THE CHALLENGE OF A SCALE GLIDER:

SCHWEIZER 1-26

Design by Dan Lutz

Full size Schweizer 1-26 Sailplane with new vertical surface and standard canopy. These improvements are shown on the scale model plans herewith.

A Slope Soaring Glider to be long remembered . . .

♦ Aviation began with model gliders in the early 1860's, and with the advent of proportional radio controlled gliders, the circle is now close to completion. Of course, there are space ships planned to land man on the moon, and civil aviation will see its biggest boom in the early 1970's, but for Mr. Joe Modeler, the planes he can fashion with his hands and fly to his heart's content are the ones that present a real challenge to him. Donning the garb of a philosopher for a moment, the words of William A. Ward come to mind—"A success is one who decided to succeed—and worked. A failure is one who decided to succeed—and wished!"

Certainly the Schweizer Brothers of Elmira, New York, must have learned the wisdom of Mr. Ward's proverb, as the history of the "1-26" begins in 1935 with work. This was the year when Paul and Ernie Schweizer formed the Schweizer Metal Aircraft Company. The design of the 1-26 is the 26th in a series, though only nineteen of these designs were actually built. Some designs, such as the 1-6 and the 1-15, were built in single models, whereas the 2-12 (known throughout the military services as the TG-3A) and the 2-22 were produced in the hundreds. While

Full Size Plans available through MODEL PLAN SERVICE . . .

Newest 1-26 model has Sport Canopy for summer flying. A real challenge to build and fly this scale model of America's most widely known and flown sailplane.

SCHWEIZER 1-26 ... continued ...

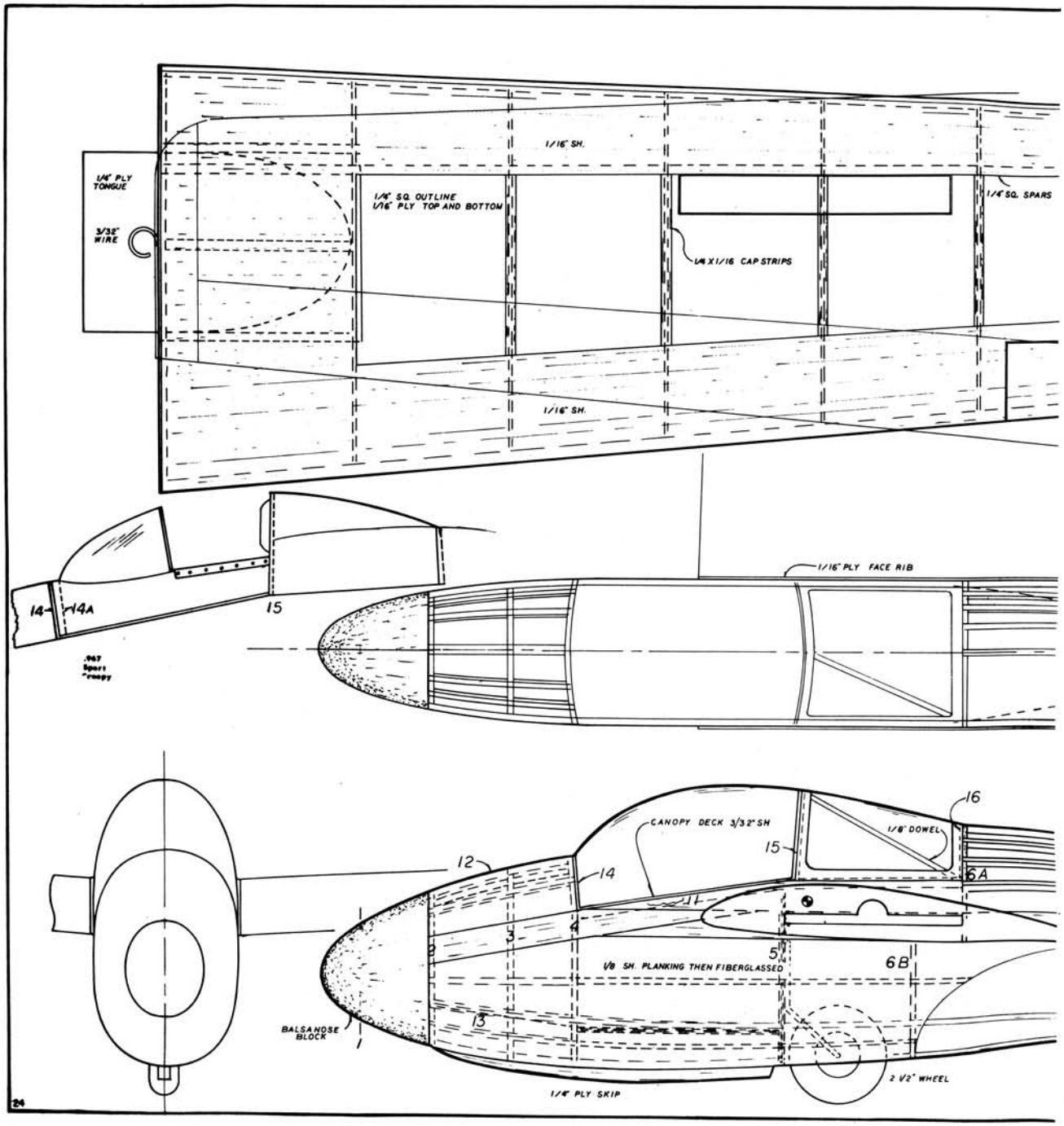
it is generally supposed the Schweizer Aircraft factory makes its payroll from glider building, such is not the case. They are sub-contractors for a number of aircraft manufacturers, and also turn out complete Grumman "AG-CATS." Bob Adair modeled the controline version of the "Ag-Cat" in the June issue of Flying Models.

The Schweizer 1-26 sailplane (not glider) is a very well known design. It is so well known that a "One Twenty Six" Association has been formed, and a yearly contest is held whereat only the 1-26 sailplane can compete. Presently this sailplane is offered in four different models, i.e., the dry kit, the standard kit, the uncovered sailplane and the ready-for-flight 1-26. The latter is priced at $3,395 F.O.B., Elmira, New York.

With such a thoroughly American background, Flying Models is proud to present a one-sixth scale model sailplane for the R/C builder. Further, it is possible to build and fly this model as a Scale Free-Flight, providing it is properly balanced at the C.G. location. There seems to be an ever-expanding interest in gliders and sailplanes, and so this design is bound to add to the pleasure of those who appreciate "silent wings."

The origin of this design is somewhat unusual. Dan Lutz, noted West Coast scale model builder became interested in slope soaring and built several R/C gliders. One was a modified Thermic 100 with pod and boom which flew consistently. Then he turned to R/C scale sailplanes and built a larger version of the 1-26 than presented here. It spanned 100 inches and was scaled $2\frac{1}{2}" = 1$ foot. When flown on reed equipment it was not quite as agile in the air as some gliders, due to the wing loading. The wing loading of his scale sailplane was close to one pound per square foot. Wing loading affects maneuverability, minimum flying speed, minimum sink and of course—safety. Though the full size 1-26 with an average man aboard has a wing loading of 3.2 lbs./sq. ft., the wing loading of a model sailplane should not exceed 15-16 oz./sq. foot, even for slope soaring.

About this time, Dan decided he need-



ed a proportional radio system and sold both his reed system and the big 1-26 sailplane to me. Not wanting this fine design to be lost, yet desiring a 1-26 in a smaller scale, Ira Achey, a draftsman and exceptionally fine model builder was contacted and he agreed to use Dan's data and construction methods and reduced this design to a one sixth scale sailplane. At that time there was little interest in such a large design, which is just the opposite nearly three years later . . . now everyone wants a twelve footer!!!

As with most designs there is a constant drive to improve the performance, looks, structural strength and sales appeal of the model. The real 1-26 was modified in 1965 with a vertical stabilizer in a swept configuration added, and in 1967 a sport canopy was offered. Both these modifications are shown on the plans. The bubble canopy is very difficult to duplicate in that it is a compound curve and must be formed by means of a vacuum forming machine. However, I have two molds and have been furnishing a vacuum formed canopy made from the newest Lexan material (which is nearly unbreakable) for $5.00 each, postpaid. The sport canopy can be fashioned from flat plate celluloid or butyrate sheet. It is possible to build the old style 1-26, or the latest up-to-date sailplane from the plans . . . so take your pick.

Slope soaring sailplanes are continually subjected to abuse through hard landings. Not all flights are made in

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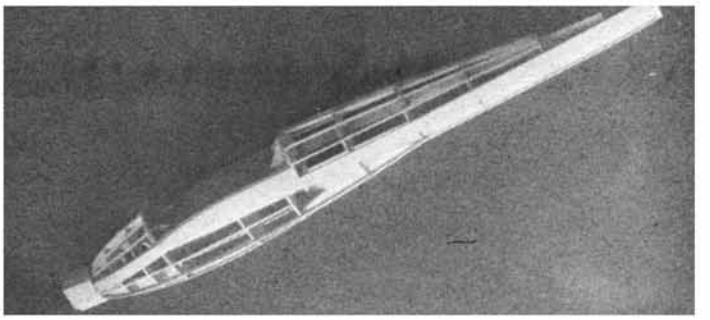
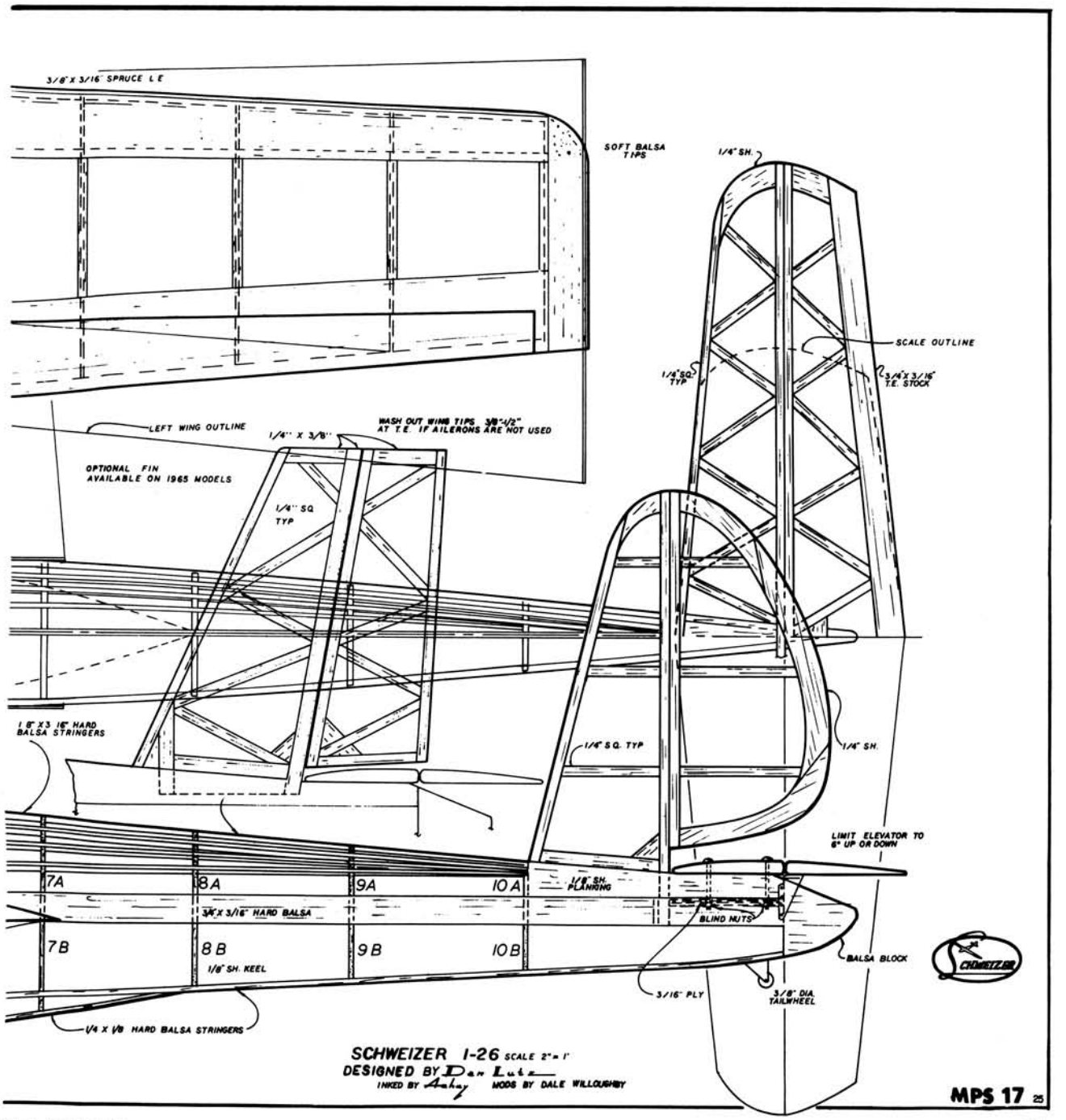
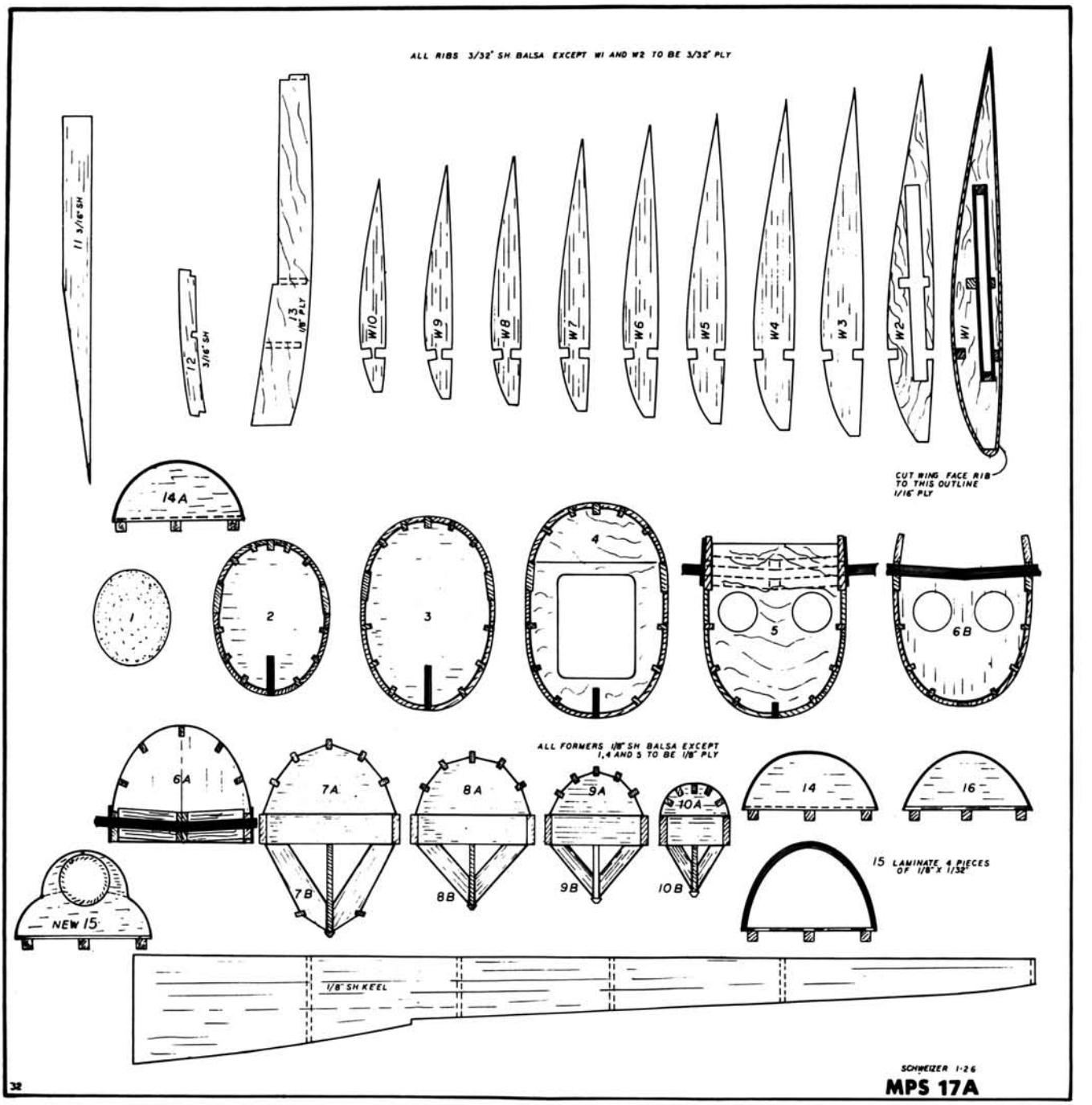




good lift conditions, nor all touchdowns made straight and level into the wind. So in building any R/C glider, build strongly. Selection of wood is an important factor in this sailplane design. Pick wood for the function it is to perform and leave out the soft balsa entirely. Note that formers #4 and #5 are cut from ⅛" plywood, and are tied together with a ¼" plywood skid and a 3/16" hard (or pine) balsa nose former (#12).

Begin construction by cutting all formers (shown full size) from hard ⅛" sheet, except #4 and #5 as noted. Then cut the plywood skid (#13) and #12. Cut and mark the former locations on the ⅛" sheet keel. Note that the two-piece plywood tongue, shown inserted into the right wing panel, fits between formers #5 and 6a and rests on #6b. Cut two each ¾" x 3/16" side strips. From the same piece of balsa cut two #11 sides and two nose stringers as shown on the side view of the fuselage. Prior to cementing to the formers, soak overnight in warm water and with rubber bands shape around former #4 on each side and bend to join former #1. Wait until dried thoroughly, then cement in place. If you have picked an exceptionally hard piece of balsa, relieve the stress by several saw cuts on the inside of the nose strips about half way through. Now cut the necessary spacers from ⅛" balsa



SCHWEIZER "1-26"

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shown just below formers #6 through #10. These spacers form the lower half of the fuselage.

Begin the assembly of the fuselage by marking the former positions on both side pieces made of 3/16" balsa. Now progressively cement spacers #6 through #10 to the sheet keel. Use a triangle to assure alignment. When dry, cement formers #6b and #6a to the framework, continuing toward the rear with formers #7b through 10b and cap the keel with a rock hard strip of 1/4" x 1/8". Next cement formers #7a through 10a to the top of the structure and when dry install the 1/8" x 3/16" hard balsa stringers. Next pre-cement the marked side strips and when tack-free, cement to the former spacers and tie in former #5 securely, holding with rubber bands. Set aside to dry completely, at least 24 hours.

Next cut the wing ribs from medium hard 3/32" balsa with the exception of W1 and W2, which are of 3/32" plywood. Also cut the wing tongue boxes from the same sheet of plywood. Notice the plywood is used for the top and bottom of the box while 1/4" hard balsa is cut to surround the wing tongue. If it is not clear, study and compare ribs W1 and W2, to understand the wing tongue and box construction. The wing tongue must fit snugly into the wing tongue box before it is installed in the wing root, and allow the proper distance for the plywood wing face rib, which is attached to the fuselage.

The assembly of the wing is conventional. No trailing edge stock is used. The "C" grain 1/16" balsa is cut 2 1/4" wide. The rib locations are marked on the T/C and then glued only to the dotted line. This allows a good firm joint at the trailing edge. We highly recommend the use of good quality spruce for the leading edge of each wing panel, and rock hard 1/4" square spars of equal weight for the wings. Add the top spar, the soft balsa tips and the wing tongue box before removing from the plans. When completely dry, add the balance of the balsa, making certain there are no warps in the wing. The leading and trailing edges are sheet balsa with capstrips completing the assembly.

Note the reinforced 1/4" x 1/4" balsa around the wing tongue box. Though not shown, the addition of several subribs on the top and bottom between ribs #1 and #2 will serve to strengthen this joint. Upon landing hard, or flipping inverted, this area takes a great deal of stress. The left wing is shown in faint lines and is constructed as prescribed for the right wing. When both are complete, sand well, fill holes and dents with Hobbypoxy "Stuff," and dope twice before applying a good grade of silk. The wings are held on with a doubled rubber band placed between two hooks screwed into the wing root ribs and when in flight, the upward pressure serves to keep them bound to the fuselage. The wing tongue-and-box method has been the means of saving many a wing during a crash, as it swings forward (or backward) upon impact.

Returning to the fuselage, cement the keel (#13) to formers #5, #4, #3, #2 and #1 at the same time. Former #1 is actually an oval shaped former with all the stringers notched into it. Glue in #12 and the two pre-bent nose strips. Allow to dry. Next join the two plywood wing tongues at the angle shown on former #6b and reinforce with a piece of Celastic or fiberglass cloth impregnated with resin. Pieces #11 are then added, which serves to strengthen the wing junction. Both the plywood root rib and #11 are cut to allow passage of rubber bands which hold the wing panels to the fuselage.

Now add the hard balsa (or pine) nose block and plank as shown with medium hard strips of 1/8" balsa. Sand to a smooth contour, retaining the shape of the nose of the full sixe 1-26 shown in the accompanying photo. Install the wheel and canopy platform, then sand the entire fuselage to shape, using coarse sandpaper, gradually changing to finer grades, and ending with 400 grit. If using for radio control, install the servos and pushrods prior to covering. Note: All R/C equipment is moved as far forward as the size of the system will allow, and this will save adding weight on the nose to balance at the C.G. Using 2-ounce fiberglass cloth, fiberglass the portion on the plans. No radio installation is shown, but only rudder and elevator controls are recommended, and will be sufficient for this scale sailplane. The total weight of the radio should not exceed 16 ounces for good performance.

Your choice of either type vertical stabilizer should pose no problem, as it is made of a combination of 1/4" balsa, as is the horizontal stabilizer. Note the horizontal stabilizer is fastened to the fuselage using blind nuts. Dowels look so out of place on a scale sailplane!

Watch for warps and steam them out as soon as discovered. The original model had 4° washout in each wing panel, achieved by doping the wings, placing the root ribs flat, and putting weights on to hold it down while a 1/4" x 1/4" strip was placed under the trailing edge. Washout allows the tip section to stall last, and makes a more stable sailplane when hitting gusting thermals. The final coat is the one to watch out for warps, as we found that nitrate dopes dry slower than butyrate dopes, at least the brand and mixture we used did, and necessitated leaving the wing under weights longer. With R/C gliders, there is no reason to use fuel-proof dopes and the nitrates cover better with less weight.

Balance this scale sailplane at the C.G. shown, even if it takes ten ounces of lead to do it! With this airfoil, it must move through the air and not linger near the stall point to retain stability. We suggest you trim it out by gliding it in tall grass initially. While this is the accepted method, as long as the C.G. is correctly located, I depend upon a good bluff and strong lift and then while airborne, trim it out with the proportional radio trim buttons. Admittedly, there have been times when I have hiked down to the sandy spot to retrieve a new glider, but not too often.

Good luck with a Scaler. May it give you many happy hours both in thermals and on the slope, it is a capable sailplane. Questions will be answered by sending a self-addressed long envelope to 14695 Candeda Place, Tustin, Calif., 92680.

. . . Dale Willoughby ●