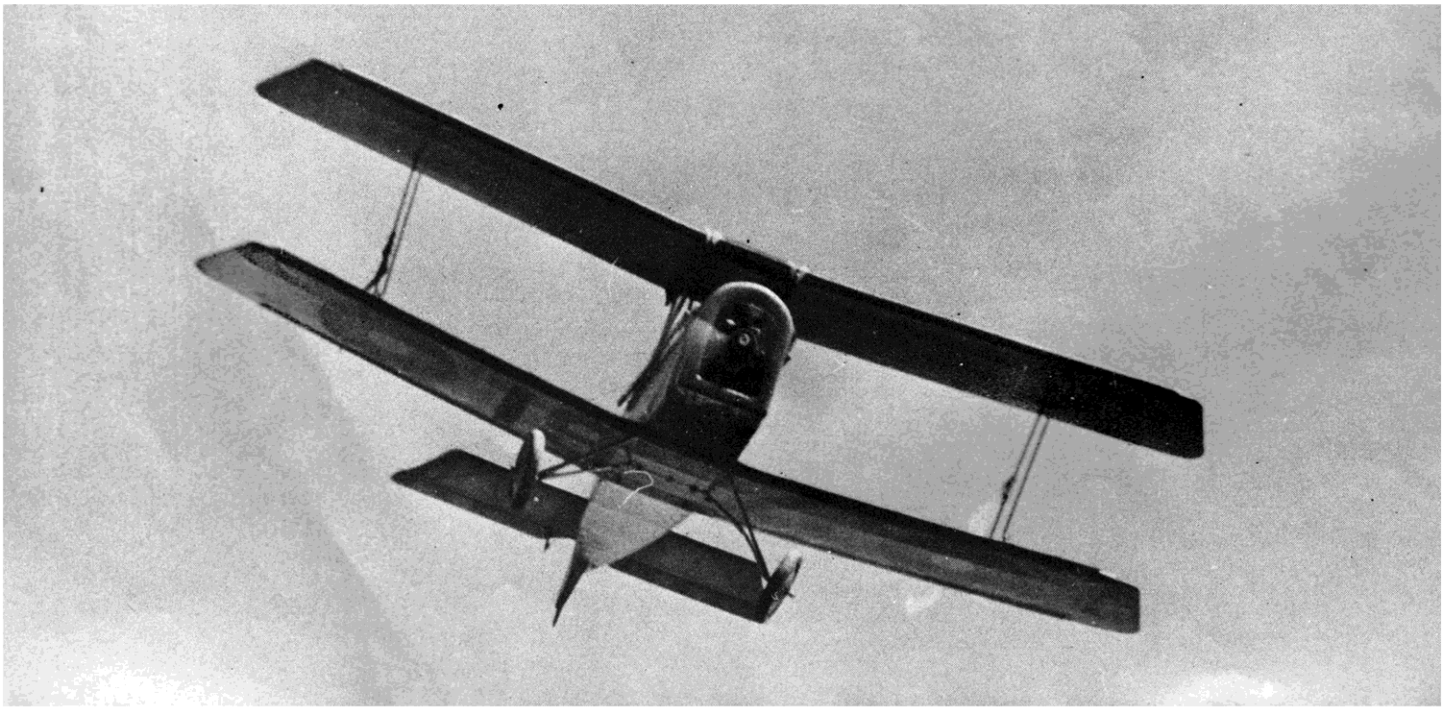
I generally sandwich one hinge between the sides when joining the tail. Cross bracing (1/4 x 1/4 balsa) is now added between the sides. Determine the length of each cross brace by using the turtledeck bulkhead layout as a guide. Cut two of each cross brace since one is required at both top and bottom. These cross braces are glued between the fuselage sides at each point of the upright bracing. Fill in the space between bulkhead #9 and the tail with 1/4" sheet on the upper surface after adding the incidence blocks. Don't forget these blocks as they provide the required positive stab incidence. This same space on the *lower fuselage* is filled with 3/16 ply since it serves as the tail skid mount platform. Now add all upper bulkheads (1a, 2a, 3a, 4a, 5-9), stringers and forward fuselage sheeting. Add maple landing gear blocks which butt against forward side of ply bulkhead #3 and ply fuselage doubler. Install 3/16 ply firewall making sure it's seated properly to provide correct right thrust. Epoxy 1/2" triangular stock to reinforce firewall and bulkhead #3. Locate and epoxy hardwood wing hold down blocks to ply fuselage doublers. Carve headrest but do not glue in place until after the fuselage is covered.

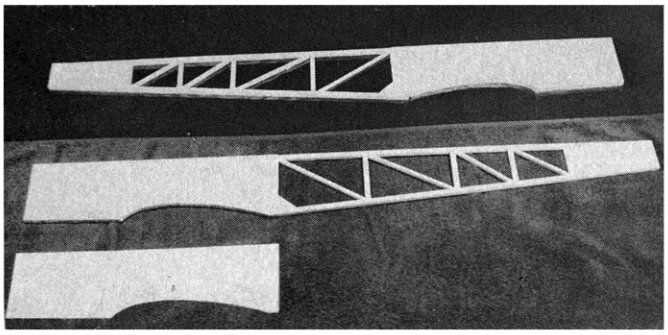
CABANES

These are simple to construct from 1/8" ply stripped to 3/4" width. Build directly over plans and make one R.H., and one L.H. assembly. Drill a series of small holes in the lower edges to provide seepage area for epoxy when these assemblies are installed. The epoxy seeping through forms "rivets" which improves strength tremendously. Using a sharp X-Acto, from the inside of the fuselage, cut through the upper sheeting to allow the cabanes to be inserted. When enough clearance has been obtained to position the cabanes exactly where you previously marked the doublers, epoxy liberally into position. Epoxy and screw 1/2 x 3/4 hardwood cabane cross members into position to form upper wing platform. This should complete basic fuselage assembly.

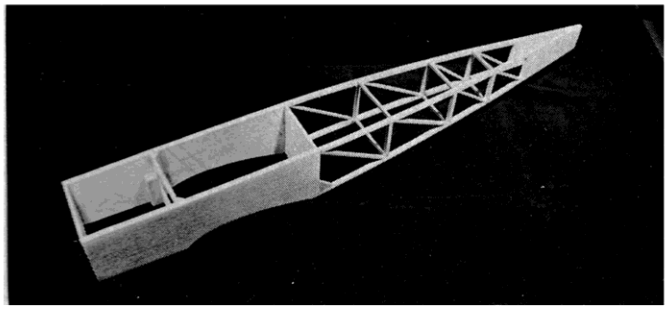
TAIL SURFACES

Simplicity! 3/16 sheet balsa fin and rudder. Cut to outline and sand. Same treatment for the elevators. These are joined by a piece of 3/16 x 3/8 ply.

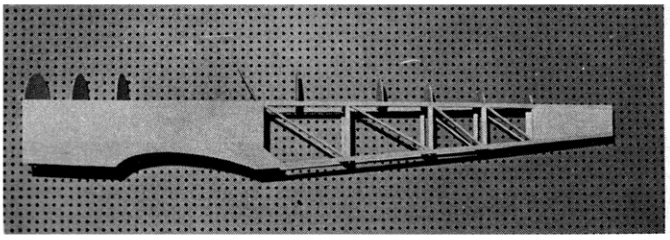




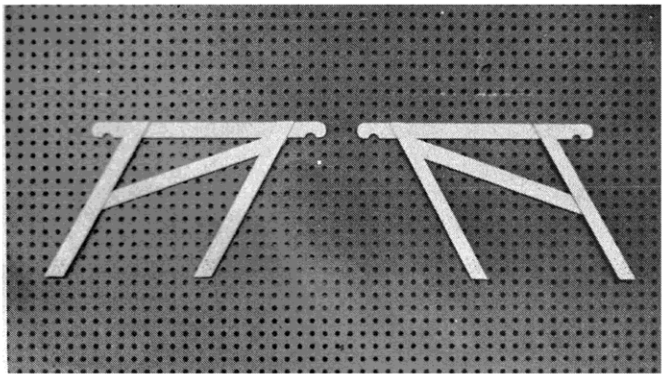
Construction of the slab sided fuselage halves is the first order of business.



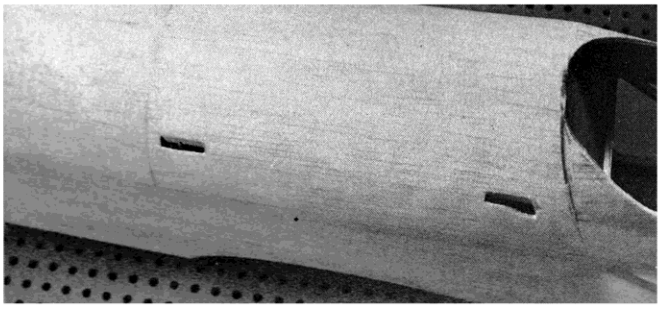
Fuselage halves joined together.



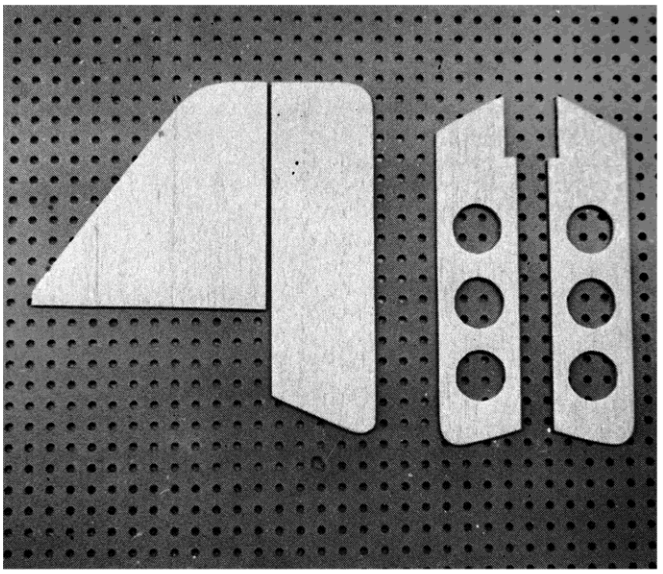
Top formers are the next step in fuselage construction.



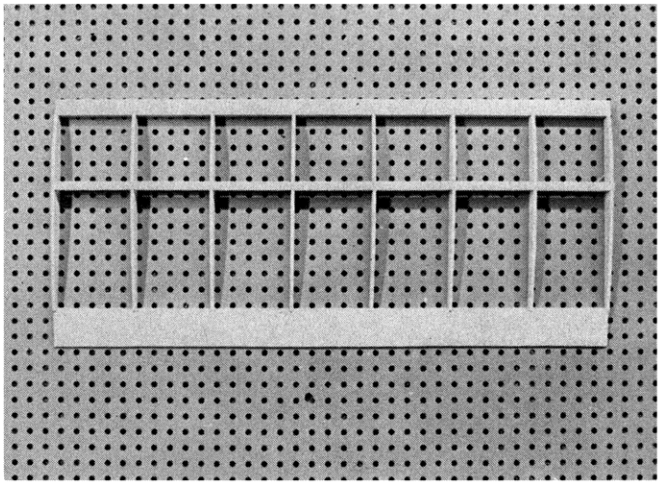
Construction of the cabane struts.



Cabane strut cutouts in the balsa sheet covered forward section of the fuselage.

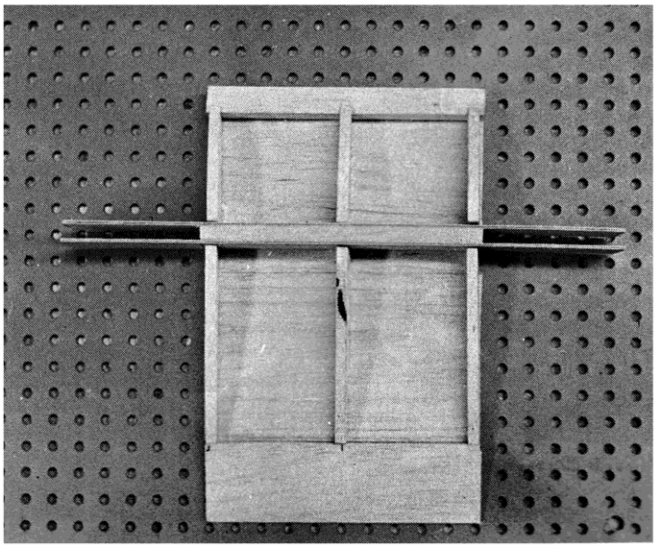


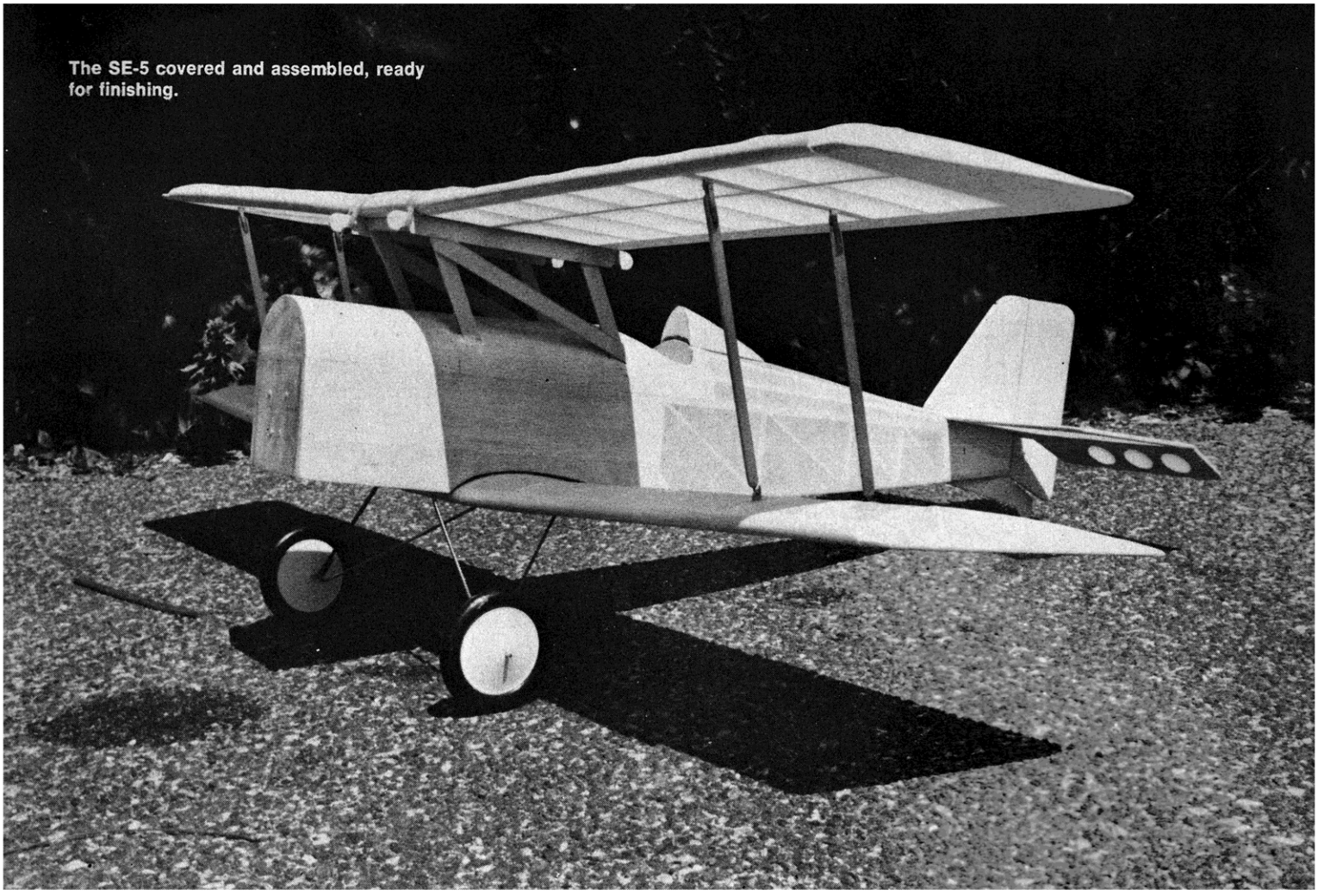
The tail surface construction is the ultimate in simplicity.



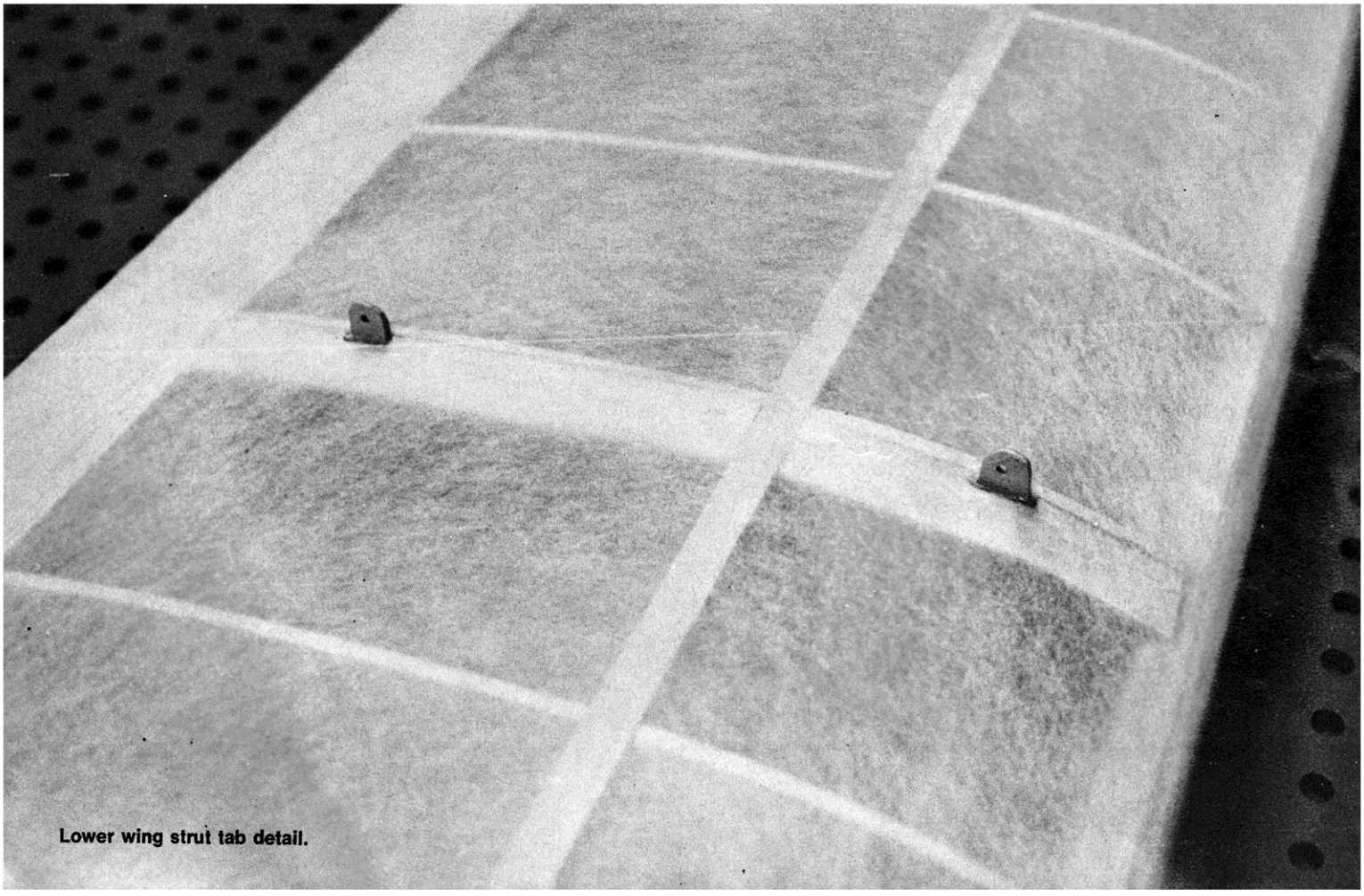
Wing construction is very straightforward helped along by identical ribs throughout.

Basic construction of the upper wing centersection.





The SE-5 covered and assembled, ready for finishing.



Lower wing strut tab detail.

The stab is built over the plans using 3/16 x 1/2 balsa for the basic outline and 3/16 x 1/8 for ribs. Gussets are cut from scrap.

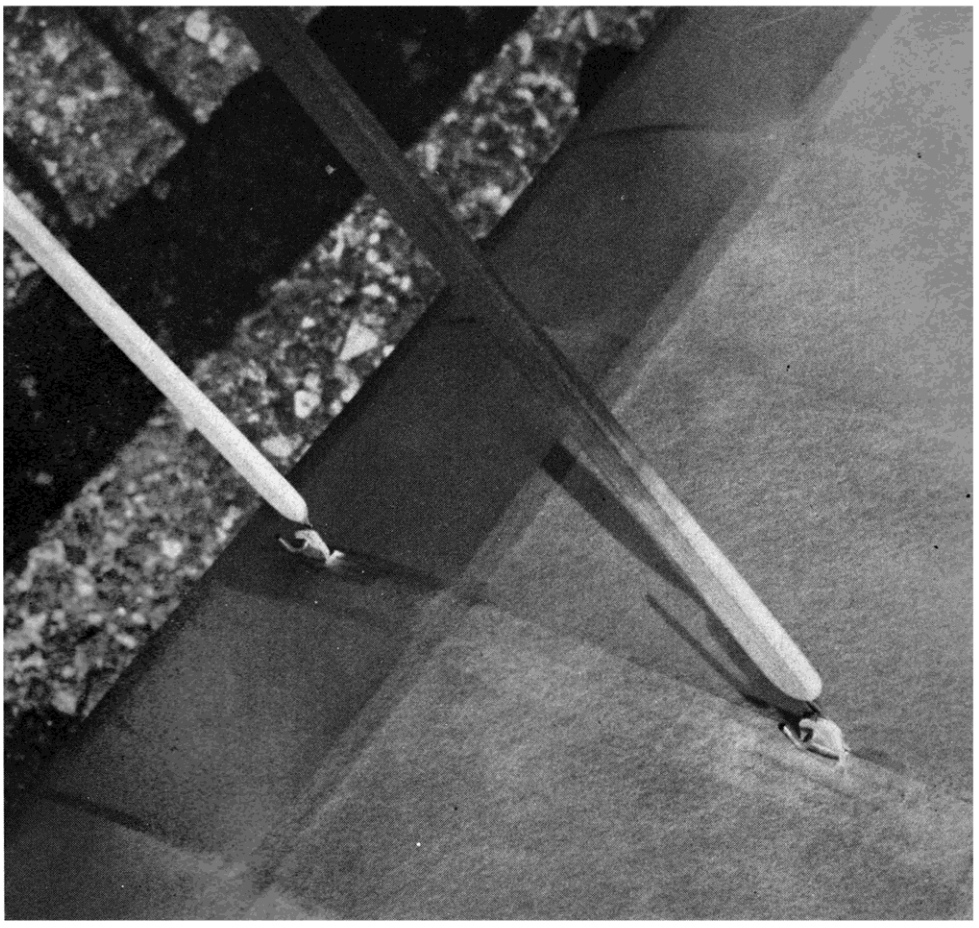
WINGS

Easy to build, even though there are two. They are identical with only a few small variations. Cut all ribs out first. Pin lower spar, leading edge and trailing edge in position over plans. Glue ribs in position and follow with upper spar. I've found the easiest approach to building these wings, since they are three pieces per wing, is to build both L.H. panels, both R.H. panels and then, the center sections. After the center sections are completed the outer panels are attached and the joint reinforced with the ply dihedral braces. Block the outer panels to the proper dihedral while the epoxy sets. All the center section ribs are cut from 332 ply with *only* the *lower set* cut out to receive the hardwood landing gear block. The only other changes are the installation of a 1/2" balsa half rib forward of the spar at the centerline of the *lower wing* only. This should be drilled to receive the 1/4" wing locating dowel. Install all 1/16 balsa center section sheeting. The 3/4" ailerons (lower wing only) are cut from the T.E. stock, strip aileron linkage installed and ailerons hinged. Remember, the interplane strut tabs protrude from the *upper surface of the lower wing* and *the lower surface of the upper wing.* (See detail drawing) A piece of 1/16 sheet balsa is glued around each of the ply tabs to provide an adequate surface to anchor the covering material.

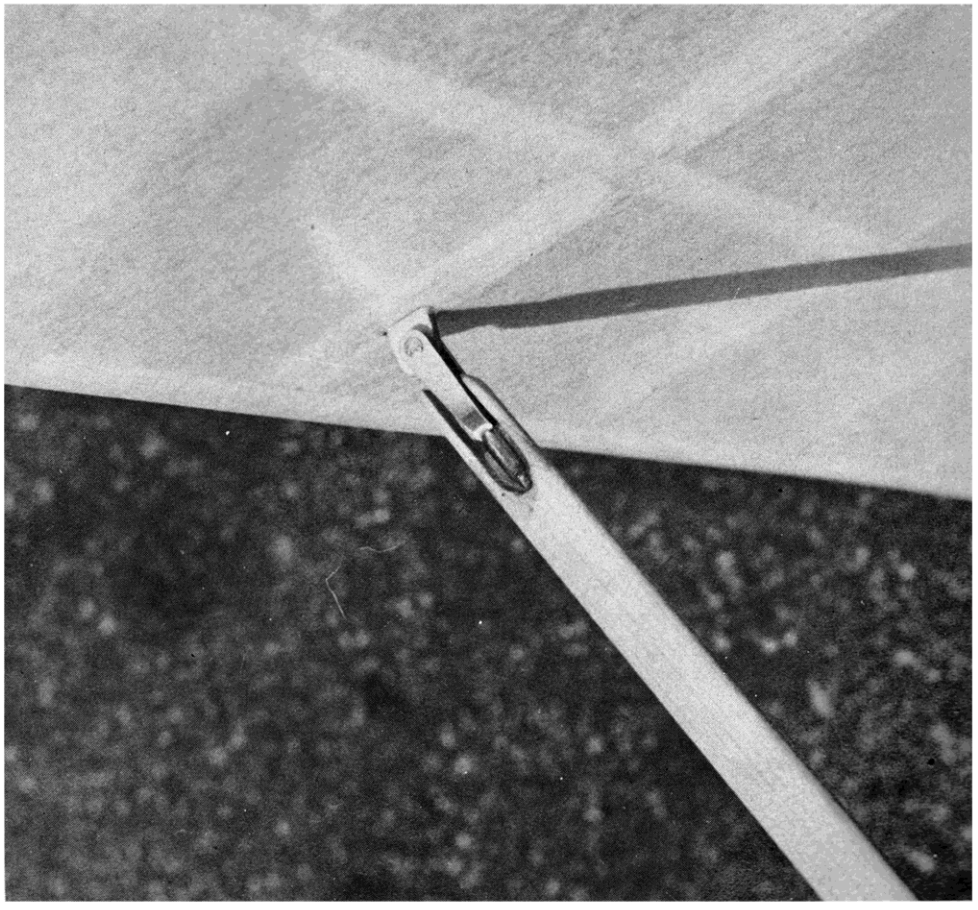
LANDING GEAR

This assembly consists of three pieces of 1/8" music wire, the main gear struts (2), and the one piece trailing strut. The main struts plug in to the vertically located gear blocks while the trailing strut rides in the grooved block located in the center section of the lower wing. By using gear straps to secure the trailing strut, the entire assembly is able to swing and yet still remain attached to the wing. This allows the wing to be removed without removing the landing gear. When soldering the trailing strut to each of the main struts, wrap and use a good quality silver solder if available.

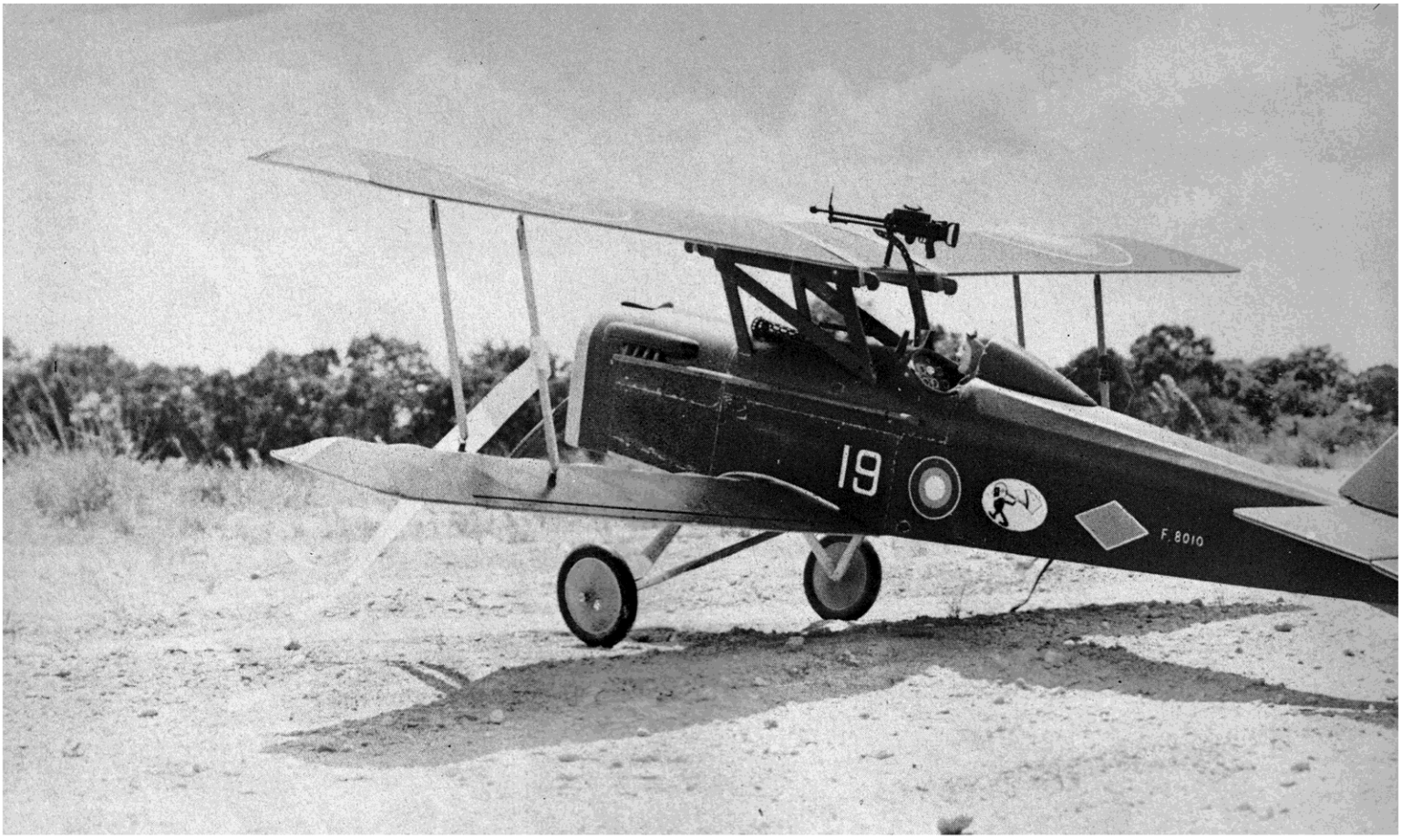
The interplane struts are made from spruce and are quick disconnect designed to hook up in seconds. The struts themselves are cut to length which is determined when both wings are in their proper positions. The ends are set up as shown on the plans. The 1/16 wire engages the tab on the lower wing while the clevis is attached to the upper tab.



Lower wing strut attachment detail.



Upper wing strut attachment detail.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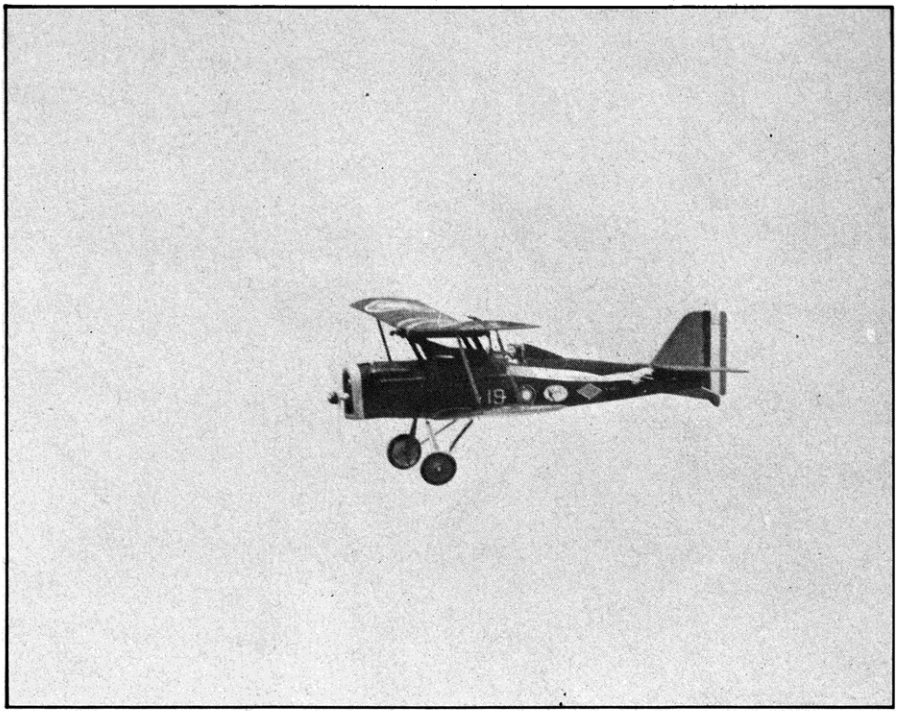
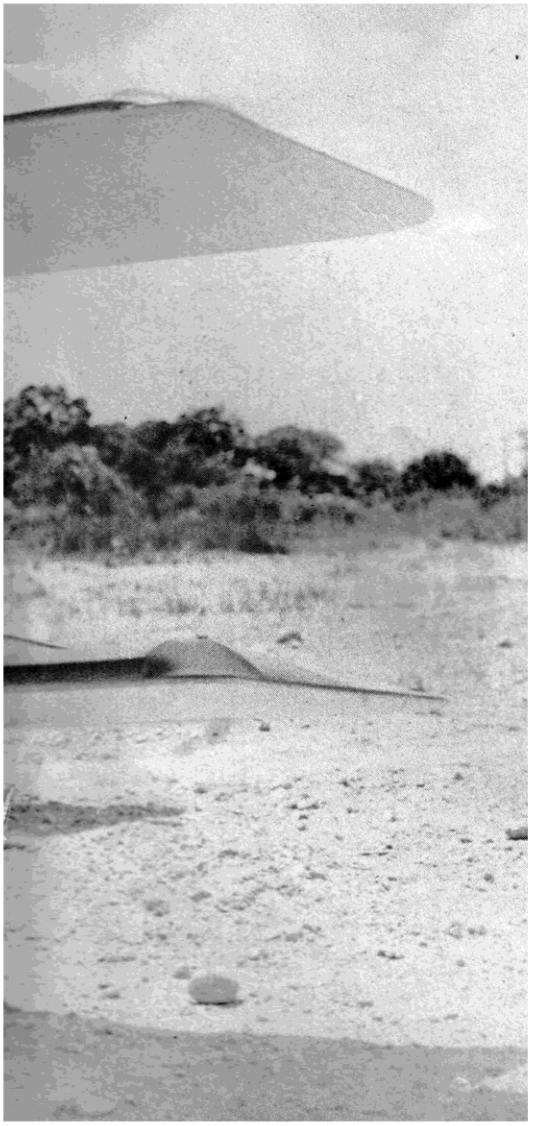
Although the prototype model carries no scale wire rigging, this could easily be accomplished for the modeler who wanted to get a bit more serious about scale appearance.





FINAL ASSEMBLY/COVERING

Sand the entire airframe, radius all edges and shape the wing leading edges to an airfoil contour. Trial fit all components and when completely satisfied, proceed with covering. Use whatever material you like from the mylars to silk. The prototypes were all covered with Silkspun Coverite and doped. Tremendously strong with little weight increase. The original prototype has about 300 flights on it and the only repair thus far required was the recovering of the wing tips caused by a spectacular 3 turn cartwheel as a result of a small bush becoming a big tree . . . instantly!

Hinge all surfaces, install rods, tank, engine and mount. Proceed with all the neat little dress up items like Williams Brothers' Lewis gun, 3-3/4" wheels, and pilot (don't forget the scarf). Add dummy exhaust manifolds and pipes . . . rig it if you like. Have a ball! This airplane can be as simple or as dressed up as you like.

FLYING

The prototypes were flown with a variety of engines ranging from a vintage Enya .35 through a SuperTigre .46. The Enya .45 or Tigre, .46 pull the airplane along briskly with scale characteristics displayed at about 50% power. The aircraft in the pictures is powered by a K&B .40 FR and weighs 5 lbs. since it carries an additional servo, battery pack and smoke device for air show work.

Check the C.G. and make certain it is not aft of the rearmost limit. Don't be concerned if additional weight must be added to the nose since it will probably take about 6-8 ounces. WWI aircraft generally have short nose moments and the SE-5 is no exception. It is, however, a bit better than most.

Run up the engine, check all controls at different power settings and aim the airplane down the runway. It may require just a touch of right rudder, depending on how accurately your gear was bent. The airplane will fly itself off in about 20-25 feet. Fly it around, set your trims and give it a real go. Aileron only rolls are smooth barrel type; snaps are achieved by application of rudder with aileron but are not treacherous. Recovery from just about any attitude is accomplished by neutralizing controls. Landings can be "wheelie" or three pointers, but the former look really great. The sink rate on final is moderate but it can be floated in by coming off power and gradually feeding in back pressure on the elevator. The stall occurs at somewhat less than a walk speed and it is straightforward.

This SE-5 flys as easy as the average Falcon, is probably as easy to build and will make a great subject for WWI combat and dog fighting.

I'm convinced you'll build this airplane quicker than you'd expect and have a great time flying it. Of the 12 prototypes now flying, the average building time was two weeks. I would appreciate hearing any comments you may have. □