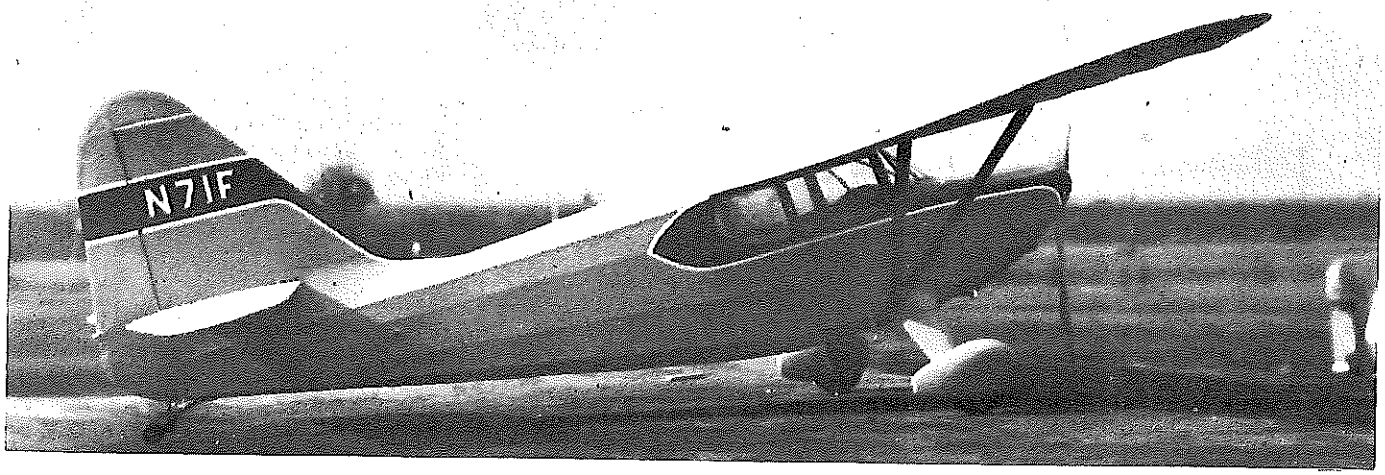


PHOTOS BY THE AUTHOR

STINSON VOYAGER 108-3

By A.P. "SPEED" WILSON . . . When the great Stinson series finally ceased to appear, it certainly went out with a flair . . . the 108's were classics, and the 108-3 was outstanding. This model is too!

• The Stinson Voyager 108-3 was the last of a long line of Stinson cabin airplanes. Some 5,500 of the 4-place 108 series were built in the late 30's and early 40's. It's docile, un-spinnable flight characteristics made it popular with private and business pilots. Many are still flying merrily in all parts of the world. It's ample dihedral, long nose, and large fin make it a fine choice for a model, and numerous versions have been built over the years. A large fin with a low dihedral can produce excellent directional stability, but at the price of spiral instability, especially in models where there is no pilot to prevent the heart-stopping spiral dive. The Voyager, however, has sufficient dihedral so that this disastrous tendency is no problem. Mine flew steadily and surely from its first flight. At 1 inch = 1 foot, the span is just short of 34 inches, a size large enough to perform well without being cumbersome to transport and handle.

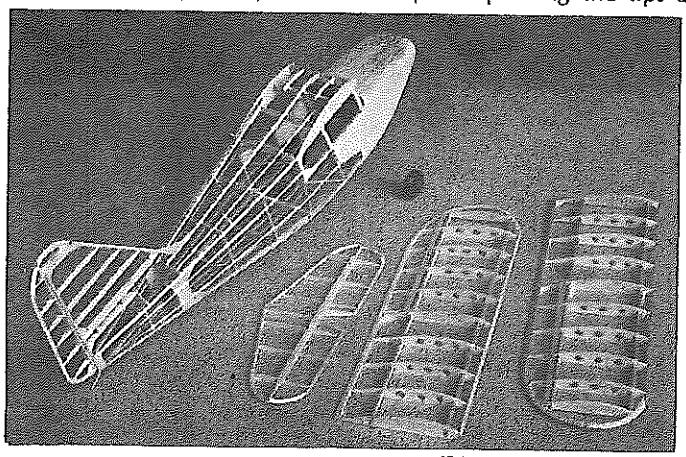
So, as customary, place the plans on your nice, flat building board and cover with waxed paper or plastic film. Taper the 1/8 square firm balsa longerons from the rear of the cabin area towards the tail. Pin them down onto the fuselage side view and glue in the upright pieces, reducing size toward the tail in keeping with the longerons. Wax paper or plastic film over the first side, then the second side is laid and glued on top of the first.

While the sides are drying, build the tail surfaces. Note that fin and rudder are separate, to allow rudder adjustment during tests.

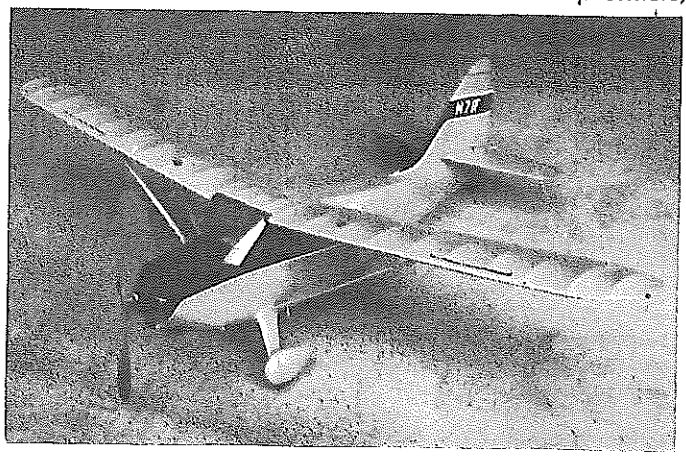
The stab and elevators are built in one piece, shaped, then the leading edge is cut at center and at the elevator balance locations. Keep the spar intact across the span. Don't forget the 1/32 gussets; they help prevent those unsightly wrinkles from forming in the covering.

The wing is built in two halves, one left, one right. Right? Right! Pin the notched trailing edge over the plan, slip the ribs over the spars to their approximate positions, then pin over plan and glue all joints. Glue on the leading edge. Now the tips are glued in, blocking and pinning the tips about 1/8 inch above the board except where they meet the trailing edges. The top aileron division sheet is glued in place now; the bottom one after the structure has dried and been lifted off the board. The wing strut mounting sheets are also glued in at this time. Round the leading edge; taper the trailing edge and tips. Sand nicely. Cut the trailing edge to form the aileron and gaps. A small groove is pressed or cut into the aileron division sheets, spanwise, to simulate the narrow wing-aileron gap.

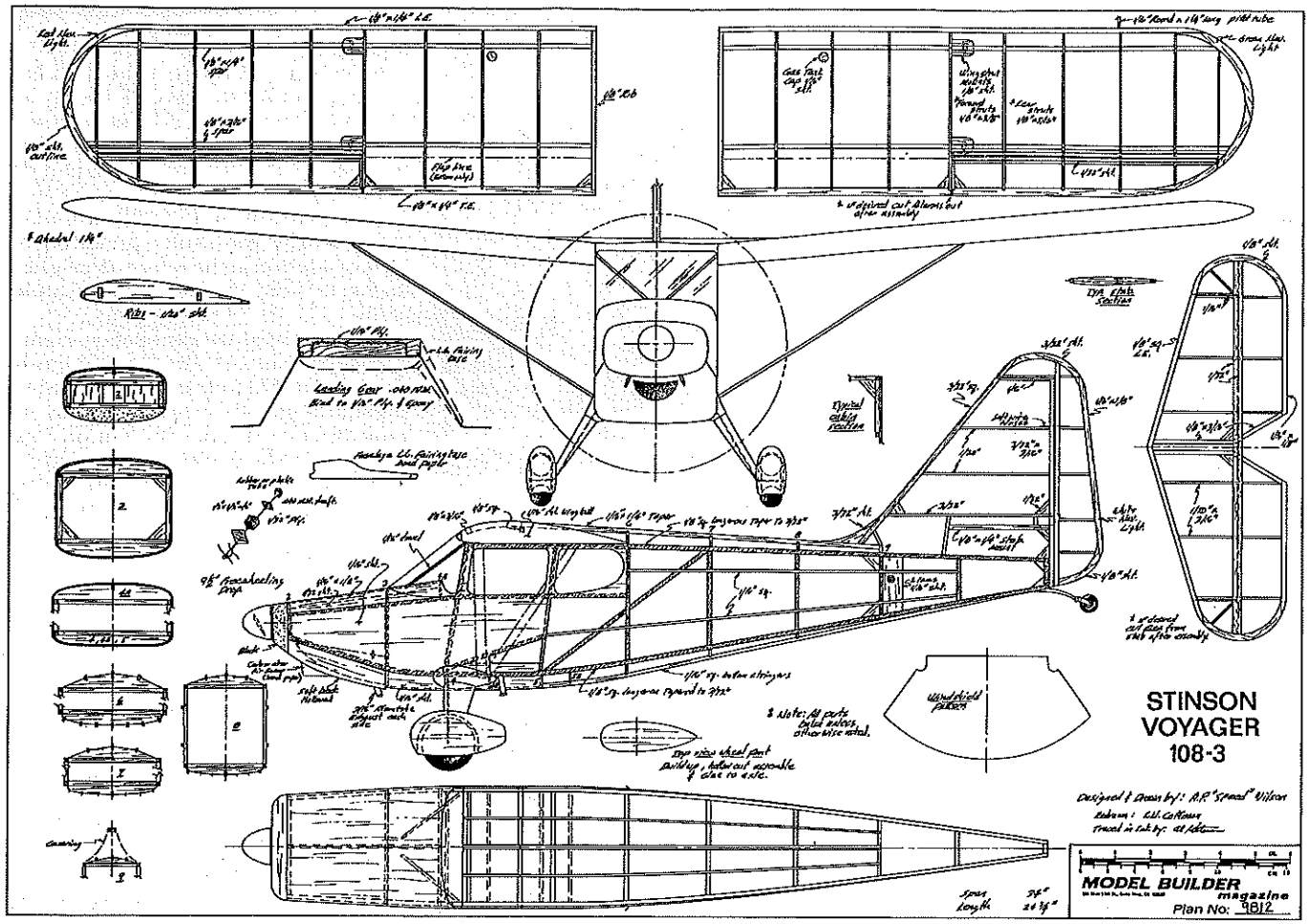
By this time the fuselage sides should have dried, so remove them from the board. Place them, cabin top down, on the board and glue in the cabin cross members, then the remainder, bringing the sides together at the tail. Length of cross members is shown in cross sections. Use a 90° triangle to keep the sides square. Again, don't forget the 1/32 gussets inside the cabin corners. Put in the forward cross members. When dry, remove and add nose and cabin 1/16 sheet sides. Add the cabin window frames. Add nose and cabin top formers,



The Stinson's bones layed out for inspection. Note lightening holes in ribs. Light structure.



Smooth flowing lines of a classic design. Came out near the end of a long line of famous aircraft.



FULL SIZE PLANS AVAILABLE — SEE PAGE 100

nose 1/32 sheet, wing butts, cabin top formers, and windshield cross member; then the three cabin top stringers. Do not add formers or stringers to fuselage bottom until after landing gear is glued in.

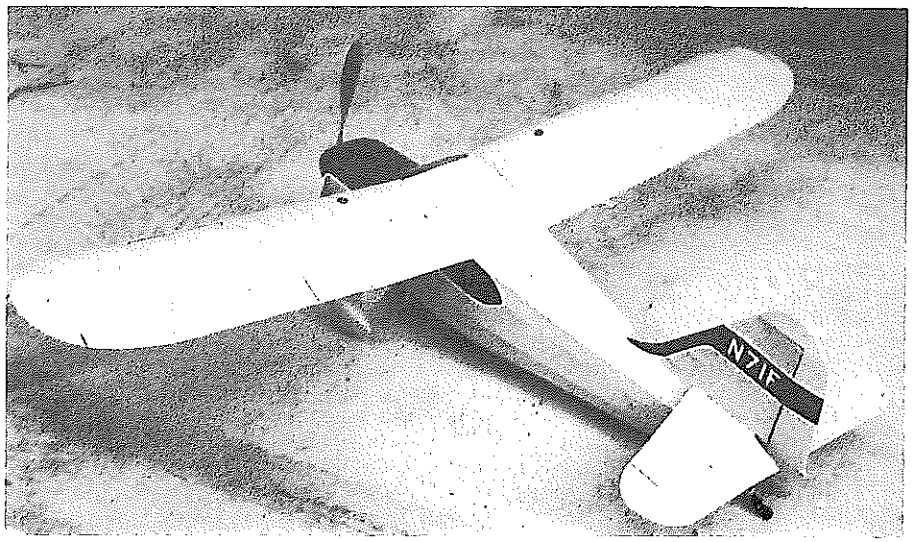
Tack glue the bottom nose block (soft), then the nose block (medium). Shape to proper contours. Remove the bottom nose block, hollow as much as you dare, then glue back in place to stay. Note that the nose block has a 1/2-inch square hole for the nose plug.

Bend the landing gear from .040 music wire, bind and epoxy to its 1/16 ply former, then glue into fuselage frame. Now, add the bottom formers and 1/16 stringers. Fill in between the bottom stringers back to the landing gear with 1/16 sheet. Add the rear rubber tube mounting sheet and gussets. Now the 1/16 side stringers. Another piece of 1/16 sheet is added flush between the stringers for the rubber tube mount. Sand all fuselage, wing, and tail frames smooth.

Glue the soft wire hinges into the fin spar. Attach the fin to the fuselage, making absolutely sure that it is perpendicular and straight. Add the stabilizer mounting pieces and former. When dry, cut the fin spar so that the stabilizer spar can be installed from the rear after covering. Do *not* add rudder at this point.

Make the nose plug of 1/2-inch square or build up from 1/8 sheet. Glue 1/32 ply for the prop shaft bearing to one end. Tack glue on other 1/32 ply bearing sheet at the aft end. This one can be moved to adjust the thrust line. Bend the winding/free-wheeling loop in the .040 prop shaft wire, insert through prop, washers, nose plug, and bend rubber loop in it. Slip a piece of plastic or rubber tubing over the rubber loop to prevent cutting the rubber. Usually a bit of down and right thrust is required. When happy that all framework is in order, sand lightly, dope, then sand again.

Now for the covering. I used lightweight silkspan. Wings and tail surfaces are covered dry, with the grain running spanwise. Fuselage is covered with wet tissue, grain length-wise, bottom first, sides, top. While the longeron-fin area is a bit tricky, if care with wet tissue is taken, a beautiful, curved, realistic appearing filet can be made. Cut a piece to cover (grain lengthwise) the longeron to stab mount and bottom rib of fin from tail post to just forward of the fin/fuselage filet piece. Then add top of fuselage, doping these two together at overlapped joint. Mine turned out better than I had dared hope. Do *not*



Dihedral is sufficient to overcome domination of huge fin/rudder area, but watch out for spiral instability, and cure with more dihedral, if needed.

cover rudder yet. Add 1/16 round windshield braces. When all is dry, give 2 or 3 coats of 50/50 thinned dope.

Install wheels (store-bought or self-built), pants (they hold wheels in place), streamlined gear strut fairings (solid soft or built up), then the fuselage/landing gear fairing strips of stiff paper. Glue these *only* to the fuselage. With body putty (or your favorite fillet material), form the fairing to fuselage. This should allow the gear to give a little within the gear/fuselage fairing. When dry, sand smooth, dope, sand, fill grain and dope until smooth as you like. Be sure the wheels turn freely.

Slip the stabilizer onto its mount, placing the spar in the gap you left in the tail post. Glue lightly, as test flights may dictate some change in its setting. *Now* install the uncovered rudder, gluing the soft wire hinges to it so it can be adjusted if desired. Cover and dope the rudder. Form and dope the streamlined wing struts, leaving them longer than necessary for now.

Color dope and decorate to your taste. Naturally, if you used colored tissue, do only the decorating if you wish. Add rear, then forward cabin side windows, then windshield. The pattern shown may require slight alteration to fit your plane. I cut the windows to fit their individual openings, then glued them in flush with fuselage sides.

Add fuselage details such as cowling lines and latches, door hinges, steps, tail wheel, exhaust pipes, carburetor scoop, and paint.

Now glue wings to their fuselage mounts, cutting to proper length and gluing in the forward strut to obtain proper dihedral and alignment with fuselage and tail references. When dry, cut and glue in rear struts, using them to eliminate any undesired warps in the wing. Usually, wash-out is preferred, but a bit of wash-in in the left panel might be useful to hold the left wing up in left turns.

Add finishing details such as navigation lights, gas tank caps, and pitot tube. Lube and install four loops of 1/8 rubber slightly longer than prop hook to rear tube distance. Balance the Stinson about 1 inch aft of the rear spar by adding a bit of weight, usually to the nose, and you're ready to head for your favorite tall-grass flying field.

First free glide. It should be smooth and steady, with perhaps a slight left turn. If stalls occur, make any of the following adjustments:

1. Add weight to nose.
2. Increase positive stabilizer incidence (lightly glued, eh?)
3. Increase turn by rudder off-set as desired.

To counteract diving tendency, if any, make adjustments in opposite directions. Then wind in a few turns and try the power flight characteristics. If model tends to stall under power, add down and/or side thrust to obtain slight turn in climb. Increase winds gradually, adjusting any or all of these settings as you proceed. Often times, the glide after rubber run-out may be quite different from that when hand launched. Amount of rubber may also require change to give best performance. Adjust power and/or glide regimes until your Voyager is performing like a veteran. HAPPY FLYING! •

Soaring . . . . . *Continued from page 41*

narrow strip of sand traditionally devoted to "dress optional" sun bathing (Black's Beach). It takes real skill to fly the sailplane to a safe landing 350 feet below your vantage point. You "S" back and forth, allowing the plane to descend slowly and steadily until you see its shadow on the sand. The distance between the plane and its shadow tells you its altitude. You spot a sparsely populated area and shout in the hopes that those on the beach will hear the warning and watch out for the plane. A good pilot can touch down smooth as silk.

A few weeks ago, a guest from Los Angeles was forced to make such a remote landing. Then there's the scramble down the cliff to retreive the plane and, of course, the breathtaking climb up what is the equivalent to a thirty-five story building. I've heard it said that some of our younger pilots fly in light lift in the hope of gaining an excuse to go down to the beach. Of course, this only occurs on warm sunny